Congress of the United States
Washington, DC 20515

September 11, 2015

The Honorable Governor Jerry Brown
State Capitol, Suite 1173
Sacramento, CA 95814

John Laird, Secretary
California Natural Resources Agency
1416 Ninth Street, Suite 1311
Sacramento, CA 95814

The Honorable Sarah "Sally" Jewell, Secretary
United States Department of the Interior
1849 C Street, NW, Room 6156
Washington, D.C. 20240

The Honorable Penny S. Pritzker, Secretary
United States Department of Commerce
1401 Constitution Avenue, NW
Washington, D.C. 20230

The Honorable Regina A. McCarthy, Administrator
United States Environmental Protection Agency
1200 Pennsylvania Avenue, NW, Room 3000
Washington, D.C. 20460

Dear Governor Brown, Secretaries Laird, Jewell and Pritzker, and Administrator McCarthy:

We write to thank you for providing a 60-day extension to October 30, 2015 to the comment period on the recently released Bay-Delta Conservation Plan (BDCP)/California "WaterFix" and the partially Recirculated Draft Environmental Impact Report and Supplemental Draft Environmental Impact Statement (RDEIR/SDEIS) and to urge that you provide an additional 60-day extension to December 29, 2015.

As you know, the RDEIR/SDEIS contains substantial changes from the initial public draft and amounts to nearly 8,000 pages of additional documentation. Given the size and complexity of the documents, particularly in light of the 40,000 pages associated with the original draft EIR/EIS which provides the context and foundation for this latest proposal, we believe the current public comment period is inadequate and an additional 60 days beyond the current review period is warranted.

Thank you for your consideration.

Sincerely,

JEFF DENHAM
Member of Congress

JOHN GARAMENDI
Member of Congress

DOUG LAMALFA
Member of Congress

JARED HUFFMAN
Member of Congress

PRINTED ON RECYCLED PAPER

TOM MCCLINTOCK
Member of Congress

MIKE THOMPSON
Member of Congress

DORIS MATSUI
Member of Congress

AMI BERA
Member of Congress

JERRY MCNERNEY
Member of Congress

MARK DESAULNIER
Member of Congress

ERIC SWALWELL
Member of Congress

To: Jared Blumenfeld (BLUMENFELD.JARED@EPA.GOV)[BLUMENFELD.JARED@EPA.GOV]
From: Kopocis, Ken
Sent: Fri 3/13/2015 5:27:28 PM
Subject: E&E BDCP story

From today's.

3. WATER POLICY:

Army Corps joins federal chorus opposing massive Calif. replumbing plan

Debra Kahn, E&E reporter

Published: Friday, March 13, 2015

The Army Corps of Engineers is among the federal agencies strongly criticizing California's massive plan to retool its main water delivery hub, according to comments obtained under a Public Records Act request.

The Bay Delta Conservation Plan (BDCP), in the works for the last eight years, would re-engineer the Sacramento-San Joaquin River Delta so that water would be delivered to the state's arid central and southern regions primarily via two large tunnels underneath the delta, rather than routed through the delta to pumps at the southern end.

The Army Corps filed comments last July saying that a draft version of the plan did not include enough information to determine whether it would comply with the National Environmental Policy Act or the Clean Water Act's rules governing discharges into waters of the United States.

The draft environmental impact statement and report, required under state and federal law, "is not sufficient at this time in meeting the Corps' needs under the National Environmental Policy Act (NEPA) and 404 (b)(1) Guidelines," wrote Col. Michael Farrell, commander for the corps' Sacramento District.

He cited a host of deficiencies, including an incomplete description of the project, incomplete analysis of the effects on federal navigation and flood control projects, and a lack of specificity regarding the effects on waters of the United States and how to compensate for them.

The documents were released yesterday by Friends of the River and Restore the Delta. The groups have loudly opposed the plan on the grounds that it would take too much

water from the delta and that the work of writing the plan has been done out of the public eye, despite open houses around the state and two public comment periods, the latest spanning 228 days.

"Since the BDCP agencies are not airing both sides of the issues -- in the traditional American way -- Friends of the River is now doing the government's job of informing, as opposed to propagandizing, the public," said Bob Wright, FOR's senior counsel.

The aim of the BDCP is to increase the reliability of water deliveries, which have dwindled due to protections for endangered and threatened fish that inhabit the delta and are pulled into the pumps. The 50-year plan would also include restoration of thousands of acres of delta habitat, all for an estimated cost of $24.75 billion in 2012 dollars.

A spokesman for the state Department of Water Resources, the main agency in charge of the BDCP, pointed to the upcoming release this spring of a revised version of the plan, which he said would take the comments into account. After the new version of the draft plan is released for public comment, the state is aiming to finish the final version of the plan this year, as well.

The recirculated draft plan "will show very clearly the impact of the public comments," Richard Stapler said in an email. "Once the documents are final, we will publish all comments received in both circulation periods. Comments from both periods are public records and can be requested at any time."

The federal agencies would have to sign off on the plan's compliance with the National Environmental Policy Act, Endangered Species Act, Clean Water Act, and Rivers and Harbors Act, among other laws. The Army Corps, which shares jurisdiction over Clean Water Act permitting with U.S. EPA, detailed more than 100 issues with the draft plan in its July comments, on top of more than 400 previous criticisms the corps had identified in an earlier draft.

Many of the corps' comments highlighted parts of the plan that it found too broad, such as the conclusion that two proposed dredging projects in the Sacramento River and San Francisco Bay did not require analysis under NEPA.

"These ship channels are significant hydrologic and economic features of the Delta, and intersect with the BDCP in numerous ways, including overlapping project mitigation and BDCP restoration areas, overlapping dredged material disposal and BDCP restoration areas, cumulative changes to salinity in the Delta, and the potential for beneficial reuse of dredged material," staff wrote.

One comment faulted an estimate of 15,876 cubic yards of waste removal for being too specific, however.

"Respectfully express skepticism at the level of exactness here when the document gives all other dimensions in very broad ranges," agency staff wrote.

EPA had published its own comments critical of the plan last year, the day after California announced it would withdraw its draft plan and resubmit it in 2015 (*Greenwire*, Aug. 29, 2014). Other agencies' comments had not been made public until now.

The State Water Resources Board, which regulates water rights and water quality, also issued extensive comments citing the lack of consideration of how reservoirs will operate under climate change and undue optimism about the effectiveness of habitat restoration and other measures.

"Significant negative impacts tend to be discounted and positive results tend to be inflated in the EIR/EIS and the BDCP," environmental program manager Diane Riddle wrote. "The assumed effectiveness of various conservation measures, for example, appear to be overly optimistic, especially with regard to the effectiveness of habitat restoration, where it is assumed that habitat restoration will be 100 percent effective."

Democratic members of Congress from Northern California also sent a letter highly critical of the plan.

"[T]he fatal flaws that we and others have identified -- repeatedly -- remain uncorrected in the documents available for comment, which confirms that the plan is legally deficient under NEPA, CEQA [California Environmental Quality Act], and several other statutes, and represents the wrong direction for the people of California," wrote Reps. Jared Huffman, George Miller, Mike Thompson, Doris Matsui, John Garamendi, Barbara Lee, Jackie Speier and Jerry McNerney.

Click here for the public comments.

Ken Kopocis

Office of Water

U.S. EPA

(202) 564-5700

To: Symmes, Gregory[GSymmes@nas.edu]
Cc: Jacobs, Jeffrey[JJacobs@nas.edu]; Jones, Dawn[DJones@nas.edu]; Penman, Crystal[Penman.Crystal@epa.gov]
From: Kopocis, Ken
Sent: Sat 10/4/2014 12:41:15 PM
Subject: RE: great to meet you

Thanks. We should find a time.

Adding my scheduler, Crystal Penman.

Ken

From: Symmes, Gregory [mailto:GSymmes@nas.edu]
Sent: Friday, October 03, 2014 10:48 AM
To: Kopocis, Ken
Cc: Jacobs, Jeffrey; Jones, Dawn
Subject: great to meet you

Dear Ken-

It was great to meet you at the ECOS meeting in Santa Fe. In addition to connecting with state and EPA leaders like yourself, the meeting was an excellent opportunity for me to hear how the states and EPA are working together to address important issues such as climate change, nutrient pollution, and hydraulic fracturing.

I am following up, as we discussed, to request a time when Jeff Jacobs (Director of the Academy's Water Science and Technology Board) and I could visit with you. We'd like to get your feedback on past National Academy of Sciences work for EPA (e.g., which activities were most useful, which were not), brief you on ongoing Academy activities on water-related issues, and discuss several new initiatives that may be of interest to you.

As you may know, the Division on Earth and Life Studies, which I head, is one of six divisions of the Academy's National Research Council. DELS is comprised of 12 boards (see http://dels.nas.edu/ for more about DELS), including the Water Science and Technology Board. Some of WSTB's recent reports that were sponsored entirely or in part by EPA include: Review of the EPA's Economic Analysis of Final Water Quality Standards for Lakes and Flowing Waters in Florida (2012), Water Reuse: Potential for

Expanding the Nation's Water Supply through Reuse of Municipal Wastewater (2012), and Improving Water Quality in the Mississippi River Basin and Northern Gulf of Mexico: Strategies and Priorities (2010).

The WSTB also has carried out, and continues to carry out, a wide range of studies on water-related issues at the request of other agencies, including recent reports on Reducing Coastal Risks on the East and Gulf Coasts (2014), Progress Towards Restoring the Everglades: The Fifth Biennial Review (2014), Delta Waters: Research to Support Integrated Water and Environmental Management in the Lower Mississippi River (2013), Alternatives for Managing the Nation's Complex Contaminated Groundwater Sites (2012), Sustainable Water and Environmental Management in the California Bay-Delta (2012).

Jeff and I look forward to having an opportunity to discuss these and other topics with you.

Please let me know if you are open to such a meeting and I'll ask my assistant Dawn Jones to follow up with your office to identify a time.

Cheers,

Greg Symmes

Gregory H. Symmes, Ph.D.

Executive Director

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To: Wynn, Renee[Wynn.Renee@epa.gov]
From: Kopocis, Ken
Sent: Tue 9/16/2014 9:44:19 PM
Subject: Fwd: CQ WEEKLY – IN FOCUS: Water Woes Turn Federal (UNCLASSIFIED)

Here is the drought story I showed you.
See, I didn't forget.

Ken Kopocis
Office of Water
US EPA
202-564-5700

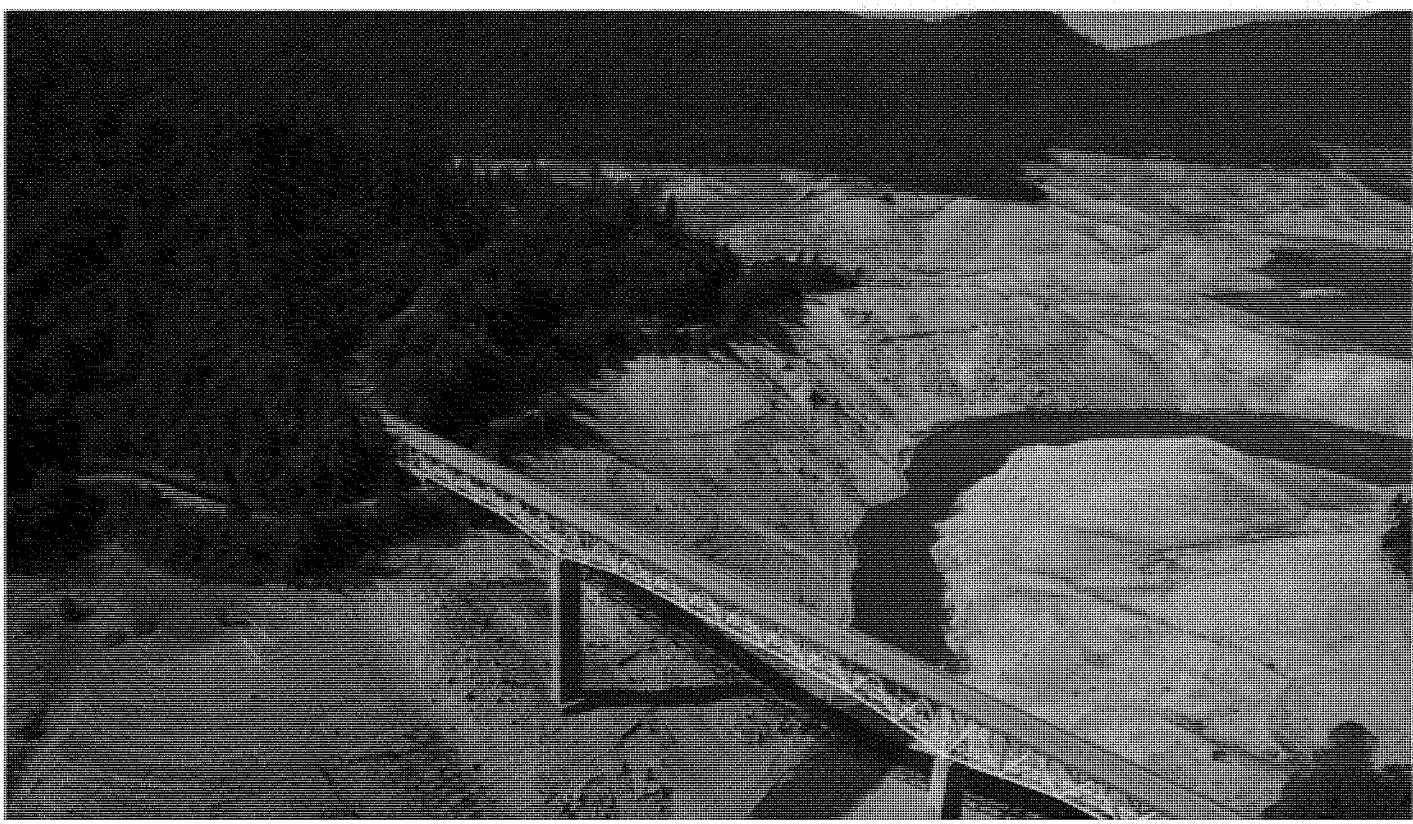
Begin forwarded message:

CQ WEEKLY – IN FOCUS
Sept. 15, 2014 – Page 1170

Water Woes Turn Federal

By Georgina Gustin, CQ Staff

On a drought map of the United States, California appears as an angry red smear, its agriculturally abundant Central Valley swallowed completely by a deep maroon signifying "exceptional" drought conditions.



DROUGHT'S TOLL: Water levels at California's Lake Oroville, in the Sierra Nevada foothills, in July 2011 (top) and last month. It is at 32 percent of capacity.(TOP: PAUL HAMES/CALIFORNIA DEPARTMENT OF WATER RESOURCES; JUSTIN SULLIVAN/GETTY IMAGES)

The map reflects a worsening reality on the ground. The state is enduring its third year of a historic drought that's forced farmers to abandon fields and pay exorbitant rates for water to quench what remains. Cattle carcasses litter cracked, brown pastures. Wells are going dry. At the edges of their fields, farmers are planting signs that say, "Pray for Rain."

The state's water woes are nothing new, of course. Arguments over water rights and regulations are entrenched in California's history and lore. But they've remained, for the most part, a West Coast problem — until recently.

The Central Valley produces roughly half of all U.S.-grown produce, and while the drought has yet to have much effect on food prices, chances are it will next year. That possibility has gotten the attention of Congress, which has waded deeply into the complexities of the state's enduring water battle — a fight that pits agricultural interests against environmental ones, and the fates of farmers against the survival of endangered species. Negotiations continue on legislation, and there are signs that farmers could come out the winners, though a deal is unlikely before this year's midterm elections.

Earlier this year, California faced its worst drought on record. Rains in March improved the situation a little, but 2014 is still the third-driest year on record, exacerbating already parched conditions, thanks to two other prolonged droughts during the past two decades. Reservoirs, already low, are running even lower. Snowpack in the Sierras, which provides as much as a third of the state's water, is at a fraction of its normal level after minimal snowfalls during the past three years. Federal and state water projects have cut down on surface water deliveries to farmers, who use about 80 percent of the state's developed water supply.

Those who can get permits are drilling new wells, venturing farther downward into dwindling reserves, and in some cases extracting more than can be replaced. The threat of wildfires looms. The ground in some areas is actually sinking under farmers' plows, continuing a decline that has seen the land subside by as much as 30 feet in some areas.

Gov. Jerry Brown declared a drought emergency in January, asking residents to voluntarily reduce water consumption by 20 percent, something critics say hasn't worked. The state's water awareness campaign, Save Our Water, this summer released a public service announcement featuring pop songstress Lady Gaga. That didn't sit well with some Californians who don't care for finger-wagging from a native New Yorker. In July, the state's first-ever emergency water conservation mandates took effect for urban areas. They prohibited certain outdoor water uses and triggered contingency plans by local water agencies, including restrictions on irrigation.

A Dry State

California's long-fought water wars ha escalated with the extreme drought.

DROUGHT KEY

- Moderate
- Severe
- Extreme
- Exceptional

EPA-HQ-2016-004924 ED_000757_000009649-00004

At the state level, the Legislature in August approved a $7.5 billion water bond that will go on the November ballot. It will focus on groundwater management and water storage projects, the latter being a goal of Central Valley agriculture interests. A package of three bills to regulate groundwater — which, to the surprise of many, the state doesn't currently require — passed at the end of August. Brown is expected to sign the bills.

The state's Central Valley Republicans have long said groundwater management could subvert property rights. The California Farm Bureau fought against the bills, but ultimately lost out to urban and environmental interests.

"California's pump-as-you-please groundwater policy hurts everyone," says Kate Poole, an attorney with the Natural Resources Defense Council. "Wells are going dry when we need groundwater the most, because it has been overpumped in wetter years."

A Water Shuffle

California's water dynamics, generally speaking, involve bringing water from the mountains and rivers in the north to urban areas in the south and to the fertile but arid Central Valley through a complex system of canals, tunnels and reservoirs. These deliveries are largely managed through the federal Central Valley Project and the state-run State Water Project. Both also distribute water from the confluence of the San Joaquin and Sacramento river deltas with San Francisco Bay, pumping it southward.

This delivery system is further complicated by a water rights plan in which senior water rights holders — those that secured rights before 1914 — have priority over junior rights holders, which include some of the major agricultural concerns in the Central Valley. During this year's drought, water allocations to junior rights holders have been slashed, in some cases to nothing.

A major shift in management — one that further divided both state and congressional lawmakers — came in 1992 with the Central Valley Project Improvement Act, which attempted to balance demand for water with fish and wildlife restoration by dedicating a certain amount of water to wildlife habitats. The act led to yet another round of quarrels between agricultural interests and environmental groups.

In an attempt to smooth things over, the state brought together 15 state and federal agencies, which signed on to an agreement known as the Bay-Delta Accord, to develop water quality standards and coordinate state and federal projects with the goal of restoring the delta estuary.

At roughly the same time, listings under the Endangered Species Act started to rise as drought conditions forced more pumping from the north to the south. Subsequent court rulings that forced the diversion of water for species listed under the act raised agricultural and Republican ire. GOP lawmakers refer to the current drought as a "man-made" problem, blaming the Obama administration for a 2009 decision that diverted water for the Delta smelt, a small fish.

In February, Rep. David Valadao, a Central Valley Republican, introduced a water bill for the Sacramento-San Joaquin Valley, which would restore water deliveries agreed to in the Bay-Delta Accord and would amend the Central Valley Improvement Project. It would give contractors within the Central Valley Project more flexibility in transferring water and would stop the implementation of another law, the San Joaquin River Restoration Settlement Act, effectively lifting restoration requirements for fish habitat. The measure passed the House by a vote of 229-191.

Environmental groups blasted the bill, calling it a vehicle for permanently repealing environmental

laws and pre-empting state laws, rather than a temporary drought fix. Among other provisions, the bill would pre-empt state laws that require stronger protections than those required by the Endangered Species Act. The Obama administration has said it strongly opposes the bill.

"It's basically an attack on environmental rights across the board," Poole said. "It tries to lift all sorts of fisheries protections; it overrides water laws."

On April 1, California Democratic Sen. Dianne Feinstein introduced her own bill, the Emergency Drought Relief Act. Like the House bill, it would provide expedited water transfers to certain areas, but at least in its original form wouldn't lift environmental requirements. It would, however, force agencies to act on water transfer permits within 30 days, potentially reducing delivery delays. The bill passed by unanimous consent in May.

Urging Conservation

In August, Feinstein and her fellow California Democratic Sen. Barbara Boxer, along with Democratic Reps. Grace F. Napolitano of California and Peter A. DeFazio of Oregon, introduced legislation to promote and provide incentives for water conservation practices and infrastructure. "This bill," Feinstein said in a statement, "complements the Emergency Drought Relief Act, which we are currently negotiating with the House, to help California and the West confront this and future droughts."

Feinstein and Boxer, a co-sponsor of the drought bill, have repeatedly said they won't waive environmental laws under the bill, which comes as heartening news to environmental groups. Negotiations, both sides say, picked up before the August recess, after a July visit to Washington by California Secretary of Food and Agriculture Karen Ross, who urged the state's chronically divided delegation to "work together for a long-term solution."

Over the August recess, negotiators worked toward resolving differences. "The House and Senate have passed very different proposals and we continue to work in good faith," the House Republican delegation said in a statement. "Progress has been made but more work remains."

Feinstein and House Majority Leader Kevin McCarthy, along with a handful of his fellow California Republicans, are said to be the top negotiators — and if they can reach agreement, given their respective political heft, a bill might have a chance of becoming law. Even before Feinstein's bill passed, Republicans said they wouldn't touch it if it included any new money — and the version that ultimately passed the House cut $300 million from the drought relief effort. Meanwhile, Feinstein, who has considerable support from agricultural interests, needs to keep Boxer, a longtime environmental champion, on board, even as some environmental protections might be stripped from the final bill.

A recent version of the legislation circulating among staff members suggests that any deal heading to conference may indeed put agricultural interests before environmental ones. But even in the unlikely event that a bill is signed into law this year, it would come too late to trigger water deliveries for farmers. Given that Congress only has a few working weeks left before November, the legislation is likely to be pushed into 2015.

With predictions for another dry year — and the strong possibility of a Republican-controlled Senate — the Chinook salmon and Delta smelt could be left out to dry next year. Farmers, on the other hand, might get some very welcome relief from Congress.

Drought Series Part 1: This is the first in a series of articles looking at the impact of the drought in California and the Plains states.

Source: **CQ Weekly**

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Classification: UNCLASSIFIED
Caveats: NONE

To: Bathersfield, Nizanna[Bathersfield.Nizanna@epa.gov]
From: Kopocis, Ken
Sent: Mon 6/2/2014 3:38:05 PM
Subject: FW: Briefing Paper: R9's Bay Delta Conservation Plan
Bay Delta Conservation Plan Draft EIS Update for June 3 5_30_14.docx

Per our discussion.

From: Martynowicz, Trina
Sent: Friday, May 30, 2014 10:40 PM
To: Bromm, Susan; Rader, Cliff; Kopocis, Ken; Giles-AA, Cynthia; Blumenfeld, Jared; Anderson, Denise
Cc: Hagler, Tom; Hanf, Lisa; Johnson, Kathleen; Goforth, Kathleen; Quast, Sylvia; Skophammer, Stephanie; Zito, Kelly; Blumenfeld, Jared; Gaudario, Abigail; Diamond, Jane
Subject: Briefing Paper: R9's Bay Delta Conservation Plan

Please see the briefing paper attached for Bob Perciasepe's meeting this Tuesday, June 3rd with the Deputies from other Federal Agencies on Region 9's Bay Delta Conservation Plan. Please let me know if you have any questions or need anything else. Thank you!

Trina Martynowicz
Special Assistant to the Administrator
Pacific Southwest Region 9
U.S. Environmental Protection Agency
415-972-3474
Martynowicz.Trina@epa.gov

To: Johnson, Kathleen[Johnson.Kathleen@epa.gov]
From: Kopocis, Ken
Sent: Sat 5/3/2014 12:04:07 PM
Subject: RE: Bay Delta: Scientists' Critiques

Thanks for your help.

From: Johnson, Kathleen
Sent: Friday, May 02, 2014 7:59 PM
To: Kopocis, Ken
Cc: Bromm, Susan; Rader, Cliff; Goforth, Kathleen; Blumenfeld, Jared; Diamond, Jane; Vendlinski, Tim; Skophammer, Stephanie; Hanf, Lisa; Hagler, Tom
Subject: Bay Delta: Scientists' Critiques

Ken,

As you requested during our BDCP call earlier this week, please find attached the recent independent scientists' critiques of the BDCP and DEIS that we mentioned during the call. The two Word documents are (1) a summary of those critiques, and (2) a summary of the comments submitted by state and federal agencies – including the lead federal agencies – on the Administrative Draft EIS that we reviewed last year. Many of the substantive issues raised in the ADEIS review remain in the DEIS. Please let me know if you have any questions or if we can provide you with other relevant information. Thanks.

Kathleen H. Johnson

Director, Enforcement Division

U.S. EPA - Region 9

75 Hawthorne Street ENF-1

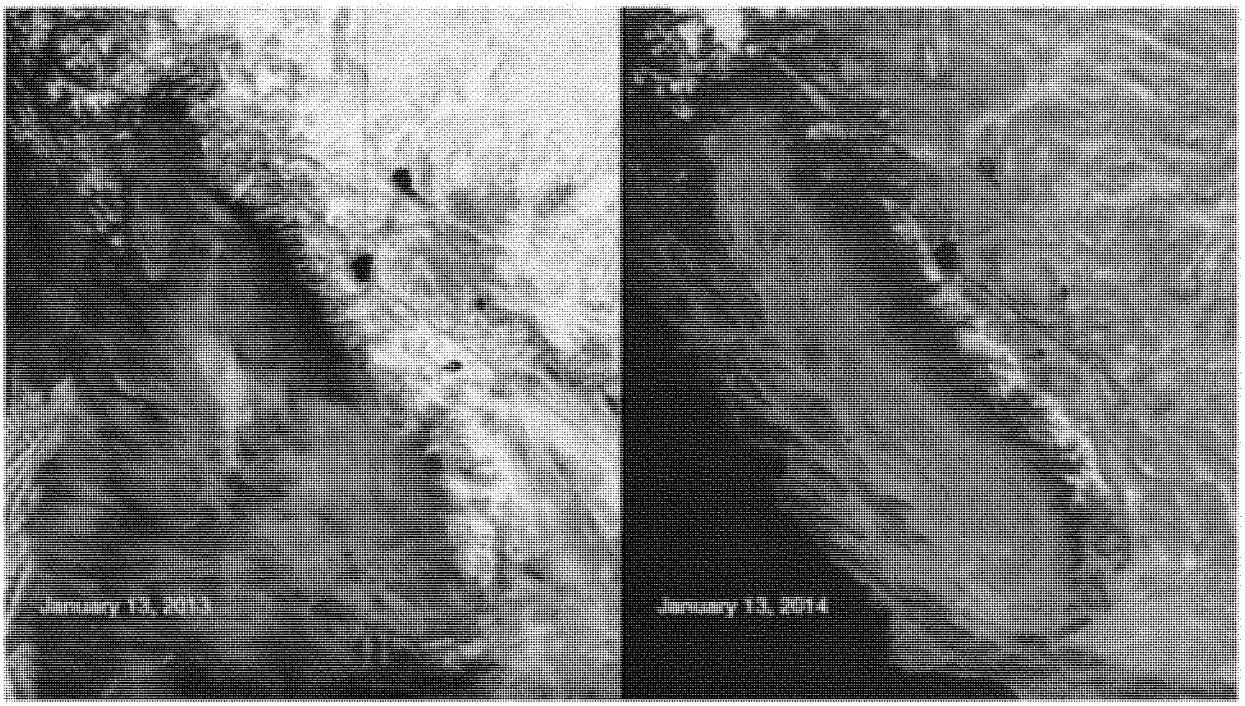
San Francisco, CA 94015

415/972-3873

johnson.kathleen@epa.gov

The Bay Delta by the Numbers

- Largest estuary on the west coast of the Americas with ~800 species flora & fauna.
- The watershed comprises 40% of CA's surface area (153,000 km^2).
- Most of the rain and snow falls in California on just 5-15 days/year.
- 75% of the precipitation occurs in N. CA while 80% of the demand exists in S. CA.
- 50% of CA's runoff flows toward the Delta.
- The federal Central Valley Project (CVP) and the State Water Project (SWP) form the backbone of CA's water supply infrastructure and rely on the Bay Delta ecosystem.
- Up to 65% of the freshwater flowing to the Delta is diverted to consumptive uses (~7.5 million acre feet, MAF).
- The snow-capped Sierra Nevada serves as CA's best water storage "reservoir" because it slowly releases ~15 MAF during the warm spring and summer seasons.
- 60% of CA's "developed" water supply originating as Sierra snowpack could diminish by 80% by the year 2100 due to climate change.
- Net use of "developed water": 62% agriculture; 16% municipal; 22% environmental.
- Drinking water for 27 million people.
- Irrigation water for 3 million acres of farmland that produces 50% of the USA's fruits & vegetables, 20% of the Nation's milk, and a $27 billion agricultural sector (2% of CA's economy).
- The Regional Water Board (Central Valley) has listed the waters of the Delta as impaired for heavy metals, pesticides, and invasive species per CWA §303(d).
- 90 native and introduced species of fish occur in the Delta; populations of all the native fish are in decline and several have been federally-listed as threatened or endangered.
- The islands of the Western Delta have subsided by up to ~25 feet due to conversion to farming and peat oxidation, and this has made the resulting levees vulnerable to collapse.
- The San Joaquin Valley floor has subsided by up to ~30 feet due to groundwater overdraft, and this represents a permanent loss of aquifer storage capacity.
- In 2012, EPA Region 9 issued a 7-point Bay Delta Action Plan focused on improving water quality and restoring aquatic resources.



This is a picture of CA from space showing lack of snow in Sierra Nevada Range where CA gets most of its water.

California's Major Water Projects

The California Water Plan Update BULLETIN 160-98

BAY DELTA CONSERVATION PLAN (BDCP)

WHAT IS THE BDCP AND WHO IS INVOLVED?

- The BDCP calls for the construction of twin tunnels 35-miles long that would draw water directly from the Sacramento River and deliver it to the existing pumping facilities in the South Delta. The BDCP is a proposed Habitat Conservation Plan ("HCP") to support a 50-year Incidental Take Permit under the federal Endangered Species Act, and a Natural Communities Conservation Plan under the CA Endangered Species Act.

    - Currently, freshwater is drawn from the Sacramento River in the North Delta and moved southward through a complex maze of channels to huge federal and State pumping plants located in the South Delta. The quality of this water can be degraded along the way due to salinity intrusion from the Bay, inputs from agricultural and municipal discharges, etc. Millions of eggs and larvae of native and introduced fishes can be entrained in the pumping facilities. Also, the 1,100 mile levee system comprising backbone of Delta infrastructure make the State water supply vulnerable because the levees could collapse in the event of an earthquake or flood.

- A joint DEIS/DEIR regarding the BDCP, issued under NEPA/CEQA, is currently out for public review; comments were due April 14; we understand the lead agencies will soon announce a 30-day extension.

- The lead federal agencies are FWS, NMFS, and BOR; the State lead is California Department of Water Resources ("DWR"). The HCP and the EIS/EIR are funded by the water exporters (the "applicants") and are being prepared by consultants directed primarily by DWR.

- The tunnels, along with various undefined restoration projects, are proposed as "conservation measures" to meet the dual goals of restoring the Bay/Delta ecosystem and ensuring a more reliable water supply for the water user communities.

KEY CONCERNS

- **Operation of the proposed tunnels would likely contribute to the degradation of waters already listed as impaired under the CWA and the decline of endangered species that the project is intended to restore**. The significant diversion of freshwater from the upper Delta is likely to exacerbate existing CWA section 303(d) listings of impaired waters in the Delta and in the Central Valley, by increasing the severity of such pollutants as salinity, selenium, methylmercury, and turbidity through reduced flows into the Delta, hydromodification, and liberation of pollutants in the Central Valley. Every segment of the Bay Delta is already listed as impaired for at least one of a variety of pollutants, and designated uses ranging from aquatic life to drinking water sources are not fully supported. The modeled operations of the proposed new intakes assume continuation of the current water allocations, which are already resulting in poor water quality and contributing to the decline of species. Continuation of such status quo operations would be unrealistic given climate change scenarios, "take limits" for listed fishes, drought, limitations on future reservoir operations, and potential inequities regarding upstream water rights.
- **Critical information that the action agencies need in order to issue permits is lacking.** Although described as a project-level DEIS for the tunnel construction, and as a programmatic DEIS for

everything else, the document lacks project-level analysis, e.g., engineering designs for the tunnels; clarity regarding operations; analysis of impacts to covered fish species; funding for restoration activities; and mitigation for drinking water impacts.

- **Impacts.** Every alternative analyzed in the DEIS would adversely affect water quality and endangered species. The DEIS itself acknowledges that at least some of the alternatives would have unacceptable adverse impacts to water quality, beneficial uses, and endangered species. No preferred NEPA alternative is identified (although one is identified for CEQA); therefore, EPA must rate all alternatives.

INTERAGENCY EFFORTS

- CEQ has been convening involved Agencies at the Deputy Secretary level for a series of meetings over the past year. All Agencies, including the lead Agencies, raised significant concerns regarding the Administrative draft of the EIS released this summer:

    - **NMFS:** "The lack of analysis of upstream operations and related effects may render this document insufficient to provide NEPA compliance for the full suite of actions necessary to integrate the BDCP into CVP operations". . ."Though the Federal agencies have had significant input into the EA (effects analysis), it is still a consultant drafted document guided by the permit applicants with several unresolved issues related to the analytical methods and resultant conclusions regarding project effects on covered species. The Federal agencies have responsibility for the content of the EIS as we (NMFS) are a co-lead and therefore must fully support the methodology and conclusions reached in the document. The EA is not a Federal agency document, it is still under review, and we have not accepted all of its methodology and conclusions."

    - **FWS:** "The FWS believes that the draft BDCP ADEIS is insufficient at this time as a disclosure document and is not yet adequate in providing all information and analyses necessary for a decision-maker to make an informed choice between alternatives". . . "The ADEIS is missing a clear, full and complete project description of the proposed action and detailed information needed to do a complete project specific level impact analysis for CM1. Additionally, the ADEIS does not provide an equal level of analysis of all alternatives".

    - **BOR:** "The identification of adverse and beneficial impacts is very subjective and appears to be based on a misreading of NEPA regulations". . . "Analysis of upstream affects may not be sufficient to serve as NEPA compliance for Reclamation to accept BiOp depending on the outcome of pending 9th circuit appeal filed by NRDC specific to NEPA analysis of RPA prior to implementation by Action Agency".

    - **Corps:** The Corps has indicated that the level of detail in the current documents is not sufficient to support a CWA 404 permit determination nor a Section 408 Letter of Permission for necessary Corps levee modifications.

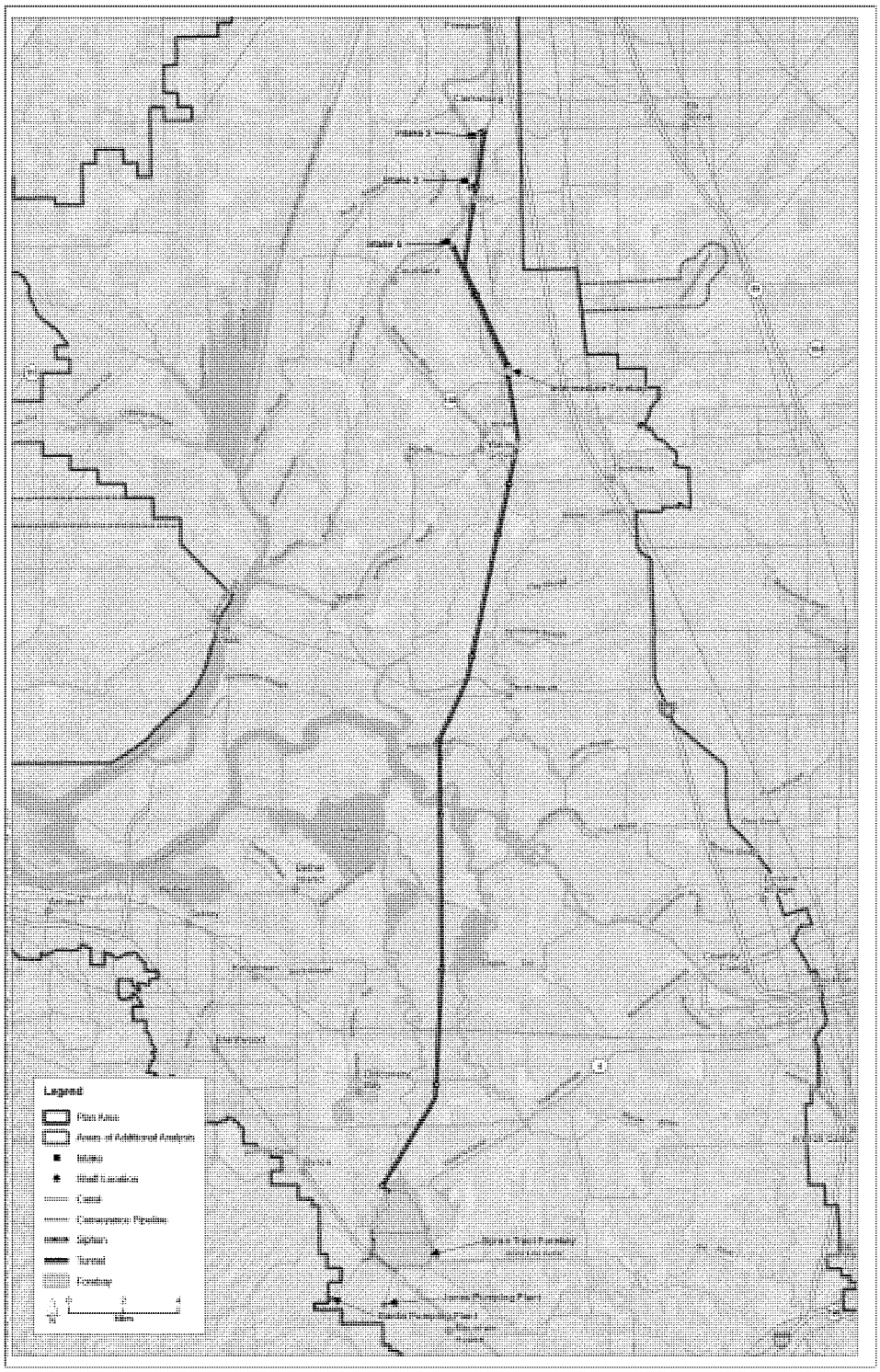
- The Deputies group met again last week, following a high-level meeting between the lead Agencies, State of California, and project applicants.

    - State of California and project applicants reiterated their strong desire to move the project forward quickly and expressed their concerns over federal commitment to make this happen.

    - DOI/Commerce committed to form a high level task force to work through the major issues over the next few months.

- EPA should participate on this group to help ensure our concerns are vetted, including potentially looking at another alternative ("the portfolio approach").

Map of Proposed Conveyance Structure in BDCP



Proposed 35 mile underground pipeline bringing water from the Sacramento River to the existing pumping facilities in the south Delta.

The U.S. Army Corps of Engineers and the **U.S. Bureau of Reclamation** (USBR) began construction of the federal **Central Valley Project (CVP)** in the late 1930s, and the project comprises more than 35 dams, reservoirs, and canals (with the Delta-Mendota Canal serving as the primary conveyance). USBR operates the CVP and delivers an annual average of 7.4 million acre feet (MAF) to agricultural users (5 MAF) on 3 million acres of farmland, municipal users (600,000 AF) for 2 million people, and for environmental requirements (800,000 AF).

The California **Department of Water Resources** (DWR) began construction of the **State Water Project (SWP)** in 1960, and the project comprises 29 dams and reservoirs (with the California Aqueduct serving as the primary conveyance). DWR operates the SWP and delivers 30% of the annual average allocation to agricultural users and 70% municipal users. The SWP is smaller than originally conceived, in part due to Wild & Scenic River designations on all or part of several North Coast rivers: Eel, Klamath, Mad, Salmon, Scott, Smith, Trinity, and Van Duzen. Consequently, the project carries an annual average of 2.4 MAF, but entitlements total 4.23 MAF. This disparity in the volume "developed" water versus "contracted" water has been a centerpiece of California's "water wars". An annual average of 4.4 MAF of freshwater is diverted from the Colorado River via the **Colorado River Aqueduct** to supply municipal and agricultural users within the Metropolitan Water District (MWD), and the Palo Verde, Imperial, and Coachella valleys, respectively. About 24 million people live on the South Coast. In 2014, Southern California received a relatively ample allocation from the Colorado River, and this will buffer the region from the drought emergency.

The **State Water Resources Control Board** governs the diversion of water from the Bay Delta by the CVP and the SWP, and mandates in-stream flows to protect *beneficial uses* (e.g., fishable, swimmable waters) in the Delta and in the Sacramento and San Joaquin river basins through the Bay Delta Water Quality Control Plan.

Groundwater: In some regions, groundwater provides 60% or more of the supply during dry years. Many towns and small cities depend entirely on groundwater for drinking water supplies, and 40% - 50% of Californians rely on groundwater for at least part of their water supply. Approximately 450 groundwater basins are used to store 850 MAF of water; and an average of 16.6 MAF were used annually -- 2 MAF more than was naturally recharged.

To: Gorke, Roger[Gorke.Roger@epa.gov]
From: Kopocis, Ken
Sent: Thur 2/6/2014 1:09:15 AM
Subject: Re: One more thing

Yes.

From: Gorke, Roger
Sent: Wednesday, February 05, 2014 8:08:27 PM
To: Kopocis, Ken
Subject: One more thing

Do you want to use the Region's one pager as a start?

From: Kopocis, Ken
Sent: Wednesday, February 05, 2014 8:00 PM
To: Gorke, Roger; Best-Wong, Benita; Southerland, Elizabeth; Bromm, Susan
Cc: Giles-AA, Cynthia; Blumenfeld, Jared; Magruder, DeMara; Penman, Crystal
Subject: Bay Delta and Administrator

We have been given 3:45 to 4:30 on Monday for the briefing of the Administrator.
We will need to expedite prep of materials.
She will need an intro on CA water situation, current issues, and politics to give context. Current drought also as context. Then, the status and issues associated with BDCP. BDCP+if we think we can fit it in.
Whether a briefing paper or Pwr Pt I leave to the preparers.
Roger, please coordinate a discussion of this for Thursday morning. We can loop in R9 once they open later in our day. I will participate.

To: Penman, Crystal[Penman.Crystal@epa.gov]
Cc: Gorke, Roger[Gorke.Roger@epa.gov]
From: Kopocis, Ken
Sent: Mon 6/3/2013 6:41:45 PM
Subject: Two meetings

Crystal,
Please set up a meeting for Thursday morning with Roger Gorke and me as a pre-brief for the CEQ meeting on Friday re Bay Delta Conservation Plan.
Also, please check with Teri about a pre-brief for Bob P on Thursday for that meeting. That should be after Roger and me.
Roger should ensure appropriate briefing materials as required, and confirm any other attendees that should be in attendance.
Ken

To: Paul Schlesinger[schlesinger@alcalde-fay.com]
From: Paul Schlesinger
Sent: Fri 10/30/2015 8:30:40 PM
Subject: Contra Costa County Comments on WaterFix
CCC Comments on Cal WaterFix 30Oct15[2].pdf

Please find attached, the comments Contra Costa County has submitted to the docket relative to the WaterFix.

Please call with any comments/questions/ideas/concerns you may have.

Thanks.

Paul Schlesinger
703-841-0626

PLANNING AND CONSERVATION LEAGUE
1107 9TH ST #901,
SACRAMENTO, CA 95814

October 29, 2015

Via Email and U.S. Mail

The Honorable Sally Jewell
Secretary of the Interior
U.S. Department of the Interior
1849 C Street, NW
Washington, D.C. 20240
exsec@ios.doi.gov

John Laird, Secretary
California Natural Resources Agency
1416 Ninth Street, Suite 1311
Sacramento, CA 95814
Kimberly.goncalves@resources.ca.gov

The Honorable Penny Pritzker
Secretary of Commerce
U.S. Department of Commerce
1401 Constitution Ave., NW
Washington, D.C. 20230
thesec@doc.gov

Mark W. Cowin, Director,
California Department of Water Resources
P.O. Box 942836, Room 1115-1
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Mark.cowin@water.ca.gov

The Honorable Gina McCarthy, Administrator
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Zachary.M.Simmons@usace.army.mil

Re: A New Draft EIR/EIS is needed to be useable for federal decision making--BDCP/CWF RDEIR/SDEIS Comments

Dear Secretary Jewell, Secretary Pritzker, Administrator McCarthy, Secretary Laird, Director Cowin, Regional Director Murillo, and Federal and California Agencies, Officers, and Staff Members Carrying out and Reviewing the BDCP/CWF:

I. Summary

The purpose of the Delta Tunnels Project is not Federally authorized & does not comply with Federal & State law. Therefore, it remains unsuitable for Federal decision making.

Planning and Conservation League, Sierra Club, California Sportfishing Protection Alliance, Winnemem Wintu Tribe, Save the American River, the Southern California Watershed Alliance and the Environmental Water Caucus (EWC) (a coalition of over 30 nonprofit environmental and community organizations and California Indian Tribes) find the RDEIR/SDEIS fails to comply with federal law and fails to include tribal interests and fishing rights.

Federal law does not authorize the Central Valley Project to be operated for the narrow stated purpose of the project: "*Restore and protect the ability of the SWP and CVP to deliver up to full contract amounts, when hydrologic conditions result in the availability of sufficient water, consistent with the requirements of state and federal law and the terms and conditions of water delivery contracts held by SWP contractors and certain members of San Luis Delta Mendota Water Authority, and other existing applicable agreements.*"[1]

The proposed project will take water from the Sacramento River before it reaches the Sacramento-San Joaquin River Estuary, for export and operations of the State Water Project (SWP) and federal Central Valley Project (CVP). Under federal law the coordinated operations of these projects are governed by the Coordinated Operations Act of 1986 (P.L. 99-546) and the Reclamation Act of 1937, as modified by the Central Valley Project Improvement Act (CVPIA) P.L 102-575 along with other laws and agreements. The proposed Delta Water Tunnels, requiring the construction of two 35-mile-long, 40-foot-wide tunnels, are designed to export more water South of the Delta estuary that current operations and will significantly harm Delta estuary water quality and beneficial uses, while boosting water quality and quantity to south of the Delta users. The purpose of the project ignores federal statutes governing these south of the Delta exports, such as the federally required provisions covered under the Coordinated Operating Agreement, the San Luis Project Act (P.L. 86-488), and the CVPIA and other federal statutes.[2] These provisions of federal law and associated regulations limit CVP exports from the Sacramento San Joaquin Delta Estuary and associated watersheds and require project yield to be reserved for fish and wildlife, tribal fishing rights and other environmental mitigation purposes.

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[1] ACE 404 Permit Application **& (73 Fed. Reg. 20326 (April 15, 2008)) first amended Notice of Intent** https://s3.amazonaws.com/californiawater/pdfs/5n2mg_Complete_Final_CA_Water_Fix_USACE_404_Permit_Application.pdf

[2] P.L. 86-488 authorizes CVP San Luis Unit water exports for only 500,000 acres to be irrigated in three counties: " ..five hundred thousand acres of land in Merced, Fresno, and Kings Counties, California, hereinafter referred to as the Federal San Luis unit service area.." Other statutes include: National Environmental Policy Act of 1969;Fish and Wildlife Coordination Act of 1958, Endangered Species Act of 1973, Clean Water Act of 1972 and the National Historic Preservation Act of 1960.

The Tunnel Project purpose of *"restore and protect the ability of the [State Water Project and Central Valley Project] to deliver up to full contract amounts"* to specified contractors is in conflict with these federal statutes, thus making the proposed NEPA compliance questionable and use for major federal actions unsuitable.[3]

II. Background

As noted by EPA[4], the stated purpose of the Tunnel Project has confusing meaning. A significant increase in exports out of the Delta is inconsistent with state legislation and it hinders the scope of alternatives necessary for federal decision making. Full deliveries on contract amounts have never occurred. EPA states "Combined, the SWP and CVP full contract amounts for Delta exports are around 7,432,883 AF. As noted....historical exports by the CVP and SWP almost never exceed 6 MAF, so it appears that the "full contract amount" of exports is at least 1 million acre feet more *than has ever been exported historically."*

EPA states further[5], "A significant increase in exports out of the Delta is inconsistent with recent state legislation. California Water Code Section 85021...states, in relevant part: "The policy of the State of California is to reduce reliance on the Delta in meeting California's future water supply needs through a statewide strategy of investing in improved regional supplies, conservation and water us efficiency. Federal Council on Environmental Quality regulations at 40 C.F.R. Section 1506.2(d) require that "[EISs] shall discuss any inconsistency of a proposed action with any approved State or local plan and laws (whether or not federally sanctioned.)" Further, under the Clean Water Act Section 404, the permit applicant must demonstrate that the chosen alternative is the "least environmentally damaging practicable alternative" (LEDPA) for meeting the overall project purpose pursuant to the CWA Section 404 (b) (I) Guidelines. In accordance with Army Corps of Engineers Standard Operating Procedures Regulatory Program, p 7, "The overall project purpose must be specific enough to define the applicant's needs, but not so restrictive as to preclude all discussion of alternatives."

EPA, citing the California Supreme Court, states clearly that significantly increasing exports out of a stressed Delta is the wrong policy. The California Supreme Court, when it evaluated appeals of the CALFED Bay Delta Program, noted that the Program was an experiment:

"The CALFED Program is premised on the theory, **as yet unproven**, that it is possible to restore the Bay-Delta's ecological health while maintaining and perhaps increasing Bay-Delta water exports through the CVP and SWP. If practical experience demonstrates that the theory is unsound, Bay-Delta water exports may need to be capped or reduced." In the Bay-Delta Programmatic Environmental Impact Report Coordinated Proceedings, 43Cal.4th. 1143 (2008)(emphasis added). Note that the Court was looking at a program that was developed during the 1990's. and adopted in 2000. The intervening ten years have not proved the theory accurate, and, in fact. seem to point the other way."[6]

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[3] Deference to action agencies is not unlimited. See, for example, Simmons v. U.S. Army Corps of Engineers, 120 F.3d 664, 666 (7th Cir. 1997) (Rejecting "single source" definition of project purpose for water supply, noting that "[i]f the agency constricts the definition of the project's purpose and thereby excludes what truly are reasonable alternatives, the EIS cannot fulfill its role."). See also Border Power Plant Working Group v. DOE, 260 F. Supp. 3d 997 (S.D. Cal., 2003)(Rejecting and broadening agency's definition of project purpose.); Similarly, Davis v. Mineta, 302 F.3d 1104 (loth Cir. 2002).

[4] EPA,Straus & Manzanilla, June 2010 letter to Glaser, Lohefener and McInnis Re "Purpose Statement for Bay Delta Conservation Plan (BDCP)

[5] Ibid.

[6] **Ibid** pg 5.

Congress limits CVP water exports, requires reservoir releases, and authorizes diversions sufficient to provide water to meet obligations to control salinity, protect water quality, and restore refuges. These requirements, along with the 800,000 acre feet of CVP water yield reserved to restore fish and aquatic habitat needs, are not clearly provided in the legal baseline for the project. Further, the proposed project purpose conflicts with federal CVP operational constraints laid out in federal statute and agreements. A review of the BDCP/CWF RDEIR/SDEIS (Delta Water Tunnels) documents finds a failure to disclose how the project purpose will comply with the federal statute and regulations that require mitigation for the environmental effects of the CVP along with the proposed additional exports from Delta Tunnels project, which seek to remove nearly ten million acre-feet of water from the watersheds of origin. The impacts of CVP exports from these watersheds have been significant. Current federal statute and regulation require water yield for these specific purposes. Water exports from north of the Sacramento River Delta to south of the Delta reduce the flow of water in the Sacramento River and its tributaries, with damaging effects on a large riparian ecosystem.[7] These statutory requirements for mitigation of these impacts include but are not limited to these provisions:

1. Water quality and flow standards (D-1641) imposed on CVP and SWP water rights
2. Sacramento River Temperature Control Operations
3. Fish and Wildlife and area of Origin Trinity River Minimum Release Requirement Increases
4. Sacramento River Winter-Run Chinook Salmon ESA Listing
5. CVPIA 3406(b)(2) and Refuge Water Supplies[8]
6. Delta Smelt ESA Listing
7. San Joaquin flow standards
8. Sacramento River Spring-Run Chinook Salmon ESA Listing,
9. Steelhead Trout ESA Listing
10. Doubling of anadromous fish.

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[7] CVPIA Section 3406(b) requires the Secretary to meet all obligations under the Endangered Species Act, 16 U.S.C. § 1531-1544, and all decisions of the California State Water Resources Control Board. In addition, § 3406(b)(1) requires by October, 1995, implementation of a plan to restore anadromous fish populations on all Central Valley rivers except the San Joaquin River at twice the average levels between 1967 and 1991. In addition § 3406(b) establishes specific guidelines for implementing and reviewing this plan. Section 3406(c) relates to restoration of the San Joaquin River. Section 3406(d) relates to rehabilitation of wetland wildlife habitats. An anadromous fish is one that hatches in a river, migrates to the 'ocean for maturity, then returns upriver to spawn. The primary anadromous fish in California are salmon, steelhead, striped bass, sturgeon, and American shad. *See* C.V.P. Improvement Act § 3403(a).

[8] Refuges within or near the Delta include:
• Stone Lakes National Wildlife Refuge
• Antioch Dunes National Wildlife Refuge
• Sacramento National Wildlife Refuge
• Delevan National Wildlife Refuge
• Colusa National Wildlife Refuge
• Sacramento River National Wildlife Refuge
• San Joaquin River National Wildlife Refuge
Refuges in or near San Francisco Bay and nearby coastal ocean include:
• San Pablo Bay National Wildlife Refuge
• Marin Island National Wildlife Refuge
• Don Edwards San Francisco Bay National Wildlife Refuge
• Farallon National Wildlife Refuge
Pursuant to CVPIA, refuge water is provided to National Wildlife Refuges South of the Delta

III. Compliance with the Central Valley Project Improvement Act requires a fundamental change in the proposed project purposes for the BDCP/CWF RDEIR/SDEIS to be useable by federal agencies and to comply with the "Least-Cost CVP Yield Increase Plan":

Central Valley Project. Section 2 of the 1937 Act was amended by the 1992 amendment as follows (italics show changes):

[T]he entire Central Valley Project . . . is hereby reauthorized and declared to be for the purposes of improving navigation, regulating the flow of the San Joaquin River and the Sacramento River, controlling floods, providing for storage and for the delivery of the stored waters thereof, ... for the reclamation of arid and semiarid lands and the lands of Indian reservations, *and mitigation, protection, and restoration of fish and wildlife,* and other beneficial uses.... And provided further, That the said dam and reservoirs shall be used, first for river regulation, improvement of navigation, and flood control; second, for irrigation and *domestic uses and fish and wildlife mitigation, protection, and restoration purposes;* and, third, for *power and fish and wildlife enhancement. The mitigation for fish and wildlife losses incurred as a result of construction, operation, or maintenance of the Central Valley Project shall be based on the replacement of ecologically equivalent habitat and shall take place in accordance with the provisions of this title and concurrent with any future actions which adversely affect fish and wildlife populations or their habitat but shall have no priority over them.*

Under the Act, new short-term, temporary, or long-term contracts are prohibited until the following events have occurred:

1. Fish and wildlife activities specified in section 3406(b)-(d) are carried out, including, among other activities, doubling the anadromous fish population in Central Valley rivers and streams, commencement of rehabilitation of the San Joaquin River, and commencement of waterfowl habitat restoration.
2. Completion by the California Water Resources Control Board of its review of Delta water quality standards required by *United States v. State Water Resources Control Board (182 Cal.App.3d 82 (1986 See below)*, and the EPA approves the Board's decision.
3. 120 days elapse after the Secretary of the Interior reports to relevant Congressional committees on how the CVP will meet its Bay Delta obligations to preserve water quality.

These required events have not been completed. Furthermore, contracts to pay for the proposed project are needed prior to construction and have not been forthcoming.[9] Before a project alternative can be determined as feasible, cost sharing and the feasibility of payment is needed. Extensive negotiations with State Contractors remain unresolved.[10] How the proposed project and each alternative will impact these federal requirements is

[9] Water Code §85089. Construction of a new Delta conveyance facility shall not be initiated until the persons or entities that contract to receive water from the State Water Project and the federal Central Valley Project or a joint powers authority representing those entities have made arrangements or entered into contracts to pay for both of the following: (a) The costs of the environmental review, planning, design, construction, and mitigation, including mitigation required pursuant to Division 13 (commencing with Section 21000 of the Public Resources Code), required for the construction, operation, and maintenance of any new Delta water conveyance facility. (b) Full mitigation of property tax or assessments levied by local governments or special districts for land used in the construction, location, mitigation, or operation of new Delta conveyance facilities.

[10] Extensive comments have been provided by PCL et. al. to identify existing costs to SWP contractors and resultant needs to raise revenues and issue debt. See comments regarding the State Water Project Contract extension and http://www.c-win.org/webfm_send/421

not disclosed in the REIR/SEIS. Needed comparisons for each alternative to the No Action alternative are vague summaries that are inadequately specified. Also, many of the scenarios of the Preferred Alternative "range" decrease Delta outflow despite the fact that several key scientific evaluations by federal and State agencies indicate that more outflow is necessary to protect aquatic resources and fish populations.[11] In addition, recent technical reports and emerging research raise questions about whether the proposed mitigation of tidal marsh is feasible[12], possible[13], or effective[14]. These are scientific questions about the assumptions used to support restoration proposals and projections of anticipated benefits to fish populations, while the costs to the environment and obligations by contractors to meet required environmental project yields remain vague and unclear. Without this information an informed decision cannot be made.

IV. Compliance with Federal Principles and Guidelines Requiring Comparison of Costs and Benefits is Absent.

Army Corps of Engineers and the Bureau of Reclamation require that new or existing Federal investments to construct new infrastructure, modify or replace existing infrastructure, or implement major changes to the operations of Federal assets comply with the Principles and Requirements for Federal Investments in Water Resources dated March 2013 and 1983. These requirements, along with Reclamation Manual Directives and Standards CMP09-02, require a clear distribution of all financial costs of a project among its authorized purposes. This is necessary to determine whether the project beneficiaries are capable of repaying the reimbursable costs assigned to them. The allocation provides the basis for establishing the repayment obligations specified in water-related contracts. Further P.L. 99-546 requires full CVP repayment and pay-off by Central Valley Contractors by 2030. The proposed project has been estimated in 2012 dollars to nominally cost more than $16 billion dollars, but ultimately cost some $67 billion with financing and operation and maintenance costs according to figures provided to the Westlands Water District Board.[15] Interior's Inspector General's audit indicates that, under current water rates, Contractors will likely fail to meet the repayment

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[11] [7] State Water Resources Control Board's, 2010 Flows Report, p.2.
"Interior remains concerned that the San Joaquin Basin salmonid populations continue to decline and believes that flow increases are needed to improve salmonid survival and habitat." USFWS May 23, 2011 Phase I Scoping Comments, available at: http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/bay_delta_plan/water_quality_control_planning/cmmnt052311/amy_aufdemberge.pdf
"Inadequate flow to support fish and their habitats is directly and indirectly linked to many stressors in the San Joaquin river basin and is a primary threat to steelhead and salmon." NMFS February 4, 2011 Phase I Scoping Comments, available at: http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/bay_delta_plan/water_quality_control_planning/cmmnt020811/010411dpowell.pdf
"…current Delta water flows for environmental resources are not adequate to maintain, recover, or restore the functions and processes that support native Delta fish." Executive Summary in 2010 CDFG Flow Criteria.
"a strong majority of scientists prioritizes habitat and flow management actions that would restore more natural processes within and upstream of the delta" (p. 2) http://www.ppic.org/content/pubs/report/R_413EHR.pdf

[12] NMFS Progress Assessment and Remaining Issues Regarding the Administrative Draft BDCP Document (04/4/2013), page 15.

[13] U.S. Fish and Wildlife Service Staff BDCP. The broad concern is that the tidal prism would be diminished over time by the large increases in tidal habitat.

[14] Lucas, L. V., and J. K. Thompson. 2012. Changing restoration rules: Exotic bivalves interact with residence time and depth to control phytoplankton productivity. Ecosphere 3(12):117. http://www.esajournals.org/doi/pdf/10.1890/ES1200251.1. The issue raised is whether the increaseed prodcution of plankton by the restored wetlands would be offset by the increased consumption by exotic bivalves as they spread into the restored wetlands..

[15] http://www.mercurynews.com/ci_24795356/deltatunnels-plans-true-price-tag-much-67

deadline for **just existing CVP costs.**[16] How these additional costs will be repaid with construction spanning over a decade is not disclosed, and, thus, ratepayers, taxpayers and decision makers are left in the dark. The REIR/SEIS provides no such information on how these financial costs will be allocated. Nor is information provided as to how the project meets the "Least-Cost CVP Yield Increase Plan" pursuant to Title 34 P.L. 102-575 Section 3408(j).

In accordance with federal regulatory requirements[17], the following information is required for projects, studies, and/ or any projects with federal funding assistance, such as the proposed Delta Water Tunnels, in order to legally implement Executive Order 12322 Water Resources Projects and Principles, Requirements and Guidelines for Water and Land Related Resources Implementation Studies:

(1) how well the planning objectives are met;
(2) the economic justification;
(3) the validity of the scientific, technical, and design assumptions;
(4) the ability to construct a project, implement a non-structural plan, or both, according to Reclamation standards and practices, within the estimated cost and schedule;
(5) the reliability of the estimated costs and benefits;
(6) the reliability of the proposed construction schedule; and
(7) the capability and willingness of the project partner(s) to financially support the project

V. Insufficient Information Is Provided to Ensure NEPA Compliance To Determine the Least Environmentally Damaging Practicable Alternative Required Under the Clean Water Act.

On July 16, 2014, the U.S. Army Corps of Engineers found that: "the EIS/EIR is not sufficient at this time in meeting the Corps' needs under the National Environmental Policy Act (NEPA) . . . in particular with regard to the incomplete description of the proposed actions, alternatives analysis . . . and impacts to waters of the United States and navigable waters, as well as the avoidance and minimization of, and compensatory mitigation for, impacts to waters of the United States." (Letter p. 1). Additional Corps comments include the absence in the EIR/EIS of "an acceptable alternatives analysis" (comment 4); no demonstration of which alternative may contain the Least Environmentally Damaging Practicable Alternative (LEDPA) for section 404, Clean Water Act purposes (Comment 5); "the document needs a clear explanation of a reasonable range of alternatives and a comparison of such, including a concise description of the environmental consequences of each" (comment 19); and, "new conveyance was not a part of the preferred alternative for CalFed. Does this EIS/EIR describe why the reasons for rejecting new conveyance in CalFed are no longer valid?" (Comment 22).

The current REIR/SEIS does not remedy these fatal flaws. Furthermore, the undersigned attempted through a FOIA request to obtain specific information provided to the Army Corps by the project applicants, but the request for this information between two public agencies was denied.[18] Thus, the following information necessary to comply with federal statute remains hidden from the public and the piece-meal approach to providing such fundamental project information leaves the public and decision makers in the dark regarding the

[16] https://www.doioig.gov/sites/doioig.gov/files/WR-EV-BOR-0003-2012Public.pdf

[17] http://www.usbr.gov/recman/cmp/cmp09-02.pdf

[18] September 30, 2015, see correspondence A. L. Faustino District Counsel to Patricia Schifferle regarding Freedom of Information Act Request FA-15-0201 (Documents and Comments Related to BDCP_DHCCP, DCE or Cal Fix for the Water Tunnels Diversion Project.

full impacts from the proposed project and the alternatives. The identified deficiencies include but are not limited to:

1. A detailed hydraulic study per Corps' standards for Section 408 NEPA
2. A detailed level of engineering design, as well as a detailed level of analysis related to effects to the Corp's civil works projects and indirect hydraulic effects.

Applying for permits prior to an approved project for a pre-determined project outcome clearly indicates bias on the part of the lead agency to a pre-determined outcome. A 408 authorization and NEPA compliance is needed and in turn must be approved under Section 404 of the Clean Water Act or Section 10 of the Rivers and Harbors Act, but this is not possible until the 408 authorization is obtained. The Central Valley Project is operated as a whole. The public and decision makers need the complete environmental impact picture prior to any decision regarding the LEDPA alternative.

On August 26, 2014, the U.S. Environmental Protection Agency (EPA) issued its 40-page review of the Draft BDCP EIS finding in BDCP's case that:

"Operating any of the proposed conveyance facilities . . . would contribute to increased and persistent violations of water quality standards in the Delta, set under the Clean Water Act, measured by electrical conductivity (EC) and chloride concentrations. We recommend that the Supplemental Draft EIS include one or more alternatives that would, instead, facilitate attainment of all water quality standards in the Delta. Specifically, we recommend that an alternative be developed that would, at minimum, not contribute to an increase in the magnitude or frequency of exceedances of water quality objectives, and that would address the need for water availability and greater freshwater flow through the Delta. Such an alternative should result in a decrease in the state and federal water projects' contributions to the exceedance of any water quality objectives in the Delta. (*Id.*, p.2).

EPA further stated that "Data and other information provided in the Draft EIS indicate that all CM1 [Tunnels Project] alternatives may contribute to declining populations of Delta smelt, Longfin smelt, green sturgeon, and winter-run, spring-run, fall-run and late-fall run Chinook salmon." (p. 10). "We recommend that the Supplemental Draft EIS consider measures to insure freshwater flow that can meet the needs of those [declining fish] populations and ecosystem as a whole, and is supported by the best available science. We recommend that this analysis recognize the demonstrated significant correlations between freshwater flow and fish species abundance." (*Id.*). "Other reasonable alternatives could be developed by incorporating a suite of measures, including Integrated Water Management, water conservation, levee maintenance, and decreased reliance on the Delta." (*Id.* p. 3). In addition, EPA concluded that "The Draft EIS does not address how changes in the Delta can affect resources in downstream waters, such as San Francisco Bay, and require changes in upstream operations, which may result in indirect environmental impacts that must also be evaluated. We recommend that the Supplemental Draft EIS include an analysis of upstream and downstream impacts." (*Id.*).

In FOIA documents provided by the National Marine and Fishery Service, it is apparent that similar warnings to the project applicants regarding impacts to critical habitat, endangered species and required temperatures have been ignored in the REIR/SEIS, leaving mitigation measures and compliance with existing ESA Reasonable and Prudent Alternative up to some future date.[19]

VI. Conclusion

[19] See DOC-NOAA-2015-001768 to Patricia Schifferle found at: https://foiaonline.regulations.gov/foia/action/public/view/request?objectId=090004d2808890c5

The singular purpose of the Tunnels Project to export Sacramento River water before it reaches the Sacramento-San Joaquin River Delta and San Francisco Bay is a fundamental flaw that renders the NEPA documents by federal agencies unusable because the documents do not comply with federal statutes and regulations.

Our organizations have already communicated several times over the years with BDCP officials about the failure to develop a range of reasonable alternatives in the BDCP process.[20] Instead of complying with the Delta Reform Act, the ESA, the Clean Water Act, and applying the public trust doctrine, all of the so-called Delta Water Tunnels alternatives involve taking freshwater water essential to the health and beneficial uses of the Sacramento-San Joaquin Estuary and San Francisco Bay before the water reaches the estuary. Taking this essential water and adding additional fish-grinding pumps on the Sacramento River (in addition to the southern Delta pumps which will still operate) , while exacerbating fish kills, damaging flows, and degrading temperatures, water quality, and water supply to over 5 million people residing in surrounding municipalities and water dependent industries, is not authorized under the Central Valley Project.

The narrow purpose of the Tunnels Project to promote the delivery of imaginary 'paper water' to south of the Delta contractors first, above all other users, also will have significant financial impacts that have not been disclosed. Under NEPA Regulations, "This [alternatives] section is the heart of the environmental impact statement." The alternatives section should "sharply" define the issues and provide a clear basis for choice among options by the decision-maker and the public. 40 C.F.R. § 1502.14. Moreover, if "a draft statement is so inadequate as to preclude meaningful analysis, the agency shall prepare and circulate a revised draft of the appropriate portion. The agency shall make every effort to disclose and discuss at appropriate points in the draft statement all major points of view on the environmental impacts of the alternatives including the proposed action." § 1502.9(a). The Responsible Exports Plan and variants on it must be among those alternatives in a new Draft EIR/EIS for BDCP that helps to disclose, sharpen and clarify the issues.[21]

Reclamation and DWR have failed to produce an alternatives section that "sharply" defines the issues and provides a clear basis for choice among options as required by the NEPA Regulations, 40 C.F.R. § 1502.14. Again, those issues must include producing more Delta inflow and outflow through the estuary as habitat for listed fish species, and documenting the impacts on Delta ecosystems as called for in Water Code § 85021. The choice presented must include increasing flows by reducing exports, not just reducing flows by increasing the capacity for exports as is called for by ***all*** of the so-called "alternatives" presented in the BDCP Draft Plan, Draft EIR/EIS, and RDEIR/SDEIS. [22]

---

[20] This letter follows previous comments from the undersigned groups including Friends of the River comment letter of May 21, 2014, joint May 28, 2014 and joint September 4, 2014 comment letters focused on the failure of the BDCP Draft plan and Draft EIR/EIS to identify and evaluate a range of reasonable alternatives that are the declared "heart" of both the NEPA and CEQA required EISs and EIRs. A detailed evaluation of the Draft EIR/EIS's inadequate alternatives analysis was provided by the EWC in its comment letter of June 11, 2014, accessible online at http://ewccalifornia.org/reports/bdcpcomments6-11-2014-3.pdf.

[21] The EIS alternatives section is to "Rigorously explore and objectively evaluate all reasonable alternatives, and for alternatives which were eliminated from detailed study, briefly discuss the reasons for their having been eliminated." § 1502.14(a).

[22] In *California v. Block,* 690 F.2 753, 765-769 (9th Cir. 1982), the project at issue involved allocating to wilderness, non-wilderness or future planning, remaining roadless areas in national forests throughout the United States. The court held that the EIS failed to pass muster under NEPA because of failure to consider the alternative of increasing timber production on federally owned lands currently open to development; and also because of failure to allocate to wilderness a share of the subject acreage "at an intermediate percentage between 34% and 100%." 690 F.2d at 766. Like the situation here where the BDCP agencies claim a trade-off involved between water exports and Delta restoration (RDEIR/SDEIS ES 4-6), the Forest Service program involved "a trade-off between wilderness use and development. This trade-off however, cannot be intelligently made without examining whether it can be softened or eliminated by increasing resource extraction and use from already developed areas." 690 F.2d at 767. Here, likewise, trade-offs cannot be

In short, the fundamental flaws in the alternatives sections in the BDCP Draft EIR/EIS, Chapter 9 of the BDCP plan, and the RDEIR/SDEIS, have led to NEPA and CEQA documents "so fundamentally and basically inadequate and of a summary nature that meaningful public review and comment were precluded."40 C.F.R. § 1502.9(a).

Least cost alternatives presented in EWC's Plan have been completely ignored so far by Reclamation and DWR. These alternatives fit into Congressional directives under the Central Valley Project Improvement Act to follow the "Least-Cost CVP Yield Increase Plan." Additionally these alternatives save ratepayer and taxpayers money while fitting the EPA's and the SWRCB's calls for alternatives that would increase freshwater flow through the Delta, as well as the Army Corps' call for an acceptable alternatives analysis. It is time to include increasing freshwater flows through the Delta by reducing exports among the range of reasonable alternatives required by law, and presented to the public for comment.. Consideration of this alternative approach is imperative. Extinction of species is forever.

Should you have any questions, please contact Conner Everts, Co-Facilitator, Environmental Water Caucus at (310) 394-6162 ext. 111 or Jonas Minton Planning and Conservation Leagues at (916) 719-4049.

Sincerely,

Sincerely,

/s/ Conner Everts
Co-Facilitator
Environmental Water Caucus

/s/ Jonas Minton
Senior Water Policy Advisor
Planning and Conservation League .

/s/ Kathryn Phillips
Director
Sierra Club California

/s/ Bill Jennings
Executive Director
California Sportfishing Protection Alliance

/s/ Chief Caleen Sisk
Spirtual Leader
Winnemen Wintu Tribe

/s/ Stephen Green
President
Save the American River Association

Additional Addressees, all via email:

Maria Rea, Assistant Regional Administrator
National Marine Fisheries Service

---

intelligently analyzed without examining whether the impacts of alternatives reducing exports can be softened or eliminated by increasing water conservation, recycling, and eventually retiring drainage-impaired agricultural lands in the areas of the exporters from production. *Accord, Oregon Natural Desert Assn. v. Bureau of Land Management*, 625 F.3d 1092, 1122-1124 (9th Cir. 2010) (EIS uncritical alternatives analysis privileging of one form of use over another violated NEPA). Here, the BDCP alternatives analysis has unlawfully privileged water exports over protection of Delta water quality, water quantity, public trust values, and ESA values.

Michael Tucker, Fishery Biologist
National Marine Fisheries Service

Larry Rabin, Acting, Field Supervisor, S.F. Bay-Delta
U.S. Fish and Wildlife Service

Lori Rinek
U.S. Fish and Wildlife Service

Mary Lee Knecht, Program Manager
U.S. Bureau of Reclamation

Patty Idloff
U.S. Bureau of Reclamation

Deanna Harwood
NOAA Office of General Counsel

Kaylee Allen
Department of Interior Solicitor's Office

Jared Blumenfeld, Regional Administrator
U.S. EPA, Region IX

Tom Hagler
U.S. EPA General Counsel Office

Tim Vendlinski, Bay Delta Program Manager, Water Division
U.S. EPA, Region IX

Stephanie Skophammer, Program Manager
U.S. EPA, Region IX

Erin Foresman, Bay Delta Coordinator
U.S. EPA

Lisa Clay, Assistant District Counsel
U.S. Army Corps of Engineers

Michael Nepstad, Deputy Chief, Regulatory Division
U.S. Army Corps of Engineers

Zachary M. Simmons, Senior Regulatory Project Manager
U.S. Army Corps of Engineers

Diane Riddle, Environmental Program Manager
State Water Resources Control Board

To: Evans, David[Evans.David@epa.gov]
Cc: Miller, Clay[Miller.Clay@epa.gov]
From: Landers, Timothy
Sent: Tue 9/22/2015 5:54:42 PM
Subject: RE: Ken's very interested in Bay-Delta project, 404 permit
OW Meeting Request Form_CA WaterFix Project.docx
SPK200800861 WaterFix ARNI 3b DRAFT_09 16 15.docx

DRAFT, DELIBERATIVE

Dave,

I pulled this together just in case this is how Benita would like to proceed.

From: Evans, David
Sent: Monday, September 21, 2015 6:22 PM
To: Landers, Timothy
Subject: RE: Ken's very interested in Bay-Delta project, 404 permit

Let me check how Benita wants to proceed.

Dave

Sent from my Windows Phone

To: Johnson, Kathleen[Johnson.Kathleen@epa.gov]
Cc: Wilson, Shari[Wilson.Shari@epa.gov]; Leff, Karin[Leff.Karin@epa.gov]
From: Miles, Erin
Sent: Fri 1/8/2016 5:42:21 PM
Subject: RE: Meeting Request re: BDCP/Fix

Great, thanks.

From: Johnson, Kathleen
Sent: Thursday, January 07, 2016 8:04 PM
To: Miles, Erin <Miles.Erin@epa.gov>
Cc: Wilson, Shari <Wilson.Shari@epa.gov>; Leff, Karin <Leff.Karin@epa.gov>
Subject: FW: Meeting Request re: BDCP/Fix

OK, we suggest that the inquiry be sent over to Benita Best-Wong over in OWOW. Given future activity by our water division (and potentially OWOW) a short meet and greet might be a good idea.

Kathleen H. Johnson

Director, Enforcement Division

U.S. EPA - Region 9

75 Hawthorne Street ENF-1

San Francisco, CA 94015

415/972-3873

johnson.kathleen@epa.gov

From: Giles-AA, Cynthia
Sent: Thursday, January 07, 2016 9:04 AM
To: Johnson, Kathleen <Johnson.Kathleen@epa.gov>
Cc: Wilson, Shari <Wilson.Shari@epa.gov>; Leff, Karin <Leff.Karin@epa.gov>; Miles, Erin <Miles.Erin@epa.gov>
Subject: RE: Meeting Request re: BDCP/Fix

Ok thanks. That makes sense. Can you circle back with erin on what you decide, so we get some response to them from someone in my office declining the meeting or suggesting it be with someone else? Thanks Kathleen.

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Sent: Thursday, January 07, 2016 11:54 AM
To: Giles-AA, Cynthia <Giles-AA.Cynthia@epa.gov>
Cc: Wilson, Shari <Wilson.Shari@epa.gov>; Leff, Karin <Leff.Karin@epa.gov>
Subject: RE: Meeting Request re: BDCP/Fix

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415/972-3873

johnson.kathleen@epa.gov

From: Giles-AA, Cynthia
Sent: Wednesday, January 06, 2016 6:07 PM
To: Johnson, Kathleen <Johnson.Kathleen@epa.gov>
Cc: Wilson, Shari <Wilson.Shari@epa.gov>; Leff, Karin <Leff.Karin@epa.gov>
Subject: FW: Meeting Request re: BDCP/Fix

I assume we should decline this request, but please advise if anyone should meet, and if so who. Thanks!

Sent from my Windows Phone

From: Erik Ringelberg
Sent: 1/6/2016 8:23 PM
To: Giles-AA, Cynthia
Subject: Meeting Request re: BDCP/Fix

Hello,

I'm coordinating for the Local Agencies of the North Delta (LAND), a coalition of 18 Reclamation and Water Districts in Northern California. We have been commenting on the Bay Delta Conservation Plan (BDCP) Fix and what we see are some significant impacts on fish, riparian habitat, water quality, agriculture, and flood protection, associated with the proposed project. Our representative, Ms. Osha Meserve, is going to be out in your area this coming January 26th and 27th. I know it is very short notice, but I was wondering if she could have 15 minutes of your time for a brief discussion.

Thank you for your consideration,

Erik Ringelberg

Natural Resources and Land Planning Group Manager

BSK Associates
Engineers & Laboratories

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eringelberg@bskassociates.com www.bskassociates.com

BSK Associates provides analytical chemistry, construction observation, ecological services, environmental engineering, geotechnical engineering, construction materials testing, and water resources management.

Please consider the environment before printing this e-mail

To: Johnson, Kathleen[Johnson.Kathleen@epa.gov]; Leff, Karin[Leff.Karin@epa.gov]; Miles, Erin[Miles.Erin@epa.gov]
From: Wilson, Shari
Sent: Fri 1/8/2016 3:28:49 PM
Subject: RE: Meeting Request re: BDCP/Fix

Noted – thanks Kathleen.

From: Johnson, Kathleen
Sent: Thursday, January 07, 2016 7:56 PM
To: Wilson, Shari <Wilson.Shari@epa.gov>; Leff, Karin <Leff.Karin@epa.gov>; Miles, Erin <Miles.Erin@epa.gov>
Subject: FW: Meeting Request re: BDCP/Fix

Gals,

Still working on a recommendation for someone to potentially meet these folks from water. However, did want to let you know that Joel Beauvais requested a briefing on WaterFix – which is now scheduled for Monday jan 11th at 4:00 Eastern. Folks from our Water Division will help do the briefing and I think the primary focus will be on the water issues going forward – as opposed to anything related to NEPA – but wanted you all to be aware.

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To: Miles, Erin[Miles.Erin@epa.gov]
Cc: Wilson, Shari[Wilson.Shari@epa.gov]; Leff, Karin[Leff.Karin@epa.gov]
From: Johnson, Kathleen
Sent: Fri 1/8/2016 1:03:30 AM
Subject: FW: Meeting Request re: BDCP/Fix

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johnson.kathleen@epa.gov

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Cc: Wilson, Shari <Wilson.Shari@epa.gov>; Leff, Karin <Leff.Karin@epa.gov>; Miles, Erin <Miles.Erin@epa.gov>
Subject: RE: Meeting Request re: BDCP/Fix

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To: Wilson, Shari[Wilson.Shari@epa.gov]; Leff, Karin[Leff.Karin@epa.gov]; Miles, Erin[Miles.Erin@epa.gov]
From: Johnson, Kathleen
Sent: Fri 1/8/2016 12:55:57 AM
Subject: FW: Meeting Request re: BDCP/Fix

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Natural Resources and Land Planning Group Manager

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eringelberg@bskassociates.com www.bskassociates.com

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Please consider the environment before printing this e-mail

To: Prijatel, Jean[PRIJATEL.JEAN@EPA.GOV]; Johnson, Kathleen[Johnson.Kathleen@epa.gov]; Leff, Karin[Leff.Karin@epa.gov]
From: Goforth, Kathleen
Sent: Mon 11/2/2015 7:02:39 PM
Subject: WaterFix: Fwd: AX-16-000-1048 Due on 11/18/2015
AX-16-000-1048 Control Slip.pdf
ATT00001.htm
AX-16-000-1048.pdf
ATT00002.htm

Kathleen, Karin -
FYI, extensive comments on WaterFix SDEIS from a large coalition of environmental and sport fishing stakeholders. See attached.

Jean -
Please draft a reply, noting that Reclamation is the lead federal agency and, pursuant to NEPA, is responsible for responding to all comments received on the SDEIS.
Thanks -
- Kathy

Sent from my iPhone

Begin forwarded message:

From: "Plack, Beatrice" <Plack.Beatrice@epa.gov>
To: "Goforth, Kathleen" <Goforth.Kathleen@epa.gov>, "Dunning, Connell" <Dunning.Connell@epa.gov>
Cc: "Kwok, Frances" <Kwok.Frances@epa.gov>
Subject: FW: AX-16-000-1048 Due on 11/18/2015

Kathy,

Yet another one that I believe goes to your group.

b.

From: Kwok, Frances
Sent: Monday, November 02, 2015 9:58 AM
To: Plack, Beatrice <Plack.Beatrice@epa.gov>
Cc: Gaudario, Abigail <Gaudario.Abigail@epa.gov>
Subject: AX-16-000-1048 Due on 11/18/2015

B,

ORA received the attached AX-16-000-1048. The subject is Comments on Bay Delta Conservation Plan. The due date is November 18, 2015.

Thanks,

Frances

Frances Kwok

Office of the Regional Administrator

U.S. E.P.A. Region 9

75 Hawthorne Street

San Francisco, CA 94105

(415) 947-4232

kwok.frances@epa.gov

Correspondence Management System
Control Number: AX-16-000-1048
Printing Date: November 02, 2015 12:33:21

Citizen Information

Citizen/Originator: **Stroshane, Tim**
Organization: Restore the Delta
Address: 10100 Trinity Parkway, Stockton, CA 95219

Everts, Conner
Organization: Environmental Water Caucus
Address: 120 Broadway, Santa Monica, CA 90401

Sisk, Caleen
Organization: Winnemen Wintu Tribe
Address: 14840 Bear Mountain Road, Redding, CA 96003

Jennings, Bill
Organization: California Sportfishing Protection Alliance
Address: 1248 East Oak Avenue #D, Woodland, CA 95776

Miller, Jeff
Organization: Center for Biological Diversity
Address: 351 California Street, San Francisco, CA 94104

Minton, Jonas
Organization: Planning and Conservation League
Address: 1107 9th Street, Sacramento, CA 95814

Phillips, Kathryn
Organization: Sierra Club California
Address: 909 12th Street, Sacramento, CA 95814-2920

DiFalco, Robyn
Organization: Butte Environmental Council
Address: 116 W. 2nd Street, Chico, CA 95928

Krieger, Carolee
Organization: California Water Impact Network
Address: 808 Romero Canyon Road, Stanta Barbara, CA 93108

Mammon, Roger
Organization: Lower Sherman Island Duck Club
Address: Address Unknown

Wesselman, Eric
Organization: Friends of the River
Address: Address Unknown

Shelton, Amber
Organization: Environmental Protection Information Center
Address: Address Unknown

Carter, Lloyd
Organization: California Save Our Streams Council
Address: Address Unknown

Rockwell, C. Mark
Organization: Endangered Species Coalition
Address: Address Unknown

Cox, Jim
Organization: California Striped Bass Association
Address: Address Unknown

Dolan, Siobahn
Organization: Desal Response Group
Address: Address Unknown

Ashbaugh, Lowell
Organization: Northern California Council Federation of Fly Fishers
Address: Address Unknown

Smith, Cecily
Organization: Foothill Conservancy
Address: Address Unknown

Plambeck, Lynne
Organization: Santa Claritans for Pllanning and the Environment
Address: Address Unknown

Green, Stephen
Organization: Save the American River Association
Address: P.O. Box 277638, Sacramento, CA 95827

Tucker, Craig
Organization: Karuk Tribe
Address: Address Unknown

Bacher, Dan
Organization: Fish Sniffer
Address: Address Unknown

Sheehan, Linda
Organization: Earth Law Center
Address: Address Unknown

Fisher, Konrad
Organization: Klamath Riverkeeper
Address: Address Unknown

Bailey, Colin
Organization: Environmental Justice Coalition for Water
Address: Address Unknown

Barrigan-Parilla, Barbara
Organization: Restore the Delta
Address: 10100 Trinity Parkway, Stockton, CA 95219

Egger, Frank
Organization: North Coast Rivers Alliance
Address: Address Unknown

Scow, Adam
Organization: Food and Water Watch
Address: Address Unknown

Jacobs, Diana

Organization: Sacramento River Preservation Trust
Address: Address Unknown

Collins, Larry
Organization: San Francisco Crab Boat Owners Association
Address: Address Unknown

Pool, Dick
Organization: Water4Fish
Address: Address Unknown

Vlamis, Barbara
Organization: AquaAlliance
Address: Address Unknown

Dunlap, Marty
Organization: Citizens Water Watch
Address: Address Unknown

Gordon, Miriam
Organization: Clean Water Action
Address: Address Unknown

Constituent: N/A
Committee: N/A **Sub-Committee:** N/A

Control Information

Control Number:	AX-16-000-1048	**Alternate Number:**	N/A
Status:	Pending	**Closed Date:**	N/A
Due Date:	Nov 18, 2015	**# of Extensions:**	0
Letter Date:	Oct 30, 2015	**Received Date:**	Oct 30, 2015
Addressee:	AD-Administrator	**Addressee Org:**	EPA
Contact Type:	EML (E-Mail)	**Priority Code:**	Normal
Signature:	DX-Direct Reply	**Signature Date:**	N/A

File Code: 404-141-02-01_141_b Controlled and Major Corr. Record copy of the offices of Division Directors and other personnel.

Subject: DRF - Daily Reading File - Comments on Bay Delta Conservation Plan/"California WaterFix" Tunnels Project Recirculated Draft Environmental Impact Report/Supplemental Draft Environmental Impact Statement (RDEIR/SDEIS) Dear Secretaries Jewell, Pritzker and Laird; Administrator McCarthy; Regional Director Murillo

Instructions: DX-Respond directly to this citizen's questions, statements, or concerns

Instruction Note: N/A

General Notes: N/A

CC: Matthew Klasen - OW
OPA - Office of Public Affairs
OW - Office of Water -- Immediate Office

Lead Information

Lead Author: N/A

Lead Assignments:

Assigner	Office	Assignee	Assigned Date	Due Date	Complete Date
Jacqueline Leavy	OEX	R9	Nov 2, 2015	Nov 18, 2015	N/A
	Instruction: DX-Respond directly to this citizen's questions, statements, or concerns				

Supporting Information

Supporting Author: N/A

Supporting Assignments:

Assigner	Office	Assignee	Assigned Date
No Record Found.			

History

Action By	Office	Action	Date
Jacqueline Leavy	OEX	Assign R9 as lead office	Nov 2, 2015

Comments

Commentator	Comment	Date
No Record Found.		

Date: Fri Oct 30 16:00:59 EDT 2015
From: Leavy.Jacqueline@epamail.epa.gov
To: CMS.OEX@epamail.epa.gov
Subject: FW: Environmental Water Caucus Comments on "California WaterFix" Recirculated Draft EIR/ Supplemental Draft EIS

-----Original Message-----
From: Tim Stroshane [mailto:spillwayguy@gmail.com]
Sent: Friday, October 30, 2015 3:19 PM
To: BDCPComments@icfi.com; Sally Jewell <exsec@ios.doi.gov>; Penny Pritzker <thesec@doc.gov>; Mccarthy, Gina <McCarthy.Gina@epa.gov>; John Laird <Kimberly.goncalves@resources.ca.gov>; Mark W. Cowin <Mark.cowin@water.ca.gov>; David Murrillo <dmurillo@usbr.gov>
Cc: Conner Everts <connere@gmail.com>; Tom Howard <Tom.Howard@waterboards.ca.gov>; Diane Riddle <DRiddle@waterboards.ca.gov>; Maria Rea <maria.rea@noaa.gov>; Michael Tucker <Michael.Tucker@noaa.gov>; Larry Rabin <larry_rabin@fws.gov>; Lori Rinek <lori_rinek@fws.gov>; Mary Lee Knecht <mknecht@usbr.gov>; Patty Idloff <pidlof@usbr.gov>; Deanna Harwood <deanna.harwood@noaa.gov>; Kaylee Allen <kaylee.allen@sol.doi.gov>; Blumenfeld, Jared <BLUMENFELD.JARED@EPA.GOV>; Hagler, Tom <Hagler.Tom@epa.gov>; Vendlinski, Tim <vendlinski.tim@epa.gov>; Skophammer, Stephanie <SKOPHAMMER.STEPHANIE@EPA.GOV>; Foresman, Erin <Foresman.Erin@epa.gov>; Lisa Clay <Lisa.clay@usace.army.mil>; Michael Nepstad <Michael.G.Nepstad@usace.army.mil>; Zachary M. Simmons <Zachary.M.Simmons@usace.army.mil>
Subject: Environmental Water Caucus Comments on "California WaterFix" Recirculated Draft EIR/ Supplemental Draft EIS

Dear Secretary Jewell, Secretary Pritzker, Administrator McCarthy, Secretary Laird, Director Cowin, Regional Director Murillo, and officers of various Federal and California agencies with responsibilities concerning the Bay Delta Conservation Plan/"California WaterFix?:

Thank you for the opportunity to comment on these documents.

On behalf of Conner Everts, Facilitator of the Environmental Water Caucus and the signatories of the attached letter, Environmental Water Caucus member groups in California object to the adverse effects of the Bay Delta Conservation Plan/"California WaterFix? Tunnels Project. We find the Recirculated Draft EIR/Supplemental Draft EIS released this past July deficient. Its defects may only be repaired by recirculating another EIR/EIS that reflects needed corrections and revisions. Its defects are comprehensive: project objectives, purpose and need omit key details and rationales; essential baseline data and analyses are omitted; adverse impacts are numerous while others go unreported; mitigations are weak or nonexistent, and rely far too heavily on a too-optimistic assessment of state and federal water project operators? management of real-time operations and adaptive management research and monitoring agendas and outcomes; and the excessively narrow range of alternatives described in the RDEIR/SDEIS defeats CEQA and NEPA requirements that a reasonable range of alternatives be evaluated.

Should you have questions concerning this letter, please contact Tim Stroshane or Conner Everts with the Environmental Water Caucus. Our contact information is in the attached cover letter.

ENVIRONMENTAL WATER CAUCUS COMMENTS ON THE PARTIALLY RECIRCULATED DRAFT ENVIRONMENTAL IMPACT REPORT/ DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT FOR THE BAY DELTA CONSERVATION PLAN / "CALIFORNIA WATERFIX"

OCTOBER 30, 2015

KLAMATH RIVERKEEPER

Water4Fish.org

epic
wildcalifornia.org

Desal Response Group

PLANNING AND CONSERVATION LEAGUE

CALIF. STRIPED BASS ASSOC.

NORTH COAST RIVERS ALLIANCE

SACRAMENTO RIVER PRESERVATION TRUST

ENDANGERED SPECIES COALITION

citizens water watch of Northern California

FLY FISHERS DAVIS, CALIF.

Lower Sherman Island Duck Hunters Association

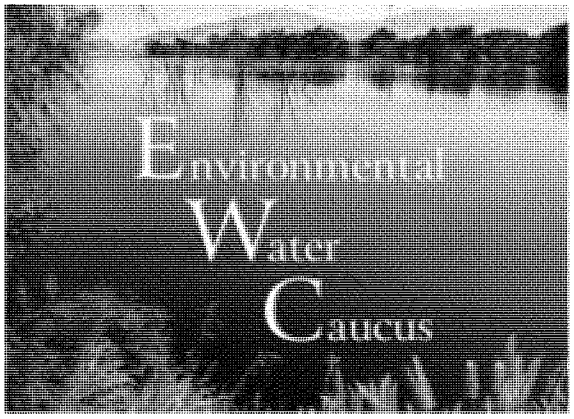
CRAB BOAT OWNERS ASSOCIATION, Inc.
2907 Jones Street
San Francisco, California 94133-1115
415-885-1180

food&waterwatch

Santa Clarita Organization for Planning and the Environment (SCOPE)

CA Save Our Streams Council

CLEAN WATER ACTION
CALIFORNIA



October꿿□ŋ30,꿿□ŋ2015

The꿿□ŋHonorable꿿□ŋSally꿿□ŋJewell
Secretary꿿□ŋof꿿□ŋthe꿿□ŋInterior
U.S.꿿□ŋDepartment꿿□ŋof꿿□ŋthe꿿□ŋInteri
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Mark꿿□ŋW.꿿□ŋCowin,꿿□ŋDirector,
California꿿□ŋDepartment꿿□ŋof꿿□ŋWater꿿
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U.S.꿿□ŋEnvironmental꿿□ŋProtection꿿□ŋAge
WJC꿿□ŋNorth,꿿□ŋRoom꿿□ŋ3,000꿿□ŋ꿿□
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David꿿□ŋMurillo,꿿□ŋRegional꿿□ŋDirector
U.S.꿿□ŋBureau꿿□ŋof꿿□ŋReclamation
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Sacramento,꿿□ŋCA꿿□ŋ꿿□ŋ95812

BDCPComments@icfi.com

**Subject:꿿□ŋComments꿿□ŋon꿿□ŋBay꿿□ŋDelta꿿□ŋConservation꿿□ŋPlan/"California꿿□ŋWaterFix"
Project꿿□ŋRecirculated꿿□ŋDraft꿿□ŋEnvironmental꿿□ŋImpact꿿□ŋReport/Supplemen
Environmental꿿□ŋImpact꿿□ŋStatement꿿□ŋ(RDEIR/SDEIS)**

Dear꿿□ŋSecretaries꿿□ŋJewell,꿿□ŋPritzker꿿□ŋand꿿□ŋLaird;꿿□ŋAdministrator꿿□ŋMcCarthy;꿿□ŋRegi
Director꿿□ŋCowin,꿿□ŋand꿿□ŋother꿿□ŋaddressees꿿□ŋbelow:

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Myth꿯□η3:꿯□η California꿯□ηWaterFix꿯□ηwill꿯□ηmitigate꿯□ηthe꿯□ηseismic꿯□ηand꿯□ηsea꿯□ηle

Fact:꿯□ηThe꿯□ηTunnels꿯□ηproject꿯□ηdoes꿯□ηnothing꿯□ηto꿯□ηprotect꿯□ηthe꿯□ηDelta;꿯□ηit꿯
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Myth꿯□η4:꿯□η The꿯□ηCalifornia꿯□ηWaterFix꿯□ηwill꿯□ηbe꿯□ηaffordable꿯□ηto꿯□ηCalifornians꿯□
it.

Fact:꿯□η Funding꿯□ηand꿯□η[inancing꿯□ηplans꿯□ηfor꿯□ηthe꿯□ηTunnels꿯□ηProject꿯□ηare꿯□ηstalled.
of꿯□ηTunnels꿯□ηwater,꿯□ηwhile꿯□ηurban꿯□ηratepayers꿯□ηbalk꿯□ηat꿯□ηthe꿯□ηprospect꿯□ηo
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Section꿯□ηIII꿯□ηcomments,꿯□ηattached.)

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Hope Congress is going to provide money through the Corps of Engin
Reclamation? Or other agencies? Or are we ready to take the bull
funding sources? Obviously every project comes down to a different equa
that riddle I think is probably one of the biggest linchpins in mov

The enclosed comment document goes into detail about these and
Project.

Should you have questions about our comments, do not hesitate
(connere@gmail.com; 310/804-6615), or Tim Stroshane (stroshane@gmail.com; 510/524-6313).

Conner Everts
Facilitator
Environmental Water Caucus
Southern California Watershed Alliance

Tim Stroshane
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Policy Analyst, Restore the Delta

Dr. C. Mark Rockwell
PaciFic Coast Representative
Endangered Species Coalition

Jeff Miller
Conservation Advocate
Center for Biological Diversity

Chief Caleen Sisk
Spirtual Leader
Winnemem Wintu Tribe

Jonas Minton
Senior Water Policy Advisor
Planning and Conservation League

Bill Jennings
Executive Director
California SportFishing Protection Alliance

Kathryn Phillips
Director
Sierra Club California

Jim Cox
President
California Striped Bass Association

Robyn DiFalco
Executive Director
Butte Environmental Council

Siobahn Dolan
Director
Desal Response Group

Lloyd Carter
President
California Save Our Streams Council

Amber Shelton
Conservation Advocate
Environmental Protection Information Center

Carolee Krieger
Executive Director
California Water Impact Network

Eric Wesselman
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Friends of the River

Colin Bailey
Executive Director
Environmental Justice Coalition for Water

Roger Mammon
President
Lower Sherman Island Duck Club

Barbara Barrigan-Parrilla
Executive Director
Restore the Delta

Lowell Ashbaugh
Vice President, Conservation
Northern California Council Federation of Fly Fishers

Frank Egger
President
North Fork Eel Rivers Alliance

Cecily Smith
Executive Director
Foothill Conservancy

Adam Scow
California Campaign Director
Food and Water Watch

Lynne Plambeck
Executive Director
Santa Claritans for Planning and Conservation

Diana Jacobs
Chair, Board of Directors
Stanislaus River Preservation Trust

Stephen Green
President
Save the American River Association

Larry Collins
President
San Francisco Crab Boat Owners Associatio

Craig Tucker
Karuk Tribe

Dick Pool
President
Water4Fish

Dan Bacher
Editor
Fish Sniffer

Barbara Vlamis
Executive Director
AquAlliance

Linda Sheehan
Executive Director
Earth Law Center

Marty Dunlap
Citizens Water Watch

Konrad Fisher
Executive Director
Klamath Riverkeeper

Miriam Gordon
California Director
Clean Water Action

Attachments: EWC Comments on Bay Delta Conservation Plan/California

cc: (next page)

Additional꿯□ηAddressees,꿯□ηall꿯□ηvia꿯□ηemail:

Tom꿯□ηHoward,꿯□ηExecutive꿯□ηDirector
State꿯□ηWater꿯□ηResources꿯□ηControl꿯

Diane꿯□ηRiddle,꿯□ηEnvironmental꿯□ηProg
State꿯□ηWater꿯□ηResources꿯□ηControl꿯

Maria꿯□ηRea,꿯□ηAssistant꿯□ηRegional꿯
National꿯□ηMarine꿯□ηFisheries꿯□ηService

Michael꿯□ηTucker,꿯□ηFishery꿯□ηBiologist
National꿯□ηMarine꿯□ηFisheries꿯□ηService

Larry꿯□ηRabin,꿯□ηActing꿯□ηField꿯□ηSu
Delta
U.S.꿯□ηFish꿯□ηand꿯□ηWildlife꿯□ηService

Lori꿯□ηRinek
U.S.꿯□ηFish꿯□ηand꿯□ηWildlife꿯□ηService

Mary꿯□ηLee꿯□ηKnecht,꿯□ηProgram꿯□ηM
U.S.꿯□ηBureau꿯□ηof꿯□ηReclamation꿯□η

Patty꿯□ηIdloff
U.S.꿯□ηBureau꿯□ηof꿯□ηReclamation

Deanna꿯□ηHarwood
NOAA꿯□ηOffice꿯□ηof꿯□ηGeneral꿯□ηCoun

Kaylee꿯□ηAllen
Department꿯□ηof꿯□ηInterior꿯□ηSolicitor's

Jared꿯□ηBlumenfeld,꿯□ηRegional꿯□ηAdmir
U.S.꿯□ηEPA,꿯□ηRegion꿯□ηIX

Tom꿯□ηHagler
U.S.꿯□ηEPA꿯□ηGeneral꿯□ηCounsel꿯□ηOf

Tim꿯□ηVendlinski,꿯□ηBay꿯□ηDelta꿯□ηPr
Water꿯□ηDivision
U.S.꿯□ηEPA,꿯□ηRegion꿯□ηIX

Stephanie꿯□ηSkophammer,꿯□ηProgram꿯□η
U.S.꿯□ηEPA,꿯□ηRegion꿯□ηIX

Erin꿯□ηForesman,꿯□ηBay꿯□ηDelta꿯□ηCo
U.S.꿯□ηEPA,꿯□ηRegion꿯□ηIX

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Manager
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Environmental Water Caucus Comments on
Recirculated Draft EIR/Supplemental Draft EIS
for Bay Delta Conservation Plan and Tunnels Project

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[1]뀀□ηComment뀀□ηpreparation뀀□ηand뀀□ηconsultation뀀□ηmanaged뀀□ηby뀀□ηTim뀀□ηStroshane뀀□ηfor뀀□ηthe Contributors뀀□ηinclude뀀□ηColin뀀□ηBailey뀀□ηand뀀□ηEsther뀀□ηMin뀀□η(Environmental뀀□ηJustice뀀□ηCoalitio Barrigan-□Parrilla뀀□η(Restore뀀□ηthe뀀□ηDelta),뀀□ηChelsea뀀□ηTu뀀□η(Center뀀□ηfor뀀□ηBiological뀀□ηDiversit Jackson뀀□η(California뀀□ηWater뀀□ηImpact뀀□ηNetwork),뀀□ηLinda뀀□ηSheehan뀀□ηand뀀□ηGrant뀀□ηWilson뀀□ (Friends뀀□ηof뀀□ηthe뀀□ηRiver),뀀□ηPatricia뀀□ηSchifferle뀀□η(Pacicic뀀□ηAdvocates),뀀□ηand뀀□ηBill뀀□ηJenni Protection뀀□ηAlliance).

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Executive Summary

Did 18 months make a difference that matters in the Tunnels Project?

No,꿯□ηnot꿯□ηreally.

The꿯□ηEnvironmental꿯□ηWater꿯□ηCaucus꿯□η(EWC)꿯□ηobjects꿯□ηto꿯□ηapproval[2]꿯□ηof꿯□ηthe꿯
(BDCP)/California꿯□ηWaterFix꿯□ηproject꿯□ηincluding꿯□ηthe꿯□ηWe꿯□ηTunnels꿯□ηProject꿯□ηto꿯□ηappr
Final꿯□ηEnvironmental꿯□ηImpact꿯□ηReport/Environmental꿯□ηImpact꿯□ηStatement꿯□η(EIR/EIS)꿯□
Project.꿯□ηThe꿯□ηdecinite꿯□ηlead꿯□ηagencies꿯□ηfor꿯□ηthe꿯□ηproject꿯□ηcontinue꿯□ηto꿯□ηbe
the꿯□ηCalifornia꿯□ηDepartment꿯□ηof꿯□ηWater꿯□ηResources꿯□η(DWR),꿯□ηalthough꿯□ηthere꿯□
other꿯□ηTunnels꿯□ηApplicants.[4]

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[2]꿯□ηBDCP,꿯□ηthe꿯□ηBay꿯□ηDelta꿯□ηConservation꿯□ηPlan,꿯□ηhere꿯□ηdescribes꿯□ηall꿯□η22꿯□ηmeasur
plan.꿯□ηThat꿯□ηplan꿯□ηconsisted꿯□ηof꿯□ηwhat꿯□ηwe꿯□ηreferred꿯□ηto꿯□ηin꿯□ηlast꿯□ηyear's꿯□ηcor
and꿯□ηmeasures꿯□η2꿯□ηthrough꿯□η22,꿯□ηconsisting꿯□ηof꿯□ηthe꿯□ηYolo꿯□ηBypass꿯□ηFish꿯□ηFaciliti
restoration꿯□ηmeasures꿯□η3꿯□ηthrough꿯□η11,꿯□ηmeasures꿯□ηaddressing꿯□ηseveral꿯□ηecosystem꿯□η"str
invasive꿯□ηaquatic꿯□ηvegetation,꿯□ηdissolved꿯□ηoxygen,꿯□ηpredation꿯□ηhotspots)꿯□ηin꿯□ηmeasures꿯□η1
in꿯□ηmeasure꿯□η18,꿯□ηand꿯□ηhuman꿯□ηbehavior꿯□ηmanagement꿯□ηmeasures꿯□η(including꿯□ηurban꿯□
boating꿯□ηimports꿯□ηof꿯□ηinvasive꿯□ηspecies,꿯□ηnon-□project꿯□ηin-□Delta꿯□ηdiversions,꿯□ηand꿯□ηavoi
measures꿯□ηfor꿯□ηconstruction꿯□ηactivity)꿯□η19꿯□ηthrough꿯□η22.꿯□η

[3]꿯□η"California꿯□ηWaterFix"꿯□ηis꿯□ηa꿯□ηmisnomer;꿯□ηit꿯□ηwill꿯□ηnot꿯□ηcix꿯□ηCalifornia꿯□ηwater꿯
appears꿯□ηto꿯□ηbe,꿯□ηa꿯□ηTunnels꿯□ηProject.꿯□ηWe꿯□ηthink꿯□ηit꿯□ηbest꿯□ηnot꿯□ηto꿯□ηdignify꿯
"branding"꿯□ηeffort꿯□ηsince꿯□ηit꿯□ηrhetorically꿯□ηapplies꿯□ηideological꿯□ηlipstick꿯□ηto꿯□ηa꿯□ηmetap

[4]꿯□ηLast꿯□ηyear,꿯□ηaccording꿯□ηto꿯□ηBay꿯□ηDelta꿯□ηConservation꿯□ηPlan,꿯□ηthe꿯□η"authorized꿯□
for꿯□ηthe꿯□ηBay꿯□ηDelta꿯□ηConservation꿯□ηPlan꿯□ηincluded:

- California꿯□ηDepartment꿯□ηof꿯□ηWater꿯□ηResources,꿯□ηwhich꿯□ηwould꿯□ηown꿯□ηthe꿯□ηTunne
  Conservation꿯□ηMeasure꿯□η1
- US꿯□ηBureau꿯□ηof꿯□ηReclamation꿯□η(whose꿯□ηauthorization꿯□ηfor꿯□ηtake꿯□ηis꿯□ηsought꿯□ηu
- Kern꿯□ηCounty꿯□ηWater꿯□ηAgency
- Metropolitan꿯□ηWater꿯□ηAgency꿯□ηof꿯□ηSouthern꿯□ηCalifornia
- San꿯□ηLuis꿯□η&꿯□ηDelta꿯□ηMendota꿯□ηWater꿯□ηAuthority
- Santa꿯□ηClara꿯□ηValley꿯□ηWater꿯□ηDistrict
- State꿯□ηand꿯□ηFederal꿯□ηContractors꿯□ηWater꿯□ηAgency
- Westlands꿯□ηWater꿯□ηDistrict
- Alameda꿯□ηCounty꿯□ηFlood꿯□ηControl꿯□ηand꿯□ηWater꿯□ηConservation꿯□ηDistrict꿯□η(Zone꿯□η7

This꿯□ηyear,꿯□ηEWC꿯□ηwill꿯□ηcontinue꿯□ηto꿯□ηrefer꿯□ηto꿯□ηthe꿯□η"Authorized꿯□ηEntities"꿯□ηas꿯
Applicants",꿯□η"Tunnels꿯□ηApplicants,"꿯□ηor꿯□η"Tunnels꿯□ηPropponents"꿯□ηwith꿯□ηconcidence꿯
we꿯□ηknow꿯□ηany꿯□ηlonger꿯□ηwhich꿯□ηentities꿯□ηconstitute꿯□ηthe꿯□ηTunnels꿯□ηApplicants.꿯□ηNone
identicied꿯□ηin꿯□ηthe꿯□η2015꿯□ηRDEIR/SDEIS.꿯□ηAssuming꿯□ηthe꿯□ηabsence꿯□ηof꿯□ηthe꿯□ηothers'꿯
signicicant꿯□ηit꿯□ηsuggests,꿯□ηcirst,꿯□ηthat꿯□ηthey꿯□ηdid꿯□ηnot꿯□ηwish꿯□ηto꿯□ηbe꿯□ηassociated꿯□
and꿯□ηsecond,꿯□ηthat꿯□ηthey꿯□ηmay꿯□ηbe꿯□ηconclicted꿯□ηabout꿯□ηcontinuing꿯□ηovert꿯□ηsupport꿯□
the꿯□ηTunnels꿯□ηProject.꿯□ηNot꿯□ηidentifying꿯□ηall꿯□ηapplicants꿯□ηassociated꿯□ηwith꿯□ηthe꿯□ηproje
Guidelines꿯□η§꿯□η15051.꿯□ηThe꿯□ηexisting꿯□ηBDCP꿯□ηcinancing꿯□ηplan꿯□ηof꿯□ηChapter꿯□η8,꿯□ηNo
"authorized꿯□ηentities"꿯□ηwould꿯□ηbe꿯□ηpaying꿯□ηfor꿯□ηmost꿯□ηTunnels꿯□ηcapital꿯□ηfacilities꿯□ηinv
their꿯□ηbeing꿯□ηlead꿯□ηagencies,꿯□ηyet꿯□ηtheir꿯□ηnames꿯□ηare꿯□ηnot꿯□ηdisclosed꿯□ηin꿯□ηsections
review꿯□ηprocesses.

Environmental Water Caucus Comments on
Recirculated Draft EIR/Supplemental Draft EIS
for Bay Delta Conservation Plan and Tunnels Project

We provide our comments on the Recirculated Draft EIR/Supplemental both observations, legal and policy analysis, and criticisms in Section and conclude with specicic comments on the RDEIR/SDEIS in Section document roughly parallels that of our June 11, 2014, comments review for the Bay Delta Conservation Plan and its Tunnels Project.[5]

Last year, the Bay Delta Conservation Plan was certainly challenging strategic plan for habitat restoration and a quasi-project description Project export facility. The Tunnels project was considered as a hyped reduction of harm to listed species at the federal and "conservation strategy" contained 21 other specicic "conservation measures." forward detailed biological goals and objectives, yet states that none would be used to measure compliance of the Plan with respect Among the Plan's other conservation measures was a "reserve system "restoration opportunity areas" in the legal Delta region and Suisun conservation measures were actions aiming to address "other stressors" Unfortunately, some stressors, like selenium toxicity and nonnative invasi *Potamocorbula amurensis* are ignored altogether.

This year, the 2015 Tunnels Project is shorn of its restoration water conveyance scheme. The RDEIR/SDEIS details specicic changes to and operations, and proposes retaining "environmental commitments" to conservation strategy through Section 7 consultation. These environmental consist of "portions of actions previously contemplated" under Conservati communities protection and restoration), 4 (tidal natural communities), 6 enhancement), 7 (riparian natural community), 8 (grassland natural comm and alkali seasonal wetlands), 10 (nontidal marsh restoration), 11 (n enhancement and management), 12 (methylmercury management), 15 (localiz reduction), and 16 (non-physical cish barriers). Instead of nearly 16 restoration under BDCP, there would be at most up to 13,300 protection and restoration, just 59 acres of tidal natural community acres of restoration work in environmental commitments 6 through preferred California WaterFix alternative is barely one-tenth (1/10) the effort contemplated 18 months ago by the Bay Delta Conservation

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[5] The Environmental Water Caucus incorporates by reference comments of the North Delta, North Delta Water Agency, Central Delta Water Age Francisco BayKeeper, Friends of the River, Earth Law Center, the Environm Friends of the San Francisco Estuary, California Water Impact Network, Cal Alliance, and AquAlliance, the Bay Institute, Natural Resources Defense Council, Fishermen's Associations, Institute for Fishery Resources, the Greater Stockton the San Joaquin Council of Governments.

[6] Environmental Water Caucus, *Comments on the Draft BDCP and Draft EIR/EIS* addressed to Ryan Wulff, National Marine Fisheries Service, Sacramento, pp. Comments, June 11, 2014. *Accessible online at* http://www.ewccalifornia.org/reports/bdcpcomments6-11-2014-2.pdf and http://ewccalifornia.org/reports/ewcbdcpsupplementalcomments7-30-2014.pdf.

[7] Bay Delta Conservation Plan, *California WaterFix, Environmental Impact Report/Supplemental Draft Environmental Impact Statement, Executive Summary* p. ES-19. Herein *RDEIR/SDEIS* 18, and Table *Accessible online at* http://www.baydeltaconservationplan.com/Home.aspx.

Last꿯□ηyear꿯□ηwe꿯□ηprovided꿯□ηseveral꿯□ηbroad꿯□ηreasons꿯□ηwhy꿯□ηBDCP꿯□ηwas꿯□ηa꿯
Project꿯□ηis꿯□ηworse.꿯□η

BDCP꿯□ηrelied꿯□ηon꿯□ηa꿯□ηscienticically꿯□ηclawed꿯□ηhypothesis꿯□ηthat꿯□ηhabitat꿯□ηrestora
clows꿯□ηas꿯□ηthe꿯□ηchief꿯□ηstrategy꿯□ηfor꿯□η"cixing꿯□ηthe꿯□ηDelta,"꿯□ηand꿯□ηits꿯□ηim
the꿯□ηDelta's꿯□ηaquatic꿯□ηecosystems,꿯□ηbecause꿯□ηit꿯□ηused꿯□ηscience꿯□ηto꿯□ηmarket꿯□
Delta꿯□ηproblems.꿯□ηThe꿯□ηhabitat꿯□ηrestoration꿯□ηhypothesis꿯□ηfor꿯□ηBDCP꿯□ηcould꿯□ηbe
freshwater꿯□ηclows꿯□ηto꿯□ηand꿯□ηand꿯□η꿯□η꿯□η

the꿿□ηTunnels꿿□ηProject꿿□ηthat꿿□ηwill꿿□ηviolate꿿□ηfederal꿿□ηClean꿿□ηWater꿿□ηAct꿿□ηber
the꿿□ηabsence꿿□ηof꿿□ηa꿿□η"least꿿□ηenvironmental꿿□ηdamaging꿿□ηpracticable꿿□ηalternative."꿿
Section꿿□η7꿿□ηconsultation꿿□ηprocess꿿□ηneeds꿿□ηto꿿□ηaddress꿿□ηthis꿿□ηissue꿿□ηsquarely꿿
food꿿□ηsupplies꿿□ηfor꿿□ηlisted꿿□ηspecies,꿿□ηreasonable꿿□ηand꿿□ηprudent꿿□ηclow꿿□ηmanage
incidental꿿□ηtake꿿□ηstatement꿿□ηlevels,꿿□ηand꿿□ηreduction꿿□ηof꿿□ηtoxic꿿□ηcontamination꿿□
selenium,꿿□ηand꿿□ηother꿿□ηcriteria꿿□ηpollutants.

Moving꿿□ηforward꿿□ηhabitat꿿□η꿿□η꿿□η

I. Introduction

The EWC objects to the Tunnels Project.

After꿯□ηnine꿯□ηyears,꿯□ηthe꿯□ηBay꿯□ηDelta꿯□ηConservation꿯□ηPlan꿯□ηapplicants꿯□ηhave꿯□
more꿯□ηclawed꿯□ηthan꿯□ηits꿯□ηexpensive꿯□ηand꿯□ηmonstrous꿯□ηpredecessor.

The꿯□ηTunnels꿯□ηProject꿯□ηwould꿯□ηdivert꿯□ηmore꿯□ηof꿯□ηthe꿯□ηDelta꿯□ηcommon꿯□ηpo
contractors꿯□ηat꿯□ηa꿯□ηtime꿯□ηwhen꿯□ηthe꿯□ηstate꿯□ηhas꿯□ηover-□promised,꿯□ηwasted,꿯
water꿯□ηresources;꿯□ηwhen꿯□ηthe꿯□ηDelta꿯□ηis꿯□ηdeteriorating꿯□ηfrom꿯□ηState꿯□ηWater꿯
Project꿯□ηmismanagement꿯□ηduring꿯□ηthe꿯□ηcurrent꿯□ηfour-□year꿯□η(and꿯□ηperhaps꿯□ηcour
species꿯□ηare꿯□ηeven꿯□ηcloser꿯□ηto꿯□ηthe꿯□ηbrink꿯□ηof꿯□ηextinction;꿯□ηand꿯□ηlow-□inco
the꿯□ηDelta꿯□ηfor꿯□ηsubsistence꿯□ηcishing,꿯□ηjobs,꿯□ηand꿯□ηrecreation꿯□ηcontinue꿯□ηto꿯□

The꿯□ηTunnels꿯□ηproject꿯□ηwould꿯□ηbe꿯□ηa꿯□ηnew꿯□ηfacility꿯□ηproviding꿯□ηthe꿯□ηState
new꿯□ηdiversion꿯□ηpoints꿯□η(or꿯□η"north꿯□ηDelta꿯□ηintakes")꿯□ηfor꿯□ηwater꿯□ηalong꿯□η
new꿯□ηintakes꿯□ηwould꿯□ηdivert꿯□ηthe꿯□ηriver꿯□ηinto꿯□ηtwo꿯□ηgigantic꿯□ηtunnels꿯□ηtha
salty꿯□ηtidal꿯□ηclows꿯□ηin꿯□ηthe꿯□ηBay-□Delta꿯□ηEstuary꿯□ηfor꿯□ηdirect꿯□ηdelivery꿯□ηto
export꿯□ηto꿯□ηthe꿯□ηCalifornia꿯□ηAqueduct꿯□ηof꿯□ηthe꿯□ηSWP.꿯□ηThe꿯□ηTunnels꿯□ηProject
Delta꿯□ηwater꿯□ηtransfers꿯□ηmarket,꿯□ηand꿯□ηenable꿯□ηthe꿯□ηUS꿯□ηBureau꿯□ηof꿯□ηRecla
clow꿯□ηdiversions꿯□ηnot꿯□ηonly꿯□ηvia꿯□ηthe꿯□ηintertie꿯□ηbetween꿯□ηthe꿯□ηstate's꿯□ηCali
Delta꿯□ηMendota꿯□ηCanal꿯□ηor꿯□ηvia꿯□ηthe꿯□ηintermingling꿯□ηof꿯□ηstored꿯□ηwater꿯□ηat
Delta,꿯□ηbut꿯□ηalso꿯□ηthrough꿯□ηnew꿯□ηconnectors꿯□ηamong꿯□ηthe꿯□ηnew꿯□ηnorth꿯□ηce
Banks꿯□η(State꿯□ηWater꿯□ηProject)꿯□ηand꿯□ηJones꿯□η(Central꿯□ηValley꿯□ηProject)꿯□ηpumpi

Last꿯□ηyear꿯□ηwe꿯□ηasked꿯□ηof꿯□ηthe꿯□ηBDCP:꿯□ηWhy꿯□ηshould꿯□ηBDCP꿯□ηApplicants꿯
the꿯□ηfederal꿯□ηEndangered꿯□ηSpecies꿯□ηAct꿯□ηas꿯□ηthe꿯□η"regulatory꿯□ηstability"꿯□ηof꿯□
would꿯□ηfavor꿯□ηtheir꿯□ηconveyance꿯□ηinvestments꿯□ηover꿯□ηthe꿯□η"regulatory꿯□ηstability"꿯
holders꿯□ηand꿯□ηa꿯□ηhuge꿯□ηarray꿯□ηof꿯□ηhuman꿯□ηand꿯□ηnon-□human꿯□ηbenecicial꿯□η
Valley꿯□ηand꿯□ηthe꿯□ηDelta?꿯□η

This꿯□ηyear꿯□ηwe꿯□ηask:꿯□ηwhat꿯□ηmakes꿯□ηthe꿯□ηTunnels꿯□ηProject꿯□ηproponents꿯□ηt
in꿯□ηthe꿯□ηform꿯□ηof꿯□ηa꿯□ηmassive꿯□ηTunnels꿯□ηsystem,꿯□ηjust꿯□ηbecause꿯□ηthey꿯□η
should꿯□ηtheir꿯□ηdesire꿯□ηto꿯□ηexport꿯□ηwater꿯□ηfrom꿯□ηthe꿯□ηDelta꿯□ηtrump꿯□ηthe꿯□ηprio
protected꿯□ηbenecicial꿯□ηuses꿯□ηin꿯□ηthe꿯□ηBay꿯□ηDelta꿯□ηEstuary꿯□ηto꿯□ηhave꿯□ηa꿯□
all꿯□ηDelta꿯□ηresidents꿯□ηand꿯□ηecosystems,꿯□ηand꿯□ηall꿯□ηpeople꿯□ηof꿯□ηCalifornia꿯□ηc
in꿯□ηthe꿯□ηfuture?

Historically,꿯□ηthe꿯□ηBay-□Delta꿯□ηEstuary꿯□ηhas꿯□ηbeen꿯□ηenormously꿯□ηproductive,꿯□ηa꿯
species꿯□ηto꿯□ηreproduce꿯□ηin꿯□ηand꿯□ηmigrate꿯□ηthrough.꿯□ηIts꿯□ηnative꿯□ηspecies꿯□ηe
Estuary's꿯□ηannual꿯□ηand꿯□ηseasonal꿯□ηvariations꿯□ηin꿯□ηwater꿯□ηquality꿯□ηand꿯□ηclow.꿯
Delta꿯□ηEstuary꿯□ηcycles꿯□ηthrough꿯□ηsuch꿯□ηecological꿯□ηroles꿯□ηas꿯□ηaquatic꿯□ηnursery
The꿯□ηDelta's꿯□ηcommunities꿯□ηand꿯□ηeconomy꿯□ηwere꿯□ηbuilt꿯□ηon꿯□ηthis꿯□ηecological꿯
diverse꿯□ηecosystem꿯□ηdepends꿯□ηon꿯□ηhaving꿯□ηvariable꿯□ηand꿯□ηgood꿯□ηwater꿯□ηqualit
roles.

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[9]꿯□ηThis꿯□ηis꿯□ηpossible꿯□ηin꿯□ηpart꿯□ηunder꿯□ηState꿯□ηWater꿯□ηResources꿯□ηControl꿯□ηBoard꿯
of꿯□ηdiversion"꿯□ηin꿯□ηWater꿯□ηRights꿯□ηDecision꿯□η1641.꿯□ηSee꿯□ηalso꿯□ηRDEIR/SDEIS,꿯□ηJuly꿯□
RDEIR/SDEIS,꿯□ηAppendix꿯□ηA,꿯□ηSection꿯□η3.6.1.4,꿯□η3-□51,꿯□η"Expanded꿯□ηClifton꿯□ηCourt꿯□ηForebay,
and꿯□ηSection꿯□η3.6.1.5,꿯□η"Connections꿯□ηto꿯□ηBanks꿯□ηand꿯□ηJones꿯□ηPumping꿯□ηPlants,"꿯□ηp.꿯

Development□and□implementation□of□the□Tunnels□Project□must□be□acc
Water□Act□(CWA).□Sound□planning□dictates□that□implementation□of□the
begin□***now***,□to□prevent□violations□by□the□Tunnels□Project.□One□CWA□
during□Tunnels□Project□implementation□is□CWA□Section□401□certication,□
"[f]ederal□license□or□permit□to□conduct□any□activity□…□[that]□may
navigable□waters."[10]

This□year□as□well□as□last□year,□our□comments□focus□on□two□
Project□will□create□and□worsen□in□the□Delta:□First,□the□massive□
lower□Sacramento□River□used□seasonally□and□inter-□annually□by□several□
populations,□two□of□which□are□highly□vulnerable□to□the□threat□of
reduction□of□Delta□outclows□and□the□eastward-□moving□position□of□X
entrainment,□***this□time□in□the□North□Delta□to□go□along□with□con***
risks□in□the□South□Delta□and□nightmare□threatens□longcin□smelt,□Delta
juvenile□salmonids□with□entrainment□and□extinction.

Four□million□people□in□the□cive□Delta□counties□depend□on□good
livelihoods□and□quality□of□life.□Nearly□one□million□Delta□residents□
primary□drinking□water□supply.□To□improve□the□Delta□as□a□cishab
farmable□region□will□require□protecting□and□enhancing□the□Estuary's□
If□we□are□to□leave□generations□to□come□an□Estuary□with□sust
Estuary□deserves□and□needs□more□clowing□water,□cleansed□of□the□
and□federal□rejection□of□the□Tunnels□Project□will□only□help□in□

Apply the precautionary principle to water policy.

The□uncertainties□facing□the□Bay□Delta□Estuary□match□up□well□wi
principle.□The□precautionary□principle□has□the□following□characteristics□ap
and□uncertainty□in□environmental□(and□other□[illegible]□Montague□describes□the□essence□of□the□precautionary□principle□this□

> In□all□formulations□of□the□precautionary□principle,□we□have□have□
> suspicion□of□harm,□and□(2)□scienticic□uncertainty□about□cause□and□effect,
> action□to□prevent□harm.□
>
> The□precautionary□principle□does□not□tell□us□what□action□to□take.□H
> approach□have□suggested□a□series□of□actions:□(1)□Set□goals;□(2)□
> the□goals,□intending□to□adopt□the□least-□harmful□way;□(3)□Assume□that
> harmful,□and□therefore□seek□the□least-□harmful□alternative.□Shift□the□burden
> are□uncertain,□give□the□benecit□of□the□doubt□to□nature,□public□healt
> responsible□parties□(not□governments□or□the□public)□to□bear□the□burden
> Expect□reasonable□assurances□of□safety□for□products□before□they□can□be
> Drug□Administration□expects□reasonable□assurances□of□safety□before□new□ph
> marketed.□(4)□Throughout□the□decision-□making□process,□honor□the□knowledge
> affected□by□the□decisions,□and□give□them□a□real□"say"□in□the□ou
> of□ethics,□right-□and-□wrong,□history,□cultural□appropriateness,□and□justice□to□
> decision.□(5)□Assume□that□humans□will□make□mistakes□and□that□dec
> Therefore,□monitor□results,□heed□early□warnings,□and□be□prepared□to□ma
> needed;□this□implies□that□we□will□avoid□irreversible□decisions□and□irretr

[10]□33□U.S.C.□§□1341(a)(1).

> Instead of asking the basic question of the precautionary approach asks, 'How little harm is possible?' In sum: Fac
> harm, the precautionary approach urges a full evaluation of available al
> preventing or minimizing harm.[11]

Last year, we commented critically that the BDCP sought to app
time operations as sure-cire solutions to the profound biological, ge
public health uncertainties involved with constructing and operating such
a complex environment as the San Bay Delta Estuary. overly
optimistic BDCP, the Tunnels Project described and evaluated in the
over-concidence in adaptive management and real-time monitoring as
solutions to Tunnels Project uncertainties.

We are not alone in detecting excessive optimism throughout last
Project environmental documentation; the Delta Independent Science Board
this pervasive characteristic in 2014 Many and of the impact fall assessments
overly optimistic expectations about the feasibility, effectiveness, or timin
conservation actions…." And: "In essence, it is often argued that
will have sufcicient positive benecits for covered species to counterb
water diversions and changes in clow caused ***This is a*** ***alternatives***
implausible standard of perfection for such a complex problem ***reviews*** of Chapters 11 and 12….It would be better to begin
include contingency or back-up plans."[12]

This year, time was much shorter for reviewing 8,000 pages of
found that "the [RDEIR/SDEIS] retains unwarranted optimism…" and that
consequences remain inadequately addressed, improvements notwithstanding. Unce
be dealt with by establishing "a robust program of collaborative
management. No details about this program are provided, so there
whether uncertainties will be dealt with effectively, and that
Project modeling efforts did not adequately conduct "modeling that
ranges of uncertainties or (more importantly) assess propagation of

Substantive BDCP Revisions (Appendix D) contained in this year's re
increasing grasp of the number, kind, and degree of uncertainties
operation of the Tunnels Project[13] "key uncertainties and potential
actions relevant" to Conservation Measure 1—and hence to the Tunn

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[11] Peter Montague, accessed online September 1, 2015 at

[12] Environmental Water Caucus, *Comments on the Draft BDCP and Draft EIR/EIS* addressed to Ryan Wulff, National Marine Fisheries Service, Sacramento, pp.

[13] Delta Independent Science Board, *Comments on Draft EIR/EIS for the Bay Delta* 2014, pp. 3, 5. Emphasis added.

[14] RDEIR/SDEIS, *Executive Summary*, Section ES-2, Conservative Science and Adaptive management Program," p. ES-37 to ES-39.

[15] Delta Independent Science Board, *Environmental documents for* September 30, 2015, pp. 10-11.

[16] RDEIR/SDEIS, 2015, *Appendix D*, Table 3.4.1-5, p. D.3-24 through D

six뀔□ η(6)뀔□ηare뀔□ηnew뀔□ηand뀔□ηeight뀔□η(8)뀔□ηare뀔□ηsignicicantly뀔□ηrevised뀔□ηfrom뀔□η
conservation뀔□ηstrategy.뀔□η

The뀔□ηstatus뀔□ηand뀔□ηutility뀔□ηof뀔□ηthese뀔□ηand뀔□ηa뀔□ηvast뀔□ηnumber뀔□ηof뀔□ηother뀔
considerable뀔□ηdoubt뀔□ηsince뀔□ηSection뀔□η7뀔□ηconsultation뀔□ηwith뀔□ηthe뀔□ηfederal뀔□ηcish
and뀔□ηthe뀔□ηexact뀔□ηcontent뀔□ηof뀔□ηenvironmental뀔□ηcommitments,뀔□ηincidental뀔□ηtake뀔□η
and뀔□ηprudent뀔□ηalternatives뀔□ηare뀔□ηalso뀔□ηhighly뀔□ηuncertain.

Free Speech, Transparency, and Tunnels Project Commentary

In뀔□ηlate뀔□η2013,뀔□ηthe뀔□ηBay뀔□ηDelta뀔□ηConservation뀔□ηPlan뀔□ηweb뀔□ηsite뀔□ηwas뀔□η
"Correspondence"뀔□ηpage뀔□ηcontains뀔□ηthe뀔□ηstatement:뀔□η"The뀔□ηBDCP뀔□ηencourages뀔□ηpu
is뀔□ηa뀔□ηlist뀔□ηof뀔□ηcorrespondence뀔□ηand뀔□ηpublic뀔□ηcomments뀔□ηthat뀔□ηhave뀔□ηbeen
from뀔□η2007-□2013."뀔□ηIn뀔□ηthe뀔□ηEWC's뀔□ηJune뀔□η11,뀔□η2014,뀔□ηletter뀔□ηon뀔□ηBDCP,
clamping뀔□ηdown뀔□ηon뀔□ηthe뀔□ηfree뀔□ηclow뀔□ηof뀔□ηinformation뀔□ηand뀔□ηopinion뀔□ηabo
concerned,뀔□ηwith뀔□ηthese뀔□ηnew뀔□ηdocuments,뀔□ηabout뀔□ηhow뀔□ηpublic뀔□ηcomments뀔□ηa
handled.뀔□ηIn뀔□ηthe뀔□ηRDEIR/SDEIS,뀔□ηTunnels뀔□ηProject뀔□ηproponents뀔□ηexplain뀔□ηthey뀔□
complete뀔□ηrevisions뀔□ηto뀔□ηthe뀔□ηoriginal뀔□ηDraft뀔□ηEIR/EIS,뀔□ηbut뀔□ηrather뀔□ηto뀔□ηp
contents뀔□ηof뀔□ηthe뀔□ηDraft뀔□ηEIR/EIS.뀔□ηnew뀔□ηcontents"뀔□ηappear뀔□ηto뀔□ηinclude뀔□ηchange
describing뀔□ηand뀔□ηanalyzing뀔□η"changes뀔□ηto뀔□ηconveyance뀔□ηfacility뀔□ηdesign;뀔□ηrevisions
changes뀔□ηto뀔□ηthe뀔□ηproposed뀔□ηconservation뀔□ηstrategy뀔□ηand뀔□ηhabitat뀔□ηmitigation뀔□η
corrections뀔□ηto뀔□ηthe뀔□ηanalysis뀔□η[18]뀔□η certain뀔□ηimpacts."

Alternative뀔□η4A,뀔□ηa뀔□ηnew뀔□ηalternative,뀔□ηwould뀔□ηhave뀔□η"the뀔□ηsame뀔□ηconveyance
would뀔□ηnot뀔□ηinclude뀔□ηthe뀔□ηsame뀔□ηkinds뀔□ηof뀔□ηchanges뀔□ηto뀔□ηAlternative뀔□η4뀔□
measures뀔□ηof뀔□ηBDCP;뀔□ηit뀔□ηwould뀔□ηnot뀔□ηinclude[19]뀔□η habitat뀔□ηconservation뀔□ηp

Given뀔□ηthese뀔□ηchanges뀔□ηin뀔□ηlight뀔□ηof뀔□ηCEQA뀔□ηGuidelines,뀔□ηthe뀔□ηTunnels뀔□ηPro
comments뀔□ηbe뀔□ηrestricted뀔□ηto뀔□ηthe뀔□ηnewly뀔□ηcirculated뀔□ηinformation뀔□ηcontained뀔□
words,"뀔□ηthey뀔□η*continue뀔□η partial뀔□η recirculation 뀔□η is 뀔□η not 뀔□η an 뀔□η opportunity 뀔□η to 뀔□η res*
previously 뀔□η published 뀔□η topics, 뀔□η or 뀔□η to 뀔□η add 뀔□η additional 뀔□η comments 뀔□η the 뀔□η previous
comments뀔□ηpreviously뀔□ηsubmitted뀔□ηon뀔□ηthe뀔□ηDraft뀔□ηEIR/EIS뀔□ηremain뀔□ηa뀔□ηpart
responded뀔□ηto뀔□ηin뀔□ηthe뀔□ηFinal뀔□ηEIR/EIS.뀔□ηTunnels뀔□ηProject뀔□ηproponents뀔□ηcite뀔□ηCEQA
15088.5(f)(2)뀔□ηin뀔□ηsupport뀔□ηof뀔□ηtheir뀔□η"directive"뀔□ηto뀔□ηthe뀔□ηpublic.뀔□η

We뀔□ηare뀔□ηdeeply뀔□ηconcerned뀔□ηthis뀔□ηseeks뀔□ηillogically,뀔□ηarbitrarily,뀔□ηcapriciously,뀔□ηand뀔□η
the뀔□ηscope뀔□ηof뀔□ηpublic뀔□ηcomment뀔□ηwhen뀔□ηit뀔□ηcomes뀔□ηto뀔□ηthe뀔□ηobvious뀔□η
analyses뀔□ηand뀔□ηalternatives뀔□ηof뀔□ηthe뀔□ηRDEIR/SDEIS뀔□ηwith뀔□ηalternatives뀔□ηand뀔□ηa
EIS.뀔□ηTo뀔□ηmake뀔□ηsense뀔□ηof뀔□ηthe뀔□ηrelative뀔□ηmerits뀔□ηof뀔□ηone뀔□ηalternative뀔□η
documents,뀔□ηthe뀔□ηpublic,뀔□ηgovernmental뀔□ηand뀔□ηother뀔□ηreviewers뀔□ηmust뀔□ηbe뀔□ηab
them.뀔□ηEWC뀔□ηcinds뀔□ηthe뀔□ηTunnels뀔□ηProject뀔□ηproponents'뀔□η"directive"뀔□ηuntenable.

CEQA뀔□ηGuidelines뀔□ηsection뀔□η15088.5(f)(2)뀔□ηstates뀔□ηin뀔□ηfull:

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[17]뀔□ηRDEIR/SDEIS,뀔□ηSection뀔□η1.2,뀔□ηp.뀔□η1-□30,뀔□ηlines뀔□η4-□7.

[18]뀔□ηRDEIR/SDEIS,뀔□ηSection뀔□η1.2,뀔□ηp.뀔□η1-□29,뀔□ηlines뀔□η8-□10.

[19]뀔□ηRDEIR/SDEIS,뀔□ηSection뀔□η1.2,뀔□ηp뀔□η1-□29,뀔□ηline뀔□η10;뀔□ηand뀔□ηp.뀔□η1-□30,뀔□ηlines뀔□η

[20]뀔□ηRDEIR/SDEIS/,뀔□ηSection뀔□η1.2,뀔□ηp.뀔□η1-□30,뀔□ηlines뀔□η24-□29.뀔□ηEmphasis뀔□ηin뀔□ηoriginal.

> When꿯□ηthe꿯□ηEIR꿯□ηis꿯□ηrevised꿯□ηonly꿯□ηin꿯□ηpart꿯□ηand꿯□ηthe꿯□ηlead꿯□ηagency꿯□ηis꿯
> portions꿯□ηof꿯□ηthe꿯□ηlead꿯□ηagency꿯□ηmay꿯□ηrequest꿯□ηthat꿯□ηreviewers꿯□ηlimit꿯□ηtheir꿯□
> chapters꿯□ηor꿯□ηportions꿯□ηof꿯□ηthe꿯□ηrecirculated꿯□ηEIR꿯□ηneed꿯□ηonly꿯□ηrespond꿯□ηto꿯
> received꿯□ηduring꿯□ηthe꿯□ηinitial꿯□ηcirculation꿯□ηperiod꿯□ηthat꿯□ηrelate꿯□ηto꿯□ηchapters꿯□ηor꿯
> not꿯□ηrevised꿯□ηand꿯□ηrecirculated,꿯□ηand꿯□η(ii)꿯□ηcomments꿯□ηreceived꿯□ηduring꿯□ηthe꿯□ηrec
> chapters꿯□ηor꿯□ηportions꿯□ηof꿯□ηthe꿯□ηearlier꿯□ηEIR꿯□ηthat꿯□ηwere꿯□ηrevised꿯□ηand꿯□ηrecir
> reviewers꿯□ηlimit꿯□ηthe꿯□ηscope꿯□ηof꿯□ηtheir꿯□ηcomments꿯□ηshall꿯□ηbe꿯□ηincluded꿯□ηeither꿯□
> by꿯□ηan꿯□ηattachment꿯□ηto꿯□ηthe꿯□ηrevised꿯□ηEIR.

The꿯□ηTunnels꿯□ηProject꿯□ηproponents'꿯□η"directive"꿯□ηin꿯□ηthe꿯□ηRDEIR/SDEIS꿯□ηimproper
for꿯□ηcomments꿯□ηunder꿯□ηCEQA꿯□ηGuidelines.꿯□ηThe꿯□ηplain꿯□ηlanguage꿯□ηof꿯□η15988.5
directive꿯□ηprecluding꿯□η"comments꿯□ηon꿯□ηpreviously꿯□ηpublished꿯□ηchapters꿯□ηrestriction꿯□ηis꿯□ηfor
"comments꿯□ηreceived...that꿯□ηrelate꿯□ηto꿯□ηchapters꿯□ηor꿯□ηportions"꿯□ηof꿯□ηthe꿯□ηrecir
limitation꿯□ηdoes꿯□ηnot꿯□ηextend꿯□ηto꿯□ηthe꿯□ηlevel꿯□ηof꿯□ηdetail꿯□ηimplied꿯□ηby꿯□η
the꿯□ηword꿯□η"topics"꿯□ηin꿯□ηthe꿯□ηRDEIR/SDEIS.꿯□ηSo꿯□ηlong꿯□ηas꿯□ηour꿯□ηcomments
portions꿯□ηof꿯□ηthe꿯□ηRDEIR/SDEIS—even꿯□ηif꿯□ηthey꿯□ηcompare꿯□ηor꿯□ηcontrast꿯□ηor꿯
the꿯□ηDraft꿯□ηEIR/EIS—the꿯□ηTunnels꿯□ηProject꿯□ηproponents꿯□ηmust,꿯□ηunder꿯□ηCEQA꿯□
comments.

The Public Trust, the Delta Common Pool, and the ESA

The꿯□ηBay-□Delta꿯□ηEstuary꿯□ηis꿯□ηan꿯□ηover-□appropriated꿯□ηcommon꿯□ηpool꿯□ηplagued
to꿯□ηprotect꿯□ηall꿯□ηbenecicial꿯□ηuses꿯□ηof꿯□ηwater—human꿯□ηand꿯□ηnon-□human꿯□ηalik
most꿯□ηsensitive꿯□ηbenecicial꿯□ηuses.[22]꿯□ηThis꿯□ηfailure꿯□ηviolates꿯□ηthe꿯□ηstate's꿯□ηpublic꿯□ηtrust꿯□
Tunnels꿯□ηProject꿯□ηwould꿯□ηcontinue꿯□ηthis꿯□ηrecord꿯□ηof꿯□ηfailure.꿯□ηIt꿯□ηfails꿯□ηto
through꿯□ηand꿯□ηin꿯□ηthe꿯□ηDelta꿯□η(and꿯□ηcalled꿯□ηfor꿯□ηin꿯□ηthe꿯□ηDelta꿯□ηReform
framework꿯□ηof꿯□ηstate꿯□ηwater꿯□ηpolicy:

- Achieving꿯□ηthe꿯□ηcoequal꿯□ηgoals꿯□ηof꿯□ηWater꿯□ηCode꿯□ηSection꿯□η85054꿯□ηof
  water꿯□ηsupply꿯□ηreliability.꿯□η
- Water꿯□ηCode꿯□ηSection꿯□η85023,꿯□ηstating:꿯□η"The꿯□ηlongstanding꿯□ηconstitutional꿯□ηprinc
  use꿯□ηand꿯□ηthe꿯□ηpublic꿯□ηtrust꿯□ηdoctrine꿯□ηshall꿯□ηbe꿯□ηthe꿯□ηfoundation꿯□η
  and꿯□ηare꿯□ηparticularly꿯□ηimportant꿯□ηand꿯□ηapplicable꿯□ηto꿯□ηthe꿯□ηDelta."꿯□η
- Water꿯□ηCode꿯□ηSection꿯□η85021꿯□ηrequiring꿯□ηreduced꿯□ηreliance꿯□ηon꿯□ηthe꿯□η
  future꿯□ηwater꿯□ηsupply꿯□ηneeds꿯□η(and꿯□ηwhose꿯□ηstrategy꿯□ηspecicies꿯□η"investin
  supplies,꿯□ηconservation,꿯□ηand꿯□ηwater꿯□ηuse꿯□ηefciciency").꿯□η

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[21]꿯□ηEmphasis꿯□ηadded.

[22]꿯□ηState꿯□ηWater꿯□ηResources꿯□ηControl꿯□ηBoard,꿯□η*Bay-Delta Water Rights Hearing*,꿯□η*the* 꿯□η*Bay-Delta* 꿯□η*Water* 꿯□η*Rights* 꿯□η*Hearing*,꿯□η*September* 꿯□η*26*,꿯□η2008,꿯□
presented꿯□ηto꿯□ηDelta꿯□ηVision꿯□ηBlue꿯□ηRibbon꿯□ηTask꿯□ηForce꿯□η*October* 꿯□η*2017*,꿯□η2008.꿯□ηA
http://deltavision.ca.gov/BlueRibbonTaskForce/Oct2008/Response_from_SWRCB.pdf;꿯□ηCalifornia꿯□ηWater꿯□ηImpact꿯□ηNetwork,꿯□ηCalifo
Sportcishing꿯□ηProtection꿯□ηAlliance,꿯□η*and* 꿯□η*Bay* 꿯□η*Alliance*,꿯□η*Water* 꿯□η*Availability* 꿯□η*Analysis* 꿯□η*for* 꿯□η*Tr*
Sacramento, 꿯□η*and* 꿯□η*San* 꿯□η*Joaquin* 꿯□η*River* 꿯□η*Basins* 꿯□η*Tributary* 꿯□η*Watersheds*,꿯□η*submitted* 꿯□η*to* 꿯□η*State* 꿯□η*Water* 꿯□η*Resources* 꿯□η*Control* 꿯□η*Board*,꿯□η*Bay-Delta* 꿯□η*Water*
October꿯□η26,꿯□η2012,꿯□η*accessible* 꿯□η*at*:꿯□η http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/docs/comments111312/tim_stroshane.pdf;꿯□ηand꿯□ηTheodore꿯□ηE.꿯□ηGrantham꿯□ηand꿯□ηJoshua꿯
Years꿯□ηof꿯□ηCalifornia's꿯□ηwater꿯□ηrights꿯□ηsystem:꿯□η*patterns,* 꿯□η*trends,* 꿯□η*and* 꿯□η*uncertainty*,"꿯□η
9(2014),꿯□ηaccessible꿯□η*at*:꿯□η https://watershed.ucdavis.edu/files/biblio/WaterRights_UCDavis_study.pdf.꿯□η

- Water꿯□ηCode꿯□ηSection꿯□η[illegible]꿯□ηDelta꿯□ηProtection꿯□ηAct꿯□ηof꿯□η1959)꿯□ηrec
state꿯□ηnor꿯□ηfederal꿯□ηwater꿯□ηprojects꿯□ηshould꿯□ηdivert꿯□ηwater꿯□ηfrom꿯□ηthe
entitled.

- Achieving꿯□ηthe꿯□ηcish꿯□ηand꿯□ηspecicically꿯□ηsalmonid꿯□ηabundance꿯□ηgoals꿯□ηof꿯
Code꿯□ηSections꿯□η5937,꿯□η5946,꿯□ηand꿯□η6902(a);꿯□ηand꿯□ηthe꿯□ηCentral꿯□ηValle
1992,꿯□ηSection꿯□η3406(b)(1).)꿯□η

- The꿯□ηfederal꿯□ηClean꿯□ηWater꿯□ηAct꿯□ηrequiring꿯□ηprotection꿯□ηof꿯□ηthe꿯□ηchem
integrity꿯□ηof꿯□ηthe꿯□ηnation's꿯□ηwaters꿯□η(including꿯□ηthose꿯□ηof꿯□ηnavigable꿯□ηBay-□
waters꿯□ηof꿯□ηthe꿯□ηUnited꿯□ηStates꿯□η(including꿯□ηthose꿯□ηof꿯□ηthe꿯□ηEstuary)꿯□η
regulation꿯□ηof꿯□ηwater꿯□ηquality꿯□ηstandards꿯□ηfor꿯□ηthe꿯□ηEstuary꿯□ηbe꿯□ηbase
benecicial꿯□ηuse꿯□ηamong꿯□ηthose꿯□ηoccurring꿯□ηin꿯□ηa꿯□ηparticular꿯□ηwater꿯□ηbo

And꿯□ηthe꿯□ηRDEIR/SDEIS꿯□ηfails꿯□ηto꿯□ηevaluate꿯□ηthe꿯□ηTunnels꿯□ηProject꿯□ηin꿯□ηlig
cish꿯□ηspecies꿯□ηare꿯□ηthe꿯□ηmost꿯□ηsensitive꿯□ηbenecicial꿯□ηuses꿯□ηin꿯□ηthe꿯□ηBay-□
*human*꿯□ηbenecicial꿯□ηuses꿯□ηare꿯□ηsubsistence꿯□ηcishers꿯□ηtaking꿯□ηnutrition꿯□ηdirectly꿯□
is꿯□ηdeeply꿯□ηconcerned꿯□ηthat꿯□ηthe꿯□ηTunnels꿯□ηProject's꿯□ηswitch꿯□ηto꿯□ηreliance꿯□
preventing꿯□ηmere꿯□η"jeopardy"꿯□ηrather꿯□ηthan꿯□ηthe꿯□ηoverall꿯□ηESA꿯□ηgoal꿯□ηof꿯□η
deterioration꿯□ηof꿯□ηthe꿯□ηBay-□Delta꿯□ηEstuary,꿯□ηmade꿯□ηall꿯□ηthe꿯□ηeasier꿯□ηby꿯□η
Tunnels꿯□ηProject.

Restoring the Delta for All

The꿯□ηTunnels꿯□ηProject꿯□ηRDEIR/SDEIS꿯□ηfails꿯□ηto꿯□ηconsider꿯□ηfully꿯□ηproject꿯□ηimpa
to꿯□ηpublic꿯□ηhealth,꿯□ηwater꿯□ηquality,꿯□ηsubsistence꿯□ηcishing,꿯□ηland꿯□ηuse,꿯□ηclood꿯□
participation,꿯□ηand꿯□ηlanguage꿯□ηaccessibility꿯□ηfor꿯□ηenvironmental꿯□ηjustice꿯□ηcommunities
violate꿯□ηCivil꿯□ηRights꿯□ηand꿯□ηEnvironmental꿯□ηLaws꿯□ηand꿯□ηfail꿯□ηto꿯□ηmeet꿯□ηEn
For꿯□ηthe꿯□ηreasons꿯□ηlisted꿯□ηabove,꿯□ηthe꿯□ηBDCP/Tunnels꿯□ηProject꿯□ηpresents꿯□ηan
should꿯□ηnot꿯□ηproceed꿯□ηas꿯□ηproposed.꿯□ηWe꿯□ηcomment꿯□ηfurther꿯□ηon꿯□ηenvironme
Tunnels꿯□ηProject꿯□ηin꿯□ηSection꿯□ηV꿯□ηof꿯□ηthese꿯□ηcomments.

The Tunnels Project must be excluded from the Delta Plan.

Last꿯□ηyear,꿯□ηwhen꿯□ηthe꿯□ηBay꿯□ηDelta꿯□ηConservation꿯□ηPlan꿯□ηwas꿯□ηconsidered꿯□
conservation꿯□ηplan꿯□ηunder꿯□ηfederal꿯□ηESA꿯□ηSection꿯□η10꿯□ηand꿯□ηa꿯□ηnatural꿯□ηco
the꿯□ηCalifornia꿯□ηESA,꿯□ηit꿯□ηcould꿯□ηqualify꿯□ηfor꿯□ηeventual꿯□ηincorporation꿯□ηas꿯□η
prepared꿯□ηby꿯□ηthe꿯□ηDelta꿯□ηStewardship꿯□ηCouncil,꿯□ηprovided꿯□ηthe꿯□ηBDCP꿯□ηmet꿯
Delta꿯□ηReform꿯□ηAct꿯□ηof꿯□η2009.꿯□ηEWC꿯□ηmembers꿯□ηcommented꿯□ηthat꿯□ηBDCP꿯□η
specicically꿯□ηthat:꿯□η

> ***BDCP꿯□ηcannot꿯□ηdemonstrate꿯□ηcompliance꿯□ηwith,꿯□ηand꿯□ηthe꿯□ηDepartment꿯□ηof꿯□ηFish
> to꿯□ηsustain,꿯□ηthis꿯□ηrequired꿯□ηfinding꿯□ηunder꿯□ηSection꿯□η[illegible]꿯□ηwithout꿯□ηabusing꿯□ηits꿯□ηdiscretion
> interpret꿯□ηthis꿯□ηlaw.꿯□η***[illegible]eling꿯□ηresults꿯□ηshow꿯□ηdecreased꿯□ηsalmonid꿯□ηsurvival꿯□ηrates,꿯□
> entrainment꿯□ηrisk꿯□η(including꿯□ηat꿯□ηthe꿯□ηNorth꿯□ηDelta꿯□ηintakes),꿯□ηeastward꿯□ηmigration
> and꿯□ηlonger꿯□ηresidence꿯□ηtimes꿯□ηof꿯□ηwater꿯□ηpassing꿯□ηthrough꿯□ηthe꿯□ηDelta.꿯□ηThe꿯□
> away꿯□ηfrom꿯□ηthe꿯□ηcriterion꿯□ηin꿯□ηWater꿯□ηCode꿯□ηSection꿯□η85320(b)(2)(A),꿯□ηwhich꿯□η
> recovering꿯□ηthe꿯□ηDelta꿯□ηecosystem꿯□ηand꿯□ηrestoring꿯□ηcisheries꿯□ηunder꿯□ηa꿯□ηreasonable
> conditions.[23]

[23] EWC꿯□ηComments,꿯□ηJune꿯□η11,꿯□η2014,꿯□ηpp.꿯□η119-□120.꿯□ηEmphasis꿯□ηin꿯□ηoriginal.

The legal trigger for whether BDCP may be incorporated by the recommendation of the California Department of Fish and Wildlife is part of an HCP/NCCP. This year, it is not. Therefore the Tun "covered action" in which the Delta Stewardship Council (DSC) is proponents assertion that the proposed project is consistent with the

The Delta Plan is itself currently the subject of litigation about the policies of the Delta Reform Act adopted in 2009. covered action st Tunnels Project. If the Court vacates the DSC's approval of the Delta Reform Act policies, then there would be no Delta Plan legally be found to conform, until such time as the DSC app

(The causes of action in the Delta Plan litigation are entirely Project operation. In formulating Delta Plan policies and recommendation Council:

- Formulated a "reduced reliance on the Delta" policy that does
- Failed to observe the Act's mandate to rely on "best avai Plan.
- Promoted BDCP in violation of the Act, since the Tunnels goals, and misinterpreted the meaning of "improving conveyance."
- Failed to perform its duties to protect public trust resources Plan.[25])

This year, we again cind that through-Delta salmonid survival rates the North Delta intakes, eastward migration X2, longer residence tim are all endemic to the preferred alternative of the RDEIR/SDEIS.

EWC was pleased to learn that the DSC recognizes that the Project, cannot be incorporated into the Delta Plan and must be

> Although WaterFix is shown as a new alternative in the environmental practical purposes the BDCP as it has been envisioned for the past BDCP, the new WaterFix project is not a conservation plan aiming exchange for a long-term operational permit. Rather, the objectives of —"to make physical and operational improvements to the State Water Project (CVP) systems in the Delta necessary to restore and protect the SWP and CVP south of the Delta, and water quality within with statutory and contractual obligation"….Because WaterFix will not be a conservation plan…, the Council is not required to incorporate the Wat

[24] There were numerous complaints cited by both water contractor, commu water parties. They are sometimes described as "the Delta Plan cases." until perhaps mid-2016.

[25] *Petitioners Central Delta Water Agency et al and California Water Impact on the merits in support of Qirst amended veriQied petitions for Writ and Injunctive Declaratory Relief, 2014.*

Plan. WaterFix instead will be subject to the Council's authority over covered actions to be consistent with the regulatory portions of the Delta Plan.[26]

It appears that DWR and the Tunnels Project proponents more
the Tunnels Project status with respect to the Delta Plan. Section
description of the Department of Fish and Wildlife's role in mak
Code Section 85320(b)(2).[27]

But Tunnels Project proponents [illegible] 1 of the RDEIR
states later that "Delta Reform Act compliance" for its alternatives
"would be achieved through either the Delta Plan Consistence certici
possible future amendment to the Delta Plan." This "future amendme
Project proponents' belief that the inclusion/incorporation pathway for H
limitation in time.

This ambiguity is confusing. The ambiguity goes to the heart of
alternative." The RDEIR/SDEIS states that the Tunnels Project is the
of the other RDEIR/SDEIS alternatives put forward in July 2015
substance associated with them. [illegible] RDEIR/SDEIS [illegible] in stating that
Reform Act still provides a pathway for one of these speci.ic
into the Delta Plan. This error needs to be corrected.[28]

The RDEIR/SDEIS also contains Appendix G, which is "intended to
considered for Alternative 4A...to met the Delta Plan consistency requ
represents the Tunnels Project proponents' view of the Delta Reform
Council, and the Delta Plan.

Appendix G contains no listing of Delta Plan policies and recomm
the policy framework against which it would be evaluated for co
listing of "consistency requirements" contained in the Plan's implementing
includes mitigation measures, best available science, adaptive management,
Delta through Improved Regional Water Self-Reliance," delta clow object
regulations. The listing omits the regulation's de.inition [illegible] "coequal
we are certain the Tunnels Project proponents cind challenging to

We note too that the Delta Plan implementing regulations contain
"consistency" with Delta Plan policies and recommendations means. The
avoids this topic too.

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[26] See Delta Conservation Plan Draft, [illegible] August Review 28, [illegible] 2015 Delta Stewardship staff report, http://deltacouncil.ca.gov/docs/delta-stewardship-council-august-27-28-2015-meeting-agenda-item-17-bay-delta-conservation-plan. Emphasis added.

[27] RDEIR/SDEIS, Section 1.1.5.5, California Department of Fish and Wildlife,

[28] But in committing the error, EWC recognizes that the Tunnels Project policy certainty on behalf of their project and cind it psychologically advantage for the project.

When뀡□ηit뀡□ηcomes뀡□ηto뀡□ηreducing뀡□ηreliance뀡□ηon뀡□ηthe뀡□ηDelta,뀡□ηRDEIR/SDEIS뀡□η
"Demand뀡□ηManagement뀡□ηMeasures"뀡□ηdescribed뀡□ηin뀡□ηAppendix뀡□η1C,뀡□ηwe뀡□ηy
stated뀡□ηlast뀡□ηyear,뀡□ηthe뀡□ηreduced-□reliance-□on-□the-□Delta뀡□ηpolicy뀡□ηof뀡□ηthe뀡□ηAct
Tunnels뀡□ηProject's뀡□ηpurpose뀡□ηand뀡□ηneed뀡□ηis뀡□ηvalid뀡□ηor뀡□ηcapable뀡□ηof뀡□ηbeing
Act뀡□ηpolicies뀡□ηand뀡□ηthe뀡□ηDelta뀡□ηPlan.뀡□ηWe뀡□ηcontend뀡□ηthat뀡□ηthe뀡□ηRDEIR/SDE
need뀡□ηfor뀡□ηthe뀡□ηproposed뀡□ηproject뀡□ηin뀡□ηlight뀡□ηof뀡□ηanalysis뀡□ηof뀡□ηother뀡□ηw
Delta뀡□ηwater뀡□η(such뀡□ηas뀡□ηthose뀡□ηspecicied뀡□ηin뀡□ηWater뀡□ηCode뀡□ηSection뀡□η850
water뀡□ηconservation뀡□ηthroughout뀡□ηCalifornia.뀡□η(We뀡□ηremark뀡□ηelsewhere뀡□ηin뀡□ηthese
water뀡□ηconservation뀡□ηachievements뀡□ηof뀡□ηCalifornia's뀡□ηpopulation뀡□ηduring뀡□ηthe뀡□ηlas
year뀡□ηdrought.뀡□ηAppendix뀡□η1C,뀡□ηwe뀡□ηcommented뀡□ηlast뀡□ηyear뀡□η(since뀡□ηthe뀡□η
"fails뀡□ηto뀡□ηconsider뀡□ηcost뀡□ηand뀡□ηprice뀡□ηissues뀡□ηassociated뀡□ηwith뀡□ηwater뀡□ηusage.뀡
limitations뀡□ηof뀡□ηconservation뀡□ηis뀡□ηan뀡□ηargument뀡□ηemploying뀡□ηa뀡□ηstraw뀡□ηman:뀡
we뀡□ηcan뀡□ηconserve뀡□ηour뀡□ηway뀡□ηout뀡□ηof뀡□ηthe뀡□ηstate's뀡□ηfuture뀡□ηwater뀡□ηde
believes뀡□ηthat뀡□ηwe뀡□ηcan뀡□ηbuild뀡□ηenough뀡□ηstorage뀡□ηand뀡□ηconveyance뀡□ηto뀡□ηeli

Instead, *뀡□ηthe 뀡□ηpoint 뀡□ηis 뀡□ηthat 뀡□ηwe 뀡□ηhave 뀡□ηremaining 뀡□ηpotential 뀡□ηto 뀡□ηachi*
by 뀡□ηchanging 뀡□ηhow 뀡□ηCalifornia 뀡□ηculture 뀡□ηviews 뀡□ηits 뀡□ηwater 뀡□ηsupplies. 뀡□ηCalif
remiss 뀡□ηin 뀡□ηfailing 뀡□ηto 뀡□ηtap 뀡□ηthis 뀡□ηpotential 뀡□ηregardless 뀡□ηof뀡□ηwhether 뀡□ηit
demand 뀡□ηproblem; 뀡□ηit 뀡□ηis 뀡□ηsimply 뀡□ηa 뀡□ηno[7] *□regrets 뀡□ηstep 뀡□ηthat 뀡□ηneeds 뀡□η*
ignores 뀡□ηthis 뀡□ηstep 뀡□ηin 뀡□ηdeveloping 뀡□ηand 뀡□ηstating 뀡□ηthe 뀡□ηpurpose 뀡□ηand 뀡□ηn
Tunnels뀡□ηProject뀡□ηseeks뀡□ηto뀡□ηprotect뀡□ηa뀡□ηstatus뀡□ηquo뀡□ηof뀡□ηwater뀡□ηbehavior
sustained,뀡□ηregardless.

The뀡□ηDemand뀡□ηManagement뀡□ηMeasures뀡□ηof뀡□ηAppendix뀡□η1C뀡□ηare뀡□ηnot뀡□ηpart뀡□
descriptions,뀡□ηwhether뀡□ηassociated뀡□ηwith뀡□ηthe뀡□ηDraft뀡□ηEIR/EIS뀡□ηlast뀡□ηyear뀡□ηor
year's뀡□ηBDCP,뀡□ηthere뀡□ηis뀡□ηno뀡□ηconservation뀡□ηmeasure뀡□ηdevoted뀡□ηto뀡□ηdemand뀡
reducing뀡□ηreliance뀡□ηon뀡□ηthe뀡□ηDelta.뀡□ηThis뀡□ηyear's뀡□ηpurpose뀡□ηand뀡□ηneed뀡□ηsta
reiterates뀡□ηthe뀡□ηTunnels뀡□ηProject's뀡□ηintention뀡□η(like뀡□ηlast뀡□ηyear)뀡□ηto뀡□η(as뀡□ηr
supply뀡□ηreliability뀡□ηto뀡□ηmaximize뀡□ηcontractual뀡□ηdeliveries뀡□ηusing뀡□ηthe뀡□ηTunnel뀡□
measures뀡□ηare뀡□ηnot뀡□ηonly뀡□ηNOT뀡□ηincluded뀡□ηas뀡□ηpart뀡□ηof뀡□ηthe뀡□ηalternatives'
reader뀡□ηattention뀡□ηfrom뀡□ηthe뀡□ηTunnels뀡□ηProject뀡□ηand뀡□ηits뀡□ηinability뀡□ηto뀡□ηco
85021.뀡□ηThe뀡□ηTunnels뀡□ηProject뀡□ηmust뀡□ηbe뀡□ηable뀡□ηto뀡□ηcertify뀡□ηconsistency뀡□ηw
reclected뀡□ηin뀡□ηa뀡□ηlawful뀡□ηDelta뀡□ηPlan.뀡□ηIt뀡□ηcannot.

The 뀡□ηessential 뀡□ηpoint 뀡□ηof뀡□ηthe 뀡□ηmandate 뀡□ηin 뀡□ηWater 뀡□ηCode 뀡□ηSection 뀡□η850
Delta. 뀡□ηThis 뀡□ηis 뀡□ηnot 뀡□ηjust 뀡□ηa 뀡□ηwater 뀡□ηconservation 뀡□ηissue,
litigation뀡□ηaddresses뀡□ηas뀡□ηone뀡□ηof뀡□ηits뀡□ηcentral뀡□ηpoints뀡□ηof뀡□ηargument뀡□ηwhe
formulated뀡□ηa뀡□ηPlan뀡□ηand뀡□ηimplementing뀡□ηregulations뀡□ηthat뀡□ηachieve뀡□ηwhat뀡□ηth
The 뀡□ηRDEIR/SDEIS 뀡□ηfails 뀡□ηto 뀡□ηdemonstrate 뀡□ηthat 뀡□ηthe 뀡□ηproject 뀡□ηcontributes 뀡□
Delta, 뀡□ηand 뀡□ηfails 뀡□ηto 뀡□ηdemonstrate 뀡□ηthat 뀡□ηit 뀡□ηcan 뀡□ηachieve 뀡□ηthe 뀡□ηco*[7] *□e
whether 뀡□ηthe 뀡□ηDelta 뀡□ηPlan 뀡□ηcan 뀡□ηbe 뀡□ηsaid 뀡□ηto 뀡□ηachieve 뀡□ηthem 뀡□ηor 뀡□ηn

The State Water Resources Control Board's Bay-Delta Plan

[29]뀡□ηHere뀡□ηis뀡□ηjust뀡□ηone뀡□ηof뀡□ηmany뀡□ηinstances뀡□ηwhere뀡□ηthe뀡□ηSection뀡□η1뀡□ηdirectiv
the뀡□ηRDEIR/SDEIS뀡□ηrefers뀡□ηto뀡□ηor뀡□ηeven뀡□ηincorporates뀡□ηthe뀡□ηcontent뀡□ηof뀡□ηthe뀡□ηDra
becomes뀡□ηnecessary뀡□ηand뀡□ηlogical뀡□ηfor뀡□ηreviewers뀡□ηto뀡□ηreview,뀡□ηverify,뀡□ηand뀡□ηanalyze

[30]뀡□ηEWC뀡□ηComments,뀡□ηJune뀡□η11,뀡□η2014,뀡□ηp.뀡□η147.뀡□ηSince뀡□ηthe뀡□ηRDEIR/SDEIS뀡□ηapplies뀡
EIR/EIS뀡□ηnow,뀡□ηwe뀡□ηreiterate뀡□ηour뀡□ηcomments뀡□ηabout뀡□ηit뀡□ηfrom뀡□ηlast뀡□ηyear,뀡□ηwith

A꿯□ηlarge꿯□ηbut꿯□ηwholly꿯□ηimplicit꿯□ηassumption꿯□ηthrough꿯□ηthe꿯□ηTunnels꿯□ηProject꿯
of꿯□ηthese꿯□ηalternatives꿯□ηwould꿯□ηrequire꿯□ηwholesale꿯□ηrevision꿯□ηto꿯□ηhow꿯□ηwater
Delta꿯□ηestuary,꿯□ηin꿯□ηorder꿯□ηfor꿯□ηthe꿯□ηTunnels꿯□ηProject꿯□ηto꿯□ηmove꿯□ηforward.
announces꿯□η"proposed꿯□ηnew꿯□ηclow꿯□ηcriteria"꿯□ηfor꿯□ηnorth꿯□ηand꿯□ηsouth꿯□ηDelta꿯
and꿯□ηthe꿯□ηproposed꿯□ηnew꿯□ηhead꿯□ηof꿯[31]□ηOld꿯□ηRiver꿯□ηoperable꿯□ηbarrier.

Such꿯□ηchanges꿯□ηto꿯□ηDelta꿯□ηclows꿯□ηand꿯□ηhydrodynamics꿯□ηmust꿯□ηbe꿯□ηevaluated
the꿯□ηState꿯□ηWater꿯□ηResources꿯□ηControl꿯□ηBoard,꿯□ηthe꿯□ηonly꿯□ηstate꿯□ηbody꿯□ηau
standards.꿯□ηWe꿯□ηare꿯□ηconcerned꿯□ηthat꿯□ηthe꿯□ηTunnels꿯□ηProject꿯□ηproponents꿯□ηho
by꿯□ηmaking꿯□ηTunnels꿯□ηoperational꿯□ηcriteria꿯□ηseem꿯□ηinevitable꿯□ηand꿯□ηnecessary;꿯□
be꿯□ηthe꿯□ηsubject꿯□ηof꿯□ηcareful꿯□ηand꿯□ηcritical꿯□ηreview꿯□ηin꿯□η*the*꿯□η꿯□η꿯□η

II. Major Environmental Issues

This뀕□ηsection뀕□ηpresents뀕□ηthe뀕□ηmajor뀕□ηenvironmental뀕□ηand뀕□ηecological뀕□ηissues뀕□η
Project뀕□ηand뀕□ηits뀕□ηRDEIR/SDEIS.뀕□ηIt뀕□ηis뀕□ηorganized뀕□ηaround뀕□ηfour뀕□ηmajor뀕□η

- The뀕□ηcomplete뀕□ηpolicy뀕□ηfailure뀕□ηof뀕□ηtheTunnels뀕□ηProject뀕□ηproponents뀕□ηthro
  confront뀕□ηwhether뀕□ηthere뀕□ηis뀕□ηa뀕□ηreal뀕□ηneed뀕□ηfor뀕□ηthe뀕□ηproject.
- The뀕□ηresulting뀕□ηabsence뀕□ηof뀕□ηa뀕□ηreasonable뀕□ηrange뀕□ηof뀕□ηalternatives뀕□ηto
  including뀕□ηmeaningful뀕□ηdirect뀕□ηcomparisons뀕□ηof뀕□ηenvironmental뀕□ηimpacts뀕□ηof뀕
- Specicic뀕□ηways뀕□ηin뀕□ηwhich뀕□ηthe뀕□ηTunnels뀕□ηProject뀕□ηwill뀕□ηviolate뀕□ηthe뀕
- Various뀕□ηways뀕□ηin뀕□ηwhich뀕□ηthe뀕□ηTunnels뀕□ηProject뀕□ηwill뀕□ηviolate뀕□ηbenecicial뀕□ηus
  pollutant뀕□ηwater뀕□ηquality뀕□ηobjectives,뀕□ηand뀕□ηtherefore뀕□ηviolate뀕□ηthe뀕□ηfedera

Introduction

A 뀕□ηreasonable 뀕□ηrange 뀕□ηof 뀕□ηalternatives 뀕□ηstill 뀕□ηare 뀕□ηnot 뀕□ηbeing 뀕□ηconsidered. 뀕□η
increasing뀕□ηclows뀕□ηthrough뀕□ηthe뀕□ηDelta뀕□ηhas뀕□ηalways뀕□ηbeen뀕□ηa뀕□ηdirect뀕□ηand
California's뀕□ηpublic뀕□ηtrust뀕□ηdoctrine뀕□ηprotecting뀕□ηDelta뀕□ηwater뀕□ηquantity뀕□ηand뀕□η
with뀕□ηthe뀕□ηDelta뀕□ηReform뀕□ηAct,뀕□ηthe뀕□ηESA,뀕□ηthe뀕□ηClean뀕□ηWater뀕□ηAct뀕□ηan
the뀕□ηso-□called뀕□ηBDCP뀕□ηalternatives뀕□ηinvolve뀕□ηnew뀕□ηconveyance뀕□ηas뀕□ηopposed뀕□
through-□Delta뀕□ηconveyance뀕□ηalternatives뀕□ηreducing뀕□ηexports.뀕□η

Our뀕□ηorganizations뀕□ηhave뀕□ηalready뀕□ηcommunicated뀕□ηseveral뀕□ηtimes뀕□ηover뀕□ηthe뀕□
about뀕□ηthe뀕□ηfailure뀕□ηto뀕□ηdevelop뀕□ηa뀕□ηreasonable뀕□ηrange[33]뀕□ηof뀕□ηalternatives뀕□ηi

The뀕□ηdirect뀕□ηand뀕□ηobvious뀕□ηway뀕□ηto뀕□ηincrease뀕□ηclows뀕□ηthrough뀕□ηthe뀕□ηDelta
policy뀕□ηalternatives뀕□ηthat뀕□ηshould뀕□ηbe뀕□ηhighlighted뀕□ηin뀕□ηthe뀕□ηBDCP뀕□ηNEPA뀕□η
reduce뀕□ηexisting뀕□ηexport뀕□ηlevels뀕□ηand뀕□ηthereby뀕□ηincrease뀕□ηDelta뀕□ηclows;뀕□η2)뀕□
and뀕□ηDelta뀕□ηclows;뀕□ηand뀕□η3)뀕□ηfurther뀕□ηreduce뀕□ηDelta뀕□ηclows뀕□ηby뀕□ηestablishi
Tunnels뀕□ηProject,뀕□ηupstream뀕□ηfrom뀕□ηthe뀕□ηBDCP뀕□ηagencies뀕□ηand뀕□ηthe뀕□ηnew뀕□ηRD
to 뀕□ηignore η the뀕□ηdirect뀕□ηand뀕□ηobvious뀕□ηbroad뀕□ηpolicy뀕□ηalternative뀕□ηof뀕□ηreducing
thereby뀕□ηincrease뀕□ηDelta뀕□ηclows—which뀕□ηis뀕□ηmandated뀕□ηby뀕□ηsection뀕□η85021뀕□η

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[33]뀕□ηSee뀕□ηalso뀕□ηpreviously뀕□ηsubmitted뀕□ηFriends뀕□ηof뀕□ηthe뀕□ηRiver뀕□ηcomment뀕□ηletter뀕□ηo
September뀕□η4,뀕□η2014뀕□ηcomment뀕□ηletters뀕□ηfocused뀕□ηon뀕□ηthe뀕□ηfailure뀕□ηof뀕□ηBDCP뀕□ηDra
and뀕□ηevaluate뀕□η뀕□ηa뀕□ηreasonable뀕□ηrange뀕□ηof뀕□ηalternatives뀕□ηas뀕□ηthe뀕□ηdeclared뀕□η"heart
EISs뀕□ηand뀕□ηEIRs.뀕□ηA뀕□ηdetailed뀕□ηevaluation뀕□ηof뀕□ηthe뀕□ηDraft뀕□ηEIR/EIS's뀕□ηinadequate뀕□η
the뀕□ηEWC뀕□ηin뀕□ηits뀕□ηcomment뀕□ηletter뀕□ηof뀕□η http://www.californiawaterfocus.com/wp-content/uploads/2015/09/7-□22-□15-□BDCP-□alts-□ltr뀕□ηpdf.pdf followed뀕□ηby뀕□ηa뀕□ηletter뀕□ηof뀕□ηJuly뀕□η22,뀕□η2015,뀕□ηregarding
reasonable뀕□ηrange뀕□ηof뀕□ηalternatives뀕□ηin뀕□ηthe뀕□η RDEIR/SDEIS뀕□ηAccessible뀕□η at뀕□η
bdcpcomments6-□11-□2014-□.pdf

[34]뀕□η뀕□ηTunnels뀕□ηProject뀕□ηalternative뀕□ηis뀕□ηinfeasible뀕□ηbecause뀕□ηit뀕□ηis뀕□ηnot뀕□ηlawful뀕□η
Reform뀕□ηAct뀕□ηand뀕□ηthe뀕□ηpublic뀕□ηtrust뀕□ηdoctrine.뀕□ηIt뀕□ηis뀕□ηpuzzling뀕□ηat뀕□ηthis뀕□ηDra
process뀕□ηthat뀕□ηthe뀕□ηBDCP뀕□ηagencies뀕□ηwould뀕□ηrefuse뀕□ηto뀕□ηconsider뀕□ηlawful뀕□ηalternatives
considering뀕□ηand뀕□ηgiving뀕□ηpreferred뀕□ηalternative뀕□ηstatus뀕□ηto뀕□ηunlawful뀕□ηalternatives.뀕□ηAs뀕
"Many뀕□ηcommenters뀕□ηargued뀕□ηthat뀕□ηbecause뀕□ηthe뀕□ηproposed뀕□ηproject뀕□ηwould뀕□ηlead뀕□ηto
quality뀕□ηeffects,뀕□ηDWR뀕□ηcould뀕□ηnot뀕□ηobtain뀕□ηvarious뀕□ηapprovals뀕□ηneeded뀕□ηfor뀕□ηthe뀕□
the뀕□ηState뀕□ηWater뀕□ηResources뀕□ηControl뀕□ηBoard뀕□ηof뀕□ηnew뀕□ηpoints뀕□ηof뀕□ηdiversion뀕□ηfo
Executive뀕□ηSummary,뀕□ηp.뀕□ηES-□2.뀕□η

The ***Endangered*** ***Species*** ***Act*** ***continues*** ***to*** ***protect*** ***listed*** ***species*** ***and*** ***their*** ***habitat*** ***is*** ***not*** ***a***
project under the Endangered Species Act (ESA) because it would
for at least cive endangered and threatened cish species. We prev
BDCP agencies to develop and consider a reasonable range of al
reducing exports in our July 22, 2015, letter to you.

To summarize, the Sacramento River Winter-Run Chinook Salmon is
species under the Endangered Species Act, 16 U.S.C. § 1531 et
Spring-Run Chinook Salmon, Central Valley Steelhead, Southern Distinct
North American Green Sturgeon, and Delta smelt, are listed[35] as th
Second, reaches of the Sacramento River, sloughs, and the Delta
quantities of freshwater clows through operation of the proposed Tu
critical habitats for each of these cive listed ***Third***, agreements and thr
Biological Assessment has been prepared and transmitted to the U.S.
National Marine Fisheries Service (NMFS) by Reclamation with respect
Fourth, ESA Section 7 consultations are not completed and no B
by either USFWS or NMFS with respect to the effects of the
cive federally listed species of cish or ***Fifth***, ***or*** ***no*** ***designated*** ***critical*** ***habitat***
prudent alternatives" (RPAs) have been developed or suggested by th
species jeopardy or adverse modication of designated critical habitat
RDEIR/SDEIS or the Draft EIR/EIS last year.

Approval of the Tunnels Project in the form of preferred Alterna
the substantive prohibitions of Section 7 of the ESA by adversely
habitat as well as by jeopardizing the continued existence of the
species.

Approval of the Tunnels Project would violate the procedural require
Reclamation has not evaluated its proposed action "at the earliest
whether its action may affect listed species or critical habitat an
consultation with USFWS and NMFS.

Approval of the Tunnels Project would violate the procedural require
Draft EIR/EIS and RDEIR/SDEIS have not been prepared "concurrently
Biological Assessments and Biological Opinions required by the ESA.
Assessments and Biological Opinions, though required, remain unavailable.

These are not deciciencies that can be "cixed" by responses to
the RDEIR/SDEIS must be circulated for public review and comment.
include a reasonable range of alternatives including alternatives increasin
exports. The new public Draft NEPA document must also be pre
integrated with the ESA required Biological Assessments, Biological Opini

[35] Each of these species is listed under the California Endangered Species
considered threatened. Bay Delta Conservation Plan, Section 1.4.3, Covered Spec
table shows that under the California Endangered Species Act, Delta smelt
the BDCP species account for Delta Smelt states that the California Fish
smelt to the status of endangered on March 4, 2009. (BDCP, Appendix
21-24.) Longcin smelt is considered threatened, winter-run Chinook salmon
spring-run Chinook salmon threatened, fall- and late fall-run Chinook salmo
special concern; and green sturgeon (southern DPS) is also considered a
smelt is at this time a candidate species for listing under the fede

reasonable뀀□ηand뀀□ηprudent뀀□ηalternatives,뀀□ηdeveloped뀀□ηby뀀□ηthe뀀□ηUSFWS뀀□ηand뀀□ηNMFS
and뀀□ηprudent뀀□ηalternatives뀀□ηwould뀀□ηinclude뀀□ηalternatives뀀□ηincreasing뀀□ηclows뀀□ηthro
Francisco뀀□ηBay뀀□ηby뀀□ηreducing뀀□ηexports.뀀□η

The뀀□ηproject뀀□ηis뀀□ηnot뀀□ηpermissible뀀□ηunder [illegible] ***ηWater Act.*** [illegible]
clows뀀□ηto뀀□ηand뀀□ηthrough뀀□ηand뀀□ηdegrade뀀□ηwater뀀□ηquality뀀□ηin뀀□ηthe뀀□ηSan뀀□η
will뀀□ηadversely뀀□ηimpact뀀□ηnumerous뀀□ηrecognized뀀□ηbenecicial뀀□ηuses뀀□ηand뀀□ηpublic뀀□

First,뀀□ηthe뀀□ηTunnels뀀□ηProject뀀□ηwill뀀□ηviolate [illegible] ***Second*** [illegible] ***ηcanno***
issue뀀□ηa뀀□η401뀀□ηcerticication뀀□ηto뀀□ηa뀀□ηTunnels뀀□ηProject뀀□ηthat뀀□ηdoes뀀□ηnot뀀□η
objectives,뀀□ηthe뀀□ηCorps뀀□ηof뀀□ηEngineers뀀□ηcannot뀀□ηlegally뀀□ηissue뀀□ηa뀀□η404뀀□ηper
waters뀀□ηof뀀□ηthe뀀□η [illegible] ***Third*** [illegible] ***ηTunnels뀀□ηProject뀀□ηhas뀀□η뀀□ηantidegradation뀀□ηana***
Draft뀀□ηEIR/EIS뀀□ηor뀀□ηthe뀀□ηRecirculated뀀□ηDraft뀀□ηEIR/Supplemental뀀□ηDraft뀀□ηEIS뀀□η(
required뀀□ηfor뀀□ηcompliance뀀□ηwith뀀□ηthe뀀□ηClean뀀□ηWater뀀□ηAct.뀀□ηAnd뀀□ηthe뀀□ηlack
analysis뀀□ηis뀀□ηyet뀀□ηanother뀀□ηreason뀀□ηthe뀀□ηstate뀀□ηwill뀀□η [illegible] ***Fourth*** [illegible] ***ηto뀀□ηiss***
Tunnels뀀□ηProject뀀□ηthreatens뀀□ηto뀀□ηdictate뀀□ηwater뀀□ηquality뀀□ηobjectives뀀□ηand뀀□ηprejudic
Resources뀀□ηControl뀀□ηBoard's뀀□ηBay-□Delta뀀□ηWater뀀□ηQuality뀀□ηControl뀀□ηPlan뀀□ηPhase뀀
violation뀀□ηof뀀□ηthe뀀□ηCle [illegible] ***ηproposed뀀□ηproject뀀□ηfails뀀□ηto뀀□ηmeet뀀□ηthe뀀□***
requirement뀀□ηfor뀀□ηthe뀀□ηLeast뀀□ηEnvironmentally뀀□ηDamaging뀀□ηPracticable뀀□ηAlternative뀀

Project Objectives, Purposes and Needs

The뀀□ηTunnels뀀□ηProject's뀀□ηframework뀀□ηfor뀀□ηpolicy뀀□ηevaluation뀀□ηmust뀀□ηbe뀀□ηbroad
proponents,뀀□ηthe뀀□ηreasonable뀀□ηrange뀀□ηof뀀□ηalternatives뀀□ηconsists뀀□ηof뀀□ηvariations뀀□
to뀀□ηthe뀀□ηproblems뀀□ηof뀀□ηhow뀀□ηto뀀□ηstabilize뀀□ηreliable뀀□ηexports뀀□η(decined뀀□ηto뀀
annual뀀□ηallocations)뀀□ηfrom뀀□ηthe뀀□ηDelta뀀□ηand뀀□ηimprove뀀□ηthe뀀□ηquality뀀□ηof뀀□ηth
This뀀□ηis뀀□ηfar뀀□ηtoo뀀□ηnarrow뀀□ηa뀀□ηdecinition뀀□ηand뀀□ηhelps뀀□ηaccount뀀□ηfor뀀□ηw
Peripheral뀀□ηCanal뀀□ηin뀀□η1982,뀀□ηand뀀□ηwhy뀀□ηthey뀀□ηshould뀀□ηreject뀀□ηthe뀀□ηTunnels뀀

The뀀□ηstate뀀□ηfaces뀀□ηa뀀□ηpolicy뀀□ηcrossroads,뀀□ηof뀀□ηwhich뀀□ηthe뀀□ηnarrower뀀□ηengin
Project뀀□ηmust뀀□ηbe뀀□ηseen뀀□ηas뀀□ηjust뀀□ηone뀀□ηpart.뀀□η뀀□ηThe뀀□ηpolicy뀀□ηproblems
key뀀□ηpolicies뀀□ηof뀀□ηthe뀀□ηDelta뀀□ηReform뀀□ηAct뀀□ηof뀀□η2009:뀀□ηprotecting,뀀□ηenhanc
ecosystem,뀀□ηeconomy,뀀□ηand뀀□ηvalue뀀□ηas뀀□ηa뀀□ηunique뀀□ηplace뀀□ηin뀀□ηCalifornia;뀀□ηi
generally;뀀□ηand뀀□ηreducing뀀□ηreliance뀀□ηon뀀□ηthe뀀□ηDelta뀀□ηas뀀□ηpart뀀□ηof뀀□ηachievin
to뀀□ηdemonstrate뀀□ηCalifornia's뀀□ηneed뀀□ηfor뀀□ηthe뀀□ηTunnels뀀□ηProject뀀□ηin뀀□ηthe뀀□ηg
framework.

To뀀□ηachieve뀀□ηreliable뀀□ηwater뀀□ηsupplies뀀□ηfor뀀□ηthe뀀□ηTunnels뀀□ηProject뀀□ηwe뀀□ηm
demand뀀□ηshould뀀□ηbe뀀□ηbalanced뀀□ηat뀀□ηsome뀀□ηlevel뀀□ηthat뀀□ηdoes뀀□ηnot뀀□ηprejudic
policy뀀□ηframework.뀀□ηThe뀀□ηfailure뀀□ηof뀀□ηthe뀀□ηumpteen뀀□ηalternatives뀀□η(of뀀□ηthe뀀□
RDEIR/SDEIS뀀□ηthis뀀□ηyear)뀀□ηis뀀□ηthat뀀□ηthey뀀□ηassume뀀□ηthat뀀□ηthe뀀□ηneed뀀□ηfor뀀□
reasonably뀀□ηrepresented뀀□ηby뀀□ηstate뀀□ηand뀀□ηfederal뀀□ηwater뀀□ηcontract뀀□ηamounts.뀀□η
proponents뀀□ηfail뀀□ηto뀀□ηdemonstrate뀀□ηthe뀀□ηreasonableness뀀□ηof뀀□ηthis뀀□ηassumption.뀀□

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[36] 뀀□ηshelf뀀□ηproject뀀□ηmay,뀀□ηon뀀□ηone뀀□ηhand,뀀□ηreceive뀀□ηconditional뀀□ηpermits뀀□ηfor뀀□ηthe뀀□ηno
including뀀□ηgaping뀀□ηexemptions뀀□ηfrom뀀□ηwater뀀□ηquality뀀□ηstandards뀀□η(masquerading뀀□ηas뀀□ηpe
undermine뀀□ηbenecicial뀀□ηthat뀀□ηshould뀀□ηbe뀀□ηprotected뀀□ηby뀀□ηthe뀀□ηwater뀀□ηquality뀀□ηcontrol
Tunnels뀀□ηproject뀀□ηwill뀀□ηprejudice뀀□ηthe뀀□ηPhase뀀□η1뀀□ηand뀀□η2뀀□ηprocesses뀀□ηwith뀀□ηprema
requests,뀀□ηpotential뀀□ηDelta뀀□ηisland뀀□ηpurchases뀀□ηby뀀□ηthe뀀□ηMetropolitan뀀□ηWater뀀□ηDistrict뀀□ηof
the뀀□ηinadequate뀀□ηTunnels뀀□ηenvironmental뀀□ηreview뀀□ηprocess.뀀□ηUnder뀀□ηboth뀀□ηof뀀□ηthese뀀□η
Project뀀□ηtail뀀□ηthreatens뀀□ηto뀀□ηwag뀀□ηState뀀□ηWater뀀□ηBoard뀀□ηand뀀□ηArmy뀀□ηCorps뀀□ηdog.

into 꿯question 꿯the 꿯contracts 꿯for[37] 꿯and 꿯[illegible] 꿯years, 꿯[illegible] 꿯of 꿯[illegible] 꿯presented 꿯analysis 꿯
water 꿯agencies 꿯in 꿯southern 꿯California 꿯that 꿯are 꿯increasingly 꿯investing 꿯in 꿯
sufciciency 꿯of 꿯their 꿯water 꿯supplies, 꿯becoming 꿯more 꿯efcicient 꿯users 꿯of
stormwater 꿯capture, 꿯groundwater 꿯remediation, 꿯[38] 꿯and 꿯other 꿯means.

The 꿯EWC 꿯has 꿯presented 꿯clear 꿯alternatives 꿯for 꿯achieving 꿯water 꿯supply
restoration 꿯(Responsible 꿯Exports 꿯Plan, 꿯2015 꿯Sustainable 꿯[39] 꿯Water 꿯Plan 꿯for 꿯California
alternative 꿯was 꿯not 꿯considered 꿯in 꿯the 꿯Draft 꿯EIS/EIR, 꿯nor 꿯is 꿯it 꿯
EWC 꿯alternatives 꿯rely 꿯on 꿯strict 꿯enforcement 꿯of 꿯water 꿯quality 꿯laws, 꿯
Resources 꿯Control 꿯Board 꿯and 꿯Fish 꿯and 꿯Game 꿯(now 꿯Wildlife) 꿯clow 꿯
shoring 꿯up 꿯existing 꿯levees, 꿯ceasing 꿯unreasonable 꿯use 꿯of 꿯water 꿯to 꿯
western 꿯San 꿯Joaquin 꿯Valley) 꿯that 꿯return 꿯pollution 꿯to 꿯the 꿯estuary, 꿯
Delta 꿯export 꿯water 꿯supply 꿯with 꿯statewide 꿯water 꿯conservation, 꿯efciciency,
ensure 꿯existing 꿯supplies 꿯are 꿯extended 꿯to 꿯meet 꿯demand.

Need 꿯for 꿯the 꿯Tunnels 꿯Project 꿯must 꿯be 꿯analyzed 꿯directly 꿯against
year, 꿯Californians 꿯have 꿯responded 꿯to 꿯a 꿯fourth 꿯year 꿯of 꿯drought 꿯by
goals 꿯established 꿯by 꿯Governor 꿯Brown 꿯for 꿯the 꿯third 꿯straight 꿯month
August 꿯the 꿯cumulative 꿯statewide 꿯savings 꿯rate 꿯was 꿯28.7 꿯percent," 꿯the
Board 꿯said 꿯in 꿯an 꿯October 꿯2015 꿯press 꿯release. 꿯"That 꿯equates 꿯to
percent 꿯of 꿯the 꿯overall 꿯goal 꿯of 꿯saving 꿯1.2 꿯million 꿯acre- 꿯feet 꿯from
governor 꿯had 꿯sought 꿯in 꿯his 꿯April 꿯1 꿯executive 꿯order. 꿯While 꿯this
largest 꿯conserving 꿯jurisdictions 꿯were 꿯located 꿯within 꿯the 꿯hydrologic 꿯region
federal 꿯water 꿯contractors 꿯have 꿯seen 꿯substantial 꿯decreases 꿯[40] 꿯
conservation 꿯a 꿯way 꿯of 꿯life 꿯will 꿯be 꿯increasingly 꿯important 꿯as 꿯drou
under 꿯rising 꿯greenhouse 꿯gas 꿯emissions 꿯and 꿯climate 꿯change 꿯conditions. 꿯
analyzed 꿯in 꿯determining 꿯the 꿯need 꿯for 꿯the 꿯Tunnels 꿯Project. 꿯

The 꿯need 꿯for 꿯the 꿯Tunnels 꿯Project 꿯is 꿯poorly 꿯specicied. 꿯A 꿯new
RDEIR/SDEIS 꿯states 꿯that:

> The 꿯ecological 꿯health 꿯of 꿯the 꿯Delta 꿯continues 꿯to 꿯be 꿯at 꿯risk, 꿯the
> Delta 꿯water 꿯exports 꿯have 꿯become 꿯more 꿯pronounced, 꿯as 꿯amply 꿯evidenced
> decisions 꿯regarding 꿯the 꿯intersection 꿯of 꿯the 꿯ESA, 꿯the 꿯CESA, 꿯and 꿯the
> CVP. 꿯Other 꿯factors, 꿯such 꿯as 꿯the 꿯continuing 꿯subsidence 꿯of 꿯lands 꿯within

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[37] 꿯For 꿯example, 꿯Environmental *꿯Water 꿯Caucus, 꿯 꿯the 꿯US 꿯Bureau 꿯of 꿯Reclamati*
Lake 꿯Water 꿯Resources 꿯Investigation 꿯DEIS 꿯30, 꿯2013, 꿯 꿯 꿯

and 꿯 □ η levee 꿯 □ η failures, 꿯 □ η and 꿯 □ η sea 꿯 □ η level 꿯 □ η rise 꿯 □ η associated 꿯 □ η with 꿯 □ η climate 꿯 □ η change, 꿯 □
conclicts. 꿯 □ η Simply 꿯 □ η put, 꿯 □ η the 꿯 □ η overall 꿯 □ η system 꿯 □ η as 꿯 □ η it 꿯 □ η is 꿯 □ η currently 꿯 □ η designed 꿯 □ η
sustainable 꿯 □ η from 꿯 □ η an 꿯 □ η environmental 꿯 □ η perspective, 꿯 □ η proposal 꿯 □ η to 꿯 □ η implement 꿯 □ η a 꿯 □ η funda
change 꿯 □ η to 꿯 □ η the 꿯 □ η current 꿯 □ η systems 꿯 □ η change 꿯 □ η necessary 꿯 □ η necessary 꿯 □ η if 꿯 □ η California 꿯 □ η is 꿯 □ η t
coequal 꿯 □ η goals 꿯 □ η of 꿯 □ η providing 꿯 □ η a 꿯 □ η more 꿯 □ η reliable 꿯 □ η water 꿯 □ η supply 꿯 □ η for 꿯 □ η California 꿯
enhancing 꿯 □ η the 꿯 □ η Delta 꿯 □ η ecosystem.' 꿯 □ η (California 꿯 □ η Public 꿯 □ η Resources[41] 꿯 □ η Code 꿯 □ η Section 꿯 □ η 2

This 꿯 □ η passage 꿯 □ η uses 꿯 □ η lawsuit 꿯 □ η defeats 꿯 □ η for 꿯 □ η DWR 꿯 □ η and 꿯 □ η the 꿯 □ η Bureau 꿯 □ η comb
earthquake 꿯 □ η risk, 꿯 □ η sea 꿯 □ η level 꿯 □ η rise, 꿯 □ η and 꿯 □ η worsening 꿯 □ η conditions 꿯 □ η for 꿯 □ η Delta 꿯
justify 꿯 □ η "systemic 꿯 □ η change" 꿯 □ η apparently 꿯 □ η in 꿯 □ η the 꿯 □ η form 꿯 □ η of 꿯 □ η the 꿯 □ η Tunnels 꿯 □ η
"fundamental, 꿯 □ η systemic 꿯 □ η change" 꿯 □ η to 꿯 □ η achieve 꿯 □ η the 꿯 □ η two 꿯 □ η coequal 꿯 □ η goals 꿯 □ η of 꿯
Tunnels 꿯 □ η Project 꿯 □ η ("the 꿯 □ η change" 꿯 □ η offered) 꿯 □ η would ***The 꿯 □ η Tunnels 꿯 □ η Project 꿯 □ η is 꿯 □ η spin***
a 꿯 □ η water 꿯 □ η grab, 꿯 □ η intended 꿯 □ η to 꿯 □ η boost 꿯 □ η "water 꿯 □ η supply 꿯 □ η reliability" 꿯 □ η and 꿯 □
exports 꿯 □ η and 꿯 □ η no 꿯 □ η other 꿯 □ η user 꿯 □ η the 꿯 □ η Tunnels 꿯 □ η environment 꿯 □ η proponents 꿯 □ η engage 꿯 □ η
truncated 꿯 □ η misreading 꿯 □ η of 꿯 □ η the 꿯 □ η Delta 꿯 □ η Reform 꿯 □ η Act 꿯 □ η and 꿯 □ η its 꿯 □ η coequal 꿯 □ η go
far 꿯 □ η broader, 꿯 □ η more 꿯 □ η encompassing 꿯 □ η policy 꿯 □ η framework 꿯 □ η with 꿯 □ η which 꿯 □ η the 꿯 □ η Tu
consistency.

The 꿯 □ η Bay- □ Delta 꿯 □ η Estuary 꿯 □ η is 꿯 □ η an 꿯 □ η over- □ appropriated 꿯 □ η common 꿯 □ η pool 꿯 □ η plagued 꿯
to 꿯 □ η rein 꿯 □ η in 꿯 □ η water 꿯 □ η rights 꿯 □ η and 꿯 □ η contractual 꿯 □ η commitments 꿯 □ η that 꿯 □ η exceed 꿯 □
watershed 꿯 □ η to 꿯 □ η supply 꿯 □ η them. 꿯 □ η The 꿯 □ η Tunnels 꿯 □ η Project 꿯 □ η includes 꿯 □ η no 꿯 □ η adjustme
commitments 꿯 □ η of 꿯 □ η either 꿯 □ η the 꿯 □ η State 꿯 □ η Water 꿯 □ η Project 꿯 □ η or 꿯 □ η the 꿯 □ η Central 꿯 □ η Va
with 꿯 □ η demand 꿯 □ η and 꿯 □ η prevent 꿯 □ η jeopardy 꿯 □ η to 꿯 □ η listed 꿯 □ η Delta 꿯 □ η cish 꿯 □ η species 꿯 □ η a
long 꿯 □ η term. 꿯 □ η No 꿯 □ η analysis 꿯 □ η of 꿯 □ η need 꿯 □ η and 꿯 □ η alternative 꿯 □ η sources 꿯 □ η of 꿯 □ η supply
is 꿯 □ η provided 꿯 □ η in 꿯 □ η the 꿯 □ η RDEIR/SDEIS 꿯 □ η to 꿯 □ η demonstrate 꿯 □ η and 꿯 □ η justify 꿯 □ η need 꿯 □
This 꿯 □ η is 꿯 □ η contrary 꿯 □ η to 꿯 □ η CEQA 꿯 □ η and 꿯 □ η NEPA 꿯 □ η and 꿯 □ η defeats 꿯 □ η the 꿯 □ η purpose 꿯 □
why 꿯 □ η a 꿯 □ η project 꿯 □ η is 꿯 □ η truly 꿯 □ η needed 꿯 □ η beyond 꿯 □ η the 꿯 □ η usual 꿯 □ η DWR, 꿯 □ η Bureau 꿯 □
concerning 꿯 □ η their 꿯 □ η own 꿯 □ η "water 꿯 □ η supply 꿯 □ η reliability," 꿯 □ η their 꿯 □ η own 꿯 □ η "improved 꿯 □
"ecosystem 꿯 □ η health 꿯 □ η and 꿯 □ η productivity 꿯 □ η benecits" 꿯 □ η of 꿯 □ η additional 꿯 □ η huge 꿯 □ η diversion

The 꿯 □ η failure 꿯 □ η to 꿯 □ η adequately 꿯 □ η decine 꿯 □ η and 꿯 □ η quantify 꿯 □ η "increased 꿯 □ η water 꿯 □ η suppl
documents 꿯 □ η legally 꿯 □ η inadequate. 꿯 □ η The 꿯 □ η RDEIR/SDEIS 꿯 □ η fails 꿯 □ η to 꿯 □ η inform 꿯 □ η the 꿯 □ η p
about 꿯 □ η adverse 꿯 □ η consequences 꿯 □ η of 꿯 □ η ***absent 꿯 □ η Tunnels 꿯 □ η Project. 꿯 □ η documentation 꿯 □ η of 꿯 □***
purpose 꿯 □ η and 꿯 □ η need 꿯 □ η for 꿯 □ η the 꿯 □ η Tunnels 꿯 □ η Project 꿯 □ η with 꿯 □ η respect 꿯 □ η to 꿯 □ η wat
reasonable 꿯 □ η alternative 꿯 □ η sources 꿯 □ η of 꿯 □ η supply 꿯 □ η for 꿯 □ η state 꿯 □ η and 꿯 □ η federal 꿯 □ η wat
makers 꿯 □ η cannot 꿯 □ η understand 꿯 □ η what 꿯 □ η type 꿯 □ η and 꿯 □ η level 꿯 □ η of 꿯 □ η reliability 꿯 □ η migh
means. 꿯 □ η The 꿯 □ η National 꿯 □ η Environmental 꿯 □ η Policy 꿯 □ η Act 꿯 □ η and 꿯 □ η the 꿯 □ η California 꿯 □ η
are 꿯 □ η both 꿯 □ η violated 꿯 □ η as 꿯 □ η a 꿯 □ η result.

Cross-Delta 꿯 □ η Water 꿯 □ η Transfers 꿯 □ η inhere 꿯 □ η in 꿯 □ η the 꿯 □ η Tunnels 꿯 □ η Project 꿯 □ η purpose,
RDEIR/SDEIS 꿯 □ η statements 꿯 □ η of 꿯 □ η Objective, 꿯 □ η Purpose 꿯 □ η and 꿯 □ η Need 꿯 □ η
Tunnels 꿯 □ η Project 꿯 □ η will 꿯 □ η function 꿯 □ η to 꿯 □ η increase 꿯 □ η the 꿯 □ η Central 꿯 □ η Valley 꿯 □ η Project 꿯 □ η a
to 꿯 □ η arrange 꿯 □ η and 꿯 □ η facilitate 꿯 □ η cross- □ Delta 꿯 □ η water 꿯 □ η market 꿯 □ η transfers 꿯 □ η in 꿯 □ η drier
SDEIS 꿯 □ η argues 꿯 □ η that 꿯 □ η the 꿯 □ η Project 꿯 □ η will 꿯 □ η increase 꿯 □ η the 꿯 □ η reliability 꿯 □ η of 꿯 □ η cont
present 꿯 □ η time.[42] 꿯 □ η This 꿯 □ η cinding 꿯 □ η is 꿯 □ η at 꿯 □ η best 꿯 □ η arguable 꿯 □ η since 꿯 □ η climate 꿯 □ η change 꿯

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[41] 꿯 □ η RDEIR/SDEIS, 꿯 □ η Section 꿯 □ η 1.1.1, 꿯 □ η p. 꿯 □ η 1-7, 꿯 □ η lines 꿯 □ η 31- □ 35, 꿯 □ η and 꿯 □ η
1- □ 6. 꿯 □ η Emphasis 꿯 □ η added.

[42] 꿯 □ η RDEIR/SDEIS, 꿯 □ η Section 꿯 □ η 4.3.1, 꿯 □ η p. 꿯 □ η 4.3.1- □ 9, 꿯 □ η lines 꿯 □ η 9- □ 11 꿯 □ η for 꿯 □ η Alternative 꿯 □ η 4A. 꿯
Alternative 꿯 □ η 2D 꿯 □ η at 꿯 □ η Section 꿯 □ η 4.4.1, 꿯 □ η p. 꿯 □ η 4.4.1- □ 9, 꿯 □ η lines 꿯 □ η 20- □ 33; 꿯 □ η and 꿯 □ η to 꿯 □ η Alter
20- □ 33.

contractual뀡□ηreliability뀡□ηwith뀡□ηreductions뀡□ηin뀡□ηprecipitation,뀡□ηsnowpack뀡□ηand뀡□ηrun
support뀡□ηsuch뀡□ηa뀡□ηcinding.뀡□ηHowever,뀡□ηthe뀡□ηTunnels뀡□ηProject뀡□ηproponents뀡□ηvie
against뀡□ηclimate뀡□ηchange뀡□ηimpacts뀡□ηon뀡□ηcontractual뀡□ηallocation뀡□ηdeliveries.뀡□η

The뀡□ηRDEIR/SDEIS뀡□ηattempts뀡□ηto뀡□ηprovide뀡□ηsome뀡□ηperspective뀡□ηgiven뀡□ηthe뀡□ηdi
baselines,뀡□ηbut뀡□ηappears뀡□ηto뀡□ηsuffer뀡□ηfrom뀡□ηpoor,뀡□ηconfused뀡□ηediting.뀡□ηAs뀡□η
Tunnels뀡□ηProject뀡□ηwould뀡□ηincrease뀡□ηoverall뀡□ηreliability뀡□ηof뀡□ηcontractual뀡□ηdeliveries뀡□
conditions뀡□ηand뀡□ηrelative뀡□ηto뀡□ηthe뀡□ηNo뀡□ηAction뀡□ηAlternative뀡□η(the뀡□ηfuture뀡□η
Project뀡□ηin뀡□ηplace).뀡□ηTo뀡□ηaccomplish뀡□ηthis,뀡□ηit뀡□ηwould뀡□ηincrease뀡□ηoverall뀡□ηc
Delta뀡□η(due뀡□ηto뀡□ηits뀡□ηvaunted뀡□ηopportunities뀡□ηfor뀡□ηclexible뀡□ηdual뀡□ηdiversion뀡□
Tunnels뀡□ηProject뀡□ηproponents,뀡□ηis뀡□ηpresently뀡□ηa뀡□ηlimiting뀡□ηfactor뀡□ηon뀡□ηconsum
(understood뀡□ηregardless뀡□ηof뀡□ηtheir뀡□ηcontractual뀡□ηcontrary market뀡□ηthesis).[43] ηNEPA뀡□ηconc
the뀡□ηRDEIR/SDEIS뀡□ηfor뀡□ηAlternative뀡□η4A,뀡□ηAlternative 4A뀡□ηdecreased□ηas□ηis뀡□ηstat
therein,뀡□ηwhich뀡□ηdoes뀡□ηnot뀡□ηmake뀡□ηsense,뀡□ηsince뀡□ηwhat뀡□ηare뀡□ηthe뀡□ηTunnels
capacity?)뀡□ηconveyance뀡□ηcapacity뀡□ηoverall,뀡□ηenabling뀡□ηcross-□Delta뀡□ηwater뀡□ηtransfers
increases뀡□ηin뀡□ηDelta뀡□ηexports뀡□ηwhen뀡□ηcompared뀡□ηto뀡□ηthe뀡□ηNo뀡□ηAction뀡□ηAlte

The뀡□ηCEQA뀡□ηconclusion뀡□ηappears뀡□ηlogically뀡□ηstated뀡□ηto뀡□ηus뀡□η(though뀡□ηwe뀡□η

> Alternative뀡□η4A뀡□ηwould뀡□ηincrease뀡□ηwater뀡□ηtransfer뀡□ηdemand뀡□ηcompared뀡□ηto뀡□ηexisting
> would뀡□ηincrease뀡□ηconveyance뀡□ηcapacity,뀡□ηenabling뀡□ηadditional뀡□ηcross-□Delta뀡□ηwater뀡□ηtran
> increases뀡□ηin뀡□ηDelta뀡□ηexports뀡□ηwhen뀡□ηcompared뀡□ηto뀡□ηexisting뀡□ηconditions.[44]

These뀡□ηconclusions뀡□ηmake뀡□ηclear뀡□ηthat뀡□ηincreased뀡□ηconveyance뀡□ηcapacity뀡□ηboosts
supply뀡□ηreliability,뀡□ηbut뀡□ηalso뀡□ηmarket-□based뀡□ηwater뀡□ηsupply뀡□ηreliability,뀡□ηthe뀡□
in뀡□ηthe뀡□ηRDEIR/SDEIS's뀡□ηstatement뀡□ηof뀡□ηobjectives,뀡□ηpurpose뀡□ηand뀡□ηneed뀡□ηin뀡

***Plus** 뀡□η,뀡□η**the** 뀡□η**very** 뀡□η**existence** 뀡□η**of** 뀡□η**the** 뀡□η**water** 뀡□η**transfer** 뀡□η**market** 뀡□η**is** 뀡□η
ful.ill 뀡□η**SWP** 뀡□η**and** 뀡□η**CVP** 뀡□η**water** 뀡□η**right** 뀡□η**claims,** 뀡□η**and** 뀡□η**the** 뀡□η**contractual** 뀡□η**d**
customer 뀡□η**agencies** 뀡□η**The** 뀡□η**both** 뀡□η**more** 뀡□η**reliable** 뀡□η**contractual***
deliveries뀡□η**and** 뀡□ηa뀡□ηwater뀡□ηtransfer뀡□ηmarket뀡□ηthat뀡□ηmoves뀡□ηsenior뀡□ηwater뀡□ηright
Delta뀡□ηfor뀡□ηcompensation.뀡□ηThe뀡□ηTunnels뀡□ηProject뀡□ηassumes뀡□ηthat뀡□ηcontractual뀡□
primary뀡□ηpurpose,뀡□ηbut뀡□ηthis뀡□ηimproperly뀡□ηplaces뀡□ηmarket-□based뀡□ηwater뀡□ηtransfe
causes뀡□ηthe뀡□ηRDEIR/SDEIS뀡□ηto뀡□ηfail뀡□ηas뀡□ηa뀡□ηfull뀡□ηdisclosure뀡□ηdocument뀡□ηun
water뀡□ηis뀡□ηconveyed뀡□ηunder뀡□ηthe뀡□ηDelta뀡□ηthrough뀡□ηthe뀡□ηTunnels.뀡□ηThe뀡□ηonl
Tunnels뀡□ηProject뀡□ηin뀡□ηplace뀡□η(from뀡□ηthe뀡□ηstandpoint뀡□ηof뀡□ηobjectives,뀡□ηpurpose
moves—under뀡□ηcontract뀡□ηterms,뀡□ηor뀡□ηunder뀡□ηmarket-□based뀡□ηterms?뀡□η

***The** 뀡□η**purpose** 뀡□η**of** 뀡□η**the** 뀡□η**Tunnels'** 뀡□η**water** 뀡□η**transfer** 뀡□η**role** 뀡□η**is** 뀡□η**to** 뀡□η**gain** 뀡□
supplies 뀡□η**for** 뀡□η**south** 뀡□η**of** 뀡□η**Delta** 뀡□η**importers** 뀡□η**in** 뀡□η**the** 뀡□η**State** 뀡□η**and** 뀡□η**Federal***
RDEIR/SDEIS뀡□ηalso뀡□ηfails뀡□ηto뀡□ηevaluate뀡□ηthe뀡□ηwater뀡□ηtransfer뀡□ηpurposes뀡□ηof뀡□
to뀡□ηthe뀡□ηsource(s)뀡□ηof뀡□ηmarket-□based뀡□ηtransfer뀡□ηwater.뀡□ηLast뀡□ηyear,뀡□ηwe뀡□η
claimed뀡□ηthat뀡□ηthe뀡□ηSacramento뀡□ηValley뀡□ηis뀡□ηthe뀡□ηmain뀡□ηsource뀡□ηof뀡□ηsuppli

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[43] 뀡□ηThe뀡□ηRDEIR/SDEIS뀡□ηdoes뀡□ηa뀡□ηpoor뀡□ηjob뀡□ηof뀡□ηclarifying뀡□ηthe뀡□ηdifference뀡□ηbetwe
transfers뀡□ηacross뀡□ηthe뀡□ηDelta뀡□η-□뀡□ηthe뀡□ηnormal,뀡□ηpreferred뀡□ηcourse뀡□ηof뀡□ηexportation뀡
extra-□contractual뀡□ηacquisitions뀡□ηof뀡□ηtemporary뀡□ηsupplies뀡□ηof뀡□ηwater뀡□ηthat뀡□ηare뀡□ηmoved
project뀡□ηallocations뀡□ηreach뀡□ηas뀡□ηlow뀡□ηas뀡□η50뀡□ηpercent뀡□ηfor뀡□ηthe뀡□ηSWP뀡□ηand뀡□η40
on뀡□ηwater뀡□ηtransfers뀡□ηin뀡□ηEWC뀡□ηComment뀡□ηLetter,뀡□ηJune뀡□η11,뀡□η2014,뀡□ηpp.뀡□η192-□2

[44] 뀡□ηRDEIR/SDEIS,뀡□ηSection뀡□η4.3.1,뀡□ηp.뀡□η4.3.1-□9,뀡□ηlines뀡□η34-□36.

that 꿯 ηit 꿯 ηis 꿯 η"full" 꿯 ηin 꿯 ηmost 꿯 η[45] 꿯 η꿯 η꿯 η

The꿯□ηLead꿯□ηAgencies꿯□ηlist꿯□η"four꿯□ηexamples꿯□ηof꿯□ηdisclosure"꿯□ηfrom꿯□ηCEQA꿯□ηGuidelin
list꿯□ηinstances꿯□ηby꿯□ηwhich꿯□ηsignicicant꿯□ηnew꿯□ηinformation꿯□ηdictates꿯□ηthe꿯□ηneed
Lead꿯□ηAgencies꿯□ηcoyly꿯□ηdecline꿯□ηto꿯□ηstate꿯□ηwhich꿯□ηexample꿯□ηor꿯□ηexamples꿯□
recirculate.꿯□η

But꿯□ηof꿯□ηthese,꿯□ηthe꿯□ηEWC꿯□ηnotes꿯□ηthat꿯□ηthe꿯□ηreason꿯□ηsupplied꿯□ηin꿯□ηexa
most꿯□ηgermane:꿯□ηLast꿯□ηyear's꿯□ηdraft꿯□ηEIR꿯□ηon꿯□ηBDCP꿯□ηwas꿯□ηso꿯□ηfundament
nature꿯□ηthat꿯□ηmeaningful꿯□ηpublic꿯□ηreview꿯□ηand꿯□ηcomment꿯□ηwere꿯□ηprecluded꿯□ηa
attributes꿯□ηand꿯□ηimpacts꿯□ηwere꿯□ηdefeated.꿯□ηA꿯□ηkey꿯□ηreason꿯□ηfor꿯□ηthis꿯□ηwas
documents꿯□ηinvolved.꿯□ηWhat꿯□ηcommenters꿯□ηcould꿯□ηglean꿯□ηfrom꿯□ηthe꿯□ηenormous꿯
nonetheless꿯□ηrevealed꿯□ηa꿯□ηproject꿯□ηso꿯□ηclawed꿯□ηby꿯□ηboosterism꿯□ηand꿯□ηmagical
must꿯□ηhave꿯□ηfelt꿯□ηthat꿯□ηonly꿯□ηnew꿯□ηalternatives꿯□ηcould꿯□ηhelp꿯□ηsalvage꿯□ηan

The꿯□ηLead꿯□ηAgencies꿯□ηclaim꿯□ηthat꿯□ηproject꿯□ηrevisions꿯□ηwere꿯□ηneeded꿯□ηbecause
comments꿯□ηthat꿯□ηthey꿯□ηcould꿯□ηnot꿯□ηmeet꿯□ηthe꿯□ηrequirements꿯□ηneeded꿯□ηfor꿯□
agencies꿯□ηof꿯□η"long-□term꿯□ηassurances꿯□ηassociated꿯□ηwith꿯□ηSection꿯□η10꿯□ηof꿯□ηthe
of꿯□ηthe꿯□ηstate's꿯□ηNatural꿯□ηCommunities꿯□ηConservation꿯□ηPlanning꿯□ηAct]."꿯□ηThey꿯□
requirements꿯□ηcould꿯□ηnot꿯□ηbe꿯□ηmet.꿯□ηThe꿯□ηpublic꿯□ηis꿯□ηentitled꿯□ηto꿯□ηknow,꿯
RDEIR/SDEIS.꿯□ηWe꿯□ηcertainly꿯□ηhope꿯□ηthey꿯□ηwill꿯□ηbe꿯□ηstated꿯□ηin꿯□ηthe꿯□ηFinal
provided꿯□ηin꿯□ηthis꿯□ηregard꿯□ηis꿯□ηa꿯□ηvague꿯□ηacknowledgement꿯□ηthat:

> These꿯□ηchallenges꿯□ηrelated꿯□ηto꿯□ηthe꿯□ηdifciculties꿯□ηin꿯□ηassessing꿯□ηspecies꿯□ηstatus꿯□ηa
> year꿯□ηperiod,꿯□ηin꿯□ηlight꿯□ηof꿯□ηclimate꿯□ηchange,꿯□ηand꿯□ηaccurately꿯□ηfactoring꿯□ηin꿯□η
> in꿯□ηcontributing꿯□ηto꿯□ηthe꿯□ηrecovery꿯□ηof꿯□ηthe꿯□ηspecies.꿯□ηThere꿯□ηwere꿯□ηalso꿯□ηque
> implement꿯□ηlarge-□scale꿯□ηhabitat꿯□ηrestoration꿯□ηand꿯□ηan꿯□ηinterest꿯□ηin꿯□ηexploring꿯□ηmul
> that꿯□ηcould꿯□ηfacilitate꿯□ηexpeditious꿯□ηprogress꿯□ηon꿯□ηDelta꿯□ηsolutions.

Sufcice꿯□ηto꿯□ηsay,꿯□ηperhaps,꿯□ηthat꿯□ηthe꿯□ηpublic's꿯□ηand꿯□ηagencies'꿯□ηcomments꿯□
revealed꿯□ηto꿯□ηthe꿯□ηLead꿯□ηAgencies꿯□ηthat꿯□ηtheir꿯□ηgrasp꿯□ηof꿯□ηfuture꿯□ηconditio
alternatives꿯□ηof꿯□ηBDCP꿯□ηwere꿯□ηnot꿯□ηup꿯□ηto꿯□ηmeeting꿯□ηSection꿯□η10꿯□ηHCP꿯□
applied꿯□ηto꿯□ηsmaller,꿯□ηsimpler꿯□ηdevelopment꿯□ηprojects꿯□ηthan꿯□ηBDCP꿯□ηand꿯□ηits꿯

The꿯□ηsecond꿯□ηsentence꿯□ηof꿯□ηthis꿯□ηpassage꿯□ηalso꿯□ηsuggests꿯□ηstrongly꿯□ηthat꿯□η
meant꿯□ηjettisoning꿯□ηthe꿯□ηhabitat꿯□ηrestoration꿯□ηcomponents꿯□ηaltogether꿯□ηin꿯□ηfavor꿯
Project꿯□ηa꿯□ηTunnels꿯□ηProject.꿯□ηGiven꿯□ηthe꿯□ηnow꿯□η14-□year꿯□ηtime꿯□ηperiod꿯□η
(increased꿯□ηfrom꿯□η10꿯□ηyears꿯□ηlast꿯□ηyear),꿯□ηcan꿯□ηyou꿯□ηplease꿯□ηexplain꿯□ηwha
other꿯□ηsub-□alternatives꿯□ηoffering꿯□ηsupposed꿯□η"expeditious꿯□ηprogress꿯□ηon꿯□ηDelta꿯□η
has꿯□ηelapsed꿯□ηsince꿯□ηthe꿯□ηlast꿯□ηopportunity꿯□ηto꿯□ηcomment꿯□ηon꿯□ηthe꿯□ηTunne
"expeditious"꿯□ηmean꿯□ηthen?꿯□ηWhat꿯□ηconstitutes꿯□ηa꿯□η"solution"?꿯□ηAnd꿯□ηwhat꿯□ηw
intended꿯□ηto꿯□ηsolve꿯□ηagain?꿯□η

The꿯□ηLead꿯□ηAgencies꿯□ηsettle꿯□ηon꿯□ηtwo꿯□η"allowance"꿯□ηrationales:꿯□ηFirst꿯□η,꿯□ηt
regulatory꿯□ηrequirements꿯□ηto꿯□ηobtain꿯□η50-□year꿯□ηassurances꿯□ηfrom꿯□ηthe꿯□ηcishery꿯
desire꿯□ηto꿯□ηexplore꿯□ηalternative꿯□ηregulatory꿯□ηapproaches꿯□ηthat꿯□ηcould꿯□ηfacilitate꿯

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[48]꿯□ηThe꿯□ηLead꿯□ηAgencies,꿯□ηagain,꿯□ηappear꿯□ηto꿯□ηbe꿯□ηthe꿯□ηCalifornia꿯□ηDepartment꿯□ηof
Reclamation꿯□ηfor꿯□ηRDEIR/SDEIS꿯□ηpurposes.꿯□ηIt꿯□ηis꿯□ηnot꿯□ηclear꿯□ηwhether꿯□ηthe꿯□ηother꿯
mentioned꿯□ηabove꿯□ηare꿯□ηengaged꿯□ηin꿯□ηthis꿯□ηprocess꿯□ηas꿯□ηlead꿯□ηagencies,꿯□ηresponsible
investors.

[49]꿯□ηRDEIR/SDEIS,꿯□ηSection꿯□η1,꿯□ηp.꿯□η1-□2,꿯□ηlines꿯□η37-□42.

Delta꿯□ηsolutions"꿯□ηthey꿯□ηrevised꿯□ηthe꿯□ηprojects.꿯□ηalternative꿯□ηimplementation꿯□ηstrat
the꿯□ηnew꿯□ηalternatives꿯□ηin꿯□ηthe꿯□ηRDEIR/SDEIS,"꿯□ηrelated꿯□ηto꿯□ηachieving꿯□ηproje
second꿯□η"allowance"꿯□ηin꿯□ηthe꿯□ηimplementation꿯□ηstrategy.꿯□ηstate꿯□ηand꿯□ηfederal꿯□
address꿯□ηthe꿯□ηlong꿯□ηterm꿯□ηconservation꿯□ηefforts꿯□ηfor꿯□ηspecies꿯□ηrecovery꿯□ηin꿯□
proposed꿯□ηproject."[50]

Simply꿯□ηput,꿯□ηthe꿯□ηLead꿯□ηAgencies꿯□ηwanted꿯□ηto꿯□ηconsider꿯□ηa꿯□ηnew꿯□ηwater꿯
its꿯□ηhabitat꿯□ηrestoration꿯□ηpretenses,꿯□ηand꿯□ηto꿯□ηtry꿯□ηto꿯□ηmeet꿯□ηSection꿯□η7꿯□
than꿯□ηSection꿯□η10꿯□ηstandards.꿯□ηIt꿯□ηis꿯□ηa꿯□ηnaked꿯□ηwater꿯□ηgrab꿯□ηand꿯□ηthe
restoration꿯□ηprogram꿯□ηof꿯□ηBDCP꿯□η(which꿯□ηwas꿯□ηin꿯□ηpart꿯□ηan꿯□ηattempt꿯□ηto꿯
exports꿯□ηwithout꿯□ηactually꿯□ηdoing꿯□ηso)꿯□ηonto꿯□ηsociety꿯□ηthe꿯□ηway꿯□ηthey꿯□ηhad꿯

This꿯□ηkind꿯□ηof꿯□ηvague,꿯□ηeuphemistic,꿯□ηand꿯□ηtortured꿯□ηreasoning꿯□ηreclects꿯□ηthe꿯
bureaucratic꿯□ηcluelessness,꿯□ηand꿯□ηdesire꿯□ηby꿯□ηthe꿯□ηTunnels꿯□ηProject꿯□ηproponents꿯
the꿯□ηdestructive꿯□ηcharacter꿯□ηof꿯□ηthe꿯□ηTunnels꿯□ηProject.꿯□ηAt꿯□ηa꿯□ηminimum,꿯□η
reasoning꿯□ηbehind꿯□ηnew꿯□ηalternatives꿯□ηand꿯□ηrecirculating꿯□ηthe꿯□ηEIR/EIS꿯□ηobscures
the꿯□ηfull꿯□ηdisclosure꿯□ηpurposes꿯□ηof꿯□ηboth꿯□ηthe꿯□ηCalifornia꿯□ηEnvironmental꿯□ηQua
Environmental꿯□ηPolicy꿯□ηAct.

It꿯□ηappears꿯□ηto꿯□ηthe꿯□ηEWC꿯□ηthat꿯□ηkey꿯□ηrationales꿯□ηwere꿯□ηdeveloped꿯□ηto꿯□
volume꿯□ηand꿯□ηcontent꿯□ηof꿯□ηcritical꿯□ηcomments꿯□ηreceived꿯□ηby꿯□ηthe꿯□ηTunnels꿯□

- Modify꿯□ηAlternative꿯□η4꿯□ηto꿯□ηreduce꿯□ηits꿯□ηon-□the-□ground꿯□ηimpacts.
- Develop꿯□ηa꿯□ηwholly꿯□ηnew꿯□ηalternative꿯□ηwithout꿯□ηmuch꿯□ηhabitat꿯□ηrestoratio
- Develop꿯□ηamong꿯□ηthe꿯□ηTunnels꿯□ηProject꿯□ηproponents꿯□ηa꿯□ηrationale꿯□ηfor꿯□
  consultation꿯□ηprocess꿯□ηover꿯□ηthe꿯□ηSection꿯□η10꿯□ηhabitat꿯□ηconservation꿯□ηplan
  complying꿯□ηwith꿯□ηthe꿯□ηfederal꿯□ηand꿯□ηstate꿯□ηendangered꿯□ηspecies꿯□ηacts.

Modifying 꿯□ηAlternative 꿯□η4. The꿯□ηRDEIR/SDEIS꿯□ηstates꿯□ηthat꿯□ηin꿯□ηDecember꿯□η2014,꿯□ηGove
administration꿯□ηand꿯□η"its꿯□ηfederal꿯□ηpartners"꿯□η(we꿯□ηpresume꿯□ηthat꿯□ηmeans꿯□ηin
US꿯□ηBureau꿯□ηof꿯□ηReclamation")꿯□η"announced꿯□ηseveral꿯□ηsubstantial꿯□ηchanges꿯□ηto꿯□
conveyance꿯□ηportion꿯□ηof꿯□ηthe꿯□ηproposed꿯□ηBay꿯□ηDelta꿯□ηConservation꿯□ηPlan…"꿯□η(
disclosing꿯□ηwho꿯□ηparticipated꿯□ηin꿯□ηreformulating꿯□ηConservation꿯□ηMeasure꿯□η1꿯□ηof꿯
language꿯□ηis꿯□ηfor꿯□ηhortatory꿯□ηpress꿯□ηreleases꿯□ηand꿯□ηtriumphal꿯□ηweb꿯□ηsites,꿯□
documents꿯□ηlike꿯□ηthe꿯□ηRDEIR/SDEIS.)꿯□η

The꿯□ηchanges꿯□ηincluded:꿯□ηcish꿯□ηscreens꿯□ηfor꿯□ηeach꿯□ηof꿯□ηthree꿯□ηnorth꿯□ηDelta
fencing,꿯□ηsecurity꿯□ηgates,꿯□ηcontrol꿯□ηbuildings,꿯□ηa꿯□ηsingle-□bore꿯□ηtunnel꿯□ηbetween꿯
diameter)꿯□ηand꿯□ηthe꿯□ηintermediate꿯□ηforebay,꿯□ηvarious꿯□ηvertical꿯□ηshafts꿯□ηat꿯□ηint
from꿯□ηIntake꿯□η5꿯□ηto꿯□ηthe꿯□ηintermediate꿯□ηforebay꿯□η(28-□foot꿯□ηdiameter),꿯□ηthe꿯
to꿯□ηthe꿯□ηtwo꿯□η40-□foot꿯□ηdiameter꿯□ηtunnels꿯□ηenabling꿯□ηgravity꿯□ηclow꿯□ηto꿯□ηth
Forebay꿯□ηwhere꿯□ηa꿯□ηpumping꿯□ηplant꿯□ηwould꿯□ηbe꿯□ηconstructed꿯□ηto꿯□ηlift꿯□ηwa
Court꿯□ηfor꿯□ηdelivery꿯□ηto꿯□ηthe꿯□ηsouth꿯□ηDelta꿯□ηstate꿯□ηand꿯□ηfederal꿯□ηpumping

These꿯□ηchanges꿯□ηto꿯□ηAlternative꿯□η4꿯□ηare꿯□ηclaimed꿯□ηto꿯□ηhave꿯□ηthe꿯□ηfollowing
pumping꿯□ηplants꿯□η(one꿯□ηfrom꿯□ηeach꿯□ηnorth꿯□ηDelta꿯□ηintake);꿯□ηminimizing꿯□ηcons
where꿯□ηsandhill꿯□ηcrane꿯□ηcritical꿯□ηhabitat꿯□ηexists;꿯□ηrelocating꿯□ηproject꿯□ηfeatures꿯□
reduce꿯□ηacquisitions꿯□ηfrom꿯□ηprivate꿯□ηland꿯□ηowners;꿯□ηeliminating꿯□ηpermanent꿯□ηpow
Lakes꿯□ηNational꿯□ηWildlife꿯□ηRefuge;꿯□ηremoving꿯□ηan꿯□ηunderground꿯□ηsiphon꿯□ηthat꿯□
Slough,꿯□ηreducing꿯□ηoverall꿯□ηelectricity꿯□ηrequirements꿯□ηof꿯□ηthe꿯□ηTunnels꿯□ηProject꿯

[50] 꿯□ηRDEIR/SDEIS,꿯□ηSection꿯□η1,꿯□ηp.꿯□η1-□3,꿯□ηlines꿯□η1-□14.꿯□ηEmphasis꿯□ηadded.

to꿯□ηclow꿯□ηalmost꿯□ηentire꿯□ηby꿯□ηgravity꿯□ηexcept꿯□ηfor꿯□ηthe꿯□ηcinal꿯□ηhoist꿯□ηf
overall,꿯□η"reduc[ing]꿯□ηtunnel꿯□ηoperation꿯□ηand[51]꿯□ηmaintenance꿯□ηcosts."

EWC꿯□ηnotes꿯□ηthat꿯□ηnowhere꿯□ηin꿯□ηthis꿯□ηlist꿯□ηof꿯□ηbenecits꿯□ηdo꿯□ηthe꿯□ηLead
Tunnels꿯□ηProject꿯□η(Alternative꿯□η4)꿯□ηwere꿯□ηmade꿯□ηto꿯□ηbenecit꿯□ηcish꿯□ηspecies,꿯
The꿯□ηchanges꿯□ηmainly꿯□ηappear꿯□ηto꿯□ηreduce꿯□ηTunnels'꿯□ηoperation꿯□ηand꿯□ηmainte
fashion꿯□ηreduce꿯□ηimpacts꿯□ηto꿯□ηDelta꿯□ηhuman꿯□ηresidents꿯□η(such꿯□ηas꿯□ηthrough꿯
impacts꿯□ηof꿯□ηtransmission꿯□ηlines꿯□ηand꿯□ηpower꿯□ηplant꿯□ηbuildings꿯□ηfrom꿯□ηintake
the꿯□ηnorth꿯□ηDelta꿯□ηintakes꿯□ηare꿯□ηnot꿯□ηclaimed꿯□ηto꿯□ηprovide꿯□ηcish꿯□ηbenecits
is꿯□ηjusticied꿯□ηfor꿯□ηreducing꿯□η"the꿯□ηamount꿯□ηof꿯□ηconstruction꿯□ηactivity꿯□ηrequire
eliminate꿯□ηthe꿯□ηtemporary꿯□ηrelocation꿯□ηof꿯□ηState꿯□ηRoute꿯□η(SR)꿯□η160꿯□ηby꿯□ηr
levee꿯□ηsections꿯□ηprior꿯□ηto꿯□ηcommencing꿯□ηconstruction[52]꿯□ηof꿯□ηthe꿯□ηintake꿯□ηstructu

Construction꿯□ηrelated꿯□ηimpacts꿯□ηto꿯□ηcish꿯□ηwould꿯□ηbe꿯□ηthe꿯□ηsame꿯□ηfor꿯□ηmod
4A꿯□ηbecause꿯□η"the꿯□ηproposed꿯□ηphysical꿯□ηwater꿯□ηconveyance꿯□ηfacilities[53]꿯□ηare꿯□ηth
In꿯□ηthis꿯□ηsense,꿯□ηthe꿯□ηchanges꿯□ηrepresent꿯□ηdistinctions꿯□ηwithout꿯□ηimportant꿯□ηp
differences.

Developing 꿯□ηnew 꿯□ηalternatives 꿯□ηwith 꿯□ηlittle 꿯□ηhabitat 꿯□ηrestoration.

"desire꿯□ηto꿯□ηexplore꿯□ηalternative꿯□ηregulatory꿯□ηapproaches꿯□ηthat꿯□ηcould꿯□ηfacilitate꿯
Delta꿯□ηsolutions"꿯□ηis꿯□ηthe꿯□ηmain꿯□ηreason꿯□ηfor꿯□ηdeveloping[54]꿯□ηthese꿯□ηnew꿯□ηdistinc
what꿯□η"Delta꿯□ηsolutions"꿯□ηmeans꿯□ηand꿯□ηwhat꿯□ηexpeditious꿯□ηprogress꿯□ηtoward꿯□η
to꿯□ηaddress꿯□ηbroader꿯□ηstatewide꿯□ηwater꿯□ηpolicy꿯□ηgoals꿯□ηenacted꿯□ηin꿯□ηthe꿯□η
statement꿯□ηshould꿯□ηbe꿯□ηclaricied꿯□ηwith꿯□ηrespect꿯□ηto꿯□ηthe꿯□ηstated꿯□ηobjectives,꿯
Agencies꿯□ηemploy꿯□η(discussed꿯□ηbelow)꿯□ηto꿯□ηjustify꿯□ηthe꿯□ηTunnels꿯□ηProject.꿯□ηTh
"conveyance꿯□ηfacilities꿯□ηnecessary꿯□ηfor꿯□ηthe꿯□ηSWP꿯□ηand꿯□ηCVP꿯□ηto꿯□ηaddress꿯□η
reliability꿯□ηneeds꿯□ηin꿯□ηconjunction꿯□ηwith꿯□ηecosystem꿯□ηimprovements꿯□ηto꿯□ηreduce꿯
cish꿯□ηspecies꿯□ηimpacts꿯□ηassociated꿯□ηwith꿯□ηthe꿯□ηexisting꿯□ηsouth꿯□ηDelta꿯□ηintakes.
since꿯□ηecosystem꿯□ηimprovements꿯□ηare꿯□ηexternalized꿯□ηto꿯□ηother꿯□ηagencies,꿯□ηAlterna
Tunnels꿯□ηProject,꿯□ηa꿯□ηwater꿯□ηpipeline,꿯□ηpure꿯□ηand꿯□ηsimple.

Our꿯□ηconclusion꿯□ηis꿯□ηconcirmed꿯□ηin꿯□ηSection꿯□η3꿯□ηof꿯□ηthe꿯□ηRDEIR/SDEIS.꿯□ηT
benecits꿯□ηof꿯□ηthe꿯□η"alternative꿯□ηimplementation꿯□ηstrategy"꿯□ηis꿯□ηreducing꿯□ηreverse
River꿯□ηand꿯□ηdirect꿯□ηcish꿯□ηimpacts꿯□ηfrom꿯□ηcontinued꿯□ηexclusive꿯□ηoperation꿯□ηof
and꿯□ηcish꿯□ηfacilities.꿯□ηThe꿯□ηRDEIR/SDEIS꿯□ηsupposes꿯□ηthat꿯□ηthe꿯□η*allowable*꿯□ηalternative꿯□ηin
for꿯□ηother꿯□ηstate꿯□ηand꿯□ηfederal꿯□ηprograms꿯□ηto꿯□ηaddress꿯□ηthe꿯□ηlong꿯□ηterm꿯
recovery꿯□ηin꿯□ηprograms꿯□ηseparate꿯□ηfrom꿯□η[55]꿯□ηthe꿯□ηproposed꿯□ηproject."

In꿯□ηplain꿯□ηterms,꿯□ηthe꿯□ηLead꿯□ηAgencies꿯□ηcontinue꿯□ηto꿯□ηbelieve꿯□ηthat꿯□ηaddin
the꿯□ηsouth꿯□ηDelta꿯□ηpumps꿯□ηrepresents꿯□ηan꿯□ηimprovement꿯□ηover꿯□ηexisting꿯□ηcon
intakes꿯□ηsupposedly꿯□ηprovide꿯□ηoperational꿯□ηclexibility꿯□ηfor꿯□ηavoiding꿯□ηimpacts꿯□ηto
north꿯□ηDelta꿯□ηwaters.꿯□ηRemoval꿯□ηof꿯□ηpumps꿯□ηfrom꿯□ηthe꿯□ηnorth꿯□ηDelta꿯□ηinta
reduce꿯□ηpotential꿯□ηproblems꿯□ηwith꿯□ηthe꿯□ηnorth꿯□ηDelta꿯□ηintakes,꿯□ηand꿯□ηballyhoo

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[51]꿯□ηRDEIR/SDEIS,꿯□ηSection꿯□η3,꿯□ηp.꿯□η3-□1,꿯□ηlines꿯□η14-□33.

[52]꿯□ηRDEIR/SDEIS,꿯□ηSection꿯□η3,꿯□ηp.꿯□η3-□2,꿯□ηlines꿯□η9-□11.

[53]꿯□ηRDEIR/SDEIS,꿯□ηSection꿯□η3,꿯□ηp.꿯□η3-□7,꿯□ηlines꿯□η31-□32.

[54]꿯□ηRDEIR/SDEIS,꿯□ηSection꿯□η1,꿯□ηp.꿯□η1-□4,꿯□ηlines꿯□η15-□17.

[55]꿯□ηRDEIR/SDEIS,꿯□ηSection꿯□η1,꿯□ηp.꿯□η1-□3,꿯□ηlines꿯□η7-□8.

will뀀□ηkeep뀀□ηsmall뀀□ηcish뀀□ηlike뀀□ηDelta뀀□ηsmelt,뀀□ηlongcin뀀□ηsmelt,뀀□ηand뀀□ηjuvenile
below뀀□ηfor뀀□ηmore뀀□ηon뀀□ηcish뀀□ηscreens.)

In뀀□ηreality,뀀□ηclexible뀀□ηoperations뀀□ηthrough뀀□ηdual뀀□ηconveyance뀀□ηmeans뀀□ηthat뀀□ηat
clows뀀□ηand뀀□ηcish뀀□ηentrainment뀀□ηand뀀□ηwater뀀□ηquality뀀□ηproblems뀀□ηcan뀀□ηcontinue
Delta.뀀□ηThis뀀□ηdoes뀀□ηnot뀀□ηin뀀□ηany뀀□ηway뀀□ηmean뀀□ηthere뀀□ηare뀀□ηnet뀀□ηaquatic
conveyance뀀□ηsimply뀀□ηdoubles뀀□ηthe뀀□ηnumber뀀□ηof뀀□ηplaces뀀□ηsuch뀀□ηeffects뀀□ηwould

"These뀀□ηchanges뀀□ηare뀀□ηnecessary,"뀀□ηclaims뀀□ηthe뀀□ηdescription뀀□ηof뀀□ηthe뀀□ηnew뀀□
to뀀□ηaddress뀀□ηmore뀀□ηimmediate뀀□ηwater뀀□ηsupply뀀□ηreliability뀀□ηneeds뀀□ηwhile뀀□ηredu
ongoing뀀□ηenvironmental뀀□ηimpacts.뀀□ηThe뀀□ηstrategy뀀□ηwould뀀□ηachieve뀀□ηthe뀀□ηlatter뀀□
by뀀□ηreducing뀀□ηreverse뀀□ηclows뀀□ηand뀀□ηdirect뀀□ηcish뀀□ηimpacts뀀□ηassociated뀀□ηwith뀀[56]
This 뀀□ηformulation 뀀□ηis 뀀□ηintended 뀀□ηto 뀀□ηstop 뀀□ηreaders 뀀□ηfrom 뀀□ηthinking 뀀□ηabout
happen 뀀□ηin 뀀□ηthe 뀀□ηnorth 뀀□ηDelta 뀀□ηas 뀀□ηlong 뀀□ηas 뀀□ηthose 뀀□ηpesky 뀀□ηreverse 뀀□
reduced. 뀀□ηIt 뀀□ηis 뀀□ηa 뀀□ηframing 뀀□ηexercise, 뀀□ηa 뀀□ηlinguistic 뀀□ηshell 뀀□ηgame 뀀□ηthro
peddle 뀀□ηthe 뀀□ηTunnels 뀀□ηProject 뀀□ηto 뀀□ηthe 뀀□ηpublic. 뀀□η

Thus뀀□ηthe뀀□ηRDEIR/SDEIS뀀□ηgrandly뀀□ηexaggerates:

> Implementing뀀□ηthe뀀□ηconveyance뀀□ηfacilities뀀□ηalone,뀀□ηas뀀□ηnow뀀□ηproposed뀀□ηunder뀀□ηAltern
> help뀀□ηresolve뀀□ηmany뀀□ηof뀀□ηthe뀀□ηconcerns뀀□ηwith뀀□ηthe뀀□ηcurrent뀀□ηsouth뀀□ηDelta뀀□ηco
> reduce뀀□ηthreats뀀□ηto뀀□ηendangered뀀□ηand뀀□ηthreatened뀀□ηspecies뀀□ηin뀀□ηthe뀀□ηDelta.뀀□ηFor뀀
> conveyance뀀□ηsystem뀀□ηwould뀀□ηalign뀀□ηwater뀀□ηoperations뀀□ηto뀀□ηbetter뀀□ηreclect뀀□ηnatural뀀
> creating뀀□ηnew뀀□ηwater뀀□ηdiversions뀀□ηin뀀□ηthe뀀□ηnorth뀀□ηDelta뀀□ηequipped뀀□ηwith뀀□ηstate-
> reducing뀀□ηreliance뀀□ηon뀀□ηsouth뀀□ηDelta뀀□ηexports.
>
> The뀀□ηexisting뀀□ηoperation뀀□ηof뀀□ηthe뀀□ηSWP뀀□ηand뀀□ηCVP뀀□ηpumps뀀□ηin뀀□ηthe뀀□ηsouth뀀
> potentially뀀□ηaltering뀀□ηsalmon뀀□ηmigratory뀀□ηpatterns뀀□ηand뀀□ηcontributing뀀□ηto뀀□ηthe뀀□ηdecli
> delta뀀□ηsmelt.뀀□ηThe뀀□ηnew뀀□ηsystem뀀□ηwould뀀□ηreduce뀀□ηthe뀀□ηongoing뀀□ηphysical뀀□ηimpact
> the뀀□ηsouthern뀀□ηdiversion뀀□ηfacilities뀀□ηand뀀□ηallow뀀□ηfor뀀□ηgreater뀀□ηoperational뀀□ηclexibility
> Minimizing뀀□ηsouth뀀□ηDelta뀀□ηpumping뀀□ηwould뀀□ηprovide뀀□ηmore뀀□ηnatural뀀□ηeast-□west뀀□ηcl
> diversions뀀□ηwould뀀□ηalso뀀□ηhelp뀀□ηprotect뀀□ηcritical뀀□ηwater뀀□ηsupplies뀀□ηagainst뀀□ηthe뀀□ηth
> earthquakes.[57]

These뀀□ηtwo뀀□ηpassages뀀□ηare뀀□ηabout뀀□ηstopping뀀□ηthought,뀀□ηnot뀀□ηinforming뀀□ηit.뀀□
improvements뀀□ηin뀀□ηpotential뀀□ηdownstream뀀□ηclow뀀□ηon뀀□ηOld뀀□ηand뀀□ηMiddle뀀□ηRive
clows뀀□ηand뀀□ηclow뀀□ηreductions뀀□ηinherent뀀□ηin뀀□ηoperating뀀□ηthe뀀□ηnorth뀀□ηDelta뀀□
north뀀□ηDelta뀀□ηintakes뀀□ηwithout뀀□ηthreats뀀□ηto뀀□ηmigrating뀀□ηjuvenile뀀□ηsalmon뀀□ηsmo
times뀀□ηof뀀□ηyear.뀀□ηIf뀀□ηreal-□time뀀□ηoperations뀀□ηare뀀□ηinvoked뀀□ηto뀀□ηreturn뀀□ηope
pumping뀀□ηplants뀀□ηto뀀□ηprotect뀀□ηcish뀀□ηin뀀□ηthe뀀□ηnorth뀀□ηDelta,뀀□ηthe뀀□ηprojects뀀
Old뀀□ηand뀀□ηMiddle뀀□ηrivers뀀□ηwith뀀□ηattendant뀀□ηthreats뀀□ηand뀀□ηstresses뀀□ηto뀀□ηcis
hydrodynamic뀀□ηDelta뀀□ηin뀀□ηthe뀀□ηabsence뀀□ηof뀀□ηclogging뀀□ηmost뀀□ηkey뀀□ηchannels뀀□
at뀀□ηleast,뀀□ηthe뀀□ηDelta뀀□ηremains뀀□ηprimarily뀀□ηa뀀□ηcommon뀀□ηwater뀀□ηpool,뀀□ηand
RDEIR/SDEIS뀀□ηor뀀□η"California뀀□ηWaterFix"뀀□ηpublicity[58]뀀□ηcan뀀□ηwish뀀□ηit뀀□ηaway.

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[56]뀀□ηRDEIR/SDEIS,뀀□ηSection뀀□η4.1,뀀□ηp.뀀□η4.1-□1,뀀□ηlines뀀□η18-□21.

[57]뀀□ηRDEIR/SDEIS,뀀□ηSection뀀□η4.1,뀀□ηp.뀀□η4.1-□1,뀀□ηlines뀀□η38-□41뀀□ηand뀀□ηp.뀀□η4.1-□2,뀀□ηlin

[58]뀀□ηWe뀀□ηare뀀□ηaware뀀□ηof뀀□ηthe뀀□ηannual뀀□ηinstallation뀀□ηof뀀□ηtemporary뀀□ηbarriers뀀□ηat뀀□
water뀀□ηlevels뀀□ηand뀀□ηat뀀□ηthe뀀□ηhead뀀□ηof뀀□ηOld뀀□ηRiver뀀□ηto뀀□ηsteer뀀□ηmigrating뀀□ηsalmo
Pumping뀀□ηPlant뀀□ηin뀀□ηthe뀀□ηSan뀀□ηJoaquin뀀□ηRiver뀀□ηmainstem.

"However,"뀀□ηthe뀀□ηLead뀀□ηAgencies뀀□ηstate,뀀□ηin뀀□ηan뀀□ηeffort뀀□ηto뀀□ηkeep뀀□ηat뀀□η
Tunnels뀀□ηProject,뀀□η"habitat뀀□ηrestoration뀀□ηis뀀□ηstill뀀□ηrecognized뀀□ηas뀀□ηa뀀□ηcritical뀀
term뀀□ηplans뀀□ηfor뀀□ηthe뀀□ηDelta,뀀□ηand뀀□ηsuch뀀□ηendeavors뀀□ηwill뀀□ηlikely뀀□ηbe뀀□η
separate뀀□ηand뀀□ηapart뀀□ηfrom뀀□ηthe뀀□ηchosen."

At뀀□ηthis뀀□ηwriting,뀀□ηno뀀□ηadditional뀀□ηdocumentation뀀□ηof뀀□ηthe뀀□ηlikelihood뀀□ηCalifor
funded뀀□ηlet뀀□ηalone뀀□ηimplemented뀀□ηhas뀀□ηbeen뀀□ηprovided뀀□ηat뀀□ηthe뀀□ηCalifornia뀀□
juncture,뀀□ηCER뀀□ηis뀀□ηdescribed뀀□ηas뀀□ηbeing뀀□ηless뀀□ηthan뀀□ηone-□cifth뀀□ηthe뀀□ηsize
originally뀀□ηunder뀀□ηBDCP뀀□ηas뀀□ηConservation뀀□ηMeasure뀀□η3.뀀□ηthe뀀□ηnew뀀□ηalternatives뀀□
"restoration뀀□ηof뀀□ηhabitat뀀□ηin뀀□ηthe뀀□ηDelta...will뀀□ηinstead뀀□ηoccur뀀□ηthrough뀀□ηCalifor
activities뀀□ηwill뀀□ηbe뀀□ηfurther뀀□ηdeveloped뀀□ηand뀀□ηevaluated뀀□ηindependent뀀□ηof뀀□ηthe

The 뀀□ηRDEIR/SDEIS 뀀□ηfails 뀀□ηto 뀀□ηmake 뀀□ηdetailed 뀀□ηcomparisons 뀀□ηamong 뀀□ηalternativ
direct뀀□ηcomparison뀀□ηof뀀□ηthe뀀□ηthree뀀□ηBDCP뀀□ηand뀀□ηCalifornia뀀□ηWaterFix뀀□ηpreferr
comparison뀀□ηshows,뀀□ηcirst,뀀□ηthat뀀□ηthere뀀□ηare뀀□ηonly뀀□ηminor뀀□ηdifferences뀀□ηbetwe
preferred뀀□ηalternative,뀀□ηand뀀□ηsecond,뀀□ηthat뀀□ηto뀀□ηmake뀀□ηthis뀀□ηdirect뀀□ηcompariso
different뀀□ηdocuments:뀀□ηthe뀀□ηBay뀀□ηDelta뀀□ηConservation뀀□ηPlan,뀀□ηthe뀀□ηRDEIR/SDEIS,뀀
*Engineering 뀀□ηReport*뀀□η(dated뀀□ηJuly뀀□η2015),뀀□ηwhich뀀□ηwas뀀□ηobtained뀀□ηonly뀀□ηthrough뀀
No뀀□ηsuch뀀□ηcomparison뀀□ηwas뀀□ηprovided뀀□ηthat뀀□ηwe뀀□ηcould뀀□ηcind뀀□ηreadily뀀□ηin
Table뀀□η1.뀀□η

Last뀀□ηyear,뀀□ηwe뀀□ηnoted뀀□ηthat뀀□ηeven뀀□ηBDCP's뀀□ηDraft뀀□ηEIR/EIS뀀□ηobserved뀀□ηth
among뀀□ηalternatives뀀□ηwhen뀀□ηit뀀□ηcame뀀□ηto뀀□ηthe뀀□ηRDEIR/SDEIS뀀□ηfails뀀□ηto뀀□ηpro
comparisons뀀□ηof뀀□ηDelta뀀□ηoutclow뀀□ηand뀀□ηexports뀀□ηwith뀀□ηall뀀□ηother뀀□ηalternatives,
easily뀀□ηand뀀□ηdirectly뀀□ηgauge뀀□ηfor뀀□ηthemselves뀀□ηthe뀀□ηrelative뀀□ηdifferences뀀□ηamo
a뀀□ηcomparison뀀□ηdrawn뀀□ηfrom뀀□ηboth뀀□ηthe뀀□ηDraft뀀□ηEIR/EIS뀀□ηand뀀□ηthe뀀□ηRDEIR
illustrate뀀□ηthe뀀□ηcumbersome뀀□ηcomplexity뀀□ηeven뀀□ηof뀀□ηsummarizing뀀□ηthe뀀□η"slight뀀□
complexities뀀□ηassociated뀀□ηwith뀀□ηanalyzing뀀□ηand뀀□ηgrasping뀀□ηthe뀀□ηBDCP's뀀□ηand뀀□η
points뀀□ηup뀀□ηthe뀀□ηcontinuing뀀□ηdeciciency뀀□ηof뀀□ηthe뀀□ηRDEIR/SDEIS뀀□ηin뀀□ηfostering
comparisons뀀□ηamong뀀□ηits뀀□ηtoo-□numerous뀀□ηalternatives.뀀□ηAll뀀□ηthat뀀□ηis뀀□ηreally뀀□η

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[59]뀀□ηCalifornia뀀□ηEcoRestore's뀀□ηinitial뀀□ηgoal뀀□ηis뀀□ηto뀀□ηadvance뀀□η(i.e.뀀□ηcomplete뀀□ηor뀀□ηbreak
habitat뀀□ηrestoration:

- 25,000뀀□ηacres뀀□ηassociated뀀□ηwith뀀□ηexisting뀀□ηmandates뀀□ηfor뀀□ηhabitat뀀□ηrestoration,뀀□η
  opinions.뀀□ηThese뀀□ηprojects뀀□ηwill뀀□ηbe뀀□ηfunded뀀□ηexclusively뀀□ηby뀀□ηthe뀀□ηstate뀀□ηand
  benecit뀀□ηfrom뀀□ηthe뀀□ηState뀀□ηWater뀀□ηProject뀀□ηand뀀□ηthe뀀□ηCentral뀀□ηValley뀀□ηProject
- 5,000뀀□ηacres뀀□ηof뀀□ηhabitat뀀□ηenhancements.뀀□ηProposition뀀□η1뀀□ηgrants뀀□ηto뀀□ηlocal뀀□η
  organizations,뀀□ηand뀀□ηother뀀□ηentities뀀□ηwill뀀□ηsupport뀀□ηthese뀀□ηhabitat뀀□ηenhancements뀀
  Funding뀀□ηwill뀀□ηcome뀀□ηprimarily뀀□ηfrom뀀□ηthe뀀□ηDelta뀀□ηConservancy,뀀□ηthe뀀□ηCalifornia
  Wildlife,뀀□ηand뀀□ηthe뀀□ηCalifornia뀀□ηDepartment뀀□ηof뀀□ηWater뀀□ηResources.

California뀀□ηEcoRestore뀀□ηis뀀□ηunassociated뀀□ηwith뀀□ηany뀀□ηhabitat뀀□ηrestoration뀀□ηthat뀀□ηmay뀀□η
construction뀀□ηand뀀□ηoperation뀀□ηof뀀□ηnew뀀□η[illegible] Accessed뀀□η14뀀□ηSeptember뀀□η
2015뀀□η at뀀□η http://resources.ca.gov/ecorestore/.

There뀀□ηis뀀□ηno뀀□ηtimeline,뀀□ηschedule뀀□ηof뀀□ηphasing뀀□ηor뀀□ηplanning뀀□ηdocument뀀□ηfor뀀□ηCa
EcoRestore뀀□ηrepresents뀀□ηDWR's뀀□ηcherry-□picking뀀□ηof뀀□ηrestoration뀀□ηprojects뀀□ηit뀀□ηlikes뀀□ηfro
"existing뀀□ηmandates"뀀□ηand뀀□ηwhich뀀□ηcould뀀□ηbe뀀□ηfunded뀀□ηfrom뀀□ηthe뀀□ηrecently뀀□ηpassed뀀

[60]뀀□ηRDEIR/SDEIS,뀀□ηSection뀀□η4.1,뀀□ηp.뀀□η4.1-□2,뀀□ηlines뀀□η15-□17.

[61]뀀□ηEWC뀀□η[illegible]뀀□η1뀀□ηpp.뀀□η150-□152.

between뀀□ηthe뀀□ηmodicied뀀□ηAlternative뀀□η4뀀□ηand뀀□ηeach뀀□ηof뀀□ηthe뀀□ηthree뀀□ηother shorn뀀□ηof뀀□ηthe뀀□ηBDCP뀀□ηconservation뀀□ηstrategy.[62]

Table뀀□η1 Summary뀀□ηComparing뀀□ηBDCP뀀□ηand뀀□ηCalifornia뀀□ηWaterFix뀀□ηAl 2013뀀□ηthrough뀀□η2015			
Feature뀀□ηDescription/Surface뀀□ηAre	**Alternative뀀□ (2013)**	**ModiLied뀀□ Alternative뀀□ (2014)**	**Alternative뀀□I ("California뀀 WaterFix")**
Conveyance뀀□ηcapacity뀀□η(cfs)	9,000	9,000	9,000
Intake뀀□ηfacilities뀀□η(acres뀀□ηper뀀□ηsite)	90	90	122
Six뀀□ηpumps뀀□ηper뀀□ηintake,뀀□ηpump뀀□η	500		
Total뀀□ηdynamic뀀□ηhead뀀□η(feet)	59-□73		
Tunnel뀀□η1a뀀□ηconnecting뀀□ηintakes뀀□η2뀀□ηand뀀□η3뀀□ηto뀀□ηIntermediate뀀□ηFor			
Tunnel뀀□ηlength뀀□η(feet)	47,400	46,100	
Number뀀□ηof뀀□ηtunnel뀀□ηbores;뀀□ηnumber	1;뀀□η4	1;뀀□η3	
Tunnel뀀□ηcinished뀀□ηinside뀀□ηdiameter뀀□η(	20	28	
Tunnel뀀□η1b뀀□ηconnecting뀀□ηIntake뀀□η5뀀□ηto뀀□ηIntermediate뀀□ηForebay			
Tunnel뀀□ηlength뀀□η(feet)	24,900	25,200	
Number뀀□ηof뀀□ηtunnel뀀□ηbores;뀀□ηnumber	1;뀀□η3	1;뀀□η3	
Tunnel뀀□ηcinished뀀□ηinside뀀□ηdiameter뀀□η(	20	28	
North뀀□ηTunnels뀀□ηfrom뀀□ηIntake뀀□η2뀀□ηto뀀□ηIntake뀀□η3뀀□η(Alternative뀀□η4A뀀			
Maximum뀀□ηFlow뀀□η(Intake뀀□ηFlow,뀀□ηcfs)			3,000
Tunnel뀀□ηlength뀀□η(feet)			10,507
Number뀀□ηof뀀□ηTunnel뀀□ηbores;뀀□ηnumber			1;뀀□η1
Tunnel뀀□ηFinished뀀□ηInside뀀□ηDiameter뀀□η			28
North뀀□ηTunnels뀀□ηfrom뀀□ηIntake뀀□η3뀀□ηto뀀□ηIntermediate뀀□ηForebay뀀□η(Alterna			
Maximum뀀□ηFlow뀀□η(Intake뀀□ηFlow,뀀□ηcfs)			6,000
Tunnel뀀□ηlength뀀□η(feet)			35,587
Number뀀□ηof뀀□ηTunnel뀀□ηbores;뀀□ηnumber			1;뀀□η3

[62]뀀□ηRDEIR/SDEIS,뀀□ηSection뀀□η4.1,뀀□ηTables뀀□η4.1-□1,뀀□η4.1-□4,뀀□ηand뀀□η4.1-□6.

Table뀀□η1
Summary뀀□ηComparing뀀□ηBDCP뀀□ηand뀀□ηCalifornia뀀□ηWaterFix뀀□ηAl
2013뀀□ηthrough뀀□η2015

Feature뀀□ηDescription/Surface뀀□ηAre	Alternative뀀□ (2013)	ModiLied뀀□ Alternative뀀□ (2014)	Alternative뀀□ ("California뀀 WaterFix")
Tunnel뀀□ηcinished뀀□ηinside뀀□ηdiameter뀀□η(			40
North뀀□ηTunnel뀀□ηfrom뀀□ηIntake뀀□η5뀀□ηto뀀□ηIntermediate뀀□ηForebay			
Maximum뀀□ηFlow뀀□η(Intake뀀□ηFlow,뀀□ηcfs)			3,000
Tunnel뀀□ηlength뀀□η(feet)			25,186
Number뀀□ηof뀀□ηTunnel뀀□ηbores;뀀□ηnumber			1;뀀□η3
Tunnel뀀□ηcinished뀀□ηinside뀀□ηdiameter뀀□η(			28
Intermediate뀀□ηForebay뀀□η(acres)	245	243	243
Water뀀□ηsurface뀀□ηarea뀀□η(acres)	41	37	37
Active뀀□ηstorage뀀□ηvolume뀀□η(acre-□feet)	710	750	750
Main뀀□ηTunnels뀀□η(connecting뀀□ηIntermedia뀀□ηForebay뀀□ηto뀀□ηClifton뀀□ηCourt뀀□η			
Maximum뀀□ηFlow뀀□η(cfs)	9,000	9,000	9,000
Tunnel뀀□ηlength뀀□η(feet)	159,000	159,000	159,000
Number뀀□ηof뀀□ηTunnel뀀□ηbores;뀀□ηnumber	2;뀀□η9	2;뀀□η9	2;뀀□η9
Tunnel뀀□ηcinished뀀□ηinside뀀□ηdiameter뀀□η(	40	40	40
Clifton뀀□ηCourt뀀□ηPumping뀀□ηPlant			
Total뀀□ηNumber뀀□ηof뀀□ηPumps뀀□η(both뀀□	None	12	12
8뀀□ηlarge뀀□ηpumps,뀀□ηcapacity뀀□ηper뀀□η	None	1,125	1,125
4뀀□ηsmall뀀□ηpumps,뀀□ηcapacity뀀□ηper뀀□η	None	563	563
Total뀀□ηdynamic뀀□ηhead뀀□η(feet)	None	37	37
Expanded뀀□ηClifton뀀□ηCourt뀀□ηForebay뀀□ area,뀀□ηacres)	2,950	2,600	1,691
Forebay뀀□ηdredging뀀□ηarea뀀□η(acres)	2,030	2,010	2,121
Expanded뀀□ηwater뀀□ηsurface뀀□ηarea뀀□η(acı	690	590	806

Table 1
Summary of Comparing BDCP and California WaterFix Al
2013 through 2015

Feature Description/Surface Are	Alternative (2013)	ModiLied Alternative (2014)	Alternative ("California WaterFix")
Active storage volume (acre-feet)	9,260 (nor cell), 8,11 (south cel	4,300 to 10,200 (no cell), 14,0 (south ce	4,970 to (north) 12, (south)
Power requirements Estimated electric load (MW)	50-60	36	36

Notes: cfs = cubic feet per second; MW = megawatts. Acre footprints of selected facilities. Characteristics of other areas includ designated for borrow, spoils, and reusable tunnel material are the Recirculated DEIR/SDEIS, 2015). Overall project acreage includes permanent access roads.
[1] Intake 3's tunnel to the Intermediate Forebay (IF) will h intake clows from Intakes 2 and 3 to the IF, a total

Sources: Bay Delta Conservation Plan, Northern Alternatives 3 Chapter 4, Ass *Actions*, Table 4-3, p. 4-11; BDCP Recirculated Draft EIR/Supplement *Conveyance Facility ModiQications* Table 3-2 1/4 p. 3-3; California Resources, Delta Habitat Conservation and *Conveyance Engineering Report, Conveyance Facility, ModiQied Pipeline/Tunnel Option—Clifton Court Forebay* July 1, 2015, Table ES-1, pp. ES-4 to ES-5; Environmental

EWC's Plan Alternatives are reasonable alternatives. EWC's demand for consideration of the Responsible Exports Plan and the Sustainable W alternatives and reasonable variants. EWC's similar requests started back have to date been ignored in the BDCP and "California WaterFix

Table퀭□η2

Operational Criteria Scenarios - BDCP EIR/EIS							
Scenario	Applies to Alternative(s):	North Delta Bypass & Diversions	South Delta Exports	Yolo Bypass Diversions	Delta Cross Channel	Rio Vista Instream Flows	Delta Inflow & Outflow
A	1A, 1B, 1C, 3	Dec - June (could) make use of initial and post-pulse operational criteria; July - Sep min bypass flow of 5,000 cfs; Oct - Nov min bypass flows increase to 7,000 cfs; diversions <= to 6% of Sacramento Flow at Freeport such that North Delta Bypass flows are >= 5,000 cfs; Initial pulse trigger; post-pulse operations using Table 3-16 in EIS/EIR.	Biological Opinions' RPA actions, consistent with the No Action Alternative.	Sacramento Weir: No changes; Lisbon Weir: No changes; Fremont Weir: 17.5' notch with operable gates between Dec 1 and April 30 providing Yolo Bypass inundation of 3,000 to 6,000 cfs.	Oct - Nov: DCC closed 15 days per month; Dec - June: DCC gates closed; Jul - Sep: DCC gates open.	Sep - Dec: D-1641 criteria; Jan - Aug: minimum of 3,000 cfs.	D-1641
B	2A, 2B, 2C	Same as Scenario A	Derived from BiOps - Compare Table 3-18 of EIR/EIS to NAA operational criteria, select larger # for OMR criterion; April-May-June OMR flows in Table 3-19; Oct - Nov: No South Delta exports during D-1641 pulse flows; after D-1641 pulse flows operate to -5,000 cfs through November	Same as Scenario A	D-1641	D-1641	Dec - Aug: D-1641; Sep - Nov: Fall X2 from Delta smelt BiOp in Wet and Above Normal Years
B	2D (2015)	Same as Scenario A	Same as Scenario B	None - Fremont Weir not included.	Same as Scenario B	Same as Scenario B	Operational Scenario B without Fremon Weir modifications, evaluated at Early Long Term (about 2025).
C	5	Same as Scenario A	Same as Scenario A; Exports/Inflow ratio limited in April and May	Same as Scenario A	Same as Scenario A	Same as Scenario A	Same as Scenario B
C	5A (2015)	Same as Scenario A	Same as Scenario A; Exports/Inflow ratio limited in April and May	None - Fremont Weir not included.	Same as Scenario A	Same as Scenario A	Operational Scenario C without Fremont Weir modifications, evaluated at Early Long Term (about 2025).
D	6A, 6B, 6C	Same as Scenario A	None	Same as Scenario A	Same as Scenario A	Same as Scenario A	Same as Scenario B
E	7	Scenario A does apply: Dec - June, Table 3-16 would apply closely, unlike in Scenario A. Initial pulses similar to Scenario A; Post-pulse operations handled by Table 3-16.	OMR flows >= +1,000 cfs in Dec - Mar; OMR flows in June >= +3,000 cfs; OMR flows in April, May and Oct - Nov would have no south Delta exports.	Sacramento and Lisbon Weirs same as in Scenario A; Fremont Weir, same notch, operated to inundate Yolo Bypass with 3,000 to 8,000 cfs with duration governed by conditions in the Sacramento River.	Same as Scenario A	Sep - Dec: D-1641 criteria; Jan - Aug: minimum of 5,000 cfs.	Same as Scenario B
F	8	Same as Scenario E	Same as Scenario E	Sacramento and Lisbon Weirs same as in Scenario A; Fremont Weir, same notch, operated to inundate Yolo Bypass with 3,000 to 8,000 cfs with duration set for 30-45 days.	Same as Scenario A	Same as Scenario E	Jan - June: outflow = 55% of UF at Freeport or D-1641 flow requirements minimum; July - Aug, Dec: D-1641; Sep - Oct - Nov: Fall X2. Feather River flows to be proportional amount of 55% of UF at Freeport.
G	9	None	Similar to Scenario A; E/I ratio follows NMFS salmonid BO 2009.	Same as Scenario A	Flows < 11,000 cfs or > 25,000 cfs, DCC is closed; Flows > 11,000 cfs and < 25,000 cfs, DCC open to divert up to 25% of Sacramento River flow.	Same as Scenario A	Same as Scenario B
H	4 (2013)	Same as Scenario A	Derived from BiOps - Compare Table 3-21 of EIR/EIS to NAA operational criteria, select larger # for OMR criterion; April-May-June OMR flows in Table 3-22; A1	Same as Scenario A	D-1641 and Oct 1 to Dec 14: NMFS BO 2009, consistent with No Action Alternative modeling	Same as Scenario A	Decision Tree Outcomes: H1 - spring and fall outflows as per D-1641; H2 - Spring outflow for Longfin smelt and Fall outflow from D-1641; H3 - Fall X2 outflows for Delta smelt and spring outflow from D-1641; H4 - Fall X2 for Delta smelt and Spring outflow for Longfin smelt
H	4 (2014, modified)	Same as Scenario A	Same as Scenario H	Same as Scenario A	Same as Scenario H	Same as Scenario A	Operational Scenarios H1-H4 with Decision Tree of Chapter 3, Section 3.6.4.2 of Draft EIR/EIS; evaluated at Late Long Term.
H	4A (2015)	Same as Scenario A	Same as Scenario H	None - Fremont Weir not included.	Same as Scenario H	Same as Scenario A	Operational Scenario H3+ (a new operational scenario which includes a criterion for spring outflow bounded by the criteria associated with Scenarios H3 and H4 of Chapter 3, Section 3.6.4.2 of Draft EIR/EIS; evaluated as Scenarios H3 and H4 at early long-term, around 2025.

Source: Bay Delta Conservation Plan Draft EIR/EIS, November 2013, Chapter 3, pp. 181-209; RDEIR/SDEIS, Section 4.1, Tables 4.1-1, 4.1-4, and 4.1-6.

Deliberate ***BDCP*** ***Refusal*** ***to*** ***Consider*** ***Alternatives*** ***Increasing*** ***Delta*** ***Flow***

of alternatives reducing exports and increasing clows has been deliberately BDCP is "Reducing the adverse effects on certain listed [cish] species "[H]igher water exports" are among the factors the RDEIR/SDEIS adversely system and led to a decline in the ecological health and productivity" need to meet conditions for threatened and endangered cish species within the Delta. The RDEIR/SDEIS admits that "the Delta is in a state of crisis" and that "some species . . . have recently experienced the lowest population numbers." Alternatives reducing exports are the obvious direct response to claim "reducing the adverse effects on certain listed [cish] species due to the conditions for threatened and endangered cish species within the Delta clows is to take less water out.

Reclamation and DWR must develop alternatives that would increase clows reducing exports in order to satisfy federal and California law. The "The policy of the State of California is to meet water supply through a statewide strategy of investing in improved water conservation, and water use efficiency. Also mandates that the BDCP comprehensive review and analysis of "A reasonable range of clow other operational criteria necessary for recovering the Delta under a reasonable range of hydrologic conditions, which will identify available for export and other uses." The Act requires: "A reasonable conveyance alternatives, including through-Delta," as well as new dual alternatives.[69] In addition, the Act mandates that "The long-standing reasonable use and the public trust doctrine shall be the foundation policy and are particularly important and applicable to the Delta."

Reclamation and DWR have now marched along for over four years deliberately refusing to develop and evaluate a reasonable range of alternatives at all, that would increase clows by reducing exports. Academy of Sciences declared in reviewing the then-current version "[c]hoosing the alternative project before evaluating alternative ways to would be post hoc rationalization—in other words, putting the cart reasons for not considering alternative actions are not presented in

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[63] BDCP Draft EIR/EIS, Executive Summary, p. ES-10.

[64] RDEIR/SDEIS, Section 11, p. 10.

[65] Draft EIR/EIS, Executive Summary, p. ES-6.

[66] RDEIR/SDEIS, Executive Summary, p. ES-1.

[67] Cal. Wat. Code § 85021. Emphasis added.

[68] Cal. Wat. Code § 85320(b)(2)(A).

[69] Cal. Wat. Code § 85320(b)(2)(B).

[70] Cal. Wat. Code § 85023.

[71] National Academy of Sciences, Report in Brief at p. 2, May 5, 20

More 큁 □ ηthan 큁 □ ηthree 큁 □ ηyears 큁 □ ηago, 큁 □ ηon 큁 □ ηApril 큁 □ η16, 큁 □ η2012, 큁 □ ηthe 큁 □ ηCo- □ Facilitato
then- □ Deputy 큁 □ ηSecretary 큁 □ ηof 큁 □ ηthe 큁 □ ηCalifornia 큁 □ ηNatural 큁 □ ηResources 큁 □ ηAgency 큁 □ ηGeral
EWC's 큁 □ ηconcerns 큁 □ ηwith 큁 □ ηBDCP's 큁 □ ηcurrent 큁 □ ηapproach 큁 □ ηand 큁 □ ηdirection 큁 □ ηof 큁 □ ηthe 큁
treatment 큁 □ ηof 큁 □ ηalternatives.[72] 큁 □ ηThe 큁 □ ηletter 큁 □ ηspecicically 큁 □ ηstates:

> *The 큁 □ ηabsence 큁 □ ηof 큁 □ ηa 큁 □ ηfull 큁 □ ηrange 큁 □ ηof 큁 □ ηalternatives,* including 큁 □ ηalternative 큁 □ ηwhich 큁 □ ηwould 큁 □ ηreduce 큁 □ η
> Delta. 큁 □ ηIt 큁 □ ηis 큁 □ ηunderstandable 큁 □ ηthat 큁 □ ηthe 큁 □ ηexporters, 큁 □ ηwho 큁 □ ηare 큁 □ ηdriving 큁 □ ηthe 큁 □ η
> of 큁 □ ηalternative; 큁 □ ηhowever, 큁 □ ηin 큁 □ ηorder 큁 □ ηto 큁 □ ηbe 큁 □ ηa 큁 □ ηtruly 큁 □ ηpermissible 큁 □ ηproject, 큁 □ η
> alternatives, 큁 □ ηincluding 큁 □ ηones 큁 □ ηthat 큁 □ ηwould 큁 □ ηreduce 큁 □ ηexports, 큁 □ ηneeds 큁 □ ηto 큁 □ ηbe 큁 □ ηincl
> public 큁 □ ηtrust 큁 □ ηbalancing 큁 □ ηof[73] 큁 □ ηalternatives.

The 큁 □ ηEWC 큁 □ ηprovided 큁 □ ηits 큁 □ η"Reduced 큁 □ ηExports 큁 □ ηPlan" 큁 □ ηto 큁 □ ηBDCP 큁 □ ηagency 큁 □ ηo
again 큁 □ ηin 큁 □ ηperson 큁 □ ηon 큁 □ ηFebruary 큁 □ η20, 큁 □ η2013. 큁 □ ηThen- □ EWC 큁 □ ηCo- □ Facilitator 큁 □ ηN
December 큁 □ η2012 큁 □ ηmessage 큁 □ ηto 큁 □ η 큁 □ ηDeputy 큁 □ ηSecretary 큁 □ ηMeral 큁 □ ηthat:

> Now 큁 □ ηthat 큁 □ ηthe 큁 □ ηproject 큁 □ ηis 큁 □ ηnearing 큁 □ ηits 큁 □ ηEIR/EIS 큁 □ ηstage, 큁 □ ηwe 큁 □ ηfeel 큁 □ ηit 큁 □ ηis
> Exports 큁 □ ηPlan] 큁 □ ηto 큁 □ ηyou 큁 □ ηand 큁 □ ηrequest 큁 □ ηthat 큁 □ ηyou 큁 □ ηget 큁 □ ηit 큁 □ ηon 큁 □ ηthe 큁 □ ηrecord
> know, 큁 □ ηCEQA 큁 □ ηand 큁 □ ηNEPA 큁 □ ηboth 큁 □ ηrequire 큁 □ ηa 큁 □ ηfull 큁 □ ηrange 큁 □ ηof 큁 □ ηreasonable 큁 □ ηalte
> 2012 큁 □ ηemail 큁 □ ηDi 큁 □ ηCroce 큁 □ ηto 큁 □ ηMeral).

On 큁 □ ηNovember 큁 □ η18, 큁 □ η2013, 큁 □ ηFOR 큁 □ ηsubmitted 큁 □ ηa 큁 □ ηcomment 큁 □ ηletter 큁 □ ηin 큁 □ ηthe
out 큁 □ ηthe 큁 □ ηBDCP 큁 □ ηto 큁 □ ηreview 큁 □ ηthe 큁 □ η"Responsible 큁 □ ηExports 큁 □ ηPlan," 큁 □ ηan 큁 □ ηupda
Plan" 큁 □ ηproposed 큁 □ ηby 큁 □ ηthe 큁 □ ηEWC: 큁 □ η 큁 □ ηas 큁 □ ηan 큁 □ ηalternative 큁 □ ηto 큁 □ ηthe 큁 □ ηprefer
reducing 큁 □ ηexports 큁 □ ηfrom 큁 □ ηthe 큁 □ ηDelta, 큁 □ ηimplementing 큁 □ ηstringent 큁 □ ηconservation 큁 □ ηme
upstream 큁 □ ηconveyance. 큁 □ ηThis 큁 □ ηPlan 큁 □ ηadditionally 큁 □ ηprioritizes 큁 □ ηthe 큁 □ ηneed 큁 □ ηfor 큁 □ η
and 큁 □ ηprotection 큁 □ ηof 큁 □ ηpublic 큁 □ ηtrust 큁 □ ηresources 큁 □ ηrather 큁 □ ηthan 큁 □ ηa 큁 □ ηmere 큁 □ ηcont
led 큁 □ ηthe 큁 □ ηDelta 큁 □ ηinto 큁 □ ηthese 큁 □ ηdire 큁 □ ηcircumstances. 큁 □ ηOnly 큁 □ ηthat 큁 □ ηalternative 큁 □
statements 큁 □ ηindicating 큁 □ ηthat 큁 □ ηmore 큁 □ ηoutclow 큁 □ ηis 큁 □ ηneeded 큁 □ ηto 큁 □ ηprotect 큁 □ ηaquatic
populations. 큁 □ ηThe 큁 □ ηEWC 큁 □ ηResponsible 큁 □ ηExports 큁 □ ηPlan 큁 □ ηis 큁 □ ηfeasible 큁 □ ηand 큁 □ ηaccom
therefore 큁 □ ηshould 큁 □ ηbe 큁 □ ηfully 큁 □ ηanalyzed as[74] 큁 □ ηin 큁 □ ηa 큁 □ ηDraft 큁 □ ηEIS/EIR.

All 큁 □ ηof 큁 □ ηthe 큁 □ ηso- □ called 큁 □ ηproject 큁 □ ηalternatives 큁 □ ηset 큁 □ ηforth 큁 □ ηin 큁 □ ηthe 큁 □ ηDraft 큁
SDEIS 큁 □ ηcreate 큁 □ ηa 큁 □ ηcapacity 큁 □ ηto 큁 □ ηdivert 큁 □ ηmore 큁 □ ηwater 큁 □ ηfrom 큁 □ ηthe 큁 □ ηDelta 큁 □
diversion, 큁 □ ηwhich 큁 □ ηwill 큁 □ ηundoubtedly 큁 □ ηdecimate 큁 □ ηDelta- □ reliant 큁 □ ηspecies 큁 □ ηalready 큁 □
including 큁 □ ηthe 큁 □ ηDelta 큁 □ ηsmelt, 큁 □ ηchinook 큁 □ ηsalmon, 큁 □ ηsteelhead, 큁 □ ηSan 큁 □ ηJoaquin 큁 □ ηkit
among 큁 □ ηdozens 큁 □ ηof 큁 □ ηothers. 큁 □ ηThe 큁 □ ηDraft 큁 □ ηEIR/EIS 큁 □ ηitself 큁 □ ηdescribes 큁 □ ηdifference
"slight." 큁 □ ηShould 큁 □ ηthe 큁 □ ηTunnels 큁 □ ηProject 큁 □ ηbe 큁 □ ηcompleted, 큁 □ ηthis 큁 □ ηcritical 큁 □ ηaquatic
exported 큁 □ ηthrough 큁 □ ηthe 큁 □ ηnorth 큁 □ ηDelta 큁 □ ηintakes 큁 □ ηalong 큁 □ ηthe 큁 □ ηlower 큁 □ ηSacramento
contrary 큁 □ ηto 큁 □ ηESA 큁 □ ηSection 큁 □ η10 큁 □ η(prohibiting 큁 □ ηreduction 큁 □ ηof 큁 □ ηthe 큁 □ ηlikelihood 큁
species), 큁 □ ηESA 큁 □ ηSection 큁 □ η7 큁 □ η(prohibiting 큁 □ ηfederal 큁 □ ηagency 큁 □ ηactions 큁 □ ηthat 큁 □ ηare 큁
continued 큁 □ ηexistence 큁 □ ηof 큁 □ ηany 큁 □ ηendangered 큁 □ ηspecies 큁 □ ηor 큁 □ ηthat 큁 □ η"result 큁 □ ηin 큁 □ η
modicication 큁 □ ηof 큁 □ η[critical] 큁 □ ηhabitat 큁 □ ηof 큁 □ η[listed] 큁 □ ηspecies" 큁 □ η16 큁 □ ηU.S.C. 큁 □ η§ 큁 □ η1
Code 큁 □ ηSection 큁 □ η85021 큁 □ η(requiring 큁 □ ηthat 큁 □ ηexporters 큁 □ ηreduce 큁 □ ηreliance 큁 □ ηon 큁 □ ηthe

BDCP 큁 □ ηAgencies 큁 □ ηMust 큁 □ ηConsider 큁 □ ηAlternatives 큁 □ ηThat 큁 □ ηWill 큁 □ ηIncrease 큁 □ ηDelta 큁 □ the 큁 □ ηResponsible 큁 □ ηExports 큁 □ ηPlan. 큁 □ ηWe 큁 □ ηplan 큁 □ ηagain 큁 □ ηrequest 큁 □ ηdevelopment 큁 □ ηof 큁 □ ηa 큁 □ ηreasonal
alternatives 큁 □ ηthat 큁 □ ηincreasing 큁 □ ηDelta 큁 □ ηclows 큁 □ ηwhile 큁 □ ηreducing 큁 □ ηexports. 큁 □ ηTunnels 큁

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[72] 큁 □ ηLetter, 큁 □ ηp. 큁 □ η1.

[73] 큁 □ ηLetter, 큁 □ ηp. 큁 □ η2.

[74] 큁 □ ηFOR 큁 □ ηNovember 큁 □ η18, 큁 □ η2013 큁 □ ηcomment 큁 □ ηletter 큁 □ ηat 큁 □ ηp. 큁 □ η3, 큁 □ ηAttachment 큁 □ η4 큁 □ ηto 큁 □

prepare□a□new,□legally□sufcicient,□Draft□EIR/EIS□that□incorporates□acti
Responsible□Exports□Plan□(attached□to□our□previous□comment□letters□
www.ewccalifornia.org/reports/responsibleexportsplanmay2013.pdf).[75]

EWC-□type□alternatives□could□vary□by□how□much□time□is□allotted□
time.□For□instance,□they□could□range□from□10□to□40□years,□w
range□of□timelines□provided□for□Tunnels□construction.□

The□RDEIR/SDEIS□admits□the□existence□of□paper□water,□"quantities□to
average□annual□unimpaired□clows□in□the□Delta□watershed□could□be□
face□value□of□water□permits□[76]□The□BDCP□assumes□agencies□misuse□the□Delta□
decinition□of□the□"coequal□goals"□means□the□two□goals□of□providin
water□supply□for□California□and□protecting,□restoring,□and□enhancing□[77]□
Providing□"a□more□reliable□water□supply"□means□real□water□actually□
reclecting□water□available□for□export□while□meeting□the□needs□for□
freshwater□clows,□cisheries,□public□trust□obligations,□the□ESA,□the□Clea
rights□holders.□It□does□not□mean□moving□the□exporters□who□are□
including□1.3□million□acres□of□drainage□impaired□lands—to□the□front□
and□everything□else.□It□also□does□not□mean□putting□the□exporters
lengthy□extreme□drought,□crashing□cish□populations,□and□reductions□in□
millions□of□Californians.

The□estimated□$15□billion□cost□of□the□Tunnels□Project—which□will□
or□more□including□debt□service□and□inevitable□cost□over-□runs□repres
only□true□□benecit□cost□study□prepared□on□the□Tunnels□Project□
times□higher□than□[78]□the□benecit□that□the□project□has□dropped□the□feat
conservation,□the□exporters□would□not□have□the□benecit□of□50□ye
water□deliveries.□That□change,□in□addition□to□worsening□the□adverse□
Tunnels□Project,□also□worsens□the□already□negative□cost□benecit□ratio□
change□also□leaves□the□taxpaying□public□to□be□stuck□with□all□
the□Tunnels□Project.□

BDCP□Agencies□Should□Examine□an□Instream□Water□Rights□Program

yet□unexamined,□path□forward□lies□in□use□of□a□comprehensive,□in
protects□ecosystems□and□species□as□a□reasonable□alternative.□If□water
system□by□which□water□is□allocated,□then□a□reasonable□alternative□
ethics□of□our□integration□with□our□environment:□legal□water□rights□

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[75]□We□attach□comments@icci.com□address□copy□of□*A□EWC□Sustainable□Water□Plan□for California*□(May□2015)□update□EWC□to□the□BDCP□California□WaterFix□Delta□
features□of□the□new□plan□are□similar□in□pertinent□part□to□the□previ
recommendations□and□features□set□forth□above.□We□also□attach□a□letter□
and□federal□ofcicials□about□alternatives□issues□this□past□summer.

[76]□RDEIR/SDEIS,□Section□1,□p.□1-□11.□The□RDEIR/SDEIS□refers□to□the□State□
memorandum□we□cited□earlier□on□Delta□watershed□water□rights,□and□tries□
"However,□the□hydrology,□the□SWP□and□CVP□water□contracts,□and□environme
quantities□that□could□be□made□available□for□use□and□diversion."

[77]□Cal.□Water□Code□§□85054.

[78]□Dr.□Jeffrey□Mount,□*Analysis□of□Delta□Water□Conveyance□Tunnels,*□Business,□
University□of□the□Pacicic,□July□12,□2012.

allocated, and enforced to support water needs for healthy aquatic
California. The alternatives analysis of the Draft EIR/EIS and the
consideration of this important legal and policy avenue. Alternatives
methods of accomplishing the[79] Hawkins of includes protection of Delta
and species and a reliable water supply for California—must be
without the area of the agency's expertise and regulatory[80] control

Formalizing and effectuating water rights for ecosystems will ensure
are considered up front, that planning is effective, and that expe
enforcement are clear. California is undertaking various processes now
policy for decades. These must include consideration of water rights
mutual well-being of the state's people and environment.

Strategies for "cinding" water in such an alternative could include:
unreasonable use provisions of the state Constitution[81] (2) [illegible] California
fees on diversions to encourage voluntary; (3) [illegible] and rights
public trust violations; (4) conducting initiatives to convince existing
all or a portion of their water rights voluntarily; (5) adjudicating
rights; and (6) other specicic approaches to acquiring water rig
to instream[82] flows successful, an instream water rights program in
ensure that we can meet the water needs of both humans
long term.

The RDEIR/SDEIS must meaningfully present and evaluate alternatives
.lows in order to comply with NEPA and CEQA.
section is the heart of the environmental impact statement."
"sharply" decine the issues and provide a clear basis for choice

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[79] *Environmental Defense Fund v. Corps of Engineers*, 492 F.2d 1123, 1135 (5th Cir. 1974); 40 C.F.R. § 1502.14(c).

[80] *Id.*; 40 C.F.R. § 1502.14(c). Again, "legislative action" (such as that wl
program of instream water rights) "does not automatically justify excluding
of Sausalito v. Weir, 13 F.3d 1186, 1208 (9th Cir. 1994); *Valley Citizens for Honest Gov't v. Bay Area Rapid Transit Dist.*, 833 F.2d 810, 815 (9th Cir. 1987); *Mathow v. Regional Forester*, 400 U.S. 411, 420 (1971); *Comanche Indian Tribe of Oklahoma v. Hodel*, 748 F.2d 1451, 1460 (10th Cir. 1984); *Ruckelshaus*, 738 F.2d 1448, 1454 (9th Cir. 1984) ("In some cases an al
therefore required by NEPA to be discussed in the EIS, even though
effect"). *See also Citizens for Better Forestry v. U.S. Dept. of Agriculture*, 341 F.3d 961, 976 (9th Cir. 2003); *Idaho Sporting Congress v. Thomas*, 137 F.3d 146, 149 (2d Cir. 1998); *Natural Resources Defense Council v. Morton*, 458 F.2d 827, 837 (D.C. Cir. 1972); *Carolina Environmental Study Group v. United States*, 510 F.2d 796, 799 (4th Cir. 1975).

[81] *See* § CA Water Code § 85021; § 85020(c); § 2 of the California C

[82] Oregon's Instream Water Rights Act (IWRA) recognizes a broad array
(O.R.S. §§ 537.332 - 537.334) (recognizing that public uses that are va
maintenance and enhancement of aquatic and cish life, wildlife, cish and
ecological values")). The IWRA converted minimum clow requirements to instrea
Minimum Perennial Streamclow Act to instream water rights. O.R.S. § 537.3
system to convert water rights to instream uses (O.R.S. § 537.348). No
water rights for waterways throughout Oregon, but it also began to create
which conservation groups, regional land trusts, state agencies and other be
health. See Janet Neuman, *A Great Notion: Oregon's Instream Water Rights Experime*
1125 (2006).

maker,[83] and the public, if "a draft statement is so inadequate as to preclude meaningful analysis, the agency shall prepare and circulate a revised draft statement. The agency shall make every effort to disclose and discuss at appropriate length all major points of view on the environmental impacts of the alternatives including the proposed action."[84] The EWC's plans and an instream clow variant must be recirculated EIR/EIS that helps to disclose, sharpen[85] and clarify the

Reclamation and DWR have failed to produce an alternatives analysis issues and provides a clear basis for choice among options as C.F.R. § 1502.14. The choice presented must include increasing clows reducing clows by increasing the capacity [illegible] called "alternatives" presented in the BDCP Draft Plan,[86] Draft EIR/EIS, and

The failure to include a reasonable range of alternatives also vio reasonable range of alternatives to the project . . . which we objectives of the project but would avoid or substantially lessen project, and evaluate the comparative merits [illegible] shall focus on alternatives to the project or its location which substantially lessening any signicicant effects of the project, even if to some degree the attainment of the project [illegible] a new Draft EIR/EIS will be required by CEQA Guidelines section Responsible Exports Plan alternative and other alternatives that would exports have not been previously analyzed but must be analyzed alternatives.

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[83] 40 C.F.R. § 1502.14.

[84] § 1502.9(a).

[85] The EIS alternatives section is to "Rigorously explore and objectively and for alternatives which were eliminated from detailed study, briecly discuss been eliminated." § 1502.14(a).

[86] *Ilan v. California*, 690 F.2d 753, 767 (9th Cir. 1982), the project at issue involv wilderness, non-wilderness or future planning, remaining roadless areas in nat United States. The court held that the EIS failed to pass muster un alternative of increasing timber production on federally owned lands currently because of failure to allocate to wilderness a share of the subject between 34% and 100%." 690 F.2d at 766. Like the situation here involved between water exports and Delta restoration (RDEIR/SDEIS ES 4-6), involved "a trade-off between wilderness use and development. This trade-off made without examining whether it can be softened or eliminated by from already developed areas." 690 F.2d at 767. Here, likewise, trade-offs without examining whether the impacts of alternatives reducing exports can increasing water conservation, recycling, and eventually retiring drainage-impaired areas of the exporters *Actmore v. Oregon Natural Desert Assn. v. BLM Bureau of* 625 F.3d 1092, 1122, 1124 (9th Cir. 2010) (EIS uncritical alternatives analysis privileging over another violated NEPA). Here, the BDCP alternatives analysis has unla over protection of Delta water quality, water quantity, public trust values,

[87] 14 Code Cal. Regs (CEQA Guidelines) § 15126.6(a).

[88] § 15126.6(b).

In the short, the fundamental claws in the alternatives sections in the the BDCP plan and the RDEIR/SDEIS have led to NEPA and basically inadequate and conclusory in nature that meaningful public precluded."[89]

Expert Federal and California Agencies have also Found the Curre Analysis De.icient.

On August 26, 2014, the U.S. Environmental Protection 40-page review of the Draft BDCP EIS cinding in BDCP's case

> operating any of the proposed conveyance facilities ... ... would cont
> violations of water quality standards in the Delta, set under the Cl
> conductivity (EC) and chloride concentrations. We recommend that the Supp
> one or more alternatives that would, instead, facilitate attainment of all
> Delta. Specicically, we recommend that an alternative be developed that
> contribute to an increase in the magnitude or frequency of exceedances
> that would address the need for water availability and greater freshwa
> alternative should result in a decrease in the state and federal wat
> exceedance of any water quality objectives in the Delta.[90]

EPA further stated that "Data and other information provided in [Tunnels project] alternatives may contribute to declining populations of green sturgeon, and winter-run, spring-run, fall-run [91] [92] [93] fall ru recommend that the Supplemental Draft EIS [now the RDEIR/SDEIS] freshwater clow that can meet the needs of those [declining cish whole, and is supported by the best available science. We recom the demonstrated signicicant correlations between freshwater clow[82] and c "Other reasonable alternatives could be developed by incorporating a Integrated Water Management, water conservation, levee maintenance, and the Delta."[93] In addition, EPA concluded that "The Draft EIS does Delta can affect resources in downstream waters, such as San Fr upstream operations, which may result in indirect environmental impacts evaluated. We recommend that the Supplemental Draft EIS include a downstream impacts."[94]

On July 29, 2014, the State Water Resources Control Board (SW BDCP EIS/EIR. The SWRCB declared that the "environmental documentati project must disclose the signicicant effects of the proposed project of interim and long-term alternatives that would reduce or avoid

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[89] 40 C.F.R. § 1502.9(a).

[90] Letter of Jared R. Blumenfeld, Regional Administrator, Region IX, USEPA, Administrator, West Coast Region, National *Marine Fisheries Service, Re: Draft Environmental Impact Statement for Bay Delta Conservation Plan, San Francisco Bay/Sacramento-San Joaquin Delta, California (CEQ#*

[91] *Id.*, p. 10.

[92] *Id.*

[93] *Id.* 3.

[94] *Id.*

environmental effects."[95] Further, "The justicication for this limited range is not clear given that there is signicicant information supporting for the protection of aquatic resources and the substantial uncertainty measures will be effective in reducing the need for Delta outclow Delta outclows should be considered for the preferred project."[96]

On July 16, 2014, the U.S. Army Corps of Engineers found th time in meeting the Corps' needs under the National Environmental particular with regard to the incomplete description of the proposed analysis ". " . " . " and impacts to waters of the United States avoidance and minimization of, and compensatory mitigation for, impacts States."[97] Additional Corps comments include the absence in the EIR/ alternatives analysis" no showing on which alternative may contain the Damaging Practicable Alternative (LEDPA) for section 404, the Water document needs a clear explanation of a reasonable range of alt including a concise description of the environmental and consequences of conveyance was not a part of the preferred alternative for CalFe the reasons for rejecting new conveyance in CalFed are no longe[98][99][100][101]

Finally, Reclamation and DWR had to drop the attempt to deceiv is part of a habitat conservation plan because of the refusal and National Marine Fisheries Service (NMFS) scientists to falsely cir would not be harmful to endangered species of cish and their their rejection as "difciculties in assessing species status and issuing period . In fact, federal scientists issued "red clag" warnings that the "potential extirpation of mainstem Sacramento River populations of Chinook salmon over the term of the permit" for more than[102]

Reclamation and DWR in their RDEIR/SDEIS have ignored what the USFWS and NMFS had to say, just as they have ignored the EWC for the past four years.

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[95] Letter of Diane Riddle, Environmental Program Manager, State Water Resourc Wulff, National Marine Fisheries Service, *Comments on the Draft Bay Delta Conservation Pla Environmental Impact Report/Environmental Impact Statement for the Bay Delta Implementing Agreement for the Bay Delta Conservation Plan* (July 29, 2014), comment 9, pp. r

[96] *Id.*, comment 10 p. 12.

[97] Letter of Colonel Michael J. Farrell, District Commander, US Army Corps National Marine Fisheries Service, July 16, 2014, p. 1.

[98] *Id.*, comment 4.

[99] *Id.*, comment 5.

[100] *Id.*, comment 19.

[101] *Id.*, comment 22.

[102] RDEIR/SDEIS, Section 1, p. 1-2.

The Tunnels Project is not permissible under the Endangered Species Act.

Section 9 of the Federal Endangered Species Act (ESA)[103] prohibits The alternatives considered in the RDEIR/SDEIS do not involve a Section 10, but instead assume the Bureau will lead Section 7 other Tunnels Project proponents in seeking a new biological opinion (NMFS and USFWS). It is our understanding that consultation is what the Bureau has submitted to qualify as a biological assessm stage the process[104] is now.

The California Endangered Species Act (CESA) contains similar take p for permitted incidental take of Regulated species. endangered species laws RDEIR/SDEIS states only that CDFW would be a responsible agency compliance for the project. The RDEIR/SDEIS fails to state which would apply for this incidental take permit.

EWC objects to the adverse modicication of critical habitat for c species, which would occur under the Bay Delta Conservation Plan Tunnels Project[106]

The Tunnels Project is not permissible project under the ESA modify critical habitat for at least .ive endangered threatened addressed the failure of the BDCP agencies to develop and consi alternatives increasing Delta clows by reducing exports in our July

First, the Sacramento River Winter-Run Chinook Salmon is listed the Endangered Species Act, *at 16 USC* § 1531. Likewise, the Central Valley Spri Chinook Salmon, Central Valley Steelhead, Southern Distinct Population Se

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[103] Section 9(a)((1)(B) prohibits anyone subject to the jurisdiction of the species within the United States or the territorial sea of the United pursue, hunt, shoot, wound, kill, trap, capture, or to attempt to engage Section 3 of the Endangered Species Act, subsection (19). The act is www.nmfs.noaa.gov/pr/pdfs/laws/esa.pdf.

[104] US Fish and Wildlife Service and *Endangered Species Act Section 7 Consultation Fisheries Service,* *Handbook: Procedures for Conducting Consultation and Conference Activities Under Species Act* March 1998, Final. *Accessible online at* https://www.nmfs.noaa.gov/pr/pdfs/laws/esa_section7_handbook.pdf.

[105] California Fish and Game Code Section 86 decines "take" to mean attempt to hunt, pursue, catch, capture, or kill" a listed species. Section prohibits take of listed species, Section 2081(b) authorizes the California De authorize incidental take permits under which incidental take of a listed mitigated, and 2081(c) specicies that no incidental take permit may be the continued existence of the species." The California equivalent of a "natural community conservation plan" or NCCP. NCCPs are authorized under Conservation Planning Act (NCCPA) in California Fish *and Game* provides the Sec the statutory standards provided in Section 2820 of the act.

[106] The lead agencies for the project are the federal Bureau of Rec Water Resources.

Green꿯□ηSturgeon,꿯□ηand꿯□ηDelta꿯□ηSmelt,꿯□ηare꿯□ηlisted꿯□ηas꿯□η[107]꿯□η꿯□η***Second***꿯□ηthe꿯□ηspecies꿯□η
reaches꿯□ηof꿯□ηthe꿯□ηSacramento꿯□ηRiver,꿯□ηsloughs,꿯□ηand꿯□ηthe꿯□ηDelta꿯□ηthat꿯□ηwo
freshwater꿯□ηclows꿯□ηthrough꿯□ηoperation꿯□ηof꿯□ηthe꿯□ηTunnels꿯□ηProject꿯□ηare꿯□ηdesig
of꿯□ηthese꿯□ηcive꿯□ηlisted꿯□ηendangered꿯□ηan꿯□η꿯□η***Third***꿯□ηthreatened꿯□ηBiological꿯□η꿯□η꿯□η꿯□η꿯□η꿯□ηhas
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Service꿯□η(NMFS)꿯□ηby꿯□ηReclamation꿯□ηwith꿯□ηresp***Fourth***꿯□η꿯□η꿯□η꿯□η꿯□η

that꿯□ηare꿯□ηcovered꿯□ηby꿯□ηBDCP?꿯□ηWe꿯□ηwere꿯□ηunable꿯□ηto꿯□ηlocate꿯□ηthis꿯□ηv
Conservation꿯□ηPlan.

The꿯□ηTunnels꿯□ηProject꿯□ηThreatens꿯□ηJeopardy꿯□ηand꿯□ηAdverse꿯□ηModi.ication꿯□ηof꿯
Habitat꿯□ηof꿯□ηEndangered꿯□ηand꿯□ηThreatened꿯□ηFish꿯□ηSpecies꿯□ηSignificant꿯□ηViolation꿯□ηo
River꿯□ηWinter-□Run꿯□ηChinook꿯□ηSalmon꿯□ηis꿯□ηlisted꿯□ηas꿯□ηan꿯□ηendangered꿯□ηspecie
habitat꿯□ηfor꿯□ηthe꿯□ηspecies꿯□ηwas꿯□ηdesignated꿯□ηto꿯□ηinclude꿯□ηthe꿯□ηSacramento꿯□
near꿯□ηthe꿯□ηDelta꿯□ηto꿯□ηRiver꿯□ηMile꿯□η302,꿯□ηwhich꿯□ηis꿯□ηfar꿯□ηnorth꿯□ηof꿯□η
Clarksburg.[109] 꿯□ηThe꿯□ηTunnels꿯□ηProject꿯□ηwould꿯□ηdivert꿯□ηenormous꿯□ηquantities꿯□ηof꿯
Winter-□Run꿯□ηChinook꿯□ηSalmon's꿯□ηdesignated꿯□ηcritical꿯□ηhabitat.꿯□ηThe꿯□ηfour꿯□ηthrea
mentioned꿯□ηabove꿯□ηwould꿯□ηlikewise꿯□ηlose꿯□ηenormous꿯□ηquantities꿯□ηof꿯□ηfreshwater꿯
critical꿯□ηhabitats꿯□ηbecause꿯□ηof꿯□ηdiversion꿯□ηof꿯□ηwater꿯□ηresulting꿯□ηfrom꿯□ηthe꿯□η

"The꿯□ηESA꿯□ηprovides꿯□η'both꿯□ηsubstantive꿯□ηand꿯□ηprocedural꿯□ηprovisions꿯□ηdesigned꿯
species꿯□ηand꿯□ηtheir꿯□ηhabitat.'꿯□ηIt꿯□ηis꿯□ηto꿯□ηthe꿯□ηcommands꿯□ηof꿯□ηSection꿯□η7꿯□ηof꿯□
agency꿯□η"shall꿯□η.꿯□η.꿯□η.꿯□ηinsure꿯□ηthat꿯□ηany꿯□ηaction꿯□ηauthorized,꿯□ηfunded,꿯□η
likely꿯□ηto꿯□ηjeopardize꿯□ηthe꿯□ηcontinued꿯□ηexistence꿯□ηof꿯□ηany꿯□ηendangered꿯□ηor꿯□
destruction꿯□ηor꿯□ηadverse꿯□ηmodicication꿯□ηof꿯□η[critical]꿯□ηhabitat.꿯□ηESA꿯□ηsection꿯□η7꿯
prohibits꿯□ηa꿯□ηfederal꿯□ηagency꿯□ηfrom꿯□ηtaking꿯□ηany꿯□ηaction꿯□ηthat꿯□ηis꿯□η'likely꿯
existence'꿯□ηof꿯□ηany꿯□ηlisted꿯□ηor꿯□ηthreatened꿯□ηspecies꿯□ηor꿯□η'result꿯□ηin꿯□ηthe꿯□
those꿯□ηspecies'꿯□ηcritical꿯□ηhabitat."

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[108] 꿯□η50꿯□ηC.F.R.꿯□η§꿯□η17.11.

[109] 꿯□η50꿯□ηC.F.R.꿯□η§꿯□η226.204.

[110] 꿯□ηThe꿯□ηCentral꿯□ηValley꿯□ηSpring-□Run꿯□ηChinook꿯□ηSalmon꿯□ηis꿯□ηlisted꿯□ηas꿯□ηa꿯□ηthrea
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-□121.7948,꿯□ηnear꿯□ηMile꿯□η0,꿯□ηupstream꿯□ηto꿯□ηElk꿯□ηSlough꿯□η(38.4140,꿯□η-□121.5212)꿯□ηin
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habitat꿯□ηfor꿯□ηthe꿯□ηspecies꿯□ηwas꿯□ηdesignated꿯□ηto꿯□ηinclude꿯□ηthe꿯□ηSacramento꿯□ηRiver꿯□
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habitat꿯□ηfor꿯□ηthis꿯□ηspecies꿯□ηis꿯□ηdesignated꿯□ηto꿯□ηinclude꿯□ηthe꿯□ηSacramento–San꿯□ηJoaqui
to꿯□ηthe꿯□ηelevation꿯□ηof꿯□ηmean꿯□ηhigher꿯□ηhigh꿯□ηwater꿯□ηwithin꿯□ηthe꿯□ηarea꿯□ηdecined꿯
CFR꿯□η§꿯□η226.219(a)(3).꿯□ηThe꿯□ηNational꿯□ηMarine꿯□ηFisheries꿯□ηService's꿯□ηwebsite꿯□ηprovides꿯
Sturgeon꿯□ηcritical꿯□ηhabitat꿯□η<http://www.nmfs.noaa.gov/pr/pdfs/criticalhabitat/greensturgeon.pdf>.꿯□ηThe꿯□ηmap꿯□η
indicates꿯□ηthat꿯□ηthe꿯□ηcritical꿯□ηhabitat꿯□ηincludes꿯□ηthe꿯□ηSacramento꿯□ηRiver꿯□ηfrom꿯□ηMile꿯
beyond꿯□ηthe꿯□ηproposed꿯□ηintake꿯□ηsite꿯□ηnear꿯□ηClarksburg.꿯□ηThe꿯□ηDelta꿯□ηSmelt꿯□ηis꿯□ηli
CFR꿯□η§꿯□η17.11.꿯□ηCritical꿯□ηhabitat꿯□ηfor꿯□ηthe꿯□ηspecies꿯□ηwas꿯□ηdesignated꿯□ηto꿯□ηinclude
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some꿯□ηof꿯□ηthe꿯□ηDelta꿯□ηSmelt's꿯□η<http://www.fws.gov/sacramento/documents/maps/delta_smelt_critical_habitat_map.pdf>.꿯□ηThe꿯□ηmap꿯□ηindicates꿯□ηthat꿯□ηthe꿯□ηDelta꿯□ηSmelt's꿯□ηcritica
Sacramento꿯□ηRiver꿯□ηnear꿯□ηMile꿯□η0꿯□ηupstream꿯□ηto꿯□ηthe꿯□ηproposed꿯□ηBDCP꿯□ηintake꿯□η

[111] *San꿯□ηLuis꿯□η&꿯□ηDelta-Mendota꿯□ηWater Auth. v. Jewell*, 747 F.3d 581, 596 (9th Cir. 2014), 꿯□η
S.Ct.꿯□η948꿯□ηand꿯□η950꿯□η(2015).

[112] 꿯□η50꿯□ηU.S.C.꿯□η§꿯□η1536(a)(2).꿯□η"Actions"꿯□ηinclude꿯□η"actions꿯□ηdirectly꿯□ηor꿯□ηindirectly꿯□ηca
water,꿯□ηor꿯□ηair."꿯□η50꿯□ηC.F.R.꿯□η§꿯□η402.02꿯□η(Emphasis꿯□ηadded).

[113] *San꿯□ηLuis꿯□η&꿯□ηDelta-Mendota꿯□ηWater Auth. v. Jewell*, 747 F.3d 581, 596 (9th Cir. 2014).

The BDCP itself identicies stressors and threats to each of the stressors to the cive species include habitat loss due to the increasing water temperatures and predation hotspots. By installing gigan least three locations between Clarksburg and Courtland, and by diver from the Sacramento River, the Tunnels Project will literally and aquatic habitat available to these cive species in their critical ha diversion will reduce clow in the critical habitat and contribute temperature. The Effects Analysis chapter (Chapter 5) of the Draft admits that signicicant adverse effects could result from the Tunnels their habitat including: "Change in entrainment of cish in water result of new structures. Modicication of river clow. Change in habit Permanent indirect and other indirect losses. Disturbances related to maintenance."[114]

The BDCP identicies key hydrologic and hydrodynamic changes that habitat of these listed cish species. (See below, this section.) The and stressors already known to affect these cish. Modeling results through-Delta survival rates of winter-run, spring-run, and fall-run relative to the No Action Alternative from Tunnels Project operation.[115]

Specicically, the BDCP identi.ies reduced habitat due to water storage systems as a stressor and threat to Winter-run Chinook salmon on juvenile winter-run Chinook salmon including near-cield (contact with of predators) and far-cield (reduced [illegible] downstream [illegible] River attraction clows for migrating adult winter-run Chinook salmon during downstream migration and possible migration of adult winter-run Chinook salmon by changing the attraction BDCP also admits that "A potential adverse effect of the BDCP will be the reduction in clow downstream of the north Delta reducing river clow below the [illegible] Delta cedistakeout clow along with change in olfactory signals due to change in the clowe mixture The RDEIR/SDEIS states: "when compared to the CEQA baseline, [Alt change, would substantially reduce the quantity and quality of spawn for winter-run Chinook salmon relative to the existing conditions. identicies

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[114] Bay Delta Conservation Plan, Chapter 5, pp. 2-13.

[115] RDEIR/SDEIS, Chapter 11, Tables 11-4A-23, 1-51, and 1-74.

[116] BDCP EIR-EIS Administrative Draft, p. 11A-47 (March 2013).

[117] Bay Delta Conservation Plan, Chapter 5, p. 5.3-23; RDEIR/SDEIS p. 4.3.

[118] Bay Delta Conservation Plan, Chapter 5, p. 5.3-29.

[119] Bay Delta Conservation Plan, Chapter 5, p. 5.3-32.

[120] Bay Delta Conservation Plan, Chapter 5, p. 5.5-3-45; BDCP Appendix 5C, Table SDEIS, Section 4.3, Figures 4.3.2-7 and 4.3.2-8.

[121] *Id.*

[122] RDEIR/SDEIS, Section 4.3, p. 4.3.7-58.

similar뀅□ηthreats뀅□ηand뀅□ηstressors뀅□ηto뀅□ηthe뀅□ηSpring-□Run뀅□ηChinook뀅□ηSalmon,뀅□ηSt
Delta뀅□ηSmelt뀅□ηthat뀅□ηwould뀅□ηresult뀅□ηfrom뀅□ηthe뀅□ηTunnels뀅□ηProject.

***The뀅□ηBDCP뀅□ηidenti.ies뀅□ηseveral뀅□ηthreats뀅□ηand뀅□ηstressors뀅□ηto뀅□ηthe뀅□ηCentral뀅
Salmon,뀅□ηwhich뀅□ηinclude뀅□η.low뀅□ηreductions뀅□ηcausing뀅□ηincreased뀅□ηwater뀅□ηtemper
elimination뀅□ηor뀅□ηdegradation뀅□ηdue뀅□ηto뀅□ηwater□ηconveyance□ηsystems.***[123]뀅□ηadmits뀅□
adverse뀅□ηeffects뀅□ηof뀅□ηthe뀅□ηproposed뀅□ηnorth뀅□ηDelta뀅□ηdiversions뀅□ηon뀅□ηjuvenile뀅
include뀅□ηnear-□cield뀅□η(physical뀅□ηcontact뀅□ηwith뀅□ηthe뀅□ηscreens뀅□ηand뀅□ηaggregation뀅
(reduced뀅□ηdownstream뀅□η(clows)[124]뀅□ηPlan뀅□ηArea뀅□ηclows뀅□ηhave뀅□ηconsiderable뀅□ηimportance뀅□
migrating뀅□ηjuvenile뀅□ηsalmonids뀅□ηand뀅□ηwill뀅□ηbe뀅□ηaffected뀅□ηby뀅□ηthe뀅□ηproposed뀅
Because뀅□ηof뀅□ηthe뀅□ηnorth뀅□ηDelta뀅□ηdiversions,뀅□ηsalmonids뀅□ηmigrating뀅□ηdown뀅□ηthe
will뀅□ηexperience뀅□ηlower뀅□ηmigration뀅□ηclows뀅□ηcompared뀅□ηto뀅□ηexisting뀅□ηconditions.뀅
Chinook뀅□ηsalmon,뀅□ηit뀅□ηwas뀅□ηassumed뀅□ηwith뀅□ηhigh뀅□ηcertainty뀅□ηthat뀅□ηPlan뀅□ηA
for뀅□ηmigrating뀅□ηjuvenile뀅□ηspring-□run뀅□ηChinook뀅□ηsalmon뀅□ηadmitted뀅□ηadverse뀅□ηeffects뀅□ηcaus
operations뀅□ηof뀅□ηthe뀅□ηnorth뀅□ηDelta뀅□ηdiversions뀅□ηinclude뀅□ηreduced뀅□ηattraction뀅□ηc
for뀅□ηmigrating뀅□ηadult뀅□ηspring-□run뀅□ηChinook뀅□ηsalmon뀅□ηlower뀅□ηsalmon뀅□ηclow뀅□ηdownstream뀅□ηof뀅□η
intakes뀅□ηunder뀅□ηthe뀅□ηBDCP뀅□ηmay뀅□ηreduce뀅□ηsurvival뀅□ηof뀅□ηjuvenile뀅□ηspring-□run
downstream뀅□ηmigration뀅□ηalong뀅□ηthe뀅□ηSacramento뀅□ηRiver뀅□ηand뀅□ηalso뀅□ηcould뀅□ηne
migration뀅□ηof뀅□ηadult뀅□ηspring-□run뀅□ηChinook뀅□ηsalmon뀅□ηby뀅□ηchanging□ηattraction뀅□
RDEIR/SDEIS뀅□ηagain뀅□ηdelivers뀅□ηbleak뀅□ηprospects뀅□ηfor뀅□ηthe뀅□ηsurvival뀅□ηof뀅□ηthis뀅
"Under뀅□ηAlternative뀅□η4A뀅□η(including뀅□ηclimate뀅□ηchange뀅□ηeffects),뀅□ηthere뀅□ηare뀅□ηcl
well뀅□ηas뀅□ηtemperature뀅□ηincreases뀅□ηin뀅□ηthe뀅□ηSacramento뀅□ηRiver뀅□ηthat뀅□ηwould뀅
increases뀅□ηin뀅□ηegg뀅□ηmortality뀅□ηrates뀅□ηand뀅□ηoverall뀅□ηreduced뀅□ηhabitat뀅□ηcondition
egg뀅□ηincubation."[128]

***The뀅□ηBDCP뀅□ηstates뀅□ηthat뀅□ηthreats뀅□ηand뀅□ηstressors뀅□ηto뀅□ηthe뀅□ηSteelhead뀅□ηi
conveyance뀅□ηsystems뀅□ηas뀅□ηwell뀅□ηas뀅□η.low뀅□ηreductions뀅□ηcontributing뀅□ηto뀅□ηinc
temperatures.***[129]뀅□ηThe뀅□ηPlan뀅□ηadmits뀅□ηnear-□cield뀅□η(physical뀅□ηcontact뀅□ηwith뀅□ηthe
predators)뀅□ηand뀅□ηfar-□cield뀅□η(reduced뀅□ηdownstream뀅□ηclows뀅□ηleading뀅□ηto뀅□ηgreater
effects뀅□ηof뀅□ηthe뀅□ηnorth뀅□ηDelta뀅□ηdiversions뀅□ηon뀅□ηjuvenile[130]뀅□ηSacramento뀅□ηPlan뀅□ηRiver
also뀅□ηadmits뀅□ηthat뀅□η"Sacramento뀅□ηRiver뀅□ηattraction뀅□ηclows뀅□ηfor뀅□ηmigrating뀅□ηad
steelhead뀅□ηwill뀅□ηbe뀅□ηlower뀅□ηfrom뀅□ηoperations뀅□ηof뀅□ηthe뀅□ηnorth[131]뀅□ηDelta뀅□ηdiver
admits뀅□ηthat뀅□ηrespect뀅□ηto뀅□ηthe뀅□ηFeather뀅□ηRiver,뀅□η"the뀅□ηreduction뀅□ηin뀅□ηclows

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[123]뀅□ηBDCP뀅□ηEIR-□EIS뀅□ηAdministrative뀅□ηDraft,뀅□ηp.뀅□η11A-□83,뀅□η11A-□76뀅□η(March뀅□η2013).

[124]뀅□ηBay뀅□ηDelta뀅□ηConservation뀅□ηPlan,뀅□ηChapter뀅□η5,뀅□ηp.뀅□η5.뀅□η4-□16;뀅□ηsee뀅□ηalso뀅□ηRDEIR/SDEIS,뀅□ηSe
15-□17.

[125]뀅□ηBay뀅□ηDelta뀅□ηConservation뀅□ηPlan,뀅□ηChapter뀅□η5,뀅□ηp.뀅□η5.뀅□η4-□17;뀅□ηBDCP뀅□ηAppendix뀅□η5C,뀅□ηTable
RDEIR/SDEIS,뀅□ηSection뀅□η4.3,뀅□ηFigures뀅□η4.3.2-□7뀅□ηand뀅□η4.3.2-□8.

[126]뀅□ηBay뀅□ηDelta뀅□ηConservation뀅□ηPlan,뀅□ηChapter뀅□η5,뀅□ηp.뀅□η5.뀅□η4-□19.

[127]뀅□ηBay뀅□ηDelta뀅□ηConservation뀅□ηPlan,뀅□ηChapter뀅□η5,뀅□ηp.뀅□η5.뀅□η4-□20.

[128]뀅□ηRDEIR/SDEIS,뀅□ηSection뀅□η4.3,뀅□ηp.뀅□η4.3.7-□98.

[129]뀅□ηBDCP뀅□ηEIR-□EIS뀅□ηAdministrative뀅□ηDraft,뀅□ηp.뀅□η11A-□129,뀅□η11A-□133뀅□η(March뀅□η2013).

[130]뀅□ηPlan,뀅□ηChapter뀅□η5,뀅□η5.뀅□η6-□11;뀅□ηsee뀅□ηalso뀅□ηRDEIR/SDEIS,뀅□ηp.뀅□η4.3.7-□199,뀅□ηlines뀅□

[131]뀅□ηPlan,뀅□ηChapter뀅□η5,뀅□η5.뀅□η6-□13;뀅□ηBDCP뀅□ηAppendix뀅□η5C,뀅□ηTables뀅□ηC.A-□41뀅□ηand뀅□ηC
Figures뀅□η4.3.2-□7뀅□ηand뀅□η4.3.2-□8.

BDCP would reduce conditions in an already [illegible] RDEIR/SDEIS habitat: "In general, Alternative 4A would degrade the quantity and quality of relative to Existing conditions."[132]

The BDCP identi.ies increased water temperatures and habitat loss the Green Strategy. With respect to admitted adverse effects, the Plan will reduce transport and migration clows in [illegible] in early fall releases], average in stream clows during some mor above (June-September, August-October, August-June) are expected to sul Feather River at Thermalito and moderately decline in the Sacramen BDCP, especially for the LOS [low-outclow scenario] (Appendix 5.C, turbidity, section 5.C.5.3.3, High Outclow and [illegible] "there is [on the Feather River] the potential for appreciable cha of operational differences between the BDCP scenarios and future co (EBC2_LLT)."[137] The RDEIR/SDEIS states: "In general, Alternative 4A woul quality of rearing habitat for larval and juvenile green [illegible]

The BDCP identi.ies several threats and stressors to the Delta and increased water temperatures. Admitted adverse effects caused by the Plan intakes include reducing the quantity of sediment entering the Plan clarity and negatively affecting [illegible] water residence time from cha operations will likely increase the *Microcystis* have green algae direct and effects on the [illegible] Delta intakes' operations will introduce and impingement of Delta smelt as well as introduce and increase pr new intakes.[142]

In 2013, NMFS reiterated its previous "Red Flag" comment that "potential extirpation of mainstem Sacramento River Populations of winte Chinook salmon over the term [illegible] the U.S. Environmental Protection Ag

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[132] Plan, Chapter 5, pp. 6-16.

[133] RDEIR/SDEIS, Section 4.3, p. 4.3.7-22.

[134] BDCP EIR-EIS Administrative Draft, p. 11A-162–165 (March 2013).

[135] Plan, Chapter 5, pp. 8-17 through 8-24.

[136] Plan, Chapter 5. 5. p. 8-18.

[137] Plan, Chapter 5, 5. p. 8-24.

[138] RDEIR/SDEIS, Section 4.3, p. 4.3.7-296.

[139] BDCP EIR-EIS Administrative Draft, p. 11A-8–11 (March 2013).

[140] Plan, Chapter 5, p. 5. 1-30; see also RDEIR/SDEIS, Section 4.3, p.

[141] Plan, Chapter 5, p. 5. 1-32; BDCP, Appendix 5C, p. 5.4-14; RDEIR

[142] RDEIR/SDEIS, Section 4.3, p. 4.3.7-24, lines 4-7.

[143] NMFS Progress Assessment and Remaining Issues Regarding the Administrative Section 1.17, 12, April 4, 2013.

(EPA) has called for alternatives addressing "the need for water clows through the Delta. Likewise, the Army Corps of Engineers, State Water Board, and USFWS scientists also raised concerns regarding the BDCP and impacts to endangered and threatened species.

However, comments from other federal agencies were ignored. In conservation elements of the BDCP have been dropped or drastically the BDCP to the "California WaterFix." As just one example, the wetland restoration" has been revised to focus almost entirely on restoration." Consequently, the current Tunnels Project proposes to kill fish and other species and their compared to the previous version that resulted in the concerns of Engineers, State Water Resources Control Board, and NMFS and

"The goal of the ESA is not just to ensure survival but it can be delisted." It is relevant to the commands of the ESA, each Fed that any action authorized, funded, or carried out by such agenc continued existence of any endangered or threatened species or modification of [critical] habitat." The purpose of establishing 'critical habitat' is for government to carve out territory that is survival but also essential for the species' existence. Any potential conserv measures outside of the critical habitat cannot properly be a sub critical habitat that is required by Section 7 of [of the ESA, 16

Taking the fresh water clows and safe refuge away from endang would neither insure their survival nor insure their recovery and restoration is not a lawful substitute under the ESA for maintain the waters of the Sacramento River, sloughs, and Delta. The redu residence times of water, and increased water temperature are adver critical habitat. Approval of the BDCP would violate the ESA. The permissible under the ESA.

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[144] EPA, Letter, August 26, 2014, p. 2.

[145] We briecly summarized some of these agencies comments in our Ju

[146] RDEIR/SDEIS, Executive Summary, p. ES–17. Emphasis added.

[147] *Alaska v. Lubchenko*, 723 F.3d 1043, 1054 (9th Cir. 2013); *Pacific Rivers Council v. U.S. Fish & Wildlife Service*, 689 F.3d 1060, 1070 (9th Cir. 2004).

[148] 16 U.S.C. § 1536(a)(2). Emphasis added.

[149] *Gifford Pinchot*, 378 F.3d 1059, 1070.

[150] *Gifford Pinchot*, 378 F.3d 1059, 1076.

[151] We have brought the impermissibility of the Tunnels Project given and the related procedural ESA and NEPA violations to the attention occasions for more than two years now. These prior communications includ September 25 and November 18, 2013, January 14, March 6, May 21, EWC letter of June 11, 2014 (including pp. 29-30) and our recent extension of time to comment), and July 22 (alternatives), 2015. We al meeting with federal agency representatives in Sacramento on November 7,

Reclamation is Presently Violating both NEPA and ESA Procedure by Not Preparing a Combined Draft EIR/EIS Concurrently with and Integrated with ESA Required Biological Opinion Consultation

Fortunately, the ESA obligates federal agencies "to afford [152] declared national policy of saving endangered species." Reclamation has failed to prepare a Biological Assessment pertaining to its action and has failed USFWS and NMFS even though Biological Assessment preparation and required by the ESA. RDEIR/SDEIS concedes that "formal consultation will be necessary.[154]

Section 7 of the ESA (16 U.S.C. § 1536(a)(4) requires that "action affect a listed species or critical habitat, it must form Secretary of the Interior, or his or her [155] USFWS and required when the acting agency or consulting agency determines that to adversely affect a listed species or critical habitat requires the agency . . . to issue a biological opinion stating whether the such species or [156] habitat."

ESA Regulations (50 C.F.R. § 402.14(a)) require that "Each Federal the earliest possible time determine whether any action may affect listed habitat. If such a determination is made, [157] formal consultation is required. Ninth Circuit Court of Appeals has repeatedly held that "Any possible adverse effect or of an undetermined character, triggers the [158] formal consultation required.

Even ardent advocates for the Tunnels Project who prepared the 48 Project documents do not contend that taking large quantities of River, sloughs, and Delta will not have "any possible effect, whether an undetermined character" on the endangered and threatened cish surprisingly, no preposterous claim of "no possible effect" is made SDEIS. But instead of reviewing the proposed Tunnels Project at Reclamation delays ESA review until some unspecicied and unacknowledg

NEPA regulations require that "To the fullest extent possible, agencies environmental impact statements concurrently with and integrated with

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[152] *Tennessee Valley Authority*, 437 U.S. 153, 185 (1978).

[153] See RDEIR/SDEIS, Chapter 1, p. 1-15 (under "Section 7 of the End

[154] *Id.*

[155] *Jewell*, 747 F.3d 581, 596. Emphasis in decision.

[156] 50 C.F.R. § § 402.13, 402.14.

[157] 16 U.S.C. § 1536(b); 50 C.F.R. § 402.14.

[158] *Karuk Tribe of California v. U.S. Forest Service*, 681 F.3d 1020 (9th Cir. 2012) (en added), *cert. denied*, 133 S.Ct. 1579 (2013).

[159] *Western Watersheds Project v. Abbey*, 719 F.3d 1035, 1050 (9th Cir. 2013); *Karuk Tribe*, 681 F.3d 1006, 1027; *Pacific Rivers Council v. U.S. Forest Service*, 689 F.3d 1012, 1029 (9th Cir. 2012); *Locklear v. Dep't of Agriculture*, 555 F.3d 1009, 1018 (9th Cir. 2009).

analyses,[160] and related surveys and studies required by the [illegible] [ESA] regulations also acknowledge that the agencies are expected to both Section 7 of the [illegible] NEPA. this threat of extinction the draft EIS public review and comment stage without Biologic Opinions leaves the public in the dark and violates both the ESA required analyses, the draft EIS/EIR is "so inadequate as to violation of NEPA.[162]

Reclamation has violated the "at the earliest possible time" ESA and integrated with" NEPA mandate by prematurely issuing the Draf SDEIS attempting to hide from the reviewing public the critical that would be supplied by the missing Biological Assessments and upstream diversions of large quantities of water from the Sacramento the listed cish species and their critical habitats.

The public now has what it does not have. [illegible] from the consultants speculating that the adverse effects will be offset or that the adverse. ***The public does not have*** [illegible] Biological Asses and Biological Opinions required by the ESA and NEPA.[163]

Evasion of ESA obligations by Reclamation is both extreme and August 26, 2015, joined with DWR in submitting a change petiti Control Board to add three new points of diversion and redivers permits for the Tunnels Project. The change petition recites that culmination of a multiyear planning process [illegible] 2006 without a biological opinion for the Tunnels Project makes a mo commence ESA review "at the earliest possible time." Because of Biological Assessments and Biological Opinions, Reclamation feels free to false representation in the petition that "The California WaterFix would improved conditions in the Delta for endangered and threatened spe supply reliability for the state."[165]

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[160] 40 C.F.R. § 1502.25(a).

[161] *See 40* C.F.R. § 402.06 ("Consultation, conference, and biological assessment may be consolidated with interagency cooperation procedures required by other National Environmental Policy Act (NEPA). 581, 648. "ESA compliance is "an agency may not take actions that will tip a species from extinction." *Nat'l Wildlife Fed'n v. Nat'l Marine Fisheries Serv.*, 524 F.3d 917, 929 (9th Cir. 2008).

[162] 40 C.F.R. § 1502.9(a). The rule is the same. Recirculation is required alternatives were not included in the Draft EIR. CEQA Guidelines, 14 C "The draft EIR was so fundamentally and basically inadequate and conclusc public review and comment were precluded." CEQA Guidelines, § 15088.5(a)(4).

[163] "The ESA requires an agency to use "the best scienticic and BiOp." *Locke*, 776 F.3d 971, 995. "The purpose of the best available science from basing its action on [illegible] *Locke*, 776 F.3d at 995.

[164] Petition cover letter, p. 1.

[165] Petition cover letter, p. 2.

Red뀕□ηclag뀕□ηcomments뀕□ηand뀕□ηthe뀕□ηRecord뀕□ηso뀕□ηfar뀕□ηhave뀕□ηmade뀕□ηit뀕□ηclea
uncertainty뀕□ηabout뀕□ηwhether뀕□ηthe뀕□ηTunnels뀕□ηProject뀕□ηis뀕□ηeven뀕□ηpermissible뀕□ηu
cannot뀕□ηbe뀕□ηresolved뀕□ηuntil뀕□ηthe뀕□ηBiological뀕□ηAssessments뀕□ηand뀕□ηOpinions뀕□ηhav
Reclamation뀕□ηhas뀕□ηnot뀕□ηobtained뀕□ηthe뀕□ηdetermination뀕□ηpursuant뀕□ηto뀕□ηESA-□requir
the뀕□ηRDEIR/SDEIS뀕□η"preferred뀕□ηalternative"—the뀕□ηTunnels뀕□ηProject—is뀕□ηeven뀕□ηlawful

Against뀕□ηthis뀕□ηthreat뀕□ηof뀕□ηextinction뀕□ηfrom뀕□ηknown뀕□ηstressors뀕□ηand뀕□ηnegative뀕
conducting뀕□ηthe뀕□ηNEPA뀕□ηenvironmental뀕□ηdraft뀕□ηprocess뀕□ηprior뀕□ηto뀕□ηand뀕□ηin뀕□
consultation뀕□ηprocess뀕□ηviolates뀕□ηthe뀕□ηESA뀕□ηcommand뀕□ηto뀕□ηcarry뀕□ηout뀕□ηthe뀕□η
possible뀕□ηtime"뀕□ηand뀕□ηviolates뀕□ηthe뀕□ηNEPA뀕□ηcommand뀕□ηto뀕□ηconduct뀕□ηthe뀕□ηN
"concurrently"뀕□ηand뀕□ηin뀕□ηan뀕□η"integrated"뀕□ηmanner.뀕□ηThis뀕□ηalso뀕□ηconstitutes뀕□ηu
segmenting뀕□η뀕□ηof뀕□ηthe뀕□ηNEPA뀕□ηprocess뀕□ηfrom뀕□ηthe뀕□ηESA뀕□ηrequired뀕□ηanalyse
posed뀕□ηby뀕□ηthe뀕□ηproposed뀕□ηTunnels뀕□ηProject.

Reclamation 뀕□ηis 뀕□ηProceeding 뀕□ηin 뀕□ηthe 뀕□ηAbsence 뀕□ηof 뀕□ηthe 뀕□η"Reasonable 뀕□ηand
Must 뀕□ηbe 뀕□ηDeveloped 뀕□ηand 뀕□ηIdenti.ied 뀕□ηpursuant 뀕□ηto 뀕□ηthe 뀕□ηESA.

repeated뀕□ηwarnings뀕□ηand뀕□ηsuggestions뀕□ηmade뀕□ηto뀕□ηthem뀕□ηover뀕□ηthe뀕□ηyears뀕□
EPA,뀕□ηU.S.뀕□ηArmy뀕□ηCorps뀕□ηof뀕□ηEngineers,뀕□ηand뀕□ηState뀕□ηWater뀕□ηResources뀕□ηC
Academy뀕□ηof뀕□ηSciences뀕□ηand뀕□ηby뀕□ηthe뀕□ηEnvironmental뀕□ηWater뀕□ηCaucus뀕□η(EWC)
documents뀕□ηincluding뀕□ηthe뀕□ηDraft뀕□ηEIR/EIS뀕□ηand뀕□ηthe뀕□ηnew뀕□ηRDEIR/SDEIS뀕□ηto
alternatives뀕□ηincreasing뀕□ηfreshwater뀕□ηclows뀕□ηthrough뀕□ηthe뀕□ηDelta뀕□ηby뀕□ηreducing뀕
new뀕□ηupstream뀕□ηconveyance.[166]

Beyond뀕□ηignoring뀕□ηthe뀕□ηNEPA뀕□ηalternatives뀕□ηmandate,뀕□ηexpert뀕□ηgovernment뀕□ηagen
EWC,뀕□ηReclamation뀕□ηis뀕□ηalso뀕□ηignoring뀕□ηthe뀕□ηcrystal뀕□ηclear뀕□ηprohibitions뀕□ηand
The뀕□ηprevious뀕□ηsection뀕□ηset뀕□ηforth뀕□ηthe뀕□ηprocedural뀕□ηESA뀕□ηrequirements뀕□ηfor
possible뀕□ηtime"뀕□ηand뀕□ηthe뀕□ηprocedural뀕□ηNEPA뀕□ηrequirements뀕□ηfor뀕□ηthe뀕□ηNEPA
"concurrently뀕□ηwith뀕□ηand뀕□ηintegrated뀕□ηwith"뀕□ηthe뀕□ηanalyses뀕□ηrequired뀕□ηby뀕□ηthe

There뀕□ηis뀕□ηmore.뀕□ηUnder뀕□ηSection뀕□η7뀕□ηof뀕□ηthe뀕□ηESA,뀕□η16뀕□ηU.S.C.뀕□η§뀕□η
appears뀕□ηthat뀕□ηan뀕□ηaction뀕□ηmay뀕□ηaffect뀕□ηan뀕□ηendangered뀕□ηor뀕□ηthreatened뀕□η
provide뀕□ηa뀕□ηbiological뀕□ηopinion뀕□ηto뀕□ηthe뀕□ηaction뀕□ηagency뀕□ηexplaining뀕□ηhow뀕□
critical뀕□ηhabitat.[167] η1536(b)(3)(A)η η뀕□ηa뀕□ηbiological뀕□ηopinion뀕□ηconcludes뀕□ηthat뀕□ηthe뀕□
jeopardize뀕□ηan뀕□ηendangered뀕□ηor뀕□ηthreatened뀕□ηspecies,뀕□ηor뀕□ηadversely뀕□ηmodify뀕□η
agency뀕□ηmust뀕□ηsuggest뀕□η'reasonable뀕□ηand뀕□ηprudent뀕□ηalternatives뀕□ηto뀕□ηthe뀕□ηproposed뀕□ηagency뀕□η
the뀕□ηcourse뀕□ηof뀕□ηproposing뀕□ηan뀕□ηRPA,뀕□ηmust뀕□ηinsure뀕□ηthat뀕□ηthe뀕□ηRPA뀕□ηc
habitat."[168]

EWC뀕□ηmember뀕□ηgroups뀕□ηwrote뀕□ηto뀕□ηstate뀕□ηand뀕□ηfederal뀕□ηofcicials뀕□ηthat뀕□ηRe
attempt뀕□ηto뀕□ηsell뀕□ηthe뀕□ηTunnels뀕□ηProject뀕□ηas뀕□η[169]
scientists뀕□ηwere뀕□ηunwilling뀕□ηto뀕□ηcind뀕□ηfalsely뀕□ηthat뀕□ηthe뀕□ηTunnels뀕□ηProject뀕□η
endangered뀕□ηspecies뀕□ηof뀕□ηcish뀕□ηand뀕□ηtheir뀕□ηhabitat.뀕□ηThe뀕□ηRDEIR/SDEIS뀕□ηeuph

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[166]뀕□ηLetter뀕□ηof뀕□ηEWC뀕□ηmember뀕□ηgroups뀕□ηto뀕□ηstate뀕□ηand뀕□ηfederal뀕□ηofcicials,뀕□ηJuly뀕□
restorethedelta.org/wp-□content/uploads/2015/09/7-□22-□15-□BDCP-□alts-□.ltr-□pdf.pdf

[167]뀕□η*Cottonwood 뀕□ηEnvtl. 뀕□ηLaw 뀕□ηCtr. 뀕□η789 뀕□ηF.3d뀕□η1075,뀕□η1085뀕□η(9뀕□η뀕□η뀕□η

assessing꿯□ηspecies꿯□ηstatus꿯□ηand꿯□ηissuing꿯□ηassurances꿯꿯ηover꿯□ηfact,꿯15꿯ηor꿯ηyear꿯ηp
three꿯□ηyears,꿯□ηfederal꿯□ηscientists꿯□ηhave꿯□ηissued꿯□η"Red꿯□ηFlag"꿯□ηwarnings꿯□ηthat꿯
"potential꿯□ηextirpation꿯□ηof꿯□ηmainstem꿯□ηSacramento꿯□ηRiver꿯□ηpopulations꿯□ηof꿯□ηwinte
Chinook꿯□ηsalmon꿯□ηover꿯□ηthe꿯□ηterm꿯□ηof꿯□ηthe꿯□ηpermit,"꿯□ηcontrary꿯□ηto꿯□ηpublic

At꿯□ηthis꿯□ηtime,꿯□ηthe꿯□ηDraft꿯□ηEIR/EIS꿯□ηand꿯□ηRDEIR/SDEIS꿯□ηalternatives꿯□ηand꿯□
value꿯□ηwhatsoever꿯□ηto꿯□ηeither꿯□ηdecision-□makers꿯□ηor꿯□ηthe꿯□ηpublic.꿯□ηThis꿯□ηapp
the꿯□ηpart꿯□ηof꿯□ηReclamation꿯□ηand꿯□ηDWR꿯□ηto꿯□ηevade꿯□ηthe꿯□ηsolemn꿯□ηlegal꿯□
for꿯□ηpublic꿯□ηreview꿯□ηand꿯□ηcomment꿯□ηa꿯□ηreasonable꿯□ηrange꿯□ηof꿯□ηalternatives꿯□
increase꿯□ηfreshwater꿯□ηclows꿯□ηthrough꿯□ηthe꿯□ηDelta꿯□ηby꿯□ηreducing꿯□ηexports꿯□ηand
upstream꿯□ηconveyance.꿯□ηA꿯□ηcentral꿯□ηfeature꿯□ηof꿯□ηthis꿯□ηintentional꿯□ηviolation꿯□ηo
premature꿯□ηissuance꿯□ηby꿯□ηReclamation꿯□ηof꿯□ηthe꿯□ηDraft꿯□ηEIR/EIS꿯□ηand꿯□ηRDEIR/
with꿯□ηthe꿯□ηother꿯□ηhand,꿯□ηReclamation꿯□ηhas꿯□ηdeliberately꿯□ηfailed꿯□ηto꿯□ηprepare꿯
and꿯□ηinitiate꿯□ηformal꿯□ηESA꿯□ηconsultation꿯□ηwith꿯□ηUSFWS꿯□ηand꿯□ηNMFS.

Other 꿯□ηEcological 꿯꿯ηIssues꿯꿯꿯

Flawed Habitat Restoration Hypothesis for Increasing Food Webs Produ
Project alternatives this year withdraw from any pretense of addition
that already required of the DWR and Bureau. What becomes of
other possible management strategies, to address nonnative invasive clam
Potamocorbula), as we discussed last year, is gapingly ambiguous. Ho
addressed in the new Section 7 biological opinions, but these ar
which the biological opinions will address last year's "habitat for
characterized then as "magical thinking") remains unknown at this ti
rendering the RDEIR/SDEIS inadequate. Without the biological opinions, the
"environmental commitments" are wishes and prayers at this time, s
USFWS and California Department of Fish and Wildlife are not c

Freshwater clow expands native cishes' critical habitat [illegible]
nonnative *Potamocorbula* westward, putting greater distance between its range
pelagic food webs and nutrients in Suisun Bay and the western
species and juvenile and smolting salmon migrating to sea.[173]

The Tunnels Project alternatives continue to fail to prevent jeopar
under the Endangered Species Acts. Tunnels Project incidental take
rejected by the state and federal .ishery agencies.

Clean Water Act Violations

The Tunnels Project will violate water quality standards for .low
preventing necessary Clean Water Act Section 401 certification
Water Resources and the United States Bureau of Reclamation ciled
404 dredge and cill permit with the US Army Corps of Engi
an application for a 401 certication on September 23, 2015 wi
Control Board (SWRCB) the 404 permit will be needed from the
because construction of the Tunnels Project will result in discharges
waters of the United States.[174] 401 requires that the SWRCB certify
404 permit meets CWA requirements before the [illegible] may [illegible]

[173] Id., at pp. 41-42.

[174] Accessed September 15, 2015, at http://www.spk.usace.army.mil/Media/RegulatoryPublicNotices/tabid/1035/Article/616568/spk-2008-00861-california-watercix-project.aspx

[175] "Many of the actions that will be implemented under the Tunnels dredged or cill materials into waters of the United States and will Draft Plan § 1.3.7.1 (November 2013), available at http://www.resourcenetplanners.com/Libraries/Dynamic_Document_Library/Public_Draft_BDCP_Chapter_1_-_Introduction.sflb.ashx This is no less intake construction of the "California WaterFix" version (Alternative 4A) of

[176] "No license or permit shall be granted until the certication has been waived as provided in the preceding sentence. No license or has been denied by the State, interstate agency, or theAdministrator, as (1).

agencies꿩□ηhave꿩□ηlong꿩□ηrecognized꿩□ηthe꿩□ηimportance꿩□ηof꿩□ηthis꿩□ηrequirement,꿩□ηm
it꿩□ηin꿩□ηthe꿩□ηcontext꿩□ηof꿩□ηthe꿩□ηpreparation꿩□ηof꿩□ηthe꿩□ηTunnels꿩□ηProject꿩□ηE

In꿩□ηthe꿩□ηAdministrative꿩□ηDraft꿩□ηof꿩□ηthe꿩□ηBay꿩□ηDelta꿩□ηConservation꿩□ηPlan꿩□ηis
conservation꿩□ηstrategy꿩□ηannounced,꿩□ηBDCP꿩□ηwill꿩□ηfundamentally꿩□ηalter꿩□ηthe꿩□ηhydrodynar
Delta."[178]꿩□ηThis꿩□ηsentence꿩□ηhas꿩□ηsince꿩□ηbeen꿩□ηtoned꿩□ηdown꿩□ηto꿩□ηread,꿩□η"The
hydrodynamics꿩□η(i.e.,꿩□ηtidal꿩□ηclows)꿩□ηin꿩□ηthe꿩□ηDelta꿩□ηchannels,"[179]꿩□ηbut꿩□ηthe꿩□η
Overall,꿩□ηsays꿩□ηBDCP,꿩□ηeast꿩□ηto꿩□ηwest꿩□ηclows꿩□ηwill꿩□ηincrease;꿩□ηthe꿩□ηfrequen
Old꿩□ηand꿩□ηMiddle꿩□ηRiver꿩□ηwill꿩□ηdecrease꿩□ηbecause꿩□ηof꿩□ηreduced꿩□ηsouth꿩□ηDe
types.꿩□ηIn꿩□ηthe꿩□ηnorth꿩□ηDelta,꿩□ηclow꿩□ηpatterns꿩□ηwill꿩□η"change"꿩□ηfrom꿩□ηincre
the꿩□ηproposed꿩□ηmodicications꿩□ηto꿩□ηFremont꿩□ηWeir.꿩□ηBDCP꿩□ηstates:꿩□η

> These꿩□ηchanges꿩□ηin꿩□ηclow꿩□ηpatterns꿩□ηin꿩□ηthe꿩□ηnorth꿩□ηDelta꿩□ηpresent꿩□ηecosystem-□
> the꿩□ηYolo꿩□ηBypass꿩□ηand꿩□ηthe꿩□ηSacramento꿩□ηRiver꿩□ηduring꿩□ηthe꿩□ηwinter-□spring꿩□ηm
> positive꿩□ηand꿩□ηnegative꿩□ηeffects꿩□ηon꿩□ηthe꿩□ηmigration꿩□ηand꿩□ηpassage꿩□ηof꿩□ηcish꿩□η[180]

This꿩□ηyear,꿩□ηthe꿩□ηTunnels꿩□ηProject,꿩□ηfreed꿩□ηfrom꿩□ηhabitat꿩□ηand꿩□ηecosystem꿩□
touted꿩□ηto꿩□ηaccomplish꿩□ηwhat꿩□ηBDCP꿩□ηapparently꿩□ηcould꿩□ηnot:꿩□η

> The꿩□ηecological꿩□ηproblems꿩□ηwith꿩□ηthe꿩□ηcurrent꿩□ηsystem꿩□ηcould꿩□ηbe꿩□ηgreatly꿩□ηreduc
> new꿩□ηnorth꿩□ηDelta꿩□ηintake꿩□ηstructures꿩□ηwith꿩□ηstate-□of-□the-□art꿩□ηcish꿩□ηscreens.[181]
>
> Although꿩□ηAlternatives꿩□η4A,꿩□η2D,꿩□ηand꿩□η5A꿩□ηcomprise꿩□ηonly꿩□ηthe꿩□ηconveyance꿩□ηfac
> formerly꿩□ηconstituted꿩□η[Conservation꿩□ηMeasure꿩□η1]꿩□ηunder꿩□ηBDCP꿩□ηalternatives,꿩□ηand꿩□
> restoration꿩□ηbeyond꿩□ηwhat꿩□ηis꿩□ηneeded꿩□ηto꿩□ηprovide꿩□ηfull꿩□ηmitigation꿩□ηunder꿩□ηCEQ
> still꿩□ηrecognized꿩□ηas꿩□ηa꿩□ηcritical꿩□ηcomponent꿩□ηof꿩□ηthe꿩□ηstate's꿩□ηlong-□term꿩□ηplans
> the꿩□ηDelta꿩□ηbeyond꿩□ηthese꿩□ηalternatives'꿩□ηmitigation꿩□ηrequirements꿩□ηwill꿩□ηoccur꿩□ηsepa
> implementation꿩□ηof꿩□ηCalifornia꿩□ηEcoRestore,꿩□ηand꿩□ηthese꿩□ηactivities꿩□ηwill꿩□ηbe꿩□ηfurther
> independent꿩□ηof꿩□ηthe꿩□ηwater꿩□ηconveyance꿩□ηfacilities.[182]

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[177]꿩□ηAs꿩□ηreclected꿩□ηby꿩□ηU.S.꿩□ηEPA꿩□ηin꿩□ηits꿩□ηcomments꿩□ηon꿩□ηthese꿩□ηdiscussions:꿩□η
requirement꿩□ηthat꿩□ηthe꿩□ηNEPA꿩□ηdocument꿩□ηprepared꿩□ηfor꿩□ηan꿩□ηHCP꿩□ηunder꿩□ηthe꿩□η
basis꿩□ηfor꿩□ηpermits꿩□ηand꿩□ηcerticications꿩□ηrequired꿩□ηunder꿩□ηCWA꿩□η§404꿩□ηto꿩□ηauthorize
recognizes꿩□ηthe꿩□ηimportance꿩□ηof꿩□ηcoordination꿩□ηin꿩□ηfederal꿩□ηreview.꿩□ηToward꿩□ηthis꿩□ηen
with꿩□ηthe꿩□ηproject꿩□ηproponent꿩□ηon꿩□ηnumerous꿩□ηoccasions꿩□ηover꿩□ηthe꿩□ηpast꿩□ηseveral꿩
BDCP꿩□ηEIS/EIR꿩□ηto꿩□ηinform꿩□ηthe꿩□ηCorps'꿩□η404꿩□ηregulatory꿩□ηdecisions.꿩□ηDespite꿩□ηthese
issues꿩□ηremain꿩□ηabout꿩□ηthe꿩□ηscope꿩□ηof꿩□ηanalysis꿩□ηfor꿩□ηthe꿩□ηproposed꿩□ηproject,꿩□ηthe
consultation꿩□ηprocess꿩□ηand꿩□ηfederal꿩□ηpermitting,꿩□ηand꿩□ηthe꿩□ηstructure꿩□ηof꿩□ηa꿩□ηcomprel
the꿩□ηproposed꿩□ηproject."꿩□ηU.S.꿩□ηEPA,꿩□η"EPA's꿩□ηComments꿩□ηon꿩□ηBDCP꿩□ηADEIS,"꿩□ηp.꿩□η
www2.epa.gov/sites/production/ciles/documents/july3-□2013-□epa-□comments-□bdcp-□adeis.pdf

[178]꿩□ηAdministrative꿩□ηDraft꿩□ηof꿩□ηthe꿩□ηBay꿩□ηDelta꿩□ηConservation꿩□ηPlan,꿩□η*Effects Analysis*,꿩□ηMarch꿩□η23,꿩□η2013,꿩□η
line꿩□η23.꿩□ηEmphasis꿩□ηadded.

[179]꿩□ηBay꿩□ηDelta꿩□ηConservation꿩□ηPlan,꿩□η*Effects Analysis*,꿩□η*Chapter 5.3*,꿩□η*Hydrodynamics*,꿩□η*Methods*,꿩□η23.

[180]꿩□η*Ibid.*,꿩□ηp.꿩□η5.3-□2,꿩□ηlines꿩□η34-□37.

[181]꿩□ηRDEIR/SDEIS,꿩□η*Executive*꿩□η*Summary*,꿩□ηp.꿩□ηES-□2,꿩□ηlines꿩□η1-□2.

[182]꿩□ηRDEIR/SDEIS,꿩□η*Executive*꿩□η*Summary*,꿩□ηp.꿩□ηES-□8.

These ***stated*** ***participants*** ***contributing*** ecological and biological benecits to cish
Project ***are,*** ***like*** ***last*** ***year's*** ***BDCP*** ***Conservation*** ***Measure*** ***1,*** ***the***
Tunnels Project will increase exports and the Delta's loss of out
above normal years.[183] Moreover, in drought years, the Bureau and the
petition the State Water Board to have Delta water quality objec
this request. There is little reason to believe the Tunnels Project

The ***project*** ***reduces*** ***Delta*** ***freshwater*** ***.low*** ***conditions*** ***in*** ***violation*** ***protect*** ***the*** ***most*** ***sensitive*** ***beneficial*** ***uses.*** ***Flow***
EIR/EIS alternatives will ensure that its implementation trips over m
CWA. Flow regimes that fully protect Delta ecosystems and aquatic
this result.

CWA regulations dictate that adopted criteria must protect[184] the "most
The SWRCB's August 2010 clow criteria represent the minimum needed to
unimpaired clow that would protect Delta cish species and habitats.
needed to comply with CWA mandates. A new Bay-Delta Plan
proposed clow regimes would fall signicicantly short of this benchma
protect the most sensitive benecicial uses as required by the CW

Instead of improving clow conditions in the Delta, the Plan allows
exports[185] reduced to inadequate Delta outclow in many months. Speci
February through June, the Tunnels would divert a majority of Delta outclow by about 1,000
per second, or almost[186] median Delta outclow by more than 2,000
January through June (the time period during which the August
called for an increase of outclow to 75 percent of unimpaired
outclow. Tunnels Project modeling (Figure 1) shows that long-term
River clows below the north Delta diversions would 38
current and future clows without the Tunnels project, and in we
between 7 and 42 percent (Tables 3 and 4). Overall, monthly
projected by "California WaterFix" to decrease between 20 and 24
Sacramento River at Rio Vista are expected to decrease[187] signicicantly

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[183] We take up the matter of BDCP's unacknowledged purpose of expa
water market transfers in Section VI of this comment letter.

[184] 40 CFR § 131.11 ("For waters with multiple use designations, the
use"); see also 40 CFR § 131.6.

[185] *See* Public Draft Plan, App. 5B, Figure 5B-4, available at http://bdcp.ca.gov/Libraries/Dynamic Document Library/Public Draft BDCP EIREIS Appendix 5B - Responses to Reduced South of Delta Water Supplies.sclb.ashx See also BDCP/California WaterFix, SDEIS, 2015, Section 4.3.1, Figures 4.3.1-15, 16, 18, 19, 20, and

[186] *See* Public Draft Plan, App. 5C, Attachment 5C.A, Table C.A-41, available http://bdcp.ca.gov/Libraries/Dynamic Document Library/Public Draft BDCP Appendix 5C - Part 5 - Flow Passage Salinity and Turbidity.sclb.ashx

[187] Estimates derived by Restore the Delta from graphical analysis interpola
4.3.2-8 from the Recirculated Draft EIR/EIS, Section 4.3.

Figure꿹□ŋ1
Sacramento꿹□ŋRiver꿹□ŋFlow꿹□ŋDownstream꿹□ŋof꿹□ŋNorth꿹□ŋDelta꿹□ŋIntakes꿹□ŋfo
Year꿹□ŋAverages

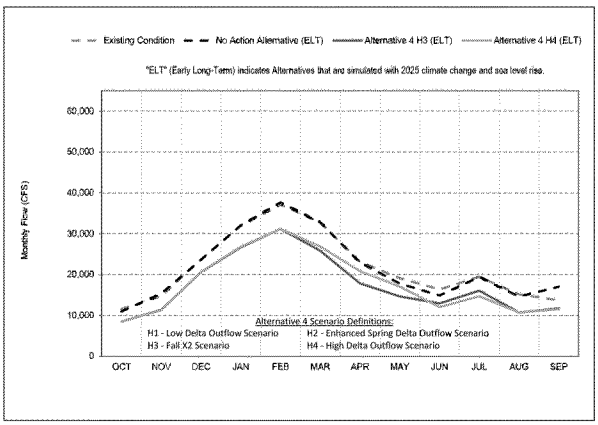

Figure 4.3.2-8
Sacramento River Flow downstream of North Delta Intakes for Alternative 4A, Long-Term Average

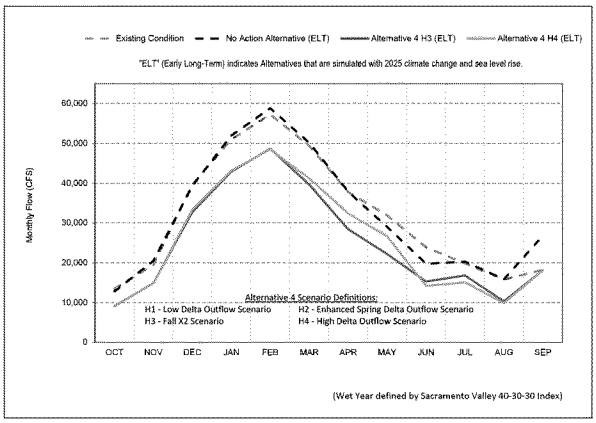

Figure 4.3.2-7
Sacramento River Flow downstream of North Delta Intakes for Alternative 4A, Average Wet Years

Source:꿹□ŋRDEIR/SDEIS,꿹□ŋSection꿹□ŋ4.3.

Table꿹□ŋ3
꿹□ŋMonthly꿹□ŋLong┐□Term꿹□ŋAverage꿹□ŋEstimates꿹□ŋof꿹□ŋFlow꿹□ŋfor꿹□ŋLower꿹
Delta꿹□ŋIntakes꿹□ŋInterpolated꿹□ŋfrom꿹□ŋFigure꿹□ŋ4.3.2┐□8꿹

	꿹□ŋExisti Conditions꿹	꿹□ŋNo꿹□ Alternative꿹	꿹□ŋAlt꿹 Scenario꿹 H3꿹□	꿹□ŋAlt꿹 Scenario꿹 H4꿹□	%꿹□ŋ Change꿹 EC꿹□ŋto	%꿹□ŋ Change꿹 EC꿹□ŋto	%꿹□ŋCha from꿹□ŋ to꿹□ŋH	%꿹□ŋCha from꿹□ŋ to꿹□ŋH
꿹□ŋOctober	11,667	11,333	8,667	8,667	-□26%	-□26%	-□24%	-□24%
November꿹	15,333	16,000	11,667	11,667	-□24%	-□24%	-□27%	-□27%
December꿹	23,333	23,333	20,667	20,667	-□11%	-□11%	-□11%	-□11%
꿹□ŋJanuary	36,000	36,000	25,667	25,667	-□29%	-□29%	-□29%	-□29%
꿹□ŋFebruar	37,000	37,667	31,333	31,333	-□15%	-□15%	-□17%	-□17%
꿹□ŋMarch꿹	33,000	33,000	26,333	27,333	-□20%	-□17%	-□20%	-□17%
꿹□ŋApril꿹	23,333	23,667	14,667	21,000	-□37%	-□10%	-□38%	-□11%
꿹□ŋMay꿹	19,000	18,000	14,667	17,000	-□23%	-□11%	-□19%	-□6%
꿹□ŋJune꿹	16,667	15,000	13,000	12,000	-□22%	-□28%	-□13%	-□20%
꿹□ŋJuly꿹	19,333	19,333	16,000	14,667	-□17%	-□24%	-□17%	-□24%
꿹□ŋAugust꿹	15,333	15,000	11,000	11,000	-□28%	-□28%	-□27%	-□27%
September꿹	14,000	17,000	11,667	11,667	-□17%	-□17%	-□31%	-□31%
꿹□ŋAverag	**22,000**	**22,111**	**17,111**	**17,722**	**┐□22%**	**┐□20%**	**┐□23%**	**┐□20%**

Table꿿□η3
꿿□ηMonthly꿿□ηLong-□Term꿿□ηAverage꿿□ηEstimates꿿□ηof꿿□ηFlow꿿□ηfor꿿□ηLower꿿
Delta꿿□ηIntakes꿿□ηInterpolated꿿□ηfrom꿿□ηFigure꿿□η4.3.2-□8꿿

	꿿□ηExisti Conditions꿿	꿿□ηNo꿿 Alternative꿿	꿿□ηAlt꿿 Scenario꿿 H3꿿□	꿿□ηAlt꿿 Scenario꿿 H4꿿□	%꿿□η Change꿿 ηto EC꿿	%꿿□η Change꿿 ηto EC꿿	%꿿□ηCha from꿿 ηto꿿	%꿿□ηCha from꿿 ηto꿿

Source:꿿□ηBay꿿□ηDelta꿿□ηConservation꿿□ηPlan/California꿿□ηWaterFix꿿□ηRecirculated꿿□ηDraft꿿□ηEIR
Restore꿿□ηthe꿿□ηDelta.꿿□η

Table꿿□η4
꿿□ηMonthly꿿□ηWet꿿□ηYear꿿□ηAverage꿿□ηEstimates꿿□ηof꿿□ηFlow꿿□ηfor꿿□ηLower
Delta꿿□ηIntakes꿿□ηInterpolated꿿□ηfrom꿿□ηFigure꿿□η4.3.2-□7꿿

	꿿□ηExisti Conditions꿿	꿿□ηNo꿿□ Alternative꿿	꿿□ηAlt꿿 Scenario꿿 H3꿿□	꿿□ηAlt꿿 Scenario꿿 H4꿿□	%꿿□η Change꿿 from꿿□η to꿿□ηH	%꿿□ηCha from꿿□η to꿿□ηH	%꿿□ηCha from꿿□ηN to꿿□ηH	%꿿□ηCha from꿿□ηN to꿿□ηH
꿿□ηOctobe	13,333	12,667	9,000	9,000	-□33%	-□33%	-□29%	-□29%
November꿿	20,000	21,000	14,667	14,667	-□27%	-□27%	-□30%	-□30%
꿿□ηDecem	40,000	40,000	33,333	34,000	-□17%	-□15%	-□17%	-□15%
꿿□ηJanuar	51,333	52,000	42,667	43,333	-□17%	-□16%	-□18%	-□17%
꿿□ηFebru	56,667	55,333	48,000	48,000	-□15%	-□15%	-□13%	-□13%
꿿□ηMarch	49,333	50,000	39,333	41,333	-□20%	-□16%	-□21%	-□17%
꿿□ηApril꿿	38,333	38,333	28,667	32,667	-□25%	-□15%	-□25%	-□15%
꿿□ηMay꿿	32,000	28,667	22,000	26,667	-□31%	-□17%	-□23%	-□7%
꿿□ηJune꿿	24,000	20,000	14,667	14,000	-□39%	-□42%	-□27%	-□30%
꿿□ηJuly꿿	20,000	20,333	16,667	15,000	-□17%	-□25%	-□18%	-□26%
꿿□ηAugust	16,000	16,000	10,667	10,000	-□33%	-□38%	-□33%	-□38%
September꿿	18,000	25,333	18,000	18,000	0%	0%	-□29%	-□29%
꿿□ηAvera	**31,583**	**31,639**	**24,806**	**25,556**	**-□23%**	**-□21%**	**-□24%**	**-□22%**

꿿□ηSource:꿿□ηBay꿿□ηDelta꿿□ηConservation꿿□ηPlan/California꿿□ηWaterFix꿿□ηRecirculated꿿□ηDraft꿿□
Restore꿿□ηthe꿿□ηDelta.꿿□η

Figure 2
Flow Differences in the Sacramento River Below Facilities by Water Year Type and

Supplemental Modeling Results for New Alternatives

Table B.7-28. Differences* (Percent Differences) between Pairs of Model Scenarios for the Sacramento River Downstream of the North Delta Diversion Facility, Year-Round

Month	Water Year Type	EXISTING CONDITIONS vs. H3 ELT	H4A ELT vs. H3 ELT	EXISTING CONDITIONS vs. H4 ELT	H4A ELT vs. H4 ELT
JAN	W	[illegible]	[illegible]	[illegible]	[illegible]
	AN	[illegible]	[illegible]	[illegible]	[illegible]
	BN	[illegible]	[illegible]	[illegible]	[illegible]
	D	[illegible]	[illegible]	[illegible]	[illegible]
	C	[illegible]	[illegible]	[illegible]	[illegible]
	All	[illegible]	[illegible]	[illegible]	[illegible]
FEB	W	[illegible]	[illegible]	[illegible]	[illegible]
	AN	[illegible]	[illegible]	[illegible]	[illegible]
	BN	[illegible]	[illegible]	[illegible]	[illegible]
	D	[illegible]	[illegible]	[illegible]	[illegible]
	C	[illegible]	[illegible]	[illegible]	[illegible]
	All	[illegible]	[illegible]	[illegible]	[illegible]
MAR	W	[illegible]	[illegible]	[illegible]	[illegible]
	AN	[illegible]	[illegible]	[illegible]	[illegible]
	BN	[illegible]	[illegible]	[illegible]	[illegible]
	D	[illegible]	[illegible]	[illegible]	[illegible]
	C	[illegible]	[illegible]	[illegible]	[illegible]
	All	[illegible]	[illegible]	[illegible]	[illegible]
APR	W	[illegible]	[illegible]	[illegible]	[illegible]
	AN	[illegible]	[illegible]	[illegible]	[illegible]
	BN	[illegible]	[illegible]	[illegible]	[illegible]
	D	[illegible]	[illegible]	[illegible]	[illegible]
	C	[illegible]	[illegible]	[illegible]	[illegible]
	All	[illegible]	[illegible]	[illegible]	[illegible]
MAY	W	[illegible]	[illegible]	[illegible]	[illegible]
	AN	[illegible]	[illegible]	[illegible]	[illegible]
	BN	[illegible]	[illegible]	[illegible]	[illegible]
	D	[illegible]	[illegible]	[illegible]	[illegible]
	C	[illegible]	[illegible]	[illegible]	[illegible]
	All	[illegible]	[illegible]	[illegible]	[illegible]
JUN	W	[illegible]	[illegible]	[illegible]	[illegible]
	AN	[illegible]	[illegible]	[illegible]	[illegible]
	BN	[illegible]	[illegible]	[illegible]	[illegible]
	D	[illegible]	[illegible]	[illegible]	[illegible]
	C	[illegible]	[illegible]	[illegible]	[illegible]
	All	[illegible]	[illegible]	[illegible]	[illegible]

Supplemental Modeling Results for New Alternatives

Month	Water Year Type	EXISTING CONDITIONS vs. H3 ELT	H4A ELT vs. H3 ELT	EXISTING CONDITIONS vs. H4 ELT	H4A ELT vs. H4 ELT
JUL	W	[illegible]	[illegible]	[illegible]	[illegible]
	AN	[illegible]	[illegible]	[illegible]	[illegible]
	BN	[illegible]	[illegible]	[illegible]	[illegible]
	D	[illegible]	[illegible]	[illegible]	[illegible]
	C	[illegible]	[illegible]	[illegible]	[illegible]
	All	[illegible]	[illegible]	[illegible]	[illegible]
AUG	W	[illegible]	[illegible]	[illegible]	[illegible]
	AN	[illegible]	[illegible]	[illegible]	[illegible]
	BN	[illegible]	[illegible]	[illegible]	[illegible]
	D	[illegible]	[illegible]	[illegible]	[illegible]
	C	[illegible]	[illegible]	[illegible]	[illegible]
	All	[illegible]	[illegible]	[illegible]	[illegible]
SEP	W	[illegible]	[illegible]	[illegible]	[illegible]
	AN	[illegible]	[illegible]	[illegible]	[illegible]
	BN	[illegible]	[illegible]	[illegible]	[illegible]
	D	[illegible]	[illegible]	[illegible]	[illegible]
	C	[illegible]	[illegible]	[illegible]	[illegible]
	All	[illegible]	[illegible]	[illegible]	[illegible]
OCT	W	[illegible]	[illegible]	[illegible]	[illegible]
	AN	[illegible]	[illegible]	[illegible]	[illegible]
	BN	[illegible]	[illegible]	[illegible]	[illegible]
	D	[illegible]	[illegible]	[illegible]	[illegible]
	C	[illegible]	[illegible]	[illegible]	[illegible]
	All	[illegible]	[illegible]	[illegible]	[illegible]
NOV	W	[illegible]	[illegible]	[illegible]	[illegible]
	AN	[illegible]	[illegible]	[illegible]	[illegible]
	BN	[illegible]	[illegible]	[illegible]	[illegible]
	D	[illegible]	[illegible]	[illegible]	[illegible]
	C	[illegible]	[illegible]	[illegible]	[illegible]
	All	[illegible]	[illegible]	[illegible]	[illegible]
DEC	W	[illegible]	[illegible]	[illegible]	[illegible]
	AN	[illegible]	[illegible]	[illegible]	[illegible]
	BN	[illegible]	[illegible]	[illegible]	[illegible]
	D	[illegible]	[illegible]	[illegible]	[illegible]
	C	[illegible]	[illegible]	[illegible]	[illegible]
	All	[illegible]	[illegible]	[illegible]	[illegible]

* Red boxes indicate that flows under the alternative are more than 5% lower than flows under the baseline; green boxes indicate that flows under the alternative are more than 5% greater than flows under the baseline.

Source: RDEIR/SDEIS, Appendix B.

Figure 3
Flow Differences in the Sacramento River by Water Year Type and Month

Supplemental Modeling Results for New Alternatives

Table B.7-B. Difference[1] (Percent Difference) between Pairs of Model Scenarios in the Sacramento River at Rio Vista, Year-Round

Alternative 4A, ELT: in Delta—Sacramento River at Rio Vista

Month	Water Year Type	EXISTING CONDITIONS vs. H1 ELT	NAA ELT vs. H3 ELT	EXISTING CONDITIONS vs. H4 ELT	NAA ELT vs. H4 ELT
JAN	W	-1,181 (-1.9%)	[illegible]	-1,680 (-1.5%)	[illegible]
	AN	[illegible]	[illegible]	[illegible]	[illegible]
	BN	[illegible]	[illegible]	[illegible]	[illegible]
	D	[illegible]	[illegible]	[illegible]	[illegible]
	C	[illegible]	[illegible]	[illegible]	[illegible]
	All	[illegible]	[illegible]	-1,693 (-1.5%)	[illegible]
FEB	W	-144 (-0.0%)	[illegible]	-294 (-0.2%)	[illegible]
	AN	-1,087 (-1.3%)	[illegible]	[illegible]	[illegible]
	BN	[illegible]	[illegible]	[illegible]	[illegible]
	D	[illegible]	[illegible]	[illegible]	[illegible]
	C	[illegible]	-300 (-0.9%)	[illegible]	[illegible]
	All	-1,671 (-1.3%)	[illegible]	-1,867 (-1.3%)	[illegible]
MAR	W	[illegible]	[illegible]	[illegible]	[illegible]
	AN	[illegible]	[illegible]	[illegible]	[illegible]
	BN	[illegible]	[illegible]	[illegible]	[illegible]
	D	[illegible]	[illegible]	[illegible]	[illegible]
	C	[illegible]	[illegible]	[illegible]	[illegible]
	All	[illegible]	[illegible]	[illegible]	[illegible]
APR	W	[illegible]	[illegible]	-1,374 (-3.3%)	-1,593 (-4.0%)
	AN	[illegible]	[illegible]	-417 (-4.0%)	-420 (-1.9%)
	BN	[illegible]	[illegible]	[illegible]	[illegible]
	D	[illegible]	[illegible]	[illegible]	[illegible]
	C	-343 (-2.5%)	-2,757 (-3.7%)	[illegible]	[illegible]
	All	[illegible]	[illegible]	-1,567 (-2.0%)	-1,601 (-2.0%)
MAY	W	[illegible]	[illegible]	[illegible]	[illegible]
	AN	[illegible]	[illegible]	693 (3.9%)	796 (4.1%)
	BN	[illegible]	[illegible]	-159 (-0.7%)	[illegible]
	D	[illegible]	-348 (-0.9%)	[illegible]	-217 (-0.8%)
	C	-1,501 (-1.7%)	[illegible]	-1,211 (-1.2%)	[illegible]
	All	[illegible]	[illegible]	[illegible]	-274 (-0.2%)
JUN	W	[illegible]	[illegible]	[illegible]	[illegible]
	AN	[illegible]	[illegible]	[illegible]	[illegible]
	BN	189 (0.5%)	201 (0.4%)	[illegible]	[illegible]
	D	-14 (-0.2%)	-244 (-1.9%)	[illegible]	[illegible]
	C	[illegible]	[illegible]	[illegible]	[illegible]
	All	[illegible]	[illegible]	[illegible]	[illegible]

Supplemental Modeling Results for New Alternatives

Alternative 4A ELT: in Delta—Sacramento River at Rio Vista

Month	Water Year Type	EXISTING CONDITIONS vs. H1 ELT	NAA ELT vs. H3 ELT	EXISTING CONDITIONS vs. H4 ELT	NAA ELT vs. H4 ELT
JUL	W	[illegible]	[illegible]	[illegible]	[illegible]
	AN	[illegible]	[illegible]	[illegible]	[illegible]
	BN	[illegible]	[illegible]	[illegible]	[illegible]
	D	[illegible]	[illegible]	[illegible]	[illegible]
	C	[illegible]	[illegible]	[illegible]	[illegible]
	All	[illegible]	[illegible]	[illegible]	[illegible]
AUG	W	[illegible]	[illegible]	[illegible]	[illegible]
	AN	[illegible]	[illegible]	[illegible]	[illegible]
	BN	[illegible]	[illegible]	[illegible]	[illegible]
	D	[illegible]	[illegible]	[illegible]	[illegible]
	C	[illegible]	-319 (-1.7%)	[illegible]	-570 (-3.0%)
	All	-361 (-2.1%)	[illegible]	-371 (-2.1%)	[illegible]
SEP	W	[illegible]	[illegible]	[illegible]	[illegible]
	AN	[illegible]	[illegible]	[illegible]	[illegible]
	BN	[illegible]	[illegible]	[illegible]	[illegible]
	D	[illegible]	[illegible]	[illegible]	[illegible]
	C	[illegible]	[illegible]	[illegible]	-201 (-1.0%)
	All	[illegible]	[illegible]	[illegible]	[illegible]
OCT	W	[illegible]	[illegible]	[illegible]	[illegible]
	AN	[illegible]	[illegible]	[illegible]	[illegible]
	BN	[illegible]	[illegible]	[illegible]	[illegible]
	D	[illegible]	[illegible]	[illegible]	[illegible]
	C	[illegible]	[illegible]	[illegible]	[illegible]
	All	[illegible]	[illegible]	[illegible]	[illegible]
NOV	W	[illegible]	[illegible]	[illegible]	[illegible]
	AN	[illegible]	[illegible]	[illegible]	[illegible]
	BN	[illegible]	[illegible]	[illegible]	[illegible]
	D	[illegible]	[illegible]	[illegible]	[illegible]
	C	[illegible]	[illegible]	[illegible]	[illegible]
	All	[illegible]	[illegible]	[illegible]	[illegible]
DEC	W	[illegible]	[illegible]	-1,504 (-1.5%)	[illegible]
	AN	-184 (-0.0%)	[illegible]	38 (0.1%)	[illegible]
	BN	-185 (-0.1%)	[illegible]	-240 (-1.4%)	[illegible]
	D	[illegible]	[illegible]	[illegible]	[illegible]
	C	[illegible]	83 (0.4%)	[illegible]	-294 (-1.4%)
	All	[illegible]	[illegible]	-81.1 (-0.1%)	[illegible]

[1] Red boxes indicate that flows under the alternative are more than 5% lower than flows under the baseline; green boxes indicate that flows under the alternative are more than 5% greater than flows under the baseline.

Source: RDEIR/SDEIS, Appendix B.

These꿤□ηtables꿤□ηand꿤□ηcigures꿤□ηshow꿤□ηthat꿤□ηmost꿤□ηchanges꿤□ηare꿤□ηcolored꿤□ηin
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intakes).[188]꿤□ηThe꿤□ηvast꿤□ηmajority꿤□ηof꿤□ηdifferences꿤□ηreported꿤□ηin꿤□ηthese꿤□ηtwo꿤□
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and꿤□ηto꿤□ηa꿤□ηfuture꿤□ηwithout꿤□ηthe꿤□ηTunnels;꿤□ηsalinity꿤□ηviolations꿤□ηand꿤□ηwill
well꿤□η(Figure꿤□η4).[189]꿤□ηDWR꿤□ηand꿤□ηits꿤□ηpartners꿤□ηopted꿤□ηnot꿤□ηto꿤□ηmodel꿤□ηresidenc
4A꿤□ηand꿤□ηthe꿤□ηother꿤□ηRDEIR/SDEIS꿤□ηalternatives꿤□η(2D꿤□ηand꿤□η5A).꿤□ηHowever,꿤
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modeling꿤□ηappendices꿤□ηshow꿤□ηreplacement꿤□ηof꿤□ηgood꿤□ηquality꿤□ηSacramento꿤□ηRiver
and꿤□ηpoorer꿤□ηquality꿤□ηSan꿤□ηJoaquin꿤□ηRiver꿤□ηwater,꿤□ηso꿤□ηit꿤□ηis꿤□ηreasonable,
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clowing꿤□ηinto꿤□ηthe꿤□ηwestern꿤□ηDelta,꿤□ηFranks꿤□ηTract,꿤□ηand꿤□ηat꿤□ηContra꿤□ηCost
intakes.[190]꿤□η꿤□ηMeanwhile,꿤□ηbetter꿤□ηquality꿤□ηSacramento꿤□ηRiver꿤□ηwater꿤□ηdiverted꿤□
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results.꿤□ηThrough-□Delta꿤□ηsurvival꿤□ηrates꿤□ηof꿤□ηthe꿤□ηjuvenile꿤□ηand꿤□ηsmolt꿤□ηlife꿤
fall-□run꿤□ηand꿤□ηlate-□fall-□run꿤□η꿤□ηand꿤□ηexpected꿤□ηto꿤□ηdecrease꿤□ηrelative꿤□ηto꿤□
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clows꿤□ηwill꿤□ηdecrease꿤□ηthe꿤□ηsize꿤□ηof꿤□ηcritical꿤□ηopen꿤□ηwater꿤□ηestuarine꿤□ηhab
federally-□listed꿤□ηspecies꿤□ηlike꿤□ηDelta꿤□ηsmelt꿤□ηand꿤□ηlongcin꿤□ηsmelt,꿤□ηboth꿤□ηof꿤
endangered꿤□ηbenecicial꿤□ηuses꿤□ηunder꿤□ηthe꿤□ηcurrent꿤□ηBay-□Delta꿤□ηWater꿤□η[192]꿤□η

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[188]꿤□ηSee꿤□ηalso꿤□ηAppendix꿤□ηB,꿤□ηTables꿤□ηB.7-□28꿤□η(downstream꿤□ηof꿤□ηnorth꿤□ηDelta꿤□ηintake
Vista),꿤□ηB.7-□32꿤□η(Delta꿤□ηoutclow),꿤□ηand꿤□ηB.7-□34꿤□η(San꿤□ηJoaquin꿤□ηRiver꿤□ηat꿤□ηVernalis

[189]꿤□ηRDEIR/SDEIS,꿤□ηSection꿤□η4.3.4,꿤□ηp.꿤□η4.3.4-□67,꿤□ηlines꿤□η4-□12.

[190]꿤□ηThis꿤□ηreasoning꿤□ηis꿤□ηconcirmed꿤□ηby꿤□ηsource-□water꿤□ηcingerprint꿤□ηmodeling꿤□ηprovide
EIS꿤□ηand꿤□ηthe꿤□η2015꿤□ηRDEIR/SDEIS.꿤□ηThe꿤□ηsource꿤□ηwater꿤□ηcingerprint꿤□ηmodeling꿤□ηres
Conservation꿤□ηPlan,꿤□ηDraft꿤□ηEIR/EIS/꿤□ηNovember꿤□η2013,꿤□ηAppendix꿤□η3D,꿤□ηpp.꿤□η147-□168,
Delta꿤□ηConservation꿤□ηPlan,꿤□ηRecirculated꿤□ηDraft꿤□ηEIR/Supplemental꿤□ηDraft꿤□ηEIS,꿤□ηAppendix꿤

[191]꿤□ηBay꿤□ηDelta꿤□ηConservation꿤□ηPlan꿤□ηDraft꿤□ηEIR/EIS,꿤□ηNovember꿤□η2013,꿤□ηAppendix꿤□η8
Scenarios꿤□ηH3꿤□ηand꿤□ηH4),꿤□η2013;꿤□ηBDCP/California꿤□ηWaterFix,꿤□ηRecirculated꿤□ηDraft꿤□ηEIR/S
Appendix꿤□ηB,꿤□ηSection꿤□ηB.4.2꿤□η(cigures꿤□ηfor꿤□ηNo꿤□ηAction꿤□ηAlternative,꿤□ηAlternative꿤□η4A
analyzed꿤□ηby꿤□ηRestore꿤□ηthe꿤□ηDelta.

[192]꿤□ηState꿤□ηWater꿤□ηResources꿤□ηControl꿤□ηBoard,꿤□ηand꿤□ηPlan꿤□ηfor꿤□ηthe꿤□ηSan꿤□ηFrancisco꿤
San꿤□ηJoaquin꿤□ηDelta꿤□ηEstuary꿤□η13,꿤□η2006,꿤□ηp.꿤□η9.

expressed꿯□ηserious꿯□ηconcerns꿯□ηabout꿯□ηthe꿯□ηEIR/EIS꿯□ηAdministrative꿯□ηDraft's꿯□η(ADI
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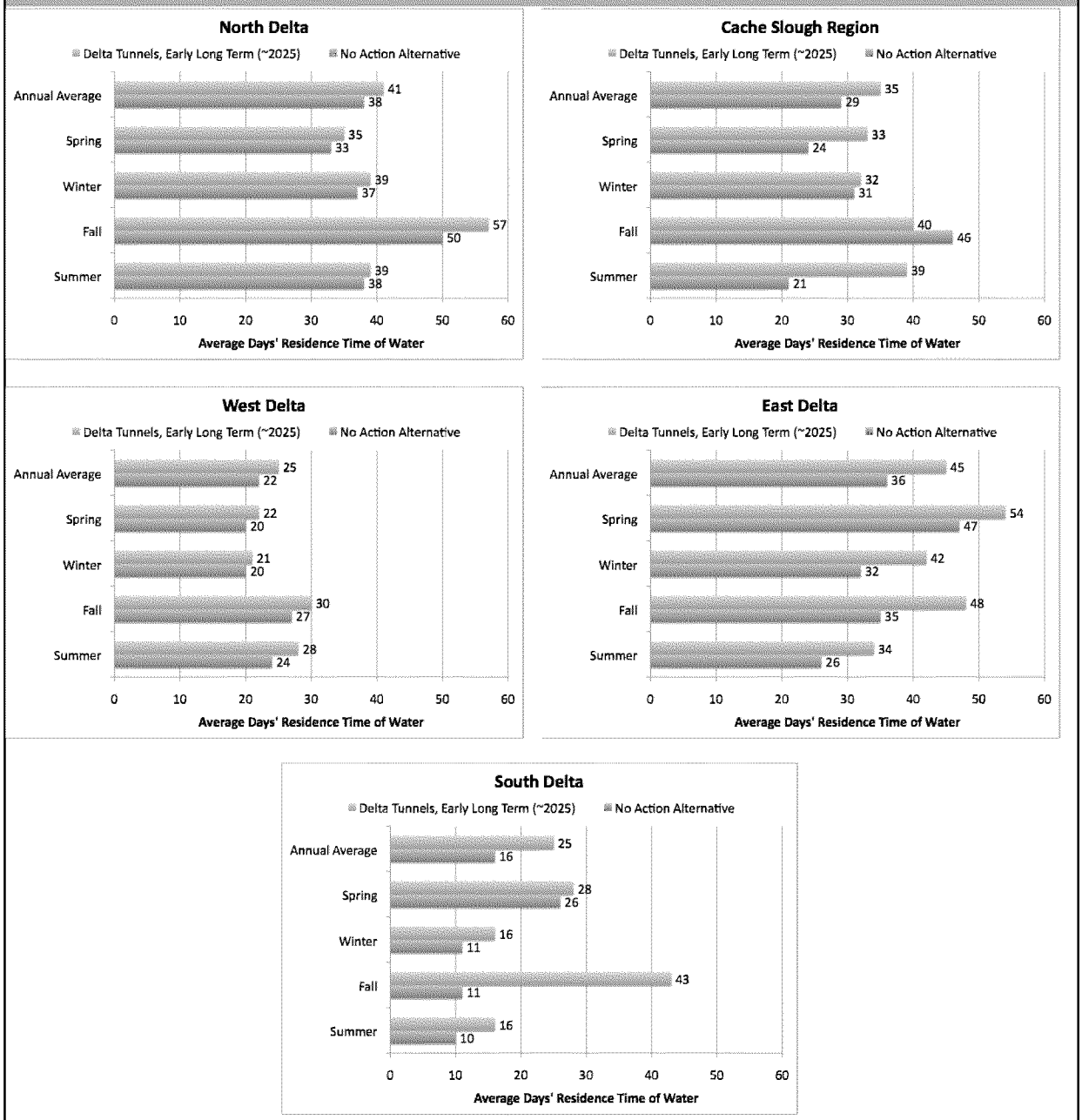
Figure꿯□η4
**Average꿯□ηResidence꿯□ηTime꿯□ηof꿯□ηWater꿯□ηin꿯□ηDelta꿯□ηRegions,꿯
and꿯□ηNo꿯□ηAction꿯□ηAlternative,꿯□η2015꿯□ηAnalysis**

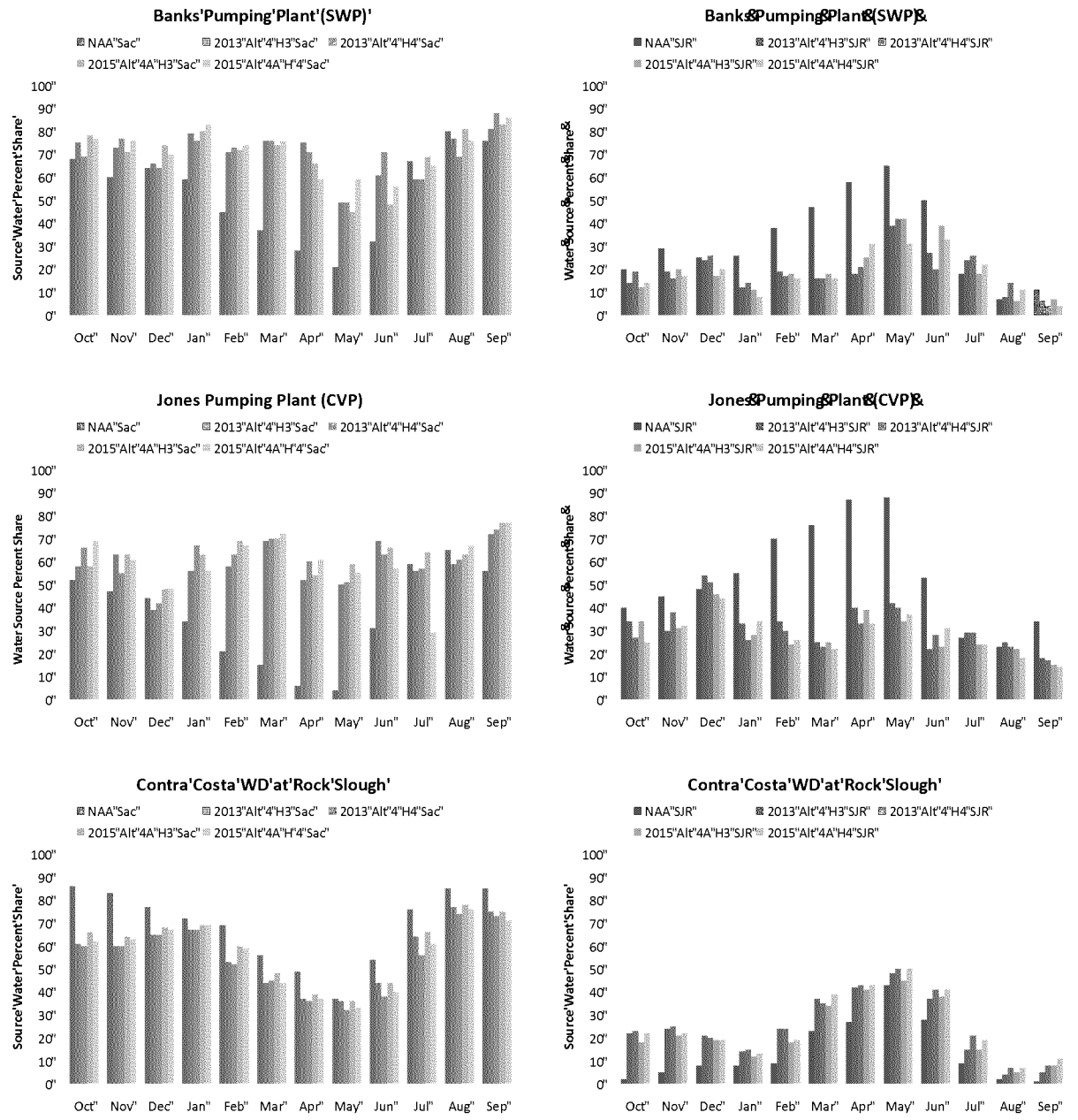


Source:꿯□ηBay꿯□ηDelta꿯□ηConservation꿯□ηPlan꿯□ηRDEIR/SDEIS,꿯□η2015,꿯□ηTable꿯□η8-□

Figure꿹□ɳ5

Share꿹□ɳof꿹□ɳDelta꿹□ɳLocation꿹□ɳRiver꿹□ɳSources꿹□ɳfrom꿹□ɳ"Fingerpri
No꿹□ɳAction꿹□ɳAlternative,꿹□ɳ2013꿹□ɳBDCP꿹□ɳConservation꿹□ɳMe
꿹□ɳand꿹□ɳ2015꿹□ɳTunnels꿹□ɳProject

Sacramento꿹□ɳRiver **San꿹□ɳJoaquin꿹□ɳRiver**



Figure꿯□ɳ5
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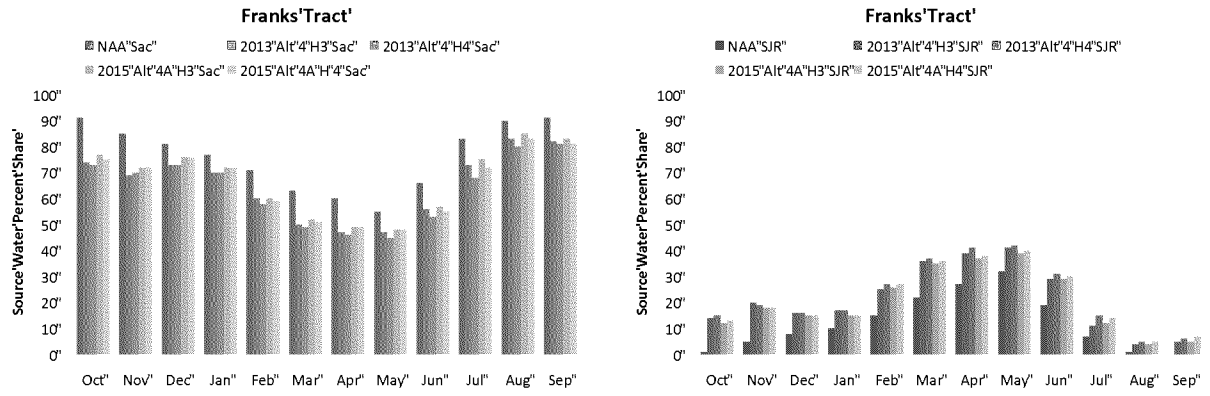
No꿯□ɳAction꿯□ɳAlternative,꿯□ɳ2013꿯□ɳBDCP꿯□ɳConservation꿯□ɳMe
꿯□ɳand꿯□ɳ2015꿯□ɳTunnels꿯□ɳProject

Sacramento꿯□ɳRiver **San꿯□ɳJoaquin꿯□ɳRiver**



Sources:꿯□ɳBDCP꿯□ɳDraft꿯□ɳEIR/EIS,꿯□ɳAppendix꿯□ɳ8D꿯□ɳ(cigures꿯□ɳfor꿯□ɳAlternative
California꿯□ɳWaterFix,꿯□ɳRecirculated꿯□ɳDraft꿯□ɳEIR/Supplemental꿯□ɳDraft꿯□ɳEIS,꿯□ɳApp
No꿯□ɳAction꿯□ɳAlternative,꿯□ɳAlternative꿯□ɳ4A,꿯□ɳScenarios꿯□ɳH3꿯□ɳand꿯□ɳH4);꿯□ɳR

Figure꿯□ɳ6
Through꿯□Delta꿯□ɳSurvival꿯□ɳRates꿯□ɳof꿯□ɳEmigrating꿯□ɳJuvenile
Alternative꿯□ɳ4A꿯□ɳ(California꿯□ɳWaterFix)

Winter꿯□ɳRun꿯□ɳChinook꿯□ɳS Spring꿯□ɳRun꿯□ɳChinook꿯□ɳS

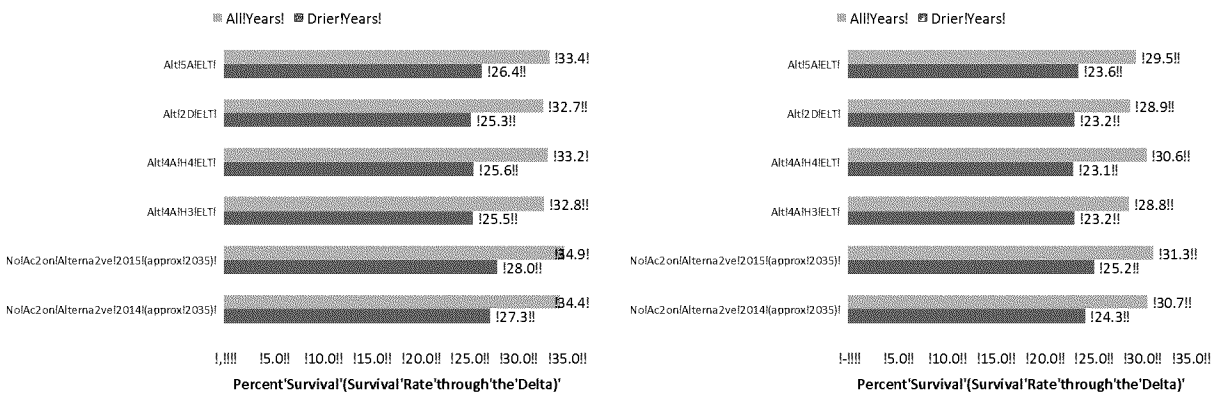
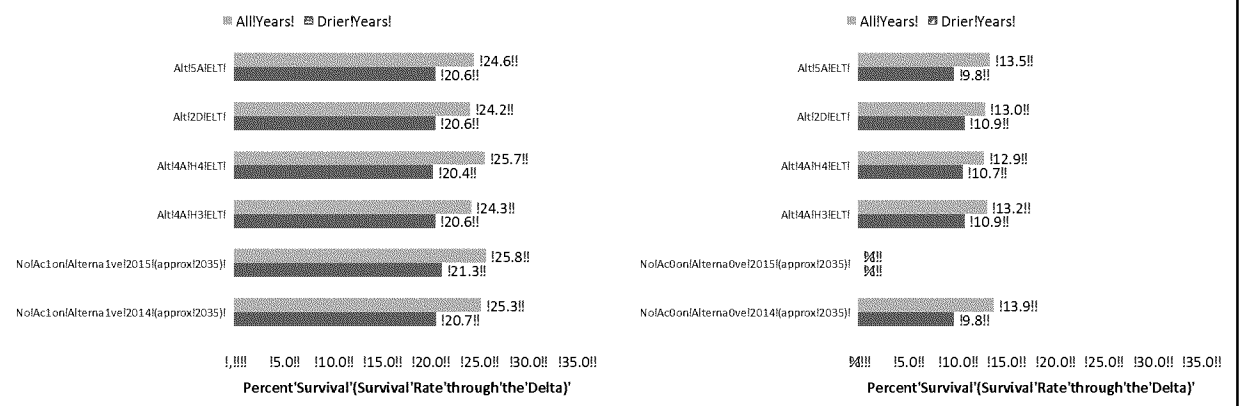


Figure 6
Through Delta Survival Rates of Emigrating Juvenile Fall Run Chinook Salmon River
Alternative 4A (California WaterFix)



Source: Bay Delta Conservation Plan/California WaterFix RDEIR/SDEIS, -51, and -74; Section 4.4, Tables 11-2D-16, -31, and -Environmental Water Caucus.

indicate that flow is necessary to protect aquatic resources and c[193] Tunnels Project's clow regime will violate the benecicial uses of violate water quality objectives. In order to receive the Section 4 Reclamation must revise the Tunnels Project to ensure that it fu uses.

The project increases Delta several pollutant concentrations, resulting pollutant criteria. Reduced through-Delta clows will stagnate water conditio water quality to deteriorate badly. RDEIR/SDEIS modeling results reveal degrade water quality for boron, bromide, chloride, electrical conductivity carbon, nitrate, mercury, pesticides, [194] (see below.) Harmful algal expected to worsen under Tunnels Project operational regimes relative as well as existing conditions. While these *increases* concentrations central Delta locations, as well as Contract Costa Water District's concentrations are *expected* export waters of the North Bay Slough, and Jones Pumping Plant and Banks Pumping Plant in th both changes compared with existing conditions as well as the which factors out most sea level rise and climate change impact

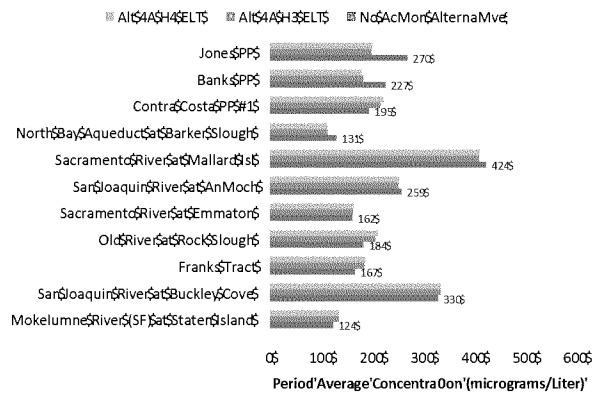
[193] U.S. EPA, "EPA Comments on Administrative Draft EIR/EIS, III Aquatic Federal Agency Release," p. 4 (July 18, 2013) (emphasis added), available production/ciles/documents/july3-2013-epa-comments-bdcp-adeis.pdf

[194] RDEIR/SDEIS, Appendix B.

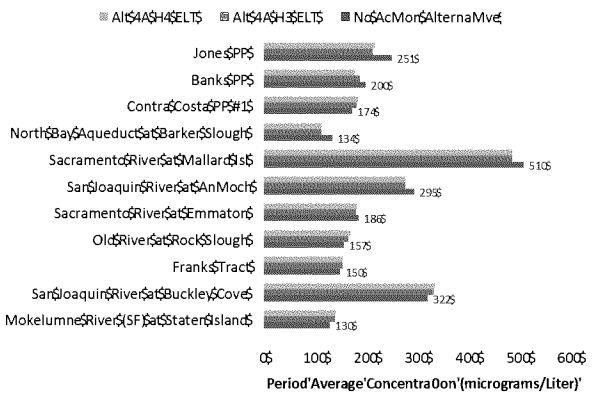
Boron

Although period average concentrations decrease with Tunnels operations River at Emmaton and Contra Costa Water District's Pumping Plant sensitivity) threshold of 500 micrograms per liter (µg/L) would see percentage of the time at San Joaquin River at Antioch[195] and The Tunnels Project will increase boron concentrations throughout the Mokelumne River, as well as at Franks Tract and Old River conditions and No Action[196] Alternatives western Delta, boron concentrations Tunnels operation relative to existing conditions and No Action Alter September, most months of the year. Finally, boron concentrations in Water District's Pumping Plant No. 1, while boron concentrations dec intakes at Barker Slough and at Banks and Jones pumping plants projects.

Figure 7
Period Average Boron Concentrations of Various



All Years



Drought Years

Source: RDEIR/SDEIS, Appendix B, Table Bo-3, p. B-71. Data for comparison purposes.

Bromide

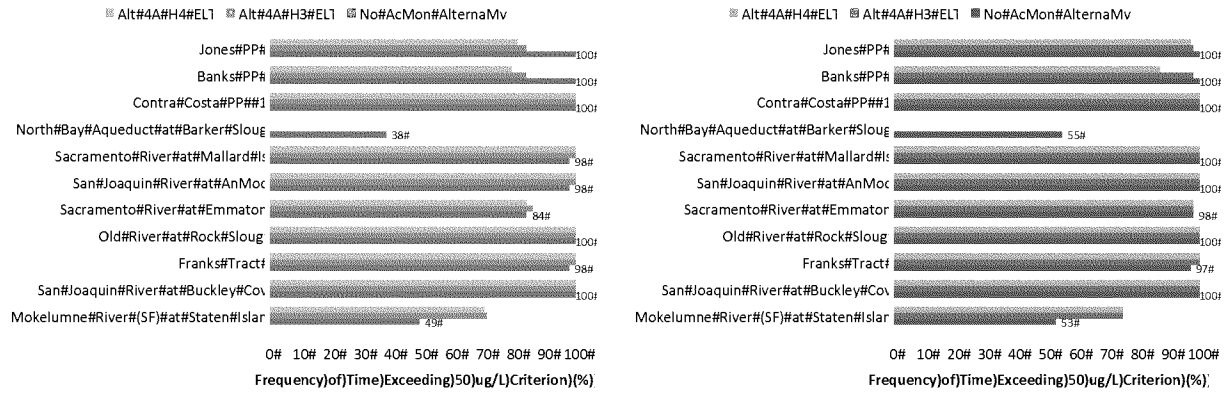
For both human health and aquatic life criteria, the Tunnels Pro criteria violations in the interior and western Delta, but would d percent of the time at Banks and Jones pumping plants. Western problem for Antioch diversions as well. One method of evaluating concentrations suggests that wet years may see [197] (Figures 3 and 10.)

[195] RDEIR/SDEIS, Appendix B, Table Bo-3, p. B-71.

[196] RDEIR/SDEIS, Appendix B, Table Bo-4 and Bo-5, pp. B-73 and

[197] RDEIR/SDEIS, Appendix B, Table Br-1 and Table Br-2, pp. B-84,

**Figure 8
Frequency Percentage of Exceedances of Bromide Human Health Criterion**

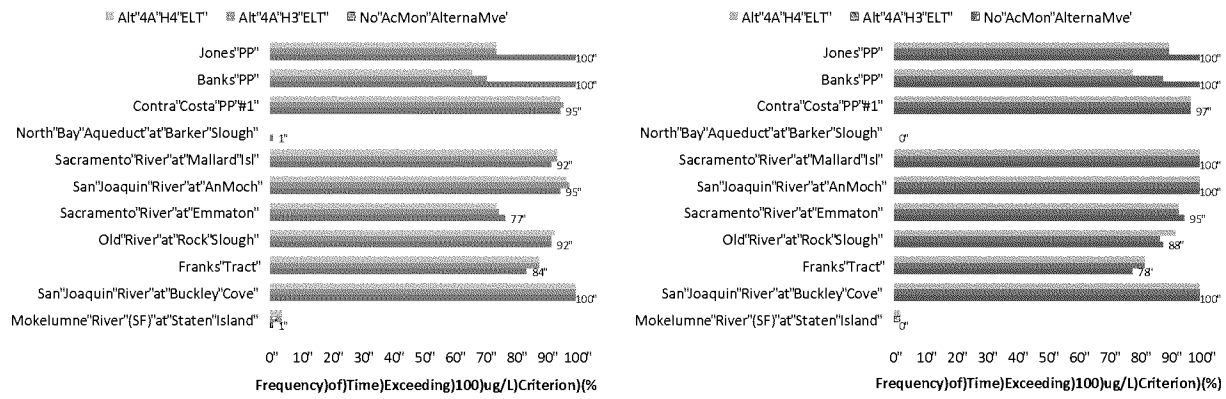


All Years

Drought Years

Source: RDEIR/SDEIS, Appendix B, Table Br-1, p. B-83. Data for comparison purposes.

**Figure 9
Frequency Percentage of Exceedances of Bromide Aquatic Life Criterion**

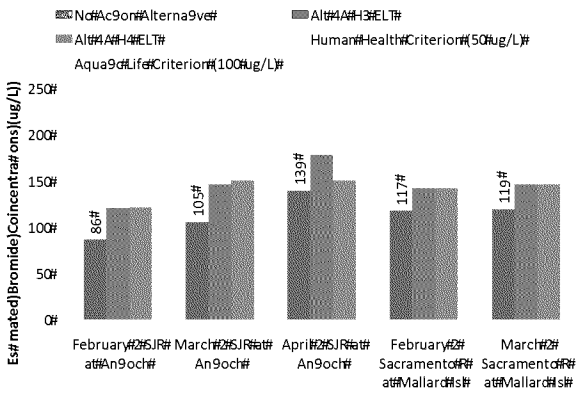


All Years

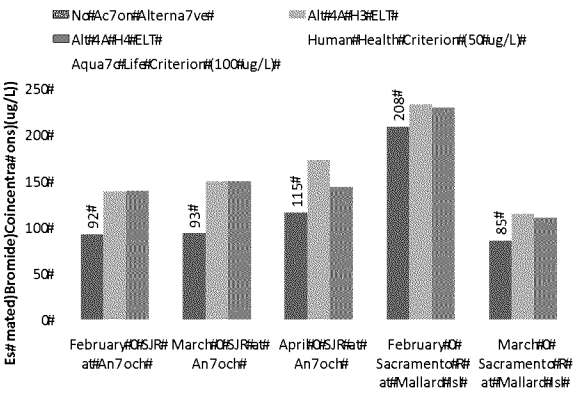
Drought Years

Source: RDEIR/SDEIS, Appendix B, Table Br-1, p. B-83. Data for comparison purposes.

Figure뀀□ŋ10
Estimated뀀□ŋConcentrations뀀□ŋof뀀□ŋBromide
뀀□ŋin뀀□ŋWet뀀□ŋand뀀□ŋAbove뀀□ŋNormal뀀□ŋWater뀀□
뀀□ŋ(Periods뀀□ŋof뀀□ŋNormally뀀□ŋAcceptable뀀□ŋWater뀀□ŋQuali



Wet뀀□ŋYears



Above뀀□ŋNormal뀀□ŋYears

Source:뀀□ŋRDEIR/SDEIS,뀀□ŋAppendix뀀□ŋB,뀀□ŋTable뀀□ŋBr-□5,뀀□ŋp.뀀□ŋB-□87.뀀□ŋData뀀□
for뀀□ŋcomparison뀀□ŋpurposes.

Chloride

The뀀□ŋMokelumne뀀□ŋRiver뀀□ŋsouth뀀□ŋfork뀀□ŋat뀀□ŋStaten뀀□ŋIsland뀀□ŋsees뀀□ŋsignicicant뀀□
concentrations뀀□ŋall뀀□ŋyear,뀀□ŋevery뀀□ŋyear.뀀□ŋThis뀀□ŋis뀀□ŋclosely뀀□ŋincluenced뀀□ŋby뀀□
Slough뀀□ŋdownstream뀀□ŋof뀀□ŋthe뀀□ŋnorth뀀□ŋDelta뀀□ŋintakes.뀀□ŋOther뀀□ŋinterior뀀□ŋand뀀□
increased뀀□ŋchloride뀀□ŋconcentrations뀀□ŋrelative뀀□ŋto뀀□ŋboth뀀□ŋexisting뀀□ŋconditions뀀□ŋand
the뀀□ŋTunnels뀀□ŋduring뀀□ŋMarch뀀□ŋthrough뀀□ŋJune뀀□ŋ(for뀀□ŋinterior뀀□ŋlocations)뀀□ŋand뀀
Sacramento뀀□ŋRiver뀀□ŋat뀀□ŋEmmaton,뀀□ŋSan뀀□ŋJoaquin뀀□ŋRiver뀀□ŋat뀀□ŋAntioch뀀□ŋand뀀□
Island.[198]

Salinity

The뀀□ŋTunnels뀀□ŋProject뀀□ŋwill뀀□ŋmore뀀□ŋthan뀀□ŋtriple뀀□ŋthe뀀□ŋnumber뀀□ŋof뀀□ŋspikes
the뀀□ŋSacramento뀀□ŋRiver뀀□ŋdownstream뀀□ŋof뀀□ŋthe뀀□ŋTunnels,뀀□ŋand뀀□ŋalong뀀□ŋthe뀀□
Point.뀀□ŋOutright뀀□ŋviolations뀀□ŋof뀀□ŋsalinity뀀□ŋobjectives뀀□ŋare뀀□ŋexpected뀀□ŋto뀀□ŋmore
in뀀□ŋplace.[199]뀀□ŋThese뀀□ŋviolations뀀□ŋwill뀀□ŋdegrade뀀□ŋwater뀀□ŋquality뀀□ŋfor뀀□ŋDelta뀀□ŋagri
benecicial뀀□ŋuses.뀀□ŋThis뀀□ŋmeans뀀□ŋthat뀀□ŋthe뀀□ŋState뀀□ŋWater뀀□ŋResources뀀□ŋControl
certication뀀□ŋregardless뀀□ŋof뀀□ŋwhether뀀□ŋit뀀□ŋhas뀀□ŋadequately뀀□ŋassessed뀀□ŋthe뀀□ŋpr
water뀀□ŋquality.뀀□ŋ

Along뀀□ŋthe뀀□ŋlower뀀□ŋSacramento뀀□ŋRiver,뀀□ŋsalinity뀀□ŋviolations뀀□ŋwill뀀□ŋmore뀀□ŋthan
quarter뀀□ŋof뀀□ŋthe뀀□ŋtime뀀□ŋthat뀀□ŋsalinity뀀□ŋobjectives뀀□ŋare뀀□ŋin뀀□ŋeffect,뀀□ŋup뀀□ŋ
and뀀□ŋwith뀀□ŋthe뀀□ŋTunnels뀀□ŋProject뀀□ŋin뀀□ŋplace.뀀□ŋThese뀀□ŋconditions뀀□ŋwill뀀□ŋwo

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[198]뀀□ŋRDEIR/SDEIS,뀀□ŋAppendix뀀□ŋB,뀀□ŋTables뀀□ŋCl-□6뀀□ŋthrough뀀□ŋCl-□9뀀□ŋfor뀀□ŋtwo뀀□ŋestimati
scenarios뀀□ŋ(H3뀀□ŋand뀀□ŋH4),뀀□ŋpp.뀀□ŋB-□93뀀□ŋand뀀□ŋB-□96.

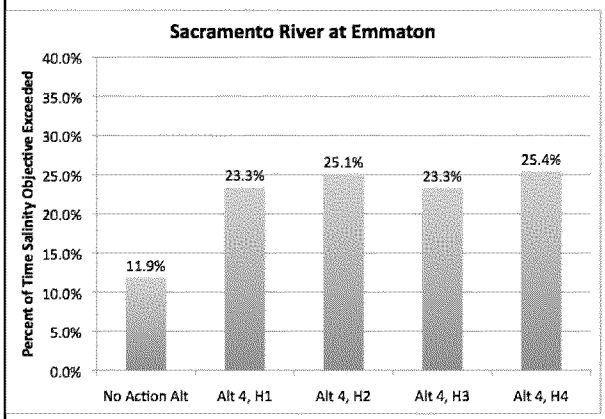
[199]뀀□ŋRDEIR/SDEIS,뀀□ŋAppendix뀀□ŋB,뀀□ŋTable뀀□ŋEC-□1,뀀□ŋp.뀀□ŋB-□129.뀀□ŋ"Spikes"뀀□ŋhere뀀□ŋmeans
objective,뀀□ŋwhile뀀□ŋcompliance뀀□ŋwith뀀□ŋobjectives뀀□ŋis뀀□ŋdetermined뀀□ŋby뀀□ŋcomparing뀀□ŋmulti-□
objective.뀀□ŋWhen뀀□ŋthe뀀□ŋrunning뀀□ŋaverage뀀□ŋis뀀□ŋexceeded,뀀□ŋa뀀□ŋviolation뀀□ŋis뀀□ŋthen뀀□ŋde

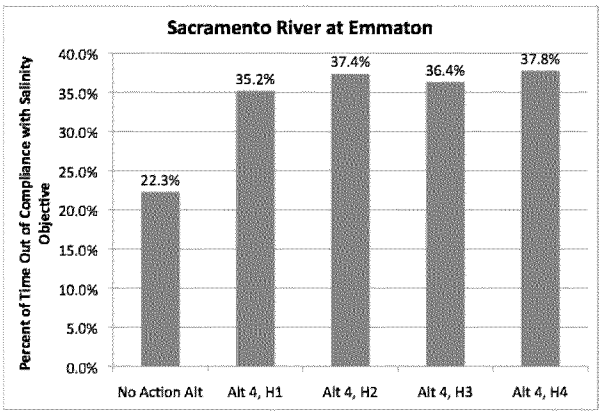
conditions뀀□ηbetween뀀□ηMay뀀□ηand뀀□ηSeptember,뀀□ηespecially뀀□ηin뀀□ηdrought뀀□ηyears뀀□η
in뀀□ηfrequency).뀀□ηInterior뀀□ηDelta뀀□ηsalinity뀀□ηwill뀀□ηalso뀀□ηworsen뀀□ηbetween뀀□ηMarch
the뀀□ηSouth뀀□ηMokelumne뀀□ηRiver뀀□ηand뀀□ηat뀀□ηSan뀀□ηAndreas뀀□ηLanding뀀□ηon뀀□ηthe
February뀀□ηand뀀□ηJune뀀□ηat뀀□ηPrisoners뀀□ηPoint뀀□ηalongηgure뀀□ηthe뀀□ηSan뀀□ηJoaquin.

Figure뀀□η11
Projected뀀□ηSalinity뀀□ηEffects뀀□ηby뀀□η2060
of뀀□ηthe뀀□ηTunnels뀀□ηProject/Bay뀀□ηDelta뀀□ηConservati
Percentage뀀□ηof뀀□ηTime뀀□ηSalinity뀀□ηExceedances뀀□ηand뀀□ηVi

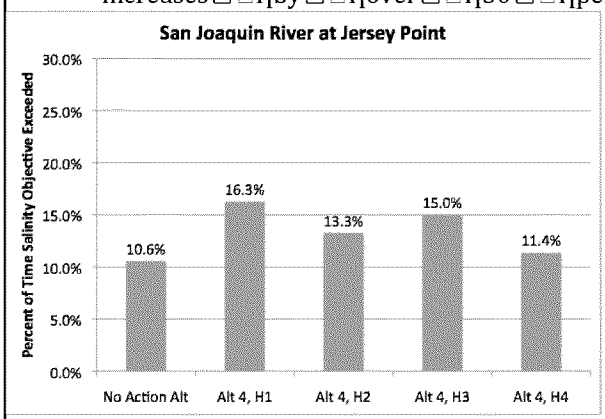
Exceeding뀀□ηWater뀀□ηQuality뀀□ηObj Out뀀□ηof뀀□ηCompliance뀀□ηwith뀀□ηWater

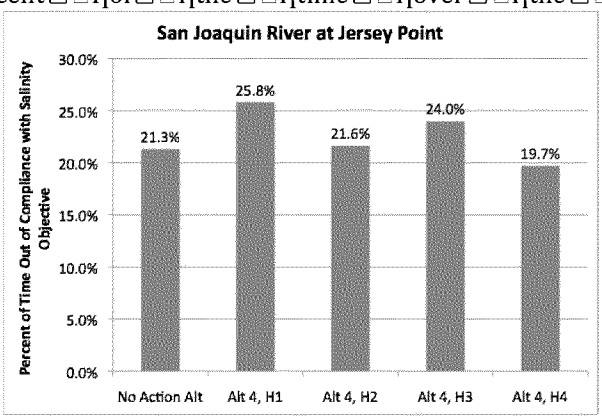
Delta뀀□ηAgricultural뀀□ηBeneLicial뀀□ηUse뀀□ηWater뀀□ηQuality뀀□ηOb





- **Sacramento뀀□ηRiver뀀□ηat뀀□ηEmmaton:**ces뀀□ηincrease뀀□ηover뀀□ηthe뀀□ηNo뀀□ηA
over뀀□η100뀀□ηpercent뀀□ηof뀀□ηthe뀀□ηtime뀀□ηin뀀□ηthe뀀□ηAlt뀀□η4뀀□ηscenario
increases뀀□ηby뀀□ηover뀀□η50뀀□ηpercent뀀□ηof뀀□ηthe뀀□ηtime뀀□ηover뀀□ηthe뀀□η



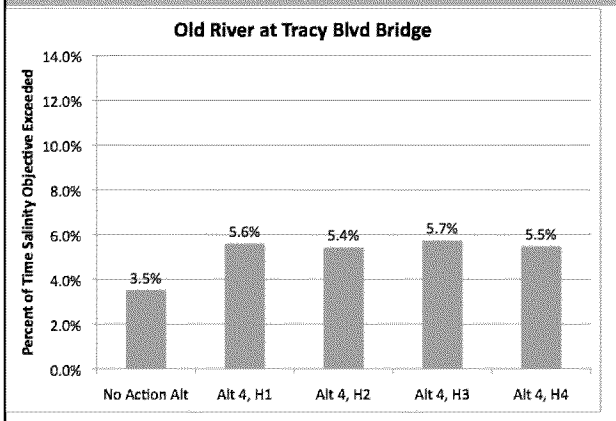


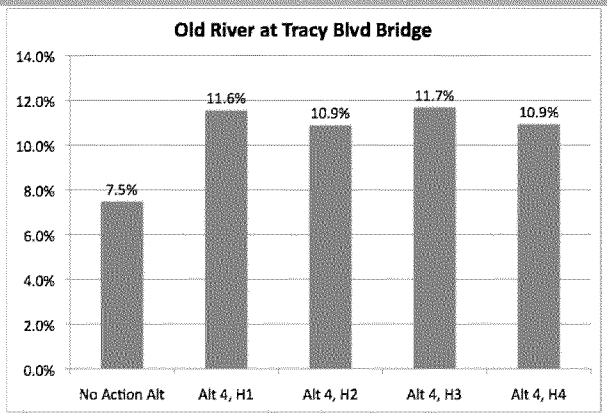
- **San뀀□ηJoaquin뀀□ηRiver뀀□ηat뀀□ηJersey뀀□ηPoint:**increase뀀□ηover뀀□ηthe뀀□ηNo뀀□
percent,뀀□ηwhile뀀□ηnon뀀□ηcompliance뀀□ηwith뀀□ηthe뀀□ηobjective뀀□ηincreases뀀□η
High뀀□ηOutclow뀀□ηScenario뀀□η(where뀀□ηboth뀀□ηSpring뀀□ηand뀀□ηFall뀀□ηX2뀀□

[200]뀀□ηRDEIR/SDEIS,뀀□ηAppendix뀀□ηB,뀀□ηTables뀀□ηEC-□8A뀀□ηand뀀□ηEC-□8B,뀀□ηpp.뀀□ηB-□134뀀□ηto뀀

Figure뀀□Ŋ11
Projected뀀□ŋSalinity뀀□ŋEffects뀀□ŋby뀀□ŋ2060
of뀀□ŋthe뀀□ŋTunnels뀀□ŋProject/Bay뀀□ŋDelta뀀□ŋConservati
Percentage뀀□ŋof뀀□ŋTime뀀□ŋSalinity뀀□ŋExceedances뀀□ŋand뀀□ŋVi

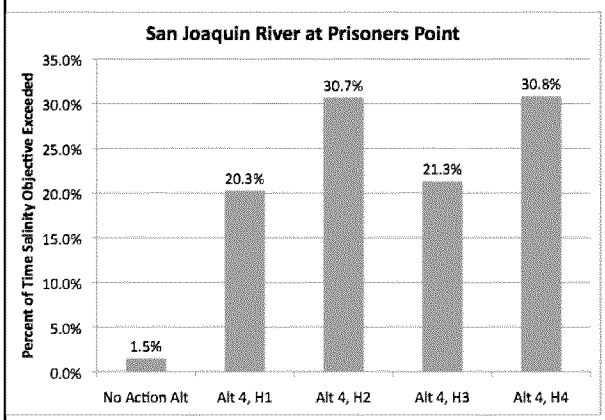
Exceeding뀀□ŋWater뀀□ŋQuality뀀□ŋObj Out뀀□ŋof뀀□ŋCompliance뀀□ŋwith뀀□ŋWater

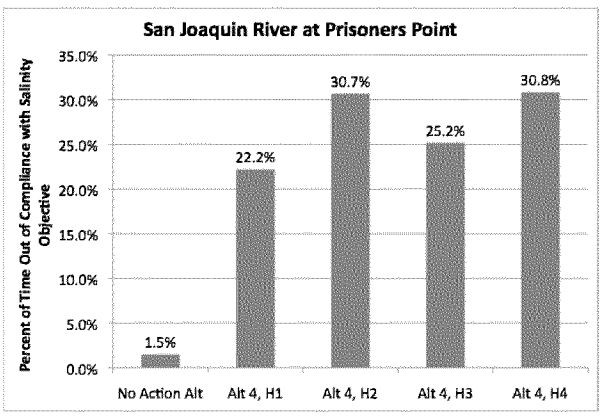




- **Old뀀□ŋRiver뀀□ŋat뀀□ŋTracy뀀□ŋBlvd뀀□ŋBridge:** increase뀀□ŋby뀀□ŋabout뀀□ŋtwo-□thi Action뀀□ŋAlternative.뀀□ŋNoncompliance뀀□ŋwith뀀□ŋthe뀀□ŋobjective뀀□ŋwould뀀□ŋinc These뀀□ŋpercents뀀□ŋare뀀□ŋlower뀀□ŋbecause뀀□ŋas뀀□ŋshown뀀□ŋabove뀀□ŋ(Table뀀 high.

Delta뀀□ŋFish뀀□ŋand뀀□ŋWildlife뀀□ŋWater뀀□ŋQuality뀀□ŋObjecti

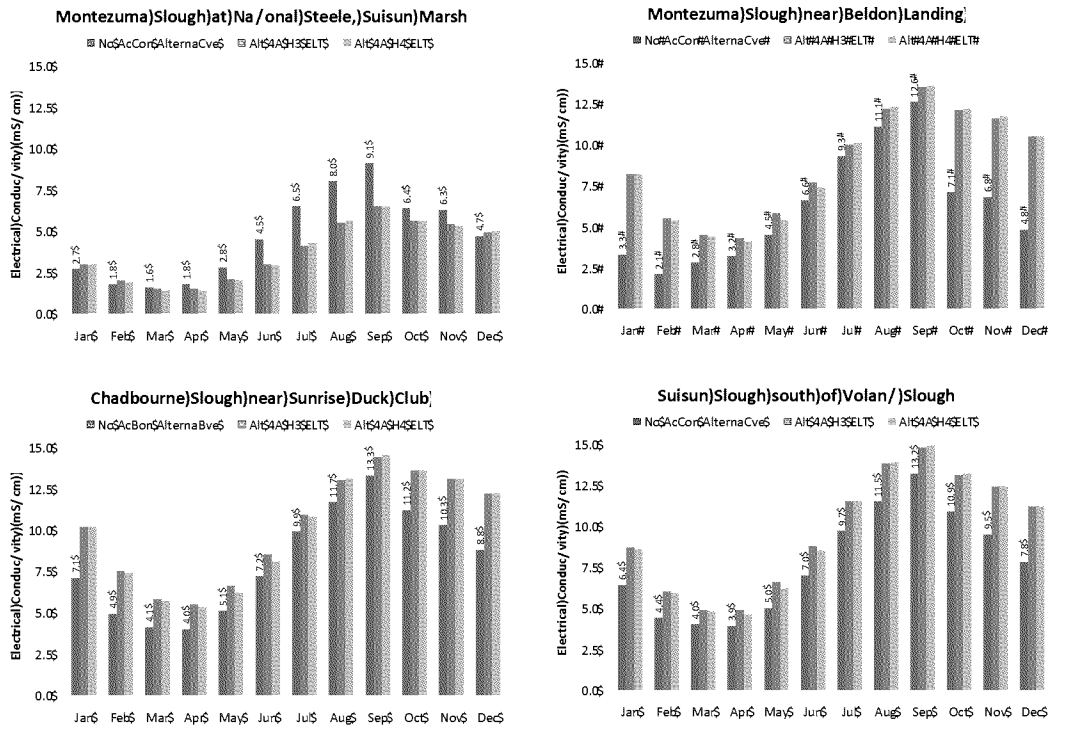




- **San뀀□ŋJoaquin뀀□ŋRiver뀀□ŋat뀀□ŋPrisoners뀀□ŋPoint:** of뀀□ŋtime뀀□ŋexceedances뀀 sharply—1200뀀□ŋto뀀□ŋ1900뀀□ŋpercent뀀□ŋincrease뀀□ŋin뀀□ŋexceedances뀀□ŋand뀀□ noncompliance.뀀□ŋThis뀀□ŋis뀀□ŋa뀀□ŋcish뀀□ŋand뀀□ŋwildlife-□related뀀□ŋsalinity뀀□ agricultural뀀□ŋbenecicial뀀□ŋuse뀀□ŋsalinity뀀□ŋobjectives.

Source:뀀□ŋBay뀀□ŋDelta뀀□ŋConservation뀀□ŋPlan뀀□ŋ*Draft EIR/EIS,*뀀□ŋ*Comparative Tables*뀀□ŋ*BDCP*뀀□ŋ4뀀□ŋp. Percentage뀀□ŋof뀀□ŋtime뀀□ŋis뀀□ŋbased뀀□ŋon뀀□ŋa뀀□ŋ16-□year뀀□ŋhydrology뀀□ŋmodeled compliance"뀀□ŋis뀀□ŋthe뀀□ŋnumber뀀□ŋof뀀□ŋdays뀀□ŋthat뀀□ŋthe뀀□ŋ30-□day뀀□ŋrunning뀀 violations뀀□ŋof뀀□ŋthe뀀□ŋsalinity뀀□ŋobjective.뀀□ŋ"Exceeding뀀□ŋWater뀀□ŋQuality뀀□ŋObject monitoring뀀□ŋequipment뀀□ŋactually뀀□ŋregisters뀀□ŋsalinity뀀□ŋexceeding뀀□ŋthe뀀□ŋthreshol

Figure꿲□ꃑ12
Interior꿲□ꃑSuisun꿲□ꃑMarsh꿲□ꃑWaterways꿲□ꃑto꿲□ꃑSee꿲
꿲□ꃑfrom꿲□ꃑTunnels꿲□ꃑOperations



Sources:꿲□ꃑRDEIR/SDEIS,꿲□ꃑAppendix꿲□ꃑB,꿲□ꃑTables꿲□ꃑEC-□4꿲□ꃑthrough꿲□ꃑ
No꿲□ꃑAction꿲□ꃑAlternative꿲□ꃑfor꿲□ꃑcomparison꿲□ꃑpurposes.

The꿲□ꃑTunnels꿲□ꃑwill꿲□ꃑbe꿲□ꃑthe꿲□ꃑopposite꿲□ꃑof꿲□ꃑa꿲□ꃑ"WaterFix"꿲□ꃑfor꿲□ꃑSuisun꿲□ꃑ
results꿲□ꃑshow꿲□ꃑthat꿲□ꃑevery꿲□ꃑmonth's꿲□ꃑaverage꿲□ꃑsalinity꿲□ꃑwill꿲□ꃑincrease꿲□ꃑabout꿲
conditions꿲□ꃑand꿲□ꃑabout꿲□ꃑ60꿲□ꃑpercent꿲□ꃑover꿲□ꃑfuture꿲□ꃑconditions꿲□ꃑin꿲□ꃑthe꿲□ꃑB
present꿲□ꃑconditions꿲□ꃑand꿲□ꃑ27꿲□ꃑpercent꿲□ꃑover꿲□ꃑfuture꿲□ꃑconditions꿲□ꃑnear꿲□ꃑSunris
over꿲□ꃑpresent꿲□ꃑconditions꿲□ꃑand꿲□ꃑ26꿲□ꃑpercent꿲□ꃑover꿲□ꃑfuture꿲□ꃑconditions꿲□ꃑalong꿲□
Slough.[201]꿲□ꃑThis꿲□ꃑaltered꿲□ꃑsalinity꿲□ꃑregime꿲□ꃑwill꿲□ꃑresult꿲□ꃑin꿲□ꃑless꿲□ꃑhabitat꿲□ꃑ
native꿲□ꃑto꿲□ꃑthe꿲□ꃑBay-□Delta꿲□ꃑEstuary,꿲□ꃑas꿲□ꃑwell꿲□ꃑas꿲□ꃑaffect꿲□ꃑagricultural꿲□ꃑs

Pesticides

The꿲□ꃑSan꿲□ꃑJoaquin꿲□ꃑRiver꿲□ꃑis꿲□ꃑan꿲□ꃑimpaired꿲□ꃑwater꿲□ꃑbody꿲□ꃑfor꿲□ꃑchlorpyrifo
A꿲□ꃑpesticides꿲□ꃑ(human꿲□ꃑcarcinogens)꿲□ꃑunder꿲□ꃑ[202]꿲□ꃑthe꿲□ꃑCleanꃑ꿲□ꃑWater꿲□ꃑAct's꿲□ꃑfraction
water꿲□ꃑcontributed꿲□ꃑto꿲□ꃑthe꿲□ꃑDelta꿲□ꃑwill꿲□ꃑresult꿲□ꃑin꿲□ꃑmore꿲□ꃑconcentrated꿲□ꃑ
western꿲□ꃑDelta꿲□ꃑwater꿲□ꃑways꿲□ꃑfrom꿲□ꃑthe꿲□ꃑSan꿲□ꃑJoaquin,꿲□ꃑand꿲□ꃑwith꿲□ꃑlonge
burdens꿲□ꃑstay꿲□ꃑlonger.꿲□ꃑThe꿲□ꃑBay-□Delta꿲□ꃑEstuary꿲□ꃑwill꿲□ꃑbe꿲□ꃑleft꿲□ꃑwith꿲□ꃑa
supplied꿲□ꃑby꿲□ꃑthe꿲□ꃑSan꿲□ꃑJoaquin꿲□ꃑRiver's꿲□ꃑagricultural꿲□ꃑefcluent.꿲□ꃑ

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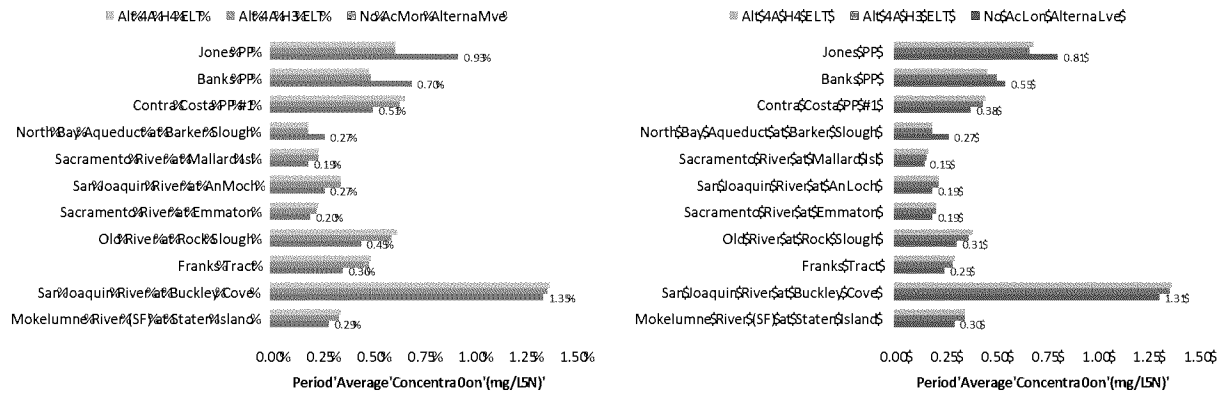
[201]꿲□ꃑRDEIR/SDEIS,꿲□ꃑAppendix꿲□ꃑB,꿲□ꃑTables꿲□ꃑEC-□5,꿲□ꃑEC-□6,꿲□ꃑand꿲□ꃑEC-□7,꿲□ꃑpp.꿲□ꃑB-□131

[202]꿲□ꃑUS꿲□ꃑEPA,꿲□ꃑ2010꿲□ꃑCalifornia꿲□ꃑCalifornia꿲□ꃑ303(d)꿲□ꃑList꿲□ꃑof꿲□ꃑWater꿲□ꃑQuality꿲□ꃑLim
http://gispublic.waterboards.ca.gov/pub/303d/2010_USEPA_approv_303d_List_Final_122311wsrcs.xls꿲□ꃑ

Nitrates

Tunnels꿯□ηProject꿯□ηmodeling꿯□ηresults꿯□ηindicate꿯□ηincreases꿯□ηof꿯□ηnitrates꿯□ηrelative꿯□
of꿯□η19꿯□ηto꿯□η34꿯□ηpercent꿯□ηfor꿯□ηinterior꿯□ηDelta꿯□ηlocations꿯□ηin꿯□ηall꿯□ηyears꿯
Cove꿯□ηnear꿯□ηStockton).꿯□ηSimilar꿯□ηmodeling꿯□ηresults꿯□ηare꿯□ηshown꿯□ηfor꿯□ηthe꿯□η
percent꿯□ηincreases꿯□ηin꿯□ηsalinity꿯□η(Figure꿯□η13).꿯□ηAnd꿯□ηContra꿯□ηCosta꿯□ηWater꿯□
projected꿯□ηto꿯□ηsee꿯□ηa꿯□η25꿯□ηpercent꿯□ηincrease꿯□ηin꿯□ηnitrates.꿯□ηThis꿯□ηwould꿯
water꿯□ηtreatment꿯□ηcosts꿯□ηfor꿯□ηthe꿯□ηDistrict.꿯□ηIn꿯□ηall꿯□ηof꿯□ηthese꿯□ηlocations꿯
were꿯□ηalmost꿯□ηall꿯□ηincreases꿯□ηin꿯□ηthe꿯□ηrange꿯□ηof꿯□η10꿯□ηto꿯□η30꿯□ηpercent.
concentrations꿯□ηare꿯□ηexpected꿯□ηin꿯□ηTunnels꿯□ηmodeling꿯□ηresults꿯□ηto꿯□ηdecrease꿯□η
Jones꿯□ηand꿯□η[203]ηBanks.

Figure꿯□η13
Period꿯□ηAverage꿯□ηNitrate┐□N꿯□ηConcentrations



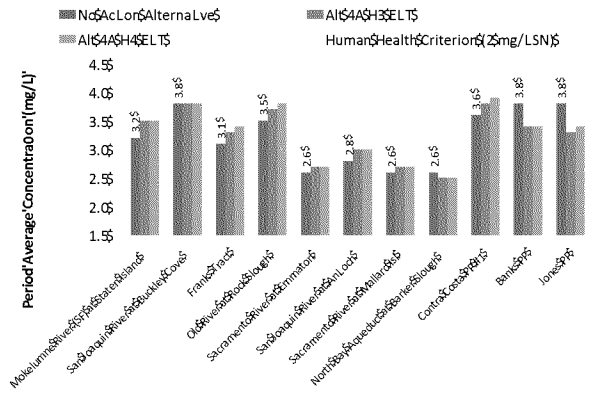
All꿯□ηYears Drought꿯□ηYears

Source:꿯□ηRDEIR/SDEIS,꿯□ηAppendix꿯□ηB,꿯□ηTables꿯□ηN-□4꿯□ηand꿯□ηN-□5,꿯□ηp.꿯□η
Alternative꿯□ηfor꿯□ηcomparison꿯□ηpurposes.

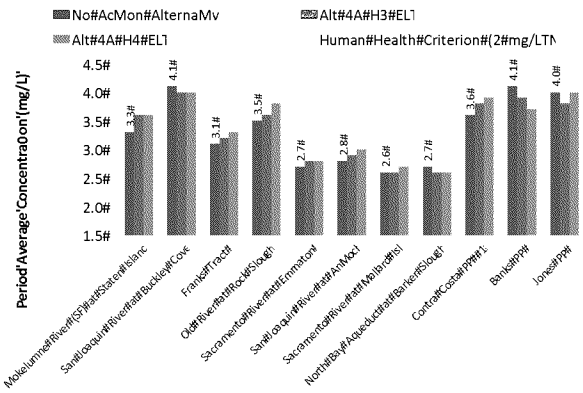
[203]꿯□ηRDEIR/SDEIS,꿯□ηAppendix꿯□ηB,꿯□ηTables꿯□ηN-□4꿯□ηand꿯□ηN-□5,꿯□ηpp.꿯□ηB-□162꿯□ηand꿯□η

Dissolved꿯□ηOrganic꿯□ηCarbon꿯□η(Figure꿯□η14)

Figure꿯□η14
Period꿯□ηAverage꿯□ηDissolved꿯□ηOrganic꿯□ηCarbon꿯□ηCon



All꿯□ηYears



Drought꿯□ηYears

Source:꿯□ηRDEIR/SDEIS,꿯□ηAppendix꿯□ηB,꿯□ηTable꿯□ηDOC-□1,꿯□ηp.꿯□ηB-□171.꿯□ηData꿯
Alternative꿯□ηfor꿯□ηcomparison꿯□ηpurposes.

Methyl꿯□ηMercury

As꿯□ηshown꿯□ηin꿯□ηFigure꿯□η15,꿯□ηthe꿯□ηratio꿯□ηof꿯□ηmercury꿯□ηconcentrations꿯□ηin꿯
Alternative꿯□η4꿯□ηTunnels꿯□ηscenarios꿯□η[204] *widewell for* [illegible] *toxicity* [illegible] *threshold* [illegible] *and* [illegible]
its꿯□ηpartners꿯□ηtry꿯□ηto꿯□ηdivert꿯□ηattention꿯□ηfrom꿯□ηthe꿯□ηtoxicity꿯□ηthreshold꿯□ηby
continuation꿯□ηof꿯□ηthe꿯□ηstatus꿯□ηquo꿯□η[205] *No* [illegible] *Alternative* [illegible] *comparison* [illegible] *is*
toxicity꿯□ηthreshold꿯□ηfor꿯□ηecological꿯□ηand꿯□ηpublic꿯□ηhealth꿯□ηprotection.)꿯□ηAlternative
shows꿯□ηthat꿯□ηthe꿯□ηTunnels꿯□ηproject꿯□ηdespite꿯□ηhaving꿯□ηless꿯□ηhabitat꿯□ηrestoratio
improvements꿯□ηwould꿯□ηhave꿯□ηonly꿯□ηslightly꿯□ηless꿯□ηeffect꿯□ηon꿯□ηcish꿯□ηtissue꿯□η
Moreover,꿯□ηcish꿯□ηtissue꿯□ηconcentrations꿯□ηat꿯□ηseveral꿯□ηEstuary꿯□ηlocations꿯□ηwould꿯
times꿯□ηthe꿯□ηUSEPA's꿯□ηmercury꿯□ηguidance꿯□ηconcentration.꿯□ηThis꿯□ηanalysis,꿯□ηoweve
"California꿯□ηEcoRestore's"꿯□ηhabitat꿯□ηrestoration꿯□ηefforts,꿯□ηwhich꿯□ηcumulatively꿯□ηcan꿯
impacts꿯□ηsimilar꿯□ηto꿯□ηthe꿯□ηTunnels꿯□ηand꿯□ηthe꿯□η[206] *Bay* [illegible] *Conservation* [illegible] *Delta* [illegible] *Plan* [illegible] *la*
Conservation꿯□ηPlan꿯□ηstates꿯□ηthat꿯□η"at꿯□ηthis꿯□ηtime…꿯□ηthere꿯□ηis꿯□ηno꿯□ηproven꿯
mobilization꿯□ηof꿯□ηmercury꿯□ηinto꿯□ηthe꿯□ηaquatic꿯□ηsystem꿯□ηresulting꿯□η*The* [illegible] *on* [illegible] *inund*

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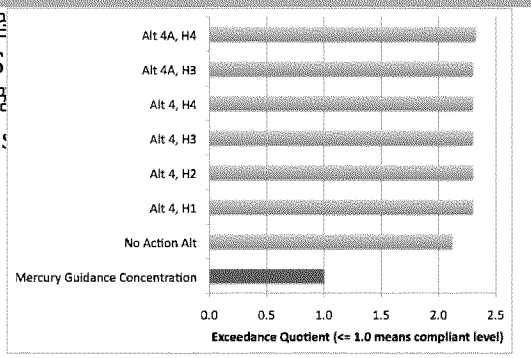
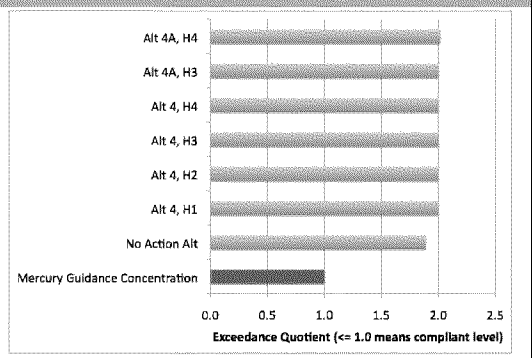
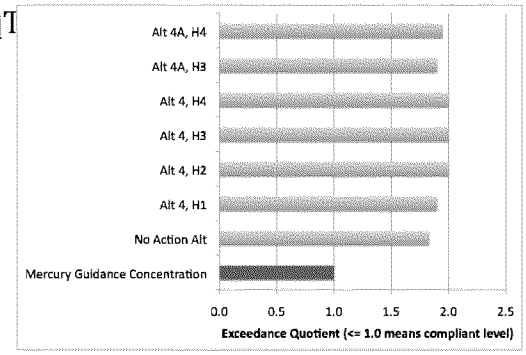
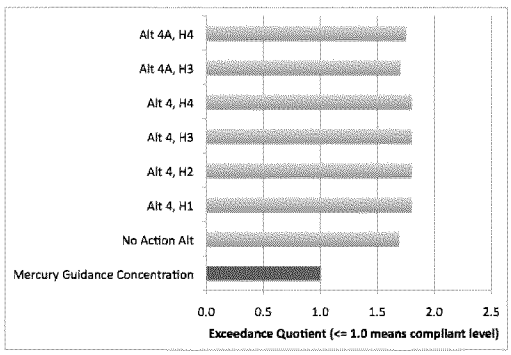
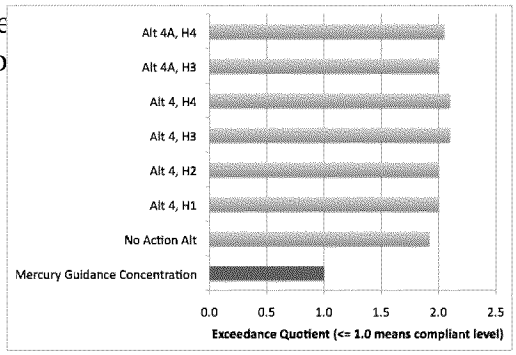
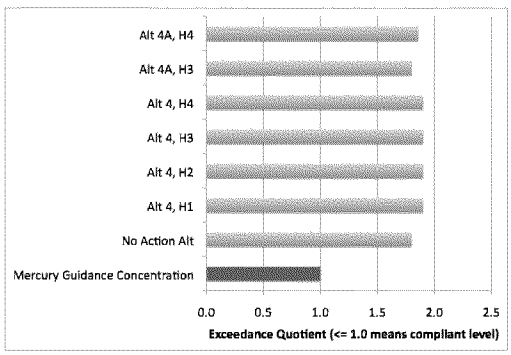
[204]꿯□ηEnvironmental꿯□ηWater꿯□η*Caucus* [illegible] *letter* [illegible] *on* [illegible] *Bay* [illegible] *Delta* [illegible] *Conservation* [illegible] *Plan* [illegible] *and* [illegible] *Impact* [illegible] *Report/Statement*,꿯□ηJune꿯□η11,꿯□η2014,꿯□ηFigure꿯□η9,꿯□η[illegible] *http://dwr.ca.gov/* [illegible] *accessible* [illegible] *online* reports/bdcpcomments6-□11-□2014-□2.pdf꿯□η

[205]꿯□ηBay꿯□ηDelta꿯□ηConservation꿯□ηPlan/California꿯□ηWaterFix,꿯□ηRecirculated꿯□ηDraft꿯□ηEIR/Supplem
4.3.4,꿯□ηp.꿯□η4.3.4-□33,꿯□ηlines꿯□η15-□45.

[206]꿯□ηBased꿯□ηon꿯□ηEquation꿯□η1꿯□ηcalculations꿯□ηaccording꿯□ηto꿯□ηAppendix꿯□η8I꿯□ηof꿯□ηthe꿯
EIS꿯□ηin꿯□η2013-□2014꿯□ηand꿯□ηAppendix꿯□ηB꿯□η(Tables꿯□ηHg-□5꿯□ηand꿯□ηHg-□7)꿯□ηand꿯□ηAp
Supplemental꿯□ηEIS꿯□ηin꿯□η2015.꿯□ηSee꿯□ηalso꿯□η*Comment* [illegible] *Water* [illegible] *Caucus*,2014꿯□ηabove.

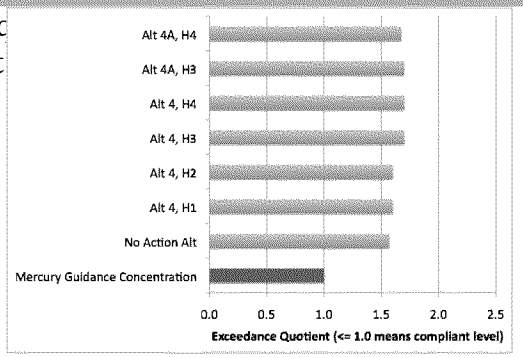
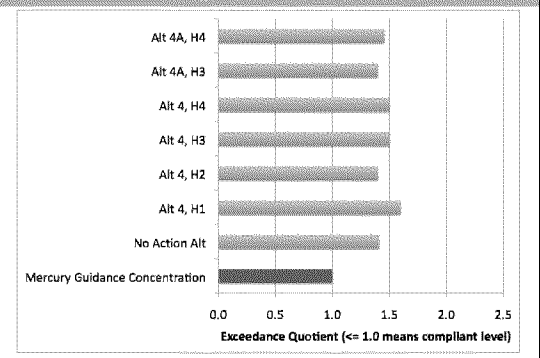
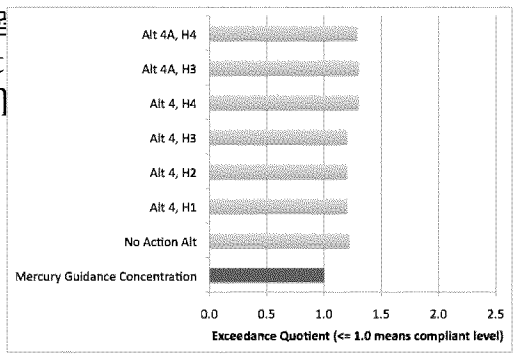
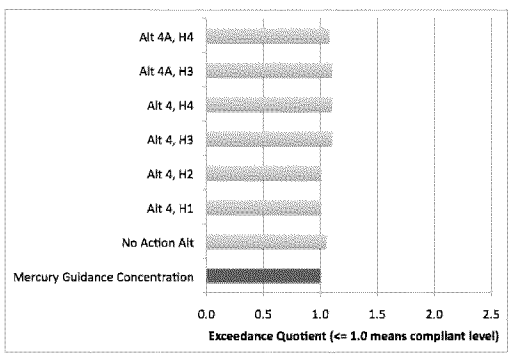
mitigation 꿹□ηmeasures...are 꿹□ηmeant 꿹□ηto 꿹□ηprovide 꿹□ηa 꿹□ηlist 꿹□ηof 꿹□ηcurrent 꿹□ηresearch 꿹 mitigate 꿹□ηmercury 꿹□ηmethylation."[207]

Figure꿹□η15
Mercury꿹□ηConcentrations꿹□ηin꿹□ηLargemouth꿹□ηBass꿹□η(350꿹□ηm
Thresholds꿹□ηin꿹□ηFuture꿹□ηCondition꿹□ηwith꿹□ηand꿹□ηwith

Location	Average꿹□ηof꿹□ηAll꿹□ηI	Average꿹□ηof꿹□ηDrought꿹
Mokelumne꿹 River꿹□η(S Fork)꿹□ηat꿹 Staten꿹□ηIs		
Franks꿹□ηT		
Old꿹□ηRive Rock꿹□ηSlo		

[207]꿹□ηCharles꿹□ηN.꿹□η*Stokes*,꿹□η*Sara*꿹□η*Houston*꿹□η*Delta*꿹□η*Regional*꿹□η*Ecosystem*꿹□η*Restoration*꿹□η*Impl Ecosystem*꿹□η*Conceptual*꿹□η*Model*,꿹□η*Prepared*꿹□ηJanuary꿹□η24,꿹□η2008,꿹□ηpp.꿹□η12-13.꿹□ηAccessible꿹 nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=6413.

Figure꿲□ŋ15
Mercury꿲□ŋConcentrations꿲□ŋin꿲□ŋLargemouth꿲□ŋBass꿲□ŋ(350꿲□ŋm
Thresholds꿲□ŋin꿲□ŋFuture꿲□ŋCondition꿲□ŋwith꿲□ŋand꿲□ŋwith

Location	Average꿲□ŋof꿲□ŋAll꿲□I	Average꿲□ŋof꿲□ŋDrought꿲
San꿲□ŋJoac River꿲□ŋat Antioch		
Sacramento꿲 River꿲□ŋat Mallard꿲□ŋ Island		

Notes:꿲□ŋ“Exceedence꿲□ŋQuotient”꿲□ŋis꿲□ŋthe꿲□ŋratio꿲□ŋof꿲□ŋestimated꿲□ŋconcentratio
the꿲□ŋDelta꿲□ŋTMDL꿲□ŋguidance꿲□ŋconcentration꿲□ŋof꿲□ŋ0.24꿲□ŋmg/kg꿲□ŋww꿲□ŋof꿲
conditions,꿲□ŋ“Exceedance꿲□ŋQuotients”꿲□ŋare꿲□ŋgreater꿲□ŋthan꿲□ŋ1.0,꿲□ŋmeaning꿲□ŋt
concentration꿲□ŋrecommended꿲□ŋby꿲□ŋUSEPA꿲□ŋis꿲□ŋviolated.꿲□ŋAll꿲□ŋExceedance꿲□ŋ
Equation꿲□ŋ1꿲□ŋcalculations꿲□ŋaccording꿲□ŋto꿲□ŋAppendix꿲□ŋ8I꿲□ŋof꿲□ŋthe꿲□ŋBay꿲
Appendix꿲□ŋB꿲□ŋ(Tables꿲□ŋHg-□5,꿲□ŋp.꿲□ŋB-□147,꿲□ŋand꿲□ŋHg-□7,꿲□ŋp.꿲□ŋB-□149)
Supplemental꿲□ŋEIS.꿲□ŋA꿲□ŋratio꿲□ŋof꿲□ŋ1.0꿲□ŋor꿲□ŋless꿲□ŋwould꿲□ŋmean꿲□ŋcom

Selenium

The꿲□ŋRDEIR/SDEIS꿲□ŋerrs꿲□ŋin꿲□ŋassuming꿲□ŋdecreasing [illegible] ***ŋselenium*** [illegible] ***ŋtissues꿲□ŋloads.*** 꿲
in꿲□ŋwater꿲□ŋare꿲□ŋexpected꿲□ŋto꿲□ŋchange꿲□ŋonly꿲□ŋslightly꿲□ŋunder꿲□ŋthe꿲□ŋTunnels
average꿲□ŋselenium꿲□ŋconcentrations꿲□ŋin꿲□ŋwhole-□body꿲□ŋsturgeon꿲□ŋare꿲□ŋexpected꿲□ŋt
according꿲□ŋto꿲□ŋTunnels꿲□ŋProject꿲□ŋmodeling꿲□ŋresults꿲□ŋin꿲□ŋthe꿲□ŋRDEIR/SDEIS.꿲□ŋT
Figures꿲□ŋ16,꿲□ŋ17,꿲□ŋand꿲□ŋ18.꿲□ŋIn꿲□ŋaddition,꿲□ŋthe꿲□ŋRDEIR/SDEIS꿲□ŋreports꿲□ŋtha
recommended꿲□ŋby꿲□ŋPresser꿲□ŋand꿲□ŋLuoma꿲□ŋwill꿲□ŋbe꿲□ŋexceeded꿲□ŋunder꿲□ŋTunnel
to꿲□ŋNo꿲□ŋAction꿲□ŋAlternative꿲□ŋconditions.꿲□ŋIn꿲□ŋparticular,꿲□ŋtheir꿲□ŋ"low"꿲□ŋthresho
would꿲□ŋsee꿲□ŋan꿲□ŋexceedance꿲□ŋquotient꿲□ŋof꿲□ŋ1.1꿲□ŋfor꿲□ŋboth꿲□ŋoperational꿲□ŋscen
relative꿲□ŋto꿲□ŋthe꿲□ŋNo꿲□ŋAction꿲□ŋAlternative꿲□ŋcondition꿲□ŋof꿲□ŋ0.95꿲□ŋfor꿲□ŋthe꿲
the꿲□ŋhigher꿲□ŋprotective꿲□ŋthreshold꿲□ŋthey꿲□ŋrecommend,꿲□ŋthe꿲□ŋexceedance꿲□ŋquotient
but꿲□ŋwould꿲□ŋnonetheless꿲□ŋincrease꿲□ŋfrom꿲□ŋ0.59꿲□ŋto꿲□ŋabout꿲□ŋ0.7.꿲□ŋFor꿲□ŋSacr
average꿲□ŋannual꿲□ŋexceedance꿲□ŋquotients꿲□ŋunder꿲□ŋTunnels꿲□ŋProject꿲□ŋclow꿲□ŋconditions꿲
the꿲□ŋNo꿲□ŋAction꿲□ŋAlternative꿲□ŋfrom꿲□ŋ0.88꿲□ŋto꿲□ŋ0.99,꿲□ŋvery꿲□ŋclose꿲□ŋto꿲□ŋe

report the error rate for the modeling here performed, so these
since they are so close to 1.0.[208]

The Tunnels Project provides no mitigation method at all, just a
research issues to be [illegible] *the Tunnels project "California Water Fi*
premature application to the Corps of Engineers are not real adap
prejudging of scientiQic [illegible] outcomes. The Tunnels construction and habitat restoration
around the Bay-Delta Estuary, DWR and its partners would have
basis.[210]

Retirement of the drainage impaired lands of the western San Jo
and again to be the most cost-effective solution to the problem
drainage.[211] Land retirement is the best and cheapest option for
loads and concentrations reach the Delta, and for sequestering seleni
longer into the future. The natural reservoir of selenium has bee
another 300 years' worth of tainted [illegible] National Research Council
2012 report on Bay-Delta sustainable water management cited this
stating in part:

> Irrigation drainage, contaminated by selenium from those soils, is also
> Joaquin Valley groundwaters. The problem is exacerbated by the recycling
> water is exported from the delta. While control of selenium releases
> controls will be effective is not clear because of the selenium reser

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[208] RDEIR/SDEIS, Appendix B, Table Se-7, p. B-186.

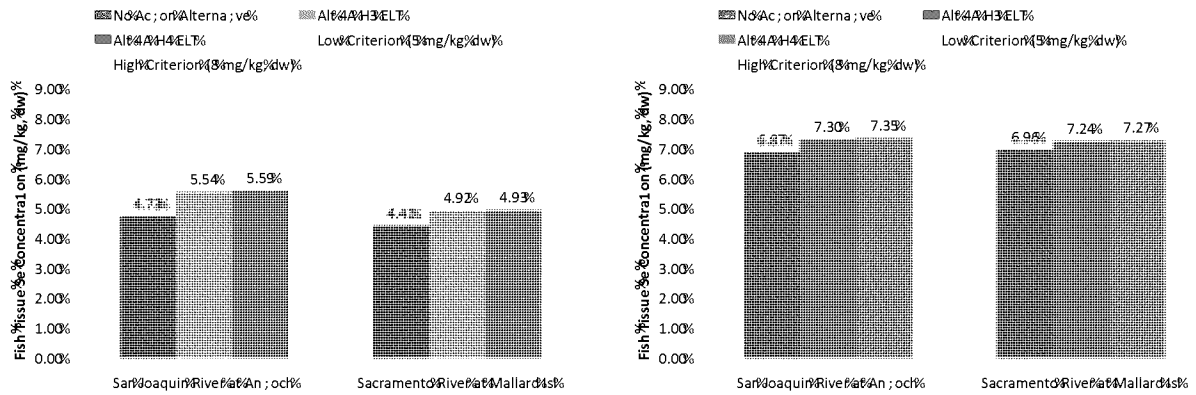
[209] These research approaches include: Characterize soil mercury concentrations
project basis; sequester MeHg using low-intensity chemical dosing techniques
like ferric sulcide or poly-aluminum chloride. These cloculants bind with
to clocculate and deposit mercury out of solution; minimize microbial meth
wetlands; design restored wetland habitat to enhance photodegradation of MeH
sediments with iron to prevent the biogeochemical reactions that methylate
sediments (essentially entomb and bury them permanently to keep from m
mercury). The research "measures" that BDCP proposes do not include basi
mercury's effects on these and other cish and aquatic species found in

[210] Bay Delta Conservation Plan Environmental Impact Report/Environmental Impact
Water Quality, p. 8-260, lines 30-35; p. 8-446, lines 39-42, and p.
uncertainties associated with site-specicic estimates of methylmercury concentrations
in source modeling and tissue modeling, the effectiveness of methylmercury
evaluated separately for each restoration effort, as part of design and
uncertainty and the known potential for methylmercury creation in the Del
considered adverse."

[211] Presser, T.S. and S.E. [illegible] *Schwarzbach, 2008, Selenium in the San Joaquin Valley Drainage Management Program for the Western San Joaquin Geographic* Survey Open File Report 2008-1210. http://pubs.usgs.gov/of/2008/1210/.

[212] T.S. Presser and [illegible] *Discharges to the San Francisco Ecological Effects of a Proposed Land Use Change* United States Geological Survey Professional 1646, [illegible] in: T. [illegible] *Recent Salinity and Selenium Science and Mod Estuary*, plus appendices, prepared for the California Water Impact Network, #1, Ecosystem Changes and the Low Salinity Zone, before the State Wa

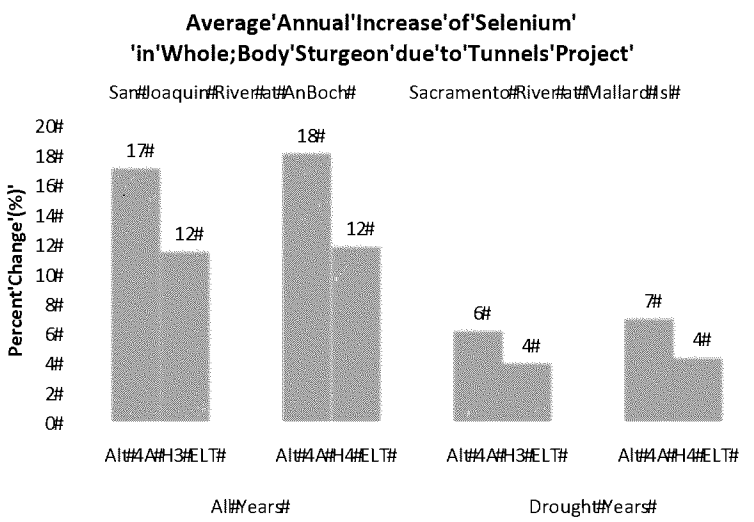
Figure꿯□ŋ16
Period꿯□ŋAverage꿯□ŋWhole┐□Body꿯□ŋSturgeon꿯□ŋSelenium꿯□I



All꿯□ŋYears Drought꿯□ŋYears

Source:꿯□ŋRDEIR/SDEIS,꿯□ŋAppendix꿯□ŋB,꿯□ŋTable꿯□ŋSe-□5,꿯□ŋp.꿯□ŋB-□185.꿯□ŋ

Figure꿯□ŋ17

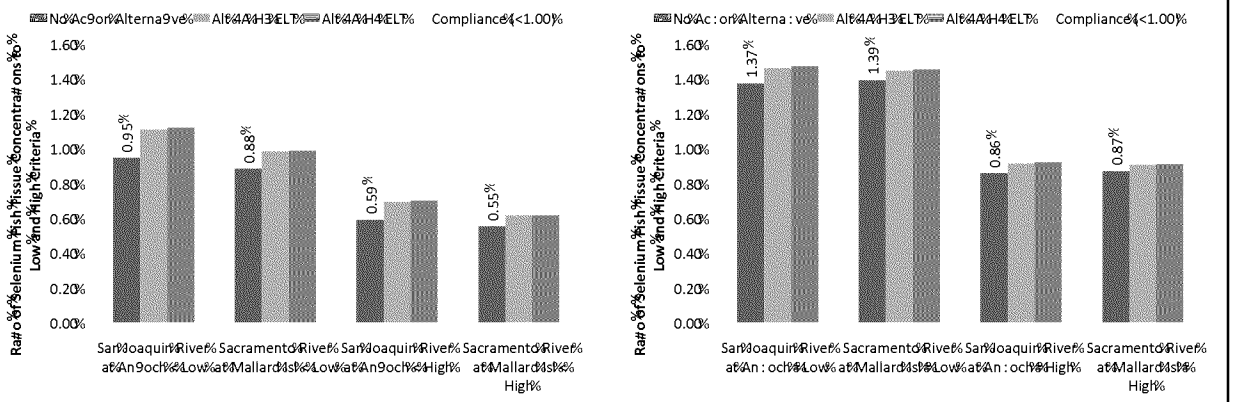


Source:꿯□ŋRDEIR/SDEIS,꿯□ŋAppendix꿯□ŋB,꿯□ŋTable꿯□ŋSe-

...Other꿯□ŋaspects꿯□ŋof꿯□ŋwater꿯□ŋmanagement꿯□ŋalso꿯□ŋcould꿯□ŋaffect꿯□ŋselenium꿯□ŋcontaminat
infrastructure꿯□ŋchanges꿯□ŋin꿯□ŋthe꿯□ŋdelta꿯□ŋsuch꿯□ŋas꿯□ŋconstruction꿯□ŋof꿯□ŋan꿯□ŋisolated꿯
more꿯□ŋSacramento꿯□ŋRiver꿯□ŋwater꿯□ŋto꿯□ŋthe꿯□ŋsouth,꿯□ŋwhich꿯□ŋwould꿯□ŋallow꿯□ŋmore꿯
water꿯□ŋto꿯□ŋenter꿯□ŋthe꿯□ŋbay.꿯□ŋThe꿯□ŋsolutions꿯□ŋto꿯□ŋselenium꿯□ŋcontamination꿯□ŋmust꿯

and the risks from selenium to the bay are an important consideration affect how San Joaquin River[213] water gets to the bay.

Figure 18
Comparison of Annual Average of Selenium in Whole Body Sturgeon with Toxicity



All Years Drought Years

Source: RDEIR/SDEIS, Appendix B, Table Se-7, p. B-186. Data Alternative for comparison purposes.

Of course, ending application of Delta waters to irrigate western impaired lands could reduce the need for deliveries to the San by up to a million [illegible] ***This reduction could provide by itself dramatic improved reliability for all other CVP contractors' allocations, without billions for the Tunnels project.***

Harmful Algal Blooms

Algae occur naturally in all fresh and marine water environments. normal circumstances, but some "cyanobacteria" (also known as "blue-g photosynthesis can "bloom" or undergo a rapid population boom dur nutrient pollution conditions (such as from nitrates, nitrogen and phe temperatures. Their sheer biomass can cause, according to the USEPA complete consumption of all dissolved oxygen in the water, suffocati like cish, and can produce "cyanotoxins" that pose a signicicant ecological health and affect taste, odor and safety of drinking wa used for recreation and as drinking water supplies.[214]

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[213] National Research Council, Committee on Sustainable Water and Environmen California Bay-Delta [illegible] *Sustainable Water and Environmental Management in the California* Washington, DC: The National Academies Press, 2012, p. 291. Accessible onli www.nap.edu/catalog.php?record_id=13394.

[214] USEPA *Regional Basin Question and Resources for Harmful Algal Blooms* *Toxins*, Version 1, July 2015, Accessible at http://www.epa.gov/nutrient-pollution/ciles/2015-07/documents/habs_faqs-and-resources_v1-july2015.pdf

When these conditions combine, harmful algal blooms can result. The August and September in the Estuary, but drought can increase most common blue-green algae species in *Microcystis* Bay-Delta 2014 Estuary, *Microcystis algae* blooms lasted beyond October into December due to temperatures—water residence time [215] was Its that toxin is deadly to wildlife, human beings, and exposure can cause liver cancer in humans. public health threat.

The Tunnels are likely to increase residence times and slow clo The recirculated Draft EIR/S this year acknowledges that "it is p frequency, magnitude, and geograp*Microcystis* extent blooms in the Delta would relative to Existing Conditions" well as compared with the "no action future condition of the Delta without "California WaterFix" Tunnels).

Because it cannot meet water quality standards, the Tunnels Proj required Clean Water Act 401 Certi.ication it needs for 404 obtain CWA Section 401 certication, the project at issue must including the requirement to meet water quality standards under CW requirements are met, then either the Regional Water Quality Contro SWRCB may grant Section 401 certication.

As implementing U.S. EPA [219] regulations [220] 401 certication "shall" include statement that there is a reasonable assurance that the activity will not violate applicable water quality standards; the state section 401 certication to a project if there is no reasonable assurance standards. The examination of whether a project violates water quali "balancing" factors such as economic considerations – a project eithe

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[215] Peggy Lehman, Staff Environmental Scientist, California Department of Water IEP 2015 Workshop, Folsom, California, "Response of Microcystis to Drought,"

[216] RDEIR/SDEIS, Section 4.3, p. 4.3.4-67.

[217] 33 U.S.C. § 1341(a)(1), (d). A state agency may also condition, circumstances. See also 33 U.S.C. § 1341(a)(1)-(2), and 33 U.S.C. § 13 certication shall set forth any efcluent limitations and other limitations … applicant"complies with certain provisions of the CWA. *PUD No. 1 of Jefferson County v. Washington Department of Ecology*, 511 U.S. 700, 713-715 (1 1).

[218] In California, the Regional Water Quality Control Boards are responsible certication, unless the project occurs in two or more regions, in which SWRCB, "Instructions for Completing the Clean Water Act Section 401 Water Application" (Jan. 2005), www.waterboards.ca.gov/centralcoast/water_issues/programs/401wqcert/docs/instruct_401_wq_cert_app.pdf.

[219] The Supreme Court held that the EPA's interpretation is consistent

[220] 40 CFR § 121.2(a)(3), 121.7(d)(2).

standards,[221] or it is not. As concirmed by the 1994 U.S. Supre
PUD No. 1 of Jefferson County v. [illegible] certication considers the impacts of activity in the not just impacts of any
discharge that triggers Section 401 the Tunnels Project to receive Section
the entire project must show it can be built and operated so as
This it will not do, as we show in this letter and its
cannot be met under the currently-proposed Tunnels Project clow
estuarine water quality and benecicial uses.

The CWA states that water quality standards "shall consist of the
waters involved [illegible] water quality criteria for such [illegible] upon
words, "a project that does not [illegible] designated [illegible] water
comply with the applicable water quality standards" [illegible] mental CWA mandate
change when the impact on benecicial uses arises from altered
specicically to "restore and maintain the chemical, physical, and biological integrity of the
waters"—not solely to regulate pollutants. U.S. Supreme Court addressed
in *PUD No. 1* stating that:

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[221] 40 CFR § 131.11 ("For waters with multiple use designations, the
use"); see also 40 CFR § 131.6. As noted by the state Supreme Court, Porter-
federal law forbids"; that is, California cannot allow for the "balancing
uses in a reliance on Porter-Cologne [illegible] *Water Quality Control Board*, 35 Cal.4th 613, 626, 108 P.3d 862 (2005).

[222] *PUD No. 1*, 511 U.S. *PUD No. 1*, 511 U.S. established that so long as there is a
regulate an activity as [illegible] *PUD No. 1*, 511 U.S. 701, 712 (1994).

[223] 33 U.S.C. § 1313(c)(2)(A) (emphasis added). In addition to the uses to
criteria to protect those uses, water quality standards include an antidegrad
standards are "sufcicient to maintain existing benecicial uses of navigable waters
degradation." *PUD No. 1*, 511 U.S. 701, 718 (1994). 33 U.S.C. § 1313(d)(4)(B); 40 CFR § 131.6. EPA
instream water uses and the level of water quality necessary to protec
and protected." 40 CFR § 131.12.

[224] *PUD No. 1*, 511 U.S. at 704. 40 CFR § 131.3(b) (U.S. EPA stating that "[
quality generally protect the designated use," [emphasis added] indicating that
always by themselves protect a designated use). Recognized benecicial uses
but are not limited to, agricultural supply (AGR), groundwater recharge (GW
(REC-1), Non-Contact Water Recreation (REC-2), Migration of Aquatic Organisms
Reproduction, and/or Early Development (SPWN), Estuarine Habitat (EST), and
Endangered Species (RARE).

[225] 33 U.S.C. § 1251(a). Emphasis added.

Petitioners 꿯 ηalso 꿯 ηassert 꿯 ηmore 꿯 ηgenerally 꿯 ηthat 꿯 ηthe 꿯 ηClean 꿯 ηWater 꿯 ηAct 꿯 ηis 꿯 η
and 꿯 ηdoes 꿯 ηnot 꿯 ηallow 꿯 ηthe 꿯 ηregulation 꿯 ηof 꿯 ηwater 꿯 η[226]quantity.' 꿯 ηThis 꿯 ηis 꿯 ηan 꿯

The 꿯 ηCourt 꿯 ηspecicically 꿯 ηtook 꿯 ηnote 꿯 ηof 꿯 ηCWA 꿯 ηSections 꿯 η101(g) 꿯 ηand 꿯 η51
over 꿯 ηthe 꿯 ηallocation 꿯 ηof 꿯 ηwater 꿯 ηas 꿯 ηbetween 꿯 ηusers. 꿯 ηThe 꿯 ηCourt 꿯 ηfound
the 꿯 ηscope 꿯 ηof 꿯 ηwater 꿯 ηpollution 꿯 ηcontrols 꿯 ηthat 꿯 ηmay 꿯 ηbe 꿯 ηimposed 꿯 ηon 꿯
state 꿯 ηlaw, 꿯 ηa 꿯 ηwater 꿯 η[227]allocation. 꿯 ηThis 꿯 ηconclusion 꿯 ηis 꿯 ηsupported 꿯 ηby 꿯 ηthe 꿯 η"exce
in 꿯 ηthis 꿯 ηAct" 꿯 ηlanguage 꿯 ηof 꿯 ηSection 꿯 η510(2), 꿯 ηwhich 꿯 ηconditions 꿯 ηstate 꿯 ηw
legislative 꿯 ηhistory 꿯 ηof 꿯 ηSection 꿯 η101(g), 꿯 ηwhich 꿯 ηallows 꿯 ηfor 꿯 ηimpacts 꿯 ηto 꿯 η
of 꿯 ηstate 꿯 ηaction 꿯 ηunder 꿯 ηthe 꿯 ηCWA 꿯 ηwhen 꿯 η"prompted 꿯 ηby 꿯 ηlegitimate 꿯 ηan
considerations."[228] 꿯 η꿯 ηAccordingly, 꿯 ηthese 꿯 ηCWA 꿯 ηprovisions 꿯 ηare 꿯 ηnot 꿯 ηimpedimen
implementation 꿯 ηof 꿯 ηits 꿯 ηCWA 꿯 ηmandate 꿯 ηto 꿯 ηensure 꿯 ηcomplia*nce* 꿯 η꿯 ηwith 꿯 ηwate
within 꿯 ηthe 꿯 ηcontext 꿯 ηof 꿯 ηclows. 꿯 η

As 꿯 ηnoted 꿯 ηabove, 꿯 ηin 꿯 ηits 꿯 ηAugust 꿯 η2010 꿯 ηclow 꿯 ηcriteria 꿯 ηreport, 꿯 ηthe 꿯 η
available 꿯 ηscience 꿯 ηsuggests 꿯 ηthat 꿯 ηcurrent 꿯 ηclows 꿯 ηare 꿯 ηinsufcicient 꿯 ηto 꿯 ηprotect 꿯
that 꿯 η"[r]ecent 꿯 ηDelta 꿯 ηclows 꿯 ηare 꿯 ηinsufcicient 꿯 ηto 꿯 ηsupport 꿯 η[229]native 꿯 ηDelta 꿯 η
However, 꿯 ηclow 꿯 ηregimes 꿯 ηproposed 꿯 ηby 꿯 ηthe 꿯 ηcurrent 꿯 ηTunnels 꿯 ηProject 꿯 ηrely
clow) 꿯 ηobjectives 꿯 ηthat 꿯 ηhave 꿯 ηbeen 꿯 ηfailing 꿯 ηto 꿯 ηprotect 꿯 ηDelta 꿯 ηecosystem 꿯 η
uses 꿯 ηfor 꿯 ηthe 꿯 ηlast 꿯 η15 꿯 ηyears 꿯 ηor 꿯 ηmore. 꿯 ηThese 꿯 η[230]includes the 꿯 ηWater 꿯 η
San 꿯 ηFrancisco 꿯 ηBay/Sacramento- 꿯 ηSan 꿯 ηJoaquin 꿯 ηDelta 꿯 ηEstuary 꿯 ηWater 꿯 ηQuality 꿯 η
NMFS 꿯 ηBiological 꿯 ηOpinion 꿯 η(BiOp); 꿯 ηand 꿯 ηthe 꿯 η2008 꿯 ηUSFWS 꿯 ηBiOp.

Further, 꿯 ηthe 꿯 ηTunnels 꿯 ηProject 꿯 ηnotably 꿯 ηincorporates 꿯 η"bypass 꿯 ηclows" 꿯 ηthat 꿯 ηos
minimum 꿯 ηamount 꿯 ηof 꿯 ηwater 꿯 ηthat 꿯 ηmust 꿯 ηclow 꿯 ηdownstream 꿯 ηof 꿯 ηthe 꿯 ηp

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[226] 꿯 η*BUDD* 꿯 η*v. U.S.* 꿯 η*Nos.* 꿯 η*12-1272, 12-1273* 꿯 η*(Fed. Cir. 2013)* 꿯 η*U.S.* 꿯 ηSupreme 꿯 ηCourt 꿯 ηtook 꿯 ηup 꿯 ηthe 꿯 ηquestio
Washington 꿯 ηstate 꿯 ηhad 꿯 ηproperly 꿯 ηissued 꿯 ηa 꿯 ηCWA 꿯 ηSection 꿯 η401 꿯 ηcerticication 꿯 ηimpe
requirement 꿯 ηto 꿯 ηprotect 꿯 ηcish 꿯 ηpopulations. 꿯 ηThe 꿯 ηSupreme 꿯 ηCourt 꿯 ηheld 꿯 ηthat 꿯 ηcond
minimum 꿯 ηstream 꿯 ηclows 꿯 ηwas 꿯 ηproper, 꿯 ηas 꿯 ηthe 꿯 ηcondition 꿯 ηwas 꿯 ηneeded 꿯 ηto 꿯 ηer
state 꿯 ηwater 꿯 ηquality 꿯 η*Id.* 꿯 η*at* 꿯 η*1223.* 꿯 η꿯 ηIn 꿯 ηreaching 꿯 ηthis 꿯 ηdecision, 꿯 ηthe 꿯 ηcourt 꿯 ηnoted
did 꿯 ηnot 꿯 ηcomply 꿯 ηwith 꿯 ηthe 꿯 ηdesignated 꿯 ηuse 꿯 ηof 꿯 η"[s]almonid 꿯 η[and 꿯 ηother 꿯 ηcish
harvesting," 꿯 ηand 꿯 ηso 꿯 ηdid 꿯 ηnot 꿯 ηcomply 꿯 ηwith 꿯 ηthe 꿯 η*Id.* 꿯 η*at* 꿯 η*1224.* 꿯 ηwater 꿯 ηquality 꿯 ηs

[227] 꿯 η*Id.* 꿯 η*at* 꿯 η720.

[228] 꿯 η*Id.* 꿯 η"See 꿯 η3 꿯 ηLegislative 꿯 ηHistory 꿯 ηof 꿯 ηthe 꿯 ηClean 꿯 ηWater 꿯 ηAct 꿯 ηof 꿯 η1977 꿯 η(C
on 꿯 ηEnvironment 꿯 ηand 꿯 ηPublic 꿯 ηWorks 꿯 ηby 꿯 ηthe 꿯 ηLibrary 꿯 ηof 꿯 ηCongress), 꿯 ηSer. 꿯 ηNo
requirements 꿯 η[of 꿯 ηthe 꿯 ηAct] 꿯 ηmay 꿯 ηincidentally 꿯 ηaffect 꿯 ηindividual 꿯 ηwater 꿯 ηrights. 꿯 η. 꿯
amendment 꿯 ηto 꿯 ηprohibit 꿯 ηthose 꿯 ηincidental 꿯 ηeffects. 꿯 ηIt 꿯 ηis 꿯 ηthe 꿯 ηpurpose 꿯 ηof 꿯 ηthi
allocation 꿯 ηsystems 꿯 ηare 꿯 ηnot 꿯 ηsubverted 꿯 ηand 꿯 ηthat 꿯 ηeffects 꿯 ηon 꿯 ηindividual 꿯 ηrights, 꿯
and 꿯 ηnecessary 꿯 ηwater 꿯 ηquality 꿯 η*See, e.g., Memorandum* 꿯 η꿯 ηfrom 꿯 ηU.S. 꿯 ηEPA 꿯 ηWater 꿯 ηand 꿯 ηW
Management 꿯 ηand 꿯 ηGeneral 꿯 ηCounsel 꿯 ηto 꿯 ηU.S. 꿯 ηEPA 꿯 ηRegional 꿯 ηAdministrators, 꿯 η"StateAu
WaterQuantities 꿯 η– 꿯 ηSection 꿯 η101(g) 꿯 ηof 꿯 ηthe 꿯 ηClean 꿯 ηWater 꿯 η꿯 η"Act" 꿯 η(Nov. 꿯 η7, 꿯 η197
scitech/swguidance/standards/upload/1999_11_03_standards_waterquantities.pdf.

[229] 꿯 ηSWRCB, 꿯 η2010 꿯 ηDelta 꿯 ηFlowCriteria 꿯 ηReport 꿯 η꿯 η*http://www.swrcb.ca.gov/waterrights/water_issues/programs/bay_delta/deltaclow/docs/cinal_rpt080310.pdf.* 꿯 η꿯 η*Accessible* 꿯 η*at* 꿯 η

[230] 꿯 ηD- 꿯 η1641 꿯 ηrequires 꿯 ηthe 꿯 ηSWP 꿯 ηand 꿯 ηCVP 꿯 ηto 꿯 ηmeet 꿯 ηclow 꿯 ηand 꿯 ηwater 꿯 ηq
requirements, 꿯 ηan 꿯 ηexport/import 꿯 ηratio, 꿯 ηspring 꿯 ηexport 꿯 ηreductions, 꿯 ηsalinity 꿯 ηrequirements
other 꿯 ηcontrolling 꿯 ηrestrictions, 꿯 ηa 꿯 ηlimit 꿯 ηto 꿯 ηDelta 꿯 ηexports 꿯 ηof 꿯 η35 꿯 ηpercent 꿯 ηtot
and 꿯 η65 꿯 ηpercent 꿯 ηinclow 꿯 ηfrom 꿯 ηJuly 꿯 ηthrough 꿯 ηJanuary.

than꿯□ηprotecting꿯□ηDelta꿯□ηclow,꿯□ηthe꿯□ηTunnels꿯□ηProject꿯□ηreduces꿯□ηaverage꿯□ηannu
downstream꿯□ηof꿯□ηthe꿯□ηNorth꿯□ηreduced꿯□ηflows꿯□ηdownstream꿯□ηof꿯□ηthe꿯□ηnorth꿯
extend꿯□ηall꿯□ηthe꿯□ηway꿯□ηpast꿯□ηBecause꿯□ηwe꿯□ηput꿯□ηneeded꿯□ηclows
waterways,꿯□ηthe꿯□ηTunnels꿯□ηProject꿯□ηwill꿯□ηviolate꿯□ηwater꿯□ηquality꿯□ηstandards꿯□ηby꿯
benecicial꿯□ηuses.꿯□ηThese꿯□ηinclude꿯□η"rare,꿯□ηthreatened꿯□ηor꿯□ηendangered꿯□ηspecies꿯□
"spawning,꿯□ηreproduction,꿯□ηand/or꿯□ηearly꿯□ηdevelopment,"꿯□ηand꿯□ηother꿯□ηsensitive꿯□η
Chinook꿯□ηsalmon,꿯□ηCentral꿯□ηValley꿯□ηsteelhead,꿯□ηsturgeon꿯□ηand꿯□ηlamprey꿯□ηall꿯□ηm
with꿯□ηDelta꿯□ηsmelt꿯□ηand꿯□ηlongcin꿯□ηsmelt꿯□ηlikely꿯□ηspawning꿯□ηin꿯□ηthe꿯□ηlower
hydraulically꿯□ηconnected꿯□ηadjacent꿯□ηchannels.꿯□ηFactoring꿯□ηout꿯□ηclimate꿯□ηchange꿯□ηe
salmon꿯□ηsmolt꿯□ηsurvival꿯□ηrates꿯□ηthrough꿯□ηthe꿯□ηDelta꿯□ηto꿯□ηChipps꿯□ηIsland꿯□ηc
under꿯□ηthe꿯□ηclow꿯□ηregimes꿯□ηput꿯□ηforward꿯□ηby꿯□ηpeople꿯□ηnets꿯□ηnonetheless꿯□ηthe꿯□ηPro
will꿯□ηthus꿯□ηfail꿯□ηas꿯□ηa꿯□ηset꿯□ηof꿯□ηclow꿯□ηregimes꿯□ηthat꿯□ηcould꿯□ηsupport꿯□
Section꿯□η404꿯□ηpermits.

Actions꿯□ηthat꿯□η"reasonably꿯□ηprotect"꿯□ηthan꿯□η"protect"꿯□ηthe꿯□ηbenecicial꿯□ηuse꿯□ηare
multiple꿯□ηbenecicial꿯□ηuses꿯□ηare꿯□ηat꿯□ηstake,꿯□ηadopted꿯□ηclows꿯□ηmust꿯□η
use꿯□ηthey꿯□ηcannot꿯□η"balance"꿯□ηaway꿯□ηuses)꿯□ηand꿯□ηmust꿯□ηbe꿯□ηbased꿯□ηsupport
Court꿯□ηfound,꿯□ηPorter-□Cologne꿯□ηbalancing꿯□ηprovide꿯□ηonly꿯□η"reasonable"꿯□ηprotec
"cannot꿯□ηauthorize꿯□ηwhat꿯□ηfederal꿯□ηlaw꿯□ηprotective꿯□ηCWA꿯□ηwater꿯□ηqual
requirements꿯□ηtake꿯□ηprecedence꿯□ηover꿯□ηweaker꿯□ηPorter-□Cologne꿯□ηlanguage;꿯□ηecosyst
cannot—and꿯□ηmust꿯□ηnot—be꿯□ηbalanced꿯□ηaway.꿯□η

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[231]꿯□ηSee꿯□ηAttachment꿯□η1꿯□ηin꿯□ηthis꿯□ηletter,꿯□ηabove,꿯□ηand꿯□ηPublic꿯□ηDraft꿯□ηPlan꿯□η§
baydeltaconservationplan.com/Libraries/Dynamic_Document_Library/Public_Draft_BDCP_Chapter_5_-□
_Effects_Analysis.sclb.ashx꿯□ηSee꿯□ηAlso꿯□ηBDCP꿯□ηDraft꿯□ηRDEIR/SDEIS꿯□ηChapter꿯□η3-□17,꿯□ηp.꿯
3-□186.

[232]꿯□ηSee꿯□ηRDEIR/SDEIS,꿯□η2015,꿯□ηAppendix꿯□ηB,꿯□ηTable꿯□ηB.7-□30,꿯□ηpp.꿯□ηB-□361꿯□ηto꿯□η

[233]꿯□ηState꿯□ηWater꿯□ηResources꿯□ηControl꿯□ηBoard꿯□ηPlan꿯□ηfor꿯□ηthe꿯□ηSan꿯□ηFrancisco꿯
San꿯□ηJoaquin꿯□ηDelta꿯□η13,꿯□η2006,꿯□ηp.꿯□η9.

[234]꿯□ηBy꿯□η"factoring꿯□ηout꿯□ηclimate꿯□ηchange꿯□ηeffects,"꿯□ηwe꿯□ηrefer꿯□ηto꿯□ηthe꿯□ηTunnels꿯
environmental꿯□ηimpact꿯□ηcomparisons꿯□ηbetween꿯□ηthe꿯□ηNo꿯□ηAction꿯□ηAlternative꿯□ηand꿯□ηAlter
H3꿯□ηor꿯□ηH4).꿯□ηThis꿯□ηcomparison꿯□ηreclects꿯□ηthe꿯□ηfuture꿯□ηmigration꿯□ηprospects꿯□ηof꿯□η
proposed꿯□ηTunnels꿯□ηProject.꿯□ηEven꿯□ηby꿯□ηthem꿯□ηpreferred꿯□ηcomparison꿯□ηof꿯□ηthe꿯□ηTunn
Alternative,꿯□ηjuveniles꿯□ηand꿯□ηsmolts꿯□ηhave꿯□ηlower꿯□ηsurvival꿯□ηrates꿯□ηthrough꿯□ηthe꿯□ηDelt

[235]꿯□ηSWRCB,꿯□η"Comments꿯□ηon꿯□ηthe꿯□ηSecond꿯□ηAdministrative꿯□ηDraft꿯□ηEnvironmental꿯□ηImpa
Impact꿯□ηStatement꿯□ηfor꿯□ηthe꿯□ηBay꿯□ηDelta꿯□ηConservationPlan,"꿯□ηp.꿯□η1꿯□η(July꿯□η05,꿯□η20
baydeltaconservationplan.com/Libraries/Dynamic_Document_Library/
State_Water_Resouces_Control_Board_Comments_on_BDCP_EIR-□EIS_7-□5-□2013.sclb.ashx꿯□ηEmphasis꿯□ηadded.

[236]꿯□ηEPA꿯□ηregulations꿯□ηstate꿯□ηthat꿯□η"criteria꿯□ηmust꿯□ηbe꿯□ηbased꿯□ηon꿯□ηsound꿯□ηscienti
parameters꿯□ηor꿯□ηconstituents꿯□ηto꿯□ηprotect꿯□ηthe꿯□ηdesignated꿯□ηuse.꿯□ηFor꿯□ηwaters꿯□ηwith꿯
criteria꿯□ηshall꿯□ηsupport꿯□ηthe꿯□ηdesignated꿯□ηuse.꿯□ηSee꿯□η40꿯□ηC.F.R.꿯□η§131.6.

[237]꿯□ηCalif.꿯□ηWater꿯□ηCode꿯□η§꿯□η13000.

[238]꿯□η*City꿯□ηof꿯□ηBurbank꿯□ηv.꿯□ηState꿯□ηWater꿯□ηResources꿯□ηControl꿯□ηBd.*,꿯□η108꿯□ηP.3d꿯□η862꿯
Supremacy꿯□ηClause).

USEPA뀀□ηcommented뀀□ηlast뀀□ηyear뀀□ηon뀀□ηthe뀀□ηBay뀀□ηDelta뀀□ηConservation뀀□ηPlan뀀□η
"[b]ecause뀀□ηthe뀀□ηlocation뀀□ηof뀀□ηX2뀀□η[the뀀□ηestuarine뀀□ηhabitat뀀□ηwater뀀□ηquality뀀□
freshwater뀀□ηclow뀀□ηthrough뀀□ηthe뀀□ηDelta,뀀□ηthe뀀□ηproposed뀀□ηproject뀀□ηwould뀀□ηhave
parameter,뀀□ηyet뀀□ηthe뀀□ηDraft뀀□ηEIS뀀□ηdoes뀀□ηnot뀀□ηanalyze뀀□ηeach뀀□ηalternative's뀀□η
of뀀□ηthis뀀□ηrelationship.[239]뀀□η뀀□ηThe뀀□ηBay-□Delta뀀□ηWater뀀□ηQuality뀀□ηControl뀀□ηPlan's뀀□ηestua
objective뀀□ηwill뀀□ηlikely뀀□ηbe뀀□ηviolated뀀□ηby뀀□ηthe뀀□ηTunnels뀀□ηProject뀀□ηas뀀□ηwell.뀀
EIR/EIS뀀□ηthere뀀□ηis뀀□ηno뀀□ηmodeling뀀□ηof뀀□ηhow뀀□ηchanges뀀□ηin뀀□ηX2,뀀□ηthe뀀□ηDel
objective뀀□ηmay뀀□ηaffect뀀□ηa뀀□ηvariety뀀□ηof뀀□ηestuarine뀀□ηspecies.뀀□ηX2,뀀□ηwhich뀀□ηme
the뀀□ηestuary's뀀□ηlow뀀□ηsalinity뀀□ηzone뀀□ηrelative뀀□ηto뀀□ηthe뀀□ηGolden뀀□ηGate,뀀□ηwas뀀
migrate뀀□ηupstream뀀□ηunder뀀□ηthe뀀□ηTunnels'뀀□ηincluence뀀□ηrelative뀀□ηto뀀□ηexisting뀀□ηco
Alternative.[240]뀀□η뀀□ηThe뀀□ηmodeled뀀□ηupstream뀀□ηmigration뀀□ηof뀀□ηX2뀀□ηmeans뀀□ηthat뀀
species뀀□ηwill뀀□ηshrink,뀀□ηespecially뀀□ηrelative뀀□ηto뀀□ηthe뀀□ηNo뀀□ηAction뀀□ηAlternative뀀
and뀀□ηX2뀀□ηare뀀□ηnegatively뀀□ηcorrelated:뀀□ηwhen뀀□ηX2뀀□ηmoves뀀□ηfurther뀀□ηfrom뀀□ηt
typically뀀□ηdecrease뀀□ηas뀀□ηthe뀀□ηsize뀀□ηof뀀□ηthe뀀□ηLow뀀□ηSalinity뀀□ηZone뀀□ηdecrease
exceptions.[241]뀀□ηThis뀀□ηapparently뀀□ηremains뀀□ηtrue뀀□ηof뀀□ηthe뀀□ηRDEIR/SDEIS,뀀□ηin뀀□ηw
conducted.

The뀀□ηState뀀□ηWater뀀□ηBoard뀀□ηhas뀀□ηindicated뀀□ηtentative뀀□ηinterest뀀□ηin뀀□ηdesignating
benecicial뀀□ηuse뀀□ηstatewide,뀀□ηincluding뀀□η[242]뀀□η뀀□ηthe뀀□ηDelta뀀□ηand뀀□ηothers뀀□ηwould뀀□
welcome뀀□ηsuch뀀□ηa뀀□ηbenecicial뀀□ηuse뀀□ηdesignation뀀□ηin뀀□ηthe뀀□ηDelta뀀□ηas뀀□ηelsew
sensitive뀀□ηecological뀀□ηand뀀□ηestuarine뀀□ηbenecicial뀀□ηuses뀀□ηwill뀀□ηalso뀀□ηprotect뀀□ηsu
use.뀀□ηHumans뀀□ηare뀀□ηconnected뀀□ηto뀀□ηthese뀀□ηother뀀□ηbenecicial뀀□ηuses,뀀□ηno뀀□ηles

The뀀□ηTunnels뀀□ηProject뀀□ηwill뀀□ηalso뀀□ηviolate뀀□ηnumerous뀀□ηpollutant뀀□ηcriteria뀀□ηmer
consequences뀀□ηfor뀀□ηpublic뀀□ηhealth뀀□ηand뀀□ηvitality뀀□ηof뀀□ηthe뀀□ηregion's뀀□ηecosystem
economic뀀□ηsectors뀀□ηlike뀀□ηtourism,뀀□ηrecreation,뀀□ηagriculture,뀀□ηand뀀□ηsubsistence뀀□ηcis
Tunnels뀀□ηProject뀀□ηwill뀀□ηfurther뀀□ηviolate뀀□ηwater뀀□ηquality뀀□ηstandards,뀀□ηprecluding뀀□ηth
Control뀀□ηBoard뀀□ηfrom뀀□ηcertifying뀀□ηthe뀀□ηproject뀀□ηunder뀀□ηClean뀀□ηWater뀀□ηAct뀀□η

In뀀□ηsummary:뀀□ηimplementation뀀□ηof뀀□ηthe뀀□ηTunnels뀀□ηProject뀀□ηwill뀀□ηrequire뀀□ηa뀀□
Army뀀□ηCorps뀀□ηof뀀□ηEngineers,뀀□ηwhich뀀□ηit뀀□ηcannot뀀□ηreceive뀀□ηunless뀀□ηthe뀀□ηsta
certicication.뀀□ηThe뀀□ηcerticication뀀□ηin뀀□ηturn뀀□ηcannot뀀□ηbe뀀□ηlegally뀀□η뀀□η뀀□ηued뀀□ηunless
rather뀀□ηthan뀀□ηthe뀀□ηindividual뀀□ηdischarge뀀□ηmandating뀀□ηthe뀀□η404뀀□ηpermit)뀀□ηmee
which뀀□ηincludes뀀□ηmeeting뀀□ηbenecicial뀀□ηuses뀀□ηdesigned뀀□ηto뀀□ηprotect뀀□ηDelta뀀□ηspe
Tunnels뀀□ηProject뀀□ηwill뀀□ηfails뀀□ηacross뀀□ηthe뀀□ηboard;뀀□ηwe뀀□ηprovide뀀□ηmore뀀□ηdet
this뀀□ηletter.뀀□η

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[239]뀀□ηUSEPA,뀀□η"Draft뀀□ηEnvironmental뀀□ηImpact뀀□ηStatement뀀□ηfor뀀□ηthe뀀□ηBay뀀□ηDelta뀀□ηConser
Delta,뀀□ηCalifornia뀀□η(CEQ#뀀□η20130365),뀀□ηAugust뀀□η26,뀀□η2014,뀀□η1-뀀□η5,뀀□ηAccessible뀀□ηat뀀□η
site/DocServer/8-□26-□14_EPA_Cmmnt_on_BDCP.pdf?docID=9539□η

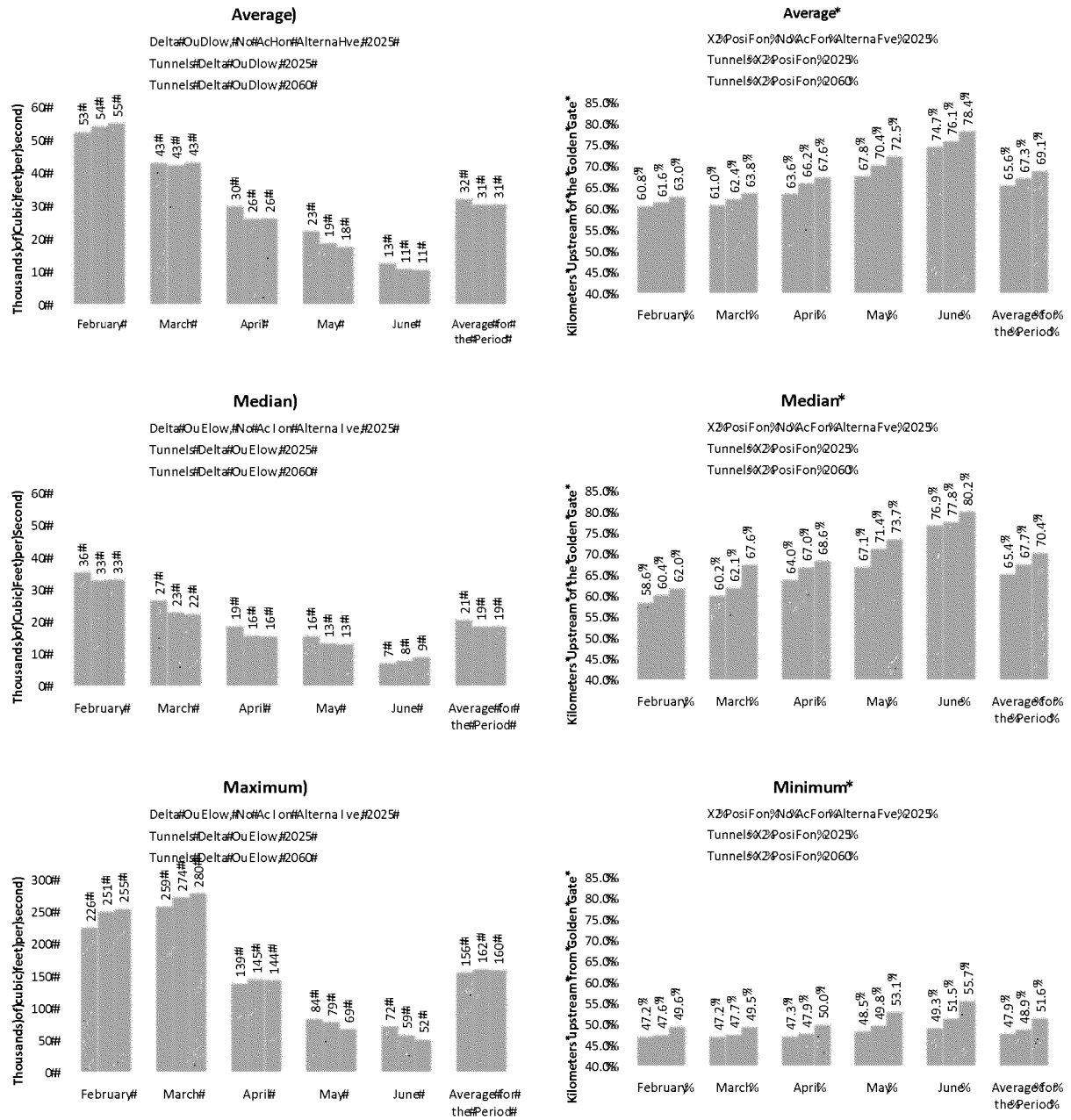
[240]뀀□ηSee뀀□ηFigure뀀□η7,뀀□ηp.,뀀□η66뀀□ηof뀀□ηEnvironmental뀀□ηWater뀀□ηCaucus뀀□ηcomments뀀□ηon뀀
2014;뀀□ηaccessible뀀□ηat:뀀□η뀀□η뀀□η
□η

[241]뀀□ηPanel뀀□ηSummary뀀□ηReport뀀□ηon뀀□ηWorkshop뀀□ηon뀀□ηDelta뀀□ηOutclows뀀□ηand뀀□ηRelated뀀□
online뀀□ηat:뀀□η
□η뀀□ηThis뀀□ηreport뀀□ηidenticies뀀□η"key뀀□ηpapers"뀀□ηin뀀□ηwhich뀀□ηthe뀀□ηrelationsh
species뀀□ηabundances뀀□ηare뀀□ηanchored.

[242]뀀□ηEmail뀀□ηfrom뀀□ηEsther뀀□ηTracy뀀□ηof뀀□ηState뀀□ηWater뀀□ηResources뀀□ηControl뀀□ηBoard,뀀□ηO
Ventura,뀀□ηClean뀀□ηWater뀀□ηAction,뀀□η"State뀀□ηWater뀀□ηResources뀀□ηControl뀀□ηBoard뀀□ηBenecicial뀀□ηUses,"뀀□η
to뀀□ηColin뀀□ηBailey뀀□ηof뀀□ηEnvironmental뀀□ηJustice뀀□ηCoalition뀀□ηfor뀀□ηWater,뀀□ηthence뀀□ηto뀀□η
Caucus뀀□ηconsultant.뀀□ηTracy's뀀□ηmessage뀀□ηprimarily뀀□ηconcerns뀀□ηsubsistence뀀□ηcishing뀀□ηby뀀□ηCa

Figure 19
Delta OutLlow to Decrease in Future Scenarios with
Average X2 Position to Move Eastward with Tu

Delta OutLlow **X2 Position**



Sources: Bay Delta Conservation Plan, Appendix 5.C., Attachment 5C
C.A-42, p. 5C.A-1678. Average NOTE: value is skewed somewhat by pr
and low X2 years. The median is the value where ha
median value, and half are less. Delta outclow and X2
distance of X2 from the Golden Gate.

There is no defensible anti-degradation analysis.[243] The State Water Regional Water Board's regulatory authority is the Antidegradation Policy which is included in the Basin Plans as an appendix. However, RDEIR/SDEIS fail to discuss or analyze constituents which will "degra documents do not evaluate whether the designated benecicial use is Clean Water Act compliance.

Section 101(a) of the Clean Water Act (CWA), the basis for objective of the Act is to "restore and maintain the chemical, nation's waters." Section 303(d)(4) of the CWA carries this further, for states to satisfy the antidegradation regulations at 40 CFR § water quality. These regulations (40 CFR § 131.12(a)) describe the and dictate that states must adopt both a policy at least as implementing procedures.

The CWA requires that the [illegible] of identiciied benecicial uses. The Federal Policy, as required in 40 CFR 131.12 states, "The antidegradation methods shall, at a minimum, be consistent with the following: the level of water quality necessary to protect the existing uses The Delta is classiciied as a Tier II, "high quality," waterbody 9's guidance on implementing antidegradation policy states, "All actions quality in Tier II waters require a determination that existing us protected."[243]

California's antidegradation policy is described in the State Antidegradatio Administrative Procedures Update 90-004, 2 July 1990 ("APU 90-004" ("Region IX Guidance"), as well as Water Quality Order 86-17.[244]

California's Antidegradation Policy (Resolution 68-16) requires that:

- Existing high quality water will be maintained until it has change will be with the maximum benecit to the people
- The change will not unreasonably affect present and anticipated
- The change will not result in water quality less than pres
- Any activity which produces a waste or increased volume or to meet waste discharge requirements using the best practicable discharge necessary to assure that neither pollution nor nuisance water quality with maximum benecit to the people of the

While California's Antidegradation Policy requires that, "[t]he change will present and anticipated benecicial uses and the change will not prescribed in the policies," the Federal Antidegradation Policy requires existing uses will be fully maintained and protected."[245]

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[243] EPA, Region 9, Guidance on Implementing the Antidegradation Provisions

[244] "Guidance on Implementing the Antidegradation Provisions of 40 CFR 1

[245] Draft BDCP EIR/EIS, 2013, page 8-408.

The뀀□ηTunnels뀀□ηProject뀀□ηwill뀀□ηreduce뀀□ηclows뀀□ηand뀀□ηresult뀀□ηin뀀□ηpoorer뀀□ηwate
constituents,뀀□ηincluding뀀□ηboron,뀀□ηbromide,뀀□ηchloride,뀀□ηelectrical뀀□ηconductivity,뀀□ηnitrate
some뀀□ηpesticides,뀀□ηmercury뀀□ηand뀀□ηselenium.뀀□ηThe뀀□ηDelta뀀□ηis뀀□ηcurrently뀀□ηimpai
constituents뀀□ηthat뀀□ηwill뀀□ηincrease뀀□ηunder뀀□ηthe뀀□ηproposed뀀□ηalternative.뀀□ηSeveral뀀□
are뀀□ηdetailed뀀□ηin뀀□ηAttachment뀀□η5뀀□ηwhere뀀□ηdegradation뀀□ηis뀀□ηexpected뀀□ηshould뀀
constructed뀀□ηand뀀□ηoperated.

Even뀀□ηif뀀□ηDWR뀀□ηand뀀□ηthe뀀□ηBureau뀀□ηof뀀□ηReclamation뀀□ηprovide뀀□ηan뀀□ηadequat
Tunnels뀀□ηProject,뀀□ηthe뀀□ηpoint뀀□ηremains뀀□ηthat뀀□ηthey뀀□ηcannot뀀□ηmove뀀□ηforward뀀
State뀀□ηWater뀀□ηResources뀀□ηControl뀀□ηBoard뀀□ηif뀀□ηany뀀□ηwater뀀□ηquality뀀□ηstandards뀀
antidegradation뀀□ηanalysis뀀□ηis뀀□ηsupposed뀀□ηto뀀□ηensure뀀□ηthey뀀□ηcomply뀀□ηwith뀀□ηany
standards,뀀□ηbut뀀□ηthere뀀□ηis뀀□ηclear뀀□ηevidence뀀□ηthat뀀□ηcannot뀀□ηand뀀□ηwill뀀□ηnot.

Water Quality, Real-Time Operations, and Adaptive Management

Tunnels 뀀□ηProject 뀀□ηoperational 뀀□ηmodeling 뀀□ηcriteria 뀀□ηscenarios 뀀□ηcould 뀀□ηprejudice 뀀□
objectives 뀀□ηfor 뀀□ηthe 뀀□ηBay 7 □Delta 뀀□ηEstuary 뀀□ηfrom 뀀□ηthe 뀀□ηState 뀀□ηWater 뀀□ηResou
wholly뀀□ηimplicit뀀□ηassumption뀀□ηthrough뀀□ηthe뀀□ηRDEIR/SDEIS뀀□ηis뀀□ηthat뀀□ηany뀀□ηone
require뀀□ηwholesale뀀□ηrevision뀀□ηto뀀□ηhow뀀□ηwater뀀□ηquality뀀□ηis뀀□ηregulated뀀□ηin뀀□ηthe
the뀀□ηTunnels뀀□ηProject뀀□ηto뀀□ηmove뀀□ηforward.뀀□ηThe뀀□ηsetting뀀□ηsections뀀□ηof뀀□ηCha
water뀀□ηsupply,뀀□ηsurface뀀□ηwater,뀀□ηgroundwater,뀀□ηand뀀□ηwater뀀□ηquality)뀀□ηcontain뀀□ηno
water뀀□ηquality뀀□ηobjectives뀀□ηas뀀□ηthey뀀□ηapply뀀□ηto뀀□ηclow뀀□ηand뀀□ηoperational뀀□ηactio
facilities뀀□ηin뀀□ηthe뀀□ηDelta.뀀□ηThe뀀□ηDraft뀀□ηEIR/EIS뀀□ηExecutive뀀□ηSummary뀀□ηlast뀀□
titling뀀□ηone뀀□ηsection뀀□η"New뀀□ηRules뀀□ηfor뀀□ηNorth뀀□ηDelta뀀□ηDiversions,"뀀□ηbut뀀□ηd
no뀀□ηmention뀀□ηof뀀□ηthe뀀□ηregulatory뀀□ηregime뀀□ηchange뀀□ηthat뀀□ηwould뀀□ηapparently뀀
Board.[246] 뀀□ηThis뀀□ηyear,뀀□ηthe뀀□ηRDEIR/SDEIS뀀□ηannounces뀀□η"proposed뀀□ηnew뀀□ηclow뀀□
Delta뀀□ηSWP뀀□ηand뀀□ηCVP뀀□ηexport뀀□ηfacilities,뀀□ηand뀀□ηthe뀀□ηproposed[247]뀀□ηnew뀀□ηhead

Such뀀□ηchanges뀀□ηto뀀□ηDelta뀀□ηclows뀀□ηand뀀□ηhydrodynamics뀀□ηmust뀀□ηbe뀀□ηevaluated뀀
the뀀□ηState뀀□ηWater뀀□ηResources뀀□ηControl뀀□ηBoard,뀀□ηthe뀀□ηonly뀀□ηstate뀀□ηbody뀀□ηau
standards. ***We뀀□ηare 뀀□ηconcerned 뀀□ηthat 뀀□ηthe 뀀□ηTunnels 뀀□ηProject 뀀□ηproponents 뀀□ηhope***
process 뀀□ηby 뀀□ηmaking 뀀□ηTunnels 뀀□ηoperational 뀀□ηcriteria 뀀□ηseem 뀀□ηinevitable 뀀□ηand 뀀
neither, 뀀□ηand 뀀□ηmust 뀀□ηbe 뀀□ηthe 뀀□ηsubject 뀀□ηof 뀀□ηcareful 뀀□ηand 뀀□ηcritical 뀀□ηreview
update 뀀□ηprocess, 뀀□ηbefore 뀀□ηthe 뀀□ηTunnels 뀀□ηProject 뀀□ηreceives 뀀□ηpermit 뀀□ηapprovals 뀀
simply: 뀀□ηwater 뀀□ηquality 뀀□ηpolicy 뀀□ηmust 뀀□ηcome 뀀□ηbefore 뀀□ηplumbing 뀀□ηdecisions 뀀□η
the 뀀□ηBay 7 □Delta 뀀□ηEstuary, 뀀□ηand 뀀□ηthe 뀀□ηDelta's 뀀□ηeconomy[248]뀀□ηand 뀀□ηcommunities 뀀□

Further뀀□ηcomplicating뀀□ηthis뀀□ηpicture뀀□ηis뀀□ηthe뀀□ηrole뀀□ηand뀀□ηregulation뀀□ηby뀀□ηS
[RTOs].[249] 뀀□ηReal-□time뀀□ηoperational뀀□ηdecisions:

> are뀀□ηexpected뀀□ηto뀀□ηbe뀀□ηneeded뀀□ηduring뀀□ηat뀀□ηleast뀀□ηsome뀀□ηpart뀀□ηof뀀□ηthe뀀□ηye
> north뀀□ηand뀀□ηsouth뀀□ηDelta뀀□ηdiversion뀀□ηfacilities."[249]

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[246]뀀□ηBay뀀□ηDelta뀀□ηConservation뀀□ηPlan,뀀□ηDraft *Executive EIS, Summary Section* 1.2 ES-1.4, 뀀□η"New뀀□η
Rules뀀□ηfor뀀□ηNorth뀀□ηDelta뀀□ηDiversions,"뀀□ηpp.뀀□ηES-□52뀀□ηto뀀□ηES-□53.뀀□η

[247]뀀□ηRDEIR/SDEIS,뀀□ηSection뀀□η4.1,뀀□ηpp.뀀□η4.1-□11뀀□ηthrough뀀□η4.1-□13.

[248]뀀□ηThis뀀□ηstance뀀□ηis뀀□ηalso뀀□ηconsistent뀀□ηwith뀀□ηthe뀀□ηDelta뀀□ηProtection뀀□ηAct뀀□ηof뀀□η

[249]뀀 *RDEIR/SDEIS,* 뀀□η4.1-□13,뀀□ηlines뀀□η17-□18.뀀□η

	Table꿲□ŋ5:꿲□ŋComparison꿲□ŋof꿲□ŋAlternatives'꿲□ŋOperational꿲□ŋCriteri	
Indicator	**Alternative꿲□ŋ4A꿲□ŋCriteria**	**Alternative꿲□ŋ4꿲□ŋCriteria**
	New꿲□ŋCriteria꿲□ŋIncluded꿲□ŋin꿲□ŋAlternative꿲□ŋ4A	
North꿲□ŋD Bypass꿲□ŋ Flows	Initial꿲□ŋPulse꿲□ŋOperations꿲□ŋplus꿲□ŋInitial꿲 꿲□ŋ꿲□ŋLow-□level꿲□ŋpumping꿲□ŋof꿲□ŋup꿲□ River꿲□ŋclow꿲□ŋsuch꿲□ŋthat꿲□ŋbypass꿲□ŋclo cfs.꿲□ŋNo꿲□ŋmore꿲□ŋthan꿲□ŋ300꿲□ŋcfs꿲□ŋc intake.꿲□ŋ 꿲□ŋ꿲□ŋIf꿲□ŋthe꿲□ŋinitial꿲□ŋpulse꿲□ŋbegins꿲 pulse꿲□ŋcriteria꿲□ŋfor꿲□ŋMay꿲□ŋgo꿲□ŋinto꿲□ Dec꿲□ŋ1.꿲□ŋOn꿲□ŋDec꿲□ŋ1,꿲□ŋthe꿲□ŋLevel꿲 in꿲□ŋthe꿲□ŋDraft꿲□ŋEIR/EIS꿲□ŋapply꿲□ŋunles If꿲□ŋa꿲□ŋsecond꿲□ŋpulse꿲□ŋoccurs,꿲□ŋthe꿲□ same꿲□ŋprotective꿲□ŋoperation꿲□ŋas꿲□ŋthe꿲□ 꿲□ŋPost-□pulse꿲□ŋCriteria꿲□ŋ(specicies꿲□ŋbypa remain꿲□ŋdownstream꿲□ŋof꿲□ŋthe꿲□ŋNorth꿲□ 꿲□ŋOctober,꿲□ŋNovember:꿲□ŋbypass꿲□ŋclows꿲 diverting꿲□ŋat꿲□ŋthe꿲□ŋNorth꿲□ŋDelta꿲□ŋinta 꿲□ŋJuly,꿲□ŋAugust,꿲□ŋSeptember:꿲□ŋbypass꿲□ŋ before꿲□ŋdiverting꿲□ŋat꿲□ŋthe꿲□ŋNorth꿲□ŋDe 꿲□ŋDecember꿲□ŋthrough꿲□ŋJune:꿲□ŋpost-□puls operations꿲□ŋwill꿲□ŋnot꿲□ŋexceed꿲□ŋLevel꿲□ŋ specicic꿲□ŋcriteria꿲□ŋhave꿲□ŋbeen꿲□ŋmet꿲□ŋt Level꿲□ŋ3꿲□ŋas꿲□ŋdecined꿲□ŋin꿲□ŋthe꿲□ŋSe EIS.꿲□ŋIf꿲□ŋthose꿲□ŋcriteria꿲□ŋare꿲□ŋmet,꿲□ decined꿲□ŋin꿲□ŋTable꿲□ŋ3.4.1-□2꿲□ŋin꿲□ŋthe specicic꿲□ŋcriteria꿲□ŋfor꿲□ŋtransitioning꿲□ŋbetv pulse꿲□ŋprotection,꿲□ŋLevel꿲□ŋ1,꿲□ŋLevel꿲□ŋ2 operations,꿲□ŋwill꿲□ŋbe꿲□ŋdeveloped꿲□ŋand꿲□ cish꿲□ŋmonitoring꿲□ŋand꿲□ŋhydrologic/behaviora upstream꿲□ŋof꿲□ŋand꿲□ŋin꿲□ŋthe꿲□ŋDelta.꿲□ adjustments꿲□ŋare꿲□ŋexpected꿲□ŋto꿲□ŋbe꿲□ŋ supply꿲□ŋand/or꿲□ŋmigratory꿲□ŋconditions꿲□ŋf real-□time꿲□ŋadjustments꿲□ŋto꿲□ŋthe꿲□ŋpumpi Delta꿲□ŋdiversions.꿲□ŋThese꿲□ŋadjustments꿲□ŋ under꿲□ŋReal꿲□ŋTime꿲□ŋOperations꿲□ŋ(RTO).꿲	Initial꿲□ŋPulse꿲□ŋOperations:꿲□ŋsee꿲□ Bay꿲□ŋDelta꿲□ŋConservation꿲□ŋPlan. October,꿲□ŋNovember:꿲□ŋFlows꿲□ŋwill꿲 cfs. July꿲□ŋthrough꿲□ŋSeptember:꿲□ŋFlows꿲 5,000꿲□ŋcfs December꿲□ŋthrough꿲□ŋJune:꿲□ŋVariab in꿲□ŋTable꿲□ŋ3.4.1-□2.

		Table꿲□ŋ5:꿲□ŋComparison꿲□ŋof꿲□ŋAlternatives'꿲□ŋOperational꿲□ŋCriteri	
Indicator		**Alternative꿲□ŋ4A꿲□ŋCriteria**	**Alternative꿲□ŋ4꿲□ŋCriteria**
South꿲□ŋD operations	1	꿲□ŋ꿲□ŋOctober,꿲□ŋNovember:꿲□ŋNo꿲□ŋsouth the꿲□ŋD-□1641꿲□ŋSan꿲□ŋJoaquin꿲□ŋRiver꿲□ and꿲□ŋMiddle꿲□ŋRiver꿲□ŋ(OMR)꿲□ŋclow꿲□ŋ weeks꿲□ŋprior꿲□ŋto꿲□ŋpulse,꿲□ŋand꿲□ŋa꿲□ cfs꿲□ŋin꿲□ŋNovember꿲□ŋafter꿲□ŋpulse.꿲□ŋ 꿲□ŋ꿲□ŋDecember:꿲□ŋOMR꿲□ŋclows꿲□ŋwill꿲 an꿲□ŋaverage꿲□ŋof꿲□ŋ−5,000꿲□ŋcfs꿲□ŋwhen Wilkins꿲□ŋSlough꿲□ŋpulse꿲□ŋtriggers,꿲□ŋand꿲 than꿲□ŋan꿲□ŋaverage꿲□ŋof꿲□ŋ−2,000꿲□ŋcfs꿲 action꿲□ŋ1꿲□ŋtriggers.꿲□ŋNo꿲□ŋOMR꿲□ŋclow Sacramento꿲□ŋRiver꿲□ŋpulse,꿲□ŋor꿲□ŋdelta꿲□ triggers.꿲□ŋ 꿲□ŋ꿲□ŋJanuary,꿲□ŋFebruary꿲□ŋOMR꿲□ŋclows꿲□ŋwill꿲 negative꿲□ŋthan꿲□ŋan꿲□ŋaverage꿲□ŋof꿲□ŋ0꿲 −3,500꿲□ŋcfs꿲□ŋduring꿲□ŋabove-□꿲□ŋnormal꿲 during꿲□ŋbelow-□normal꿲□ŋto꿲□ŋcritical꿲□ŋye in꿲□ŋJanuary꿲□ŋof꿲□ŋdry꿲□ŋand꿲□ŋcritical꿲 꿲□ŋ꿲□ŋMarch꿲□ŋOMR꿲□ŋclows꿲□ŋwill꿲□ŋnot꿲□ŋ an꿲□ŋaverage꿲□ŋof꿲□ŋ0꿲□ŋcfs꿲□ŋduring꿲□ or꿲□ŋ−3,500꿲□ŋcfs꿲□ŋduring꿲□ŋbelow-□norma −3,000꿲□ŋcfs꿲□ŋduring꿲□ŋcritical꿲□ŋyears.꿲□ 꿲□ŋ꿲□ŋApril,꿲□ŋMay:꿲□ŋAllowable꿲□ŋOMR꿲 clow꿲□ŋmeasured꿲□ŋat꿲□ŋVernalis,꿲□ŋand꿲□ a꿲□ŋlinear꿲□ŋrelationship.꿲□ŋIf꿲□ŋVernalis꿲□ cfs,꿲□ŋOMR꿲□ŋclows꿲□ŋwill꿲□ŋnot꿲□ŋbe꿲□ cfs.꿲□ŋIf꿲□ŋVernalis꿲□ŋis꿲□ŋ6,000꿲□ŋcfs,꿲□ than꿲□ŋ+1,000꿲□ŋcfs.꿲□ŋIf꿲□ŋVernalis꿲□ŋis꿲 will꿲□ŋbe꿲□ŋat꿲□ŋleast꿲□ŋ1,000꿲□ŋcfs.꿲□ŋ OMR꿲□ŋclows꿲□ŋwill꿲□ŋbe꿲□ŋat꿲□ŋleast꿲□ 15,000꿲□ŋcfs,꿲□ŋOMR꿲□ŋclows꿲□ŋwill꿲□ŋbe Vernalis꿲□ŋis꿲□ŋat꿲□ŋor꿲□ŋexceeds꿲□ŋ30,000꿲□ at꿲□ŋleast꿲□ŋ6,000꿲□ŋcfs.꿲□ŋ 꿲□ŋ꿲□ŋJune:꿲□ŋSimilar꿲□ŋto꿲□ŋApril,꿲□ŋall gaged꿲□ŋclow꿲□ŋmeasured꿲□ŋat꿲□ŋVernalis.꿲 is꿲□ŋless꿲□ŋthan꿲□ŋ3,500꿲□ŋcfs,꿲□ŋOMR꿲□ negative꿲□ŋthan꿲□ŋ−3,500꿲□ŋcfs.꿲□ŋIf꿲□ŋVe and꿲□ŋup꿲□ŋto꿲□ŋ10,000꿲□ŋcfs,꿲□ŋOMR꿲□ Vernalis꿲□ŋexceeds꿲□ŋ10,000꿲□ŋcfs꿲□ŋand꿲□ŋup꿲 clows꿲□ŋwill꿲□ŋbe꿲□ŋat꿲□ŋleast꿲□ŋ+1,000꿲 15,000꿲□ŋcfs,꿲□ŋOMR꿲□ŋclows꿲□ŋwill꿲□ŋbe 꿲□ŋ꿲□ŋJuly,꿲□ŋAugust,꿲□ŋSeptember:꿲□ŋNo꿲□	None꿲□ŋspecicied.	

	Table꿲□ŋ5:꿲□ŋComparison꿲□ŋof꿲□ŋAlternatives'꿲□ŋOperational꿲□ŋCriteri	
Indicator	**Alternative꿲□ŋ4A꿲□ŋCriteria**	**Alternative꿲□ŋ4꿲□ŋCriteria**
Head꿲□ŋof River꿲□ŋGa operations	꿲□ŋOctober꿲□ŋ1–November꿲□ŋ30th꿲□ŋmanagement꿲 to꿲□ŋprotect꿲□ŋthe꿲□ŋD-□1641꿲□ŋpulse꿲□ŋcl upstream꿲□ŋmigrating꿲□ŋadult꿲□ŋFall-□Run꿲□ŋ HORB꿲□ŋwill꿲□ŋbe꿲□ŋclosed꿲□ŋapproximately꿲 immediately꿲□ŋbefore꿲□ŋand꿲□ŋafter꿲□ŋthe꿲□ will꿲□ŋbe꿲□ŋfully꿲□ŋclosed꿲□ŋduring꿲□ŋthe꿲 information꿲□ŋsuggests꿲□ŋalternative꿲□ŋoperatior for꿲□ŋcish.꿲□ŋ 꿲□ŋJanuary:꿲□ŋWhen꿲□ŋsalmon꿲□ŋfry꿲□ŋare꿲 based꿲□ŋon꿲□ŋreal꿲□ŋtime꿲□ŋmonitoring),꿲□ŋ criterion꿲□ŋwill꿲□ŋbe꿲□ŋto꿲□ŋclose꿲□ŋthe꿲□ purposes꿲□ŋof꿲□ŋwater꿲□ŋquality,꿲□ŋstage,꿲□ŋ considerations.꿲□ŋ 꿲□ŋFebruary–June꿲□ŋ15th:꿲□ŋInitial꿲□ŋoperating to꿲□ŋclose꿲□ŋthe꿲□ŋgate꿲□ŋsubject꿲□ŋto꿲□ŋF quality,꿲□ŋstage,꿲□ŋand꿲□ŋclood꿲□ŋcontrol꿲□ŋ agencies꿲□ŋwill꿲□ŋactively꿲□ŋexplore꿲□ŋthe꿲□ reliable꿲□ŋjuvenile꿲□ŋsalmonid꿲□ŋtracking꿲□ŋte may꿲□ŋenable꿲□ŋshifting꿲□ŋto꿲□ŋa꿲□ŋmore꿲 operating꿲□ŋcriterion꿲□ŋbased꿲□ŋon꿲□ŋthe꿲□ŋ covered꿲□ŋcishes.꿲□ŋ 꿲□ŋJune꿲□ŋ16꿲□ŋto꿲□ŋSeptember꿲□ŋ30,꿲□ŋ will꿲□ŋbe꿲□ŋopen.꿲□ŋ	December,꿲□ŋJune꿲□ŋ16꿲□ŋto꿲□ŋSept during꿲□ŋthe꿲□ŋdays꿲□ŋin꿲□ŋNovemb the꿲□ŋD-□1641꿲□ŋpulse:꿲□ŋOperable꿲 All꿲□ŋother꿲□ŋmonths:꿲□ŋOperable꿲□ partially꿲□ŋor꿲□ŋcompletely꿲□ŋclosed꿲 operations,꿲□ŋto꿲□ŋminimize꿲□ŋentrain outmigrant꿲□ŋjuvenile꿲□ŋsalmonids꿲□ŋ manage꿲□ŋSan꿲□ŋJoaquin꿲□ŋRiver꿲□ŋ determining꿲□ŋthe꿲□ŋcriteria꿲□ŋfor꿲□ closure꿲□ŋof꿲□ŋthe꿲□ŋHead꿲□ŋof꿲□ and꿲□ŋwildlife꿲□ŋagencies꿲□ŋgoal꿲□ŋ of꿲□ŋOld꿲□ŋRiver꿲□ŋgate꿲□ŋclosed꿲 from꿲□ŋFebruary꿲□ŋ1꿲□ŋthrough꿲□ŋJ the꿲□ŋHead꿲□ŋof꿲□ŋOld꿲□ŋRiver꿲□ŋ subject꿲□ŋto꿲□ŋreal-□time꿲□ŋoperation of꿲□ŋwater꿲□ŋquality,꿲□ŋstage,꿲□ŋand considerations. **Note꿲□ŋto꿲□ŋReader:** 꿲□ŋto꿲□ŋissuan BDCP꿲□ŋdocument,꿲□ŋoperational꿲□ŋgu developed꿲□ŋfor꿲□ŋuse꿲□ŋby꿲□ŋproje implementing꿲□ŋthese꿲□ŋoperational꿲□ŋ
Rio꿲□ŋVist minimum꿲□ clow꿲□ŋ standard	January꿲□ŋthrough꿲□ŋAugust:꿲□ŋclows꿲□ŋwill꿲 September꿲□ŋthrough꿲□ŋDecember:꿲□ŋclows꿲□ŋ	None꿲□ŋspecicied.

	Table꿲□ŋ5:꿲□ŋComparison꿲□ŋof꿲□ŋAlternatives'꿲□ŋOperational꿲□ŋCriteri	
Indicator	**Alternative꿲□ŋ4A꿲□ŋCriteria**	**Alternative꿲□ŋ4꿲□ŋCriteria**
Spring꿲□ŋ outclow	꿲□ŋMarch,꿲□ŋApril,꿲□ŋMay:꿲□ŋTo꿲□ŋensure꿲 smelt꿲□ŋabundance,꿲□ŋinitial꿲□ŋoperations꿲□ŋw March--□May꿲□ŋaverage꿲□ŋDelta꿲□ŋoutclow꿲□ŋ requirements꿲□ŋof꿲□ŋScenario꿲□ŋH3,꿲□ŋwhich꿲 D-□1641꿲□ŋstandards,꿲□ŋand꿲□ŋScenario꿲□ŋH4 scaled꿲□ŋto꿲□ŋTable꿲□ŋ3-□24꿲□ŋin꿲□ŋChapte Draft꿲□ŋEIR/EIS.꿲□ŋOver꿲□ŋthe꿲□ŋcourse꿲□ŋc term꿲□ŋthe꿲□ŋlongcin꿲□ŋsmelt꿲□ŋindices꿲□ŋo based꿲□ŋupon꿲□ŋthe꿲□ŋ1980–2011꿲□ŋtrend꿲□ relative꿲□ŋto꿲□ŋwinter-□spring꿲□ŋclow꿲□ŋcond evaluate꿲□ŋthe꿲□ŋeffect꿲□ŋof꿲□ŋoperations꿲□ŋ evaluate꿲□ŋpositive꿲□ŋcohort꿲□ŋover꿲□ŋcohort꿲 growth).꿲□ŋAdjustments꿲□ŋto꿲□ŋthe꿲□ŋcriteria꿲 outclow꿲□ŋtargets꿲□ŋmay꿲□ŋbe꿲□ŋmade꿲□ŋus Management꿲□ŋProcess꿲□ŋand꿲□ŋthe꿲□ŋbest꿲□ information꿲□ŋavailable꿲□ŋregarding꿲□ŋall꿲□ŋfa longcin꿲□ŋsmelt꿲□ŋabundance.	March꿲□ŋthrough꿲□ŋMay:꿲□ŋAs꿲□ŋde 3.4.1.4.4, *Decision 꿲□ŋTree* 꿲□ŋoperations will꿲□ŋbe꿲□ŋdetermined꿲□ŋthrough꿲□ decision꿲□ŋtree.꿲□ŋIf꿲□ŋat꿲□ŋthe꿲□ŋ conveyance,꿲□ŋthe꿲□ŋPermit꿲□ŋOversig determines꿲□ŋthat꿲□ŋthe꿲□ŋbest꿲□ŋa resulting꿲□ŋfrom꿲□ŋstructured꿲□ŋhypot developed꿲□ŋthrough꿲□ŋa꿲□ŋcollaborat program꿲□ŋindicates꿲□ŋthat꿲□ŋspring꿲 needed꿲□ŋto꿲□ŋachieve꿲□ŋthe꿲□ŋlong abundance꿲□ŋobjective꿲□ŋthe꿲□ŋfollowi operations꿲□ŋwould꿲□ŋbe꿲□ŋimplement decision꿲□ŋtree꿲□ŋThe꿲□ŋhigh꿲□ŋout would꿲□ŋbe꿲□ŋto꿲□ŋprovide꿲□ŋa꿲□ outclow꿲□ŋscaled꿲□ŋto꿲□ŋthe꿲□ŋ90% river꿲□ŋindex꿲□ŋfor꿲□ŋthe꿲□ŋwater꿲 summarized꿲□ŋin꿲□ŋthe꿲□ŋseparate꿲□ March-□May꿲□ŋoutclow꿲□ŋtargets꿲□ŋar using꿲□ŋclow꿲□ŋsupplementation꿲□ŋpro through꿲□ŋan꿲□ŋapproved꿲□ŋwater꿲□ limiting꿲□ŋCVP꿲□ŋand꿲□ŋSWP꿲□ŋDelt of꿲□ŋ1,500꿲□ŋcfs꿲□ŋand꿲□ŋcinally,꿲□ sources꿲□ŋhave꿲□ŋbeen꿲□ŋutilized,꿲□ from꿲□ŋOroville,꿲□ŋwith꿲□ŋsubsequent accounting꿲□ŋadjustments꿲□ŋbetween꿲□ and꿲□ŋthe꿲□ŋCVP. Alternatively,꿲□ŋif꿲□ŋbest꿲□ŋavailable꿲 resulting꿲□ŋfrom꿲□ŋstructured꿲□ŋhypot testing...shows꿲□ŋthat꿲□ŋDelta꿲□ŋfoodwe improved,꿲□ŋand꿲□ŋevidence꿲□ŋfrom꿲 collaborative꿲□ŋscience꿲□ŋprogram꿲□ŋs longcin꿲□ŋsmelt꿲□ŋabundance꿲□ŋis꿲□ spring꿲□ŋoutclow,꿲□ŋthe꿲□ŋalternative꿲 under꿲□ŋthe꿲□ŋdecision꿲□ŋtree꿲□ŋfor would꿲□ŋbe꿲□ŋto꿲□ŋfollow꿲□ŋclow꿲□ established꿲□ŋunder꿲□ŋD-□1641. February,꿲□ŋJune:꿲□ŋFlow꿲□ŋconstraints꿲 under꿲□ŋD-□1641꿲□ŋwill꿲□ŋbe꿲□ŋfol All꿲□ŋother꿲□ŋmonths:꿲□ŋno꿲□ŋconst
	Key꿲□ŋExisting꿲□ŋCriteria꿲□ŋIncluded꿲□ŋin꿲□ŋModeling	
Winter꿲□ŋ summer꿲□ŋ outclow	Flow꿲□ŋconstraints꿲□ŋestablished꿲□ŋunder꿲□ŋD followed.	Flow꿲□ŋconstraints꿲□ŋestablished꿲□ŋun will꿲□ŋbe꿲□ŋfollowed꿲□ŋif꿲□ŋnot꿲□ listed꿲□ŋabove.

	Table뀀□ηΒ5:뀀□ηΒComparison뀀□ηΒof뀀□ηΒAlternatives'뀀□ηΒOperational뀀□ηΒCriteri	
Indicator	**Alternative뀀□ηΒ4A뀀□ηΒCriteria**	**Alternative뀀□ηΒ4뀀□ηΒCriteria**
Fall뀀□η outclow	뀀□ηΒSeptember,뀀□ηΒOctober,뀀□ηΒNovember뀀□ηΒimpl (2008)뀀□ηΒBiOp뀀□ηΒFall뀀□ηΒX2뀀□ηΒrequirements.뀀 spring뀀□ηΒDelta뀀□ηΒoutclow뀀□ηΒand뀀□ηΒconsistent뀀 RPA뀀□ηΒadaptive뀀□ηΒmanagement뀀□ηΒprocess,뀀□ηΒa these뀀□ηΒoutclow뀀□ηΒtargets뀀□ηΒmay뀀□ηΒbe뀀□ηΒm Management뀀□ηΒand뀀□ηΒMonitoring뀀□ηΒProgram뀀□ and뀀□ηΒthe뀀□ηΒbest뀀□ηΒavailable뀀□ηΒscienticic뀀□ηΒ regarding뀀□ηΒall뀀□ηΒfactors뀀□ηΒaffecting뀀□ηΒdelta뀀	September,뀀□ηΒOctober,뀀□ηΒNovember:뀀□ηΒ in뀀□ηΒSection뀀□ηΒ3.4.1.4.2.7뀀□ηΒthe뀀□ηΒinitial뀀 operations뀀□ηΒwill뀀□ηΒbe뀀□ηΒdetermined뀀 a뀀□ηΒdecision뀀□ηΒtree.뀀□ηΒWithin뀀□ηΒtha evaluated뀀□ηΒstarting뀀□ηΒoperations뀀□ηΒwo implement뀀□ηΒthe뀀□ηΒUSFWS뀀□ηΒ(2008)뀀 requirements,뀀□ηΒand뀀□ηΒthe뀀□ηΒalternati would뀀□ηΒbe뀀□ηΒto뀀□ηΒoperate뀀□ηΒto뀀□ The뀀□ηΒalternative뀀□ηΒoperation뀀□ηΒwoul if뀀□ηΒthe뀀□ηΒresearch뀀□ηΒand뀀□ηΒmonito through뀀□ηΒthe뀀□ηΒcollaborative뀀□ηΒscien show뀀□ηΒthat뀀□ηΒthe뀀□ηΒposition뀀□ηΒof뀀 zone뀀□ηΒdoes뀀□ηΒnot뀀□ηΒneed뀀□ηΒto뀀□ Bay뀀□ηΒand뀀□ηΒthe뀀□ηΒlower뀀□ηΒDelta,뀀 biOp,뀀□ηΒto뀀□ηΒachieve뀀□ηΒthe뀀□ηΒBDCP smelt뀀□ηΒhabitat뀀□ηΒand뀀□ηΒabundance. All뀀□ηΒother뀀□ηΒmonths:뀀□ηΒNo뀀□ηΒconst
Delta뀀□ηΒCr Channel뀀□ gates	Operations뀀□ηΒas뀀□ηΒrequired뀀□ηΒby뀀□ηΒNMFS뀀□ and뀀□ηΒD-□1641.	None뀀□ηΒspecicied.
Suisun뀀□η Marsh뀀□η Salinity뀀□η Control뀀□η Gates	□ 뀀□ηΒGates뀀□ηΒwould뀀□ηΒcontinue뀀□ηΒto뀀□ηΒbe year뀀□ηΒfrom뀀□ηΒOctober뀀□ηΒthrough뀀□ηΒMay.뀀□	None뀀□ηΒspecicied.
Export뀀□ηΒ inclow뀀□ηΒ	□ 뀀□ηΒOperation뀀□ηΒcriteria뀀□ηΒare뀀□ηΒthe뀀□ηΒsa D-□1641. □ 뀀□ηΒThe뀀□ηΒD-□1641뀀□ηΒexport/inclow뀀□ηΒ(E/I) was뀀□ηΒdesigned뀀□ηΒto뀀□ηΒprotect뀀□ηΒcish뀀□ηΒfro entrainment.뀀□ηΒFor뀀□ηΒAlternative뀀□ηΒ4A,뀀□ηΒRecl propose뀀□ηΒthat뀀□ηΒthe뀀□ηΒNorth뀀□ηΒDelta뀀□ηΒDiv affect뀀□ηΒeither뀀□ηΒDelta뀀□ηΒinclows뀀□ηΒor뀀□ηΒex the뀀□ηΒE/I뀀□ηΒratio뀀□ηΒcalculation.뀀□ηΒ	Combined뀀□ηΒexport뀀□ηΒrate뀀□ηΒis뀀□ηΒde diversion뀀□ηΒrate뀀□ηΒof뀀□ηΒthe뀀□ηΒBanks and뀀□ηΒJones뀀□ηΒPumping뀀□ηΒPlant뀀□ηΒf Delta뀀□ηΒchannels.[b] Delta뀀□ηΒinclow뀀□ηΒis뀀□ηΒdecined뀀□ηΒas Sacramento뀀□ηΒRiver뀀□ηΒclow뀀□ηΒdownstr proposed뀀□ηΒnorth뀀□ηΒDelta뀀□ηΒdiversion Bypass뀀□ηΒclow,뀀□ηΒMokelumne뀀□ηΒRiver Cosumnes뀀□ηΒRiver뀀□ηΒclow,뀀□ηΒCalaveras San뀀□ηΒJoaquin뀀□ηΒRiver뀀□ηΒclow뀀□ηΒat miscellaneous뀀□ηΒin-□Delta뀀□ηΒclows. Operation뀀□ηΒcriteria뀀□ηΒare뀀□ηΒthe뀀□ηΒ under뀀□ηΒD-□1641,뀀□ηΒsubject뀀□ηΒto뀀□ management.
Notes		[b]뀀□ηΒ=뀀□ηΒIt뀀□ηΒhas뀀□ηΒnot뀀□ηΒyet뀀□ the뀀□ηΒcombined뀀□ηΒexport뀀□ηΒrate뀀□ηΒ diversion뀀□ηΒrate뀀□ηΒof뀀□ηΒthe뀀□ηΒnew뀀 diversions.뀀□ηΒ
Sources:뀀□ηΒBay뀀□ηΒDelta뀀□ηΒConservation뀀 Conservation뀀□ηΒPlan/California뀀□ηΒWaterFix,뀀□ηΒRDEIR/SDEIS,뀀□ηΒSection뀀□ηΒ4.1,뀀□ηΒTable뀀□ηΒ4.1-□2,뀀□		

Table뀔□Ŋ5뀔□Ŋprovides뀔□Ŋa뀔□Ŋcomparison뀔□Ŋof뀔□Ŋoperational뀔□Ŋcriteria뀔□Ŋused뀔□Ŋin뀔□Ŋth
project뀔□Ŋof뀔□ŋConservation뀔□ŋMeasure뀔□ŋ1뀔□ŋlast뀔□ŋyear뀔□ŋand뀔□ŋthe뀔□ŋTunnels뀔□ŋPro
shows뀔□ŋthe뀔□ŋcomplex뀔□ŋrange뀔□ŋand뀔□ŋnumber뀔□ŋof뀔□ŋoperational뀔□ŋcriteria뀔□ŋthat뀔□
indicators뀔□ŋor뀔□ŋparameters뀔□ŋthat뀔□ŋwould뀔□ŋgovern뀔□ŋreal-□time뀔□ŋoperations뀔□ŋof뀔□
indicated뀔□ŋin뀔□ŋTable뀔□ŋ5,뀔□ŋthere뀔□ŋare뀔□ŋa뀔□ŋnumber뀔□ŋof뀔□ŋchanges뀔□ŋmade뀔□ŋt
2015,뀔□ŋthe뀔□ŋRDEIR/SDEIS)뀔□ŋrelative뀔□ŋto뀔□ŋthe뀔□ŋparameters뀔□ŋand뀔□ŋoperational뀔□ŋo
Conservation뀔□ŋMeasure뀔□ŋ1뀔□ŋtunnels뀔□ŋproject.뀔□ŋFor뀔□ŋevery뀔□ŋchange뀔□ŋand뀔□ŋincrea
criteria뀔□ŋthat뀔□ŋmust뀔□ŋbe뀔□ŋtracked뀔□ŋfor뀔□ŋoperating뀔□ŋtunnels뀔□ŋthere뀔□ŋis뀔□ŋa뀔□
interactions뀔□ŋthat뀔□ŋmust뀔□ŋbe뀔□ŋaccurately뀔□ŋaccounted뀔□ŋfor뀔□ŋin뀔□ŋreal-□time뀔□ŋin뀔
provide뀔□ŋaccurate뀔□ŋand뀔□ŋappropriate뀔□ŋfeedback뀔□ŋwithin뀔□ŋthe뀔□ŋsystem뀔□ŋof뀔□ŋwate
interactions.뀔□ŋThe뀔□ŋefcicacy뀔□ŋof뀔□ŋreal-□time뀔□ŋoperations뀔□ŋdepends뀔□ŋentirely뀔□ŋon뀔
real-□time뀔□ŋoperators뀔□ŋhave뀔□ŋan뀔□ŋaccurate뀔□ŋand뀔□ŋcomplete뀔□ŋgrasp뀔□ŋof뀔□ŋthe뀔□
interactions뀔□ŋamong뀔□ŋthe뀔□ŋvaried뀔□ŋcomponents뀔□ŋof뀔□ŋthat뀔□ŋsystem.뀔□ŋThis뀔□ŋaccur
extends뀔□ŋnot뀔□ŋonly뀔□ŋto뀔□ŋthe뀔□ŋconceptual뀔□ŋand뀔□ŋmathematical뀔□ŋmodels뀔□ŋwith뀔□
needs뀔□ŋfor뀔□ŋaccurate뀔□ŋand뀔□ŋtimely뀔□ŋdata뀔□ŋfrom뀔□ŋreliable뀔□ŋinstrumentation뀔□ŋin뀔

Real-□time뀔□ŋoperations뀔□ŋare뀔□ŋdecined뀔□ŋin뀔□ŋConservation뀔□ŋMeasure뀔□ŋ1뀔□ŋof뀔□ŋthe

> [R]eal-□time뀔□ŋoperational뀔□ŋdecision-□making뀔□ŋprocess뀔□ŋ(real-□time뀔□ŋoperations뀔□ŋ[RTOs])뀔□ŋa
> adjustments뀔□ŋin뀔□ŋoperations뀔□ŋwithin뀔□ŋthe뀔□ŋrange뀔□ŋof뀔□ŋCM1뀔□ŋ[that뀔□ŋis,뀔□ŋTunnels뀔□
> to뀔□ŋmaximize뀔□ŋwater뀔□ŋsupply뀔□ŋfor뀔□ŋSWP뀔□ŋand뀔□ŋCVP뀔□ŋrelative뀔□ŋto뀔□ŋthe뀔□ŋ[BDCP]
> updates뀔□ŋsubject뀔□ŋto뀔□ŋproviding뀔□ŋthe뀔□ŋnecessary뀔□ŋprotections[250]뀔□ŋfor뀔□ŋcovered뀔□ŋspecies.

The뀔□ŋTunnels뀔□ŋProject's뀔□ŋdocuments뀔□ŋexpect뀔□ŋretention뀔□ŋof뀔□ŋBDCP's뀔□ŋuse뀔□ŋof뀔
Delta뀔□ŋfacility뀔□ŋand뀔□ŋcoordinating뀔□ŋwith뀔□ŋeach뀔□ŋother.뀔□ŋWe뀔□ŋnote뀔□ŋthat뀔□ŋthe
post뀔□ŋhoc뀔□ŋdescriptions뀔□ŋof뀔□ŋRTOs뀔□ŋwould뀔□ŋbe뀔□ŋmade뀔□ŋpublic뀔□ŋthrough뀔□ŋsu
Our뀔□ŋorganizations뀔□ŋare뀔□ŋnot뀔□ŋopposed뀔□ŋto뀔□ŋRTOs뀔□ŋin뀔□ŋprinciple.뀔□ŋTunnels뀔□
that뀔□ŋRTOs뀔□ŋcannot뀔□ŋbe[251]뀔□ŋNot modeled뀔□ŋcan뀔□ŋthey뀔□ŋnot뀔□ŋbe뀔□ŋmodeled,뀔□ŋRTOs
difcicult뀔□ŋ(if뀔□ŋnot뀔□ŋimpossible)뀔□ŋto뀔□ŋregulate뀔□ŋand뀔□ŋmonitor뀔□ŋby뀔□ŋstate뀔□ŋaut
benecicial뀔□ŋuses뀔□ŋhave뀔□ŋadmittedly뀔□ŋuncertain뀔□ŋthreshold뀔□ŋconditions뀔□ŋthat뀔□ŋshoul

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[250] BDCP,뀔□ŋNovember뀔□ŋ2013,뀔□ŋSection뀔□ŋ3.4.1.4,뀔□ŋ*Real-Time Operational Decision Making Process*,뀔□ŋ3-26,뀔□ŋlines뀔□ŋ14-□18.

[251] 뀔□ŋThis뀔□ŋis뀔□ŋmost뀔□ŋexplicitly뀔□ŋnoted뀔□ŋin뀔□ŋBDCP뀔□ŋ*CALSIM Appendix*,뀔□ŋ*5C,뀔□ŋDSM2 Attachment*,뀔□ŋ*5C.*
for 뀔□ŋthe 뀔□ŋEvaluated 뀔□ŋStarting 뀔□ŋOperations,뀔□ŋ*Scenarios*,뀔□ŋ5C.A-157뀔□ŋto뀔□ŋ162.뀔□ŋOld뀔□ŋand뀔□ŋMiddle뀔□ŋ
operations뀔□ŋare뀔□ŋan뀔□ŋexample,뀔□ŋp.뀔□ŋ5C.A-□157,뀔□ŋlines뀔□ŋ31-□44.뀔□ŋ"The뀔□ŋmagnitude뀔□ŋof
and뀔□ŋMiddle뀔□ŋRiver뀔□ŋclows]뀔□ŋcannot뀔□ŋbe뀔□ŋsimulated뀔□ŋaccurately뀔□ŋwith뀔□ŋCALSIM뀔□ŋbecau
specicied뀔□ŋby뀔□ŋthe뀔□ŋUSFWS뀔□ŋsmelt뀔□ŋworking뀔□ŋgroup,뀔□ŋbased뀔□ŋon뀔□ŋreal-□time뀔□ŋmonitor
temperature뀔□ŋconditions.뀔□ŋThe뀔□ŋassumed뀔□ŋrestrictions뀔□ŋprovide뀔□ŋa뀔□ŋrepresentative뀔□ŋsimulatio
conditions뀔□ŋwithout뀔□ŋany뀔□ŋOMR뀔□ŋrestrictions."뀔□ŋMoreover,뀔□ŋreal-□time뀔□ŋoperations뀔□ŋpose뀔□
South뀔□ŋDelta뀔□ŋexport뀔□ŋoperations뀔□ŋwith뀔□ŋreal-□time뀔□ŋadaptive뀔□ŋoperations뀔□ŋin뀔□ŋplace.뀔□
-□5,000뀔□ŋcfs뀔□ŋwere뀔□ŋallowed뀔□ŋfor뀔□ŋ6뀔□ŋmonths뀔□ŋ(January-□June),뀔□ŋa뀔□ŋmaximum뀔□ŋof뀔□
(assuming뀔□ŋthe뀔□ŋSan뀔□ŋJoaquin뀔□ŋRiver뀔□ŋdiversion뀔□ŋto뀔□ŋOld뀔□ŋRiver뀔□ŋsatiscied뀔□ŋthe뀔□ŋ3
south뀔□ŋof뀔□ŋthe뀔□ŋOMR뀔□ŋclow뀔□ŋstations.뀔□ŋBut뀔□ŋbecause뀔□ŋof뀔□ŋthe뀔□ŋ1,500뀔□ŋcfs뀔□ŋlimit
BiOp),뀔□ŋthe뀔□ŋmaximum뀔□ŋexports뀔□ŋwould뀔□ŋbe뀔□ŋ1,400뀔□ŋtaf뀔□ŋper뀔□ŋyear.뀔□ŋIf뀔□ŋthe뀔□ŋO
the뀔□ŋ6뀔□ŋmonths뀔□ŋ(with뀔□ŋ1,500뀔□ŋcfs뀔□ŋin뀔□ŋApril뀔□ŋand뀔□ŋMay),뀔□ŋa뀔□ŋtotal뀔□ŋof뀔□ŋ78
is뀔□ŋa뀔□ŋvery뀔□ŋdramatic뀔□ŋreduction뀔□ŋfor뀔□ŋthe뀔□ŋCVP뀔□ŋand뀔□ŋSWP뀔□ŋexports뀔□ŋwhich뀔□ŋ
of뀔□ŋthe뀔□ŋtotal뀔□ŋexports뀔□ŋduring뀔□ŋthese뀔□ŋmonths.뀔□ŋThis뀔□ŋuncertainty뀔□ŋin뀔□ŋthe뀔□ŋpoten
consequence뀔□ŋof뀔□ŋthe뀔□ŋadaptive뀔□ŋmanagement뀔□ŋframework뀔□ŋfor뀔□ŋthe뀔□ŋ2008뀔□ŋUSFWS뀔□ŋ
regarding뀔□ŋOMR뀔□ŋclow."뀔□ŋSince뀔□ŋBDCP뀔□ŋcontemplates뀔□ŋreal-□time뀔□ŋoperations뀔□ŋin뀔□ŋsevera
locations,뀔□ŋuncertainties뀔□ŋwill뀔□ŋcompound뀔□ŋfor뀔□ŋplanning뀔□ŋoperations,뀔□ŋexports,뀔□ŋand뀔□ŋout

Tunnels뀕□ηProject뀕□ηproponents뀕□ηpush뀕□ηuse뀕□ηof뀕□ηRTOs뀕□ηas뀕□η"silver뀕□ηbullets"뀕□η
protect뀕□ηlisted뀕□ηcish뀕□ηspecies뀕□ηbut뀕□ηwhich뀕□ηcome뀕□ηup뀕□ηshort.뀕□ηThis뀕□ηimplies
given뀕□ηbroad뀕□ηdiscretion뀕□ηover뀕□ηproject뀕□ηoperations뀕□ηto뀕□ηmake뀕□η"short-□term뀕□η
usurpation뀕□ηof뀕□ηestablished뀕□ηlaws뀕□ηand뀕□ηregulations뀕□ηin뀕□ηthe뀕□ηname뀕□ηof뀕□ηo
exports뀕□ηrelative뀕□ηto뀕□ηDelta뀕□ηinclows,뀕□ηwater뀕□ηquality뀕□ηobjectives,뀕□ηand뀕□ηDelta뀕
contrary뀕□ηto뀕□ηthe뀕□ηSWRCB's뀕□ηrole뀕□ηas뀕□ηthe뀕□ηsole뀕□ηbody뀕□ηwith뀕□ηauthority뀕□
objectives.뀕□η

Given뀕□ηthat뀕□ηthe뀕□ηadaptive뀕□ηmanagement뀕□ηresearch뀕□ηagenda뀕□ηof뀕□ηAppendix뀕□ηD
with뀕□ηlarge뀕□ηnumbers뀕□ηof뀕□ηstudies뀕□ηto뀕□ηincrease뀕□ηunderstanding뀕□ηof뀕□ηthe뀕□η
interrelationships,뀕□ηEWC뀕□ηlacks뀕□ηconcidence뀕□ηthat뀕□ηRTO's뀕□ηsilver뀕□ηbullet뀕□ηrole뀕□η
is뀕□ηnot뀕□ηthe뀕□ηkind뀕□ηof뀕□η"experiment"뀕□ηthat뀕□ηis뀕□ηcalled뀕□ηfor뀕□ηin뀕□ηthe뀕□η
resources.뀕□ηEven뀕□ηmore뀕□ηimportant뀕□ηit뀕□ηis뀕□ηunlawful뀕□ηas뀕□ηa뀕□ηbasis뀕□ηfor뀕□
impacts뀕□ηunder뀕□ηCEQA뀕□ηand뀕□ηNEPA.뀕□ηFor뀕□ηexample,뀕□ηreal-□time뀕□ηoperations뀕□ηa
2014뀕□ηand뀕□η2015뀕□ηalong뀕□ηthe뀕□ηupper뀕□ηSacramento뀕□ηRiver뀕□ηby뀕□ηthe뀕□ηBureau
control뀕□ηtemperature뀕□ηconditions,뀕□ηbut뀕□ηfailed뀕□ηto뀕□ηprevent뀕□ηlarge뀕□ηscale뀕□ηlosse
Chinook뀕□ηsalmon뀕□ηwhile뀕□ηSWRCB뀕□ηstaff뀕□ηand뀕□ηofcicials뀕□ηcould뀕□ηonly뀕□ηstand뀕□
can뀕□ηcreate뀕□ηsituations뀕□ηin뀕□ηwhich뀕□ηproject뀕□ηoperators뀕□ηcan뀕□ηbehave뀕□ηas뀕□ηt
is뀕□ηunacceptable뀕□ηnow뀕□ηthat뀕□ηlisted뀕□ηcish뀕□ηspecies뀕□ηare뀕□ηso뀕□ηclose뀕□ηto뀕□η
operations뀕□ηcan뀕□ηbe뀕□ηpermitted뀕□ηsufcicient뀕□ηmargins뀕□ηof뀕□ηerror뀕□ηto뀕□ηprevent뀕
advocate뀕□ηapplication뀕□ηof뀕□ηthe뀕□ηprecautionary뀕□ηprinciple뀕□ηfor뀕□ηenforcing뀕□ηand뀕□η
objectives.

Adjustments뀕□ηto뀕□ηwater뀕□ηquality뀕□ηclow뀕□ηobjectives뀕□ηand뀕□ηbenecicial뀕□ηuses뀕□ηsho
precaution.뀕□ηDesignated뀕□ηbenecicial뀕□ηuses뀕□ηshould뀕□ηbe뀕□ηprotected뀕□ηas뀕□ηrequired뀕
implementing뀕□ηregulations.뀕□ηThe뀕□ηmost뀕□ηsensitive뀕□ηof뀕□ηthem뀕□ηwill뀕□ηbe뀕□ηendang
Project뀕□ηoperating뀕□ηcriteria뀕□ηthat뀕□ηreduce뀕□ηand뀕□ηreverse뀕□ηSacramento뀕□ηRiver뀕□η
San뀕□ηJoaquin뀕□ηRiver뀕□ηwater뀕□ηto뀕□ηDelta뀕□ηchannels.뀕□ηThe뀕□ηprecautionary뀕□ηprincip
state뀕□ηand뀕□ηfederal뀕□ηcisheries뀕□ηand뀕□ηwater뀕□ηpro[252]뀕□η***should뀕□ηopt***[illegible]***ηpolicy뀕□ηpreventing뀕□η***
extinction뀕□ηand뀕□ηrestoring뀕□ηand뀕□ηenhancing뀕□ηthe뀕□ηintegrity뀕□ηof뀕□ηBay[7]***□Delta뀕***
before뀕□ηnew뀕□ηplumbing뀕□ηand뀕□ηsouth뀕□ηof뀕□ηDelta뀕□ηexport뀕□ηdeliveries.뀕□η

This뀕□ηis뀕□ηnot뀕□ηa뀕□ηcall뀕□ηto뀕□ηend뀕□ηsouth뀕□ηof뀕□ηDelta뀕□ηexports,뀕□ηbut뀕□ηan
realistically뀕□ηassess뀕□ηhow뀕□ηto뀕□ηprotect뀕□ηfully뀕□ηall뀕□ηbenecicial뀕□ηuses뀕□ηby뀕□ηpro
them뀕□ηfully뀕□ηunder뀕□ηthe뀕□ηCWA뀕□ηbefore뀕□ηreasonable뀕□ηquantities뀕□ηof뀕□ηDelta뀕□η
permitted.뀕□η***The뀕□ηTunnels뀕□ηProject뀕□ηas뀕□ηproposed뀕□ηwould뀕□ηput뀕□ηplumbing뀕□ηand뀕***
neither뀕□ηan뀕□ηacceptable,뀕□ηlawful뀕□ηnor뀕□ηreasonable뀕□ηprioritization.

Last뀕□ηyear,뀕□ηwe뀕□ηnoted뀕□ηthat뀕□ηthe뀕□ηessential뀕□ηpurpose뀕□ηof뀕□ηreal-□time뀕□ηope
BDCP,뀕□ηis뀕□ηto뀕□η

> maximize뀕□ηwater뀕□ηsupply뀕□ηfor뀕□ηSWP뀕□ηand뀕□ηCVP뀕□ηrelative뀕□ηto뀕□ηthe뀕□ηAnnual뀕□ηOp
> subject뀕□ηto뀕□ηproviding뀕□ηthe뀕□ηnecessary뀕□ηprotections뀕□ηfor뀕□ηcovered뀕□ηspecies.뀕□ηRTOs뀕□
> timescale뀕□ηpracticable뀕□ηfor뀕□ηeach뀕□ηaffected뀕□ηfacility뀕□ηand뀕□ηare뀕□ηpart뀕□ηof뀕□ηthe뀕□ηw
> will뀕□ηbe뀕□ηperiodically뀕□ηevaluated뀕□ηand뀕□ηpossibly뀕□ηmodicied뀕□ηthrough뀕□ηthe뀕□ηadaptive뀕
> [citation].뀕□ηThe뀕□ηRTOs뀕□ηwill뀕□ηsatisfy뀕□ηWater뀕□ηCode뀕□ηSection뀕□η85321:뀕□η“The뀕□ηBDCP
> time뀕□ηoperational뀕□ηdecision-□making뀕□ηprocess뀕□ηin뀕□ηwhich뀕□ηcishery뀕□ηagencies뀕□ηensure뀕□
> performance뀕□ηmeasures뀕□ηare뀕□ηachieved뀕□ηin뀕□ηa뀕□ηtimely뀕□ηmanner뀕□ηwith뀕□ηrespect뀕□ηto

[252]뀕□ηPeter뀕□ηMontague,뀕□ηaccessed뀕□ηonline뀕□η[illegible]뀕□η[illegible]뀕□η2015뀕□η[illegible]뀕□η

When꿯□ηdeveloping꿯□ηadjustments꿯□ηto꿯□ηTunnels꿯□ηProject꿯□ηoperations,[253]꿯□ηwould꿯□ηreal-□time
consider꿯□ηcovered꿯□ηspecies꿯□ηrisks,꿯□ηactions꿯□ηneeded꿯□ηto꿯□ηavoid꿯□ηadverse꿯□ηeffec
water꿯□ηallocations꿯□ηcurrently꿯□ηor꿯□ηin꿯□ηfuture꿯□ηyears,꿯□η"end꿯□ηof꿯□ηyear꿯□η[reservo
Reservoir꿯□ηlow꿯□η"point"[254]꿯□ηdelivery꿯□ηschedules꿯□ηfor꿯□ηany꿯□ηSWP꿯□ηor꿯□ηCVP꿯□ηcontractor,
implemented꿯□ηthroughout꿯□ηthe꿯□ηyear꿯□ηto꿯□ηrecover꿯□ηany꿯□ηwater꿯□ηsupplies꿯□ηredu
RTO꿯□ηteam.[255]꿯□ηThese꿯□ηcriteria꿯□ηfor꿯□ηconsideration꿯□ηplace꿯□ηa꿯□ηgreat꿯□ηdeal꿯□ηof꿯
minimize꿯□ηwater꿯□ηcosts꿯□ηto꿯□ηNorth꿯□ηDelta꿯□ηIntake꿯□ηdiversions,꿯□ηlest꿯□ηthey꿯□η
wise꿯□ηto꿯□ηassume꿯□ηfor꿯□ηCEQA꿯□ηand꿯□ηNEPA꿯□ηpurposes꿯□ηthat꿯□ηsome꿯□ηfraction
will꿯□ηmake꿯□ηerrors.

RTO꿯□ηteam꿯□ηactivities꿯□ηwould꿯□ηbe꿯□ηneeded꿯□ηunder꿯□ηBDCP꿯□ηnot꿯□ηonly꿯□ηat꿯
Delta꿯□ηCross꿯□ηChannel꿯□ηgates,꿯□ηHead꿯□ηof꿯□ηOld꿯□ηRiver꿯□ηgate,꿯□ηthe꿯□ηFremont
"nonphysical꿯□ηbarriers"꿯□ηintended꿯□ηto꿯□ηshoo꿯□ηcish꿯□ηaway꿯□ηfrom꿯□ηcertain꿯□ηchan
river꿯□ηclows.

The꿯□ηRTO꿯□ηteam꿯□ηwould꿯□ηattempt꿯□ηto꿯□ηplan꿯□ηRTOs꿯□ηas꿯□ηpart꿯□ηof꿯□ηBDCP
by꿯□ηanticipating꿯□ηperiods꿯□ηwhen꿯□ηRTOs꿯□ηmay꿯□ηbe꿯□ηemployed,꿯□ηalternative꿯□ηres
intended꿯□ηbenecits꿯□ηto꿯□ηcovered꿯□ηspecies,꿯□ηany꿯□ηexpected꿯□ηeffects꿯□ηon꿯□ηwater
analysis꿯□ηprocedures꿯□ηused꿯□ηto꿯□ηtrack꿯□ηadjustments.꿯□ηRTOs꿯□ηwould꿯□ηnecessitate꿯
accounting꿯□ηprocedures꿯□ηsince꿯□ηthe꿯□ηstate꿯□ηand꿯□ηfederal꿯□ηwater꿯□ηprojects꿯□ηwill
water꿯□ηexports꿯□ηjust꿯□ηbecause꿯□ηcovered꿯□ηcish꿯□ηshow꿯□ηup꿯□ηunannounced꿯□ηand꿯□η
Intakes꿯□ηor꿯□ηthe꿯□ηSouth꿯□ηDelta꿯□ηpumping꿯□ηplants.꿯□η

This꿯□ηsection꿯□ηof꿯□ηChapter꿯□η3꿯□ηin꿯□ηBDCP꿯□ηstates꿯□ηsome꿯□η"salvage꿯□ηdensity
clow꿯□ηadjustments꿯□ηbetween꿯□ηJanuary꿯□η1꿯□ηand꿯□ηJune꿯□η15꿯□ηaffecting[256]꿯□ηthe꿯□η
North꿯□ηDelta꿯□ηIntakes,꿯□ηRTO꿯□ηmonitoring꿯□ηwill꿯□ηmanage꿯□ηbypass꿯□ηclow꿯□ηopera
June,꿯□ηbut꿯□ηthe꿯□η"exact꿯□ηtriggers꿯□ηand꿯□ηresponses꿯□ηfor꿯□ηRTO꿯□ηat꿯□ηthe꿯□η
development."꿯□ηGenerally꿯□ηthey꿯□ηare꿯□ηintended꿯□ηto꿯□ηmanage꿯□ηnorth꿯□ηDelta꿯□ηdi

- within꿯□ηa꿯□ηpreset꿯□ηrange꿯□ηwhen꿯□ηjuvenile꿯□ηsalmonids꿯□ηare꿯□ηemigrating꿯□ηdownstre
- within꿯□ηa꿯□ηpreset꿯□ηrange꿯□ηwhen꿯□ηadult꿯□ηsturgeon꿯□ηare꿯□ηmigrating꿯□ηupstream.
- within꿯□ηa꿯□ηpreset꿯□ηrange꿯□ηto꿯□ηavoid꿯□ηan꿯□ηincrease꿯□ηin꿯□ηfrequency꿯□ηand꿯□ηm
  entrainment)꿯□ηat꿯□ηGeorgiana꿯□ηSlough꿯□ηcompared꿯□ηto꿯□ηbaseline꿯□η(Real-□time꿯□ηadjustm
  clows꿯□ηare꿯□ηprimarily꿯□ηthe꿯□ηresponsibility꿯□ηof꿯□ηDWR꿯□ηoperators꿯□ηwith꿯□ηoccasional
  appropriate.)
- and꿯□ηto꿯□ηmanage꿯□ηthe꿯□ηdistribution꿯□ηof꿯□ηpumping꿯□ηactivities꿯□ηamong꿯□ηthe꿯□ηth
  Delta꿯□ηintake꿯□ηfacilities꿯□ηto꿯□ηmaximize꿯□ηsurvival꿯□ηof꿯□ηcovered꿯□ηcish꿯□ηspecies꿯□η[257]

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[253]꿯□ηThe꿯□ηReal-□Time꿯□ηOperations꿯□ηTeam꿯□ηwould꿯□ηcomprise꿯□ηone꿯□ηrepresentative꿯□ηeach꿯
cishery꿯□ηagencies꿯□ηand꿯□ηfrom꿯□ηDWR꿯□ηand꿯□ηthe꿯□ηBureau꿯□ηof꿯□ηReclamation.

[254]꿯□ηSan꿯□ηLuis꿯□ηReservoir꿯□ηhas꿯□ηa꿯□η"low꿯□ηpoint"꿯□ηof꿯□ηabout꿯□η300,000꿯□ηacre-□feet꿯
Felipe꿯□ηProject꿯□ηcontractors꿯□η(Santa꿯□ηClara꿯□ηValley꿯□ηWater꿯□ηDistrict꿯□ηand꿯□ηSan꿯□ηBenito꿯□ηC
to꿯□ηwithdraw꿯□ηwater꿯□ηdue꿯□ηto꿯□ηthe꿯□ηpotential꿯□ηfor꿯□ηalgal꿯□ηbloom꿯□ηcontamination꿯□η
to꿯□ηthe꿯□ηfact꿯□ηthat꿯□ηwhen꿯□ηSan꿯□ηLuis꿯□ηReservoir꿯□ηgets꿯□ηthat꿯□ηlow,꿯□ηtemperature꿯
economically꿯□ηinfeasible꿯□ηfor꿯□ηSan꿯□ηFelipe꿯□ηProject꿯□ηcontractors꿯□ηto꿯□ηtreat꿯□ηthe꿯□ηwater
benecicial꿯□ηuse.꿯□η

[255]꿯□ηBay꿯□ηDelta꿯□ηConservation꿯□ηPlan,꿯□ηChapter꿯□η3,꿯□ηp.꿯□η3.4-□26,꿯□ηlines꿯□η34-□39,꿯□ηa

[256]꿯□η*Ibid.*,꿯□ηp.꿯□η3.4-□28꿯□ηto꿯□η3.4-□29,꿯□ηTable꿯□η3.4.1-□3.

[257]꿯□η*Ibid.*,꿯□ηlines꿯□η13-□22.

But 꿯□ηthe 꿯□ηfact 꿯□ηthese 꿯□ηranges 꿯□ηand 꿯□ηpumping 꿯□ηactivities 꿯□ηare 꿯□ηundisclosed 꿯 descriptions 꿯□ηare 꿯□ηincomplete 꿯□ηin 꿯□ηboth 꿯□ηthe 꿯□ηDraft 꿯□ηEIR/EIS 꿯□ηand 꿯□ηthe 꿯□η

Undue, 꿯□ηImproper 꿯□ηand 꿯□ηExcessive 꿯□ηReliance 꿯□ηon 꿯□ηadaptive 꿯□ηMesagement

and꿯□ηstressors꿯□ηfor꿯□ηDelta꿯□ηsmelt,꿯□ηwinter-□run꿯□ηand꿯□ηspring-□run꿯□ηChinook꿯□η
steelhead,꿯□ηand꿯□ηidenticies꿯□ηsections꿯□ηof꿯□ηthe꿯□ηRDEIR/SDEIS꿯□ηand꿯□ηDraft꿯□ηEIR/
the꿯□ηTunnels꿯□ηProject꿯□ηexacerbate꿯□ηthe꿯□ηthreats꿯□ηand꿯□ηstressors,꿯□ηand꿯□ηcites꿯
charts꿯□ηthat꿯□ηdocument꿯□ηthe꿯□ηimpact꿯□ηand꿯□ηthe꿯□ηreliance꿯□ηon꿯□ηreal-□time꿯□η
management꿯□ηas꿯□ηsupposed꿯□ηmitigations.꿯□ηSuch꿯□ηalleged꿯□ηmitigations꿯□ηare꿯□ηmetap
not꿯□ηmitigations꿯□ηin꿯□ηthe꿯□ηhand.꿯□ηCEQA꿯□ηrequires꿯□ηthat꿯□ηmitigations꿯□ηactually꿯
impacts.꿯□ηRTOs꿯□ηand꿯□ηadaptive꿯□ηmanagement꿯□ηresearch꿯□ηtasks꿯□ηare꿯□ηnot꿯□ηreco
mitigation꿯□η"wild꿯□ηcards."꿯□ηYou꿯□ηeither꿯□ηmitigate꿯□ηto꿯□ηa꿯□ηlevel꿯□ηless꿯□ηthan꿯
not.꿯□ηRTOs꿯□ηand꿯□ηadaptive꿯□ηmanagement꿯□ηare꿯□ηnot꿯□η"enforceable,"꿯□ηand꿯□ηcann
must꿯□ηbe꿯□ηmeasurable꿯□ηand꿯□ηenforceable.꿯□ηDeteriorating꿯□ηthrough-□Delta꿯□ηsurvival꿯
of꿯□ηChinook꿯□ηsalmon꿯□ηdisclosed꿯□ηin꿯□ηthe꿯□ηRDEIR/SDEIS꿯□ηbelie꿯□ηthe꿯□ηRDEIR/SD
Project꿯□ηthat꿯□ηsupposed꿯□ηmitigations꿯

Thus, 꿯□ηthe 꿯□ηRDEIR/SDEIS 꿯□ηis 꿯□ηinadequate 꿯□η proposing 꿯□ηmitigations 꿯□ηbased 꿯□ηon 꿯□ηreal-□time 꿯□ηoperations 꿯□ηand 꿯□ηadaptive 꿯□ηm claiming 꿯□ηthat 꿯□ηsigni.icant, 꿯□ηadverse 꿯□ηimpacts 꿯□ηare 꿯□ηreduced 꿯□ηto 꿯□ηlevels 꿯□ηth or 꿯□ηnot 꿯□ηadverse.

The꿯□ηNational꿯□ηResearch꿯□ηCouncil's꿯□ηcommittee꿯□ηon꿯□ηSustainable꿯□ηWater꿯□ηand꿯□
of꿯□ηthe꿯□ηBay꿯□ηDelta꿯□ηEstuary꿯□ηsuggested꿯□ηusing꿯□ηa꿯□ηtechnique꿯□ηto꿯□ηdetermi
an꿯□ηappropriate꿯□ηstrategy꿯□ηbefore꿯□ηit꿯□ηis꿯□ηundertaken.꿯□ηThe꿯□ηtechnique꿯□ηprobe

- the꿯□ηexistence꿯□ηof꿯□ηinformation꿯□ηgaps
- good꿯□ηprospects꿯□ηfor꿯□ηlearning꿯□ηat꿯□ηan꿯□ηappropriate꿯□ηtime꿯□ηscale꿯□ηcom decisions,꿯□ηand
- the꿯□ηpresence꿯□ηof꿯□ηopportunities꿯□ηfor꿯□ηadjustment.[258]

In꿯□ηthe꿯□ηcase꿯□ηof꿯□ηBDCP,꿯□ηthe꿯□ηNRC꿯□ηcommittee꿯□ηconcluded꿯□ηthat꿯□ηadaptive
in꿯□ηBDCP,꿯□ηbut꿯□ηfurther꿯□ηconcluded꿯□ηthat꿯□η"BDCP꿯□ηneeds꿯□ηto꿯□ηaddress...difcicul
conservation꿯□ηmeasures꿯□ηinto꿯□ηthe꿯□ηadaptive꿯

before 꿯□ηthere 꿯□ηcanegy 꿯□ηbe 꿯□ηcon.idence the 꿯□ηadaptive 꿯□ηmanagement'꿯□ηprogram

꿯□ηNRC꿯□ηcommittee꿯□ηalso꿯□ηstressed꿯□ηthat꿯□ηit
results꿯□ηof꿯□ηadaptive꿯□ηmanagement꿯□ηefforts꿯□ηmanagement꿯□ηdecision꿯□ηmaking.

We꿯□ηare꿯□ηmore꿯□ηcircumspect꿯□ηthan꿯□ηthe꿯□ηNational꿯□ηResearch꿯□ηCouncil꿯□ηabout꿯
management꿯□ηto꿯□ηthe꿯□ηpolitics꿯□ηof꿯□ηthe꿯□ηTunnels꿯□ηProject꿯□ηand꿯□ηthe꿯□ηDelta
regulatory꿯□ηand꿯□ηoperational꿯□ηagencies꿯□ηfail꿯□ηrepeatedly꿯□ηto꿯□ηapply꿯□ηexisting꿯□ηstat
their꿯□ηactions,꿯□ηplans,꿯□ηand꿯□ηprograms.꿯□ηThe꿯□ηTunnels꿯□ηProject's꿯□η(and꿯□ηBDCP'
program꿯□ηis꿯□ηco-□opted꿯□ηby꿯□ηthe꿯□ηnarrow꿯□ηengineering꿯□ηobjectives꿯□ηwe꿯□ηdesc
policy꿯□ηgoals,꿯□ηfocused꿯□ηas꿯□ηthey꿯□ηare꿯□ηon꿯□ηbetter꿯□ηexport꿯□ηwater꿯□ηquality꿯
deliveries.

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[258] 꿯□ηNational꿯□ηResearch꿯□ηCouncil,꿯□ηPanel꿯□ηto꿯□ηReview꿯□ηCali*fornia's꿯□ηRevised꿯□ηDraft꿯□ηDelta꿯□ηConve Science 꿯□ηand 꿯□ηAdaptive 꿯□ηManagement 꿯□ηin 꿯□ηCalifornia's꿯□ηDraft꿯□ηWashington,꿯□ηDC:꿯□ηNational꿯□η* Academies꿯□ηPress,꿯□η2011꿯□ηp.꿯□η39.꿯□ηAccessible꿯□ηonline꿯□η at꿯□ηhttp://www.nap.edu/catalog.php?꿯□η2014꿯□ηat꿯□η record_id=13148 .꿯□ηEmphasis꿯□ηadded.

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Bay뀀□ηDelta뀀□ηConservation뀀□ηPlan/Alternatives뀀□η4뀀□ηand뀀□

Listed뀀 Species	Threats뀀□ηand뀀□ηStressors	Tunnels뀀□ηProject'뀀□ηSources
Delta뀀□ Smelt	• Increased뀀□ηwater뀀□ηclarity • Potential뀀□ηNorth뀀□ηDelta뀀□ηintakes entrainment뀀□ηand뀀□ηimpingement,뀀 • Exposure뀀□ηto뀀□ηcontaminants뀀□ηa algal뀀□ηblooms뀀□ηdue뀀□ηto뀀□ηinc residence뀀□ηtime • Reduced뀀□ηclows뀀□ηand뀀□ηupstrea X2뀀□ηhabitat	**Water뀀□ηclarity:** RDEIR/SDEIS,뀀□ηp.뀀□η4. 4.3.7-□29 **North뀀□ηDelta뀀□ηIntakes:뀀□ηentrainmer predation뀀□ηloss** p.뀀□η4.3.7-□24,뀀□ηlines **X2뀀□ηmoves뀀□ηupstream** alternative뀀□η4뀀□ applies뀀□ηto뀀□ηAlternative뀀□η4A뀀□η(Sec 4.1-□43,뀀□ηlines뀀□η10-□30),뀀□ηshows뀀□ migration,뀀□ηBDCP뀀□ηAppendix뀀□η5C뀀□ -□42.뀀□ηSee뀀□ηalso뀀□ηFigures뀀□η4.3.2-□ Water뀀□ηSupply. **Increased뀀□ηresidence뀀□ηtime:** Appendix뀀□η5C,뀀□ 5C.5.4-□14뀀□ηof뀀□ηBDCP;뀀□ηTable뀀□η8-
Winter-□ run뀀□η Chinook꾿 Salmon	• North뀀□ηDelta뀀□ηintakes뀀□ηcontact screens뀀□ηand뀀□ηpredator뀀□ηconce (hotspots) • North뀀□ηDelta뀀□ηintakes뀀□ηreduce clows,뀀□ηleading뀀□ηto뀀□ηgreater뀀□ predation뀀□ηeffects • Reduced뀀□ηattraction뀀□ηclows뀀□ηfo adults뀀□ηfrom뀀□ηNorth뀀□ηDelta뀀□ • Exposure뀀□ηto뀀□ηcontaminants뀀□ηi term뀀□ηperiod뀀□η(2060)	**Fish뀀□ηscreens뀀□ηoperation뀀□ηwith뀀□ management뀀□ηplan뀀□ηand뀀□ηreal** p.뀀□η4.3.7-□48,뀀□ηlines뀀□η11-□17.뀀□ηCl entrainment뀀□ηand뀀□ηimpingement뀀□ηrisl make뀀□ηsame뀀□ηclaim뀀□ηfor뀀□ηdelta뀀□ **Reduced뀀□ηdownstream뀀□ηand뀀□ηattra** BDCP뀀□ηAppendix뀀□η5C뀀□ηTables뀀□ηC.A also뀀□ηFigures뀀□η4.3.2-□7뀀□ηand뀀□η-□8 Supply. **Increased뀀□ηresidence뀀□ηtime:** Appendix뀀□η5C,뀀□ 5C.5.4-□14뀀□ηof뀀□ηBDCP;뀀□ηTable뀀□η8-
Spring-□ run뀀□η Chinook꾿 Salmon	• North뀀□ηDelta뀀□ηintakes뀀□ηcontact screens뀀□ηand뀀□ηpredator뀀□ηconce (hotspots) • North뀀□ηDelta뀀□ηintakes뀀□ηreduce clows,뀀□ηleading뀀□ηto뀀□ηgreater뀀□ predation뀀□ηeffects • Reduced뀀□ηattraction뀀□ηclows뀀□ηfo adults뀀□ηfrom뀀□ηNorth뀀□ηDelta뀀□ • Exposure뀀□ηto뀀□ηcontaminants뀀□ηi term뀀□ηperiod뀀□η(2060)	**Fish뀀□ηscreens뀀□ηoperation뀀□ηwith뀀□ management뀀□ηplan뀀□ηand뀀□ηreal** p.뀀□η4.3.7-□79,뀀□ηlines뀀□η15-□17.뀀□ηCl entrainment뀀□ηrisk. **Reduced뀀□ηdownstream뀀□ηand뀀□ηattra** BDCP뀀□ηAppendix뀀□η5C뀀□ηTables뀀□ηC.A also뀀□ηFigures뀀□η4.3.2-□7뀀□ηand뀀□η-□8 Supply. **Increased뀀□ηresidence뀀□ηtime:** Appendix뀀□η5C,뀀□ 5C.5.4-□14뀀□ηof뀀□ηBDCP;뀀□ηTable뀀□η8-
Central뀀 Valley뀀□I Steel-□ head	• North뀀□ηDelta뀀□ηintakes뀀□ηcontact뀀□r predator뀀□ηconcentration뀀□η(hotspots) • North뀀□ηDelta뀀□ηintakes뀀□ηreduce뀀□η leading뀀□ηto뀀□ηgreater뀀□ηprobability뀀□ effects • Reduced뀀□ηattraction뀀□ηclows뀀□ηfor뀀□ from뀀□ηNorth뀀□ηDelta뀀□ηintakes뀀□ηop • Exposure뀀□ηto뀀□ηcontaminants뀀□ηin뀀□ period뀀□η(2060)	**Fish뀀□ηscreens뀀□ηoperation뀀□ηwith뀀□ management뀀□ηplan뀀□ηand뀀□ηreal** p.뀀□η4.3.7-□199,뀀□ηlines뀀□η1-□6.뀀□η **Reduced뀀□ηdownstream뀀□ηand뀀□ηattra** BDCP뀀□ηAppendix뀀□η5C뀀□ηTables뀀□ηC.A also뀀□ηFigures뀀□η4.3.2-□7뀀□ηand뀀□η-□8 Supply. **Increased뀀□ηresidence뀀□ηtime:** Appendix뀀□η5C,뀀□ 5C.5.4-□14뀀□ηof뀀□ηBDCP;뀀□ηTable뀀□η8-

Researchers 뀕 □ η Craig 뀕 □ η R. 뀕 □ η Allen 뀕 □ η and 뀕 □ η Lance 뀕 □ η H. 뀕 □ η Gunderson 뀕 □ η have 뀕 □ η identicied 뀕
under 뀕 □ η which 뀕 □ η adaptive 뀕 □ η management 뀕 □ η may 뀕 □ η be 뀕 □ η applied 뀕 □ η with 뀕 □ η success. 뀕 □ η The
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environmental 뀕 □ η systems 뀕 □ η is 뀕 □ η high 뀕 □ η and 뀕 □ η the 뀕 □ η governance 뀕 □ η capacity 뀕 □ η of 뀕 □ η the 뀕 □
"pathologies" 뀕 □ η or 뀕 □ η challenges 뀕 □ η they 뀕 □ η identify 뀕 □ η about 뀕 □ η political 뀕 □ η and 뀕 □ η organizationa
undermine 뀕 □ η the 뀕 □ η efcicacy 뀕 □ η of 뀕 □ η adaptive 뀕 □ η management 뀕 □ η are: 뀕 □ η lack 뀕 □ η of 뀕 □ η stakeho
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not 뀕 □ η used 뀕 □ η to 뀕 □ η justify 뀕 □ η changing 뀕 □ η policy 뀕 □ η "Complexity management" 뀕 □ η outcomes 뀕 □ η for 뀕 □ η
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govern 뀕 □ η some 뀕 □ η or 뀕 □ η another 뀕 □ η aspect 뀕 □ η of 뀕 □ η the 뀕 □ η region's 뀕 □ η natural 뀕 □ η resources 뀕 □ η
immediately 뀕 □ η creating 뀕 □ η adaptive 뀕 □ η management 뀕 □ η challenges 뀕 □ η to 뀕 □ η social 뀕 □ η learning 뀕 □ η a
management. 뀕 □ η It 뀕 □ η is 뀕 □ η often 뀕 □ η remarked 뀕 □ η that 뀕 □ η Delta 뀕 □ η governance 뀕 □ η is 뀕 □ η fragmente
state, 뀕 □ η local 뀕 □ η and 뀕 □ η federal 뀕 □ η governmental 뀕 □ η jurisdictions 뀕 □ η that 뀕 □ η exist. 뀕 □ η Is 뀕 □ η adapt
possible 뀕 □ η when 뀕 □ η the 뀕 □ η state 뀕 □ η of 뀕 □ η California 뀕 □ η through 뀕 □ η its 뀕 □ η Department 뀕 □ η of 뀕 □ η
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There 뀕 □ η are 뀕 □ η no 뀕 □ η guarantees 뀕 □ η that 뀕 □ η scienticic 뀕 □ η cindings 뀕 □ η can 뀕 □ η successfully 뀕 □ η and
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Project 뀕 □ η proponents 뀕 □ η place 뀕 □ η too 뀕 □ η much 뀕 □ η faith 뀕 □ η in 뀕 □ η the 뀕 □ η water 뀕 □ η and 뀕 □ η enviro
the 뀕 □ η Tunnels 뀕 □ η Project 뀕 □ η and/or 뀕 □ η implement 뀕 □ η BDCP. 뀕 □ η

There 뀕 □ η is 뀕 □ η no 뀕 □ η reason, 뀕 □ η after 뀕 □ η 48,000 뀕 □ η pages 뀕 □ η of 뀕 □ η BDCP 뀕 □ η and 뀕 □ η "California 뀕
Project 뀕 □ η will 뀕 □ η be 뀕 □ η operated 뀕 □ η with 뀕 □ η any 뀕 □ η more 뀕 □ η environmental 뀕 □ η sensitivity 뀕 □ η or 뀕
from 뀕 □ η scienticic 뀕 □ η adaptive 뀕 □ η management 뀕 □ η experiments 뀕 □ η on 뀕 □ η Delta 뀕 □ η endangered 뀕 □ η sp
uses 뀕 □ η over 뀕 □ η the 뀕 □ η last 뀕 □ η six 뀕 □ η decades. 뀕 □ η

An 뀕 □ η alternative 뀕 □ η is 뀕 □ η to 뀕 □ η regulate 뀕 □ η [illegible] 뀕 □ η harm. 뀕 □ η If 뀕 □ η you 뀕 □ η aren't 뀕 □ η sure 뀕 □ η what 뀕 □ η you're 뀕 □ η doing, 뀕 □ η you 뀕 □ η should 뀕 □ η proceed 뀕
at 뀕 □ η all. 뀕 □ η Better 뀕 □ η safe 뀕 □ η than 뀕 □ η sorry must, 뀕 □ η export 뀕 □ η water 뀕 □ η from 뀕 □ η the 뀕 □ η Delta 뀕
expense 뀕 □ η of 뀕 □ η the 뀕 □ η Delta's 뀕 □ η ecological 뀕 □ η and 뀕 □ η economic 뀕 □ η needs, 뀕 □ η and 뀕 □ η not 뀕 □ η p

The 뀕 □ η Proposed 뀕 □ η Project 뀕 □ η is 뀕 □ η not 뀕 □ η the 뀕 □ η Least 뀕 □ η Environmentally 뀕 □ η Damaging 뀕 □ η
(LEDPA). 뀕 □ η Finally, 뀕 □ η the 뀕 □ η Tunnels 뀕 □ η Project 뀕 □ η also 뀕 □ η fails 뀕 □ η to 뀕 □ η meet 뀕 □ η another 뀕 □ η Sectio
requirement 뀕 □ η [under 뀕 □ η CWA 뀕 □ η § 뀕 □ η 404(b)(1)...that 뀕 □ η the 뀕 □ η project 뀕 □ η proponent 뀕 □ η must 뀕
project 뀕 □ η is 뀕 □ η the 뀕 □ η [Least 뀕 □ η Environmentally 뀕 □ η Damaging 뀕 □ η Practicable 뀕 □ η Alternative] 뀕 □ η L
action 뀕 □ η is 뀕 □ η not 뀕 □ η the 뀕 □ η LEDPA 뀕 □ η simply 뀕 □ η because 뀕 □ η a 뀕 □ η federal 뀕 □ η agency 뀕 □ η is 뀕 □ η

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[259] 뀕 □ η Craig 뀕 □ η R. 뀕 □ η Allen 뀕 □ η and 뀕 □ η Lance 뀕 □ η H. 뀕 □ η Gunderson, 뀕 □ η "Pathology 뀕 □ η and 뀕 □ η Failure 뀕 □ η in 뀕
adaptive 뀕 □ η management, *Ask* 뀕 □ η *Cooperative* 뀕 □ η *Fish* 뀕 □ η & 뀕 □ η *Wildlife* 뀕 □ η *Research* 뀕 □ η *Paper* 뀕 □ η *Staff* 뀕 □ η *Publi*
http://digitalcommons.unl.edu/ncfwrustaff/79. 뀕 □ η Also 뀕 □ η published *in* 뀕 □ η *Journal* 뀕 □ η *of* 뀕 □ η *Environmental* 뀕 □ η *Management*
(2011): 뀕 □ η 13279- □ 1384.

[260] 뀕 □ η Peter 뀕 □ η Montague, 뀕 □ η "The 뀕 □ η Uses 뀕 □ η [illegible] 뀕 □ η 1, 뀕
1999.

[261] 뀕 □ η See 뀕 □ η Environmental 뀕 □ η [illegible] 뀕 □ η *Plan* 뀕 □ η *for* 뀕 □ η *California* 뀕 □ η Accessible 뀕 □ η online 뀕 □ η 20 뀕
October 뀕 □ η 2015 뀕 □ η *http://ewcalifornia.org/reports/ewcwaterplan9-* □ 1- □ 2015.pdf 뀕 □ η

[262] 뀕 □ η EPA, 뀕 □ η Preliminary 뀕 □ η Administrative 뀕 □ η Draft 뀕 □ η Comments 뀕 □ η for 뀕 □ η the 뀕 □ η Bay 뀕 □ η Delta 뀕 □ η Conser
26, 뀕 □ η 2012.

action [illegible] as its preferred alternative." Tunnels Project [illegible] be [illegible] damaging alternative possible. It most decinitely is not the least [illegible] the LEDPA.

Over two years ago, EPA pointed out that "Chapter 8 of the [illegible] indicates that, as proposed, all project alternatives of the BDCP [illegible] one or more beneficial uses within the affected watersheds." that [illegible] should sharply distinguish between alternatives and evaluate their compa[illegible] with 40 CFR 1502.14(b)." one year ago, EPA explained to state [illegible]

> Other reasonable alternatives could be developed by incorporating a suite [illegible] conservation, levee maintenance, and decreased reliance on the Delta. Such [illegible] consistent with the purpose and need for the project, as well as [illegible] Memorandum of Understanding among Federal Agencies and the Delta Refo[illegible]

The "alternatives" of the Tunnels Project presented in the Draft [illegible] nothing more than peas [illegible] been a complete [illegible] Tunnels Project proponents to obtain and present the Reasonable [illegible] required under the Endangered Species Act in the RDEIR/SDEIS.

Under the NEPA Regulations, "This [alternatives] section is the heart [illegible] statement." The alternatives section should "sharply" decine issues and [illegible] choice among options by the decision-maker and the public. 40 [illegible] draft statement is so inadequate as to preclude meaningful analysis, [illegible] circulate a revised draft of the appropriate portion."

Operation of the Tunnels Project would have enormous adverse envi[illegible] worsening violations of water quality standards. We understand that [illegible] supporters wish to take enormous quantities of water away from [illegible] we have a government of laws, not of men and women. It [illegible] damaging and expensive project or follow the law whether certain [illegible] the project is not dropped, it will be necessary to recirculate [illegible] decision-maker review that presents a reasonable range of alternatives [illegible] Tunnels Project and that would cinally began to increase clows throu[illegible] reasonable alternatives required by NEPA must include the Reasonable [illegible] (RPA) produced pursuant to the Endangered Species Act and the [illegible] Practicable Alternative (LEDPA) pursuant to the Clean Water Act.

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[263] EPA, [illegible] BDCP DEIS Corrections and Additional Editorial Recommendations, [illegible] p. [illegible]

[264] EPA's Comments on BDCP ADEIS, p. 3, July 3, 2013.

[265] *Id.* [illegible] 2.

[266] EPA [illegible] Detailed Comments on the Draft Environmental Impact Statement for [illegible] Plan; August 26, 2014, p. 13.

[267] http://restorethedelta.org/wp-content/uploads/2015/09/7-22-15-BDCP-alts-ltr-pdf.pdf

[268] http://restorethedelta.org/wp-content/uploads/2015/09/9-9-15-BDCP-cinal-[illegible]-pdf.pdf

[269] 40 C.F.R. § 1502.9(a).

III. Continuing Failure to Provide Adequate Funding Assurances

Because뀀□ηthere뀀□ηis뀀□ηno뀀□ηnew뀀□ηcinancial뀀□ηand뀀□ηeconomic뀀□ηanalysis뀀□ηof뀀□ηthe
RDEIR/SDEIS,뀀□ηour뀀□ηcomments뀀□ηlast뀀□ηyear뀀□ηabout뀀□ηthe뀀□ηTunnels뀀□ηProject뀀□ηapp

> There뀀□ηis뀀□ηgreat뀀□ηinstability뀀□ηand뀀□ηuncertainty뀀□ηin뀀□ηthe뀀□ηfuture뀀□ηof뀀□ηwater뀀□ηex
> the뀀□ηrange뀀□ηof뀀□ηreasonably뀀□ηforeseeable뀀□ηfuture뀀□ηof뀀□ηDelta뀀□ηexports뀀□ηshows뀀□ηdram
> incremental뀀□ηwater뀀□ηcost뀀□ηand뀀□ηcinancial뀀□ηperformance.뀀□ηThis뀀□ηinstability뀀□ηfatally뀀□ηun
> provide뀀□ηcredible뀀□ηfunding뀀□ηassurances.
>
> Compared뀀□ηto뀀□ηother뀀□ηsources뀀□ηof뀀□ηpotential뀀□ηnew뀀□ηwater뀀□ηsupply뀀□ηin뀀□ηCalifornia,
> from뀀□ηthe뀀□ηhigh뀀□ηend뀀□ηof뀀□ηthese뀀□ηalternative뀀□ηsources뀀□ηto뀀□ηbeing뀀□ηinfeasible뀀□ηa
> assumptions뀀□ηused뀀□ηin뀀□ηthe뀀□ηBDCP뀀□ηanalysis.
>
> The뀀□ηBDCP뀀□ηanalysis뀀□ηof뀀□ηwater뀀□ηaffordability뀀□ηfrom뀀□ηthe뀀□ηTwin뀀□ηTunnels뀀□ηproject
> support뀀□ηthe뀀□ηdemand-□side뀀□ηbasis뀀□ηof뀀□ηcinancial뀀□ηassurances뀀□ηneeded뀀□ηto뀀□ηmake뀀□
> incidental뀀□ηtake뀀□ηpermits.뀀□ηThe뀀□ηcishery뀀□ηagencies뀀□ηshould뀀□ηreject뀀□ηBDCP뀀□ηincidental
> adequate뀀□ηfunding뀀□ηassurances.
>
> The뀀□ηTwin뀀□ηTunnels뀀□ηcinancing뀀□ηplan뀀□ηremains뀀□ηhighly뀀□ηuncertain뀀□ηand뀀□ηfails뀀□ηto
> assurances뀀□ηneeded뀀□ηto뀀□ηmake뀀□ηstatutory뀀□ηcindings뀀□ηfor뀀□ηissuance뀀□ηof뀀□ηincidental뀀□

Lack뀀□ηof뀀□ηa뀀□ηcinancing뀀□ηplan뀀□ηmeans뀀□ηthe뀀□ηTunnels뀀□ηProject뀀□ηand뀀□ηits뀀□η
fulcill뀀□ηdisclosure뀀□ηrequirements뀀□ηof뀀□ηthe뀀□ηCalifornia뀀□ηEnvironmental뀀□ηQuality뀀□ηAct
Environmental뀀□ηPolicy뀀□ηAct.

Economist뀀□ηJeffrey뀀□ηMichael,뀀□ηdirector뀀□ηof뀀□ηthe뀀□ηCenter뀀□ηfor뀀□ηBusiness뀀□ηand뀀□
of뀀□ηthe뀀□ηPacicic뀀□ηin뀀□ηStockton,뀀□ηrevisited뀀□ηhis뀀□ηanalysis뀀□ηof뀀□ηbenecits뀀□ηand
found뀀□ηthat뀀□ηthe뀀□ηTunnel뀀□ηProject's뀀□ηeconomics뀀□ηwere뀀□ηworsened뀀□ηby뀀□ηthree

- ***The뀀□ηnew뀀□ηplan뀀□ηdrops뀀□ηthe뀀□η50*** [illegible] ***year뀀□ηpermit,뀀□ηand뀀□ηany뀀□ηnotion***
  future뀀□ηwater뀀□ηdeliveries. [illegible] □ηchange뀀□ηhas뀀□ηalready뀀□ηbeen뀀□ηrevealed뀀□ηand뀀□
  importance뀀□ηto뀀□ηthe뀀□ηeconomics뀀□ηcan뀀□ηnot뀀□ηbe뀀□ηunderstated.뀀□ηAccording뀀
  consultants,뀀□ηthe뀀□ηregulatory뀀□ηassurance뀀 [illegible] □ηvalue뀀□η
  the뀀□ηTunnels뀀□ηto뀀□ηthe뀀□ηwater뀀□ηexporters'뀀□ηwho뀀□ηwould뀀□ηcinance뀀□ηthem
  case뀀□ηfor뀀□ηthe뀀□ηTunnels뀀□ηcompletely뀀□ηfalls뀀□ηapart뀀□ηwithout뀀□ηthe뀀□ηregula
  estimated뀀□ηbenecits뀀□ηby뀀□ηnearly뀀□η$10뀀□ηbillion.[270]

- ***The뀀□ηaverage뀀□ηannual뀀□ηincremental뀀□ηwater뀀□ηyield뀀□ηwith뀀□ηthe뀀□ηtunnels뀀***
  has뀀□ηdropped뀀□ηby뀀□η135,000 [illegible] □ηour뀀□ηscenarios뀀□ηwi
  incremental뀀□ηyield뀀□ηthat뀀□ηranged뀀□ηfrom뀀□ηa뀀□ηloss뀀□ηof뀀□η27,000뀀□ηaf뀀□ηto
  gain뀀□ηof뀀□η392,000뀀□ηaf뀀□ηacross뀀□ηall뀀□ηfour뀀□ηscenarios뀀□ηand뀀□ηnew뀀□ηEIR
  incremental뀀□ηyield뀀□ηranging뀀□ηbetween뀀□ηa뀀□ηloss뀀□ηof뀀□η23,000뀀□ηaf뀀□ηto뀀□η

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[270] 뀀□ηJeffrey뀀□ηMichael, *Economy,뀀□ηBDCP뀀□ηa뀀□ηgood뀀□ηdeal뀀□ηfor뀀□ηwater뀀□ηagencies?뀀□ηJaso* Sunding뀀□ηdisagree,"뀀□ηJune뀀□η23,뀀□η2012,뀀□η http://valleyaccessible.blogspot.com/2012/06/is-□bdcp-□good-□deal-□for-□water-□agencies.html□ηsee뀀□ηalsoηComparing뀀□ηBenecit뀀□ηCost뀀□ηEstimates뀀□ηof뀀□ηthe뀀□ηTunnels,"뀀□ηSepte http://valleyecon.blogspot.com/2013/09/comparing-□benecit-□cost-□estimates-□;□ηQuick뀀□ηTake뀀□ηon뀀□ηLA뀀□ Times'뀀□ηReport뀀□ηon뀀□ηRestructuring뀀□ηthe뀀□ηDelta뀀□η http://valleyecon.blogspot.com/2015/04/quick-□take-□on-□la-□times-□report-□on.html

average꿯□ηgain꿯□ηof꿯꿯1,257,000꿯□ηacre꿯□ηbest꿯□ηcase꿯□ηscenario꿯□ηfor꿯□ηwater꿯□ηe
284,000꿯□ηaf,꿯□ηand꿯□ηthe꿯□ηaverage꿯□ηdropped꿯□ηby꿯□η135,000꿯□ηaf.꿯□ηMichael꿯
would꿯□ηdrop꿯□ηbenecits꿯□ηby꿯[271]□ηabout꿯□η$1꿯□ηbillion.

- ***The꿯□ηnew꿯□ηplan꿯□ηshows꿯□ηthe꿯□ηestimated꿯□ηconstruction꿯□ηperiod꿯□ηhas꿯□η***
The꿯□ηconstruction꿯□ηperiod꿯□ηis꿯□ηnow꿯□ηdescribed꿯□ηas꿯□η2016꿯□ηto꿯□η2029,꿯
2013꿯□ηplan.꿯□ηAn꿯□ηextra꿯□η4꿯□ηyears꿯□ηof꿯□ηwaiting꿯□ηto꿯□ηreceive꿯□ηany꿯□
cinancing꿯□ηcosts)꿯□ηwill꿯□ηfurther꿯□ηreduce꿯□ηthe꿯□ηbenecit-□cost꿯□ηratio.[272]

Inaction꿯□ηon꿯□ηcinancing꿯□ηis꿯□ηunderscored꿯□ηby꿯□ηindecinite꿯□ηpostponement꿯□ηof꿯□η
State꿯□ηWater꿯□ηContractors꿯□ηand꿯□ηthe꿯□ηCalifornia꿯□ηDepartment꿯□ηof꿯□ηWater꿯□ηRes
problem꿯□ηof꿯□ηrepayment꿯□ηarrangements꿯□ηremains꿯□ηunresolved.꿯□ηHow꿯□ηwould꿯□ηthe
entity꿯□ηmake꿯□ηstate꿯□ηwater꿯□ηcontractors꿯□ηand꿯□ηtheir꿯□ηmember꿯□ηagencies꿯□ηcom
given꿯□ηthe꿯□ηTunnels꿯□ηProject's꿯□ηexorbitant꿯□ηcost꿯□ηand꿯□ηthe꿯□ηrelative꿯□ηcost꿯□η
supply꿯□ηalternatives?꿯□ηHow꿯□ηwould꿯□ηfederal꿯□ηwater꿯□ηcontractors꿯□ηof꿯□ηthe꿯□ηCen
fair꿯□ηshare꿯□ηas꿯□ηbeneciciaries꿯□ηof꿯□ηthe꿯□ηTunnels꿯□ηProject?꿯□ηCan꿯□ηcongressional

Kern꿯□ηCounty꿯□ηWater꿯□ηAgency,꿯□ηin꿯□ηits꿯□ηdraft꿯□ηcomment꿯□ηletter꿯□ηon꿯□ηthe꿯
stated꿯□ηbluntly:

> The꿯□ηalternatives꿯□ηin꿯□ηthe꿯□ηRDEIR/SDEIS꿯□ηserve꿯□ηas꿯□ηan꿯□ηimportant꿯□ηinitial꿯□ηstep
> to꿯□ηthe꿯□ηchallenges꿯□ηfacing꿯□ηCalifornia's꿯□ηwater꿯□ηresources꿯□ηand꿯□ηthe꿯□ηDelta.꿯□ηThe꿯
> currently꿯□ηprovide꿯□η[public꿯□ηwater꿯□ηagencies]꿯□ηwith꿯□ηa꿯□ηProject꿯□ηthat꿯□ηis꿯□ηeconom
> further꿯□ηdetail꿯□ηbelow,꿯□ηadditional꿯□ηefforts꿯□ηneed꿯□ηto꿯□ηbe꿯□ηtaken꿯□ηto꿯□ηreduce꿯□η
> Project's꿯□ηyield,꿯□ηand꿯□ηimprove꿯□ηthe꿯□ηlikelihood꿯□ηthat꿯□ηthe꿯□ηProject꿯□ηwill꿯□ηbe꿯□η
> manner꿯□ηthat꿯□ηimproves꿯□ηwater꿯□ηsupplies꿯□ηat꿯□ηan꿯□ηaffordable꿯□ηcost.[274]

The꿯□ηstep-□up꿯□ηprovisions꿯□ηthat꿯□ηare꿯□ηmissing꿯□ηfrom꿯□ηexisting꿯□ηcontractual꿯□ηr
Metropolitan꿯□ηWater꿯□ηDistrict꿯□ηand꿯□ηits꿯□ηmember꿯□ηagencies꿯□ηcontinues꿯□ηto꿯□ηbe
resolution.[275]꿯□η

The꿯□ηability꿯□ηand꿯□ηwillingness꿯□ηto꿯□ηpay꿯□ηof꿯□ηCentral꿯□ηValley꿯□ηProject꿯□η(CVP
question꿯□ηmark.꿯□ηAs꿯□ηwe꿯□ηnoted꿯□ηlast꿯□ηyear,꿯□ηagricultural꿯□ηwater꿯□ηagencies꿯□

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[271]꿯□ηSee꿯□ηBDCP,꿯□ηDraft꿯□η2013,꿯□ηChapter꿯□η5,꿯□ηWater꿯□ηSupply,꿯□ηTable꿯□η5-□9, baydeltaconservationplan.com/Libraries/Dynamic_Document_Library/Public_Draft_BDCP_EIR-□EIS_Chapter_5_-□_Water_Supply.sclb.aspx꿯□ηand꿯□η http://baydeltaconservationplan.com/RDEIRS508/Recirc_Figures/Fig_4.3.1.15_NS%20Delta%20LT%20Avg_Alt4A-□508.pdf

[272]꿯□ηSee꿯□η http://baydeltaconservationplan.com/RDEIRS/Ap_A_Rev_DEIR-□S/App_22B_Air_Assumptions.pdf꿯□ηand꿯□η http://baydeltaconservationplan.com/RDEIRS/Ap_A_Rev_DEIR-□S/App_16A_Regional_Imp.pdf

[273]꿯□ηNegotiation꿯□ηMeeting꿯□η#2꿯□ηoriginally꿯□ηscheduled꿯□ηfor꿯□ηTuesday,꿯□ηFebruary꿯□η17,꿯□η2015 has꿯□ηbeen꿯□ηpostponed.꿯□ηIt꿯□ηwill꿯□ηbe꿯□ηrescheduled꿯□ηfor꿯□ηa꿯□ηlater꿯□ηdate.꿯□ηDetails꿯□ new꿯□ηdate꿯□ηis꿯□ηavailable."꿯□ηThis꿯□ηis꿯□ηthe꿯□ηmost꿯□ηcurrent꿯□ηannouncement꿯□ηas꿯□ηof꿯□ negotiations,꿯□ηaccessible꿯□ηOctober꿯□η25,꿯□η2015꿯□ηat꿯□η https://www.usbr.gov/mp/bdo/swpao/swpcontractamendmentforbdcp/announcements.cfm.

[274]꿯□ηDraft꿯□ηletter꿯□ηof꿯□ηJames꿯□ηM.꿯□ηBeck,꿯□ηGeneral꿯□ηManager,꿯□ηKern꿯□ηCounty꿯□ηWater and꿯□ηDavid꿯□ηMurillo,꿯□ηRegional꿯□ηDirector,꿯□η*Subject꿯□ηRecirculated꿯□ηDraft꿯□ηEnvironmental꿯□η Impact꿯□ηReport/Supplemental꿯□ηDraft꿯□ηEnvironmental꿯□ηImpact꿯□ηStatement*,꿯□ηOctober꿯□η30,꿯□η2015,꿯□ηp.꿯□η2.

[275]꿯□ηEWC꿯□ηComments,꿯□ηJune꿯□η11,꿯□η2014,꿯□ηpp.꿯□η103-□107.

both ηcost ηallocations ηand ηwater ηdeliveries ηwithin ηthe ηCVP. ηA η200
Ribbon ηTask ηForce ηfound ηthat ηnearly η$1.3 ηbillion ηis ηowed ηby η
of ηthe ηCVP, ηwhile ηSan ηJoaquin ηValley ηand ηSacramento ηregion ηCVP
about η21.5 ηpercent η[276] ηof ηEnvironmental ηcosts ηand ηintractable ηdrainage ηchallenges ηplag
Luis ηUnit ηon ηthe ηwest ηside ηof ηthe ηSan ηJoaquin ηValley, ηwith η
the ηbooks, ηincluding ηfor ηBDCP ηApplicant ηagency ηWestlands ηWater ηDis
Department ηof ηthe ηInterior ηrecently ηannounced ηa ηproposed ηsettlement η
obligations, ηthat, ηif ηCongress ηapproves, ηwould ηrelieve ηInterior ηand ηthe
obligation ηto ηprovide ηdrainage ηservice ηto ηthe ηSan ηLuis ηUnit, ηand η
to ηthe ηCVP η(including ηfor ηdrainage ηservice ηrepayment), ηwhile ηmore η
available.[277] ηShould ηthe ηsettlement ηgo ηthrough, ηthis ηwould ηremove ηexi
increase ηthe ηdebt ηcapacity ηof ηWestlands ηWater ηDistrict ηto ηafford η
the ηTunnels ηProject—all ηat ηexorbitant ηcost ηto ηUS ηtaxpayers ηand η

On ηthe ηState ηWater ηProject ηside ηof ηthe ηpicture, ηa ηSan ηFranci
October η9, η2015, ηthat ηthe ηMetropolitan ηWater ηDistrict ηof ηSouthern η
County ηWater ηAuthority ηa ηcumulative ηtotal ηof η$231.7 ηmillion ηdue η
to ηthe ηAuthority. ηThe ηjudge ηis ηexpected ηto ηcinalize η[278] η
MWD ηlose ηas ηthis ηcase ηmakes ηits ηway ηthrough ηappeals, ηwhat η
outcome ηon ηMWD's ηability ηto ηsupport ηthe ηcinancial ηrequirements ηof η
case ηis ηresolved, ηhow ηcould ηTunnels ηProject ηfunding ηnegotiations ηresu
cinancial ηuncertainty?

An ηadditional ηcinancing ηissue ηnot ηdisclosed ηin ηthe ηRDEIR/SDEIS ηis η
regional ηwater ηcontractors ηof ηthe ηState ηWater ηProject ηand ηCentral ηV
rates ηversus ηincreases ηin ηtheir ηproperty ηtax ηbases ηto ηcinance ηthe η
contains ηno ηanalysis ηof ηthis ηpossibility ηnor ηwhat ηeconomic ηimpacts η
strategy ηwould ηhave ηon ηwater ηdemand ηand ηlocal ηwater ηconservation η
Code ηSection η85021. ηUsing ηproperty ηtaxes ηrather ηthan ηwater ηrates η
would ηdisconnect ηwater ηconsumption ηfrom ηthe ηreal ηcost η***The η*** ***SDEIS η is η de.icient η and η inadequate η for η omitting η an η economic η and η proposed η project, η and η for η omitting η discussion η of η this η particular η im environment.***

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[276] ηEWC ηComments, ηJune η11, η2014, ηpp. η107-109.

[277] ηCongressional ηResearch ηService, η*Westlands η Drainage η Settlement: η An η Issue* η2015, ηpp. η1-2
Accessible η at: η *http://pennyhill.com/jmsclieseller/docs/IF10245.pdf*; η US η Bureau η of η Reclamation, η Mid-
Region η Public η Affairs, η Westlands η v. η United η States η Settlement η September η2015,
http://wwd.ca.gov/resource-management/drainage/drainage-settlement-documents/; η *http://wwd.ca.gov/wp-content/uploads/2015/10/westlands-vs-united-states-settlement.pdf*; η Westlands' η web η site η contains η
documents η of η the η draft η settlement, η a η list η of η permanently η retired η lands, η
legislation η to η implement η the η settlement. η See η also η California η Water η Impact η N
Restore η the η *Delta, η Report: η Retiring η Toxic η Farmland η in η Western η San η Joaquin η Environment,* η and η *Taxpayer η Jeopardy,* η14, η2015, η *https://accessibleweb.org/content/c-win-special-report-retiring-toxic-farmland-western-san-joaquin-valley-would-save-the-water-ecosystem*; η Northwest η study η
of η land η retirement η is η accessible η at η *http://accessibleweb.com/media/ap_ciles/San_Luis_Unit_Land_Retirement_Final_Report_071415.pdf*.

[278] η San η Diego η County η Water η Authority η *MWD η owes η State η Relief η Authority η $232 η Million,* η
October η10, η2015, η *http://accessible.com/news/mwd-owes-water-authority-232-million-judge-declares*. η Additional η background η and η source η documents η on η the η case η are η acce
www.sdcwa.org/mwdrate-challenge. η

Finally, the BDCP Tunnels Project plan, RDEIR/RDEIS does not contain compensation for the cive Delta counties (Yolo, Solano, San Joaquin, Delta cities and towns, and dozens of reclamation districts to off declines resulting from construction and operation of the project. Wi economic mitigation for the greater Delta region, the plan fails t the Delta Reform Act. This compensation is required[279] by Water So many questions remain for the RDEIR/SDEIS; answers continue to time. Meanwhile, the RDEIR/SDEIS fails to disclose the problems let

[279] "Construction of a new Delta conveyance facility shall not be initiat contract to receive water from the State Water Project and the federal authority representing those entities have made arrangements or entered into mitigation of property tax or assessments levied by local governments or construction, location, mitigation, or operation of new Delta conveyance facilities Section 85089(b).

IV. Worsening Failure to Provide Governance and Implementation Support

Failure꿯□ηto꿯□ηcoordinate꿯□ηtimely꿯□ηSection꿯□η7꿯□ηconsultation꿯□ηwith꿯□ηNMFS꿯□ηand꿯
crucial꿯□ηelements꿯□ηof꿯□ηthe꿯□ηNEPA꿯□ηand꿯□ηCEQA꿯□ηenvironmental꿯□ηreviews꿯□ηincor
organization꿯□ηand꿯□ηadministration꿯□ηof꿯□ηTunnels꿯□ηProject꿯□ηconstruction꿯□ηand꿯□ηoper
Key꿯□ηproducts꿯□ηof꿯□ηthe꿯□ηneeded꿯□ηbiological꿯□ηopinions—the꿯□ηmatter꿯□ηof꿯□ηwheth
species,꿯□ηand꿯□ηthe꿯□ηformulation꿯□ηand꿯□ηimplementation꿯□ηof꿯□ηreasonable꿯□ηand꿯□ηp
jeopardy꿯□ηand꿯□ηencourage꿯□ηsurvival꿯□ηand꿯□ηrecovery꿯□ηof꿯□ηlisted꿯□ηspecies—are꿯□η
administering꿯□ηavoidance꿯□ηand꿯□ηminimization꿯□ηof꿯□ηimpacts,꿯□ηidentifying꿯□ηopportuniti
for꿯□ηreal-□time꿯□ηoperations,꿯□ηand꿯□ηfor꿯□ηsetting꿯□ηan꿯□ηagenda꿯□ηfor꿯□ηadaptive꿯□
critical꿯□ηelements꿯□ηhelp꿯□ηdecine꿯□ηTunnels꿯□ηProject꿯□ηgovernance.꿯□ηIn꿯□ηthe꿯□ηrush
quality꿯□ηcerticication꿯□ηand꿯□ηdredge/cill꿯□ηapprovals꿯□ηfrom꿯□ηthe꿯□ηState꿯□ηWater꿯□η
the꿯□ηUS꿯□ηArmy꿯□ηCorps꿯□ηof꿯□ηEngineers,꿯□ηperhaps꿯□ηthere꿯□ηis꿯□ηno꿯□ηgreater꿯□
prematurely꿯□ηthan꿯□ηthe꿯□ηabsence꿯□ηof꿯□ηthese꿯□ηcritical꿯□ηelements꿯□ηfrom꿯□ηthe꿯□
How꿯□ηwill꿯□ηthese꿯□ηadministrative,꿯□ηscienti.ic,꿯□ηand꿯□ηresource꿯□ηmanagement꿯□ηta
governed?

At꿯□ηleast꿯□ηin꿯□ηlast꿯□ηyear's꿯□ηBay꿯□ηDelta꿯□ηConservation꿯□ηPlan꿯□ηthere꿯□ηwere꿯□ηg
though꿯□ηin꿯□ηour꿯□ηcomments꿯□ηlast꿯□ηyear꿯□ηwe꿯□ηfelt꿯□ηthere꿯□ηwere꿯□ηegregious꿯
through꿯□ηthese꿯□ηmatters[280]꿯□ηthis꿯□ηyear,꿯□ηhowever,꿯□ηit꿯□ηappears꿯□ηno꿯□ηthought꿯□ηis꿯□
proponents꿯□ηto꿯□ηthese꿯□ηproblems;꿯□ηthey꿯□ηseem꿯□ηimplicitly꿯□ηto꿯□ηregard꿯□ηtheir꿯
primarily꿯□ηa꿯□ηwater꿯□ηproject꿯□ηthat꿯□ηwould꿯□ηbe꿯□ηowned꿯□ηand꿯□ηoperated꿯□ηby
Project꿯□ηto꿯□ηhelp꿯□ηbenecit꿯□ηthe꿯□ηBureau's꿯□ηCentral꿯□ηValley꿯□ηProject—though꿯□ηe
ownership꿯□ηis꿯□ηnot꿯□ηeven꿯□ηstated꿯□ηunequivocally꿯□ηthat꿯□ηwe꿯□ηcould꿯□ηcind꿯□ηin

Other꿯□ηquestions꿯□ηcontinue꿯□ηto꿯□ηabound꿯□ηabout꿯□ηthis꿯□ηproject꿯□ηthat꿯□ηoriginate
will꿯□ηthe꿯□ηcinancial꿯□ηassurances꿯□ηbe꿯□ηobtained꿯□ηby꿯□ηTunnels꿯□ηProject꿯□ηpropone
of꿯□ηthe꿯□ηreasonable꿯□ηand꿯□ηprudent꿯□ηalternatives,꿯□ηonce꿯□ηthey꿯□ηemerge꿯□ηfrom꿯
How꿯□ηwill꿯□ηenvironmental꿯□ηjustice꿯□ηand꿯□ηwater꿯□ηquality꿯□ηconcerns꿯□ηof꿯□ηthe꿯□
incorporated꿯□ηinto꿯□ηTunnels꿯□ηProject꿯□ηoperational꿯□ηdecision-□making?꿯□η(See꿯□ηour꿯□
there꿯□ηbe꿯□ηthe꿯□ηequivalent꿯□ηof꿯□ηa꿯□ηPermit꿯□ηOversight꿯□ηGroup?꿯□ηAn꿯□ηAuthor
be꿯□ηa꿯□η"California꿯□ηWaterFix"꿯□ηofcice꿯□ηto꿯□ηimplement꿯□ηthe꿯□ηTunnels꿯□ηProject꿯
(including꿯□ηRTOs),꿯□ηrestoration,꿯□ηannual꿯□ηplanning,꿯□ηand꿯□ηadaptive꿯□ηmanagement꿯□η
there꿯□ηare꿯□ηto꿯□ηbe꿯□ηany꿯□ηpublic꿯□ηentities꿯□ηgoverning꿯□ηoperation꿯□ηand꿯□ηman
their꿯□ηactivities꿯□ηand꿯□ηmeetings꿯□ηcomply꿯□ηwith꿯□ηBagley-□Keene꿯□ηand꿯□ηBrown꿯□η
the꿯□ηCalifornia꿯□ηGovernment꿯□ηCode?꿯□ηThe꿯□ηRDEIR/SDEIS꿯□ηis꿯□ηsilent꿯□ηon꿯□ηsuch

[280]꿯□ηEWC꿯□ηComments,꿯□ηJune꿯□η11,꿯□η2014,꿯□ηSection꿯□ηV,꿯□ηpp.꿯□η110-□117.

V. This Year's Tunnels Project is Also Contrary to Law

BDCP's 꿯 draft 꿯 July 꿯 2013 꿯 Implementing 꿯 Agreement 꿯 says 꿯 (twice) 꿯 that 꿯 "a
pursuant 꿯 to 꿯 this 꿯 Agreement, 꿯 the 꿯 BDCP, 꿯 or 꿯 the 꿯 Permits 꿯 must 꿯 be 꿯
local, 꿯 state 꿯 and 꿯 federal 꿯 laws 꿯 [281] 꿯 [illegible] 꿯 [illegible] 꿯 [illegible] 꿯 Implementing 꿯 Agreement 꿯
this 꿯 identical 꿯 [282] 꿯 provision 꿯 this 꿯 section 꿯 of 꿯 EWC's 꿯 comments 꿯 describes 꿯 the 꿯
to 꿯 comply 꿯 with 꿯 many 꿯 applicable 꿯 laws 꿯 and 꿯 regulations.

The 꿯 Bay 꿯 Delta 꿯 Conservation 꿯 Plan, 꿯 the Tunnels 꿯 Project, 꿯 and 꿯 its 꿯 Project
Need 꿯 do 꿯 not 꿯 comply 꿯 with 꿯 existing 꿯 state 꿯 or 꿯 federal 꿯 law. 꿯 The 꿯
with 꿯 established 꿯 law 꿯 in 꿯 this 꿯 section 꿯 and 꿯 the 꿯 following 꿯 section 꿯
itemized 꿯 with 꿯 respect 꿯 to 꿯 the 꿯 National 꿯 Environmental 꿯 Policy 꿯 Act 꿯 and
Quality 꿯 Act. 꿯

We 꿯 have 꿯 already 꿯 commented 꿯 in 꿯 Section 꿯 II 꿯 herein 꿯 on 꿯 unlawful 꿯
statements 꿯 of 꿯 objectives, 꿯 purpose 꿯 and 꿯 need 꿯 for 꿯 the 꿯 project, 꿯 and 꿯
and 꿯 the 꿯 Clean 꿯 Water 꿯 Act.

Our 꿯 comments 꿯 in 꿯 this 꿯 section 꿯 focus 꿯 on 꿯 many 꿯 ways 꿯 in 꿯 which 꿯
Reform 꿯 Act 꿯 of 꿯 2009, 꿯 the 꿯 California 꿯 Water 꿯 Code, 꿯 the 꿯 California 꿯
unreasonable 꿯 use 꿯 and 꿯 unreasonable 꿯 method 꿯 of 꿯 diversion 꿯 of 꿯 water, 꿯
make 꿯 a 꿯 case 꿯 for 꿯 cinding 꿯 the 꿯 Tunnels 꿯 Project 꿯 inconsistent 꿯 as 꿯 a
Act.

The RDEIR/SDEIS omits key federal legislation from its regulatory baseline.

The 꿯 RDEIR/SDEIS 꿯 fails 꿯 to 꿯 include 꿯 Coordinated 꿯 Operations 꿯 Act 꿯 (Public
(Public 꿯 Law 꿯 86-488) 꿯 and 꿯 the 꿯 Central 꿯 Valley 꿯 Project 꿯 Improvement 꿯 A

RDEIR/SDEIS does not meet Environmental Justice legal standards.

The 꿯 State 꿯 of 꿯 California 꿯 decines 꿯 environmental 꿯 justice 꿯 as 꿯 the 꿯 fair
cultures, 꿯 and 꿯 incomes 꿯 with 꿯 respect 꿯 to 꿯 the 꿯 development, 꿯 adoption,
of 꿯 environmental 꿯 laws, 꿯 regulations, [283] 꿯 [illegible] 꿯 state 꿯 laws 꿯 require
consider 꿯 environmental 꿯 justice 꿯 and 꿯 to 꿯 prohibit 꿯 discrimination 꿯 in 꿯 their
The 꿯 Presidential 꿯 Memorandum 꿯 accompanying 꿯 the 꿯 Federal 꿯 Executive 꿯 Order
singles 꿯 out 꿯 NEPA 꿯 and 꿯 states 꿯 that 꿯 "[e]ach 꿯 Federal 꿯 agency 꿯 must
community 꿯 participation 꿯 in 꿯 the 꿯 NEPA 꿯 process, 꿯 including 꿯 identifying
measures 꿯 in 꿯 consultation 꿯 with 꿯 affected 꿯 communities 꿯 and 꿯 improving 꿯 the
meetings, 꿯 crucial 꿯 documents, 꿯 and 꿯 notices. 꿯 The 꿯 Tunnels 꿯 Project 꿯 fails
requirements, 꿯 including.

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[281] *Draft 꿯 꿯 꿯 2013 꿯 꿯 Implementing 꿯 꿯 꿯 Section* 꿯 꿯 23.6 꿯 꿯 and 꿯 꿯 23.22. 꿯 꿯

[282] *Draft 꿯 꿯 꿯 2014 꿯 꿯 Implementing 꿯 꿯 꿯 Section* 꿯 꿯 24.5, 꿯 꿯 p. 꿯 꿯 89. 꿯 꿯 Section 꿯 꿯 24.20, 꿯 꿯 p. 꿯 꿯 92, 꿯 꿯
will 꿯 꿯 be 꿯 꿯 governed 꿯 꿯 by 꿯 꿯 and 꿯 꿯 construed 꿯 꿯 in 꿯 꿯 accordance 꿯 꿯 with 꿯 꿯 the 꿯 꿯 laws 꿯 꿯 of 꿯
California."

[283] California 꿯 꿯 Government 꿯 꿯 Code 꿯 꿯 § 꿯 꿯 65040.12(c).

1. ***CEQA 꿿□ηparticipation 꿿□ηrequirements*** CEQA꿿□ηrequires꿿□ηa꿿□ηprocess꿿□ηthat꿿□ηprovides
for꿿□ηmeaningful꿿□ηparticipation꿿□ηof꿿□ηthe꿿□ηpublic.꿿□ηAccording꿿□ηto꿿□ηPublic꿿□η
21061:꿿□η"The꿿□ηpurpose꿿□ηof꿿□ηan꿿□ηenvironmental꿿□ηimpact꿿□ηreport꿿□ηis꿿□ηto
the꿿□ηpublic꿿□ηin꿿□ηgeneral꿿□ηwith꿿□ηdetailed꿿□ηinformation꿿□ηabout꿿□ηthe꿿□ηeffe
likely꿿□ηto꿿□ηhave꿿□ηon꿿□ηthe꿿□ηenvironment;꿿□ηto꿿□ηlist꿿□ηways꿿□ηin꿿□ηwhich
project꿿□ηcan꿿□ηbe꿿□ηminimized;꿿□ηand꿿□ηto꿿□ηindicate꿿□ηalternatives꿿□ηto꿿□ηsuch
Code꿿□ηsection꿿□η21003(b)꿿□ηprovides:꿿□η"Documents꿿□ηprepared꿿□ηpursuant꿿□ηto꿿□
organized꿿□ηand꿿□ηwritten꿿□ηin꿿□ηsuch꿿□ηa꿿□ηmanner꿿□ηthat꿿□ηwill꿿□ηbe꿿□ηmea
makers꿿□ηand꿿□ηto꿿□ηthe꿿□ηpublic."꿿□ηCEQA꿿□ηGuidelines꿿□ηsection꿿□η15201꿿□ηex
participation꿿□ηis꿿□ηan꿿□ηessential꿿□ηpart꿿□ηof꿿□ηthe꿿□ηCEQA꿿□ηprocess.꿿□ηEach꿿
provisions꿿□ηin꿿□ηits꿿□ηCEQA꿿□ηprocedures꿿□ηfor꿿□ηwide꿿□ηpublic꿿□ηinvolvement꿿□
evaluate꿿□ηpublic꿿□ηreactions꿿□ηto꿿□ηenvironmental꿿□ηissues꿿□ηrelating꿿□ηto꿿□ηthe꿿
SDEIS꿿□ηfail꿿□ηto꿿□ηmeet꿿□ηthe꿿□ηpurpose꿿□ηof꿿□ηCEQA꿿□ηand꿿□ηhas꿿□ηobstruct
public꿿□ηparticipation.꿿□ηLead꿿□ηagencies꿿□ηfail꿿□ηto꿿□ηtranslate꿿□ηcritical꿿□ηdocume
outreach꿿□ηto꿿□ηaffected꿿□ηcommunities꿿□ηto꿿□ηfacilitate꿿□ηtheir꿿□ηmeaningful꿿□ηpar

2. ***NEPA 꿿□ηparticipation 꿿□ηrequirements 꿿□ηand 꿿□ηEqual 꿿□ηJustice 꿿□ηExecutive 꿿□ηOrder*** Executive꿿□ηOrder꿿□η(EO)꿿□η12898꿿□η(1994),꿿□ηFederal꿿□ηActions꿿□ηto꿿□ηAddress꿿
Minority꿿□ηPopulations꿿□ηand꿿□ηLow-□Income꿿□ηPopulations,꿿□ηrequires꿿□ηFederal꿿□ηa
environmental꿿□ηjustice꿿□ηpart꿿□ηof꿿□ηtheir꿿□ηmission꿿□ηand꿿□ηto꿿□ηdevelop꿿□ηen
The꿿□ηPresidential꿿□ηMemorandum꿿□ηaccompanying꿿□ηthe꿿□ηExecutive꿿□ηOrder꿿□ηspec
NEPA,꿿□ηand꿿□ηstates꿿□ηthat꿿□η"[e]ach꿿□ηFederal꿿□ηagency꿿□ηmust꿿□ηprovide꿿□ηop
community꿿□ηparticipation꿿□ηin꿿□ηthe꿿□ηNEPA꿿□ηprocess,꿿□ηincluding꿿□ηidentifying꿿□
mitigation꿿□ηmeasures꿿□ηin꿿□ηconsultation꿿□ηwith꿿□ηaffected꿿□ηcommunities꿿□ηand꿿□
accessibility꿿□ηof꿿□ηpublic꿿□ηmeetings,꿿□ηcrucial꿿□ηdocuments,꿿□ηand꿿□ηnotices.꿿□ηto꿿□η
meet꿿□ηNEPA꿿□ηparticipation꿿□ηrequirements꿿□ηand꿿□ηthe꿿□ηPresidential꿿□ηMemorand
community꿿□ηparticipation꿿□ηin꿿□ηconsultation꿿□ηwith꿿□ηaffected꿿□ηcommunities꿿□ηanc
accessibility꿿□ηof꿿□ηpublic꿿□ηmeetings,꿿□ηcrucial꿿□ηdocuments,꿿□ηand꿿□ηnotices.꿿□η

3. ***Title 꿿□ηVI 꿿□ηof 꿿□ηthe 꿿□ηCivil 꿿□ηRights 꿿□ηAct 꿿□ηof 꿿□η1964*** η in 꿿□ηthe 꿿□ηUnited 꿿
the꿿□ηground꿿□ηof꿿□ηrace,꿿□ηcolor,꿿□ηor꿿□ηnational꿿□ηorigin,꿿□ηbe꿿□ηexcluded꿿□η
benecits꿿□ηof,꿿□ηor꿿□ηbe꿿□ηsubjected꿿□ηto꿿□ηdiscrimination꿿□ηunder꿿□ηany꿿□ηprog
Federal꿿□ηcinancial꿿□ηassistance.η"꿿□ηRDEIR/SDEIS꿿□ηfails꿿□ηto꿿□ηmeet꿿□ηTitle꿿□ηVI꿿□η
1964,꿿□ηby꿿□ηfailing꿿□ηto꿿□ηprovide꿿□ηsufcicient꿿□ηdocuments꿿□ηfor꿿□ηinformation꿿
speaking꿿□ηcommunities,꿿□ηthus꿿□ηexcluding꿿□ηthem꿿□ηfrom꿿□ηparticipation.꿿□η

4. ***California 꿿□ηGovernment 꿿□ηCode 꿿□ηsection 꿿□η11135 꿿□η(a) 꿿□ηand 꿿□ηimplementing 꿿□
California 꿿□ηCode 꿿□ηof 꿿□ηRegulations 꿿□ηTitle 꿿□η22 꿿□ηSections 꿿□η98211 꿿□η(a) 꿿□ηa*** 11135(a)꿿□ηprovides:꿿□η"No꿿□ηperson꿿□ηin꿿□ηthe꿿□ηState꿿□ηof꿿□ηCalifornia꿿□ηshall
origin,꿿□ηethnic꿿□ηgroup꿿□ηidenticication,꿿□ηreligion,꿿□ηage,꿿□ηsex,꿿□ηsexual꿿□ηorienta
information,꿿□ηor꿿□ηdisability,꿿□ηbe꿿□ηunlawfully꿿□ηdenied꿿□ηfull꿿□ηand꿿□ηequal꿿□η
unlawfully꿿□ηsubjected꿿□ηto꿿□ηdiscrimination꿿□ηunder,꿿□ηany꿿□ηprogram꿿□ηor꿿□ηacti

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[284] Memorandum꿿□ηfrom꿿□ηPresident꿿□ηClinton,꿿□ηMarch꿿□η1994꿿□ηavailable꿿□ηat꿿□η https://www.epa.gov/ejscreen/documents/executive_order_12898.htm.

[285] Executive꿿□ηOrder꿿□η13166꿿□η"Improving꿿□ηAccess꿿□ηto꿿□ηServices꿿□ηfor꿿□ηPersons꿿□ηwith꿿□η
Fed.꿿□ηReg.꿿□η50,121꿿□η(Aug.꿿□η16,꿿□η200).꿿□ηEPA꿿□η"Guidance꿿□ηto꿿□ηEnvironmental꿿□ηProtectio
Recipients꿿□ηRegarding꿿□ηTitle꿿□ηVI꿿□ηProhibition꿿□ηAgainst꿿□ηNational꿿□ηOrigin꿿□ηDiscrimination꿿□η
Procicient꿿□ηPersons,꿿□η69꿿□ηFed.꿿□ηReg,꿿□η39602.꿿□η(June꿿□η25,꿿□η2004).꿿□ηLau꿿□ηv.꿿□ηNichols
National꿿□ηOrigin꿿□ηDiscrimination꿿□ηto꿿□ηLimited꿿□ηEnglish꿿□ηSpeakers.꿿□ηSee꿿□ηalso꿿□ηExecutive꿿
50,121꿿□η121꿿□η(Aug.꿿□η16,꿿□η200),꿿□ηand꿿□η69꿿□ηFed.꿿□ηReg,꿿□η39602꿿□η(June꿿□η25,꿿□η2004

operated,꿯□ηor꿯□ηadministered꿯□ηby꿯□ηthe꿯□ηstate꿯□ηor꿯□ηby꿯□ηany꿯□ηstate꿯□ηag
or꿯□ηreceives꿯□ηany꿯□ηcinancial꿯□ηassistance꿯□ηfrom꿯□ηthe꿯□ηstate."꿯□ηRDEIR/SDEIS
Government꿯□ηCode꿯□ηsection꿯□η11135꿯□η(a)꿯□ηand꿯□ηCalifornia꿯□ηCode꿯□ηof꿯□ηR
98211꿯□η(c)꿯□ηand꿯□η98100꿯□ηby꿯□ηunlawfully꿯□ηdenying꿯□ηfull꿯□ηand꿯□ηequal꿯□
communities.꿯□η

5. ***The꿯□ηDymally***[7] ***□Alatorre꿯□ηBilingual꿯□ηServices꿯□ηAct***꿯□ηGovernment꿯□ηCode꿯□ηSections꿯□η7290-□7299.8꿯
requires꿯□ηthat,꿯□ηwhen꿯□ηstate꿯□ηand꿯□ηlocal꿯□ηagencies꿯□ηserve꿯□ηa꿯□η"substant
speaking꿯□ηpeople,"꿯□ηthey꿯□ηmust꿯□η(among꿯□ηother꿯□ηthings)꿯□ηtranslate꿯□ηdocum
services꿯□ηinto꿯□ηtheir꿯□ηclients'꿯□ηlanguages.꿯□ηRDEIR/SDEIS꿯□ηfails꿯□ηto꿯□ηmeet꿯
Bilingual꿯□ηServices꿯□ηAct꿯□ηby꿯□ηnot꿯□ηproviding꿯□ηat꿯□ηminimum꿯□ηthe꿯□ηExecu
other꿯□ηthan꿯□η English.[286]

Language꿯□ηAccessibility꿯□ηand꿯□ηPublic꿯□ηParticipation꿯□ηproponents꿯□ηhave꿯□ηstill꿯□ηfail
respond꿯□ηadequately꿯□ηto꿯□ηrequests꿯□ηfor꿯□ηmaterials꿯□ηand꿯□ηoutreach꿯□ηin꿯□ηSpanish
Currently,꿯□ηonly꿯□ηsome꿯□ηdocuments꿯□η(e.g.,꿯□ηFast꿯□ηFacts)꿯□ηare꿯□ηavailable꿯□ηin꿯□
but꿯□ηthey꿯□ηonly꿯□ηpresent꿯□ηpromotional꿯□ηinformation꿯□ηthat꿯□ηis꿯□ηtoo꿯□ηlimited꿯□
audience꿯□ηto꿯□ηengage꿯□ηmeaningfully꿯□ηin꿯□ηthe꿯□ηdecision-□making꿯□ηprocess.꿯□ηMoreo
narrative꿯□ηis꿯□ηmisleading꿯□ηabout꿯□ηimpacts꿯□ηof꿯□ηthe꿯□ηTunnels꿯□ηProject.

The꿯□ηFast꿯□ηFacts꿯□ηdocuments꿯□ηissued꿯□ηthis꿯□ηsummer꿯□ηat꿯□ηthe꿯□ηJuly꿯□ηopen꿯
issues꿯□ηraised꿯□ηin꿯□ηcomments꿯□ηreceived꿯□ηon꿯□ηlast꿯□ηyear's꿯□ηDraft꿯□ηEIR/EIS.꿯□η
document꿯□ηare꿯□ηnegative꿯□ηimpacts꿯□ηof꿯□ηthe꿯□ηtunnels꿯□ηmentioned—on꿯□ηpublic꿯□η
water꿯□ηquality꿯□ηand꿯□ηsubsistence꿯□ηcishing,꿯□ηimpact꿯□ηon꿯□ηsmall꿯□ηcommunities,꿯□η
documents꿯□ηare꿯□ηstill꿯□ηnot꿯□ηavailable꿯□ηin꿯□ηother꿯□ηlanguages,꿯□ηthus꿯□ηmaking꿯□
individuals,꿯□ηbut꿯□ηto꿯□ηmany꿯□ηcommunities꿯□ηas꿯□ηa꿯□ηwhole꿯□ηwhich꿯□ηhave꿯□ηa꿯
speakers.꿯□η

In꿯□ηaddition,꿯□ηwhen꿯□ηenvironmental꿯□ηjustice꿯□ηcommunity꿯□ηmembers꿯□ηand꿯□ηpartner
number꿯□ηfor꿯□ηmore꿯□ηinformation꿯□ηin꿯□ηSpanish,꿯□ηthey꿯□ηare꿯□ηprompted꿯□ηto꿯□η
message,꿯□ηour꿯□ηcolleagues꿯□ηreported꿯□ηthat꿯□ηthe꿯□ηmessages꿯□ηwere꿯□ηreturned꿯□ηo
Immediate꿯□ηquestions꿯□ηor꿯□ηconcerns꿯□ηwere꿯□ηleft꿯□ηunanswered꿯□ηor꿯□ηreferred꿯□ηt
answers꿯□ηthat꿯□ηdo꿯□ηnot꿯□ηexist꿯□ηon꿯□ηthose꿯□ηsheets.꿯□η

As꿯□ηnoted꿯□ηin꿯□ηa꿯□ηjoint꿯□ηMay꿯□η28,꿯□η2014,꿯□ηletter꿯□ηregarding꿯□ηthe꿯□ηlack꿯
environmental꿯□ηjustice꿯□ηsurvey꿯□ηcompleted꿯□ηto꿯□ηsupport꿯□ηChapter꿯□η28꿯□ηof꿯□ηthe
Justice)꿯□ηexcluded꿯□ηnon-□English꿯□ηspeakers꿯□ηwithin꿯□ηthe꿯□ηDelta.꿯□ηSince꿯□ηthen,꿯□η
proponents.꿯□ηThus,꿯□ηEJ꿯□ηlegal꿯□ηstandards꿯□ηconcerning꿯□ηlanguage꿯□ηaccessibility꿯□ηare
to꿯□ηpublish꿯□ηeven꿯□ηthe꿯□ηExecutive꿯□ηSummary꿯□ηin꿯□ηlanguages꿯□ηother꿯□ηthan꿯□η

Last꿯□ηyear,꿯□ηwe꿯□ηalso꿯□ηcommented꿯□ηthat꿯□ηthe꿯□ηclosing꿯□ηof꿯□ηthe꿯□ηBDCP꿯□η
the꿯□ηpromise꿯□ηof꿯□ηencouraging꿯□ηpublic꿯□ηparticipation.꿯□ηThis꿯□ηyear,꿯□ηthe꿯□ηtwo꿯
28,꿯□η2015,꿯□ηin꿯□ηSacramento꿯□ηand꿯□ηthe꿯□ηsecond꿯□ηon꿯□ηJuly꿯□η29,꿯□η2015,꿯□ηi
conducted꿯□ηfor꿯□ηthe꿯□ηpurpose꿯□ηof꿯□ηcollecting꿯□ηpublic꿯□ηfeedback꿯□ηon꿯□ηthe꿯□ηt
Tunnels꿯□ηProject.꿯□ηThe꿯□ηopen꿯□ηhouse꿯□ηprocess꿯□ηonce꿯□ηagain꿯□ηavoided꿯□ηmeanin
traditional꿯□ηpublic꿯□ηhearing꿯□ηprocess꿯□ηby꿯□ηpresenting꿯□ηa꿯□η"science꿯□ηfair"꿯□ηstyle
open꿯□ηhouse꿯□ηwas꿯□ηhosted꿯□ηduring꿯□ηtypical꿯□ηworking꿯□ηhours,꿯□ηwhich,꿯□ηwhile꿯
which꿯□ηstaffed꿯□ηthe꿯□ηevent,꿯□ηdid꿯□ηnot꿯□ηallow꿯□ηmany꿯□ηcommunity꿯□ηmembers꿯□
open꿯□ηhouse's꿯□ηvery꿯□ηpurpose:꿯□ηto꿯□ηelicit꿯□ηand꿯□ηcapture꿯□ηpublic꿯□ηcomments꿯□

[286] 꿯□ηCalifornia꿯□ηGovernment꿯□ηCode꿯□ηSections꿯□η7290-□7299.8.

Project).꿿□ηAttendees꿿□ηof꿿□ηthese꿿□ηopen꿿□ηhouse꿿□ηmeetings꿿□ηconveyed꿿□ηto꿿□ηus꿿□
advertised꿿□ηat꿿□ηthese꿿□ηmeetings꿿□ηfor꿿□ηhearing꿿□ηimpaired꿿□ηpersons.꿿□η

Land꿿□ηUse,꿿□ηFlood꿿□ηRisk,꿿□ηand꿿□ηAffordable꿿□ηHousing.꿿□ηAs꿿□ηplan꿿□ηyear,꿿□ηthe꿿□ηTunn
fails꿿□ηto꿿□ηconsider꿿□ηhow꿿□ηto꿿□ηmaintain꿿□ηaffordable꿿□ηhousing꿿□ηopportunities꿿□ηin
changes꿿□ηare꿿□ηimplemented.꿿□ηImpacts꿿□ηon꿿□ηlow-□income꿿□ηhome꿿□ηowners,꿿□ηsuch꿿
and꿿□ηlowered꿿□ηhome꿿□ηvalue꿿□ηmust꿿□ηbe꿿□ηaddressed꿿□ηas꿿□ηpart꿿□ηof꿿□ηany꿿□η
RDEIR/SDEIS꿿□ηcall.꿿□η

Disproportionate꿿□ηimpacts꿿□ηof꿿□ηclooding꿿□ηon꿿□ηrenters꿿□ηmust꿿□ηbe꿿□ηmitigated꿿□ηfo
impacts꿿□ηon꿿□ηexisting꿿□ηcommunities꿿□ηof꿿□ηalterations꿿□ηin꿿□ηland꿿□ηuse꿿□ηplans꿿□η
potential꿿□ηfor꿿□ηincreased꿿□ηvulnerability꿿□ηto꿿□ηclooding.꿿□η

A꿿□ηsustainable꿿□ηDelta꿿□ηwill꿿□ηrequire꿿□ηdramatic꿿□ηchanges꿿□ηin꿿□ηland꿿□ηuse꿿□ηde
developed,꿿□ηthereby꿿□ηlimiting꿿□ηchoices꿿□ηfor꿿□ηclood꿿□ηattenuation꿿□ηand꿿□ηincreasing꿿
catastrophic꿿□ηdamage꿿□ηassociated꿿□ηwith꿿□ηa꿿□ηseismic꿿□ηevent.꿿□ηAs꿿□ηthose꿿□ηchoice
to꿿□ηprovide꿿□ηequitable꿿□ηbenecits꿿□ηin꿿□ηplanning꿿□ηfor꿿□ηEJ꿿□ηcommunities,꿿□ηbut꿿□
disproportionate꿿□ηimpacts꿿□ηon꿿□ηthose꿿□ηsame꿿□ηcommunities.꿿□ηFor꿿□ηthis꿿□ηreason,꿿□
Delta꿿□ηmust꿿□ηidentify꿿□ηand꿿□ηaccount꿿□ηfor꿿□ηthe꿿□ηparticular꿿□ηimpacts꿿□ηon꿿□ηEJ

We꿿□ηare꿿□ηdeeply꿿□ηconcerned꿿□ηthat꿿□ηthe꿿□ηTunnel꿿□ηProject꿿□ηfacilities꿿□ηand꿿□ηa
viable꿿□ηoptions꿿□ηfor꿿□ηimproving꿿□ηland꿿□ηuse꿿□ηand꿿□ηaffordable꿿□ηhousing꿿□ηfor꿿□
disproportionate꿿□ηnumber꿿□ηof꿿□ηthe꿿□ηdevelopments꿿□ηthe꿿□ηTunnels꿿□ηProject꿿□ηwould
by꿿□ηlow-□income,꿿□ηpredominantly꿿□ηLatino꿿□ηresidents.꿿□ηChanges꿿□ηin꿿□ηclood꿿□ηmappi
profound꿿□ηeffect꿿□ηon꿿□ηthese꿿□ηdevelopments,꿿□ηwhile꿿□ηtheir꿿□ηability꿿□ηto꿿□ηrecover

Moreover,꿿□ηthese꿿□ηexisting꿿□ηcommunities꿿□ηmay꿿□ηbe꿿□ηdetrimentally꿿□ηimpacted꿿□ηby
developments꿿□ηprotected꿿□ηby꿿□ηnew꿿□η"super꿿□ηlevees,"꿿□ηwhich꿿□ηhave꿿□ηthe꿿□ηpoter
ways꿿□ηthat꿿□ηmay꿿□ηnegatively꿿□ηimpact꿿□ηlower꿿□ηincome꿿□ηcommunities.꿿□ηThe꿿□ηfol
EIR/EIS꿿□η(Appendix:꿿□ηFigure꿿□η6-□5꿿□ηSPFC꿿□ηand꿿□ηNon-□SPFC꿿□ηLevees,꿿□η6-□6꿿□η
Areas,꿿□η6-□7꿿□ηEffective꿿□ηFederal꿿□ηEmergency꿿□ηManagement꿿□ηAgency꿿□ηFlood꿿□ηZone
Populations꿿□ηin꿿□ηthe꿿□ηPlan꿿□ηArea,꿿□ηand꿿□η28-□2꿿□ηLow-□Income꿿□ηPopulations꿿□ηi
FEMA꿿□ηclood꿿□ηzone꿿□ηencompasses꿿□ηmuch꿿□ηof꿿□ηthe꿿□ηcentral,꿿□ηsouth,꿿□ηand꿿□ηv
Marsh꿿□ηwhere꿿□ηmany꿿□ηlow-□income꿿□ηand꿿□ηminority꿿□ηDelta꿿□ηresidents꿿□ηlive.꿿□ηF
impacts꿿□ηto꿿□ηcommunities꿿□ηwhose꿿□ηtransportation꿿□ηroutes꿿□ηcould꿿□ηbe꿿□ηdisrupted꿿

At꿿□ηan꿿□ηeven꿿□ηgreater꿿□ηdisadvantage꿿□ηare꿿□ηcommunities꿿□ηthat꿿□ηreside꿿□ηin,꿿□η
cloodplains—including꿿□ηtenants꿿□ηand꿿□ηfarmworkers.꿿□ηThese꿿□ηcommunities꿿□ηreceive꿿□ηl
property꿿□ηowners꿿□ηafter꿿□ηa꿿□ηclood꿿□ηevent꿿□ηand꿿□ηare꿿□ηmore꿿□ηlikely꿿□ηto꿿□η
total꿿□ηor꿿□ηnear꿿□ηtotal꿿□ηloss꿿□ηof꿿□ηtheir꿿□ηmovable꿿□ηproperty.꿿□ηAny꿿□ηemergenc
and꿿□ηvulnerabilities꿿□ηof꿿□ηthese꿿□ηresidents꿿□ηas꿿□ηwell꿿□ηas꿿□ηtheir꿿□ηcapacity꿿□ηto
is,꿿□ηin꿿□ηfact,꿿□ηsupported꿿□ηwith꿿□ηresources.꿿□η

As꿿□ηdevelopment꿿□ηbecomes꿿□ηlimited꿿□ηand/or꿿□ηmore꿿□ηexpensive꿿□ηin꿿□ηcloodplains,꿿
housing꿿□ηwill꿿□ηbe꿿□ηcurtailed.꿿□ηAny꿿□ηland꿿□ηuse꿿□ηchanges꿿□ηmust꿿□ηinclude꿿□ηa꿿
housing꿿□ηfor꿿□ηthe꿿□ηcurrent꿿□ηand꿿□ηexpected꿿□ηpopulation꿿□ηin꿿□ηthe꿿□ηDelta꿿□ηRe
RDEIS/DEIR.꿿□η

Public꿿□ηHealth꿿□η&꿿□ηWater꿿□ηQuality.꿿□ηProject꿿□ηdegrades꿿□ηrather꿿□ηthan꿿□ηprotects꿿
water꿿□ηquality꿿□ηin꿿□ηthe꿿□ηDelta.꿿□ηIn꿿□ηaddition,꿿□ηwater꿿□ηquality꿿□ηand꿿□ηother꿿
Health꿿□ηare꿿□ηbased꿿□ηon꿿□ηmany꿿□ηdecisions/papers꿿□ηpublished꿿□ηprior꿿□ηto꿿□ηour꿿
effectively꿿□ηconsider꿿□ηpublic꿿□ηhealth꿿□ηimpacts꿿□ηfor꿿□ηenvironmental꿿□ηjustice꿿□ηcomm

The 뀀□ηTunnels 뀀□ηProject 뀀□ηcreates 뀀□ηan 뀀□ηoverall 뀀□ηpattern 뀀□ηof 뀀□ηinequitable 뀀□ηand 뀀□
impacts, 뀀□ηseveral 뀀□ηof 뀀□ηwhich 뀀□ηwould 뀀□ηhave 뀀□ηpublic 뀀□ηhealth 뀀□ηimplications. 뀀□ηBy 뀀
right 뀀□ηas 뀀□ηit 뀀□ηenters 뀀□ηthe 뀀□ηDelta, 뀀□ηthe 뀀□ηTunnels 뀀□ηdiversions 뀀□ηreduce 뀀□ηclows
increases 뀀□ηresidence 뀀□ηtime, 뀀□ηwhich, 뀀□ηin 뀀□ηturn, 뀀□ηconcentrates 뀀□ηsalinity 뀀□ηand 뀀□ηpo
central 뀀□ηDelta, 뀀□ηwhile 뀀□ηprivileging 뀀□ηexport 뀀□ηwater 뀀□ηquality 뀀□ηsouth 뀀□ηof 뀀□ηthe 뀀□
Over 뀀□ηand 뀀□ηover 뀀□ηagain 뀀□ηin 뀀□ηthe 뀀□ηRDEIR/SDEIS, 뀀□ηmodeling 뀀□ηresults 뀀□ηfor 뀀□ηb
nitrate, 뀀□ηpesticides, 뀀□ηmercury, 뀀□ηselenium, 뀀□ηand 뀀□ηdissolved 뀀□ηorganic 뀀□ηcarbon 뀀□ηshow
water 뀀□ηquality 뀀□ηimpacts 뀀□ηfrom 뀀□ηthe 뀀□ηTunnels 뀀□ηProject. 뀀□η(See 뀀□ηour 뀀□ηSection 뀀□
above.) 뀀□ηIt 뀀□ηalso 뀀□ηcontributes 뀀□ηto 뀀□ηwhy 뀀□ηharmful 뀀□ηalgal 뀀□ηblooms 뀀□ηwill 뀀□ηbe 뀀
the 뀀□ηproject 뀀□ηdown 뀀□ηthe 뀀□ηroad. 뀀□ηThese 뀀□ηand 뀀□ηother 뀀□ηwater 뀀□ηquality 뀀□ηconsti
the 뀀□ηRDEIR/SDEIS, 뀀□ηall 뀀□ηworsen 뀀□ηfor 뀀□ηsouth 뀀□ηand 뀀□ηwest 뀀□ηDelta 뀀□ηwater 뀀□ηwa
improve 뀀□ηfor 뀀□ηthe 뀀□ηexport 뀀□ηpumps. 뀀□ηThis 뀀□ηis 뀀□ηa 뀀□ηconscious 뀀□ηdecision 뀀□ηto 뀀
the 뀀□ηenvironmental 뀀□ηjustice 뀀□ηcommunities 뀀□ηthat 뀀□ηrely 뀀□ηon 뀀□ηit; 뀀□ηit 뀀□ηis 뀀□ηan 뀀
purpose 뀀□ηand 뀀□ηthe 뀀□ηwater 뀀□ηquality 뀀□ηmodeling, 뀀□ηhowever 뀀[287] 뀀□ηincompletely 뀀□ηdone, 뀀□

In 뀀□ηaddition, 뀀□ηas 뀀□ηnoted 뀀□ηin 뀀□ηRDEIR/SDEIS 뀀□ηChapter 뀀□η25-□66, 뀀□ηthere 뀀□ηare 뀀□
drinking 뀀□ηwater 뀀□ηquality, 뀀□ηwhich 뀀□ηrelate 뀀□ηto 뀀□ηprecursors 뀀□ηfor 뀀□ηcarcinogenic 뀀□ηd
signicicant 뀀□ηwater 뀀□ηsupply 뀀□ηtreatment 뀀□ηcost 뀀□ηissue 뀀□ηfor 뀀□ηboth 뀀□ηmunicipal 뀀□ηexpo
drinking 뀀□ηwater 뀀□ηsuppliers, 뀀□ηsuch 뀀□ηas 뀀□ηStockton, 뀀□ηWalnut 뀀□ηGrove, 뀀□ηIsleton, 뀀□ηRic
upgrades 뀀□ηwould 뀀□ηfurther 뀀□ηincrease 뀀□ηthe 뀀□ηburden 뀀□ηof 뀀□ηwater 뀀□ηaccessibility 뀀□ηor
communities. 뀀□η

As 뀀□ηnoted 뀀□ηin 뀀□ηthe 뀀□ηRDEIR/SDEIS, 뀀□η*which cysts* 뀀□η*health blooms impacts have* 뀀□η*from yet* 뀀□η to 뀀□ηb
assessed.[288] 뀀□ηAs 뀀□ηRDEIR/SDEIS 뀀□ηstate, 뀀□ηpublic 뀀□ηhealth 뀀□ηimpact 뀀□ηwould 뀀□ηbe 뀀□ηsig
addition, 뀀□ηRDEIR/SDEIS 뀀□ηstill 뀀□ηfails 뀀□ηto 뀀□ηcomprehensively 뀀□ηevaluate 뀀□ηthe 뀀□ηpublic 뀀
communities 뀀□ηon 뀀□ηcish 뀀□ηconsumption 뀀□ηand 뀀□ηexposure 뀀□ηto 뀀□ηmethylmercury. 뀀□ηSpecie
Tunnels 뀀□ηproject 뀀□ηare 뀀□ηpursued 뀀□ηduring 뀀□ηsubsistence 뀀□ηcishing 뀀□ηby 뀀□ηpopulations 뀀□ηal
environmental 뀀□ηinjustice. 뀀□ηDespite 뀀□ηthe 뀀□ηRDEIR/SDEIS 뀀□ηstating 뀀□ηthe 뀀□ηadverse 뀀□ηeffe
impacts 뀀□ηof 뀀□ηthe 뀀□ηTunnels 뀀□ηProject, 뀀□ηmore 뀀□ηinvestigation 뀀□ηand 뀀[289] 뀀□η Analysis 뀀□η needs
in 뀀□ηEWC's 뀀□ηletter, 뀀□ηInterior 뀀□ηSuisun 뀀□ηMarsh 뀀□ηsalinity 뀀□ηis 뀀□ηexpected 뀀□ηto 뀀□ηinc
of 뀀□ηthe 뀀□ηTunnels, 뀀□ηaccording 뀀□ηto 뀀□ηdata 뀀□ηin 뀀□ηthe 뀀□ηRDEIR/SDEIS. 뀀□ηReverse 뀀□ηc
will 뀀□ηincrease, 뀀□ηwhich 뀀□ηmay 뀀□ηinjure 뀀□ηneighboring 뀀□ηwater 뀀□ηright 뀀□ηholders. 뀀□ηNum
criteria 뀀□ηand 뀀□ηbenecicial 뀀□ηuses 뀀□ηwill 뀀□ηbe 뀀□ηviolated 뀀□ηand 뀀□ηconditions 뀀□ηdegraded.
be 뀀□ηharmed 뀀□ηby 뀀□ηworsening 뀀□ηmercury 뀀□ηand 뀀□ηselenium 뀀□ηconcentrations 뀀□ηcontamina
long 뀀□ηterm, 뀀□ηresulting 뀀□ηfrom 뀀□ηTunnels 뀀□ηoperations. 뀀□η

BDCP's 뀀□ηanalysis 뀀□ηof 뀀□ηselenium 뀀□ηas 뀀□ηa 뀀□ηwater 뀀□ηquality 뀀□ηstressor 뀀□ηis 뀀□ηinade
address 뀀□ηuncertainties 뀀□ηabout 뀀□ηthe 뀀□ηregulatory 뀀□ηand 뀀□ηtechnological 뀀□ηsetting 뀀□ηof 뀀□
Project 뀀□ηand 뀀□ηlong 뀀□ηterm 뀀□ηmanagement 뀀□ηand 뀀□ηmitigation 뀀□ηof 뀀□ηselenium 뀀□ηloadi
the 뀀□ηwestern 뀀□ηSan 뀀□ηJoaquin 뀀□ηValley. 뀀□ηThese 뀀□ηprojects 뀀□ηindicate 뀀□ηthe 뀀□ηecologica

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[287] 뀀□η See 뀀□ηProject 뀀□ηObjectives 뀀□ηat 뀀□η1-□8, 뀀□ηSection 뀀□η1.1.4.1, 뀀□ηlines 뀀□η18-□21, 뀀□ηstating 뀀□η"DW
proposing 뀀□ηthe 뀀□ηproposed 뀀□ηproject 뀀□ηis 뀀□ηto 뀀□ηmake 뀀□ηphysical 뀀□ηand 뀀□ηoperational 뀀□ηimprov
Delta 뀀□ηnecessary 뀀□ηto 뀀□ηrestore 뀀□ηand 뀀□ηprotect 뀀□η... 뀀□ηwater 뀀□ηquality 뀀□ηwithin 뀀□ηa 뀀□ηstable
statutory 뀀□ηand 뀀□ηcontractual 뀀□ηobligations" 뀀□ηand 뀀□ηProject 뀀□ηObjectives 뀀□ηat 뀀□η1-□8, 뀀□ηSection 뀀□
project 뀀□ηobjectives 뀀□ηinclude 뀀□ηto 뀀□η"[r]estore 뀀□ηand 뀀□ηprotect 뀀□ηthe 뀀□ηability 뀀□ηof 뀀□ηthe 뀀□ηSV
amounts...". 뀀□ηEmphasis 뀀□ηadded.

[288] 뀀□ηRDEIR/SDEIS, 뀀□ηAppendix 뀀□ηA, 뀀□ηChapter 뀀□η2.3.3.2

[289] 뀀□ηRDEIR/SDEIS, 뀀□ηAppendix 뀀□ηA, 뀀□ηChapter 뀀□η28.5.8.7.

various꿯□ηscenarios꿯□ηof꿯□ηselenium꿯□ηloading꿯□ηto꿯□ηthe꿯□ηBay꿯□ηDelta꿯□ηEstuary.꿯□η
risks꿯□ηand꿯□ηforeseeable꿯□ηcosts꿯□ηand꿯□ηcircumstances꿯□ηinvolved.[290]

The꿯□ηRDEIR/SDEIS꿯□ηhave꿯□ηconducted꿯□ηno꿯□ηanalysis꿯□ηof꿯□ηin-□Delta꿯□ηwater꿯□ηder
patterns꿯□ηrepresented꿯□ηby꿯□ηthese꿯□ηbenecicial꿯□ηuses꿯□ηwhen꿯□ηit꿯□ηconducts꿯□ηits꿯
Tunnels꿯□ηProject.꿯□ηThese꿯□ηuses꿯□ηare꿯□ηprotected꿯□ηby,꿯□ηamong꿯□ηother꿯□ηstatutes,꿯
1959.꿯□ηAdditional꿯□ηevaluation꿯□ηmust꿯□ηbe꿯□ηconducted꿯□ηand꿯□ηallow꿯□ηfor꿯□ηproper
the꿯□ηprecautionary꿯□ηprinciple꿯□η(see꿯□ηour꿯□ηSection꿯□ηI꿯□ηand꿯□ηII꿯□ηcomments꿯□ηa
time꿯□ηoperational꿯□ηdecisions꿯□ηto꿯□ηexacerbate꿯□ηenvironmental꿯□ηinjustices꿯□ηfor꿯□ηDelt
communities.

To꿯□ηensure꿯□ηthat꿯□ηcommunity꿯□ηand꿯□ηpublic꿯□ηhealth꿯□ηand꿯□ηthe꿯□ηenvironment꿯
Project,꿯□ηwe꿯□ηrecommend꿯□ηthat꿯□ηdecisions꿯□ηon꿯□ηchanges꿯□ηin꿯□ηconveyance꿯□ηand
infrastructure꿯□ηbe꿯□ηincremental꿯□ηand꿯□ηreversible,꿯□ηdependent꿯□ηupon꿯□ηthe꿯□ηmeasur
ecosystem,꿯□ηessentially꿯□ηincorporated꿯□ηinto꿯□ηthe꿯□ηproposed꿯□ηCollaborative꿯□ηScience꿯
Management꿯□ηProgram꿯□ηagenda.꿯□ηThis꿯□ηcan꿯□ηonly꿯□ηbe꿯□ηdone꿯□ηby꿯□ηhaving꿯□η
that꿯□ηthe꿯□ηpublic꿯□ηknows꿯□ηit꿯□ηwill꿯□ηsucceed.꿯□ηSuccess꿯□ηfor꿯□ηthe꿯□ηDelta꿯□η
assured꿯□ηbefore꿯□ηany꿯□ηTunnels꿯□ηProject꿯□ηproject꿯□ηis꿯□ηdeemed꿯□ηsafe꿯□ηto꿯□ηde
discharges꿯□ηmust꿯□ηbe꿯□ηlimited꿯□ηto꿯□ηprotect꿯□ηwater꿯□ηquality.꿯□ηRemediation꿯□ηof꿯
must꿯□ηbe꿯□ηprioritized꿯□ηand꿯□ηecosystem꿯□ηrestoration꿯□ηprojects꿯□ηmust꿯□ηbe꿯□ηprior
as꿯□ηto꿯□ηlimit꿯□ηthe꿯□ηpotential꿯□ηfor꿯□ηadditional꿯□ηmethylation꿯□ηof꿯□ηmercury꿯□ηa
wildlife꿯□ηand꿯□ηhuman꿯□ηhealth.꿯□η

Violations꿯□ηof꿯□ηCivil꿯□ηRights꿯□ηand꿯□ηEnvironmental꿯□ηJustice꿯□η[291]꿯□ηthe꿯□ηcumulative꿯□ηimpacts꿯□ηof꿯□ηconsideration꿯□ηfor꿯□ηenviron
justice꿯□ηcommunities,꿯□ηlack꿯□ηof꿯□ηproper꿯□ηassessment꿯□ηof꿯□ηpublic꿯□ηhealth꿯□ηimpa
of꿯□ηaccess꿯□ηto꿯□ηinformation꿯□ηregarding꿯□ηthe꿯□ηproject,꿯□ηlack꿯□ηof꿯□ηprovision꿯□η
bilingual꿯□ηinformation,꿯□ηfailure꿯□ηto꿯□ηnotice꿯□ηmeetings꿯□ηin꿯□ηvarious꿯□ηlanguages,꿯□η
the꿯□ηdocument꿯□ηthrough꿯□ηrequired꿯□ηcomputer꿯□ηaccess,꿯□ηexorbitant꿯□ηfees꿯□ηviolate꿯
of꿯□ηenvironmental꿯□ηjustice꿯□ηand꿯□ηconstitutes꿯□ηviolations꿯□ηof꿯□ηCEQA꿯□ηand꿯□ηNEPA
civil꿯□ηrights꿯□ηof꿯□ηa꿯□ηsignicicant꿯□ηpopulation꿯□ηof꿯□ηthe꿯□ηcive꿯□ηDelta꿯□ηcounties.

The Tunnels Project is contrary to the Delta Reform Act.

Tunnels꿯□ηProject꿯□ηproponents꿯□ηcontinue꿯□ηto꿯□ηconstrue꿯□ηtheir꿯□ηresponsibilities꿯□ηunc
of꿯□η2009꿯□ηfar꿯□ηtoo꿯□ηnarrowly.꿯□ηThat꿯□ηanalysis꿯□ηfocuses꿯□ηalmost꿯□ηentirely꿯□ηo
sets꿯□ηout꿯□ηspecial꿯□ηcindings꿯□ηthe꿯□ηCalifornia꿯□ηDepartment꿯□ηof꿯□ηFish꿯□ηand꿯□ηW
describes꿯□ηan꿯□ηappeal꿯□ηprocess꿯□ηto꿯□ηthe꿯□ηDelta꿯□ηStewardship꿯□ηCouncil.[291]꿯□ηother꿯□

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[290]꿯□ηCalifornia꿯□ηWater꿯□ηImpact꿯□ηNetwork꿯□ηtesticied꿯□ηto꿯□ηthe꿯□ηState꿯□ηWater꿯□ηResources
the꿯□ηGrassland꿯□ηBypass꿯□ηProject꿯□ηand꿯□ηthe꿯□ηchallenges꿯□ηGrassland꿯□ηarea꿯□ηfarmers꿯□ηfac
a꿯□ηcost-□effective꿯□ηtreatment꿯□ηtechnology꿯□ηfor꿯□ηconcentrating,꿯□ηisolating,꿯□ηmanaging꿯□ηand꿯□
C-□WIN, *Testimony 꿯□ηon 꿯□ηRecent 꿯□ηSalinity 꿯□ηand 꿯□ηSelenium 꿯□ηScience 꿯□ηand꿯□ηModeling꿯□ηpro꿯□η*
T.꿯□ηStroshane꿯□ηand꿯□ηsubmitted꿯□ηto꿯□ηthe꿯□ηState꿯□ηWater꿯□ηResources꿯□ηControl꿯□ηBoard꿯□
and꿯□ηthe꿯□ηLow꿯□ηSalinity꿯□ηZone,꿯□ηSeptember꿯□η5,꿯□η2012,꿯□η44꿯□ηpages꿯□ηplus꿯□ηappendic
www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/docs/cmnt081712/
tim_stroshane.pdf.

[291]꿯□ηThis꿯□ηnarrow꿯□ηtreatment꿯□ηis꿯□ηexemplicied꿯□ηidentication꿯□ηof꿯□ηAlternatives, *꿯□ηNo꿯□ηAction꿯□ηAlternative꿯□ηin꿯□ηthe꿯□ηDEIR/EIS꿯□ηAppendix꿯□ηC꿯□ηconveyance꿯□η*
*Alternatives, 꿯□ηConservation 꿯□ηMeasures꿯□ηand꿯□η*Table꿯□η3A-□15,꿯□ηp.꿯□η3A-□149.꿯□ηIt꿯□ηerroneously꿯□ηassumes꿯□
conditions,꿯□ηclow꿯□ηcriteria,꿯□ηdiversion꿯□ηrates,꿯□ηand꿯□ηconveyance꿯□ηdesigns꿯□ηare꿯□ηthe꿯□ηu
criteria꿯□ηfor꿯□η"a꿯□ηreasonable꿯□ηrange꿯□ηof꿯□ηalternatives"꿯□ηfor꿯□ηBDCP.

with the Tunnels Project must also comply, and which are analysis provided in the RDEIR/SDEIS.

A new section in "Project Objectives" introduces a Tunnels Project "Improve the ecosystem of the Delta by reducing the adverse effects diverting water by siting additional intakes of the SWP and coordinate The objective alleges as fact something that is demonstrably false results and information: Adding north Delta intakes on the lower number of places where adverse impacts of State Water Project reduced critical aquatic habitat, and increased pollutant loads and concentrations and federal endangered species acts and the Delta Reform Act

The Act declares that "the Sacramento- San Joaquin Delta watershed infrastructure are in crisis and existing Delta policies are not sustainable important natural resource for California and the nation. It serves as the hub of the California water system and the most valuable west coast of North America. Some 400 species are in many ecologically and commercially important species (which are also public trust resources) declined years. These declines are related, among other factors, to increased

Under the Act, departments of the State of California have the in the Delta. This includes the California Department of Water Resources goals" have a holistic purpose beyond water and ecology:

> "Coequal goals" means the two goals of providing a more reliable water supply, protecting, restoring, and enhancing the Delta ecosystem. The coequal goals that protects and enhances the unique cultural, recreational, natural resources of the Delta as an evolving place.

The Act states that the public trust doctrine is at the heart of "The longstanding constitutional principle of reasonable use and the foundation of state water management policy and are particularly the Delta." Objectives in the Act also inhere in and clesh out water supply reliability is to be understood:

> The policy of the State of California is to achieve the following inherent in the coequal goals for management of the Delta:
> (a) Manage the Delta's water and environmental resources and the water long term.
> (b) Protect and enhance the unique cultural, recreational, and agricultural an evolving place.

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[292] RDEIR/SDEIS, Section 3.1.4.1, *Project Objectives*, p. 1-8, lines 32-33.

[293] Wat. Code § 85001 subd. (a).

[294] Wat. Code § 85002.

[295] California Water Code Sections 85210 and 85023.

[296] California Water Code Section 85054.

[297] California Water Code Section 85023.

(c) Restore the Delta ecosystem, including its cisheries and wildlife, as
wetland ecosystem.
(d) Promote statewide water conservation, water use efciciency, and sustain
(e) Improve water quality to protect human health and the environmer
quality objectives in the Delta.
(f) Improve the water conveyance system and expand statewide water
(g) Reduce risks to people, property, and state interests in the Del
appropriate land uses, and investments in clood protection.
(h) Establish a new governance structure with the authority, responsibility,
support, and adequate and secure funding to achieve these objectives.[298]

To implement objectives to restore Delta ecosystems and promote sta
water use efciciency, and sustainable water use[299] [illegible]
reduced reliance on the Delta for the state's future water supply

The policy of the State of California is to reduce reliance on the Delta in meeting Cali
water supply needs through a statewide strategy of investing in improved r
conservation, and water use efciciency. Each region that depends on wa
improve its regional self-reliance for water through investment in water
advanced water technologies, local and regional water supply projects, and
coordination of local and regional water supply efforts.[300]

The Act cinds and declares that the coequal goal of "water
implementation of water use efciciency and conservation projects, wastew
desalination, and new and improved[301] [illegible] objective, to which
Tunnels Project proponents refer often to "[i]mprove the water conve
85020 subd. (f) therefore must conform to achieving the coequal
considerations that the Act says inhere in those goals as well
the Act.[302]

When the Act's objectives (" inherent in the coequal goals") and
the Delta are taken as a whole (which is [illegible] legislation sh
evident the Act intends active protection of the Delta's water, cu
—cumulatively, they [illegible] steward, [illegible] *According* [illegible]
Dictionary of the English Language manage, guide, administer, or supervis
real property, passengers on a ship or airliner. More recent mea
the landscape and the environment. The plain meaning of "stewardsh
the sustainable management of the Sacramento- San Joaquin Delta ecosy
reliable water supply for the state, to protect and enhance the
Delta, and to establish a governance structure that will direct ef
develop a legally enforceable Delta Plan."[303]

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[298] California Water Code Section 85020.

[299] California Water Code Sections 85020 subds. (c- d).

[300] California Water Code Section 85021.

[301] California Water Code Sections 85054, 85004 subd. (b).

[302] *Ibid.*

[303] California Water Code Section 85001 subd. (c).

While뀡□ηthe뀡□ηTunnels뀡□ηProject뀡□ηaspires뀡□ηto뀡□η"fundamental,뀡□ηsystemic뀡□ηchange"뀡□η
responsibility뀡□ηfor뀡□ηand뀡□ηeven뀡□ηevinces뀡□ηopen뀡□ηhostility뀡□ηto뀡□ηstatewide뀡□ηwater뀡□
the뀡□ηDelta뀡□ηbe뀡□ηprotected뀡□ηand뀡□ηsustainably뀡□ηmanaged뀡□ηas뀡□η"the뀡□ηmost뀡□ηva
west뀡□ηcoast뀡□ηof뀡□ηNorth뀡□ηAmerica.뀡□ηThe뀡□ηTunnels뀡□ηProject뀡□ηsevers뀡□ηthe뀡□ηcoe
and뀡□ηto뀡□ηconcentrate뀡□ηstate뀡□ηagency뀡□ηeffort뀡□ηon뀡□ηwater뀡□ηsupply뀡□ηreliability뀡□
enhancement뀡□ηin뀡□ηthe뀡□ηDelta.

Merely뀡□ηachieving뀡□ηprevention뀡□ηof뀡□η"jeopardy"뀡□ηfor뀡□ηlisted뀡□ηcish뀡□ηspecies뀡□ηund
opinion뀡□ηwill뀡□ηnot뀡□ηprotect뀡□ηand뀡□ηenhance뀡□ηthe뀡□ηDelta뀡□ηecosystem.뀡□ηJeopardy뀡
since뀡□ηone뀡□ηpurpose뀡□ηof뀡□ηthe뀡□ηTunnels뀡□ηproject뀡□ηis뀡□η

> restor[ing]뀡□ηand뀡□ηprotect[ing]뀡□ηthe뀡□ηability뀡□ηof뀡□ηthe뀡□ηSWP뀡□ηand뀡□ηCVP뀡□ηto뀡□ηdeli
> hydrologic뀡□ηconditions뀡□ηresult뀡□ηin뀡□ηthe뀡□ηavailability뀡□ηof뀡□ηsufcicient뀡□ηwater,뀡□ηconsistent
> state뀡□ηand뀡□ηfederal뀡□ηlaw뀡□ηand뀡□ηthe뀡□ηterms뀡□ηand뀡□ηconditions뀡□ηof뀡□ηwater뀡□ηdelive
> and뀡□ηcertain뀡□ηmembers뀡□ηof뀡□ηSan뀡□ηLuis뀡□ηDelta뀡□ηMendota뀡□ηWater뀡□ηAuthority뀡□ηand뀡
> agreements."[304]뀡□η

While 뀡□ηthe 뀡□ηRDEIR/SDEIS 뀡□ηprotests 뀡□ηthat 뀡□ηthis 뀡□ηpurpose 뀡□ηof 뀡□ηmeeting 뀡□ηcont
target," 뀡□ηand 뀡□η"not 뀡□ηintended 뀡□ηto 뀡□ηimply 뀡□ηthat 뀡□ηincreased 뀡□ηquantities 뀡□ηof 뀡□
Tunnels 뀡□ηProject, 뀡□ηthis 뀡□ηpurpose 뀡□ηis 뀡□ηdirectly 뀡□ηcontrary 뀡□ηto 뀡□ηthe 뀡□ηDelta 뀡□η
importers 뀡□ηto 뀡□ηreduce 뀡□ηtheir 뀡□ηreliance 뀡□ηon 뀡□ηDelta 뀡□ηsupplies.[305]

Last 뀡□ηyear, 뀡□ηthe 뀡□ηDraft 뀡□ηEIR/EIS 뀡□ηfailed 뀡□ηto 뀡□ηproperly 뀡□ηconsider 뀡□ηwhat 뀡□η
ecosystems 뀡□ηand 뀡□ηrestore California's fisheries.[306] As 뀡□ηWater뀡□ηCode뀡□ηSection뀡□η85320뀡□ηlays뀡□ηout뀡□
which뀡□ηBDCP뀡□ηwould뀡□ηgo뀡□ηbefore뀡□ηthe뀡□ηCalifornia뀡□ηDepartment뀡□ηof뀡□ηFish뀡□η
approval뀡□ηof뀡□ηits뀡□ηnatural뀡□ηcommunities뀡□ηconservation뀡□ηplan뀡□ηand뀡□ηincidental뀡□η
package뀡□ηand뀡□ηissuance뀡□ηof뀡□ηincidental뀡□ηtake뀡□ηpermits.뀡□ηSection뀡□η85320(b)(2)뀡□η
cindings뀡□ηCDFW뀡□ηmust뀡□ηmake:뀡□η

> (A) 뀡□η*reasonable 뀡□ηrange 뀡□ηof 뀡□ηflow 뀡□ηcriteria, 뀡□ηrates 뀡□ηof 뀡□ηdiversion 뀡□ηor 뀡□ηdelivery 뀡□η*
> the뀡□ηcriteria뀡□ηfor뀡□ηapproval뀡□ηof뀡□ηa뀡□ηnatural뀡□ηcommunity뀡□ηconservation뀡□ηplan뀡□ηas뀡
> Section뀡□η2820뀡□ηof뀡□ηthe뀡□ηFish뀡□η*and 뀡□ηGame 뀡□ηCode, 뀡□ηrequirements 뀡□ηand 뀡□ηQlows 뀡□ηnece*
> *recovering 뀡□ηthe 뀡□ηDelta 뀡□ηecosystem 뀡□ηand 뀡□ηrestoring 뀡□ηQisheries 뀡□ηunder 뀡□ηa, 뀡□ηreasonable 뀡□*
> *which 뀡□ηwill 뀡□ηidentify 뀡□ηthe 뀡□ηremaining 뀡□ηwater 뀡□ηavailable 뀡□ηfor 뀡□ηexport 뀡□ηand 뀡□ηother 뀡□*[306]

The뀡□ηTunnels뀡□ηProject뀡□ηis뀡□ηno뀡□ηlonger뀡□ηeligible뀡□ηfor뀡□ηthis뀡□ηspecial뀡□ηprocess
instead뀡□ηbe뀡□ηhandled뀡□ηas뀡□ηa뀡□ηcovered뀡□ηaction뀡□ηby뀡□ηthe뀡□ηDelta뀡□ηStewardship
consistence뀡□ηwith뀡□ηthe뀡□ηDelta뀡□ηPlan.뀡□ηWe뀡□ηbelieve뀡□ηthis뀡□ηwill뀡□ηbe뀡□ηhard뀡□
currently뀡□ηin뀡□ηlitigation뀡□ηover뀡□ηwhether뀡□ηthe뀡□ηDelta뀡□ηPlan뀡□ηitself뀡□ηcomplies뀡□
challenging뀡□ηto뀡□ηdetermine뀡□ηwhether뀡□ηa뀡□ηcovered뀡□ηaction뀡□ηsuch뀡□ηas뀡□ηthe뀡□η
consistent뀡□ηwith뀡□ηthe뀡□ηDelta뀡□ηPlan뀡□ηwithout뀡□ηhaving뀡□ηto뀡□ηrevise뀡□ηthe뀡□ηPlan

Last 뀡□ηyear's 뀡□ηDraft 뀡□ηEIR/EIS 뀡□ηfailed 뀡□ηto 뀡□ηproperly 뀡□ηcomply 뀡□ηwith 뀡□ηthe 뀡□η
goals"뀡□ηare뀡□ηdecined뀡□ηas:

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[304]뀡□ηRDEIR/SDEIS,뀡□ηSection뀡□η1.4.2.2, 뀡□ηpage뀡□η1-□9,뀡□ηlines뀡□η33-□37.

[305]뀡□ηCalifornia뀡□ηWater뀡□ηCode뀡□ηSection뀡□η85021.

[306]뀡□ηEmphasis뀡□ηadded.

the뀀□ηtwo뀀□ηgoals뀀□ηof뀀□ηproviding뀀□ηa뀀□ηmore뀀□ηreliable뀀□ηwater뀀□ηsupply뀀□ηfor뀀□ηCalifor
enhancing뀀□ηthe뀀□ηDelta뀀□ηecosystem.뀀□ηThe뀀□ηcoequal뀀□ηgoals뀀□ηshall뀀□ηbe뀀□ηachieved뀀□ηin뀀
enhances뀀□ηthe뀀□ηunique뀀□ηcultural,뀀□ηrecreational,뀀□ηnatural뀀□ηresource,뀀□ηand뀀□ηagricultural뀀□
evolving뀀□ηplace.[307]

The뀀□ηTunnels뀀□ηProject뀀□ηthoroughly뀀□ηunbalances뀀□ηapplication뀀□ηof뀀□ηthe뀀□ηco-□equal뀀
Act.뀀□ηIt뀀□ηfails뀀□ηto뀀□η"improve뀀□ηthe뀀□ηwater뀀□ηconveyance뀀□ηsystem,"뀀□ηas뀀□ηrequir
While뀀□ηthis뀀□ηsection뀀□ηof뀀□ηthe뀀□ηAct뀀□ηdoes뀀□ηnot뀀□ηset뀀□ηforth뀀□ηcriteria뀀□ηby뀀
system뀀□ηof뀀□ηthe뀀□ηDelta뀀□ηare뀀□ηto뀀□ηbe뀀□ηjudged,뀀□ηthe뀀□ηTunnels뀀□ηProject뀀□ηfa
Delta뀀□ηecosystem;뀀□ηas뀀□ηwe뀀□ηhave뀀□ηalready뀀□ηpointed뀀□ηout뀀□ηin뀀□ηthese뀀□ηcomm
habitat뀀□ηfor뀀□ηlisted뀀□ηcish뀀□ηspecies,뀀□ηand뀀□ηit뀀□ηwill뀀□ηdegrade뀀□ηwater뀀□ηquality뀀
pollutant뀀□ηcriteria뀀□ηor뀀□ηdegradations뀀□ηto뀀□ηsensitive뀀□ηbenecicial뀀□ηuses뀀□ηof뀀□ηthe뀀
cannot뀀□ηbe뀀□ηfound뀀□ηto뀀□η"improve뀀□ηthe뀀□ηwater뀀□ηconveyance뀀□ηsystem"뀀□ηover뀀□
the뀀□ηfuture뀀□ηtime뀀□ηwithout뀀□ηthe뀀□ηproject뀀□ηin뀀□ηthe뀀□ηRDEIR/SDEIS's뀀□ηNo뀀□ηAct
"improvement"뀀□ηmust뀀□ηbe뀀□ηevaluated뀀□ηunder뀀□ηthe뀀□ηcoequal뀀□ηgoals뀀□ηframework뀀□

The뀀□ηTunnels뀀□ηProject뀀□ηalso뀀□ηfails뀀□ηto뀀□ηcomply뀀□ηwith뀀□ηWC뀀□ηSection뀀□η85020
Delta뀀□ηlevee뀀□ηimprovements뀀□ηin뀀□ηits뀀□ηproject뀀□ηThe purpose/objectives[308] ODEIR/SDEIS뀀□ηonly뀀□ηconsider
Tunnels뀀□ηProject뀀□ηas뀀□ηa뀀□ηmeans뀀□ηof뀀□ηreducing뀀□ηfuture뀀□ηimpacts뀀□ηto뀀□ηwater
seismic뀀□ηor뀀□ηother뀀□ηlevee뀀□ηfailure.뀀□ηIt뀀□ηdoes뀀□ηnot뀀□ηconsider뀀□ηDelta뀀□ηlevee뀀
clood뀀□ηrisk뀀□ηnot뀀□ηonly뀀□ηto뀀□ηwater뀀□ηconveyance,뀀□ηbut뀀□ηalso뀀□ηto뀀□ηthe뀀□ηpe
Delta.

Omission뀀□ηof뀀□ηDelta뀀□ηlevee뀀□ηimprovements뀀□ηclies뀀□ηin뀀□ηthe뀀□ηface뀀□ηof뀀□ηthe뀀
*Economic뀀□ηSustainability뀀□ηPlan*뀀□ηstates뀀□ηthat뀀□ηlevees뀀□ηcan뀀□ηbe뀀□ηbrought뀀□ηup뀀□
reduce뀀□ηthe뀀□ηprobability뀀□ηof뀀□ηcatastrophic뀀□ηlevee뀀□ηfailure뀀□ηfor뀀□η$2뀀□ηto뀀□η$4뀀□
Code뀀□ηSection뀀□η85020(g),뀀□ηBDCP뀀□ηwould뀀□ηhave뀀□ηto뀀□ηinclude뀀□ηa뀀□ηgoal뀀□η(and
measures뀀□ηand뀀□ηfunding뀀□ηassurances)뀀□ηto뀀□ηimprove뀀□ηcritical뀀□ηDelta뀀□ηlevees뀀□ηfo
and뀀□ηwater뀀□ηsupply뀀□ηreliability.

Last뀀□ηyear's뀀□ηDraft뀀□ηEIR/EIS뀀□ηfailed뀀□ηto뀀□ηcomply뀀□ηwith뀀□ηWater뀀□ηCode뀀□ηSe
reduce뀀□ηreliance뀀□ηon뀀□ηdiversions뀀□ηfrom뀀□ηthe뀀□ηDelta.[309] However, the Coalition
objectives뀀□ηand뀀□ηpurpose뀀□ηcall뀀□ηfor뀀□η"full뀀□ηcontract뀀□ηdeliveries"뀀□ηto뀀□ηCVP뀀□ηa
USEPA[310],뀀□ηthat뀀□ηvolume뀀□ηof뀀□ηwater뀀□ηis뀀□η7.43뀀□ηmillion뀀□ηacre-□feet,뀀□ηnearly뀀□
maximum뀀□ηamount뀀□ηof뀀□ηwater뀀□ηever뀀□ηdiverted뀀□ηfrom뀀□ηthe뀀□ηDelta뀀□ηin뀀□ηa뀀□
increase,뀀□ηnot뀀□ηreduce,뀀□ηreliance뀀□ηon뀀□ηthe뀀□ηDelta뀀□ηfor뀀□ηimported뀀□ηwater.뀀□η
that뀀□ηalternatives뀀□ηproviding뀀□ηless뀀□ηthan뀀□ηfull뀀□ηcontract뀀□ηdeliveries뀀□ηis뀀□ηaccepta
work뀀□ηtoward뀀□ηmeeting뀀□ηfull뀀□ηCVP뀀□ηand뀀□ηSWP뀀□ηcontract뀀□ηdeliveries뀀□ηis뀀□ηcle
diversions,뀀□ηnot뀀□ηreduce뀀□ηthem.뀀□η뀀□ηThis뀀□ηfundamental뀀□ηclaw뀀□ηcontinues뀀□ηin뀀□

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[307]뀀□ηCalifornia뀀□ηWater뀀□ηCode뀀□ηSection뀀□η85054.

[308]뀀□ηWater뀀□ηCode뀀□ηSection뀀□η85020(g)뀀□ηThe뀀□ηwhich뀀□ηpolicy뀀□ηstates뀀□ηthat뀀□ηthe뀀□ηState뀀□ηof뀀□ηCalifornia뀀□ηis뀀□η
objectives뀀□ηthat뀀□ηthe뀀□ηLegislature뀀□ηdeclares뀀□ηare뀀□ηinherent뀀□ηin뀀□ηthe뀀□ηcoequal뀀□ηgoals뀀
Reduce뀀□ηrisks뀀□ηto뀀□ηpeople,뀀□ηproperty,뀀□ηand뀀□ηstate뀀□ηinterests뀀□ηin뀀□ηthe뀀□ηDelta뀀□ηby뀀
appropriate뀀□ηland뀀□ηuses,뀀□ηand뀀□ηinvestments뀀□ηin뀀□ηclood뀀□ηprotection."

[309]뀀□ηSee뀀□ηfootnote뀀□η217,뀀□ηabove.

[310]뀀□ηSee뀀□ηJune뀀□η2010뀀□ηletter뀀□ηfrom뀀□ηUSEPA뀀□ηto뀀□ηUSBR뀀□ηNMFS뀀□ηand뀀□ηUSFWS.뀀□η
webfm_send/150뀀□η

It꿲□ηshould꿲□ηalso꿲□ηbe꿲□ηnoted꿲□ηthat꿲□ηin꿲□ηdrought꿲□ηyears,꿲□ηthe꿲□ηBureau꿲□ηar
Water꿲□ηResources꿲□ηControl꿲□ηBoard꿲□ηto꿲□ηhave꿲□ηDelta꿲□ηwater꿲□ηquality꿲□ηstandards꿲□ηw
protecting꿲□η"health꿲□ηand꿲□ηsafety"꿲□ηfor꿲□ηtheir꿲□ηcontractors.꿲□ηThe꿲□ηBoard꿲□ηhas꿲
deciance꿲□ηof꿲□ηlegal꿲□ηdue꿲□ηprocess꿲□ηof꿲□ηall꿲□ηother꿲□ηinterested꿲□ηparties,꿲□ηand
operational꿲□ηcriteria꿲□ηmodeled꿲□ηin꿲□ηthe꿲□ηDraft꿲□ηEIR/EIS[311]꿲□ηand꿲□ηchange꿲□ηthe꿲□ηRD
propensity꿲□ηto꿲□ηrequest꿲□ηtemporary꿲□ηurgency꿲□ηchanges꿲□ηthat꿲□ηthe꿲□ηBoard꿲□ηgra
event,꿲□ηBDCP꿲□ηmodeling꿲□ηand꿲□ηexpected꿲□ηreliance꿲□ηon꿲□η"real-□time꿲□ηoperations"꿲
reliance꿲□ηon꿲□ηthe꿲□ηDelta꿲□ηfor꿲□ηexports.

By꿲□ηdecinition꿲□ηof꿲□ηthe꿲□ηproject's꿲□ηpurpose,꿲□ηneed,꿲□ηand꿲□ηdesign꿲□ηof꿲□ηeach꿲
Project꿲□ηviolates꿲□ηCalifornia꿲□ηWater꿲□ηCode꿲□ηSection꿲□η85021,꿲□ηwhich꿲□ηrequires꿲□η
for꿲□ηfuture꿲□ηwater꿲□ηsupplies꿲□ηamong꿲□ηthose꿲□ηalready꿲□ηdepending꿲□ηon꿲□ηDelta꿲
operational꿲□ηgoals꿲□ηfocus꿲□ηon꿲□ηincreasing꿲□ηreliance꿲□ηon꿲□ηthe꿲□ηDelta꿲□ηfor꿲□ηN
wet꿲□ηand꿲□ηabove꿲□ηnormal꿲□ηyears,꿲□ηwhile꿲□ηcontinuing꿲□ηemphasis꿲□ηon꿲□ηSouth꿲□
other꿲□ηwater꿲□ηsupplies.[312] Moreover,꿲□ηthe꿲□ηTunnels꿲□ηProject's꿲□ηunacknowledged꿲□ηpurpose꿲□η
reliability꿲□ηof꿲□ηmarket-□based꿲□ηcross-□Delta꿲□ηwater꿲□ηtransfers꿲□ηis꿲□ηalso꿲□ηcontrary
85021.

Tunnels꿲□ηProject꿲□ηproponents꿲□ηfail꿲□ηto꿲□ηdemonstrate꿲□ηin꿲□ηthe꿲□ηRDEIR/SDEIS꿲□ηv
and꿲□ηregionally꿲□ηto꿲□ηdecrease꿲□ηtheir꿲□ηreliance꿲□ηon꿲□ηDelta꿲□ηimports/exports꿲□ηar
for꿲□ηthe꿲□ηTunnels꿲□ηProject.

The꿲□ηTunnels꿲□ηProject꿲□ηproponents'꿲□ηobsessive꿲□ηfocus꿲□ηon꿲□ηfull꿲□ηcontract꿲□ηdeli
diversions꿲□ηto꿲□ηthe꿲□ηTunnels꿲□ηProject꿲□ηcome꿲□ηat꿲□ηexclusion꿲□ηof꿲□ηother꿲□ηpot
the꿲□η2009꿲□ηDelta꿲□ηReform꿲□ηAct꿲□ηcan꿲□ηbe꿲□ηmet꿲□ηby꿲□ηother꿲□ηactivities꿲□ηle
improvements,꿲□ηincreased꿲□ηDelta꿲□ηoutclows꿲□ηand꿲□ηregional꿲□ηself-□reliance꿲□ηfor꿲□ηw
water꿲□ηuse꿲□ηefciciency,꿲□ηwater꿲□ηrecycling,꿲□ηadvanced꿲□ηwater꿲□ηtechnologies,꿲□ηlocal꿲□η
projects,꿲□ηand꿲□ηimproved꿲□ηregional꿲□ηcoordination꿲□ηof꿲□ηlocal꿲□ηand꿲□ηregional꿲□ηwa
actions꿲□ηare꿲□ηanalyzed꿲□ηas꿲□ηreasonable꿲□ηalternatives꿲□ηin꿲□ηthe꿲□ηRDEIR/SDEIS.꿲□η

The꿲□ηTunnels꿲□ηProject꿲□ηRDEIR/SDEIS꿲□ηfails꿲□ηto꿲□ηspecify꿲□ηhow꿲□ηthe꿲□ηpreferred
Water꿲□ηCode꿲□ηSection꿲□η85086(c)(2)꿲□ηof꿲□ηthe꿲□ηDelta꿲□ηReform꿲□ηAct.꿲□ηThis꿲□ηsc
Resources꿲□ηControl꿲□ηBoard꿲□ηto꿲□ηinclude꿲□η"appropriate꿲□ηclow꿲□ηcriteria"꿲□ηin꿲□ηits꿲□
change꿲□ηpetition.꿲□ηThese꿲□ηcriteria꿲□η"shall꿲□ηbe꿲□ηinformed꿲□ηby꿲□ηthe꿲□ηanalysis꿲□
Code꿲□ηSection꿲□η85086(c)(1)]"—meaning꿲□η*Delta꿲□η꿲□η꿲□η

The RDEIR/SDEIS fails to demonstrate compliance with Water Code speci.ically area of origin laws and doctrine [illegible] to the [illegible]

California Water Code requires that actions contemplated under the area of origins water rights statutes. The RDEIR/SDEIS fails to d results ior any other analysis that it complies with Water Code Protection Act of 1959). Delta outclow is reported by the RDEIR times of water in the Delta increase. In-Delta salinity levels are increase which will reduce the quality of water for in-Delta ag benecicial uses enjoyed by environmental justice communities whose mer cishing in the Delta for a signicicant portion of their diet ar is expected to increase substantially from Tunnels operation, according (Figure 12, this document). Reverse clows on the lower Sacramento injure neighboring water right holders and put vulnerable listed and entrainment and death at the north Delta intakes. Numerous water benecicial uses will be violated and degraded. And subsistence cisher mercury and selenium concentrations contaminating cish tissues in the Tunnels operation, ***The RDEIR/SDEIS has conducted no analysis of in[7] Delt subsistence .ishing patterns represented by these bene.icial uses when operational studies of the Tunnels Project. These uses are protect the Delta Protection Act of 1959.***

In addition, the RDEIR/SDEIS fails ***Delta common [illegible]*** experiences of environmental justice communities and the informal ways Delta habitat, cish, and other resources for their subsistence and users of water via the common pool and its public trust res Water Resources recognizes the Delta common pool for purposes of transfers.[313]

The EWC described the relevance of the 1959 Delta Protection that governs projects like the [illegible] linked Delta Protection environmental justice by virtue of the fact that the Act treats includes, in our view, not just lawful water diverters residing in water, human and non-human.

The RDEIR/SDEIS fails to comply with Water Code Section 1700, et seq.

Last year, we commented on Conservation Measure 21 (addressing through "remediation" or removal of land owners' diversions. This w installation, but it was also about eliminating competing diversions a DWR complained to the State Water Resources [illegible] Board to [illegible] of water rights complaints, charges, counter-charges, and counter-complain

[313] California Department of [illegible] Resources, 27, [illegible] above, p. 3.

[314] EWC Comment Letter, June 11, 2014, pp. 124-125.

[315] Letter of Mark Cowin, Director, California Department of Water Resourc Director, US Bureau of Reclamation, to Barbara Evoy, Chief, Division of Control Board, July 23, 2014. http://www.swrcb.ca.gov/waterrights/water_issues/programs/bay_delta/complaints/docs/072314_dwr_reclam_s and_c_deltadiversions.pdf

parties뀡□ηwho뀡□ηuse뀡□ηor뀡□ηdivert뀡□ηwater뀡□ηin뀡[316]뀡□ηand뀡subsequent뀡□ηthe뀡□ηBay-Delta뀡□ηSWRCB뀡□ηissued뀡□ηnotices뀡□ηseeking뀡□ηadditional뀡□ηinformation뀡□ηabout뀡□ηwater뀡□ηrights뀡□ηthe뀡□ηstate's뀡□ηpriority뀡□ηsystem뀡□ηof뀡□ηallocating뀡□ηwater뀡□ηduring뀡□ηdrought뀡□ηconditi Sacramento뀡□ηValley뀡□ηand뀡□ηthe뀡[317]뀡□ηSWRCB뀡□ηissued뀡□ηan뀡□ηorder뀡□ηrequiring뀡□ηal claimants뀡□ηin뀡□ηthe뀡□ηCentral뀡□ηValley뀡□ηwatershed뀡□ηof뀡□ηthe뀡□ηDelta뀡□ηto뀡□ηdisclos and뀡□ηreport뀡□ηtheir뀡□ηclaims뀡□ηand뀡□ηusage뀡□ηplans뀡□ηduring뀡□η2015.뀡□ηThe뀡□ηBoard of뀡□ηall뀡□ηthe뀡□ηinformation뀡□ηthey뀡□ηreceived뀡□ηfrom뀡□ηthe뀡□ηsolicitation.뀡□ηUsing뀡□η and뀡□ηreleased뀡□ηdemand뀡□ηcurves뀡□ηfrom뀡□ηwhich뀡□ηit뀡□ηdetermined뀡□ηwater뀡□ηavailab during뀡□η2015.뀡□ηOn뀡□ηApril뀡□η23뀡□ηand뀡□ηMay뀡□η1,뀡□η2015,뀡□ηthe뀡□ηBoard뀡□ηissue appropriative뀡□ηwater뀡□ηrights뀡□ηin뀡□ηthe뀡□ηSacramento뀡□ηand뀡□ηSan뀡□ηJoaquin뀡□ηRiver Delta,뀡□ηdue뀡□ηto뀡□ηinsufcicient뀡□ηprojected뀡□ηwater뀡□ηsupplies.뀡□ηOn뀡□ηJune뀡□η12,뀡□η curtailments뀡□ηof뀡□ηdiversion뀡□ηactivity,뀡□ηbased뀡□ηon뀡□ηupdated뀡□ηwater뀡□ηsupply뀡□ηpr of뀡□ηWater뀡□ηResources뀡□ηin뀡□ηearly뀡□ηMay,뀡□ηto뀡□ηinclude뀡□ηwater뀡□ηright뀡□ηclaiman and뀡□ηlater.뀡□η

The뀡□ηBoard뀡□ηfailed뀡□ηto뀡□ηact뀡□ηtimely뀡□ηon뀡□ηCSPA's뀡□ηcomplaint,뀡□ηwhich뀡□ηallege diversions뀡□ηof뀡□ηwater뀡□ηby뀡□ηDWR뀡□ηand뀡□ηUSBR뀡□ηat뀡□ηtheir뀡□ηDelta뀡□ηpumping뀡 and뀡□ηothers뀡□ηfor뀡□ηunauthorized뀡□ηand뀡□ηillegal뀡□ηdiversion뀡□ηof뀡□ηSan뀡□ηJoaquin뀡□η to뀡□ηthe뀡□ηState뀡□ηWater뀡□ηBoard뀡□ηto뀡□ηinitiate뀡□ηon뀡□ηits뀡□ηown뀡□ηmotion,뀡□ηan뀡 rights."[318]뀡□ηIn뀡□ηresponding뀡□ηto뀡□ηthe뀡□ηBoard's뀡□ηnotice뀡□ηrequesting뀡□ηinformation뀡□η public뀡□ηworkshop,뀡□ηCSPA뀡□ηset뀡□ηforth뀡□ηseveral뀡□ηanalytic뀡□ηand뀡□ηevidentiary뀡□ηtask important뀡□ηfor뀡□ηfull뀡□ηdocumentation뀡□ηand뀡□ηfeasibility뀡□ηdeterminations뀡□ηfor뀡□ηthe뀡□ include뀡□ηmeasuring:

- Actual뀡□ηDelta뀡□ηoutclow뀡□ηas뀡□ηopposed뀡□ηto뀡□ηthe뀡□ηNet뀡□ηDelta뀡□ηOutclow뀡□η Board.뀡□η뀡□ηThe뀡□ηNDOI뀡□ηis뀡□ηa뀡□ηcalculated뀡□ηguesstimate뀡□ηand뀡□ηseriously뀡 drier뀡□ηperiods뀡□ηas뀡□ηcompared뀡□ηto뀡□ηthe뀡□ηtidally뀡□ηciltered뀡□ηclow뀡□ηdata뀡□ Survey뀡□η(USGS)뀡□ηstream뀡□ηclow뀡□ηgages뀡□ηat뀡□ηRio뀡□ηVista,뀡□ηThree뀡□ηMile뀡□ Slough.뀡□η뀡□ηThe뀡□ηUSGS뀡□ηdata뀡□ηcorrelates뀡□ηwith뀡□ηsalinity뀡□ηchanges뀡□ηand뀡 while뀡□ηthe뀡□ηNDOI뀡□ηreported뀡□ηaverage뀡□ηDelta뀡□ηoutclow뀡□ηas뀡□η3,805뀡□ηcubi May뀡□η2014,뀡□ηthe뀡□ηUSGS뀡□ηgages뀡□ηreported뀡□ηthat뀡□ηactual뀡□ηDelta뀡□ηoutclow

- Actual뀡□ηnatural뀡□ηinclow뀡□ηas뀡□ηopposed뀡□ηto뀡□ηthe뀡□ηcalculated뀡□ηguesstimates뀡 dams뀡□ηthe뀡□ηBoard뀡□ηhas뀡□ηhistorically뀡□ηrelied뀡□ηupon.뀡□ηThe뀡□ηBoard뀡□ηhas뀡 comprehensive뀡□η"gaging"뀡□ηof뀡□ηnatural뀡□ηclows.뀡□ηNatural뀡□ηsprings뀡□ηin뀡□ηthe뀡 River뀡□ηwatersheds뀡□ηprovide뀡□ηmillions뀡□ηof뀡□ηacre-□feet뀡□η(AF)뀡□ηof뀡□ηclow뀡□η summer.뀡□ηDWR/USBR뀡□ηhave뀡□ηno뀡□ηstorage뀡□ηrights뀡□ηfor뀡□ηthese뀡□ηartesian뀡□ upstream뀡□ηreservoirs뀡□ηwhen뀡□ηdownstream뀡□ηriparian뀡□ηand뀡□ηappropriative뀡□ηdem

- Actual뀡□ηaccretions뀡□ηof뀡□ηwater뀡□ηto뀡□ηthe뀡□ηDelta뀡□ηand뀡□ηreaches뀡□ηof뀡□ηstr including뀡□ηreturn뀡□ηclows,뀡□ηdischarges뀡□ηand뀡□ηother뀡□ηinputs,뀡□ηas뀡□ηopposed뀡 guesstimates뀡□ηof뀡□ηaccretions뀡□ηthe뀡□ηBoard뀡□ηhas뀡□ηhistorically뀡□ηrelied뀡□ηupon.뀡 from뀡□ηthe뀡□ηColusa뀡□ηBasin뀡□ηDrain뀡□ηat뀡□ηKnights뀡□ηLanding,뀡□ηButte뀡□ηCreek/

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[316]뀡□ηVarious뀡□ηrespondents'뀡□ηletters뀡□ηare뀡□ηonline뀡□ηat뀡□η https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/complaints/index.shtml.

[317]뀡□ηThe뀡□ηBoard뀡□ηissued뀡□ηits뀡□ηnotice뀡□ηof뀡□ηpublic뀡□ηworkshop뀡□ηon뀡□ηSeptember뀡□η5,뀡□ September뀡□η10,뀡□η2014,뀡□ηand뀡□ηits뀡□ηcinal뀡□ηorder뀡□ηon뀡□η http://www.swrcb.ca.gov/waterrights/board_decisions/adopted_orders/orders/2015/wro2015_0002.pdf.뀡□η2015.뀡□ηAccessib .뀡□η

[318]뀡□ηAccessible뀡□ηonline뀡□ηat뀡□η http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/complaints/docs/081314_cspa_evoy.pdf.

Slough뀀□ηand뀀□ηthe뀀□ηNatomas뀀□ηBasin뀀□ηCross뀀□ηCanal뀀□ηare뀀□ηunknown뀀□ηbeca
gages.뀀□ηAll뀀□ηaccretions,뀀□ηwhether뀀□ηfrom뀀□ηreturn뀀□ηclows,뀀□ηdischarges뀀□ηfrom
facilities,뀀□ηgroundwater,뀀□ηetc.뀀□ηare뀀□ηsubject뀀□ηto뀀□ηthe뀀□ηwater뀀□ηrights뀀□ηpri

- Actual뀀□ηchannel뀀□ηlosses뀀□ηin뀀□ηthe뀀□ηDelta뀀□ηand뀀□ηreaches뀀□ηof뀀□ηstreams뀀□
to뀀□ηthe뀀□ηcalculated뀀□ηguesstimates뀀□ηhistorically뀀□ηrelied뀀□ηupon뀀□ηby뀀□ηthe뀀□η
must뀀□ηidentify뀀□ηand뀀□ηquantify뀀□ηlosing뀀□ηreaches뀀□ηof뀀□ηstreams뀀□ηtributary뀀□
effort뀀□ηto뀀□ηidentify뀀□ηthe뀀□ηcauses.뀀□η뀀□ηAre뀀□ηlosing뀀□ηreaches뀀□ηof뀀□ηstrea
adjacent뀀□ηpumping뀀□ηof뀀□ηgroundwater뀀□ηfor뀀□ηlocal뀀□ηuse뀀□ηor뀀□ηsubstitution뀀□
project뀀□ηfacilities?뀀□η

- The뀀□η"abandoned뀀□ηwater"뀀□ηin뀀□ηthe뀀□ηDelta뀀□ηand뀀□ηthe뀀□ηlegal뀀□ηrights뀀□η
system.뀀□ηRiparian뀀□ηand뀀□ηreturn뀀□ηclows,뀀□ηaccretions뀀□ηand뀀□ηcompliance뀀□ηclo
considered뀀□η"abandoned"뀀□ηclow뀀□ηwhen뀀□ηthe뀀□ηDelta뀀□ηis뀀□ηin뀀□ηbalance.뀀□η뀀
by뀀□ηDWR/USBR뀀□ηmust뀀□ηbe뀀□ηin뀀□ηaccordance뀀□ηwith뀀□ηthe뀀□ηrights뀀□ηof뀀□η

- Commingled뀀□ηwater뀀□ηfrom뀀□ηall뀀□ηsources뀀□ηthat뀀□ηare뀀□ηdrawn뀀□ηfrom뀀□ηthe
San뀀□ηJoaquin뀀□ηwatershed,뀀□ηas뀀□ηthe뀀□ηresult뀀□ηof뀀□ηexport뀀□ηpumping뀀□ηby뀀
statute뀀□ηand뀀□ηprecedent,뀀□ηit뀀□ηis뀀□ηthe뀀□ηresponsibility뀀□ηof뀀□ηthe뀀□ηparty뀀□
from뀀□ηone뀀□ηwatershed뀀□ηto뀀□ηanother뀀□ηto뀀□ηensure뀀□ηthat뀀□ηthe뀀□ηwater뀀□η
diminished뀀□ηor뀀□ηimpaired.뀀□ηThe뀀□ηBoard뀀□ηmust뀀□ηdetermine뀀□ηwhether뀀□ηin-□
taking뀀□ηstored뀀□ηProject뀀□ηwater,뀀□ηwhether뀀□ηthe뀀□ηProjects뀀□ηare뀀□ηstoring뀀□η
store뀀□ηand뀀□ηwhether뀀□ηthe뀀□ηProjects뀀□ηcommingling뀀□ηof뀀□ηwater뀀□ηis뀀□ηadve
Delta뀀□ηwater뀀□ηusers뀀□ηfrom뀀□ηexercising뀀□ηtheir뀀□ηlegal뀀□ηentitlements.뀀□η

In뀀□ηsum,뀀□ηCSPA뀀□ηconcluded,뀀□ηthe뀀□ηBoard뀀□ηmust뀀□ηdetermine,뀀□ηamong뀀□ηother뀀□
have뀀□ηlegal뀀□ηrights뀀□ηto뀀□ηall뀀□ηof뀀□ηthe뀀□ηwater뀀□ηthey뀀□ηclaim뀀□ηor뀀□ηhave뀀□η
accused뀀□ηof뀀□ηimproperly뀀□ηtaking뀀□ηactually뀀□ηreach뀀□ηthe뀀□ηDelta;뀀□ηwhether뀀□ηthe뀀
commingling뀀□ηof뀀□ηwater뀀□ηhave뀀□ηdeprived뀀□ηDelta뀀□ηwater뀀□ηusers뀀□ηof뀀□ηentitled뀀□
diverters뀀□ηare뀀□ηentitled뀀□ηto뀀□ηtidal뀀□ηclows뀀□ηin뀀□ηa뀀□ηcommon뀀□ηDelta뀀□ηPool뀀□
claiming뀀□ηabandoned뀀□ηwater뀀□ηthat뀀□ηis뀀□ηinstead뀀□ηsubject뀀□ηto뀀□ηthe뀀□ηpriority뀀□η
make뀀□ηthe뀀□ηnecessary뀀□ηcindings뀀□ηbased뀀□ηsolely뀀□ηon뀀□ηinformation뀀□ηregarding뀀□ηD
diversions뀀□ηrequested뀀□ηin뀀□ηthe뀀□ηDraft뀀□ηOrder.뀀□η

The뀀□ηissues뀀□ηof뀀□ηcommingled뀀□ηwaters뀀□ηin뀀□ηa뀀□ηDelta뀀□ηcommon뀀□ηpool뀀□ηand뀀
Board뀀□ηis뀀□ηalso뀀□ηcritical뀀□ηto뀀□ηthe뀀□ηfuture뀀□ηof뀀□ηthe뀀□ηBay-□Delta뀀□ηEstuary뀀□
pool뀀□ηconcept뀀□ηwould뀀□ηprovide뀀□ηmeaningful뀀□ηdecinition뀀□ηof뀀□ηDelta뀀□ηcommon뀀□η
have뀀□ηthe뀀□ηadded뀀□ηbenecit뀀□ηof뀀□ηsupplementing뀀□ηestablishment뀀□ηof뀀□ηthe뀀□ηlegal
decinition뀀□ηof뀀□ηthe뀀□ηEstuary's뀀□ηregion.뀀□ηIn뀀□ηthe뀀□ηabsence뀀□ηof뀀□ηdecining,뀀□ηleg
common뀀□ηpool뀀□ηas뀀□ηa뀀□ηsustainable뀀□ηcommons,뀀□ηDelta뀀□ηexports뀀□ηwill뀀□ηthemselv
suspicion뀀□ηof뀀□ηillegal뀀□ηdiversions.

The뀀□ηRDEIR/SDEIS뀀□ηpresents뀀□ηmodeling뀀□ηresults뀀□ηthat뀀□ηindicate뀀□ηchanges뀀□ηin뀀□η
be뀀□ηobtained뀀□ηfor뀀□ηexport뀀□ηpumping뀀□ηby뀀□ηthe뀀□ηTunnels뀀□ηProject뀀□ηfrom뀀□ηthe
shown뀀□ηin뀀□ηthis뀀□ηcomment뀀□ηdocument뀀□ηthe뀀□ηexpected뀀□ηnegative뀀□ηwater뀀□ηqualit
Tunnels뀀□ηdiversion뀀□ηand뀀□ηrediversion뀀□ηwill뀀□ηcause.뀀□ηSource뀀□ηcingerprint뀀□ηmodelin
shows뀀□ηthat뀀□ηBanks뀀□ηand뀀□ηJones뀀□ηpumping뀀□ηplants뀀□ηwill뀀□ηcontinue뀀□ηexporting
Unfortunately,뀀□ηthe뀀□ηRDEIR/SDEIS뀀□ηfails뀀□ηto뀀□ηpresent뀀□ηmodeling뀀□ηresults뀀□ηin뀀□ηa
evaluate뀀□ηCSPA's뀀□ηAugust뀀□η13,뀀□η2014,뀀□ηallegations뀀□ηconcerning뀀□ηthe뀀□ηMokelumne,
River뀀□ηfractions뀀□ηthat뀀□ηTunnels뀀□ηProject뀀□ηoperations뀀□ηmay뀀□ηinvolve.[319]

[319]뀀□ηRDEIR/SDEIS,뀀□ηAppendix뀀□ηB,뀀□ηFigures뀀□ηB.4-□19뀀□ηthrough뀀□η-□22,뀀□ηB.4-□41뀀□ηthrough

These뀀□ηwater뀀□ηrights뀀□ηissues뀀□ηare뀀□ηnot뀀□ηaddressed뀀□ηin뀀□ηthe뀀□ηRDEIR/SDEIS뀀□
and뀀□ηsetting뀀□ηanalyses뀀□ηmeans뀀□ηthe뀀□ηimpacts뀀□ηof뀀□ηthe뀀□ηproject뀀□ηon뀀□ηin-□De
supplies뀀□ηare뀀□ηnot뀀□ηadequately뀀□ηdisclosed뀀□ηand뀀□ηanalyzed.

The Tunnels Project will violate the federal Clean Water Act.

We뀀□ηidentify뀀□ηseveral뀀□ηinstances뀀□ηearlier뀀□ηin뀀□ηthese뀀□ηcomments뀀□ηon뀀□ηthe뀀□η
Project뀀□ηwould뀀□ηviolate뀀□ηthe뀀□ηfederal뀀□ηClean뀀□ηWater뀀□ηAct뀀□ηviolate뀀□ηexisting
inadequate뀀□ηclow뀀□ηobjectives.뀀□ηincreases뀀□ηin뀀□ηconcentrations뀀□ηof뀀□ηcriteria뀀□ηpollutants
water뀀□ηquality뀀□ηand뀀□ηviolate뀀□ηexisting뀀□ηbromide,뀀□ηselenium뀀□ηdissolved뀀□ηorganic뀀□
criteria.뀀□ηand,뀀□ηRDEIR/SDEIS뀀□ηmodeling뀀□ηresults뀀□ηindicate뀀□ηreduced뀀□ηsurvival뀀□ηrates뀀
under뀀□ηconditions뀀□ηof뀀□ηTunnel뀀□ηProject뀀□ηoperations,뀀□ηwhich뀀□ηdemonstrates뀀□ηfailure
key뀀□ηbenecicial뀀□ηuses뀀□η(rare뀀□ηand뀀□ηthreatened뀀□ηspecies,뀀□ηmigratory뀀□ηuses,뀀□ηand
are뀀□ηthe뀀□ηmost뀀□ηsensitive뀀□ηin뀀□ηthe뀀□ηBay-□Delta뀀□ηEstuary.뀀□ηDegradation뀀□ηof뀀□
further뀀□ηimpacts뀀□ηto뀀□ηin-□Delta뀀□ηdrinking뀀□ηwater뀀□ηquality뀀□ηand뀀□ηenvironmental뀀□
recreational뀀□ηbenecicial뀀□ηuses.뀀□η

There뀀□ηare뀀□ηno뀀□ηdesignated뀀□ηbenecicial뀀□ηuses뀀□ηor뀀□ηcriteria뀀□ηset뀀□ηto뀀□ηbeneci
Bay-□Delta뀀□ηEstuary.뀀□ηThe뀀□ηprivileging뀀□ηof뀀□ηDelta뀀□ηexport뀀□ηwater뀀□ηquality뀀□ηand
benecicial뀀□ηuses뀀□ηand뀀□ηpollutant뀀□ηcriteria뀀□ηcompliance뀀□ηparallels뀀□ηthe뀀□ηTunnels뀀□
junior뀀□ηwater뀀□ηrights뀀□ηover뀀□ηsenior뀀□ηwater뀀□ηdiverters뀀□ηin뀀□ηthe뀀□ηDelta.뀀□ηWe
promised뀀□ηby뀀□ηthe뀀□ηTunnels뀀□ηProject뀀□ηto뀀□ηsouth뀀□ηof뀀□ηDelta뀀□ηimporters뀀□ηcon
benecicial뀀□ηuses,뀀□ηenvironmental뀀□ηjustice뀀□ηcommunities,뀀□ηand뀀□ηpublic뀀□ηhealth뀀□ηas뀀
Tunnels뀀□ηProject뀀□η***The뀀□ηRDEIR/SDEIS뀀□ηfails뀀□ηutterly뀀□ηto뀀□ηdisclose뀀□ηthese뀀□ηfailures뀀□η***

The Tunnels Project is contrary to Article X, Section 2 of the California Constitution.

The뀀□ηTunnels뀀□ηProject뀀□η뀀□ηwould뀀□ηbe뀀□ηcontrary뀀□ηto뀀□ηArticle뀀□ηX,뀀□ηSection뀀□
California뀀□ηWater뀀□ηCode뀀□ηSection뀀□η100뀀□ηbecause뀀□ηit뀀□ηviolates:

- Various뀀□ηsections뀀□ηof뀀□ηthe뀀□ηDelta뀀□ηReform뀀□ηAct뀀□ηof뀀□η2009뀀□ηidenticied뀀
- State뀀□ηand뀀□ηfederal뀀□ηclean뀀□ηwater뀀□ηlegislation뀀□ηand뀀□ηregulation.
- California뀀□ηWater뀀□ηCode's뀀□ηno뀀□ηinjury뀀□ηrule뀀□ηand뀀□ηunlawful뀀□ηdiversion뀀□η
- Ecological뀀□ηand뀀□ηfunding뀀□ηassurance뀀□ηrequirements뀀□ηof뀀□ηthe뀀□ηstate뀀□ηand뀀□
  NCCPA.
- The뀀□ηDelta뀀□ηProtection뀀□ηAct뀀□ηof뀀□η1959뀀□η-□뀀□ηthe뀀□ηDelta's뀀□ηarea뀀□ηof뀀

The Tunnels Project violates the Public Trust Doctrine.

The뀀□ηTunnels뀀□ηProject뀀□ηwould뀀□ηfurther뀀□ηdivert뀀□ηand뀀□ηdegrade뀀□ηthe뀀□ηDelta뀀□η
rights뀀□ηof뀀□ηenvironmental뀀□ηjustice뀀□ηcommunities뀀□ηto뀀□ηcontinue뀀□ηcishing뀀□ηin뀀□ηlo
and뀀□ηenclosed뀀□ηby뀀□ηBDCP뀀□ηfacilities뀀□ηand뀀□ηrestoration뀀□ηprojects.뀀□ηThe뀀□ηpresenc
estuary뀀□ηpool뀀□ηin뀀□ηthe뀀□ηDelta뀀□ηmakes뀀□ηit뀀□ηsubject뀀□ηto뀀□η***The뀀□ηstate뀀□ηunder뀀□η***
of뀀□ηCalifornia뀀□ηhas뀀□ηa뀀□η.iduciary뀀□ηresponsibility뀀□ηto뀀□ηprotect뀀□ηsuch뀀□ηcommon
for뀀□ηthe뀀□ηpeople뀀□ηof뀀□ηCalifornia.

VI. Specific Comments on the RDEIR/SDEIS

Objective, Purpose and Need Issues

We 뀀□ηcommented 뀀□ηearlier 뀀□ηon 뀀□ηsevere 뀀□ηdeciciencies 뀀□ηof 뀀□ηBDCP's 뀀□ηpurpose 뀀□ηand
transfers, 뀀□ηDelta 뀀□ηPlan 뀀□ηconsistency, 뀀□ηthe 뀀□ηattempt 뀀□ηto 뀀□ηuse 뀀□ηreal-□time 뀀□ηopera
to 뀀□ηsubstitute 뀀□ηfor 뀀□ηenforceable 뀀□ηand 뀀□ηtrackable 뀀□ηmitigation 뀀□ηmeasures, 뀀□ηreasonab
alternatives, 뀀□ηand 뀀□ηother 뀀□ηmatters. 뀀□η(See 뀀□ηSection 뀀□ηII 뀀□ηcomments, 뀀□ηabove.)

Cumulative impacts are not adequately analyzed in the RDEIR/SDEIS.

Last 뀀□ηyear, 뀀□ηEWC 뀀□ηcommented 뀀□ηthat 뀀□ηthe 뀀□ηDraft 뀀□ηEIR/EIS 뀀□ηimproperly 뀀□ηexclud
known 뀀□ηstorage 뀀□ηprojects 뀀□ηfrom 뀀□ηits 뀀□ηlist 뀀□ηof 뀀□ηprojects 뀀□ηconsidered 뀀□ηfor 뀀□ηcu
Delta 뀀□ηConservation 뀀□ηPlan. 뀀□ηWe 뀀□ηprovided 뀀□ηa 뀀□ηlist 뀀□ηof 뀀□ηprojects, 뀀□ηprograms 뀀□
the 뀀□ηDraft 뀀□ηEIR/EIS 뀀□ηcumulative 뀀□ηimpact 뀀□ηanalysis. 뀀□η(That 뀀□ηis, 뀀□ηthey 뀀□ηwere 뀀□
cumulative 뀀□ηprojects, 뀀□ηbut 뀀□ηwere 뀀□ηexcluded 뀀□ηfrom 뀀□ηmodeling 뀀□ηand 뀀□ηnarrative 뀀□η
impacts.) 뀀□ηNo 뀀□ηexplanations 뀀□ηwere 뀀□ηprovided 뀀□ηfor 뀀□ηtheir 뀀□ηexclusion. 뀀□ηWe 뀀□ηfour
justicication 뀀□ηof 뀀□ηitself 뀀□ηas 뀀□ηa 뀀□η"stand-□alone 뀀□ηproject" 뀀□ηextended 뀀□ηto 뀀□ηstorage
recent 뀀□ηlevee 뀀□ηstudies. 뀀□ηWe 뀀□ηconcluded 뀀□ηthat 뀀□ηthe 뀀□ηDraft 뀀□ηEIR/EIS 뀀□ηwas 뀀□ηdeci
reasonably 뀀□ηexpected 뀀□ηcumulative 뀀□ηprojects 뀀□ηand 뀀□ηtheir 뀀□ηcumulative 뀀□ηimpacts 뀀□ηin
the 뀀□ηDraft 뀀□ηEIR/EIS 뀀□ηneeded 뀀□ηrevision[320] 뀀□ηand 뀀□ηrecirculation.

This 뀀□ηyear, 뀀□ηwith 뀀□ηthe 뀀□ηsevering 뀀□ηof 뀀□ηthe 뀀□ηhabitat 뀀□ηconservation 뀀□ηplan 뀀□ηfro
arises 뀀□ηof 뀀□ηthe 뀀□ηrelationship 뀀□ηof 뀀□ηCalifornia 뀀□ηEcoRestore 뀀□ηto 뀀□ηbaseline 뀀□ηand 뀀□
under 뀀□ηCEQA 뀀□ηand 뀀□ηNEPA. 뀀□ηThe 뀀□ηRDEIR/SDEIS 뀀□ηdoes 뀀□ηnot 뀀□ηconfront 뀀□ηthese 뀀□

- There 뀀□ηcontinues 뀀□ηto 뀀□ηbe 뀀□ηno 뀀□ηsingle, 뀀□ηunicied 뀀□ηsection 뀀□ηin 뀀□ηthe 뀀□ηR
  cumulative 뀀□ηimpacts 뀀□ηadequately 뀀□ηand 뀀□ηclearly.

- The 뀀□ηCEQA 뀀□ηbaseline 뀀□ηdoes 뀀□ηnot 뀀□ηcontain 뀀□ηBDCP-□scaled 뀀□ηhabitat 뀀□ηrestora
  therefore 뀀□ηthere 뀀□ηneeds 뀀□ηto 뀀□ηbe 뀀□ηa 뀀□ηCEQA 뀀□ηcumulative 뀀□ηimpacts 뀀□ηanaly
  EcoRestore 뀀□ηas 뀀□ηpart 뀀□ηof 뀀□ηthe 뀀□ηreasonably 뀀□ηforeseeable 뀀□ηcumulative 뀀□ηproje

뀀□η

- The 뀀□ηNEPA 뀀□ηbaseline 뀀□η(the 뀀□ηNo 뀀□ηAction 뀀□ηAlternative) 뀀□ηis 뀀□ηclaimed 뀀□ηby
  California 뀀□ηEcoRestore 뀀□ηprojects 뀀□ηspun 뀀□ηoff 뀀□ηfrom 뀀□ηBDCP 뀀□ηlike 뀀□ηthe 뀀□ηYo
  Restoration 뀀□ηand 뀀□ηFish 뀀□ηPassage 뀀□ηImplementation 뀀□ηPlan, 뀀□ηwhich 뀀□ηwas 뀀□ηorig
  NMFS 뀀□ηsalmon 뀀□ηbiological 뀀□ηopinion. 뀀□ηThere 뀀□ηis 뀀□ηno 뀀□ηquanticied 뀀□ηdemonstra
  Action 뀀□ηAlternative's 뀀□ηmodeling 뀀□ηis 뀀□ηa 뀀□ηblack 뀀□ηbox 뀀□ηin 뀀□ηthe 뀀□ηRDEIR/SD
  separately 뀀□ηidenticied 뀀□ηin 뀀□ηthe 뀀□ηRDEIR/SDEIS's 뀀□ηAppendix 뀀□η3D 뀀□ηin 뀀□ηwhich
  indication 뀀□ηis 뀀□ηgiven 뀀□ηas 뀀□ηto 뀀□ηwhere 뀀□ηin 뀀□ηthe 뀀□ηexisting 뀀□ηconditions, 뀀□
  cumulative 뀀□ηimpacts 뀀□ηanalysis 뀀□ηthe 뀀□ηproject 뀀□ηwas 뀀□ηanalyzed. 뀀□η

Such 뀀□ηproblems 뀀□ηof 뀀□ηpresentation 뀀□ηand 뀀□ηanalysis 뀀□ηcontribute 뀀□ηgreatly 뀀□ηto 뀀□ηour
relies 뀀□ηon 뀀□ηobfuscation 뀀□ηand 뀀□ηconfusion 뀀□ηto 뀀□ηcreate 뀀□ηan 뀀□ηelaborate 뀀□ηshell 뀀□η
Tunnels 뀀□ηProject. 뀀□ηThere 뀀□ηis 뀀□ηno 뀀□ηattempt 뀀□ηto 뀀□ηclearly 뀀□ηand 뀀□ηsuccinctly 뀀□ηso
various 뀀□ηassumptions 뀀□ηthat 뀀□ηhave 뀀□ηgone 뀀□ηinto 뀀□ηthe 뀀□ηRDEIR/SDEIS's 뀀□ηchanges 뀀□η
Alternative, 뀀□ηand 뀀□ηcumulative 뀀□ηimpacts 뀀□ηanalysis. 뀀□ηDiscussion 뀀□ηof 뀀□ηbaseline 뀀□ηand 뀀
assumptions 뀀□ηare 뀀□ηanalyzed 뀀□ηmainly 뀀□ηin 뀀□ηSections 뀀□η4.1 뀀□ηand 뀀□η4.2 뀀□ηand 뀀□ηno
provided 뀀□ηanywhere 뀀□ηin 뀀□ηSections 뀀□η1 뀀□ηthrough 뀀□η5 뀀□ηof 뀀□ηthe 뀀□ηRDEIR/SDEIS, 뀀□

[320] 뀀□ηEWC 뀀□ηComments, 뀀□ηJune 뀀□η11, 뀀□η2014, 뀀□ηpp. 뀀□η220-□225.

extensive,꿯□ηrevised꿯□ηcompendium꿯□ηof꿯□ηAttachment꿯□η3D-□A꿯□ηin꿯□ηAppendix꿯□η3D.꿯□
is꿯□ηprovided꿯□ηto꿯□ηguide꿯□ηreaders꿯□ηthrough꿯□η*this꿯□ηdeficiency꿯□ηand꿯□ηinadequate꿯□ηpro*
treatment꿯□ηof꿯□ηcumulative꿯□ηimpacts꿯□ηand꿯□ηthe꿯□ηRDEIR/SDEIS꿯□ηshould꿯□ηbe꿯□ηr
de.iciency꿯□ηand꿯□ηthen꿯□ηrecirculated.

This꿯□ηyear,꿯□ηwe꿯□ηalso꿯□ηcind꿯□ηthat꿯□ηthe꿯□ηTunnels꿯□ηProject꿯□ηmust꿯□ηnot꿯□ηb
and꿯□ηthe꿯□ηBureau꿯□ηrecently꿯□ηconcluded꿯□ηpublic꿯□ηreview꿯□ηand꿯□ηcomment꿯□ηperio
Coordinated꿯□ηLong-□Term꿯□ηOperations꿯□ηof꿯□ηthe꿯□ηCentral꿯□ηValley꿯[321]□ηProject꿯□ηand꿯□
Earlier꿯□ηin꿯□η2015,꿯□ηthe꿯□ηSan꿯□ηLuis꿯□ηDelta꿯□ηMendota꿯□ηWater꿯□ηAuthority꿯□η(SL
Reclamation꿯□ηran꿯□ηa꿯□ηpublic꿯□ηreview꿯□ηprocess꿯□ηon꿯□ηa꿯□ηlong-□term꿯□η10-□year꿯
Delta꿯□ηwater꿯□ηtransfers.[322]꿯□η

Neither꿯□ηof꿯□ηthese꿯□ηother꿯□ηreview꿯□ηprocesses꿯□ηwere꿯□ηreferenced꿯□ηin꿯□ηthe꿯□η
though꿯□ηboth꿯□ηof꿯□ηthem꿯□ηbear꿯□ηon꿯□ηthe꿯□ηpresumed꿯□ηneed꿯□ηfor꿯□ηand꿯□ηin
practical꿯□ηand꿯□ηcumulative꿯□ηways.꿯□ηThe꿯□ηOCAP꿯□ηis꿯□ηintegral꿯□ηto꿯□ηreview꿯□ηa
because꿯□ηthere꿯□ηwould꿯□ηnot꿯□ηbe꿯□ηa꿯□ηTunnels꿯□ηProject꿯□ηwithout꿯□ηthe꿯□ηstate
which꿯□ηit꿯□ηwould꿯□ηbe꿯□ηintegrated.꿯□ηAnd,꿯□ηas꿯□ηwe꿯□ηhave꿯□ηargued꿯□ηearlier꿯□
unacknowledged꿯□ηpurpose꿯□ηof꿯□ηthe꿯□ηTunnels꿯□ηProject꿯□ηis꿯□ηto꿯□ηfacilitate꿯□ηthe꿯
that꿯□ηwas꿯□ηevaluated꿯□ηearlier꿯□ηthis꿯□ηyear꿯□ηby꿯□ηSLDMWA꿯□ηand꿯□ηthe꿯□ηBureau
transfer꿯□ηprogram꿯□ηare꿯□ηreasonable꿯□ηand꿯□ηforeseeable,꿯□ηand꿯□ηneither꿯□ηis꿯□ηanal
RDEIR/SDEIS.꿯□ηEach꿯□ηwere꿯□ηreasonable꿯□ηand꿯□ηforeseeable꿯□ηprojects꿯□ηin꿯□ηFebruary
coordinated꿯□ηlong-□term꿯□ηoperation꿯□ηof꿯□ηthe꿯□ηstate꿯□ηand꿯□ηfederal꿯□ηwater꿯□ηsyst
at꿯□ηleast꿯□η1986꿯□η(with꿯□ηpassage꿯□ηof꿯□ηthe꿯□ηCoordinated꿯□ηOperations꿯□ηAct꿯□ηm
CalFED꿯□ηRecord꿯□ηof꿯□ηDecision꿯□ηwas꿯□ηsigned),꿯□ηand꿯□ηthe꿯□ηwater꿯□ηtransfer꿯□ηp
the꿯□ηcirst꿯□ηDrought꿯□ηWater꿯□ηBank꿯□ηwas꿯□ηorganized꿯□ηto꿯□ηaddress꿯□ηdrought꿯□η
of꿯□ηwater꿯□η*The꿯□ηRDEIR/SDEIS꿯□ηis꿯□ηinadequate꿯□ηin꿯□ηits꿯□ηtreatment꿯□ηof꿯□ηth*
cumulative꿯□ηimpact꿯□ηanalysis,꿯□ηand꿯□ηshould꿯□ηbe꿯□ηrevised꿯□ηto꿯□ηcorrect꿯□ηthis
recirculated.꿯□η

Army Corps Permitting

The꿯□ηTunnels꿯□ηProject꿯□ηmust꿯□ηobtain꿯□η404꿯□ηpermits꿯□ηconcerning꿯□ηdischarge꿯□ηa
material꿯□ηinto꿯□ηthe꿯□ηnavigable꿯□ηwaters꿯□ηof꿯□ηthe꿯□ηUnited꿯□ηStates.꿯□ηIn꿯□ηadditi
permits꿯□ηunder꿯□ηthe꿯□ηRivers꿯□ηand꿯□ηHarbors꿯□ηAct꿯□ηSections꿯□η10꿯□ηand꿯□η14꿯
under꿯□ηor꿯□ηover꿯□ηnavigable꿯□ηwaters,꿯□ηand꿯□ηto꿯□ηclood꿯□ηcontrol꿯□ηprojects꿯□ηan
ways—in꿯□ηthe꿯□ηTunnels꿯□ηProject꿯□ηcase,꿯□ηthe꿯□ηSacramento꿯□ηand꿯□ηSan꿯□ηJoaquin꿯
levee꿯□ηsystems꿯□ηand꿯□ηthe꿯□ηStockton꿯□ηDeep꿯□ηWater꿯□ηShip꿯□ηChannel.꿯□η

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[321]꿯□ηUS꿯□ηBureau꿯□ηof꿯□ηReclamation꿯□ηand꿯□ηCalifornia꿯□ηDepartment꿯□ηof꿯□ηWater꿯□ηResource
Statement/Draft꿯□ηEnvironmental꿯□ηImpact꿯□ηStatement,꿯□η*Coordinated꿯□ηLong-□Term꿯□ηOperation꿯□ηof꿯□ηthe꿯□ηCentral꿯□*
*and꿯□ηthe꿯□ηState꿯□ηWater꿯□ηProject,*꿯□ηdated꿯□ηJuly꿯□η31,꿯□η2015꿯□η*http://www.usbr.gov/mp/nepa/*꿯□ηat꿯□η
nepa_projdetails.cfm?Project_ID=21883.꿯□ηSee꿯□ηcomments꿯□ηon꿯□ηthis꿯□ηdocument꿯□ηby꿯□ηFriends꿯□ηo
29,꿯□η2015;꿯□ηAquAlliance,꿯□ηSeptember꿯□η29,꿯□η2015,꿯□ηand꿯□ηby꿯□ηCalifornia꿯□ηWater꿯□ηImpact
Sportcishing꿯□ηProtection꿯□ηAlliance,꿯□ηSeptember꿯□η29,꿯□η2015;꿯□ηand꿯□ηEnvironmental꿯□ηWater꿯□η
http://calsport.org/news/wp-□content/uploads/Final-□Draft-□Comments-□on-□OCAP-□Remand-□DEIS꿯□η9-□18-□15.pdf

[322]꿯□ηUS꿯□ηBureau꿯□ηof꿯□ηReclamation꿯□ηand꿯□ηSan꿯□ηLuis꿯□η*Delta꿯□ηMendota꿯□ηWater*꿯□ηAuth
Environmental꿯□ηImpact꿯□ηStatement/Environmental꿯□ηImpact꿯□ηReport,꿯□ηPublic꿯□ηDraft,꿯□ηreleased꿯□
accessible꿯□ηat꿯□η*http://www.usbr.gov/mp/nepa/nepa_projdetails.cfm?Project_ID=18361*.꿯□ηSee꿯□ηAquAlliance꿯□ηmedia꿯
release꿯□ηon꿯□ηits꿯□ηdecision꿯□ηto꿯□ηlitigate꿯□η*http://www.usbr.gov/mp/nepa/documents/accessible-water-*꿯□η
issues/lawsuit-□ciled-□against-□10-□year-□water-□transfer-꿯□ηprogram/

The뀕□ηEWC뀕□ηobjects뀕□ηstrenuously뀕□ηto뀕□ηthe뀕□ηTunnels뀕□ηProject뀕□ηreceiving뀕□ηa뀕□η
permit,뀕□ηas뀕□ηwe뀕□ηpointed뀕□ηout뀕□ηearlier뀕□ηin뀕□ηthese뀕□ηcomments,뀕□ηthe뀕□ηproject
water뀕□ηquality뀕□ηcerticication뀕□ηfrom뀕□ηthe뀕□ηState뀕□ηWater뀕□ηResources뀕□ηControl뀕□ηB
results뀕□ηin뀕□ηthe뀕□ηRDEIR/SDEIS뀕□ηthat뀕□ηthe뀕□ηTunnels뀕□ηProject뀕□ηwill뀕□ηdegrade뀕□ηD
pollutants,뀕□ηreduce뀕□ηfresh뀕□ηwater뀕□ηclows뀕□ηfurther뀕□ηthan뀕□ηthey뀕□ηalready뀕□ηhave뀕
central뀕□ηDelta,뀕□ηincrease뀕□ηresidence뀕□ηtimes,뀕□ηincrease뀕□ηthe뀕□ηoverall뀕□ηshare뀕□ηof
violate뀕□ηexisting뀕□ηwater뀕□ηquality뀕□ηobjectives뀕□ηand뀕□ηcriteria뀕□ηfor뀕□ηstill뀕□ηother뀕□
and뀕□ηendangered뀕□ηcish뀕□ηbenecicial뀕□ηuses,뀕□ηas뀕□ηwell뀕□ηas뀕□ηestuarine뀕□ηhabitat뀕□
a뀕□ηresult,뀕□ηa뀕□ηfurther뀕□ηviolation뀕□ηof뀕□η[illegible]
***We뀕□ηbelieve뀕□ηit뀕□ηwould뀕□ηbe뀕□ηarbitrary
capricious—an뀕□ηabuse뀕□ηof뀕□ηagency뀕□ηdiscretion—for뀕□ηthe뀕□ηState뀕□ηWater뀕□ηBoard
certi.ication뀕□ηfor뀕□ηthe뀕□ηTunnels뀕□ηProject.뀕□η***

But뀕□ηshould뀕□ηthe뀕□ηBoard뀕□ηmake뀕□ηthat뀕□ηdetermination뀕□ηanyway,뀕□ηwe뀕□ηfeel뀕□η
the뀕□η404뀕□ηpermit뀕□ηon뀕□ηother뀕□ηenvironmental뀕□ηgrounds.뀕□ηWe뀕□ηnote뀕□ηthat뀕□ηd
impacts뀕□ηto뀕□ηwaters뀕□ηof뀕□ηthe뀕□ηUnited뀕□ηStates뀕□ηin뀕□ηAppendix뀕□ηE뀕□ηof뀕□ηthe
595.3뀕□ηacres뀕□ηof뀕□η"impact뀕□ηacreages"뀕□ηfacing뀕□ηpermanent뀕□ηimpacts,뀕□ηanother뀕□η
impacted뀕□ηacreage뀕□ηto뀕□ηbe뀕□ηtreated뀕□ηas뀕□ηpermanent뀕□η(and뀕□ηtherefore뀕□ηcompen
policy)뀕□ηand뀕□ηa뀕□ηtotal뀕□ηof뀕□η1,931뀕□ηacres뀕□ηof뀕□ηtemporary뀕□ηimpact뀕□ηacreage.뀕
is뀕□ηreported뀕□ηby뀕□ηthe뀕□ηCorps뀕□ηof뀕□ηEngineers'뀕□ηdescription뀕□ηat뀕□ηits뀕□ηweb뀕□
proponents'뀕□η404뀕□ηpermit뀕□ηapplication뀕□ηas뀕□η284.03뀕□ηacres뀕□ηand뀕□η490.98뀕□ηacres
unclear뀕□ηhow뀕□ηthese뀕□ηtwo뀕□ηmethods뀕□ηof뀕□ηaccounting뀕□ηfor뀕□ηpermanent뀕□ηversus
wetland뀕□ηand뀕□ηnon-□wetland뀕□ηwater뀕□ηbodies뀕□ηgiven뀕□ηwhat뀕□ηis뀕□ηfound뀕□ηin뀕□η

***The뀕□ηRDEIR/SDEIS뀕□ηfails뀕□ηto뀕□ηdisclose뀕□ηthe뀕□ηlocation뀕□ηor뀕□ηresource뀕□ηdescrip
relation뀕□ηto뀕□ηproject뀕□ηfeatures.뀕□η***

The뀕□ηClean뀕□ηWater뀕□ηAct뀕□η404뀕□ηprogram뀕□ηrequires뀕□ηthat뀕□ηthe뀕□ηLeast뀕□ηEnvir
Alternative뀕□η(LEDPA)뀕□ηbe뀕□ηidenticied.뀕□ηThe뀕□ηRDEIR/SDEIS뀕□ηfails뀕□ηto뀕□ηdisclose뀕□η
alternatives뀕□η(or뀕□ηany뀕□ηof뀕□ηthose뀕□ηfrom뀕□ηthe뀕□ηDraft뀕□ηEIR/EIS뀕□ηlast뀕□ηyear)뀕

The뀕□ηRDEIR/SDEIS,뀕□ηas뀕□ηwe뀕□ηpointed뀕□ηout뀕□ηearlier뀕□ηin뀕□ηthese뀕□ηcomments,뀕□η
jeopardy/no뀕□ηjeopardy뀕□ηto뀕□ηlisted뀕□ηspecies,뀕□ηreasonable뀕□ηand뀕□ηprudent뀕□ηalternativ
statement뀕□ηand뀕□ηso뀕□ηis뀕□ηincomplete뀕□ηand뀕□ηtherefore뀕□ηinadequate뀕□ηfor뀕□ηevaluati
application뀕□ηinformation뀕□ηand뀕□ηwater뀕□ηquality뀕□ηcerticication뀕□ηneeds.뀕□η

EWC뀕□ηincorporates뀕□ηby뀕□ηreference뀕□ηin뀕□ηthese뀕□ηcomments뀕□ηand뀕□ηsupports뀕□ηthe
of뀕□ηthe뀕□ηNorth뀕□ηDelta뀕□η(LAND)'s뀕□ηrecent뀕□ηletter뀕□ηto뀕□ηthe뀕□ηCorps뀕□ηof뀕□ηEn

- The뀕□ηTunnels뀕□ηProject뀕□ηwould뀕□ηat뀕□ηa뀕□ηminimum뀕□ηresult뀕□ηin뀕□ηchanges뀕
  and뀕□ηassociated뀕□ηtides뀕□ηin뀕□ηrelation뀕□ηto뀕□ηlevee뀕□ηelevations;뀕□η
- Increase뀕□ηsalinity뀕□ηin뀕□ηthe뀕□ηnorth뀕□ηDelta;뀕□η
- Impair뀕□ηclood뀕□ηmanagement뀕□ηoperations뀕□ηof뀕□ηlocal뀕□ηreclamation뀕□ηdistricts;
- Interfere뀕□ηwith뀕□ηwater뀕□ηand뀕□ηland-□based뀕□ηrecreation뀕□ηalong뀕□ηDelta뀕□ηwate
  Tunnels뀕□ηProject's뀕□ηalignment뀕□ηand뀕□ηsurface뀕□ηfacility뀕□ηelement;
- Destroy뀕□ηcultural뀕□ηresources,뀕□ηand뀕□ηimperil뀕□ηstate뀕□ηand뀕□ηfederally뀕□ηlisted뀕
  species.[323]

[323]뀕□ηLetter뀕□ηof뀕□ηOsha뀕□ηR.뀕□ηMeserve,뀕□ηrepresenting뀕□ηLocal뀕□ηAgencies뀕□ηof뀕□ηthe뀕□ηNorth
Regulatory뀕□ηBranch,뀕□ηUS뀕□ηArmy뀕□ηCorps뀕□ηof뀕□η[illegible]
Resources' 뀕□η2015 뀕□ηCalifornia 뀕□ηWater 뀕□ηFix 뀕□ηProject 뀕□η[illegible]
[illegible] Application
[illegible] Water 뀕
[illegible] 2015 뀕
[illegible] p.뀕□η2.

Moreover,꿯□ηLAND꿯□ηnotes꿯□ηthat꿯□ηthe꿯□ηapplication꿯□ηwas꿯□ηincomplete꿯□ηand꿯□ηhad꿯
ofcially꿯□ηauthorized꿯□ηsignature.꿯□ηIn꿯□ηaddition,꿯□ηwetland꿯□ηdelineations꿯□ηincluded꿯□η
apparently꿯□ηmapped꿯□ηremotely꿯□ηand꿯□ηcigures꿯□ηincluded꿯□ηin꿯□ηthe꿯□ηapplication꿯□η
authorization꿯□ηfor꿯□ηentry꿯□ηby꿯□ηlandowners꿯□ηthat꿯□ηwould꿯□ηbe꿯□ηaffected꿯□ηby꿯□

According꿯□ηto꿯□ηthe꿯□ηDelta꿯□ηIndependent꿯□ηScience꿯□ηBoard's꿯□ηSeptember30,꿯□η2015,꿯
SDEIS꿯□ηfails꿯□ηto꿯□ηclearly꿯□ηstate꿯□ηthe꿯□ηsequence꿯□ηand꿯□ηprovide꿯□ηdetail꿯□ηof꿯
application:꿯□ηavoid꿯□ηwetland꿯□ηloss,꿯□ηbecause꿯□ηit꿯□ηis꿯□ηeasier꿯□ηto꿯□ηprotect꿯□ηex
successful꿯□ηnew꿯□ηones;꿯□ηif꿯□ηloss꿯□ηcannot꿯□ηbe꿯□ηavoided,꿯□ηthe꿯□ηminimize꿯□ηits
design;꿯□ηand꿯□ηcinally,꿯□ηif꿯□ηloss꿯□ηcannot꿯□ηbe꿯□ηminimized꿯□ηsufciciently,꿯□ηthen꿯□
of꿯□ηwetlands꿯□η(the꿯□ηNo꿯[324]□ηNet꿯□ηLoss꿯□ηPolicy)꿯□ηto꿯□ηhave꿯□ηprovide꿯□ηa꿯□ηfu
of꿯□ηthe꿯□ηstatus꿯□ηof꿯□ηwaters꿯□ηof꿯□ηthe꿯□ηUnited꿯□ηStates꿯□ηin꿯□ηrelation꿯□ηto꿯□
have꿯□ηbeen꿯□ηthe꿯□η"Surface꿯□ηWaters"꿯□ηsections꿯□ηof꿯□ηthe꿯□ηRDEIR/SDEIS.꿯□ηThey꿯
the꿯□ηPlan꿯□ηArea꿯□ηof꿯□ηthe꿯□ηproposed꿯□ηTunnels꿯□ηProject.꿯□ηAlternative꿯□ηdescriptio
intermediate꿯□ηforebay,꿯□ηvertical꿯□ηshafts,꿯□ηcontrol꿯□ηbuildings,꿯□ηpower꿯□ηfacilities,꿯□ηle
aspects꿯□ηof꿯□ηwetland꿯□ηdelineation꿯□ηare꿯□ηnot꿯□ηfound꿯□ηin꿯□ηthis꿯□ηsection.꿯□ηThe
waters꿯□ηsections꿯□ηcover꿯□ηonly꿯□ηstate꿯□ηand꿯□ηfederal꿯□ηwater꿯□ηproject꿯□ηreservoir꿯□
reverse꿯□ηclows꿯□ηin꿯□ηrelation꿯□ηto꿯□ηclood꿯□ηpotential꿯□ηand꿯□ηsouth꿯□ηDelta꿯□ηpum
discussion꿯□ηof꿯□ηimpacts꿯□ηof꿯□ηproject꿯□ηconstruction,꿯□ηand꿯□ηdredge꿯□ηand꿯□ηcill꿯□
wetlands꿯□ηof꿯□η***Appendix꿯□ηE꿯□ηof꿯□ηthe꿯□ηRDEIR/SDEIS꿯□ηfails꿯□ηto꿯□ηprovide꿯□ηthi***
and꿯□ηis꿯□ηtherefore꿯□ηinadequate.꿯□ηThe꿯□ηRDEIR/SDEIS꿯□ηshould꿯□ηbe꿯□ηrecirculated꿯
accurate꿯□ηinformation꿯□ηconcerning꿯□ηefforts꿯□ηby꿯□ηthe꿯□ηTunnels꿯□ηProject꿯□ηpropon
and,꿯□ηif꿯□ηnecessary,꿯□ηcompensate꿯□ηfor꿯□ηwetlands꿯□ηimpacts.

In꿯□ηaddition꿯□ηto꿯□ηthe꿯□η404꿯□ηpermit꿯□ηapplication,꿯□ηthe꿯□ηTunnels꿯□ηProject꿯□ηm
affect꿯□ηnavigable꿯□ηwaters꿯□ηof꿯□ηthe꿯□ηUnited꿯□ηStates,꿯□ηeither꿯□ηin,꿯□ηunder꿯□ηor꿯
nor꿯□ηChapter꿯□η19꿯□ηof꿯□ηAppendix꿯□ηA꿯□ηof꿯□ηthe꿯□ηRDEIR/SDEIS꿯□ηlack꿯□ηsufcicien
sizes꿯□ηand꿯□ηuses꿯□ηof꿯□ηthese꿯□ηwaters꿯□ηand꿯□ηwhere꿯□ηand꿯□ηhow꿯□ηTunnels꿯□η
operation꿯□ηwould꿯□ηaffect꿯□ηnavigable꿯□ηwaters꿯□η***The꿯□ηRDEIR/SDEIS꿯□ηis꿯□ηtherefore꿯□η***
inadequate.꿯□ηIt꿯□ηshould꿯□ηbe꿯□ηupdated꿯□ηwith꿯□ηinformation꿯□ηthat꿯□ηis꿯□ηunderst
that꿯□ηconforms꿯□ηto꿯□ηlaw,꿯□ηand꿯□ηanother꿯□ηdraft꿯□ηEIR/EIS꿯□ηshould꿯□ηbe꿯□ηre

Section꿯□η4.3.2꿯□ηof꿯□ηthe꿯□ηRDEIR/SDEIS꿯□ηaddresses꿯□η"surface꿯□ηwaters."꿯□ηIts꿯□ηsub
CVP-□SWP꿯□ηreservoir꿯□ηclood꿯□ηstorage꿯□ηcapacity,꿯□ηhighest꿯□ηmonthly꿯□ηriver꿯□ηclows꿯
Joaquin꿯□ηRivers꿯□ηrelated꿯□ηto꿯□ηclood꿯□ηpotential,꿯□ηand꿯□ηreverse꿯□ηclows꿯□ηin꿯□ηC
construction꿯□ηactivity꿯□ηimpacts꿯□ηon꿯□ηrunoff꿯□ηand꿯□ηclooding꿯□ηpotential꿯□ηin꿯□ηthis
baseline꿯□ηor꿯□ηexisting꿯□ηconditions꿯□ηinformation꿯□ηabout꿯□ηclood꿯□ηcontrol꿯□ηfacilities꿯
Delta꿯□ηand꿯□ηTunnels꿯□ηProject꿯□ηis꿯□ηprovided꿯□ηin꿯□ηthis꿯□ηsection,꿯□ηnor꿯□ηis꿯□
information꿯□ηprovided꿯□ηto꿯□ηChapter꿯□η6꿯□ηof꿯□ηthe꿯□ηDraft꿯□ηEIR/EIS꿯□ηlast꿯□ηyear
provided.꿯□ηThe꿯□ηRDEIR/SDEIS꿯□ηin꿯□ηSection꿯□η4.3.2꿯□ηdoes꿯□ηnot꿯□ηstate꿯□ηthat꿯□η
the꿯□η404꿯□ηpermit,꿯□ηnor꿯□ηdoes꿯□ηit꿯□ηattempt꿯□ηto꿯□ηprovide꿯□ηany꿯□ηanalysis꿯□
description꿯□ηthat꿯□ηwould꿯□ηsupport꿯□ηthe꿯□ηTunnels꿯□ηProject꿯□ηapplication꿯□ηto꿯□ηthe
attempt꿯□ηis꿯□ηmade꿯□ηto꿯□ηrelate꿯□ηthe꿯□ηchange꿯□ηin꿯□ηreverse꿯□ηclow꿯□ηconditions,
patterns꿯□ηfrom꿯□ηTunnels꿯□ηProject꿯□ηconstruction꿯□ηor꿯□ηimplementation꿯□ηof꿯□ηEnviron
and꿯□η6-□11,꿯□ηthe꿯□ηpotential꿯□ηto꿯□ηcreate꿯□ηor꿯□ηcontribute꿯□ηpolluted꿯□ηrunoff꿯□η
capacity,꿯□ηor꿯□ηexpose꿯□ηpeople꿯□ηor꿯□ηstructures꿯□ηto꿯□ηsignicicant꿯□ηrisks꿯□ηof꿯□ηlo
to꿯□ηconstruction꿯□ηof꿯□ηthe꿯□ηTunnels꿯□ηProject꿯□ηto꿯□ηspecicic꿯□ηaffected꿯□ηlevee꿯□η
or꿯□ηnavigable꿯□ηstreams꿯□ηor꿯□ηdredge/cill꿯□ηdisposal꿯□ηsites꿯□ηin꿯□ηthis꿯□ηSection.꿯□

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[324]꿯□ηDelta꿯□ηIndependent꿯□η***Science꿯□ηBoard,environmental꿯□ηdocuments꿯□ηfor꿯□ηSeptember꿯□ηWaterFix***
30,꿯□η2015,꿯□ηp.꿯□η6.꿯□η*https://deltacouncil.ca.gov/delta-isb-comments-partially-recirculated-draft-environmental-impact-reportsupplemental*꿯□η

unconnected뀡□ηto뀡□ηthe뀡□ηconcerns뀡□ηof뀡□ηthe뀡□ηCorps뀡□ηof뀡□ηEngineers뀡□ηin뀡□ηevalua
proposed뀡□ηTunnels뀡□ηProject뀡□ηon뀡□ηDelta뀡□ηlevees뀡□η(levees뀡□ηthat뀡□ηcomprise뀡□ηstate
operated뀡□ηlevees뀡□ηthat뀡□ηmake뀡□ηup뀡□ηclood뀡□ηprotection뀡□ηthroughout뀡□ηthe뀡□ηDelta)
dredge/cill뀡□ηdisposal뀡□ηoptions뀡□ηfor뀡□ηthe뀡□ηproject.뀡□η

Moreover,뀡□ηMitigation뀡□ηMeasure뀡□ηSW-□4,뀡□η"Implement뀡□ηMeasures뀡□ηto뀡□ηReduce뀡□ηRunoff
states뀡□ηthat뀡□η"proponents뀡□ηwill뀡□ηimplement뀡□ηmeasures뀡□ηto뀡□ηprevent뀡□ηan뀡□ηincre
from뀡□ηland-□side뀡□ηconstruction뀡□ηareas뀡□ηand뀡□ηto뀡□ηprevent뀡□ηan뀡□ηincrease뀡□ηin뀡□
the뀡□ηconstruction뀡□ηarea뀡□ηas뀡□ηcompared뀡□ηto뀡□ηExisting뀡□ηConditions."뀡□ηThere뀡□ηis뀡
the뀡□ηRDEIR/SDEIS뀡□ηas뀡□ηto뀡□ηwhere,뀡□ηwhen,뀡□ηand뀡□ηhow뀡□ηsuch뀡□ηmitigations뀡□η
should뀡□ηalready뀡□ηbe뀡□ηin-□hand뀡□ηfor뀡□ηthe뀡□ηRDEIR/SDEIS뀡□ηsince뀡□ηsuch뀡□ηmitigati
level뀡□ηreview뀡□ηby뀡□ηpermitting뀡□ηagencies뀡□η(for뀡□ηSection뀡□η401뀡□ηwater뀡□ηquality뀡
permitting,뀡□ηnavigable뀡□ηwaters뀡□ηand뀡□ηfederal뀡□ηfacilities뀡□ηimpacts뀡□ηreview).뀡□ηProjec
to뀡□η"drainage뀡□ηstudies"뀡□ηto뀡□ηbe뀡□ηprepared뀡□ηfor뀡□ηeach뀡□ηconstruction뀡□ηsite뀡□ηlat

There뀡□ηis뀡□ηno뀡□ηconnection뀡□ηof뀡□ηthis뀡□ηmitigation뀡□ηto뀡□ηthe뀡□ηactual뀡□ηconstructi
the뀡□ηDraft뀡□ηEIR/EIS뀡□ηor뀡[325]뀡□ηthe뀡□ηRDEIR/SDEIS.뀡□ηMoreover,뀡□ηit뀡□ηis뀡□ηclear뀡□ηthat뀡□ηwhile뀡□ηprojec
needed뀡□ηby뀡□ηthe뀡□ηCorps뀡□ηof뀡□ηEngineers뀡□ηto뀡□ηprocess뀡□ηthe뀡□η404뀡□ηpermit,뀡□
provide뀡□ηit뀡□ηin뀡□ηthis뀡□ηRDEIR/SDEIS.뀡□ηThe뀡□ηRDEIR/SDEIS뀡□ηis뀡□ηthus뀡□ηinadequate
document,뀡□ηand뀡□ηinadequate뀡□ηfor뀡□ηthe뀡□ηpurpose뀡□ηof뀡□ηfully뀡□ηdisclosing뀡□ηproject-
measures뀡□ηat뀡□ηspecicic뀡□ηlocations,뀡□ηat뀡□ηspecicic뀡□ηtimes,뀡□ηand뀡□ηunder뀡□ηspecicic
control뀡□ηcapacity.

The뀡□ηhandling뀡□ηof뀡□ηthese뀡□ηmatters뀡□ηstrongly뀡□ηsuggests뀡□ηthat뀡□ηthe뀡□ηTunnels뀡□
hand뀡□ηto뀡□ηhave뀡□ηthe뀡□ηRDEIR/SDEIS뀡□ηrepresent뀡□ηa뀡□ηproject-□level뀡□ηreview뀡□ηfor
"jump-□start"뀡□ηconstruction뀡□ηand뀡□ηstill뀡□ηtry뀡□ηto뀡□ηcomply뀡□ηwith뀡□ηDelta뀡□ηReform
and뀡□ηon뀡□ηthe뀡□ηother뀡□ηhand,뀡□ηthey뀡□ηhave뀡□ηonly뀡□ηprogram-□levels뀡□ηof뀡□ηdescr
implying뀡□ηthat,뀡□ηas뀡□ηmuch뀡□ηas뀡□ηpossible뀡□ηas,뀡□ηthey뀡□ηhope뀡□ηto뀡□ηcomply뀡□η
level뀡□ηof뀡□ηevaluation뀡□ηand뀡□ηreview뀡□ηrather뀡□ηthan뀡□ηa뀡□ηproject-□level뀡□ηdocument
of뀡□ηdetail,뀡□ηand뀡□ηhoping뀡□ηthat뀡□ηsuch뀡□ηlevel뀡□ηof뀡□ηanalysis뀡□ηand뀡□ηmitigation뀡
approach뀡□ηis뀡□ηas뀡□ηhasty뀡□ηas뀡□ηit뀡□ηseems뀡□ηto뀡□ηbe뀡□ηwasteful.

The뀡□ηambiguity뀡□ηbetween뀡□ηproject-□level뀡□ηand뀡□ηprogram-□level뀡□ηreview뀡□ηin뀡□ηthe
the뀡□ηanalysis뀡□ηof뀡□ηMitigation뀡□ηMeasure뀡□ηSW-□8뀡□ηaddresses뀡□η"wind뀡□ηfetch"뀡□ηmitig
potential뀡□ηdamage뀡□ηfrom뀡□ηwind-□driven뀡□ηwaves뀡□ηacross뀡□ηexpanded뀡□ηopen뀡□ηwater
locations.뀡□ηOnce뀡□ηagain,뀡□ηno뀡□ηproject-□level뀡□ηspecicics뀡□ηare뀡□ηprovided뀡□ηin뀡□ηthe
EIR/EIS뀡□ηstates뀡□ηthat뀡□η"these뀡□ηmeasures뀡□ηwill뀡□ηbe뀡□ηdesigned뀡□ηbased뀡□ηupon뀡□
completed뀡□ηprior뀡□ηto뀡□ηconstruction뀡□ηof뀡□ηhabitat뀡□ηrestoration뀡□ηareas뀡□ηwith뀡□ηinc
Delta."[326]뀡□ηThis뀡□ηmitigation뀡□ηapplied뀡□ηto뀡□ηlast뀡□ηyear's뀡□ηpreferred뀡□ηalternative,뀡□η
Bay뀡□ηDelta뀡□ηConservation뀡□ηPlan뀡□ηand뀡□ηits뀡□ηAlternative뀡□η4뀡□ηconciguration뀡□ηat뀡
continues뀡□ηto뀡□ηrely뀡□ηon뀡□ηthis뀡□ηmitigation뀡□ηmeasure뀡□ηas뀡□ηmitigation뀡□ηfor뀡□ηth
acknowledging뀡□ηthe뀡□ηnearly뀡□ηentire뀡□ηdeletion뀡□ηof뀡□ηBDCP뀡□ηrelated뀡□ηhabitat뀡□ηres
more뀡□ηor뀡□ηless뀡□ηneed뀡□ηfor뀡□η[illegible]뀡□η[illegible]뀡□η[illegible]

These꿯□ηsame꿯□ηcomments꿯□ηapply꿯□ηto꿯□ηSections꿯□η4.4.2,꿯□ηaddressing꿯□ηAlternative꿯□η
Alternative꿯□η5A꿯□ηsince꿯□ηthe꿯□ηsame꿯□ηproject-□level/program-□level꿯□ηimpact꿯□ηanalysis꿯
exist꿯□ηthere.[327]꿯□η

In꿯□ηaddition,꿯□ηthese꿯□ηsections꿯□ηrefer꿯□ηat꿯□ηImpact꿯□ηSW-□7꿯□ηin꿯□ηSections꿯□η4.3
Measure꿯□ηSW-□7꿯□ηin꿯□ηAlternative꿯□η1A꿯□ηthat꿯□ηis꿯□ηsupposed꿯□ηto꿯□ηbe꿯□ηdescrib
EIR/EIS.꿯□ηWe꿯□ηreferred꿯□ηback꿯□ηto꿯□ηImpact꿯□ηSW-□7꿯□ηand꿯□ηcind꿯□ηno꿯□ηsuch꿯
provided꿯□ηthere.[328]꿯□η***The꿯□ηRDEIR/SDEIS꿯□ηand꿯□ηthe꿯□ηDraft꿯□ηEIR/EIS꿯□ηare꿯□ηboth꿯□ηde.i***
phantom꿯□η.lood꿯□ηcontrol□related꿯□ηmitigation꿯□ηmeasure,꿯□ηand꿯□ηare꿯□ηtherefore꿯□
Project꿯□ηRDEIR/SDEIS꿯□ηmust꿯□ηbe꿯□ηrevised,꿯□ηcorrected,꿯□ηand꿯□ηrecirculated꿯□ηagai

The꿯□ηSection꿯□η14꿯□ηreview꿯□ηby꿯□ηthe꿯□ηCorps꿯□ηneed꿯□ηonly꿯□ηfocus꿯□ηon꿯□ηTur
and꿯□ηSan꿯□ηJoaquin꿯□ηRiver꿯□ηclood꿯□ηcontrol꿯□ηprojects꿯□ηand꿯□ηthe꿯□ηStockton꿯□ηD
RDEIR/SDEIS꿯□ηis꿯□ηthoroughly꿯□ηdecicient꿯□ηfor꿯□ηpurposes꿯□ηof꿯□ηunderstanding꿯□ηthe꿯
entire꿯□ηspectrum꿯□ηof꿯□ηclood꿯□ηcontrol꿯□ηfacilities꿯□ηin꿯□ηthe꿯□ηDelta.꿯□ηA꿯□ηlogical
analysis꿯□ηof꿯□ηthe꿯□ηstatus꿯□ηclood꿯□ηcontrol꿯□ηfacilities꿯□ηin꿯□ηrelation꿯□ηto꿯□ηTunne
would꿯□ηhave꿯□ηbeen꿯□ηthe꿯□η"Surface꿯□ηWaters"꿯□ηsections꿯□ηof꿯□ηthe꿯□ηRDEIR/SDEIS.
Appendix꿯□ηE꿯□ηof꿯□ηthe꿯□ηDelta꿯□ηStewardship꿯□ηCouncil's꿯□ηcurrent꿯□ηprocess꿯□ηof꿯□
Delta꿯□ηLevee꿯□ηInvestment꿯□ηStrategy.꿯□ηThere꿯□ηis꿯□ηno꿯□ηdata꿯□ηprovided꿯□ηin꿯□ηth
levee꿯□ηmileage꿯□ηoperation꿯□ηand꿯□ηmaintenance꿯□ηresponsibilities꿯□ηfor꿯□ηstate,꿯□ηfedera
levee꿯□ηresponsibilities.꿯□ηThere꿯□ηis꿯□ηno꿯□ηeffort꿯□ηin꿯□ηthe꿯□ηRDEIR/SDEIS꿯□ηor꿯□η
entities'꿯□ηlevees꿯□ηwould꿯□ηbe꿯□ηdirectly꿯□ηaffected꿯□ηby꿯□ηTunnels꿯□ηProject꿯□ηdesign,
activities.[329]꿯□η***These꿯□ηomissions꿯□ηrender꿯□ηthe꿯□ηRDEIR/SDEIS꿯□ηincomplete꿯□ηand꿯□ηtherefor***
should꿯□ηbe꿯□ηupdated꿯□ηwith꿯□ηinformation꿯□ηthat꿯□ηis꿯□ηunderstandable꿯□ηby꿯□ηthe
law,꿯□ηand꿯□ηanother꿯□ηdraft꿯□ηEIR/EIS꿯□ηshould꿯□ηbe꿯□ηrecirculated.

Appendix꿯□ηE꿯□ηacknowledges꿯□ηthat꿯□ηadditional꿯□ηhistoric꿯□ηpreservation꿯□ηand꿯□ηclood
performed꿯□ηunder꿯□ηNational꿯□ηHistoric꿯□ηPreservation꿯□ηAct꿯□ηSection꿯□η106꿯□η(includin
agreement꿯□ηexecution꿯□ηand꿯□ηNative꿯□ηAmerican꿯□ηtribal꿯□ηconsultation)꿯□ηand꿯□ηExecut
concerning꿯□ηcloodplain꿯□ηmodicication꿯□ηand꿯□ηdevelopment.꿯□ηNone꿯□ηof꿯□ηthese꿯□ηsecti
substantive꿯□ηanalysis꿯□ηand꿯□ηevidence꿯□ηof꿯□ηcompliance꿯□ηwith꿯□ηthese꿯□ηimportant꿯□
review꿯□ηrequirements.꿯□ηWhat꿯□ηis꿯□ηprovided꿯□ηis꿯□ηlittle꿯□ηmore꿯□ηthan꿯□ηa꿯□ηglo
these꿯□ηthings."꿯□ηThese꿯□ηthings꿯□ηmust꿯□ηbe꿯□ηdone꿯□ηin꿯□ηpublic꿯□ηand꿯□ηthey꿯□
established꿯□ηpublic꿯□ηprocesses꿯□ηthat꿯□ηmust꿯□ηbe꿯□ηcompleted꿯□ηin꿯□ηdraft꿯□ηenviron
to꿯□ηthe꿯□ηpublic꿯□ηprior꿯□ηto꿯□ηissuance꿯□ηof꿯□ηthe꿯□ηFinal꿯□ηEIR/EIS꿯□ηon꿯□ηthe
that꿯□ηno꿯□ηTunnels꿯□ηProject꿯□ηfacilities꿯□ηintersect꿯□ηat꿯□ηthe꿯□ηsurface꿯□ηwith꿯□ηan
facilities꿯□ηin꿯□ηthe꿯□ηDelta,꿯□ηwithout[330]꿯□η***Absence꿯□ηof꿯□ηevidence꿯□ηthat꿯□ηthese꿯□ηprocesses***
been꿯□ηcompleted꿯□ηand꿯□ηtheir꿯□ηanalysis꿯□ηand꿯□η.indings꿯□ηput꿯□ηto꿯□ηuse꿯□ηme
inadequate.꿯□ηIt꿯□ηshould꿯□ηbe꿯□ηupdated꿯□ηwith꿯□ηevidence꿯□ηthat꿯□ηthese꿯□ηtwo꿯□
and꿯□ηanother꿯□ηdraft꿯□ηEIR/EIS꿯□ηshould꿯□ηbe꿯□ηrecirculated.

We꿯□ηreiterate꿯□ηthat꿯□ηthe꿯□ηTunnels꿯□ηProject꿯□ηis꿯□ηnot꿯□ηthe꿯□ηLeast꿯□ηEnviron
Alternative꿯□η(LEDPA),꿯□η[331]꿯□η꿯□ηthe꿯□ηTunnels꿯□ηProject꿯□ηalso꿯□ηfails꿯□ηto꿯□ηmeet꿯□ηanothe
requirement,꿯□η"[t]he꿯□ηrequirement꿯□η[under꿯□ηCWA꿯□η§꿯□η404(b)(1)...that꿯□ηthe꿯□ηproje
demonstrate꿯□ηthat꿯□ηthe꿯□ηproject꿯□ηis꿯□ηthe꿯□η[Least꿯□ηEnvironmentally꿯□ηDamaging꿯□

[327]꿯□ηRDEIR/SDEIS,꿯□ηSection꿯□η4.4.2,꿯□ηpp.꿯□η4.4.2-□6꿯□ηto꿯□η4.4.2-□10꿯□ηfor꿯□ηAlternative꿯□η2D
4.5.2-□10꿯□ηfor꿯□ηAlternative꿯□η5A.

[328]꿯□ηDraft꿯□ηEIR/EIS,꿯□ηChapter꿯□η6,꿯□ηp.꿯□η6-□62.

LEDPA."[329] "A proposed action is not the LEDPA simply because chooses that proposed action as its preferred alternative." Project appears *most* environmentally damaging alternative possible. It most decinitely is n and therefore, it is not the LEDPA.

The Corps in its March 2013 paper states that once DWR su "practicable alternatives, the Corps "intends to make a preliminary d Least Environmentally Damaging Practicable Alternative (LEDPA) under the meets its overall project purpose. Project phases and related timing authorizations will be acknowledged [330] We respectfully request detailed clar the LEDPA process in the next recirculated Draft EIR/EIS. What alternatives aiming to arrive at a LEDPA? How do they relate, analysis and the need for the range of alternatives to be rea the public for participating in the review, analysis and evaluation

Finally, we recall that the Army Corps of Engineers stated in was still expected to be a habitat conservation plan, that the Tu the BDCP EIR/EIS to be a project level document for the pu and federal cish and wildlife agencies of take authorizations….It will document for the actions set out in the BDCP and provide construction of a new SWP north of Delta intake facilities and intakes and existing SWP facilities, known [331] [332] The Corps [333] a proposed schedule that one year later had already slipped sub issuance of Corps issuing Section 408 (RHA Section 14) permissions CM1 phases in "late 2015 through 2018." It is now late 201 have project-level information needed by the Corps of Engineers in

We understand that the Corps, as a cooperating agency, "will provide proponents so that the EIR/EIS can be used by the Corps "t future permit decisions." We observe there is much work left to Tunnels Project is so fundamentally unlawful, clawed, and poorly org monumental task to take this sow's ear and render it a silk

Supplemental Modeling for SWRCB (Increased Delta Outflows)

The *2010 Delta Flow Criteria* was rejected as an alternative by BDCP grounds that modeling showed that the State Water Board's clow widespread dead pools in and depleted deliveries from upstream res

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[329] EPA, Preliminary Administrative Draft Comments for the Bay Delta Conser 26, 2012.

[330] EPA, BDCP DEIS Corrections and Additional Editorial Recommendations, p.

[331] *Ibid.*, p. 3.

[332] US Army Corps of Engineers, "BDCP: Permit Application Approach for 2013, p. 1.

[333] State Water Resources Development Board, *Flow Criteria for the Sacramento-San Ecosystem*, prepared pursuant to the Sacramento-San Joaquin Delta Reform Act Accessible online at: http://www.swrcb.ca.gov/waterrights/water_issues/programs/bay_delta/deltaclow/docs/cinal_rpt080310.pdf

BDCP뀀□ηEIR/EIS뀀□ηalternative뀀□ηscreening뀀□ηcriteria.뀀□ηThe뀀□ηBoard뀀□ηincluded뀀□ηDWR's뀀
the뀀□ηDraft뀀□ηDelta뀀□ηFlow뀀□ηCriteria뀀□ηreport뀀□ηin뀀□ηJuly뀀□η2010.뀀□ηOnce뀀□ηout뀀□η
(Appendix뀀□ηB뀀□η"Water뀀□ηSupply뀀□ηModeling"뀀□ηof뀀□ηthe뀀□ηdraft뀀□ηreport)뀀□ηwere뀀□η
quarters,뀀□ηbecause뀀□ηit뀀□ηexceeded뀀□ηthe뀀□ηcharge뀀□ηof뀀□ηWater뀀□ηCode뀀□ηSection뀀□η
expert뀀□ηand뀀□ηpublic뀀□ηreview뀀□ηin뀀□ηthe뀀□ηinformational뀀□ηproceedings,뀀□ηand뀀□ηhad뀀
its뀀□ηrelease.뀀□ηIn뀀□ηputting뀀□ηthe뀀□ηwater뀀□ηsupply뀀□ηimpact뀀□ηappendix뀀□ηforward,뀀□
agenda뀀□ηof뀀□ηthe뀀□ηDelta뀀□ηFlow뀀□ηCriteria뀀□ηprocess뀀□ηafter뀀□ηthe뀀□ηproceeding뀀□ηy
primary뀀□ηreason뀀□ηreservoirs뀀□ηwould뀀□ηgo뀀□ηto뀀□ηdead뀀□ηpool뀀□ηin뀀□ηtheir뀀□ηanalys
simultaneously뀀□ηmaximized뀀□ηDelta뀀□ηinclows,뀀□ηoutclows,뀀□ηand뀀□ηsouth뀀□ηof뀀□ηDelta뀀□
prudent뀀□ηcarry-□over뀀□ηfor뀀□ηdry뀀□ηyear뀀□ηor뀀□ηdrought뀀□ηconditions.뀀□η뀀□ηCVP뀀□ηa
point뀀□ηto뀀□ηconsulting뀀□ηengineer뀀□ηand뀀□ηmodeler뀀□ηWalter뀀□ηBourez뀀□ηwhen뀀□ηinterv
2013뀀□ηthat뀀□ηthey뀀□ηwould뀀□ηnot뀀□ηoperate뀀□ηthe뀀□ηreservoirs뀀□ηthat뀀□ηway;뀀□ηthey
reservoir뀀□ηreleases뀀□ηfor뀀□ηmeeting뀀□ηDelta뀀□ηwater뀀□ηquality뀀□ηobjectives,뀀□ηmanage뀀□
meeting뀀□ηsenior뀀□ηwater뀀□ηrights뀀□ηand뀀□ηmaking뀀□ηreleases뀀□ηavailable뀀□ηfor뀀□η deliver
approved뀀□ηreport뀀□ηin뀀□ηAugust뀀□η2010뀀□ηdoes뀀□ηnot뀀□ηinclude뀀□ηDWR's뀀□ηsuspect뀀□

The뀀□ηpoint뀀□ηof뀀□ηthe뀀□ηDelta뀀□ηclow뀀□ηcriteria뀀□ηproceeding뀀□ηwas뀀□ηto뀀□ηanswer뀀
need?"뀀[334]뀀□***ηThis뀀□ηis뀀□ηneeded뀀□ηto뀀□ηdetermine뀀□ηthe뀀□ηpublic뀀□ηtrust뀀□ηinstream뀀□η.low***
public뀀□ηtrust뀀□ηdoctrine뀀□ηand뀀□ηWater뀀□ηCode뀀□ηSection뀀□η85086(c)(2),뀀□ηonly뀀□ηwh
analysis뀀□ηshould뀀□ηbe뀀□ηallocated뀀□ηto뀀□ηSWP뀀□ηand뀀□ηCVP뀀□ηcontractors.뀀□ηDeletion
alternative뀀□ηremoved뀀□ηa뀀□ηscienti.ically뀀□ηinformed뀀□ηand뀀□ηreasonable뀀□ηoption뀀□ηfr
another뀀□ηdisservice뀀□ηto뀀□ηthe뀀□ηpublic뀀[335]□ηof뀀□ηthis뀀□ηRDEIR/SDEIS.

Reading뀀□ηa뀀□ηbit뀀□ηbetween뀀□ηthe뀀□ηlines,뀀□ηit뀀□ηappears뀀□ηto뀀□ηus뀀□ηthat뀀□ηinclus
was뀀□ηdone뀀□ηunder뀀□ηprotest.뀀□ηThe뀀□ηbarely-□contained뀀□ηhostility뀀□ηto뀀□ηthis뀀□ηset뀀
bleed뀀□ηthrough.뀀□ηGrudgingly,뀀□ηthe뀀□ηTunnels뀀□ηProject뀀□ηproponents뀀□ηacknowledge뀀□ηt
agency,뀀□ηthe뀀□ηState뀀□ηWater뀀□ηBoard's뀀□η"consideration뀀□ηof뀀□ηthe뀀□ηproposed뀀□ηproje
the뀀□ηCEQA뀀□ηanalysis뀀□ηand뀀□ηthe뀀□ηState뀀□ηWater뀀□ηBoard뀀□ηwater뀀□ηright뀀□ηappro
consideration뀀□ηof뀀□ηissues뀀□ηbeyond뀀□ηthat뀀□ηrequired뀀□ηin뀀□ηCEQA."뀀□η

(This뀀□ηpassage뀀□ηfrom뀀□ηSection뀀□ηC.1뀀□ηof뀀□ηthe뀀□ηRDEIR/SDEIS뀀□ηmisconstrues뀀□ηCE
is뀀□ηto뀀□ηensure뀀□ηthat뀀□ηinformation뀀□ηis뀀□ηfully뀀□ηdisclosed뀀□ηabout뀀□ηthe뀀□ηnature
merits뀀□ηin뀀□ηcomparison뀀□ηto뀀□ηa뀀□ηreasonable뀀□ηrange뀀□ηof뀀□ηalternatives,뀀□ηdisclosur
conditions뀀□ηinto뀀□ηwhich뀀□ηthe뀀□ηproject뀀□ηwould뀀□ηbe뀀□ηintroduced,뀀□ηthe뀀□ηimpacts뀀
of뀀□ηthe뀀□ηproject뀀□ηon뀀□ηthe뀀□ηphysical뀀□ηenvironment,뀀□ηand뀀□ηwhether뀀□ηthose뀀□ηi

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[334]뀀□ηOf뀀□ηthe뀀□ηassumptions뀀□ηdisclosed뀀□ηfor뀀□ηthe뀀□ηimpact뀀□ηanalysis뀀□ηin뀀□ηthe뀀□η2010뀀
assumes뀀□η"full뀀□ηentitlements뀀□ηfor뀀□ηCVP뀀□ηand뀀□ηSWP뀀□ηcontractors."뀀□ηThis뀀□ηwas뀀□ηand뀀□
given뀀□ηthe뀀□ηconstraints뀀□ηplaced뀀□ηon뀀□ηCVP뀀□ηand뀀□ηSWP뀀□ηDelta뀀□ηoperations뀀□ηto뀀□ηkeep
under뀀□ηthe뀀□ηlaw.뀀□η"Full뀀□ηentitlements"뀀□ηis뀀□ηalso뀀□ηan뀀□ηambiguous뀀□ηterm;뀀□ηit뀀□ηcould뀀
entitlements뀀□ηregardless뀀□ηof뀀□ηwater뀀□ηyear뀀□ηtype,뀀□ηor뀀□ηaccording뀀□ηto뀀□ηwater뀀□ηyear뀀□η
exports,"뀀□ηas뀀□ηwell.뀀□ηThese뀀□ηambiguities뀀□ηare뀀□ηneither뀀□ηidenticied뀀□ηnor뀀□ηclaricied뀀□ηin뀀
2010.뀀□ηThe뀀□ηCalifornia뀀□ηWater뀀□ηImpact뀀□ηNetwork뀀□ηand뀀□ηthe뀀□ηCalifornia뀀□ηSportcishing뀀□η
the뀀□ηState뀀□ηWater뀀□ηBoard뀀□ηthat뀀□ηit뀀□ηwas뀀□ηapplication뀀□ηof뀀□η"full뀀□ηentitlements"뀀□ηto뀀
operations뀀□ηin뀀□ηthe뀀□ηDelta뀀□ηthat뀀□ηled뀀□ηto뀀□ηthe뀀□ηLegislature's뀀□ηpassage뀀□ηof뀀□ηWater뀀
of뀀□ηthe뀀□ηDelta뀀□ηFlow뀀□ηCriteria뀀□ηReport뀀□ηin뀀□ηthe뀀□ηcirst뀀□ηplace.뀀□ηLetter뀀□ηof뀀□ηCarol
Hoppin,뀀□ηChair,뀀□ηState뀀□ηWater뀀□ηResources뀀□ηControl뀀□ηBoard,뀀□η"Comment뀀□ηLetter뀀□η-□뀀□ηD
28,뀀□η2010,뀀□η2뀀□ηpages.뀀□ηAccessible뀀 http://www.swrcb.ca.gov/waterrights/water_issues/programs/bay_delta/deltaclow/docs/comments072910/carolee_krieger.pdf뀀□η

[335]뀀□ηAppendix뀀□η3A,뀀□ηp.뀀□η3A-□67,뀀□ηlines뀀□η40-□48뀀□ηto뀀□ηp.뀀□η3A-□68,뀀□ηlines뀀□η1-□14;뀀
online뀀□η4뀀□ηMay뀀□η2014뀀□ηat뀀□η http://www.swrcb.ca.gov/waterrights/water_issues/programs/bay_delta/deltaclow/뀀□η

The ηscope ηof ηthe ηCEQA ηalternatives ηanalysis ηin ηthe ηRDEIR/SDEIS η
narrowly ηexhibiting ηonly η"slight ηdifferences" ηin ηdesign ηand ηoperational η
the ηviewpoint ηof ηstatewide ηwater ηpolicies ηrooted ηin ηthe ηvoter-η appro
California's ηConstitution, ηthe ηPublic ηTrust ηDoctrine, ηand ηthe η2009 ηDel

Appendix ηC ηcontinues:

> This ηevaluation ηwas ηconducted ηprimarily ηto η***without η consideration η of η clow, η water η supply η benefits η that η included η this η operational η scenari likely η not η meet η the η project η objectives η or η purpose, η and η need η statemen*** evaluation ηwas ηto ηprovide ηa ηbroader ηrange ηof ηDelta ηoutclows ηand η consider ηduring ηthe ηState ηWater ηBoard's ηanticipated ηwater ηrights ηhearing η [the ηstate ηand ηfederal ηprojects'] ηauthorized ηpoints ηof ηdiversion ηnecessary η project.[336]

The ηhostility ηis ηevident ηin ηthe ηfailure ηto ηinclude ηwater ηsupply η provision ηof ηthese ηmodeling ηresults ηbuttresses ηour ηargument ηin ηthese Project ηproponents ηconstrue ηthe ηpurpose ηand ηneed ηfor ηtheir ηproject η agency, ηthe ηCalifornia ηDepartment ηof ηWater ηResources ηis ηfailing ηmigh policies ηset ηforth ηby ηthe ηLegislature ηin ηthe ηDelta ηReform ηAct, η

One ηcan ηsense ηthe ηclenched ηteeth ηof ηthe ηTunnels ηProject ηpropon pools ηin ηreservoirs ηfor ηlater ηtemperature-η controlled ηreleases ηbeneciting η and ηDelta ηinclows ηand ηoutclows ηfrom ηexports ηin ηthis ηsentence ηfr

> In ηorder ηto ηprovide ηDelta ηoutclow ηsimilar ηto ηwhat ηwas ηincluded η instream ηclows ηand η***additional η storage η Delta η outclows*** η BCP ηDraft ηEIR/EIS ηor ηAlternative η ***were η achieved η by η RDEIR/SDEIS η using η SWP η and exports.***[337]

It ηis ηironic ηthat ηit ηappears ηthe ηRDEIR/SDEIS ηdiscloses ηthe ηmodel this ηas ηan ηalternative η(even ηif ηit ηis ηone ηthat ηDWR ηand η they ηincorporated ηit ηas ηa ηmore ηfully-η cledged ηalternative, ηit ηwould η comments ηon ηthe ηRDEIR/SDEIS ηand ηthe ηDraft ηEIR/EIS; ηit ηwould η and ηgenuine ηalternative ηto ηthe ηparade ηof ηonly η"slightly ηdifferent" η address ηin ηa ηmeaningful ηway ηthe ηrestoration ηand ηclow ηneeds ηof up ηand ηdown ηthe ηCentral ηValley ηby ηstate ηand ηfederal ηwater η

The ηassumptions ηbuilt ηinto ηthe ηmodeling ηresults ηprovided ηin ηAppendi alternative ηthat ηaddresses ηmany, ηthough ηnot ηall ηof ηour ηconcerns η as ηwell ηas ηendangered ηspecies ηconcerns.

> *In η general, η the η intent η behind η the η additional η modeling η* η η η

California뀀□ηDepartment뀀□ηof뀀□ηFish뀀□η&뀀□ηWildlife뀀□ηCalifornia뀀□ηEndangered뀀□ηSpecies뀀□ηAct뀀
Water뀀□ηBoard's뀀□ηcurrent뀀□ηWQCP.뀀□ηIncreased뀀□ηfall뀀□ηDelta뀀□ηoutclow뀀□ηwill뀀□ηshift뀀□ηthe뀀□ηlo
downstream뀀□ηin뀀□ηthe뀀□ηDelta,뀀□ηlikely뀀□ηresulting,뀀□ηbased뀀□ηon뀀□ηcurrent뀀□ηunderstanding뀀
favorable뀀□ηconditions뀀□ηfor뀀□ηDelta뀀□ηsmelt뀀□ηhabitat뀀□ηin뀀□ηthe뀀□ηwestern뀀□ηDelta뀀□ηand뀀
winter/spring뀀□ηDelta뀀□ηoutclow뀀□ηwill뀀□ηshift뀀□ηthe뀀□ηlow뀀□ηsalinity뀀□ηzone뀀□ηfurther뀀□ηdow
likely뀀□ηresulting뀀□ηin뀀□ηmore뀀□ηfavorable뀀□ηconditions뀀□ηfor뀀□ηlongcin뀀□ηsmelt뀀□ηand뀀□ηDelta
outclow뀀□ηduring뀀□ηthis뀀□ηperiod뀀□ηcould뀀□ηalso뀀□ηshift뀀□ηpelagic뀀□ηcish뀀□ηfurther뀀□ηfrom뀀□
migrating뀀□ηsalmonids.뀀□ηAdditionally,뀀□ηthe뀀□ηincreased뀀□ηwinter/spring뀀□ηDelta뀀□ηoutclow뀀□ηwo
through뀀□ηthe뀀□ηDelta,뀀□ηpast뀀□ηthe뀀□ηSuisun뀀□ηregion,뀀□ηand뀀□ηout뀀□ηinto뀀□ηthe뀀□ηSan뀀□
estuarine뀀□ηspecies뀀□ηthat뀀□ηhave뀀□ηevolved뀀□ηunder뀀□ηconditions뀀□ηof뀀□ηseasonally뀀□ηcluctuati
Delta뀀□ηoutclow뀀□ηduring뀀□ηthe뀀□ηsummer뀀□ηover뀀□ηthe뀀□ηamount뀀□ηspecicied뀀□ηin뀀□ηAlterna
habitat뀀□ηbenecits뀀□ηand뀀□ηa뀀□ηquantity뀀□ηof뀀□ηclow뀀□ηthat뀀□ηcan뀀□ηbe뀀□ηadaptively뀀□ηmar
conditions뀀□ηduring뀀□ηthe뀀□ηprevious뀀□ηwinter뀀□ηand뀀□ηspring뀀□ηare뀀□ηlikely뀀□ηto뀀□ηproduce
between뀀□ηthe뀀□ηsurvival뀀□ηand뀀□ηabundance뀀□ηof뀀□ηvarious뀀□ηspecies뀀□ηand뀀□ηhabitat뀀□ηcon
under뀀□ηactive뀀□ηinvestigation뀀□ηby뀀□ηthe뀀□ηCollaborative뀀□ηAdaptive뀀□ηManagement뀀□ηTeam,뀀□
scientists뀀□ηinvestigating뀀□ηoutclow뀀□ηand뀀□ηother뀀□ηissues뀀□ηpertinent뀀□ηto뀀□ηCVP뀀□ηand뀀□ηS
will뀀□ηalso뀀□ηbe뀀□ηcentral뀀□ηto뀀□ηthe뀀□ηState뀀□ηWater뀀□ηBoard's뀀□ηcurrent뀀□ηwater뀀□ηquali
making뀀□ηprocesses.[338]

Missing뀀□ηfrom뀀□ηthis뀀□ηdescription뀀□ηof뀀□ηa뀀□ηpositive뀀□ηfeedback뀀□ηloop뀀□ηor뀀□η"vir
on뀀□ηhow뀀□ηincreased뀀□ηDelta뀀□ηthrough-□clow뀀□ηwould뀀□ηbenecit뀀□ηmigratory뀀□ηcish뀀□
Central뀀□ηValley뀀□ηSteelhead,뀀□ηgreen뀀□ηand뀀□ηwhite뀀□ηsturgeon,뀀□ηand뀀□ηlamprey뀀□ηspe
Sacramento,뀀□ηSan뀀□ηJoaquin뀀□ηRivers,뀀□ηthe뀀□ηDelta.뀀□ηWe뀀□ηwould뀀□ηlike뀀□ηto뀀□ηsee
this뀀□ηalternative뀀□ηto뀀□ηsee뀀□ηwhat뀀□ηeffects뀀□ηthese뀀□ηalternatives뀀□ηwould뀀□ηhave뀀□
rates뀀□ηto뀀□ηChipps뀀□ηIsland.뀀□ηAs뀀□ηwe뀀□ηpointed뀀□ηout뀀□ηelsewhere뀀□ηin뀀□ηthese뀀□
could뀀□ηestimate뀀□ηwhat뀀□ηeffects뀀□ηthese뀀□ηincreased뀀□ηclows뀀□ηcould뀀□ηpotentially뀀□ηh
smelt,뀀□ηthe뀀□ηvarious뀀□ηruns뀀□ηof뀀□ηChinook뀀□ηsalmon,뀀□ηand뀀□ηwater뀀□ηquality뀀□ηco
one.

Moreover,뀀□ηsince뀀□ηAppendix뀀□ηC's뀀□ηintent뀀□ηwas뀀□ηto뀀□ηevaluate뀀□ηwater뀀□ηsupply뀀□
initially뀀□ηclaims—then뀀□ηAppendix뀀□ηC뀀□ηis뀀□ηitself뀀□ηincomplete.뀀□ηAppendix뀀□ηC's뀀□ηm
illustrating뀀□ηimpacts뀀□ηto뀀□ηmonthly뀀□ηclows뀀□ηof뀀□ηthe뀀□ηState뀀□ηWater뀀□ηBoard's뀀□
outclow뀀□ηand뀀□ηtotal뀀□ηDelta뀀□ηexports.뀀□ηUnsurprisingly,뀀□ηDelta뀀□ηoutclows뀀□ηincrease,뀀
decrease.뀀□ηBut뀀□ηthe뀀□ηsequence뀀□ηof뀀□ηTables뀀□ηshowing뀀□ηmodeling뀀□ηresults뀀□ηby뀀□
along뀀□ηthe뀀□ηvarious뀀□ηnodes뀀□ηof뀀□ηCalSIM뀀□ηII뀀□ηomits뀀□ηdisclosure뀀□ηof뀀□ηnumeric

So뀀□ηAppendix뀀□ηC뀀□ηis뀀□ηa뀀□ηmissed뀀□ηopportunity.뀀□ηFailure뀀□ηto뀀□ηinclude뀀□ηit뀀□
failure뀀□ηof뀀□ηboth뀀□ηpurpose뀀□ηand뀀□ηCEQA뀀□ηand뀀□ηNEPA뀀□ηpro***The뀀□ηassociated뀀□η***
RDEIR/SDEIS뀀□ηshould뀀□ηbe뀀□ηrevised뀀□ηto뀀□ηinclude뀀□ηnew뀀□ηreasonable뀀□ηalternatives
out.low뀀□ηand뀀□ηprovide뀀□ηcold뀀□ηwater뀀□ηpool뀀□ηprotection뀀□ηfor뀀□ηupstream뀀□ηspaw
salmonids,뀀□ηand뀀□ηshould뀀□ηbe뀀□ηrecirculated.[339]

Delta뀀□ηout.lows뀀□ηare뀀□ηBay뀀□ηim.laws.
□ηFrancisco뀀□ηestuary뀀□ηreceives뀀□η90뀀□ηpercent
inclow뀀□ηfrom뀀□ηthe뀀□ηSacramento-□San뀀□ηJoaquin뀀□ηRiver뀀□ηwatershed,뀀□ηwhich뀀□ηpasses
reaches뀀□ηthe뀀□ηlower뀀□ηestuary뀀□ηas뀀□ηSan뀀□ηFrancisco뀀□ηBay.뀀□ηThe뀀□ηSan뀀□ηFrancisco

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[338]뀀□ηRDEIR/SDEIS,뀀□ηAppendix뀀□ηC,뀀□ηSection뀀□ηC.1,뀀□ηp.뀀□ηC-□2,뀀□ηlines뀀□η1-□25.뀀□ηEmphasis뀀

[339]뀀□ηThis뀀□ηis뀀□ηurgent.뀀□ηThe뀀□ηNational뀀□ηMarine뀀□ηFisheries뀀□ηService뀀□ηannounced뀀□ηthis뀀□
salmon뀀□ηspawning뀀□ηactivity뀀□ηsuffered뀀□η95뀀□ηpercent뀀□ηmortality뀀□ηof뀀□ηfry뀀□ηeggs뀀□ηthis뀀□
"Heavy뀀□ηdrought뀀□ηtoll뀀□ηon뀀□ηsalmon:뀀□η95%뀀□ηdeath뀀□ηrate뀀□η
October뀀□η29,뀀□η2015,뀀□ηp.뀀□η1.

> Freshwater 꿯 ηinclows 꿯 ηto 꿯 ηthe 꿯 ηSan 꿯 ηFrancisco 꿯 ηEstuary 꿯 ηhave 꿯 ηbeen 꿯 ηhighly 꿯 ηalter
> variability 꿯 ηof 꿯 ηinclows 꿯 ηhave 꿯 ηbeen 꿯 ηreduced, 꿯 ηwith 꿯 ηthe 꿯 ηresult 꿯 ηof 꿯 ηcreating 꿯
> "drought" 꿯 ηconditions 꿯 ηin 꿯 ηthe 꿯 ηEstuary. 꿯 ηLarge 꿯 ηscale 꿯 ηalteration 꿯 ηof 꿯 ηfreshwater 꿯
> the 꿯 η1950s 꿯 ηand 꿯 η1960s 꿯 ηwhen 꿯 ηmost 꿯 η[of] 꿯 ηthe 꿯 ηlarge 꿯 ηdams 꿯 ηand 꿯 ηwater 꿯
> clow 꿯 ηconditions 꿯 ηhave 꿯 ηdeteriorated 꿯 ηfurther[340] 꿯 ηin 꿯 ηthe 꿯 ηlast 꿯 ηdecade.

Improving 꿯 ηthe 꿯 ηalternatives 꿯 ηanalysis 꿯 ηof 꿯 ηthe 꿯 ηRDEIR/SDEIS 꿯 ηmust 꿯 ηinclude 꿯 η
purpose 꿯 ηand 꿯 ηneed 꿯 ηstatement 꿯 ηof 꿯 ηthe 꿯 ηTunnels 꿯 ηProject. 꿯 ηThis 꿯 ηmeans 꿯 η
"improving 꿯 ηconveyance" 꿯 ηin 꿯 ηa 꿯 ηbroader, 꿯 ηbalanced 꿯 ηcontext 꿯 ηof 꿯 ηthe 꿯 ηcoequa
narrow 꿯 ηengineering 꿯 ηalternatives 꿯 ηthat 꿯 ηentail 꿯 ηslight 꿯 ηoperational 꿯 ηdifferences 꿯 η
reverse 꿯 ηclows 꿯 ηin 꿯 ηthe 꿯 ηlower 꿯 ηSacramento 꿯 ηRiver, 꿯 ηdegrade 꿯 ηwater 꿯 ηquality
closer 꿯 ηto 꿯 ηextinction.

Failure to Mitigate Adverse Impacts of North Delta Intakes in Reliance on Adaptive Management and Fish Screens

Key 꿯 ηto 꿯 ηthe 꿯 ηtalking 꿯 ηpoints 꿯 ηand 꿯 ηmitigation 꿯 ηapproach 꿯 ηof 꿯 ηthe 꿯 ηTunnels
river 꿯 ηimpacts 꿯 ηof 꿯 ηthe 꿯 ηthree 꿯 ηnorth 꿯 ηDelta 꿯 ηintakes 꿯 ηbetween 꿯 ηCourtland 꿯
Sacramento 꿯 ηRiver 꿯 ηis 꿯 ηthe 꿯 ηplacement 꿯 ηand 꿯 ηoperation 꿯 ηof 꿯 ηcish 꿯 ηscreens 꿯
structure 꿯 ηthat 꿯 ηdo 꿯 ηnot 꿯 ηyet 꿯 ηexist. 꿯 ηTunnels 꿯 ηProject 꿯 ηpromotional 꿯 ηdescripti
below) 꿯 ηinclude 꿯 ηthis 꿯 ηconceptual 꿯 ηillustration 꿯 ηof 꿯 ηnorth 꿯 ηDelta 꿯 ηintake 꿯 ηcish
acknowledges 꿯 ηrisks 꿯 ηof 꿯 ηboth 꿯 ηclow 꿯 ηvelocities 꿯 ηand 꿯 ηpredation 꿯 ηrisk 꿯 ηto 꿯 η
the 꿯 ηscreens 꿯 ηof 꿯 ηthe 꿯 ηnorth 꿯 ηDelta 꿯 ηintakes. 꿯 ηIt 꿯 ηis 꿯 ηconceptual 꿯 ηand 꿯 η
(4 꿯 ηto 꿯 η8 꿯 ηinches) 꿯 ηand 꿯 ηsmall 꿯 ηDelta 꿯 ηand 꿯 ηlongcin 꿯 ηsmelt 꿯 η(2 꿯 ηto 꿯 η
screens 꿯 ηat 꿯 ηleast 꿯 η10 꿯 ηto 꿯 η20 꿯 ηfeet 꿯 ηhigh.

However, 꿯 ηneither 꿯 ηconceptual, 꿯 ηscaled 꿯 ηillustrations 꿯 ηnor 꿯 ηengineered 꿯 ηdrawings 꿯 η
screens 꿯 ηare 꿯 ηprovided 꿯 ηin 꿯 ηthe 꿯 ηDraft 꿯 ηEIR/EIS 꿯 ηor 꿯 ηthe 꿯 ηRDEIR/SDEIS. 꿯 η

The 꿯 ηRDEIR/SDEIS 꿯 ηdescribes 꿯 ηwater 꿯 ηconveyance 꿯 ηfrom 꿯 ηthe 꿯 ηnorth 꿯 ηDelta 꿯 η
Tunnels 꿯 ηProject. 꿯 η"Water 꿯 ηwould 꿯 ηbe 꿯 ηdiverted 꿯 ηfrom 꿯 ηthe 꿯 ηSacramento 꿯 ηRive
intakes 꿯 ηon 꿯 ηthe 꿯 ηeast 꿯 ηbank 꿯 ηof 꿯 ηthe 꿯 ηSacramento 꿯 ηRiver[341] 꿯 ηto 꿯 ηthe 꿯 ηlark
new 꿯 ηsub-□alternatives, 꿯 ηthe 꿯 ηRDEIR/SDEIS 꿯 ηstates: 꿯 η"...implementing 꿯 ηa 꿯 ηdual 꿯 ηco
align 꿯 ηwater 꿯 ηoperations 꿯 ηto 꿯 ηbetter 꿯 ηreclect 꿯 ηnatural 꿯 ηseasonal 꿯 ηclow 꿯 ηpattern
diversions 꿯 ηin 꿯 ηthe 꿯 ηnorth 꿯 ηDelta 꿯 ηequipped 꿯 ηwith 꿯 ηstate-□of-□the-□art 꿯 ηcish 꿯 η
south 꿯 ηDelta 꿯 ηexports."[342]

The 꿯 η*2011 꿯 ηFish 꿯 ηFacilities 꿯 ηTechnical 꿯 ηTeam 꿯 ηTechnical 꿯 ηMemorandum* 꿯 ηis 꿯 η
high 꿯 ηlevel 꿯 ηof 꿯 ηuncertainty 꿯 ηas 꿯 ηto 꿯 ηthe 꿯 ηtype 꿯 ηand 꿯 ηmagnitude 꿯 ηof 꿯 ηin
have 꿯 ηon 꿯 ηcovered 꿯 ηcish 꿯 ηspecies 꿯 ηthat 꿯 ηoccur 꿯 ηwithin[343] 꿯 ηthe 꿯 ηproposed 꿯 ηdiv
screens 꿯 ηare 꿯 ηexperimental 꿯 ηand 꿯 ηhave 꿯 ηnever 꿯 ηbeen 꿯 ηemployed 꿯 ηanywhere 꿯 ηe
large 꿯 ηand 꿯 ηin 꿯 ηclose 꿯 ηproximity), 꿯 ηtype 꿯 η(on-□bank 꿯 ηclat 꿯 ηplate) 꿯 ηand 꿯 ηtid

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[340] 꿯 η*The* 꿯 ηState 꿯 ηof 꿯 ηthe 꿯 ηSan 꿯 ηFrancisco 꿯 η2011 꿯 ηEstuary 꿯 ηPartnership, 꿯 ηp. 꿯 η23.

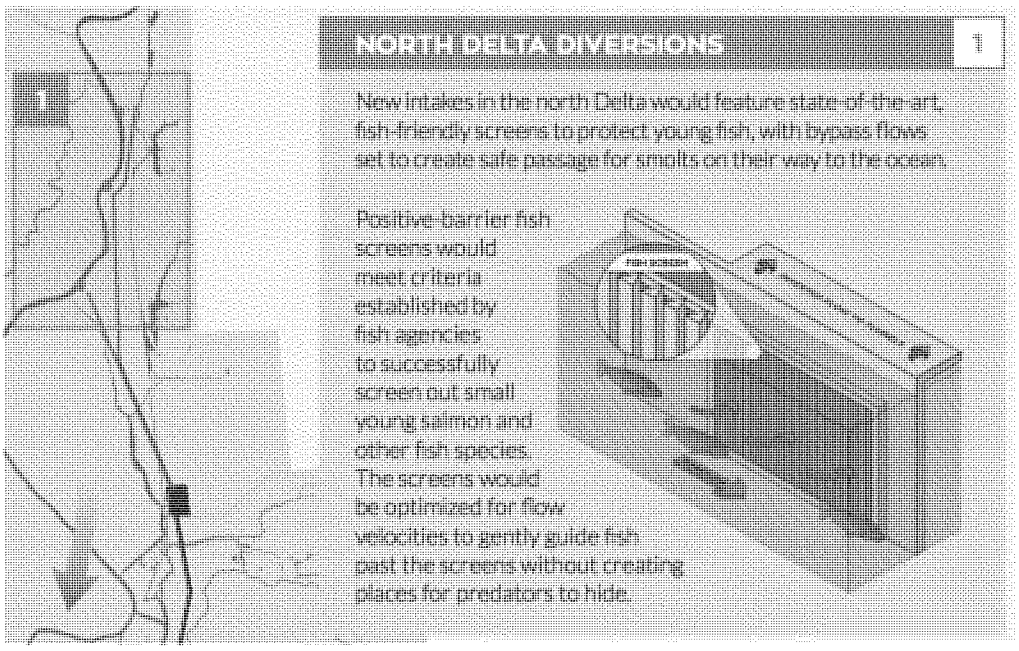
[341] 꿯 ηRDEIR/SDEIS, 꿯 ηSection 꿯 η3, 꿯 η"Conveyance 꿯 ηFacility 꿯 ηModicications 꿯 ηto 꿯 ηAlternative 꿯 η4,

[342] 꿯 ηRDEIR/SDEIS, 꿯 ηSection 꿯 η4.1, 꿯 ηp. 꿯 η4.1-□1 꿯 ηto 꿯 η4.1-□2.

[343] 꿯 ηBDCP 꿯 ηFish 꿯 ηFacilities 꿯 ηTechnical 꿯 ηTeam, 꿯 ηTechnical 꿯 ηMemorandum, 꿯 ηJuly 꿯 η15, 꿯 η2
baydeltaconservationplan.com/Libraries/Dynamic_Document_Library/
Fish_Facilities_Team_Technical_Memo_Final_7_15_2011.sclb.ashx

almost꿯□ηimpossible꿯□ηto꿯□ηconform꿯□ηto꿯□ηexisting꿯□ηDFW꿯□ηand꿯□ηNMFS꿯□ηcish꿯□ηscreening꿯□ηcriteria,꿯□ηenormous꿯□ηuncertainties꿯
the꿯□ηtechnical꿯□ηteam꿯□ηsuggested꿯□ηphased꿯□ηconstruction꿯□ηto꿯□ηsee꿯□ηif꿯□ηthe꿯□ηc
the꿯□ηrest.[345]꿯□ηPart꿯□ηof꿯□ηthe꿯□ηproblem꿯□ηis꿯□ηthat꿯□ηDelta꿯□ηsmelt꿯□ηare꿯□ηpresent꿯
months꿯□ηof꿯□ηFebruary꿯□ηthrough꿯□ηJune,꿯□ηand꿯□ηno꿯□ηscreens꿯□ηcan꿯□ηprevent꿯□ηe
longcin꿯□ηsmelt,꿯□ηSacramento꿯□ηsplittail꿯□ηand꿯□ηsmaller꿯□ηlamprey꿯□ηammocoetes.[346]

**Figure꿯□η20
Conceptual꿯□ηIllustration꿯□ηof꿯□ηNorth꿯□ηDelta꿯□ηIntake꿯
꿯□ηfrom꿯□ηTunnels꿯□ηProject꿯□ηPromotional꿯□ηBroc**



Source:꿯□ηCalifornia꿯□ηWaterFix,꿯□ηSeptember꿯□η2015.꿯□ηFrom꿯□ηsource꿯
https://s3.amazonaws.com/californiawater/pdfs/ajqxf_FIX_FS_Fish_Final.pdf.꿯□η

Fish꿯□ηscreen꿯□ηdescriptions꿯□ηindicate꿯□ηthey꿯□ηwould꿯□ηexclude꿯□ηcish꿯□ηgreater꿯□ηtha
length꿯□ηfrom꿯□ηbeing꿯□ηscooped꿯□ηup꿯□ηby꿯□ηdiversions,꿯□ηbut꿯□ηthere꿯□ηis꿯□ηno꿯□
descriptions꿯□ηof꿯□ηBDCP,꿯□ηthe꿯□ηDraft꿯□ηEIR/EIS꿯□ηor꿯□ηthe꿯□ηRDEIR/SDEIS꿯□ηwhat꿯□
that꿯□ηare꿯□η20꿯□ηmm꿯□ηin꿯□ηsize꿯□ηor꿯□ηsmaller.꿯□ηWhen꿯□ηEWC꿯□ηconsultant꿯□ηT
a꿯□ηDWR꿯□ηrepresentative꿯□ηat꿯□ηthe꿯□ηWalnut꿯□ηGrove꿯□ηOpen꿯□ηHouse꿯□ηin꿯□ηlate꿯
screen꿯□ηat꿯□ηthe꿯□ηBureau's꿯□ηRed꿯□ηBluff꿯□ηdiversion꿯□ηto꿯□ηthe꿯□ηTehama꿯□ηColusa
River꿯□ηrepresented꿯□ηa꿯□η"prototype"꿯□ηof꿯□ηwhat꿯□ηwould꿯□ηbe꿯□ηused꿯□ηat꿯□ηthe꿯
Project.꿯□ηA꿯□ηFebruary꿯□η2015꿯□ηDWR꿯□ηengineering꿯□ηstudy꿯□ηprovided꿯□ηthree꿯□ηcish
design꿯□ηfeatures꿯□ηhad꿯□ηpotential꿯□ηfor꿯□ηuse꿯□ηin꿯□ηthe꿯□ηDelta:꿯□ηThe꿯□ηaforemen

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[344] 꿯□η*Ibid.*,꿯□ηpp.꿯□η22,꿯□η23.

[345] 꿯□η*Ibid.*,꿯□ηpp.꿯□η35,꿯□η36.

[346] 꿯□ηAdministrative꿯□ηDraft꿯□ηBay꿯□ηDelta꿯□ηConservation꿯□η*Plan*,꿯□η*Marshall*꿯□η*Appendix*,꿯□η*Chapter*꿯□η
Entrainment,꿯□ηp.꿯□ηB.0-□12.

at뀔□ηthe뀔□ηGlenn-□Colusa뀔□ηIrrigation뀔□ηDistrict's뀔□ηHamilton뀔□ηCity뀔□ηdiversion뀔□ηand뀔□
facility.[347]

The뀔□ηcish뀔□ηscreens뀔□ηare뀔□ηassumed뀔□ηto뀔□ηbe뀔□ηin뀔□ηplace뀔□ηas뀔□ηpart뀔□ηof뀔□η
Project뀔□ηoperational뀔□ηcriteria뀔□ηfor뀔□ηeach뀔□ηof뀔□ηAlternatives뀔□η4A뀔□η(the뀔□ηpreferred

> The뀔□ηobjectives뀔□ηof뀔□ηthe뀔□ηnorth뀔□ηDelta뀔□ηdiversion뀔□ηbypass뀔□ηclow뀔□ηcriteria뀔□ηinclude
> cish뀔□ηscreen뀔□ηsweeping뀔□ηvelocities;뀔□η2)뀔□ηreduce뀔□ηupstream뀔□ηtransport뀔□ηfrom뀔□ηdownstr
> downstream뀔□ηof뀔□ηthe뀔□ηintakes뀔□η[that뀔□ηis,뀔□ηreduce뀔□η"reverse뀔□ηclows"뀔□ηin뀔□ηthe뀔□η
> distributaries];뀔□η3)뀔□ηsupport뀔□ηsalmonid뀔□ηand뀔□ηpelagic뀔□ηcish뀔□ηtransport뀔□ηand뀔□ηmigratio
> habitat;뀔□η4)뀔□ηreduce뀔□ηlosses뀔□ηto뀔□ηpredation뀔□ηdownstream뀔□ηof뀔□ηthe뀔□ηdiversions;뀔□ηar
> habitat뀔□ηconditions뀔□ηin뀔□ηthe뀔□ηnorth뀔□ηDelta.[348]

Both뀔□ηthe뀔□ηNMFS뀔□ηand뀔□ηthe뀔□ηCalifornia뀔□ηDepartment뀔□ηof뀔□ηFish뀔□ηand뀔□ηWildl
criteria뀔□ηfor뀔□ηcish뀔□ηscreens.[349]뀔□ηThese뀔□ηare뀔□ηtwo뀔□ηvectors뀔□ηof뀔□ηclow뀔□ηthat뀔□ηshape뀔□ηt
sweeping뀔□ηvelocity.뀔□ηTable뀔□η7뀔□ηcompares뀔□ηthese뀔□ηagencies'뀔□ηcish뀔□ηscreen뀔□ηdesig
Project뀔□ηapproach뀔□ηto뀔□ηcish뀔□ηscreen뀔□η*Conceptual Design Criteria Engineering Paper*,뀔□η
summarizes뀔□ηcurrent뀔□ηTunnels뀔□ηProject뀔□ηthinking뀔□ηabout뀔□ηcish뀔□ηscreens.뀔□η

The뀔□ηproposed뀔□ηcish뀔□ηscreens뀔□ηfor뀔□ηthe뀔□ηnorth뀔□ηDelta뀔□ηintakes뀔□ηare뀔□ηintend
to뀔□ηbe,뀔□ηthey뀔□ηwill뀔□ηconsist뀔□ηof뀔□ηgear뀔□ηmotors뀔□ηwith뀔□ηvariable뀔□ηspeed뀔□η
screen뀔□ηbay뀔□ηgroup.뀔□ηThe뀔□ηcapacity뀔□ηof뀔□ηa뀔□ηscreen-□bay뀔□ηgroup뀔□ηis뀔□η500뀔
groups뀔□ηper뀔□η3000뀔□ηcfs뀔□ηintake.뀔□ηTherefore뀔□ηthere뀔□ηwill뀔□ηbe뀔□ηsix뀔□ηmotorize
cleaning뀔□ηsystem뀔□ηwill뀔□ηtraverse뀔□ηits뀔□ηscreen뀔□ηbay뀔□ηat뀔□ηa뀔□ηrate뀔□ηof뀔□η0.5
or뀔□η1.4뀔□ηmiles뀔□ηper뀔□ηhour).뀔□ηEach뀔□ηcleaning뀔□ηcycle뀔□ηis뀔□ηestimated뀔□ηto뀔□ηt[350]

Debris뀔□ηremoval뀔□ηand뀔□η"biofouling"뀔□ηcan뀔□ηcreate뀔□ηdifciculties뀔□ηfor뀔□ηthe뀔□ηcish뀔
frequency뀔□ηdepends뀔□ηon뀔□ηthe뀔□ηdebris뀔□ηload,뀔□ηstates뀔□ηbe뀔□ηintake뀔□ηscreen뀔□η
functionality뀔□ηmust뀔□ηbe뀔□ηperiodically뀔□η"biofouling"뀔□ηhas뀔□ηtroubling뀔□ηaspects뀔□ηas뀔□ηwell,뀔□ηa[351]

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[347]뀔□ηCalifornia뀔□ηDepartment뀔□ηof뀔□η*Engineering 뀔□ηSolutions,*뀔□η*to 뀔□ηFurther 뀔□ηReduce 뀔□ηDiversion 뀔□η*
Juvenile 뀔□ηSalmonids 뀔□ηto 뀔□ηthe 뀔□ηInterior 뀔□ηand 뀔□ηSouther 뀔□ηDelta 뀔□ηand 뀔□ηRedace 뀔□ηExposure 뀔□
Draft뀔□ηPhase뀔□ηII뀔□η-□뀔□ηRecommended뀔□ηSolutions뀔□ηReport,뀔□ηprepared뀔□ηin뀔□ηresponse뀔□ηto
Service뀔□η2009뀔□ηBiological뀔□ηOpinion뀔□ηand뀔□ηConference뀔□ηOpinion뀔□ηon뀔□ηthe뀔□ηLong-□Term뀔□
Project뀔□ηand뀔□ηState뀔□ηWater뀔□ηProject,뀔□ηReasonable뀔□ηand뀔□ηPrudent뀔□ηAlternative뀔□ηIV.1.3,뀔□η
Hereafter,뀔□η*DWR 뀔□η*
Engineering 뀔□ηSolutions.

[348]뀔□ηRDEIR/SDEIS,뀔□ηSection뀔□η4.1,뀔□ηp.뀔□η4.1-□11.

[349]뀔□ηCDFW's뀔□ηcish뀔□ηscreening뀔□ηcriteria뀔□η*are 뀔□ηfound 뀔□η*http://www.dfg.ca.gov/cisfishrearing/projects/Engin/
Engin_ScreenCriteria.asp.뀔□ηThe뀔□ηstates'뀔□ηcish뀔□ηscreening뀔□η*policy 뀔□η*http://www.dfg.ca.gov/index/ 뀔□ηonline뀔□ηat뀔□
Resources/Projects/Engin/Engin_ScreenPolicy.asp.뀔□ηNMFS'뀔□ηcish뀔□ηscreening뀔□ηcriteria뀔□η*are 뀔□ηfound 뀔□η*http://
www.westcoast.cisheries.noaa.gov/publications/hydropower/
southwest_region_1997_cish_screen_design_criteria.pdf뀔□η

[350]뀔□ηCalifornia뀔□ηDepartment뀔□ηof뀔□η*Conveyance 뀔□ηResources,뀔□η*
Water 뀔□η
Engineering 뀔□ηReport: 뀔□ηDual 뀔□ηConveyance 뀔□ηFacili
ModiQied 뀔□ηPipeline/Tunnel 뀔□ηOption—Clifton 뀔□ηCourt 뀔□ηFore bay 뀔□ηPumping 뀔□η
Plant
*Table*뀔□η6-□2,뀔□η
through뀔□η6-□6.

[351]뀔□η*Ibid.*,뀔□ηp.뀔□η6-□17.

Table 7
Comparison of Fish Screen Design Criteria

In streams an	CDFW	NMFS	BDCP/Tunnels Project
Approach velocity (the water velo vector component perpendicular to screen face)	For self-cleaning screens, 0.33 fe second, where exposure to the screen shall no 15 minutes; for "screens which self-cleaning, the 1/4 the river/stream approach velocity, about 0.0825 fe second. "The sc shall be cleane the approach v exceeds the app velocity" of 0.33 per second.	Shall not excee feet per second for all locations cingerling criteria 0.8 feet per	0.33 feet per salmonid fry, e the presence o smelt when ap velocity shall be per second. One cleaning sy per screen ope 0.5 to 2 fe with a cycle approximately 5 minutes (maximum cleaners per cl system at each
Sweeping velocity water velocity v component parallel adjacent to the face)	At least two allowable approach velocity in stre rivers.	Sweeping velocity be greater than approach velocity.	Greater than th approach velocity under NMFS cr and "at least approach velocity the CDFW (200 criteria."
Other	Screen face sha parallel to clow adjacent bankline. No explicit crit small cish like smelt.	Screen face "sh generally parallel river clow and with the adjace bankline."	"Unused sections cish screens w covered to pro operational clexibili as necessary."

Sources: Footnote below for NMFS and CDFW cish screen November 2013, Chapter 5, Effects *Environmental Analysis, Appendix 5B-1, California* Department of Water *Comparison of Engineering Report: Dual Conveyance Pipeline/Tunnel Option—Clifton Court Forebay, Pulsing Jetty* 2015, Table

Biofouling, the accumulation of algae, freshwater sponge, Asian clams, muss organisms, can occlude the screens and jeopardize function. A key desig that all mechanical elements can be moved to the top surface for intake facilities have top-side gantry crane systems for removal and bafcle assemblies, and bulkheads.

> All뀀□ηpanels뀀□ηwill뀀□ηrequire뀀□ηremoval뀀□ηfor뀀□ηpressure뀀□ηwashing.뀀□ηAdditionally,뀀□ηscreen뀀
> dewatering뀀□ηfor뀀□ηinspection뀀□ηand뀀□ηassessment뀀□ηof뀀□ηbiofoul뀀□ηgrowth뀀□ηrates.
>
> With뀀□ηthe뀀□ηinvasion뀀□ηof뀀□ηQuagga뀀□ηand뀀□ηZebra뀀□ηmussels뀀□ηinto뀀□ηinland뀀□ηwaters,뀀□
> Coatings뀀□ηand뀀□ηother뀀□ηdeterrents뀀□ηwill뀀□ηbe뀀□ηmore뀀□ηthoroughly뀀□ηinvestigated뀀□ηduring뀀
> design.[352]

The 뀀*DERR*뀀□ηanticipates뀀□ηthat뀀□ηa뀀□η

> log뀀□ηboom뀀□ηsystem뀀□ηwill뀀□ηbe뀀□ηaligned뀀□ηwithin뀀□ηthe뀀□ηriver뀀□ηalongside뀀□ηthe뀀□ηinta
> and뀀□ηtheir뀀□ηcleaning뀀□ηsystems뀀□ηfrom뀀□ηdamage뀀□ηby뀀□ηlarge뀀□ηcloating뀀□ηdebris.뀀□ηSpare
> the뀀□ηintake뀀□ηstructure뀀□ηshould뀀□ηbe뀀□ηavailable뀀□ηto뀀□ηminimize뀀□ηddowntime뀀□ηshould뀀□η
> majority뀀□ηof뀀□ηworking뀀□ηcomponents뀀□ηbeing뀀□ηsubmerged뀀□ηand뀀□ηwith뀀□ηsecurity뀀□ηprovisi
> damage뀀□ηis뀀□ηnot뀀□ηexpected뀀[353]□ηto뀀□ηbe뀀□ηsignicicant.

No뀀□ηestimate뀀□ηis뀀□η*provided*뀀□η*DERR*뀀□η*how*뀀□η*often*뀀□ηand뀀□ηhow뀀□ηlong뀀□ηindividual뀀□η
from뀀□ηthe뀀□ηriver뀀□ηfor뀀□ηcleaning.뀀□ηSuch뀀□ηmaintenance뀀□ηwould뀀□ηforce뀀□ηtemporary
portion뀀□ηof뀀□ηthe뀀□ηscreened뀀□ηintake.뀀□ηThis뀀□ηcould뀀□ηcause뀀□ηeither뀀□ηloss뀀□ηof뀀
continued,뀀□ηor뀀□ηinterrupt뀀□ηdiversions뀀□ηwhile뀀□ηscreen뀀□ηwas뀀□ηcleaned.뀀□ηIn뀀□ηeithe
on뀀□ηrisks뀀□ηto뀀□ηcish뀀□ηor뀀□ηto뀀□η*water*뀀□η*diversions*.뀀□η*RDEIR/SDEIS*뀀□η*the*뀀□η*propose*뀀□ηany
assurance뀀□ηor뀀□ηmitigation뀀□ηmeasure뀀□ηto뀀□ηavoid뀀□ηimpacts뀀□ηto뀀□ηcish뀀□ηduring뀀□η
at뀀□ηeach뀀□ηnorth뀀□ηDelta뀀□ηintake.뀀□ηPromotional뀀□ηmaterials뀀□ηfor뀀□ηthe뀀□ηTunnels뀀□
problems뀀□ηwith뀀□ηthe뀀□ηcish뀀□ηscreens.

None 뀀□ηof 뀀□ηthis 뀀□ηinformation 뀀□ηis 뀀□ηincorporated 뀀□ηinto 뀀□ηthe 뀀□ηRDEIR/SDEIS's 뀀□ηd
alternatives. 뀀□ηAlternative 뀀□ηdescriptions 뀀□ηfor 뀀□ηthe 뀀□ηnorth 뀀□ηDelta 뀀□ηintakes 뀀□ηare 뀀
the 뀀□ηRDEIR/SDEIS 뀀□ηshould 뀀□ηbe 뀀□ηrevised, 뀀□ηimproved, 뀀□ηcorrected, 뀀□ηand 뀀□ηrecircula
de.iciency.

These뀀□ηcritical뀀□ηomissions뀀□ηfrom뀀□ηalternative뀀□ηdescriptions뀀□ηdo뀀□ηnot뀀□ηprevent뀀□η
from뀀□ηclaiming뀀□ηand뀀□ηapplying뀀□ηalleged뀀□ηbenecits뀀□ηof뀀□ηsuch뀀□ηcish뀀□ηscreens뀀□η
mitigations뀀□ηto뀀□ηlisted뀀□ηcish뀀□ηspecies뀀□ηand뀀□ηnon-□covered뀀□ηcish뀀□ηspecies뀀□ηthat
the뀀□ηnorth뀀□ηDelta뀀□ηintakes뀀□ηand뀀□ηtheir뀀□ηscreened뀀□ηentrances.뀀□ηThe뀀□ηalleged뀀□
Tunnels뀀□ηProject's뀀□ηapproach뀀□ηto뀀□ηadaptive뀀□ηmanagement:뀀□η

> Specicically,뀀□ηcollaborative뀀□ηscience뀀□ηand뀀□ηadaptive뀀□ηmanagement뀀□ηwill,뀀□ηas뀀□ηappropriate,
> information뀀□ηand뀀□ηinsight뀀□ηgained뀀□ηduring뀀□ηthe뀀□ηcourse뀀□ηof뀀□ηproject뀀□ηconstruction뀀□
> improve:...the뀀□ηdesign뀀□ηof뀀□ηcish뀀□ηfacilities뀀□ηincluding[354]뀀□η the뀀□ηintake뀀□ηcish뀀□ηscreens.

As뀀□ηforward-□looking뀀□ηas뀀□ηthis뀀□ηpassage뀀□ηtries뀀□ηto뀀□ηbe,뀀□ηit뀀□ηreclects뀀□ηan뀀
mitigation뀀□ηon뀀□ηbehalf뀀□ηof뀀□ηcish뀀□ηprotection뀀□ηin뀀□ηthe뀀□ηdesign뀀□ηof뀀□ηintake뀀□
proponents뀀□ηwant뀀□ηto뀀□ηbuild뀀□ηthe뀀□ηintakes뀀□ηwith뀀□ηscreens,뀀□ηand뀀□ηthen뀀□ηim
adaptive뀀□ηmanagement.뀀□η"As뀀□ηappropriate"뀀□ηis뀀□ηa뀀□ηnotoriously뀀□ηmeaningless뀀□ηphra
establishing뀀□ηa뀀□ηdecinite뀀□ηcourse뀀□ηof뀀□ηaction;뀀□ηit뀀□ηmeans뀀□η"whatever뀀□ηwe뀀□η

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[352] *Ibid.*, 뀀□ηp.뀀□η6-□17.

[353] *Ibid.*, 뀀□ηp.뀀□η6-□18.

[354] 뀀□ηRDEIR/SDEIS,뀀□ηSection뀀□η6.뀀□η*Collaborative*뀀□η*Science*뀀□η*and*뀀□η*Adaptive*뀀□η*Management*뀀□η*Program*뀀□η*lines*뀀□
28-□31;뀀□ηsee뀀□ηalso뀀□ηSection뀀□η4.1.3.1,뀀□ηp.뀀□η4.1-□29뀀□ηfor뀀□ηAlternative뀀□η2D뀀□ηand뀀□ηSec

> The뀀□ηcollaborative뀀□ηscience뀀□ηprocess뀀□ηwill뀀□ηalso뀀□ηinform뀀□ηthe뀀□ηdesign뀀□ηand뀀□ηconst
> new뀀□ηintakes.뀀□ηThis뀀□ηrequires뀀□ηactive뀀□ηstudy뀀□ηto뀀□ηmaximize뀀□ηwater뀀□ηsupply,뀀□ηensu
> operation,뀀□ηand뀀□ηminimize뀀□ηeffects뀀□ηto[355]뀀□ηcovered뀀□ηspecies.

The뀀□ηcollaborative뀀□ηscience뀀□ηprocess뀀□ηof뀀□ηcourse뀀□ηassumes뀀□ηthe뀀□ηintakes뀀□ηand
screens뀀□ηare뀀□ηbuilt뀀□ηcirst,뀀□ηthen뀀□ηsubjected뀀□ηto뀀□ηstudy.뀀□ηIt뀀□ηis뀀□ηnot뀀□ηa뀀
cish뀀□ηscreens뀀□ηto뀀□ηgo뀀□ηforward뀀□ηwithout뀀□ηdemonstrating뀀□ηthat뀀□ηthe뀀□ηimpact뀀
mitigated.뀀□ηIt뀀□ηemploys뀀□ηadaptive뀀□ηmanagement뀀□ηin뀀□ηthe뀀□ηservice뀀□ηof뀀□ηbuilding
structures뀀□ηin뀀□ηthe뀀□ηpresence뀀□ηof뀀□ηlisted뀀□ηcish뀀□ηspecies뀀□ηand뀀□ηasking뀀□ηCalif
the뀀□ηTunnels뀀□ηProject뀀□ηproponents뀀□ηthat뀀□ηthey뀀□ηwill뀀□ηsolve뀀□ηthe뀀□ηproblems뀀
routinized뀀□ηscreen뀀□ηcleaning뀀□ηand뀀□ηmaintenance뀀□ηwhile뀀□ηignoring뀀□ηconsideration뀀□η
achieves뀀□ηthe뀀□ηDelta뀀□ηReform뀀□ηAct's뀀□ηcoequal뀀□ηgoals뀀□ηand뀀□ηreduced뀀□ηDelta뀀□
the뀀□ηstate's뀀□ηreasonable뀀□ηuse뀀□ηand뀀□ηpublic뀀□ηtrust뀀□ηdoctrines.뀀□η

But뀀□ηeven뀀□ηmore—what뀀□ηis뀀□ηthis뀀□η"Collaborative뀀□ηScience뀀□ηand뀀□ηAdaptive뀀□ηMa
The뀀□ηRDEIR/SDEIS뀀□ηsays뀀□ηonly뀀□ηthat

> it뀀□ηis뀀□ηassumed뀀□ηthat뀀□ηthe뀀□η[AMMP]뀀□ηdeveloped뀀□ηfor뀀□ηAlternative뀀□η4A뀀□ηwould뀀□
> any뀀□ηnew뀀□ηsignicicant뀀□ηenvironmental뀀□ηeffects;뀀□ηinstead뀀□ηthe뀀□ηAMMP뀀□ηwould뀀□ηincluen
> maintenance뀀□ηof뀀□ηfacilities뀀□ηand뀀□ηprotected뀀□ηor뀀□ηrestore뀀□ηhabitat[356]뀀□ηassociated뀀□ηwith뀀

The뀀□ηRDEIR/SDEIS뀀□ηfails뀀□ηto뀀□ηdisclose뀀□ηwhether뀀□ηthe뀀□ηAMMP뀀□ηreplaces뀀□ηBDCP
clarify뀀□ηthat뀀□ηthis뀀□ηis뀀□ηthe뀀□ηTunnels뀀□ηProject's뀀□ηanalog뀀□ηto뀀□ηlast뀀□ηyear's뀀□
management뀀□ηprogram,뀀□ηresearch뀀□ηagenda,뀀□ηand뀀□ηgovernance뀀□ηprocesses.뀀□ηThis뀀□ηi
to뀀□ηmaintain뀀□ηa뀀□ηmodicum뀀□ηof뀀□ηadaptive뀀□ηmanagement-□as-□wild-□card,뀀□ηwhile뀀□η
Section뀀□η10뀀□ηhabitat뀀□ηconservation뀀□ηplan뀀□ηapproach.

This뀀□η"wild뀀□ηcard"뀀□ηapplication뀀□ηof뀀□ηthe뀀□ηcish뀀□ηscreens뀀□ηis뀀□ηapplied뀀□ηthroug
of뀀□ηimpacts뀀□ηto뀀□ηDelta뀀□ηsmelt,뀀□ηlongcin뀀□ηsmelt,뀀□ηwinter-□run뀀□ηChinook뀀□ηsalmo
and뀀□ηCentral뀀□ηValley뀀□ηsteelhead.뀀□ηThe뀀□η"wild뀀□ηcard"뀀□ηcish뀀□ηscreens뀀□ηare뀀□ηal
and뀀□ηnon-□native뀀□ηspecies뀀□ηas뀀□ηwell뀀□ηthat뀀□ηwould뀀□ηbe뀀□ηvulnerable뀀□ηto뀀□ηim
death뀀□ηfrom뀀□ηthe뀀□ηnorth뀀□ηDelta뀀□ηintakes.뀀□ηFor뀀□ηwinter-□run뀀□ηChinook뀀□ηsalmon

> State-□of-□the뀀□ηart뀀□η[footnote]뀀□ηcish뀀□ηscreens뀀□ηoperated뀀□ηwith뀀□ηan뀀□ηadaptive뀀□ηmanag
> eliminate뀀□ηentrainment뀀□ηand뀀□ηimpingement뀀□ηrisk뀀□ηfor뀀□ηjuvenile뀀□ηwinter-□run뀀□ηChinook뀀
>
> [Footnote]뀀□ηThe뀀□ηcish뀀□ηscreens뀀□ηwould뀀□ηbe뀀□ηstate뀀□ηof뀀□ηthe뀀□ηart뀀□ηby뀀□ηincorpora
> operating뀀□ηto뀀□ηcishery뀀□ηagency뀀□ηstandards뀀□η[illegible]뀀□ηscreens뀀□
> described뀀□ηin뀀□ηmore뀀□ηdetail뀀□ηin뀀□ηSection뀀□η3.6.1.1뀀□ηof뀀□ηChapter[357]뀀□η3,뀀□ηDescription뀀□

The뀀□ηfootnote뀀□ηto뀀□ηthis뀀□ηpassage뀀□ηdoes뀀□ηnot뀀□ηsay뀀□ηwhether뀀□ηthat뀀□ηSection뀀
the뀀□η2013뀀□ηBay뀀□ηDelta뀀□ηConservation뀀□ηPlan뀀□ηor뀀□ηthe뀀□η2013뀀□ηDraft뀀□ηEIR/EIS
Draft뀀□ηEIR/EIS뀀□ηlast뀀□ηyear.뀀□ηThis뀀□ηoversight뀀□ηshould뀀□ηbe뀀□ηcorrected.뀀□ηThe뀀□η
SDEIS뀀□ηmeans뀀□ηit뀀□ηis뀀□ηpermissible뀀□ηand뀀□ηappropriate뀀□ηto뀀□ηverify뀀□ηand뀀□ηcom
have뀀□ηavailable뀀□ηto뀀□ηus뀀□ηin뀀□η2015.뀀□ηThere,뀀□ηthe뀀□ηDraft뀀□ηEIR/EIS뀀□ηacknowle

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[355]뀀□ηRDEIR/SDEIS,뀀□ηp.뀀□η4.1-□20,뀀□ηlines뀀□η4-□6.

[356]뀀□ηRDEIR/SDEIS,뀀□ηSection4.1.2.4,뀀□ηp.뀀□η4.1-□18,뀀□ηlines뀀□η20-□24;뀀□ηand뀀□ηrepeated뀀□ηin뀀□η
and뀀□ηSection뀀□η4.1.4.3,뀀□ηpp.뀀□η4.1-□36.

[357]뀀□ηRDEIR/SDEIS,뀀□ηSection뀀□η4.3.7,뀀□ηp.뀀□η4.3.7-□48,뀀□ηlines뀀□η13-□15.뀀□η

> For뀀□ηthe뀀□ηpurposes뀀□ηof뀀뀀뀀

These뀔□ηcomments뀔□ηhelp뀔□ηdocument뀔□ηconcerns뀔□ηexpressed뀔□ηby뀔□ηthe뀔□ηDelta뀔□ηInd
(DISB).뀔□ηIn뀔□ηits뀔□ηcomments뀔□ηto뀔□ηthe뀔□ηDelta뀔□ηStewardship뀔□ηCouncil뀔□ηabout뀔□η

> It뀔□ηis뀔□ηunclear뀔□ηhow뀔□η(and뀔□ηhow뀔□ηwell)뀔□ηthe뀔□ηcish뀔□ηscreens뀔□ηwould뀔□ηwork.뀔□
> that뀔□ηcish뀔□η>20뀔□ηmm뀔□ηare뀔□ηexcluded,뀔□ηbut뀔□ηwhat뀔□ηabout뀔□ηcish뀔□ηand뀔□ηlarvae뀔□
> cish뀔□ηscreens뀔□ηappear뀔□ηto뀔□ηhave뀔□ηbeen뀔□ηinstalled,뀔□ηbut뀔□ηdata뀔□ηon뀔□ηtheir뀔□ηeffect
> specicic뀔□ηdata뀔□ηon뀔□ηhow뀔□ηwell뀔□ηscreens뀔□ηfunction,뀔□ηthe뀔□ηconclusion뀔□ηthat뀔□ηthere뀔
> as뀔□ηcertain뀔□η(e.g.,뀔□ηpage뀔□η1-□100뀔□ηline뀔□η38).뀔□η
>
> Here,뀔□ηas뀔□ηin뀔□ηmany뀔□ηother뀔□ηplaces,뀔□ηmeasures뀔□ηare뀔□ηassumed뀔□ηto뀔□ηfunction뀔□ηa
> the뀔□ηassumptions.뀔□ηThe뀔□ηlevel뀔□ηof뀔□ηcertainty뀔□ηseems뀔□ηoptimistic,뀔□ηand뀔□ηit뀔□ηis뀔□η
> contingency뀔□ηplans뀔□ηin뀔□ηcase뀔□ηthings뀔□ηdon't뀔□ηwork뀔□ηout뀔□ηas뀔□ηplanned.뀔□ηThis뀔□ηp
> Draft.[362]

***Assuming 뀔□ηDelta 뀔□ηsmelt 7 □friendly 뀔□ηdesign 뀔□ηparameters 뀔□ηdoes 뀔□ηnot 뀔□ηmean 뀔□ηtho
or 뀔□ηhave 뀔□ηbeen 뀔□ηincorporated 뀔□ηinto 뀔□ηa 뀔□ηspeci.ic 뀔□ηdesign 뀔□ηthat 뀔□ηwould 뀔□ηp
was 뀔□ηnot 뀔□ηdisclosed 뀔□ηas 뀔□ηpart 뀔□ηof 뀔□ηalternative 뀔□ηdescriptions 뀔□ηin 뀔□ηthe 뀔□ηDr
This 뀔□ηpassage 뀔□ηdoes 뀔□ηnot 뀔□ηexplain 뀔□ηwhere 뀔□ηthe 뀔□ηDelta 뀔□ηsmelt 뀔□η.ish 뀔□ηscre
consistent 뀔□ηwith 뀔□ηNMFS 뀔□ηor 뀔□ηCDFW 뀔□ηcriteria 뀔□ηshown 뀔□ηin 뀔□ηTable 뀔□η7 뀔□ηabov
north 뀔□ηDelta 뀔□ηintake 뀔□η.ish 뀔□ηscreen 뀔□ηdesigns 뀔□ηare 뀔□ηin 뀔□ηerror 뀔□ηrelative 뀔□ηto
bypass 뀔□η.low 뀔□ηoperational 뀔□ηcriteria 뀔□ηmay 뀔□ηnot 뀔□ηbe 뀔□ηcorrect. 뀔□ηThe 뀔□ηTunnels
clarify 뀔□ηand 뀔□ηcorrect 뀔□ηwhere 뀔□ηnecessary 뀔□ηthe 뀔□η.ish 뀔□ηscreen 뀔□ηcriteria 뀔□ηand 뀔
RDEIR/SDEIS.***

In뀔□ηsum,뀔□ηthere뀔□ηare뀔□ηdistinct뀔□ηdisadvantages뀔□ηassociated뀔□ηwith뀔□ηeven뀔□ηthe뀔□
technology뀔□ηapplied뀔□ηalong뀔□ηthe뀔□ηSacramento뀔□ηRiver.뀔□ηFish뀔□ηscreens뀔□η"do뀔□ηaffe
recent뀔□ηDWR뀔□ηengineering뀔□ηreport뀔□ηdrafted뀔□ηfor뀔□ηcompliance뀔□ηwith뀔□ηthe뀔□ηNMF

> A뀔□ηlarge뀔□ηamount뀔□ηof뀔□ηsystem뀔□ηstructure뀔□ηwould뀔□ηbe뀔□ηplaced뀔□ηinto뀔□ηthe뀔□ηwate
> regional뀔□ηhydraulic뀔□ηpatterns.뀔□ηAnother뀔□ηdisadvantage...is뀔□ηthe뀔□ηpotential뀔□ηfor뀔□ηdebris뀔□
> obstruct뀔□ηor뀔□ηdamage뀔□ηparts뀔□ηof뀔□ηthe뀔□ηscreen,뀔□ηwhich뀔□ηpotentially뀔□ηcould뀔□ηlead뀔□
> system.뀔□ηTherefore,뀔□ηCDFW뀔□ηand뀔□ηNMFS뀔□ηscreening뀔□ηcriteria뀔□ηmay뀔□ηnot뀔□ηalways뀔□η
> require뀔□ηconstant뀔□ηmonitoring뀔□ηand뀔□ηmaintenance뀔□ηto뀔□ηassure뀔□ηthat뀔□ηthe뀔□ηsystem뀔□

The뀔□ηstudy뀔□ηadds:

- Boat뀔□ηnavigation뀔□ηmay뀔□ηalso뀔□ηbe뀔□ηaffected.뀔□ηSome뀔□ηtype뀔□ηof뀔□ηboat뀔□η
  accommodate뀔□ηrecreational뀔□ηboat뀔□ηpassage.

- In뀔□ηwaterways뀔□ηwhere뀔□ηthere뀔□ηare뀔□ηdynamic뀔□ηhydraulics뀔□ηsuch뀔□ηas뀔□ηre
  potential뀔□ηfor뀔□ηcish뀔□η[363]impingement.

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[362]뀔□ηDelta뀔□ηIndependent뀔□η*Science 뀔□ηBoard,뀔□η뀔□η뀔□η

DWR's꿯study꿯rejected꿯cish꿯screen꿯technology꿯for꿯natural꿯diversion꿯situa
Sacramento꿯River꿯splits꿯off꿯at꿯either꿯Georgiana[364] ***Slough꿯the꿯Mokelumne꿯that꿯 .ish꿯screen꿯options꿯were꿯considered꿯at꿯sites꿯just꿯a꿯few꿯miles꿯 intakes,꿯why꿯were꿯.ish꿯screens꿯rejected꿯for꿯natural꿯diversions꿯from while꿯they꿯are꿯deemed꿯acceptable꿯or꿯even꿯necessary꿯for꿯the꿯n with꿯the꿯Tunnels꿯Project?***

Absence of Baseline Information to Measure Predation Significance of North Delta Intakes

The꿯RDEIR/SDEIS's꿯conclusions꿯on꿯the꿯effects꿯of꿯the꿯north꿯Delta꿯 speculative:꿯"Predation꿯loss꿯at꿯the꿯north꿯Delta꿯intakes꿯may꿯occur꿯 delta꿯smelt꿯are꿯anticipated꿯to꿯occur꿯that꿯far꿯upstream."꿯This꿯con results꿯concerning꿯upstream꿯migration꿯of꿯X2꿯(the꿯estuarine꿯habitat꿯in component꿯of꿯Delta꿯smelt꿯habitat꿯index꿯measurement)꿯due꿯to꿯Tunnel in꿯these꿯comments꿯above꿯and꿯in꿯[365] ***EWC's꿯 X2꿯 migrates꿯 upstream,꿯*** habitat꿯grows꿯smaller꿯and꿯migrates꿯eastward,꿯and꿯the꿯Delta꿯smelt's habitat꿯grows꿯smaller꿯and꿯migrates꿯eastward꿯(upstream)꿯as꿯well.꿯By with꿯cish꿯screens꿯were꿯completed꿯and꿯begin꿯operation,꿯and꿯under and꿯Delta꿯smelt꿯could꿯frequent꿯this꿯reach꿯more꿯than꿯anticipated꿯 that꿯long.꿯

Also꿯related꿯to꿯the꿯proposed꿯introduction꿯of꿯north꿯Delta꿯intakes꿯 the꿯matter꿯of꿯predation꿯of꿯listed꿯species.꿯Last꿯year's꿯BDCP꿯states predation꿯this꿯way:

> The꿯likelihood꿯of꿯a꿯predation꿯event꿯is꿯a꿯function꿯of꿯three꿯factors:꿯 prey;꿯a꿯decision꿯by꿯the꿯predator꿯to꿯attack꿯the꿯prey;꿯and꿯capture꿯 Encounter꿯frequencies꿯between꿯predators꿯and꿯covered꿯cish꿯are꿯related꿯to꿯 spatially꿯and꿯temporally,꿯the꿯vulnerability꿯of꿯prey,꿯which꿯is꿯typically꿯lin like꿯river꿯clows꿯and꿯turbidity…,꿯and꿯their꿯abundance꿯relative꿯to꿯alterna[366]

"Predation꿯hotspots"꿯were꿯mapped꿯in꿯last꿯year's꿯[367] ***BDCP꿯 Bayes꿯 Delta꿯 Conserva*** decine꿯what꿯a꿯predation꿯hotspot꿯is,꿯but꿯they꿯appear꿯to꿯have꿯 if꿯not꿯all,꿯are꿯associated꿯with꿯articicial꿯(human-built)꿯in-channel꿯 rock꿯barriers,꿯failed꿯levees,꿯submerged꿯bridge꿯abutments,꿯and꿯Jones꿯 include꿯articicial꿯open꿯water꿯areas꿯like꿯Clifton꿯Court꿯Forebay꿯and꿯

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[364] *Ibid.*,꿯p.꿯4-꿯 꿯"of꿯cish꿯screens꿯as꿯a꿯deterrence꿯option꿯was꿯evaluate Typically,꿯maximum꿯clow꿯diversions꿯are꿯used꿯to꿯size꿯cish꿯screens꿯and꿯 requirements.꿯Given꿯the꿯range꿯of꿯high꿯maximum꿯clows꿯over꿯the꿯Delta꿯 screens꿯would꿯be꿯unreasonably꿯large꿯to꿯meet꿯these꿯requirements.꿯Average꿯 resulted꿯in꿯screen꿯sizes꿯that꿯were꿯still꿯large꿯and꿯exceptionally꿯long.꿯These at꿯its꿯January꿯28,꿯2014꿯meeting꿯(see꿯Appendix꿯A).꿯The꿯TWG꿯decided consideration꿯based꿯on꿯the꿯required꿯large꿯structure꿯sizes꿯and꿯concerns꿯ove NMFS꿯screening꿯criteria."꿯

[365] EWC꿯Comments,꿯June꿯11,꿯2014,꿯p.꿯65꿯and꿯Figure꿯7.

[366] BDCP,꿯November꿯2013,꿯p.꿯3.4-299,꿯lines꿯4-9.

[367] BDCP,꿯November꿯2013,꿯Figure꿯3.4-32,꿯"Predation꿯Hotspots꿯in꿯the꿯Plan

refuges꿿□ηfor꿿□ηprey꿿□ηcish,꿿□ηand꿿□ηprey꿿□ηvisibility꿿□ηis꿿□ηhigh꿿□ηdue꿿□ηto꿿□ηrelativel
also꿿□ηlearned꿿□ηto꿿□ηwait꿿□ηpatiently꿿□ηfor꿿□ηdeliveries꿿□ηof꿿□ηsalvaged꿿□ηcish꿿□ηfron
regular꿿□ηlocations꿿□ηalong꿿□ηthe꿿□ηlower꿿□ηSacramento꿿□ηRiver.꿿□η"Total꿿□ηconsumption꿿
predator꿿□ηnumber,꿿□ηpredator꿿□ηsize,꿿□ηwater꿿□ηtemperature,꿿□ηprey꿿□ηdensity,꿿□ηand꿿□
(i.e.,꿿□ηmicrohabitat꿿□ηuse꿿□ηof꿿□ηpredator꿿□ηand꿿□ηprey꿿□ηand꿿□ηwhether꿿□ηthe꿿□ηpre
Currently꿿□ηknown꿿□ηpredation꿿□ηhotspots꿿□ηare꿿□ηlisted꿿□ηsalvage ηonηcreasehesηsibest꿿□ηar
areas꿿□ηwhere꿿□ηmicrohabitat꿿□ηuse꿿□ηcoincides꿿□ηwith꿿□ηpredator꿿□ηfrequency.

Last꿿□ηyear's꿿□ηDraft꿿□ηEIR/EIS꿿□ηacknowledges꿿□ηthat꿿□ηboth꿿□ηthe꿿□ηnorth꿿□ηDelta
nonphysical꿿□η.ish꿿□ηbarriers꿿□ηare꿿□ηexpected꿿□ηto꿿□ηcreate꿿□ηnew꿿□ηpredation꿿□ηho

The꿿□ηbaseline꿿□ηof꿿□ηpredation꿿□ηin꿿□ηthe꿿□ηlower꿿□ηSacramento꿿□ηRiver꿿□ηbetween꿿□
each꿿□ηof꿿□ηthe꿿□ηlisted꿿□ηcish꿿□ηspecies꿿□ηis꿿□ηunknown꿿□ηand꿿□ηnot꿿□ηdisclosed꿿□
alternatives.꿿□ηPredation꿿□ηlosses꿿□ηfor꿿□ηwinter-□run꿿□ηChinook꿿□ηsalmon꿿□ηat꿿□ηthe꿿□η
acknowledged꿿□ηby꿿□ηthe꿿□ηRDEIR/SDEIS:꿿□η"

> Potential꿿□ηpredation꿿□ηeffects꿿□ηat꿿□ηthe꿿□ηnorth꿿□ηDelta꿿□ηintakes꿿□ηfor꿿□ηjuvenile꿿□ηsalmo
> River꿿□η(as꿿□ηopposed꿿□ηto꿿□ηentering꿿□ηthe꿿□ηYolo꿿□ηBypass)꿿□ηcould꿿□ηoccur꿿□ηif꿿□ηpred
> as꿿□ηhas꿿□ηbeen꿿□ηobserved꿿□ηat꿿□ηother꿿□ηlong꿿□ηscreens꿿□ηin꿿□ηthe꿿□ηCentral꿿□ηValley꿿
> uncertain,꿿□ηhowever.꿿□η

This꿿□ηsection's꿿□ηlengthy꿿□ηdescription꿿□ηof꿿□ηa꿿□η"bioenergetics꿿□ηmodel"꿿□ηto꿿□ηestim
the꿿□ηSacramento꿿□ηRiver꿿□ηexemplicies꿿□ηthe꿿□ηTunnels꿿□ηProject꿿□ηProponents'꿿□ηwilling
serves꿿□ηTunnels꿿□ηProject꿿□η***Taking ηfacηpeinηreηains꿿□ηthat꿿□ηthe꿿□ηRDEIR/SDEIS꿿□ηstill***
baseline꿿□ηof꿿□ηcomparison꿿□ηfor꿿□η.ish꿿□ηpredation꿿□ηin꿿□ηthe꿿□ηriver꿿□ηreach꿿□ηb
on꿿□ηthe꿿□ηSacramento꿿□ηRiver꿿□ηneeded꿿□ηto꿿□ηarrive꿿□ηat꿿□ηa꿿□ηreasonable꿿□ηCE
signi.icance꿿□ηof꿿□ηpredation꿿□ηeffects꿿□ηin꿿□ηthe꿿□ηRDEIR/SDEIS꿿□ηhas꿿□ηneither꿿□ηadequat
persuasively꿿□ηdemonstrated꿿□ηits꿿□ηclaim꿿□ηthat꿿□ηlisted꿿□η.ish꿿□ηwould꿿□ηnot꿿□ηbe

No꿿□ηlawful꿿□ηmitigation꿿□ηplan꿿□ηfor꿿□ηpredation꿿□ηhotspot꿿□ηmitigation꿿□ηor꿿□ηavo
descriptions꿿□ηof꿿□ηthe꿿□ηRDEIR/SDEIS's꿿□ηalternative꿿□ηdescriptions.꿿□ηTherefore,꿿□ηthe
impact꿿□ηconclusions꿿□ηconcerning꿿□ηpredation꿿□ηloss꿿□ηfor꿿□ηDelta꿿□ηsmelt꿿□ηand꿿□η
speculative꿿□ηand꿿□ηtherefore꿿□ηinadequate.꿿□ηThe꿿□ηRDEIR/SDEIS꿿□ηshould꿿□ηbe꿿□ηrevi
baseline꿿□ηinformation꿿□ηon꿿□ηpredation꿿□ηin꿿□ηthis꿿□ηreach꿿□ηof꿿□ηthe꿿□ηriver꿿□ηa
SDEIS꿿□ηfor꿿□ηadditional꿿□ηpublic꿿□ηreview.

The RDEIR/SDEIS is incomplete for lack of other critical baseline data.

Last꿿□ηyear,꿿□ηEWC꿿□ηcommented꿿□ηthat꿿□ηthe꿿□ηDraft꿿□ηEIR/EIS꿿□ηand꿿□ηBDCP꿿□ηdo
DWR꿿□ηhas꿿□ηbeen꿿□ηunable꿿□ηto꿿□ηcollect꿿□ηnecessary꿿□ηenvironmental,꿿□ηcultural꿿□ηre
and꿿□ηcield꿿□ηdata꿿□ηfrom꿿□ηDelta꿿□ηlands꿿□ηalong꿿□ηthe꿿□ηTunnels꿿□ηProject꿿□ηalignm

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[368]꿿□ηBDCP,꿿□ηNovember꿿□η2013,꿿□ηp.꿿□η3.4-□299,꿿□ηlines꿿□η12-□14.

[369]꿿□ηBDCP,꿿□ηNovember꿿□η2013,꿿□ηp.꿿□η3.4-□299,꿿□ηlines꿿□η15-□39,꿿□ηand꿿□ηp.꿿□η3.4-□300,꿿□η

[370]꿿□ηBDCP,꿿□ηNovember꿿□η2013,꿿□ηp.꿿□η3.4-□300,꿿□ηline꿿□η12.

[371]꿿□ηSee꿿□ηRDEIR/SDEIS,꿿□ηfootnote꿿□η5,꿿□ηp.꿿□η4.3.7-□66,꿿□ηindicating꿿□ηmethodological꿿□ηproble
study꿿□ηat꿿□ηthe꿿□ηGCID꿿□ηcish꿿□ηscreen꿿□ηin꿿□ηthe꿿□ηSacramento꿿□ηRiver꿿□ηnear꿿□ηHamilton꿿
Delta-□located꿿□ηintakes꿿□ηhas꿿□ηbeen꿿□ηexpected꿿□ηsince꿿□ηat꿿□ηleast꿿□ηthe꿿□ηCalFED꿿□ηRecord꿿
studies꿿□ηwere꿿□ηconducted꿿□ηin꿿□ηanticipation꿿□ηapparently.

and뀀□ηConservation뀀□ηMeasure뀀□η1[372]뀀□ηLastability,year,뀀□ηwe뀀□ηalso뀀□ηnoted뀀□ηthat뀀□ηthe뀀□η
disclose뀀□ηadequately뀀□ηthe뀀□ηcultural뀀□ηresource뀀□ηsetting뀀□ηof뀀□ηthe뀀□ηDelta뀀□ηPlan뀀□
Sacramento's뀀□ηcomments뀀□ηon뀀□ηthe뀀□ηincomplete뀀□ηdiscussion뀀□ηof뀀□ηChapter뀀□η18's뀀□
was뀀□ηinadequate뀀□ηfor뀀□ηomitting뀀□ηspecial뀀□ηplanning뀀□ηand뀀□ηneighborhood뀀□ηpreservat
zoning뀀□ηcode.뀀□η

This뀀□ηyear,뀀□ηwe뀀□ηnote뀀□ηthat뀀□ηthe뀀□ηRDEIR/SDEIS뀀□ηfails뀀□ηto뀀□ηincorporate뀀□ηSac
of뀀□ηits뀀□ηRDEIR/SDEIS[373]뀀□ηThis뀀□ηyear,뀀□ηthe뀀□ηhabitat뀀□ηrestoration뀀□ηactivities뀀□ηare뀀□ηnow
preferred뀀□ηalternative뀀□ηand뀀□ηthe뀀□ηother뀀□ηtwo뀀□ηsub-□alternatives뀀□ηaddressed뀀□ηin뀀
we뀀□ηcind,뀀□ηhowever,뀀□ηthat뀀□ηthe뀀□ηsame뀀□ηbroad뀀□η***Issues뀀□ηinability뀀□ηof뀀□ηthe뀀□η***
California뀀□ηDepartment뀀□ηof뀀□ηWater뀀□ηResources뀀□ηto뀀□ηgain뀀□ηaccess뀀□ηto뀀□ηDelta
the뀀□ηTunnels뀀□ηProject뀀□ηmeans뀀□ηthat뀀□ηdata뀀□ηnecessary뀀□ηfor뀀□ηcultural뀀□ηand뀀
geotechnical뀀□ηmatters뀀□ηis뀀□ηunavailable뀀□ηto뀀□ηadequately뀀□ηdescribe뀀□ηthe뀀□ηTunnels
environmental뀀□ηbaseline.뀀□η

The뀀□ηlack뀀□ηof뀀□ηavailable뀀□ηdata뀀□ηis뀀□ηacknowledged뀀□ηin뀀□ηthe뀀□ηRDEIR/SDEIS.뀀□η

> Although뀀□ηthe뀀□ηmajority뀀□ηof뀀□ηthe뀀□ηfootprint뀀□ηof뀀□ηthe뀀□ηwater뀀□ηconveyance뀀□ηfacility
> resources뀀□ηhave뀀□ηbeen뀀□ηlocated뀀□ηwith뀀□ηand뀀□ηnear뀀□ηthe뀀□ηportions뀀□ηof뀀□ηthe뀀□ηalig
> this뀀□ηreason,뀀□ηadditional뀀□ηarchaeological뀀□ηresources뀀□ηare뀀□ηlikely뀀□ηto뀀□ηbe뀀□ηfound뀀□ηi
> where뀀□ηsurveys뀀□ηhave뀀□ηnot뀀□ηyet[374]뀀□ηbeen뀀□ηconducted.

The뀀□ηRDEIR/SDEIS뀀□ηfurther뀀□ηacknowledges뀀□ηthat뀀□ηthere뀀□ηremain뀀□η"unidenticied뀀□ηa
architectural뀀□ηand뀀□ηbuilt뀀□ηenvironment뀀□ηresources뀀□ηthat뀀□ηcould뀀□ηbe뀀□ηaffected뀀□η
associated뀀□ηwith뀀□ηthe뀀□ηTunnels뀀□ηProject.

> As뀀□ηdescribed뀀□ηin뀀□ηdetail뀀□η*site*뀀□η[illegible]뀀□ηmoes뀀□ηnot뀀□ηhave뀀□ηlegal뀀□ηaccess
> the뀀□ηfootprint뀀□ηfor뀀□ηthe뀀□ηwater뀀□ηconveyance,뀀□ηhistorical뀀□ηdocumentation뀀□ηsuggests뀀□ηu
> occur뀀□ηin뀀□ηthe뀀□ηfootprint뀀□ηof뀀□ηthe뀀□ηwater뀀□ηconveyance뀀□ηfacilities뀀□ηthat뀀□ηhave뀀□η
> currently뀀□ηbe뀀□ηaccessed뀀□ηand뀀□ηevaluated.뀀□ηConstruction뀀□ηmay뀀□ηresult뀀□ηin뀀□ηdirect뀀□η
> damage뀀□ηthrough뀀□ηvibration,뀀□ηor뀀□ηindirect뀀□ηeffects뀀□η[375]뀀□ηsuch뀀□ηas뀀□ηchanges뀀□ηto뀀□ηthe뀀□

Impact뀀□ηCUL-□6뀀□ηis뀀□ηnot뀀□ηso뀀□ηmuch뀀□ηan뀀□ηimpact뀀□ηdiscussion,뀀□ηbut뀀□ηan뀀□
incomplete.뀀□ηAn뀀□ηadequate뀀□ηand뀀□ηcomplete뀀□ηCEQA/NEPA뀀□ηdocument뀀□ηis뀀□ηrequired
full뀀□ηdue뀀□ηdiligence뀀□ηby뀀□ηthe뀀□ηdocument뀀□ηpreparers,뀀□ηand뀀□ηacknowledging뀀□ηits
resolve뀀□ηthe뀀□ηRDEIR/SDEIS's뀀□ηdefects뀀□ηin뀀□ηthis뀀□ηarea,뀀□ηnor뀀□ηdoes뀀□ηMitigation뀀
survey뀀□ηof뀀□ηinaccessible뀀□ηproperties뀀□ηto뀀□ηassess뀀□ηeligibility,뀀□ηdetermine뀀□ηif뀀□ηthe
impacted뀀□ηby뀀□ηthe뀀□ηProject뀀□ηand뀀□ηDevelop뀀□ηtreatment뀀□ηto뀀□ηresolve뀀□ηor뀀□ηmi
mitigation뀀□ηfor뀀□ηthe뀀□ηincomplete뀀□η***these뀀□ηlanguage뀀□ηimpact뀀□ηresearch뀀□ηagenda뀀□ηand뀀□ηmethodology뀀□***
the뀀□ηnext뀀□ηrecirculated뀀□ηdraft뀀□ηCEQA/NEPA뀀□ηdocument,뀀□ηnot뀀□ηadequate뀀□ηtreatm
under뀀□ηCEQA뀀□ηand뀀□ηNEPA.뀀□ηThey뀀□ηare뀀□ηa뀀□ηspeculative뀀□ηto 7 ***□do뀀□ηlist,뀀□ηno***

In뀀□ηthe뀀□ηarea뀀□ηof뀀□ηgeotechnical뀀□ηand뀀□ηsoils뀀□ηmatters,뀀□ηthe뀀□ηDraft뀀□ηEIR/EIS
evaluate뀀□ηthe뀀□ηTunnels뀀□ηProject's뀀□ηvulnerability뀀□ηto뀀□ηearthquake뀀□ηand뀀□ηground-□s

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[372]뀀□ηEWC뀀□ηComments,뀀□ηJune뀀□η11,뀀□η2014,뀀□ηpp.뀀□η133-□135.

[373]뀀□ηRDEIR/SDEIS,뀀□ηSections뀀□η4.3.14,뀀□η4.4.14,뀀□ηand뀀□η4.5.14.

[374]뀀□ηRDEIR/SDEIS,뀀□ηSection뀀□η4.3.14,뀀□ηImpact뀀□ηCUL-□2,뀀□ηp.뀀□η4.3.14-□2,뀀□ηlines뀀□η15-□19.

[375]뀀□ηRDEIR/SDEIS,뀀□ηSection뀀□η4.3.14,뀀□ηImpact뀀□ηCUL-□6,뀀□ηp.뀀□η4.3.14-□5,뀀□ηlines뀀□η25-□30.뀀□
Section뀀□η4.4.14,뀀□ηpp.뀀□η4.4.14-□5뀀□ηto뀀□η4.4.14-□6;뀀□ηand뀀□ηSection뀀□η4.5.14,뀀□ηpp.뀀□η4.5.14-□5

groundwater뀕□ηfrom뀕□ηconstruction뀕□ηactivities,뀕□ηground뀕□ηsettlement,뀕□ηpotential뀕□ηslope뀕
fault뀕□ηrupture,뀕□ηliquefaction,뀕□ηand뀕□ηcanal뀕□ηseepage.뀕□ηEach뀕□ηimpact뀕□ηand뀕□ηmitiga
"could,"뀕□ηrather뀕□ηthan뀕□η"would"뀕□ηor뀕□η"will."뀕□ηThis뀕□ηis뀕□ηbecause뀕□ηneither뀕□ηdo
geotechnical뀕□ηissues뀕□ηis뀕□ηbased뀕□ηon뀕□ηdata뀕□ηfrom뀕□ηactual뀕□ηconditions뀕□ηalong뀕□
acknowledged뀕□ηimplicitly뀕□ηwhen뀕□ηthe뀕□ηRDEIR/SDEIS뀕□ηstates:

> ***NEPA 뀕□ηEffects.*** 뀕□ηThis뀕□ηpotential뀕□ηcause뀕□ηsubstantial뀕□ηbecause뀕□ηsettlement뀕□ηor뀕□ηcollapse뀕□η
> *could*뀕□ηcause뀕□ηinjury뀕□ηof뀕□ηworkers뀕□ηat뀕□ηthe뀕□ηconstruction뀕□ηsites뀕□ηas뀕□ηa뀕□ηresult뀕
>
> The뀕□ηhazard뀕□ηof뀕□ηsettlement뀕□ηand뀕□ηsubsequent뀕□ηcollapse뀕□ηof뀕□ηelevated뀕□ηcavity뀕□ηas뀕□ηassessing뀕□η
> specicic뀕□ηgeotechnical뀕□ηand뀕□ηhydrological뀕□ηconditions뀕□ηat뀕□ηintake뀕□ηlocations,뀕□ηas뀕□ηwell
> pipelines뀕□ηcross뀕□ηwaterways뀕□ηand뀕□ηmajor뀕□ηirrigation뀕□ηcanals.뀕□ηA뀕□ηCalifornia-□registered뀕
> certicied뀕□ηengineering뀕□ηgeologist뀕□ηrecommend뀕□ηmeasures뀕□ηin뀕□ηa뀕□ηgeotechnical뀕□ηreport뀕□ηto
> hazards,뀕□ηsuch뀕□ηas뀕□ηseepage뀕□ηcutoff뀕□ηwalls뀕□ηand뀕□ηbarriers,뀕□ηshoring,뀕□ηgrouting뀕□ηof
> strengthening뀕□ηof뀕□ηnearby뀕□ηstructures,뀕□ηexisting뀕□ηutilities,뀕□ηor뀕□ηburied뀕□ηstructures.[376]

Again,뀕□ηsuch뀕□ηprospective뀕□ηstatements뀕□ηare뀕□ηdue뀕□ηto뀕□ηthe뀕□ηfact뀕□ηthat뀕□ηDWR
lands뀕□ηalong뀕□ηthe뀕□ηalignment뀕□ηof뀕□ηthe뀕□ηTunnels뀕□ηProject뀕□ηor뀕□ηany뀕□ηof뀕□ηi
the뀕□ηdrilling,뀕□ηboring,뀕□ηand뀕□ηpetrologic뀕□ηand뀕□ηsoils뀕□ηanalyses뀕□ηneeded뀕□ηto뀕□η
Project뀕□ηon뀕□ηgeological뀕□ηand뀕□ηsoils뀕□ηpassage뀕□ηin뀕□ηthis뀕□ηNEPA뀕□ηconclusion,뀕□ηlike
resources 뀕□ηcounterpart 뀕□ηabove, 뀕□ηis 뀕□ηnot 뀕□ηa 뀕□ηvalid 뀕□ηNEPA 뀕□ηconclusion, 뀕□ηbut 뀕
methodology 뀕□ηdescription 뀕□ηfor 뀕□ηrecirculating 뀕□ηthe 뀕□ηnext 뀕□ηDraft 뀕□ηEIR/EIS. 뀕□ηIt 뀕□
represent 뀕□ηthe 뀕□ηextent, 뀕□ηlocation 뀕□ηor 뀕□ηmagnitude 뀕□ηof 뀕□ηproject 뀕□ηimpacts. 뀕□ηTh
the 뀕□ηRDEIR/SDEIS's 뀕□ηtreatment 뀕□ηof 뀕□ηgeology/seismicity 뀕□ηissues, 뀕□ηand 뀕□ηis 뀕□ηinade
disclosure 뀕□ηpurposes 뀕□ηof 뀕□ηCEQA 뀕□ηand 뀕□ηNEPA.

DWR's뀕□ηdifciculties뀕□ηobtaining뀕□ηentry뀕□η[377]뀕□ηin뀕□ηDecember뀕□ηof뀕□η2013,뀕□ηafter뀕□ηcive뀕□ηy
oral뀕□ηargument뀕□ηin뀕□ηthe뀕□ηconsolidated뀕□ηappeals뀕□ηin뀕□ηthe뀕□ηDelta뀕□η"access뀕□ηw
of뀕□ηAppeal뀕□ηfor뀕□ηthe뀕□ηThird뀕□ηAppellate뀕□ηDistrict뀕□ηin뀕□ηSacramento.뀕□η뀕□ηThis뀕
battle뀕□ηspawned뀕□ηby뀕□ηthe뀕□ηState's뀕□ηmulti-□billion뀕□ηdollar뀕□ηtwin-□tunnel뀕□ηproject뀕
Bay뀕□ηDelta뀕□ηConservation뀕□ηPlan.뀕□ηCounsel뀕□ηfor뀕□ηthe뀕□ηState뀕□ηurged뀕□ηthe뀕□ηcou
prevented뀕□ηthe뀕□ηDepartment뀕□ηof뀕□ηWater뀕□ηResources뀕□ηfrom뀕□ηgaining뀕□ηaccess뀕□ηto
investigations뀕□ηthey뀕□ηinsisted뀕□ηwere뀕□ηessential뀕□ηto뀕□ηcomplete뀕□ηplanning뀕□ηfor뀕□ηt
landowners뀕□ηsought뀕□ηto뀕□ηafcirm뀕□ηand뀕□ηstrengthen뀕□ηthe뀕□ηfavorable뀕□ηrulings뀕□ηtha
ambitious뀕□ηplans.뀕□η

The뀕□ηargument뀕□ηbefore뀕□ηthe뀕□ηCourt뀕□ηof뀕□ηAppeal뀕□ηfocused뀕□ηon뀕□ηwhether뀕□ηD
access뀕□ηrights뀕□ηby뀕□ηproceeding뀕□ηunder뀕□ηthe뀕□η"pre-□condemnation뀕□ηentry"뀕□ηstatute
et뀕□ηseq.).뀕□ηThe뀕□ηentries뀕□ηDWR뀕□ηrequested뀕□ηwere뀕□ηprolonged뀕□ηand뀕□ηinvasive.뀕
condemnation뀕□ηentry뀕□ηstatute뀕□ηallows뀕□ηit뀕□ηto뀕□ηobtain뀕□ηthose뀕□ηentry뀕□ηrights뀕□
many뀕□ηrights뀕□ηand뀕□ηsafeguards뀕□ηDWR뀕□ηwould뀕□ηbe뀕□ηrequired뀕□ηto뀕□ηgive뀕□ηthe
time-□consuming뀕□ηprocedure뀕□ηknown뀕□ηas뀕□η"eminent뀕□ηdomain."

The뀕□ηlandowners,뀕□ηon뀕□ηthe뀕□ηother뀕□ηhand,뀕□ηargued뀕□ηthat뀕□ηthe뀕□ηrequested뀕□η"
intrusive뀕□ηthat뀕□ηthey뀕□ηamounted뀕□ηto뀕□ηeasements뀕□ηthat뀕□ηcould뀕□ηbe뀕□ηlawfully뀕□

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[376]뀕□ηRDEIR/SDEIS,뀕□ηSection뀕□η4.3.5,뀕□ηp.뀕□η4.3.5-□2,뀕□ηlines뀕□η16-□22.뀕□ηSimilar뀕□ηnarrative뀕□η
4.5.5뀕□ηas뀕□ηwell.

[377]뀕□ηEWC뀕□ηis뀕□ηgrateful뀕□ηto뀕□ηmember뀕□ηgroup뀕□ηRestore뀕□ηthe뀕□ηDelta뀕□ηand뀕□ηThomas뀕
California,뀕□ηfor뀕□ηthis뀕□ηsummary뀕□ηdescription뀕□ηof뀕□ηtemporary뀕□ηand뀕□ηpermanent뀕□ηentry뀕□η
Department뀕□ηof뀕□ηWater뀕□ηResources뀕□ηand뀕□ηDelta뀕□ηland뀕□ηowners.

They꿯contended꿯that꿯DWR's꿯entry꿯requests꿯were꿯not꿯brief꿯and꿯in
the꿯pre-condemnation꿯entry꿯statute.꿯By꿯attempting꿯to꿯obtain꿯these꿯
abbreviated꿯pre-condemnation꿯entry꿯procedure,꿯DWR꿯tried꿯to꿯do꿯an꿯
domain꿯laws꿯and,꿯in꿯fact,꿯sought꿯an꿯unconstitutional꿯taking꿯of꿯pr

In꿯March,꿯2014꿯the꿯Court꿯of꿯Appeal꿯issued꿯its꿯Decision.꿯꿯꿯Th
landowners,꿯holding꿯that꿯DWR꿯could꿯not꿯proceed꿯with꿯"geotechnical"꿯
pre-condemnation꿯entry꿯statute꿯because꿯that꿯would꿯effectuate꿯an꿯uncon
point,꿯the꿯appellate꿯court꿯afcirmed꿯the꿯Superior꿯Court's꿯ruling.꿯꿯꿯꿯
favor꿯of꿯Delta꿯landowners꿯with꿯respect꿯to꿯DWR's꿯requested꿯"environ
they,꿯too,꿯amounted꿯to꿯unconstitutional꿯takings.꿯꿯꿯On꿯this꿯issue,꿯t
court's꿯ruling.

DWR꿯petitioned꿯the꿯California꿯Supreme꿯Court꿯for꿯review꿯of꿯that꿯
granted.꿯꿯꿯Briecing꿯on꿯the꿯merits꿯is꿯now꿯complete,꿯and꿯we꿯
sometime꿯in꿯2016.꿯꿯꿯We꿯think꿯that꿯well-established꿯case꿯law,꿯t
principles꿯of꿯judicial꿯and꿯public꿯policy꿯favor꿯the꿯Delta꿯landowners꿯

However,꿯regardless꿯of꿯the꿯outcome꿯in꿯the꿯Supreme꿯Court,꿯Delta꿯
successfully꿯blocked꿯DWR's꿯effort꿯to꿯invoke꿯a꿯procedural꿯"shortcut"꿯
invasive꿯"surveys"꿯in꿯the꿯Delta꿯to꿯advance꿯the꿯pernicious꿯twin꿯tu

DWR's꿯Eminent꿯Domain꿯Attempts꿯[illegible] its failed effort to access Delta
of the pre-condemnation entry statute, in mid-2011—even as the
Trial Judge's rulings were being perfected—DWR commenced eminent do
counties in order to condemn temporary easements to access its
its drilling operations. DWR also tried to condemn permanent
feet by 4 feet, for each boring it intended to drill.

However, DWR made several serious missteps in its zeal to obta
easements it insisted it needed for BDCP-related geotechnical research.
landowners' counsel successfully resisted DWR's eminent domain efforts.
since dismissed its eminent domain actions in San Joaquin, Yolo,
Counties.

The gaps in setting/baseline, impact, and mitigation information rend
the RDEIR/SDEIS of these issues incomplete. As a consequence, the
It should be revised, updated with site speci.ic data on these
public review.

Clifton Court Pump Failure, Water Hammer and Back-flow Effects

The RDEIR/SDEIS states that a key modication to Alternative 4
removal of three north Delta intake pumps to be replaced with
from the southern end of the Tunnels[378] [illegible]
assumed for modicied Alternative 4 and the new preferred Alternativ

[378] RDEIR/SDEIS, Section 3.1, pp. 3-1 to 3-2. "...after extensive engineeri
it is not necessary to build pumping plants adjacent to each intake
tunnels. Instead, water could be moved from the river into tunnels by
miles away on DWR property at the southern end of the tunnels

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evaluates뀀□η"one뀀□ηof뀀□ηthe뀀□ηmore뀀□ηcritical뀀□ηconditions...associated뀀□ηwith뀀□ηa뀀□ηtotal
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Yours truly,

Tim Stroshane
Consultant
Environmental Water Caucus
Policy Analyst
Restore the Delta

To: Leff, Karin[Leff.Karin@epa.gov]; Wright, Justin[wright.justin@epa.gov]
From: Goforth, Kathleen
Sent: Sat 10/31/2015 1:31:57 AM
Subject: Fwd: Contra Costa County Comment Letter & Attachments on the Cal WaterFix RDEIR/SDEIS
CCC Comment Letter & Attachments on Cal WaterFix 30Oct15.pdf
ATT00001.htm

Sent from my iPhone

Begin forwarded message:

From: "Richard Denton" <rdenton06@comcast.net>
To: "Foresman, Erin" <Foresman.Erin@epa.gov>, "Skophammer, Stephanie" <SKOPHAMMER.STEPHANIE@EPA.GOV>
Cc: "Goforth, Kathleen" <Goforth.Kathleen@epa.gov>
Subject: Fw: Contra Costa County Comment Letter & Attachments on the Cal WaterFix RDEIR/SDEIS

Erin and Stephanie
,
Please find attached Contra Costa County's comments on the Cal. WaterFix environmental documents that were submitted yesterday.

Can you please send me EPA's comments when they are completed. Thanks.

It is amazing that no actual full model runs were done for the new alternatives, and the sensitivity analyses that were done violate the Army Corps limits on inflows to Clifton Court Forebay, violate the SWRCB's export/inflow ratio limits, and fail to comply with the San Joaquin inflow to export ratio required by their biological opinions. All the time, the project proponents claim the project will benefit fish by reducing exports from the south Delta and minimizing reverse flows. It is not what they say but what their model analyses actually say.

And now we have Governor Brown saying (before the comment period even closed) that "Claims to the contrary are false, shameful and do a profound disservice to California's future."

Richard

(510) 339-3618

The Board of Supervisors

County Administration Building
651 Pine Street, Room 107
Martinez, California 94553-1293

John M. Gioia, 1st District
Candace Andersen, 2nd District
Mary N. Piepho, 3rd District
Karen Mitchoff, 4th District
Federal D. Glover, 5th District

Contra Costa County

David J. Twa
Clerk of the Board
and
County Administrator
(925) 335-1900

October 30, 2015

John Laird
Secretary
California Natural Resources Agency
1416 Ninth Street, Suite 1311
Sacramento, CA 95814

David Murillo
Regional Director, Mid-Pacific Region
U.S. Bureau of Reclamation
Federal Office Building
2800 Cottage Way
Sacramento CA 95825-1898

BDCP/WaterFix Comments
P.O. Box 1919
Sacramento, CA 95812
Email: BDCPComments@icfi.com

Re: Proposed Changes to the Bay Delta Conservation Plan/California WaterFix Continue to Threaten the Delta, Time for Plan "B"

Dear Secretary Laird and Director Murillo:

Attached to this letter are Contra Costa County's comments on the Draft Bay Delta Conservation Plan ("BDCP")/California WaterFix ("CWF") and associated partially Recirculated Draft Environmental Impact Report/Supplemental Draft Environmental Impact Statement ("RDEIR/SDEIS"). As further explained in this letter and its attachments, the RDEIR/SDEIS fails to consider a reasonable range of viable project alternatives, fails to model and disclose the full adverse environmental impacts of the project, and assumes away what were previously considered significant adverse, but unavoidable, water quality impacts of the project without any actual detailed water quality modeling being done. The RDEIR/SDEIS is therefore totally inadequate under CEQA and NEPA, and not responsive to state policies (2009 Delta Reform Act), and should be withdrawn.

A great deal of information is circulating on the release of the BDCP/CWF and its recirculated environmental documents. The California WaterFix has been portrayed positively and unduly optimistically by the project proponents, but there are a host of major problems with the project. We request your personal review of the issues with the proposed project and urgent consideration of an alternative approach outlined herein.

The current proposal by the California Department of Water Resources (DWR) and the U.S. Bureau of Reclamation (Reclamation) to build new intakes in the north of the Sacramento-San Joaquin Delta (Delta) and export a significant percentage of Delta inflow will be a disaster for the Delta ecosystem, threatened and endangered fish species, the already degraded Delta water quality, and those living in or near the Delta that rely on the Delta for their water supply. The availability of good quality water in the Delta is essential for municipal drinking water for the residents of Contra Costa County as well as agriculture, recreation, and industry in this region.

Contra Costa County asks you both to undertake a serious review and reconsideration of this deeply flawed RDEIR/SDEIS and work with the U.S. Fish and Wildlife Service (USFWS) and the National Oceanic and Atmospheric Administration (NOAA) fisheries to develop a new approach (including the ability to capture and store "new" water during periods of high flow) that will actually restore and sustain the Delta ecosystem and address California's water supply needs. This would greatly benefit not only California, but also the nation. The time to consider a Plan "B" is long overdue.

Despite what is stated by the project proponents in their press releases, the current project as proposed by DWR and, apparently, as supported by Reclamation, continues to have serious flaws and will harm, rather than improve the Delta ecosystem. Equally serious, it fails to produce any real increase in water supply reliability for California – something that is even more important in view of our current drought emergency.

The following are examples of the major problems with the current BDCP/CWF proposal:

- The preferred alternative in the current RDEIR/SDEIS fails to achieve either of the two co-equal goals of "providing a more reliable water supply for California and protecting, restoring, and enhancing the Delta ecosystem." (See Wat. Code, §§ 85054; 85301(a).) This renders the RDEIR/SDEIS noncompliant with the requirements of the state Sacramento-San Joaquin Delta Reform Act of 2009 (Wat. Code, §§ 85000-85350) and Division B, Title 2, Section 205 of the federal Consolidated Appropriations Act of 2012 (Pub. L. 112-74 (Dec. 23, 2011) 125 Stat. 786).
- The DWR and the California Natural Resource Agency (CNRA) and Reclamation have allowed the export water contractors to develop a flawed project and valuable input from Delta interests and environmental organizations and even other State Agencies (e.g. Delta Stewardship Council Independent Science Board) have gone unanswered. The Delta Independent Science Board's September 30, 2015 letter indicates in no uncertain terms that the BDCP/CWF is "*sufficiently incomplete and opaque to deter its evaluation and use by decision makers, resource managers, scientists and the broader public.*"
- DWR, CNRA, Reclamation and Interior have failed to consider or analyze a reasonable range of alternatives. Fourteen (14) of the 15 alternatives in the draft RDEIR/SDEIS involve an isolated facility and north Delta intakes, with no new storage or actions to reduce demand on the Delta and increase local sources of water. The three new alternatives in the RDEIR/SDEIS have the same basic configuration as those 14, meaning 17 out of 18 project alternatives are essentially the same project alternative. These project alternatives do not foster informed decision-making, and do not permit a reasoned choice.

- The current RDEIR/SDEIS preferred alternative still relies on exports from the existing south Delta export locations (especially in dry years when the Delta is most stressed) and often would result in worse reverse flows in Old and Middle Rivers. The new North Delta intakes also adversely impact listed fish species (*i.e.*, species listed as threatened and endangered under the state and federal Endangered Species Acts) by reducing flows through the Delta to San Francisco Bay, reducing the percentage of flow through Sutter and Steamboat Sloughs, and increasing predation. Therefore, the project's net benefits to listed fish species are minimal, if any.
- Astonishingly, the RDEIR/SDEIS's preferred alternative would increase exports in dry periods and would only infrequently capture additional surplus water in wet periods. This is completely contrary to the original BDCP planning principles and the "Big Gulp, Little Sip" concept touted in the BDCP "An Overview and Update" dated March 2009. Specifically, principle #2 states "Divert more water in the wetter periods and less in the drier periods." Moreover, the preferred alternative is in direct conflict with State policies of reducing reliance on the Delta in meeting California's future water supply needs. (See Wat. Code, §§ 10608(c) & 85021.)
- The Operations and Water Quality modeling for the November, 2013 BDCP Draft EIR/EIS contained major errors and the computer models needed to be revised. However, no new modeling was done for the new RDEIR/SDEIS project or project alternatives. Instead DWR and Reclamation have based their RDEIR/SDEIS analyses on the original flawed modeling studies from three and a half years ago, and on water quality sensitivity analyses performed for completely different future demand, climate change scenarios, and habitat restoration conditions, *i.e.*, late-long-term rather than early-long-term.
- The estimated $15 billion cost for construction of the tunnels does not represent the total cost of the whole project, estimated upwards of $50 billion, and would most likely be rendered obsolete once the State Water Resources Control Board (SWRCB) adopts long-overdue, more-stringent, Delta flow requirements to protect fish and other beneficial uses.

These major issues are discussed in more detail in the attachments to this letter.

Time for a Fresh Approach - Plan "B"

The Bay Delta Conservation Plan/California WaterFix proponents have done very little to develop a holistic and sustainable solution. The Delta is in serious decline and there are major water shortages in California, even in non-drought years. Fish populations are plummeting. DWR and Reclamation should fully embrace the responsibility and complexity of solving the problems of fish decline, degraded Delta water quality, the increasing demands for water in California, and the impacts of climate change.

It is unfortunate that due to state and federal budget constraints, this responsibility has been ceded to a special interest group, the export water contractors, who do not have the interests of the environment or the rest of California at heart. Because of the control exerted by the export contractors over the BDCP planning budget, the BDCP/CWF RDEIR/SDEIS was rushed into

print without any new modeling, and no new viable project alternatives. This seriously flawed document is not worthy of DWR or Reclamation, and has further delayed addressing the urgent needs of the Delta and California's water supply.

A sustainable solution to California's Bay-Delta fish and water supply problems can be achieved using the following approach. These are not new ideas. They have been provided by numerous Bay-Delta stakeholders to DWR and Reclamation as part of the BDCP process, and they were addressed in large part in the January 2014 California Water Action Plan. They have mainly been ignored or prematurely rejected by the single-focused BDCP/CWF proponents.

1. Capture water when there is high flow in the Delta and its upstream tributaries. This will require additional storage in or close to the Delta and south of the Delta. Additional storage located north of the Delta is needed, but it will not address the current problems of increasing water availability south of the Delta.
2. Storing captured water in wet periods will reduce the pressure to rely on the Delta for exports in drier periods. This will reduce resistance to adoption by the SWRCB and fishery agencies of necessary increased protections for fish in drier periods in the form of increased flows, and more stringent reverse flow limits and export restrictions. Only after the flows needed to sustain fish species are established will it be possible to determine how much water is available for export by the BDCP/CWF proponents.
3. If increases in Delta exports are focused on periods of high Delta outflow, water quality will be good enough in the western Delta to meet export needs. DWR and Reclamation should analyze alternatives involving new intakes in the western Delta in the vicinity of Sherman Island. Such an alternative would maintain flows for the fish through the Delta and eliminate the problems of reverse flows caused by both the south and north Delta intakes. During high flow periods, key pelagic fish species will be located west of Sherman Island. This alternative will also eliminate the need to construct lengthy expensive tunnels all the way under the Delta.
4. Increasing flows in the Delta during drier months will also help restore and maintain good water quality in the interior Delta.
5. Exports from the south Delta could still continue but only under "safe" conditions for fish. Reverse flows in Old and Middle Rivers would need to be highly constrained, *e.g.*, Old and Middle River flows that are never less than, say, -2,000 cfs, as a monthly average, in all months.
6. Implement a portfolio of other actions to reduce demand on the Delta, strengthen Delta levees, address other fish stressors, and restore habitat in the Delta and in its upstream tributaries.

If done right, this approach will result in a win-win-win solution that <u>achieves</u> both coequal goals and the inherent goals of improving water quality in the Delta and protecting the Delta as an evolving place (see Wat. Code, § 85020). The current Bay Delta Conservation Plan/California WaterFix maintains the existing "lose-lose" situation that pits water users against the environment and forces the SWRCB to balance rather than <u>enhance</u> beneficial uses. Indeed, it is

telling that despite the court decisions upholding the Fall X2 limits, the export contractors still included an analysis of the proposed project without Fall X2 in the RDEIR/SDEIS (Appendix F).

It is unfortunate not to mention tragic for Delta smelt and other declining fish populations that after the expenditure of more than $250 million on planning studies, and after tying up the staff resources of state and federal agencies and interested stakeholders for more than nine years, the BDCP/CWF proponents have failed to produce a viable or legally-permissible solution to the water and ecosystem problems facing California, and have failed to produce a legally adequate environmental document.

Once again, Contra Costa County respectfully asks that you both take a hard look at the current flawed BDCP/CWF process (and the legally inadequate RDEIR/SDEIS).

As discussed earlier, what is needed is an inclusive process – one that involves local agencies and other Bay-Delta stakeholders –to seriously consider new project alternatives that will actually solve rather than exacerbate the problems of the Delta, and that will sustain a healthy Delta ecosystem and a reliable water supply.

If you have any questions regarding Contra Costa County's comments, please contact me at (510) 231-8686 or Ryan Hernandez at (925) 674-7824.

Sincerely,

John Gioia, Chair
Contra Costa County Board of Supervisors

Attachments
A – Summary of CEQA/NEPA Comments
B – Detailed Comments on BDCP/CWF RDEIR/SDEIS
C – Detailed Analysis Of WaterFix Project Impacts based on Water Fix Modeling and Sensitivity Analysis Data
D – Recent Contra Costa County correspondence regarding BDCP and WaterFix

Cc: Governor Jerry Brown
U.S. Secretary of Commerce, Jenny Pritzker
U.S. Secretary of Interior, Sally Jewell
U.S. Deputy Secretary of Interior, Michael Connor
Senator Diane Feinstein
Senator Barbara Boxer
Congressman Mark DeSaulnier
Congressman Mike Thompson
Congressman Eric Swalwell

Congressman John Garamendi
Congressman Jerry McNerney
Congressman Jared Huffman
Congresswoman Nancy Pelosi
Christy Goldfuss, Managing Director, Council on Environmental Quality
Will Stelle, Regional Administrator, NOAA Fisheries, West Coast Regional Office
Ren Lohoefener, Regional Director, USFWS, Pacific Southwest Region
Jared Blumenfeld, Region 9 Administrator, U.S. Environmental Protection Agency
Brigadier General Mark Toy, South Pacific Region, U.S. Army Corps of Engineers
Charlton H. Bonham, Director, California Department of Fish and Wildlife
Mark W. Cowin, Director, California Department of Water Resources
Felicia Marcus, Chair, State Water Resources Control Board
Contra Costa County Board of Supervisors

Attachment A

Summary of Contra Costa County's CEQA/NEPA Comments

The following is a summary of Contra Costa County's comments regarding the California WaterFix (CWF) Partially Recirculated Draft Environmental Impact Report / Supplemental Draft Environmental Impact Statement (RDEIR/SDEIS). Contra Costa County hereby incorporates by reference all of its previously-submitted comments on the BDCP EIR/EIS, and reiterates those comments to the extent that they apply to the RDEIR/SDEIS. Unless noted otherwise, comments in the July 2014 summary remain relevant to review of the RDEIR/SDEIS.

Contra Costa County provided extensive and constructive comments on the November 2013 Bay Delta Conservation Plan (BDCP) Draft Environmental Impact Report/Environmental Impact Statement (DEIR/EIS) but the County's comments do not appear to have been thoughtfully considered. None of the County's constructive suggestions were incorporated into the RDEIR/SDEIS. This new environmental document perpetuates the flawed BDCP DEIR/EIS, and another 20 months or more have been wasted – time that the dramatically declining fish populations, and Californians with insufficient water supply don't have.

Unfortunately, it is clear from the commitment of resources to, and support of, the proposed project, and from the degree of specificity with which the proposed project has already been planned, the lead agencies have predetermined what would be the preferred project before undertaking adequate environmental review. The proposed project was not analyzed under CEQA and NEPA at the earliest possible time. Moreover, the proposed project was not described in such a way that would allow for flexibility to respond to changes arising during environmental review. Instead, the lead agencies' favoring towards the proposed project ripened into commitment to a definitive course of action (*i.e.*, a commitment to the proposed project, without any variation) well before meaningful environmental review was performed; and, consequently, the power to influence key public decisions about the project was lost at the outset. (See, e.g., *Save Tara v. City of West Hollywood* (2008) 45 Cal.4th 116, 130-131.) What followed was inadequate environmental review and the preparation of a flawed environmental document.

Contra Costa County also has identified the following specific defects with the RDEIR/SDEIS:

1. The **Project Need** acknowledges there is an urgent need to improve the conditions for threatened and endangered fish species within the Delta. (ES.1.2.2.3 Project Need, Page ES-6). However, the RDEIR/SDEIS is inadequate because it narrowly confines the Project Need statement to improvements in the conveyance system. As described in detail in the January 2014 California Water Action Plan and the 2009 Delta Reform Act, additional storage and actions to conserve water and reduce demand are also needed "*to respond to increased demands upon and risks to water supply reliability, water quality, and the aquatic ecosystem*. (Page ES-6).

2. The RDEIR/SDEIS is inadequate because the preferred alternative (Alternative 4A) and the other BDCP and WaterFix alternatives are not consistent with the Project Objectives (Executive Summary, Page ES-5)

The proposed physical and operational improvements would not help to restore and protect ecosystem health, water supplies of the State Water Project (SWP) and Central Valley Project (CVP) south of the Delta, and water quality in the Delta.
The proposed changes to the operation of existing SWP Delta facilities are not adequate to address the existing adverse effects of the SWP on state and federally listed species.
The SWP and CVP south Delta intakes would still be used for 50% of exports, and the intake to Clifton Court Forebay would remain unscreened.
Most of the exports during dry years, when the Delta is most stressed, would be from south Delta.
The lead agencies are assuming the Army Corps of Engineers' limits on inflow to Clifton Court Forebay will no longer apply, and the lead agencies have improperly redefined the SWRCB's export/inflow standards to allow increased exports from the Delta, especially during drier months when the Delta ecosystem is most stressed.

The proposed new facilities and operations for diverting water entering the Delta from the Sacramento Valley and conveying it to existing SWP and CVP pumping plants in the southern Delta will harm and impair, rather than improve, conditions for state and federally listed species. To restore and sustain the Delta ecosystem and also improve water supply reliability, it will be necessary to develop new facilities to capture and store water when there are high flows in the Delta (wet months) and convey that water to south-of-Delta groundwater storage. The RDEIR/SDEIS is inadequate because the proposed project does not meet any of California's urgent ecosystem and water needs.

3. The RDEIR/SDEIS states that the **NEPA Purpose statement** reflects the intent to advance the coequal goals set forth in the Sacramento–San Joaquin Delta Reform Act of 2009 of providing a more reliable water supply for California and protecting, restoring, and enhancing the Delta ecosystem (Page ES-6, Line 21). The RDEIR/SDEIS is inadequate because the project alternatives would hinder rather than advance achievement of the coequal goals.
   a. Both the unscreened south Delta intakes and the new north Delta intakes on the pathway of migrating anadromous fish would significantly harm key fish species.
   b. The project proponents have not incorporated increased Delta flow criteria considered by the SWRCB and Department of Fish and Wildlife to be necessary to restore and sustain fish populations.
   c. The project proponents continue to oppose increased flows in the Fall to protect key fish species (*i.e.*, maintaining Fall X2) and they still include alternatives with no Fall X2 (see Appendix F).
   d. The project would increase exports from the Delta during dry months when outflows are lowest and the Delta ecosystem is most stressed.

4. The unseemly rush to "*get stuff done*," and the export contractors' mandate to remain within the BDCP $250 million planning budget, meant that no detailed modeling was done of the new alternatives before the RDEIR/SDEIS was released. The RDEIR/SDEIS is

woefully inadequate under CEQA and NEPA because the preferred alternative and other new alternatives were not actually modeled. In other words, there was no objective analysis of project alternatives. This is unacceptable for any project, not to mention a $15 billion project that would likely significantly harm key fish species; and this is not worthy of State agencies tasked with managing California's water and fish resources.

a. There are major differences in acreage of habitat restoration and compliance with the Emmaton water quality standard between new alternatives (4A, 2D, and 5A) and the alternatives that were analyzed in the BDCP DEIR/EIS.
b. In addition, in response to extensive comments by Contra Costa Water District, the City of Antioch, the North Delta Water Agency and others, the CALSIM II and DSM2 models have been recently corrected and updated to correct problems with the original BDCP Draft EIR/EIS modeling. The lead agencies decided to use the flawed modeling "as is" in the RDEIR/SDEIS (RDEIR/SDEIS Appendix B, page B-3).
c. The RDEIR/SDEIS is "*sufficiently incomplete and opaque to deter its evaluation and use by decision makers, resource managers, scientists and the broader public*" (Delta Independent Science Board. September 30, 2015 comment letter).
d. Even DWR agrees that the "sensitivity analyses" **are not full model runs.** Minor changes were made to the full model runs performed for the BDCP Public Draft to assess the effects of individual changes to the Emmaton compliance location, the amount of habitat restoration, etc. CALSIM II sensitivity model runs were not re-balanced to address any new or modified effects (as would be done for a full model run) that may be a result of the minor changes. The sensitivity analyses are only valid to assess the impacts of the minor changes. CALSIM II and DSM2 results from the sensitivity runs should only be used to answer the specific questions for which the runs were performed (WaterFix Modeling Data Disclaimer provided to Contra Costa County with the electronic versions of the "sensitivity analysis" data).
e. The Alternative 4 CALSIM II models from BDCP Draft EIR/EIS were used, as is, for the Alternative 4A sensitivity analysis, without including any recent updates to the CALSIM II since the draft EIR/EIS was completed. The RDEIR/SDEIS states that this was done "*to remain consistent with the draft EIR/EIS modeling*" (Appendix B, Page B-3, Line 6). Because there were serious problems with the Draft EIR/EIS modeling, the models had to be updated. It is unacceptable to use these flawed analyses for the RDEIR/SDEIS. Relying on these models results in inaccurate estimates of changes in flows, exports and water quality caused by the proposed project and does not provide a reasoned analysis of environmental impacts.

5. The preferred alternative (Alternative 4A) and the other BDCP and WaterFix alternatives would seriously harm key fish species and the Delta ecosystem. The RDEIR/SDEIS is inadequate because it fails to avoid or mitigate these significant adverse impacts to the Bay and Delta ecosystems.
   a. The unscreened south Delta intakes will continue to be used for 50% of the SWP and CVP exports and the WaterFix project would implement new operations rules that would increase rather than decrease south Delta exports.

b. The new north Delta intakes on the pathway of migrating anadromous fish would significantly harm key fish species, as acknowledged in the BDCP Draft EIR/EIS Executive Summary.
c. The north Delta intakes will impact flows in Sutter and Steamboat Sloughs reducing survival of key anadromous fish species.
d. The elimination of almost all habitat restoration projects in WaterFix means that there will be no ecosystem offset (*i.e.*, no mitigation) for these substantial, adverse impacts on fish.
e. The project alternatives are contrary to State and Federal law (Public Law 112-74) because they fail to contribute to achievement of both of the coequal goals.

6. The RDEIR/SDEIS is inadequate because the preferred alternative (Alternative 4A) and the other BDCP and WaterFix alternatives would not result in any significant increase in **water supply** to exports areas. This therefore fails to meet the project purpose and fails to help achieve the coequal goal of improving water supply reliability for California (2009 Delta Reform Act).

7. The RDEIR/SDEIS is inadequate because the preferred alternative (Alternative 4A) and the other BDCP and WaterFix alternatives fail to analyze and disclose the potentially significant adverse impacts on **water quality** in the Delta. The RDEIR/SDEIS is inadequate because: the water quality changes due to the preferred alternative have not been modeled using full DSM2 runs; the sensitivity analyses are not the same as actual model runs; and any conclusions about water quality impacts in the RDEIR/SDEIS are, therefore, purely speculative.
   a. The BDCP Draft EIR/EIS showed significant adverse water quality impacts throughout the Delta that were described by the BDCP proponents as unavoidable.
   b. The RDEIR/SDEIS now attempts to demonstrate through sleight of hand (but no actual modeling) that the new project proposal will not result in any water quality impacts.
   c. The failure to do actual water quality model runs means that the RDEIR/SDEIS relies on speculative language that is not based on fact, or good science. With respect to Barker Slough, the RDEIR/SDEIS states: "Because new alternatives 4A, 2D, and 5A contain a lower acreage of tidal restoration, significant impacts with regard to bromide <u>are not expected</u> under these alternatives (Page ES-28, Line 19). With respect to Suisun Marsh water quality, the RDEIR/SDEIS states: "the results of sensitivity analyses performed indicate that chloride increases in Suisun Marsh predicted via the modeling would not occur, ... For these reasons, any changes in chloride in Suisun Marsh are <u>expected to have no adverse effect</u> on marsh beneficial uses."
   d. Fostering further degradation of Delta water quality is poor public policy and contrary to the statutory requirements of the 2009 Delta Reform Act (Cal. Water Code 85020(e));

8. The BDCP Draft EIR/EIS signaled DWR's intent to shift the compliance point for the SWRCB's **Emmaton water quality standard** from Emmaton to Three Mile Slough. This

has been dropped from the RDEIR/SDEIS preferred alternative because it caused significant degradation of water quality in the Delta. This significant adverse impact on Delta water quality is apparently avoidable, despite assertions made in the BDCP Draft EIR/EIS. Because DWR intends to shift the Emmaton compliance point, but after certification of the Final EIR, this represents piecemealing of a project under CEQA (*California Code of Regulations, Section 15126*). ***All*** phases of a project must be considered when evaluating its impact on the environment: planning, acquisition, development, and operation.

9. The RDEIR/SDEIS does not comply with CEQA because additional storage will be needed to meet the project need of improving CVP and SWP water supply. Increase Delta flows are also needed to restore and sustain the Delta ecosystem. Apparently this will not be addressed by the SWRCB until after the SWRCB issues water right and Clean Water Act Section 401 approvals for the WaterFix project. Because both additional storage and increased Delta outflows are necessary to achieve the project goals and comply with the 2009 Delta Reform Act, this also represents piecemealing of the project under CEQA (*California Code of Regulations, Section 15126*).

10. The RDEIR/SDEIS is inadequate because it fails to analyze a reasonable range of alternatives, as required under CEQA and NEPA, as well as the 2009 Delta Reform Act. The nature and scope of the alternatives analyzed in the RDEIR/SDEIS do not satisfy the "rule of reason" and do not enable the lead agencies to make a "reasoned choice" regarding the project.
    a. Fourteen (14) of the 15 alternatives in the BDCP Draft EIR/EIS were essentially the same alternative (an isolated facility and north Delta intakes). The three new alternatives in the RDEIR/SDEIS have the same basic infrastructure as the original 14. Only BDCP Draft EIR/EIS Alternative 9, through-Delta conveyance only, is different from the others. None contributes to achievement of the coequal goals.
    b. Previous commenters on the BDCP have suggested alternatives that incorporate a portfolio of actions, such as water conservation, desalination, and local water supply reliability to reduce demand for water from the Delta. Commenters have also suggested adding new storage to allow water to be captured during periods of high flow into the Delta and through into San Francisco Bay, as well as alternative locations for the new intakes, such as the western Delta at Sherman Island. Commenters and the SWRCB have also requested alternatives that include significant increases in Delta outflows, but these were not taken seriously by the WaterFix lead agencies. Therefore, the lead agencies have failed to comply with CEQA by failing to provide a good faith, reasoned analysis of comments and suggested project alternatives. Moreover, although commenters have proposed alternatives that would reduce significant environmental impacts and achieve most project objectives, the lead agencies have excluded those suggestions from the alternatives analysis, thereby violating CEQA.

c. No actions to reduce reliance on the Delta, such as regional supplies, conservation or water use efficiency, are considered. (2009 Delta Reform Act, Cal. Water Code Section 80521);
d. No screening of the Clifton Court Forebay even though screening of other Delta diversions is proposed as a conservation measure, and the Conceptual Engineering Report for a through-Delta alternative shows that constructing a screened intake off Victoria Canal is indeed feasible.

11. The analysis of water quality impacts in the BDCP Draft EIR/EIS used computer models that contained significant errors. These models have since been updated. The analysis for the RDEIR/SDEIS was based only on "sensitivity analyses" which DWR acknowledges are not actual model runs. The RDEIR/SDEIS is woefully inadequate because it:
    a. Fails to accurately model and disclose the magnitude of adverse Delta water quality impacts;
    b. Fails to disclose adverse water quality impacts that would occur in subsequent months once the BDCP modeling errors were corrected;
    c. Fails to meet required SWRCB standards such as the Rock Slough chloride standards, even in the base cases (i.e., without BDCP);
    d. Fails to apply consistent flow inputs to the water quality models. The use of daily variations in Sacramento River inflows to the Delta but monthly variations in Delta exports in the BDCP modeling studies caused large unrealistic spikes in water quality that distort the impact analyses. It is reasonably feasible to evaluate the true environmental impacts of the proposed project using accurate modeling; the lead agencies just choose not to do that. And the lead agencies have failed to provide a reasoned basis for not analyzing these impacts.

12. The analysis of environmental impacts in the RDEIR/SDEIS includes a number of significant changes to existing facilities and existing Delta operation standards (e.g., State Water Resources Control Board Water Rights Decision 1641 ("D-1641")). The RDEIR/SDEIS is inadequate because it hides and fails to disclose the individual adverse impacts of each individual change. These changes are:
    a. Adding new diversion intakes in the north Delta on the Sacramento River;
    b. Adding a permanent operable flow barrier at the Head of Old River;
    c. Eliminating or ignoring the existing U.S. Army Corps limits of the inflow from the south Delta into Clifton Court Forebay;
    d. Relaxing the SWRCB's D-1641 export/inflow standards to allow increased exports;
    e. Ignoring the current biological opinion limits on the ratio of San Joaquin inflow to south Delta exports.

13. The RDEIR/SDEIS assumes new limits on operation of the south Delta export pumps in the fall (September-November) and the spring (March-May), which when combined with existing Delta standards in the spring (February-June X2 limits) will shift the existing impacts of reduced flows and export diversions to July-August. Unless enhanced protections for fish are also set during July and August along with Fall X2 limits in critical,

dry and below normal years, the proposed project will put other fish species, not currently listed or in decline, at risk. The RDEIR/SDEIS is inadequate because it fails to protect resident fish species from redirection of adverse impacts to the summer months.

a. The WaterFix operations criteria need to include Old and Middle River flow limits for July- September. This is consistent with the original objectives of reducing (not increasing) exports from the south Delta;
b. The BDCP operational criteria needs to have Fall X2 limits for critical, dry and below normal years, as well as corresponding Delta outflow, X2 and Rio Vista flow requirements for July-August;
c. The proposed WaterFix north Delta intake would need to include more protective limits for July- September to avoid shifting adverse impacts to these three months.

14. The RDEIR/SDEIS fails to fully analyze alternatives with increased flows as a percentage of unimpaired flow as informed by the SWRCB's 2010 Delta Flow Criteria Report and corresponding California Department of Fish and Wildlife (formerly Fish and Game) 2010 Quantifiable Biological Objectives and Flow Criteria for Aquatic and Terrestrial Species of Concern Dependent on the Delta Report. The RDEIR/SDEIS is also inadequate because it fails to present modeling study flow results as percentages of unimpaired flow to allow comparison with the SWRCB and DFW recommendations. By not presenting this essential information, the RDEIR/SDEIS hides significant adverse environmental impacts from decision makers, regulators, and the public, in violation of CEQA and NEPA. Once again, it is reasonably feasible to evaluate the true environmental impacts of the proposed project using accurate modeling; the lead agencies just choose not to do that. And the lead agencies have failed to provide a reasoned basis for not analyzing these impacts.

15. The RDEIR/SDEIS fails to optimize reservoir operation rule curves to represent realistic reservoir and export operations by the SWP and CVP in response to new conveyance facilities, global climate change and enhanced Delta flow requirements.

Because of these and other WaterFix RDEIR/SDEIS inadequacies, a new Draft EIR/EIS must be prepared that addresses all of these important issues. A broad group of Delta stakeholders must be invited by the California Natural Resources Agency and the U.S. Department of Interior to engage in this process of getting the development of a viable solution to the ecosystem, water quality, levee, groundwater, instream flow, and water supply reliability problems of the Bay-Delta system back on track. The new Draft EIR/EIS must then be released for detailed public review and comment.

Attachment B

Contra Costa County Comments on WaterFix RDEIR/SDEIS

General Comment on the Inadequacy of All BDCP Alternatives

The Draft Bay-Delta Conservation Plan (BDCP)/California WaterFix (WaterFix) partially Recirculated Draft Environmental Impact Report/Supplemental Draft Environmental Impact Statement (RDEIR/SDEIS) focuses on the WaterFix preferred alternative (Alternative 4A), a 9,000 cfs isolated facility with continued use of the south Delta export intakes. However, most of the flaws identified by Contra Costa County and others with respect to this preferred alternative also apply to the other new alternatives and those in the BDCP Draft EIR/EIS.

All of the alternatives analyzed in the RDEIR/SDEIS are inadequate. A new Draft EIR/EIS must be prepared that analyzes new alternatives incorporating increased Delta flows to restore and sustain fish populations (consistent with the State Water Resources Control Board's (SWRCB) 2010 Delta Flow Criteria), new storage, other potential intake locations, actions to reduce demand for water from the Delta, levee strengthening, and groundwater recharge and management actions. The new Draft EIR/EIS must include actual modeling studies of the alternatives, not brief sensitivity analyses, with water quality analyses for the full period of the operations studies (1922-2003, preferably extended through 2014). The new Draft EIR/EIS should then be released for public review and comment.

The County's comments focus on the WaterFix preferred alternative 4A, Scenario H3. The County is still very concerned that the alternatives still include elimination of the Army Corps limits on inflow to Clifton Court Forebay, and fail to comply with the Central Valley Project (CVP) and State Water Project (SWP) biological opinion limits on the San Joaquin inflow to south Delta exports ratio. The preferred alternative includes Fall X2, but the project proponents are still leaving open the possibility of operating the WaterFix preferred alternative without Fall X2 (see RDEIR/SDEIS Appendix F).

Considering the significant historical reduction of flows and degradation of water quality in the Delta in the fall, as well as the scientific relationships between fish abundance and X2 in the Fall, it is outrageous that the Natural Resources Agency, the Department of Water Resources, and the U.S. Bureau of Reclamation continue to fail to accept the need for increased outflows in the Fall and decreased Fall X2.

It is also appalling that these agencies with responsibilities to contribute to protecting fish in the Delta, have failed to analyze alternatives designed to adapt to reasonably foreseeable SWRCB increased Delta flow requirements (consistent with the 2010 Delta Flow Criteria developed by the SWRCB and Department of Fish and Wildlife). An alternative (4H3) that responds to a SWRCB request for analysis of increased Delta flow requirements is discussed in Appendix C, but no attempt was made modify the proposed project, e.g., by adding storage, to optimize this potentially more viable alternative.

Most of the serious flaws identified by Contra Costa County and others with the WaterFix preferred alternative remain, such as the harm caused to key fish species, degradation of Delta water quality, increasing rather than decreasing total exports and even south Delta exports during drier months (relative to existing conditions), and the failure to increase water supply reliability, also apply to the other WaterFix and BDCP alternatives.

A new Draft EIR/EIS must be prepared that includes alternatives that commit to actions that actually achieve the co-equal goals of improving water supply reliability and restoring the Delta ecosystem, while improving Delta water quality and protecting the Delta as a place. The new Draft EIR/EIS must then be released for public review and comment.

General Comment – The WaterFix preferred alternative hinders rather than contributes to meeting coequal goals and the needs of California

The RDEIR/SDEIS preferred alternative is significantly flawed and is not in the interest of California. The latest WaterFix proposal is the result of the state and federal administrations ceding their responsibilities to the export water contractors. The proposed north Delta intakes and operating rules will harm key fish species by reducing flows downstream of the intakes which also increases predation and reduces survival, altering the olfactory cues for returning salmon and steelhead, and impinging and entraining fish at the new screened intakes. The preferred alternative will continue to rely on south Delta exports for 50% of the total exports and will increase rather than decrease exports in drier months, will not minimize reverse flows in many months and will increase reverse flows in some, and Clifton Court Forebay will remain unscreened. The south Delta exports will, therefore, continue to harm key fish species.

The BDCP proposed project was found to significantly degrade water quality in the Delta and impair drinking water, agriculture, recreation and fish and wildlife beneficial uses in the Delta. No full model runs were performed to determine the water quality impacts of the new WaterFix alternatives, only "brief sensitivity analyses" with incomplete information and based on earlier flawed BDCP model runs for entirely different amounts of habitat restoration and sea level rise (late long term instead of early long term) have been run. The WaterFix proponents now speculate that the water quality impacts identified in the Draft BDCP EIR/EIS are now avoidable, but present no model run data to support this claim.

Depending on how much habitat restoration is done for WaterFix and EcoRestore and the locations of that habitat restoration, the adverse water quality impacts in some areas of the Delta such as Barker Slough and Suisun Marsh could be extremely large. The habitat restoration under WaterFix and EcoRestore is not specified or analyzed in the RDEIR/SDEIS.

The BDCP proponents have refused to seriously consider alternatives that incorporate actions identified in the January 2014 California Water Action Plan and requested repeatedly by commenters on the BDCP Administrative Draft EIR/EIS and Public Draft EIR/EIS, *e.g.*, additional storage and other infrastructure to allow the project to capture additional water in wet months, and water use efficiency and demand reduction actions. This would make more water available in an environmentally responsible way that could then be used to improve water supply

reliability and improve the Delta ecosystem by reducing exports in drier periods. The current drought emergency has demonstrated the need for ways to capture water in wet months and store it for later use during drier periods.

The WaterFix preferred alternative also hinders and delays California's efforts to increase California's water supply reliability. The proposed north Delta intake and tunnel project fails to produce any significant increase in water supply from the Delta.

The WaterFix and BDCP alternatives fail to achieve either of the coequal goals set by the legislature, and endorsed by Congress in 2009 (Public Law 112-74). The immense financial and human resources cost of the proposed project will prevent other more viable actions to address California's water problems from being realized.

The RDEIR/SDEIS must be withdrawn, new alternatives developed and analyzed in detail, and a new Draft EIR/EIS must be released for public comment and review.

General Comment – The WaterFix proposed project is seriously flawed because it will harm rather than benefit listed fish species

The WaterFix proposed project is seriously flawed. The original basis for the Bay-Delta Conservation Plan was to obtain regulatory assurance (50 years) by improving and restoring the ecosystem in the Delta for key fish species. The WaterFix project will no longer restore the promised 65,000 acres of habitat, instead only a small amount of restoration is proposed by the project proponents to be enough to mitigate impacts from the WaterFix project.

However, the conveyance component of the BDCP proposal, adding new export intakes in the north Delta on the Sacramento River, was retained. This was recommended by the fish agencies many years ago as a means of reducing the impacts of south Delta exports on fish. Detailed review of the analyses performed for the BDCP and WaterFix environmental documents reveal that the impacts of the south Delta exports will remain significant.

The WaterFix preferred alternative would:

(a) Eliminate or ignore existing U.S. Army Corps of Engineers limits on inflow to Clifton Court Forebay which would result in increases in the maximum inflows from 6,680-7,180 cfs up to 10,300 cfs (BDCP Draft EIR/EIS, page 3-32. line 12 and not disclosed in the RDEIR/SDEIS);

(b) Fails to screen the intake to the Forebay (even though DWR's November 2009 Conceptual Engineering Report – Through-Delta Facility Conveyance Option contains feasible examples of how this could be done, see Fig. 7-5 of the CER);

(c) Creates reverse flows in Old and Middle River (OMR) that are even worse at certain times of the year relative to existing conditions, and fail to minimize reverse flows in many other months;

(d) Ignore the biological opinion limits on the ratio of San Joaquin inflow to south Delta exports;

(e) Still use the south Delta for 50% of the total SWP and CVP exports.

As revealed in the November 2013 Draft BDCP, the north Delta intake would also harm key fish species by reducing flows on the Sacramento River below the new intakes which will reduce the survival of anadromous fish heading to and from the ocean, change the olfactory cues used by the salmon to return to their native spawning grounds, and increase predation (see BDCP pages 3.2-8, 5.5.3-32 and 5.5.3-39).

The three new WaterFix intakes will be upstream of the entrances to Sutter and Steamboat Sloughs. Reductions in flows in the Sacramento River below the intakes will likely reduce the percentage of out-migrating salmon using the safer Sutter-Steamboat route to the ocean. The project proponents considered locating the north Delta intakes downstream of the entrances to Sutter and Steamboat to reduce this significant adverse impact on these key fish species (BDCP Draft EIR/EIS, Appendix 3F, page 3F-6), but the intakes are now proposed to be located upstream. The BDCP also assumed that tidal restoration in the Cache Slough complex could modify flows and tidal variations and reduce the impacts of the north Delta intakes on fish passage through Sutter and Steamboat. However, this tidal habitat restoration is no longer part of the WaterFix project.

The proposed WaterFix new intake and tunnel facilities and continued use of the inadequately screened south Delta export intakes are likely to seriously harm key fish species and fail to contribute to restoring and sustaining the Delta ecosystem. A new Draft EIR/EIS must be prepared that includes new alternatives incorporating new storage, other possible intake locations in the Delta, that would benefit threatened and endangered species and other resident fish in the Delta. The new Draft EIR/EIS must then be recirculated for public review and comment.

General Comment – The impacts of the WaterFix plan to increase the inflow to the unscreened Clifton Court Forebay from the south Delta are not disclosed, analyzed or permitted

A detailed review of the WaterFix sensitivity analyses data for Alternative 4A reveals that the monthly exports from the south Delta exceeded the U.S. Army Corps of Engineers (USACE) limits on inflow to Clifton Court Forebay from the south Delta. See Attachment C to this letter.

As described on page 5A-B6, per U.S. Army Corps of Engineers Public Notice 5820A (13 October 1981), the USACE determined that DWR would not require additional USACE permitting for the SWP's diversions from the Delta as long as the SWP is limited to daily diversion into Clifton Court Forebay that would not exceed 13,870 acre-feet and the 3-day average diversions into Clifton Court Forebay would not exceed 13,250 acre-feet (about 6,680 cfs). In addition, the SWP can increase diversions into Clifton Court Forebay by one third of the

San Joaquin River flow at Vernalis during the period from mid-December to mid-March when the flow of the San Joaquin River at Vernalis exceeds 1,000 cfs.

As also described on page 5A-B3 of the BDCP Draft EIR/EIS, an additional capacity of 500 cfs (up to 7,180 cfs) is allowed into Clifton Court Forebay for July–September for reducing impact of NMFS biological opinion (June 2009) Action IV.2.1 Phase II on the SWP.

During April-November when inflows are limited 6,680 – 7,180 cfs, the sensitivity analyses for Alternative 4A, and BDCP modeling studies suggest inflows to Clifton Court (SWP through-Delta exports) will be as high as 9,750 cfs with total south Delta exports as high as 14,350 cfs. This is not consistent with the claimed benefit of the north Delta intakes of reducing exports from the south Delta.

The WaterFix RDEIR/SDEIS is inadequate because it fails to clearly disclose to the public and to decision makers like the Army Corps that DWR is proposing to eliminate existing limits on the inflow to Clifton Court. In several locations in the BDCP Draft EIR/EIS, it was noted that pumping at Banks Pumping Plant is assumed to be up to the installed capacity of 10,300 cfs. In Table 3-6 on page 3-36 of the BDCP Draft EIR/EIS, it is stated that Alternatives 1-4 and Alternatives 6-8 do not incorporate the operational rule related to the permitted limit on Clifton Court Forebay inflow (6,680 cfs plus 1/3 of San Joaquin River Dec 15–March 15). Therefore, it is not clear whether the operation rule is in fact 10,300 cfs. The revisions to BDCP Draft EIR/EIS Chapter 3 in the RDEIR/SDEIS (Appendix A, Chapter 3) no longer include reference to the limits on Clifton Court inflow, nor are there any tracked change deletions.

DWR also failed to disclose its intent to eliminate the limits on inflow to Clifton Court in its Section 404 application to the Army Corps. Nowhere is it disclosed whether this is DWR's intent or not, but the sensitivity analysis data in the RDEIR/SDEIS contains frequent willful exceedances of this limit.

This proposal to increase SWP exports from the south Delta is a major change that could have significant impacts on the Delta ecosystem and Delta water quality. It is also contrary to the stated project goal of reducing the existing adverse impacts of south Delta diversions. A new Draft EIR/EIS must be prepared that fully discloses DWR's intent to increase south Delta exports and to disclose the environmental impacts of eliminating the current U.S. Army Corps limits. This will enable the public and regulatory agencies to assess the adverse environmental impacts of this proposed change.

General Comment – RDEIR/SDEIS is inadequate because it fails to describe and analyze alternatives that would improve rather than degrade water quality in the Delta

CEQA requires that an "*EIR shall describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives. An EIR need not consider every conceivable alternative to a project. Rather it must consider a reasonable range of potentially feasible*

alternatives that will foster informed decision making and public participation." (CEQA Guidelines, 14 CCR § 15126.6(a))

The RDEIR/SDEIS is inadequate because it fails to consider and analyze feasible alternatives that incorporate additional storage and new infrastructure to capture "new" water during periods of high flow in the Delta, as well as other more viable intake locations that would not harm key fish species. Both the south Delta and north Delta intake locations would significantly harm fish species. The south Delta export intakes are unscreened or inadequately screened and cause reverse flows that increase entrainment and mortality of fish species in the Delta.

The north Delta intakes will reduce flow into and through the Delta, cause reverse flows in the north Delta and reduce migrating fish survival, and increase predation impacts. The November 2013 Draft BDCP acknowledged that the north Delta intakes will have an adverse impact on key fish species. This is not offset by reducing exports from the south Delta because the south Delta export intakes will continue to be used for 50% of the total exports and most of the exports will still be from the south Delta in dry periods.

The RDEIR/SDEIS also fails to seriously analyze alternatives that incorporate increased Delta flows consistent with the Delta Flow Criteria developed by the SWRCB and Department of Fish and Wildlife in 2010. The analyses that were done (BDCP Alt. 8 and WaterFix Alt. 4H3) used the same configuration as the proposed project without incorporating any infrastructure such as new storage that would allow "new" water to be captured to offset the water being made available to help restore and sustain the Delta ecosystem. New alternatives involving higher Delta flows during dry periods and new storage will help to improve water quality in the Delta, as required by the 2009 Delta Reform Act, rather than degrade it.

The RDEIR/SDEIS must be withdrawn immediately and additional more viable, less costly, alternatives developed. A new Draft EIR/EIS must then be prepared and released for public review and comment.

General Comment – RDEIR/SDEIS is inadequate because it assumes away significant adverse impacts on water quality without doing any detailed modeling runs

The November 2013 BDCP Draft EIR/EIS disclosed significant adverse impacts on water quality in the Delta. The BDCP Draft EIR/EIS described these significant adverse impacts as unavoidable, despite State policy and antidegradation statutes requiring that Bay-Delta projects not only contribute to achieving the both coequal goals, but also contribute to **improving** water quality in the Delta (2009 Delta Reform Act, Cal. Water Code § 85020(e)). The BDCP Draft EIR/EIS failed to offer any meaningful, binding, or effective mitigation for these significant adverse impacts.

Incomprehensibly, the July 2015 California WaterFix RDEIR/SDEIS states that the new alternatives (4A, 2D and 5A) do not have any significant impacts on water quality in the Delta. Apparently, the lead agencies new position is that the significant adverse impacts in the Draft EIR/EIS were avoidable after all.

The July 2015 RDEIR/SDEIS assumes away these significant adverse impacts without supporting those assumptions with any detailed model runs, and only using "brief sensitivity analyses" (Appendix B, page B-1) based on BDCP Draft EIR/EIS modeling studies that were flawed. Comments on the BDCP Draft EIR/EIS by Contra Costa Water District, the City of Antioch, North Delta Water Agency and others identified significant problems with those studies and the modeling tools that were used. The RDEIR/SDEIS acknowledges the CALSIM II model has since been updated (Appendix B, page B-3) but the lead agencies apparently did not consider it was necessary to provide the public and regulatory agencies with new, corrected, detailed model runs. The CALSIM II model runs from the Draft EIR/EIS were "*used as is ..... to remain consistent with the draft EIR/EIS modeling*" (Page B-3) so errors with the original modeling are also in the RDEIR/SDEIS sensitivity analyses.

The claims, in the RDEIR/SDEIS, that there are no significant adverse water quality impacts are purely speculative and optimistic, without any accurate analysis to support them. A new Draft EIR/EIS must be prepared with input from a wide stakeholder group that analyzes and discloses the water quality and other environmental impacts of Alternatives 4A, 2D and 5A and new alternatives that actually contribute to achieving both coequal goals. The new Draft EIR/EIS should then be released for public review and comment.

General Comment – Sensitivity Analyses based on completely different operating rules and climate change conditions are not a substitute for full model runs

The lead agencies used "brief sensitivity analyses" that DWR acknowledges are not full model runs.

The RDEIR/SDEIS in revised language states (Appendix A, Appendix 8G, page 8G-1): "*Understanding the uncertainties and limitations in the modeling and assessment approach is important for interpreting the results and effects analysis, including assessment of compliance with water quality objectives. ..... In light of these limitations, the assessment of compliance is conducted in terms of assessing the overall direction and degree to which Delta chloride would be affected relative to a baseline, and discussion of compliance does not imply that the alternative would literally cause Delta chloride to be out of compliance a certain period of time. In other words, the model results are used in a comparative mode, not a predictive mode.*" The RDEIR/SDEIS is inadequate because it fails to carry out full model runs that simulate the absolute impacts of the proposed project.

DWR included the following Disclaimer with its transmittal of the RDEIR/SDEIS "sensitivity analyses" data to the public.

> **Sensitivity analyses are not full model runs!** Minor changes (as summarized below) have been made to the full model runs performed for the BDCP Public Draft to assess the effects of the specific change. CALSIM II sensitivity model runs were not re-balanced to address any new or modified effects (as would be done for a full model run) that may be a result of the minor changes. The

> sensitivity analyses are only valid to assess the impacts of the minor changes. CALSIM II and DSM2 results from the sensitivity runs should only be used to answer the specific questions for which the runs were performed.

The RDEIR/SDEIS (Appendix B, Page B-3) states that Alternative 4 CALSIM II models from draft EIR/EIS were used, as is, for the Alternative 4A sensitivity analysis, without including any recent updates to the CALSIM II. The RDEIR/SDEIS says the reason for not using the most recent, corrected, versions of the CALSIM II flow operations model was "*to remain consistent with the draft EIR/EIS modeling.*" As discussed in detail in comments by Contra Costa Water District, the City of Antioch, the North Delta Water Agency, and others on the November 2013 Draft EIR/EIS, the draft EIR/EIS modeling was seriously flawed, and the models themselves have since had to be updated.

The sensitivity analyses are also unacceptable for a CEQA/NEPA analysis of environmental impacts because only minor changes were made to the flawed draft EIR/EIS model runs and the CALSIM II runs were not rebalanced or optimized to take into account other changes to the alternatives (DWR Modeling Data Disclaimer).

The sensitivity analyses approach in the RDEIR/SDEIS is not valid and does not inform the Alternative 4A impact analysis.. In fact, it may result in misleading results. For example, the water quality sensitivity analyses were carried out using BDCP proposed project Alternative 4 at late long term (year 2060 future conditions, 65,000 acres of habitat restoration and 45 cm of sea level rise) but the impact analysis in the RDEIR/SDEIS is done at the early long term (year 2025, 25,000 acres of habitat restoration and 15 cm of sea level rise) conditions. Because the water quality analyses still included sea level rise, the effect of seawater is simulated to be much greater at late long term than at early long term.

The RDEIR/SDEIS is inadequate because it uses flawed draft EIR/EIS modeling and a "*brief sensitivity analysis*" (RDEIR/SDEIS Appendix B, page B-1) to analyze and disclose the environmental impacts of a project of statewide importance that is likely to cause significant harm to the Delta ecosystem, and other Delta beneficial uses.

The RDEIR/SDEIS itself acknowledges that "*there is notable uncertainty in the results of all quantitative assessments that refer to modeling results, due to the differing assumptions used in the modeling and the description of the No Action Alternative (ELT)*" (Chapter 4, Page 4.2-18).

The RDEIR/SDEIS states that "*Based on the sensitivity analyses, optimizing the design and siting of restoration areas is expected to be able to reduce EC and chloride increases in Suisun Marsh, relative to Existing Conditions and the No Action Alternative, to levels that would be less than significant.*" (Page ES-27, Line 16) As discussed above, the sensitivity analyses were performed under quite different conditions (late long term with additional sea level rise and much more habitat restoration, 65,000 acres) than the preferred alternative, Alternative 4A (early long term, less sea level rise, no shift in the Emmaton compliance location, and no significant amount of habitat restoration). The RDEIR/SDEIS makes no firm commitments to mitigate the expected impacts by implementing habitat restoration at optimized sites. Only a small amount of

habitat restoration is being considered as part of California EcoRestore and that is already required under the OCAP Biological Opinions. There is no commitment by the WaterFix lead agencies to site that habitat restoration to mitigate Suisun Marsh, Barker Slough or other expected Delta water quality impacts. There are no reliable "facts in evidence" to support the optimistic expectation that water quality impacts will be reduced to less than significant levels. The RDEIR/SDEIS must be withdrawn immediately and detailed modeling studies and analysis of Alternative 4A and additional more viable, less costly, alternatives must be carried out. A new Draft EIR/EIS must then be prepared and released for public review and comment.

General Comment – Sensitivity Analyses show a large range of potential water quality impacts at Barker Slough and in Suisun Marsh

The Sensitivity Analyses were based on the flawed modeling for Alternative 4, Scenario H3 at late long term, i.e., 2060 conditions with habitat restoration, and were not updated using the most recent versions of the CALSIM II and DSM2 models. Figures B-1 and B-2 show the range of EC at Barker Slough for some of the sensitivity analyses:

SA1 BDCP Draft EIR/EIS Alternative 4, Scenario H3 at LLT
SA2d Same as SA1 but with compliance at Emmaton and daily flow variations
SA4 Same as SA1 but with Suisun Marsh Control Gate operations consistent with the NAA
SA4a Same as SA4 but without the 65,000 acres of tidal habitat restoration

The sensitivity analysis data were provided to the County by DWR. Also plotted for comparison purposes is the No Action Alternative developed for the WaterFix RDEIR/SDEIS for late long term. The RDEIR/SDEIS only presented the water quality data as the averages for each month of the year for the short period modeled, water years 1976-1991, and for the water year 1987-1991 drought period. The 1976-1977 drought period was not included in the drought averaging.

As shown in Figure B-1 and Figure B-2, removing the 65,000 acres of habitat restoration could reduce EC at Barker Slough during drought periods (relative to the BDCP Draft EIR/EIS proposed project, SA1) but increases EC significantly in normal and wetter years.

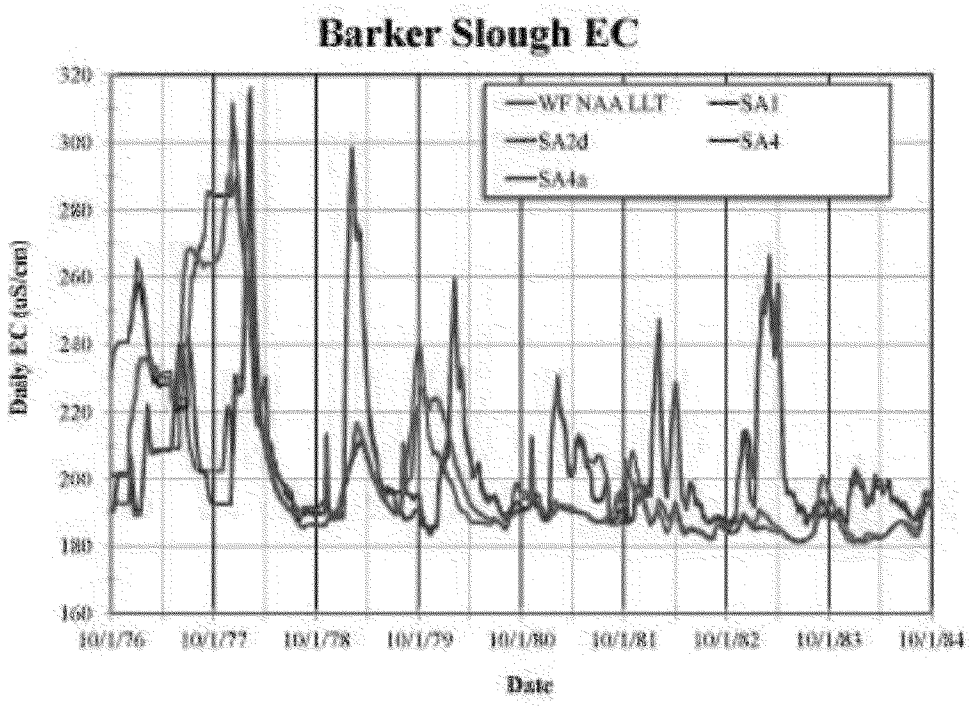

Figure B-1: *Daily EC values at Barker Slough from the sensitivity analyses for the period October 1976 through September 1984.*

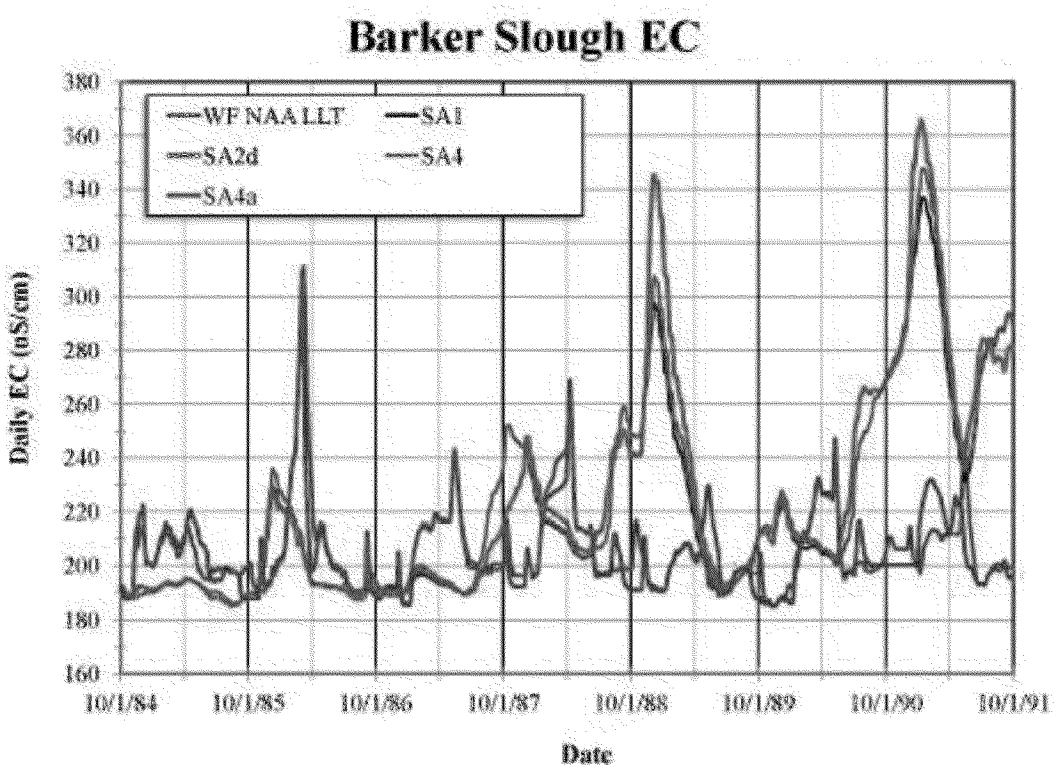

Figure B-2: *Daily EC values at Barker Slough from the sensitivity analyses for the period October 1984 through September 1991.*

The RDEIR/SDEIS only presents bromide concentration changes at Barker Slough and Belden's Landing as period averages (Appendix B, Tables Br-1 and Br-2) but does present chloride concentration changes at these two locations as period averages for each month of the year (Tables Cl-6 and Cl-7). The bromide and chloride concentrations are derived from the simulated EC data using two different methods. However, the corresponding presentation of EC data (Table EC-8A) does not show the averages for Barker Slough or Belden's Landing. This is a major omission.

However, as noted by the Delta Independent Science Board in their September 30, 2015 review of the RDEIR/SDEIS, the presentation of data in this environmental document is "*sufficiently incomplete and opaque to deter its evaluation and use by decision makers, resource managers, scientists and the broader public*." The use of long-term averages in the tables in Appendix B masks the significant changes in water quality at Barker Slough and Belden's Landing and fails to disclose significant adverse water quality impacts.

Depending on where the habitat restoration needed to mitigate the significant adverse impacts of the WaterFix preferred alternative is implemented, and where the habitat restoration for California EcoRestore is implemented, the water quality impacts at Barker Slough and in Suisun Marsh could be significant. The timing of those impacts will also vary depending on the degree of habitat restoration. It is crucial that these impacts be determined, analyzed using full model runs, disclosed and either avoided or mitigated defined, before decisions are made by regulatory agencies such as SWRCB and the Army Corps and the lead agencies regarding the WaterFix project.

Figures B-3 and B-4 show the EC data for each month of the 16-year sensitivity analysis simulation period (192 data points) in the form of scatter plots. The EC data for Barker Slough and Belden's Landing for Sensitivity Analysis #4 (no habitat restoration) are plotted as a function of the WaterFix No Action Alternative and both are at late long term.

Some peak ECs at Barker Slough are reduced relative to the No Action equivalent but significant adverse impacts occur at other times. There are some reductions in EC relative to the No Action equivalent at Belden's Landing but significant adverse impacts occur at other times. The presentation of water quality data must present the data in sufficient detail to fully disclose the daily or month to month variations in water quality, in particular the occasions when salinities increase significantly. It is not acceptable to only present long-term averages that obscure and reduce the significant impacts on urban and agricultural water users, and the Delta ecosystem.

The RDEIR/SDEIS is inadequate because it fails to present analyses data in a form that discloses the daily or month to month impacts of the proposed project on water quality and fails to avoid or provide definitive mitigation for these significant impacts on water quality.

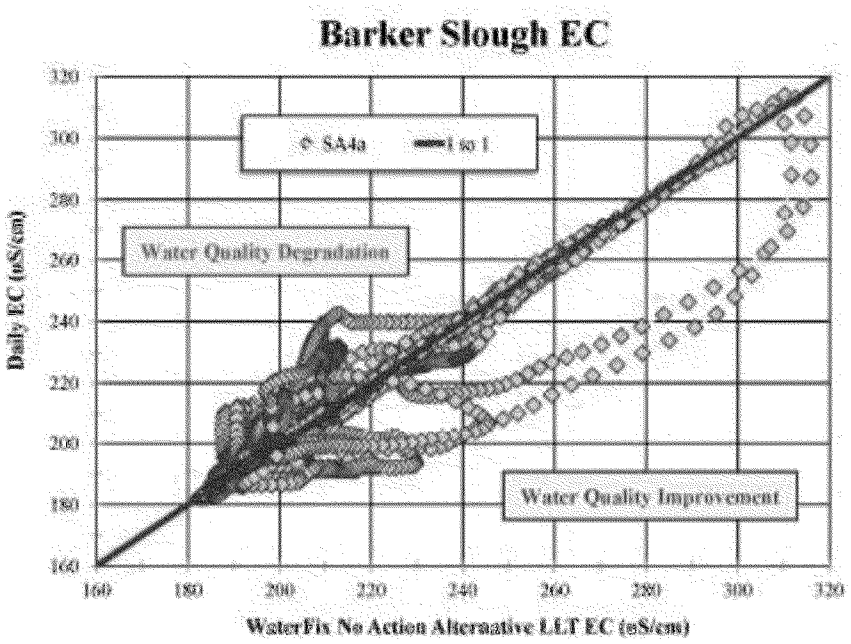

Figure B-3: *Scatter plot of daily EC values at Barker Slough from the WaterFix sensitivity analyses with no restoration (SA4a, LLT) for the period October 1975 through September 1991. Some peak EC are reduced relative to the No Action equivalent but significant adverse impacts occur at other times.*

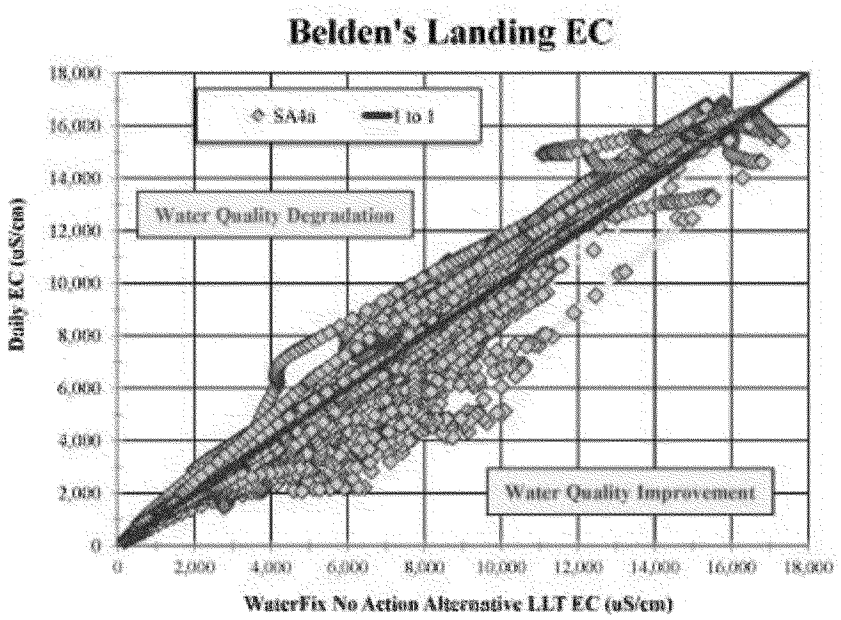

Figure B-4: *Scatter plot of daily EC values at Belden's Landing from the WaterFix sensitivity analyses with no restoration (SA4a, LLT) for the period October 1975 through September 1991. There are some reductions in EC relative to the No Action equivalent but significant adverse impacts occur at other times.*

General Comment – The RDEIR/SDEIS appears to deceive the public and decision makers by presenting tabulated water quality data for the new alternatives when no modeling was done for these specific alternatives

The RDEIR/SDEIS appears to deceive the public and decision makers by claiming that Alternatives 4A, 2D and 5A were evaluated, and that the evaluation was at early long term. Of particular concern are the tables in Appendix B, Supplemental Modeling Results for New Alternatives that claim to present the water qualities for Alternative 4A for Scenario H3 and H4 at early long term when no full model runs or even sensitivity runs were performed for those cases.

A new Draft EIR/EIS must be prepared that performs full modeling of the operations and water quality with the proposed project and new alternatives designed to actually help achieve both coequal goals. Revised modeling results, not based on speculated or assumed values must be presented in the water quality tables. A new Draft EIR/EIS must then be prepared and released for public review and comment.

General Comment – The assumptions in the CALSIM II modeling regarding Delta outflows required to meet Fall X2 may exaggerate the amount of flow needed and reduce the actual water quality impacts of the proposed project

Under existing conditions, the equivalent steady-state Delta outflows required to meet the D-1641 estuarine habitat standards (X2) at Chipps Island (aka Mallard Island) and Collinsville are defined as 11,400 cfs and 7,100 cfs, respectively. By 2025 (early long term) and 2060 (late long term), sea level rise will mean that the amount of Delta outflow needed to meet X2 will increase.

The outflows required to meet the Fall X2 requirement in September and October in the WaterFix analyses using CALSIM II, however, are very much larger. As shown in Figure B-5, the assumed minimum Delta outflows to meet X2 at Mallard Island (in wet years) and Collinsville (above normal years) are about 19,500 cfs and 11,500 cfs, respectively. These flows seem to be too high and may be artificially freshening the Delta during September and underestimating the water quality impacts of the proposed project. The reason for these high flows may be because the CALSIM II only attempts to meet September X2 requirements at the last minute, whereas increasing Delta outflows earlier will require much less Delta outflow.

Figure B-6 shows in the corresponding Delta outflows and minimum required Delta outflows for October. The October outflows are governed by the need to meet Fall X2 in wet and above normal years. Otherwise the D-1641 requirement of 3,000 cfs in critical years and 4,000 cfs in other water years applies. The flows assumed to be required to meet Fall X2 are consistent with the existing X2 outflow requirements. However, excess Delta outflows are occurring in many below normal, dry and critical years, which may underestimate the actual water quality impacts of the proposed project.

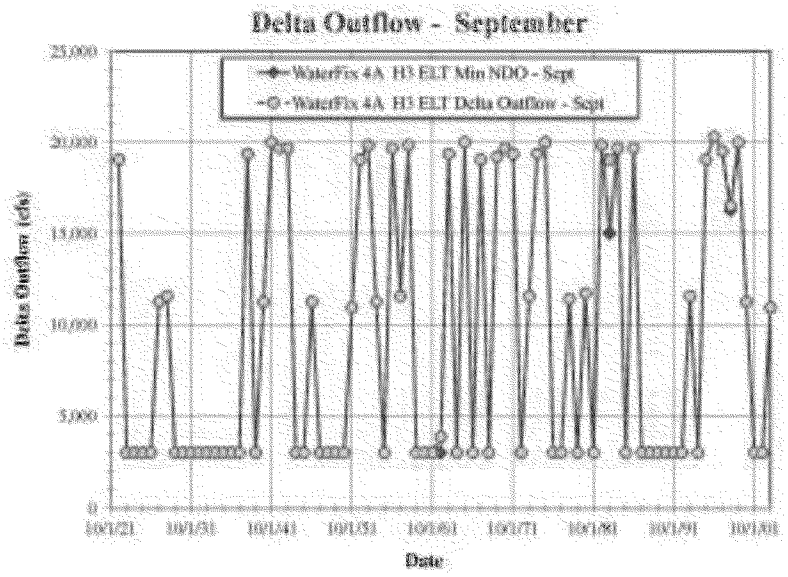

Figure B-5: *Delta outflows and minimum required outflows for September for the WaterFix operations modeling to represent the preferred alternative 4A at early long term. The outflows are governed by the need to meet Fall X2 in wet and above normal years. Otherwise, the D-1641 requirement of 3,000 cfs applies. The flows assumed to meet Fall X2 are much higher than the outflow requirements for existing conditions, i.e., 11,400 and 7,100 cfs, respectively.*

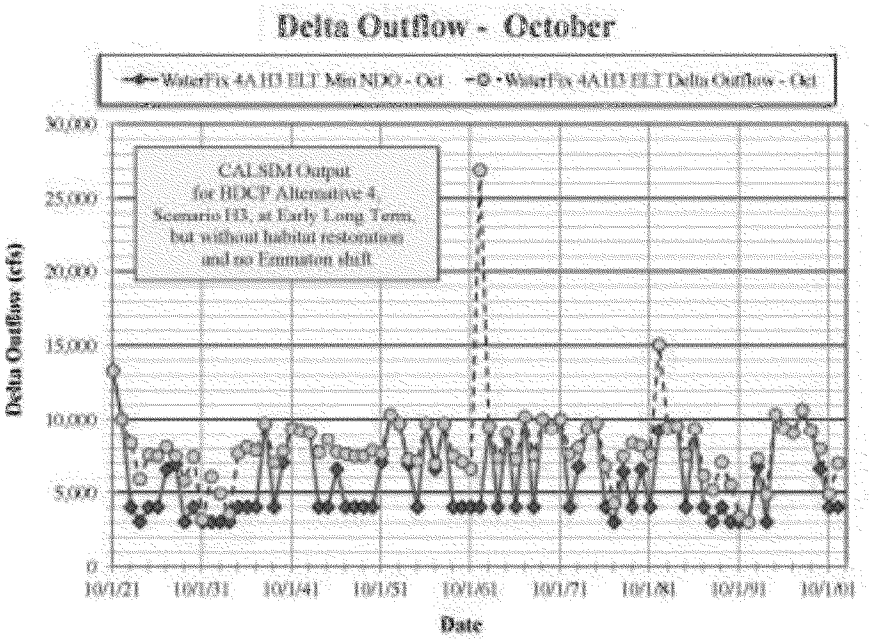

Figure B-6: *Delta outflows and minimum required outflows for October for the WaterFix operations modeling to represent the preferred alternative 4A at early long term. The outflows are governed by the need to meet Fall X2 in wet and above normal years. Otherwise, the D-1641 requirement of 3,000 cfs in critical years and 4,000 cfs in other water years applies. The flows*

assumed to be required to meet Fall X2 are consistent with the existing X2 outflow requirements, but excess Delta outflows are occurring in drier years which may underestimate the actual water quality impacts of the proposed project.

The limited analysis of water quality impacts in the RDEIR/SDEIS is also inadequate because the reason for unexpectedly high Delta outflows in September to meet Fall X2 is not explained or justified. The real time operations of the proposed project would likely call for the start of increased flows to begin in August to meet the September Fall X2 requirements (to account for the delayed response between outflow and salinity in the western Delta) and require much less total outflow. The actual water quality impacts in September are likely to be higher than presented in the RDEIR/SDEIS so the real adverse impacts are not fully disclosed. Similarly, excess Delta outflows are being provided by the CALSIM II model in drier years in October which also underestimates the potential adverse water quality impacts in October.

A new Draft EIR/EIS must be prepared that corrects or justifies through detailed modeling and detailed data presentations, the apparent excessive Delta outflows in both September and October which cause water quality impacts to be under predicted. The new Draft EIR/EIS must then be released for public review and comment.

General Comment – The 1976-1991 period used for the water quality modeling is too short and not representative of (much drier than) the full historical period

The water quality analyses are only performed and presented for the period October 1975 through September 1991 (16 years). This period contains two major droughts (1976-1977 and 1987-1991) but only the latter is used to represent the water quality changes under drought conditions. When the data are categorized by month and by water year type, the amount of data available to be averaged can be as few as 2-5 months of data. That is not sufficient data to develop a statistically significant representation of the variations by month and water year type.

Also as shown in Figure B-7, the water year 1976-1991 period is considerably drier than the full historical record (1906-2014) and the 1922-2003 period used for the Central Valley operations modeling using CALSIM II.

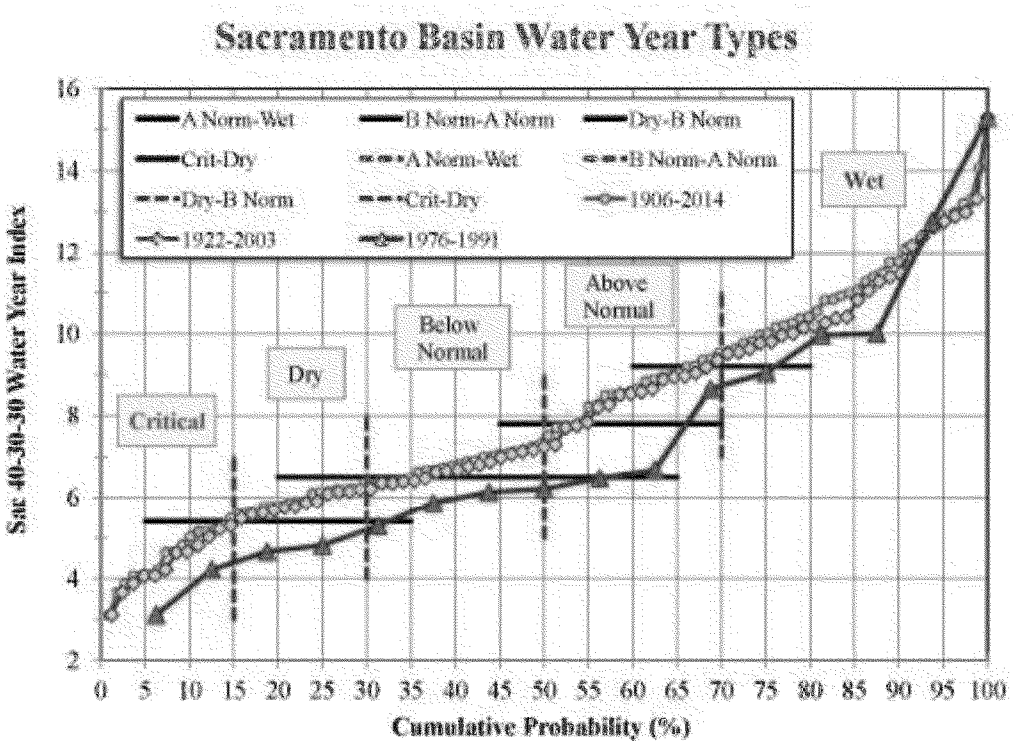

Figure B-7: *Cumulative probability distributions of the Sacramento 40-30-30 water year indices for the available historical record (1906-2014), the period used for the CALSIM II operations studies (1922-2003) and the WaterFix water quality analyses (1976-1991). The 16-year period used for reporting water quality impacts is much drier and not representative of the range of variations in the operations studies or historical record.*

Detailed Comments

Executive Summary

Page ES-3, Line 9

The RDEIR/SDEIS states that the new WaterFix "sub-alternatives address the reverse flow problem by focusing on the construction and operation of new north Delta intakes and on habitat restoration commensurate with the footprint of these new facilities." The construction of north Delta intakes only reduces south Delta exports and minimize reverse flows in the south Delta some of the time. The WaterFix sensitivity analysis data show that many other times south Delta exports and reverse flows actually increase. Reverse flows in the south Delta remain significant (e.g., more negative than -2,000 cfs) 55% of the time during the simulation period.

A new Draft EIR/EIS must be prepared that fully discloses in clear, understandable and detailed tables and graphs the actual changes in reverse flows as a result of the WaterFix preferred

alternative. This lack of clarity and transparency has been identified on numerous occasions by the Delta Independent Science Board, most recently in its September 30, 2015 review comments. The new Draft EIR/EIS must then be released for public review and comment.

Page ES-4, Line 14

The new WaterFix sub-alternatives, Alternatives 4A, 2D, and 5A, do not "*ensure a reasonable range of alternatives*." These new alternatives do not include increased flows in the Delta consistent with the SWRCB's 2010 Delta Flow Criteria and are unable to capture "new" water during wet periods, so are unable to help achieve the coequal goals or provide the ecosystem improvements necessary to achieve federal and state endangered species act compliance. A new Draft EIR/EIS must be prepared that analyzes and discloses alternatives that will actually achieve the coequal goals, and released for public review and comment.

Page ES-5, Line 22
ES.1.2.2.1 Project Objectives

The WaterFix preferred alternative fails to satisfy DWR's fundamental purpose in proposing the proposed project which is "*to make physical and operational improvements to the SWP/CVP system in the Delta necessary to restore and protect ecosystem health, water supplies of the SWP and CVP south of the Delta, and water quality within a stable regulatory framework, consistent with statutory and contractual obligations.*" The WaterFix project will harm the Delta ecosystem, degrade Delta water quality, and fails to improve water supply reliability for CVP and SWP export contractors. It is also very expensive.

A new Draft EIR/EIS must be prepared that analyzes and discloses alternatives that will actually comport with DWR's fundamental purpose and help achieve the coequal goals. The new Draft must then be released for public review and comment.

Page ES-8, Line 33

The RDEIR/SDEIS states that "*the other alternatives evaluated in the RDEIR/SDEIS, Alternative 4A, 2D, and 5A, are evaluated at the Early Long-Term (ELT) timeframe because the project implementation period is anticipated to be shorter.*" This is not correct. No full model runs for these three alternatives were carried out and the "brief sensitivity analyses" of water quality impacts that were performed were at late long term (2060 rather than 2025 conditions). The sensitivity analyses were based on flawed Alternative 4 model runs from the BDCP Draft EIR/EIS, never included all the components of the preferred alternative 4A, and most included 65,000 acres of habitat restoration and much greater sea level rise and seawater intrusion.

The RDEIR/SDEIS deceives the public and decision makers by claiming that Alternatives 4A, 2D and 5A were evaluated, and that the evaluation was at early long term. Of particular concern are the tables in Appendix B, Supplemental Modeling Results for New Alternatives that claim to present the water qualities for Alternative 4A for Scenario H3 and H4 at early long term when no full model runs or even sensitivity runs were performed for those cases.

A new Draft EIR/EIS must be prepared that carries out full model runs for the preferred alternative, the other WaterFix alternatives, as well as new alternatives that actually help to achieve the coequal goals. The new Draft must then be released for public review and comment.

Page ES-9
ES.1.3 Areas of Known Controversy

The RDEIR/SDEIS identifies as one known area of controversy the insufficient range of alternatives. The range and adequacy of alternatives is an issue of concern to the public as well as to governmental agencies. Of the 15 alternatives in the BDCP Draft EIR/EIS, only one (Alternative 9) was substantially different in terms of infrastructure than the others. The others all involved new intakes in the north Delta with an isolated conveyance system linking these 3-5 intakes to the SWP and CVP export pumps in the south Delta. The adverse environmental impacts on aquatic species in the Delta and water quality were not significantly different whether the isolated conveyance was a canal, pipeline or tunnel or whether it followed an eastern or western alignment. The three new "sub-alternatives" added in the RDEIR/SDEIS are very similar to the earlier 14 in terms of intake location and isolated conveyance and again fail to reduce exports during drier months and capture more water when it is surplus to the needs of the Delta in wetter months, or otherwise contribute to achievement of the coequal goals.

A new Draft EIR/EIS must be prepared that includes new alternatives that are substantially different than those already studied, e.g., incorporating new storage, actions to reduce demand on the Delta especially during drier periods, levee strengthening, etc., and fully analyzes and discloses, avoids and mitigates their impacts. The Draft EIR/EIS must then be released for public review and comment.

Page ES-12
ES.1.4.3 Cumulative Impact Analyses

The RDEIR/SDEIS includes additional reasonably foreseeable proposed projects that, when considered together with the action alternatives, could have a significant cumulative effect. The analysis includes a discussion of the California Water Action Plan, California EcoRestore, and the Sustainable Groundwater Management Act to better describe the roles of the new Delta conveyance facilities and habitat restoration in the context of the state's comprehensive vision for water management.

The proposed project fails to produce any significant improvement in water supply reliability, degrades rather than improves water quality in the Delta, harms key fish species (BDCP Executive Summary), and otherwise fails to meet the state and federal statutory requirements to contribute to achieving the coequal goals. The California Water Action Plan includes additional actions such as new storage that will be necessary in the future to actually achieve what BDCP was originally intended to do. As such the RDEIR/SDEIS should have analyzed operations of the preferred alternative in the future with new storage, actions to reduce demand, and the long overdue habitat restoration required by the SWP and CVP biological opinions (Cal. EcoRestore).

DWR also indicated, in the BDCP Draft EIR/EIS, its intent to request that the compliance location for the Emmaton standard be moved to Three Mile Slough. The new alternatives do not include this change in compliance location to reduce the significant adverse water quality impacts of the BDCP alternatives, but a future request that this compliance location be shifted is reasonably foreseeable and should also be modeled as a cumulative impact.

The RDEIR/SDEIS also notes that the SWRCB is working on revising its Water Quality Control Plan to increase flows on the San Joaquin River (Phase 1) and in the Delta and the other tributaries. The cumulative impact of these flow increases on the proposed project and the viability of the new intakes and twin tunnels once the increased flows are implemented by the SWRCB must be fully analyzed. A new Draft EIR/EIS that performs these revised cumulated impact analyses must be prepared and released for public review and comment.

Page ES-15

The RDEIR/SDEIS says their alternative implementation strategy (Alternatives 4A, 2D, and 5A) focuses on the conveyance facility improvements necessary for the SWP to address more immediate water supply reliability needs, and allows for other state and federal programs to address the long-term conservation efforts for species recovery through programs separate from the proposed project. This is further confirmation that the WaterFix proposal is contrary to the 2009 Delta Reform Act because it only attempts to achieve one of the coequal goals.

The new conveyance facilities will not improve conditions for endangered and threatened aquatic species in the Delta. Instead reverse flows in the south Delta will continue, exports from the south Delta will actually increase during drier months, Clifton Court Forebay will remain unscreened, and the new north Delta intakes will harm key fish species (Draft BDCP Executive Summary). Implementing the conveyance facilities alone <u>will exacerbate</u> rather than help resolve many of the concerns with the current south Delta conveyance system. The RDEIR/SDEIS also fails to present any evidence or arguments why implementing new conveyance separately will somehow allow for implementing habitat restoration projects on an expedited schedule through the state's EcoRestore program. These are restoration projects required under the biological opinions that are already long overdue, and there is no guarantee that the funding or will is there to complete these programs.

A new Draft EIR/EIS must be prepared that includes alternatives that address and help achieve both coequal goals and the other inherent State objectives, and released for public review and comment.

Page ES-26

The RDEIR/SDEIS states that "*the cause of the modeled increases in bromide in Barker Slough, which was driving the impact conclusion for almost all alternatives, is due to the assumptions regarding tidal habitat restoration not due to conveyance facility operations.*" No full model runs were performed for the preferred alternative 4A to support that statement, only brief sensitivity analyses that cannot be depended upon for decision making on a more than $15

billion project. There are also no full model runs to support the speculation that "*because new alternatives 4A, 2D, and 5A contain a lower acreage of tidal restoration, significant impacts with regard to bromide are not expected under these alternatives.*"

A new Draft EIR/EIS must be prepared that models, analyzes, discloses and avoids or mitigates the impacts of the new alternatives and habitat restoration on water quality in the north Delta. The new Draft EIR/EIS must then be released for public review and comment.

Page ES-27, Line 16

The RDEIR/SDEIS speculates that "based on the sensitivity analyses, optimizing the design and siting of restoration areas is expected to be able to reduce EC and chloride increases in Suisun Marsh, relative to Existing Conditions and the No Action Alternative, to levels that would be less than significant." The brief sensitivity analyses are not full model runs and were not even carried out for the preferred alternative configuration and operations. The CEQA requirement to avoid or mitigate significant adverse impacts requires more than an expectation that as yet specified habitat restoration will not result in significant adverse water quality impacts. The full, albeit flawed, model runs for Alternative 4 clearly indicate the impacts of habitat restoration on water quality at Barker Slough and in Suisun Marsh. The habitat restoration to be done as part of WaterFix and eventually as part of EcoRestore must be analyzed in the environmental documentation from the proposed WaterFix project and disclosed, not piecemealed and postponed.

A new Draft EIR/EIS must be prepared that establishes a best estimate of the habitat restoration under WaterFix, and as part of the Cumulative Analysis for EcoRestore, and full model runs and analysis of the water quality impacts analyzed and disclosed. The new Draft EIR/EIS must then be released for public review and comment.

Page ES-27, Line 36

Because Alternatives 4A, 2D, and 5A were not fully modeled for the RDEIR/SDEIS, it is not possible to be certain that they would not result in significant impacts for EC related to objective exceedance in the Sacramento River at Emmaton, or would not result in substantial degradation in the western Delta due to increased chloride concentrations, or would have less adverse water quality effects in the western Delta related to EC, or would have fewer exceedances of the fish and wildlife EC objective between Prisoners Point and Jersey Point. The same applies to speculation regarding bromide concentration impacts at Barker Slough (Page ES-28, Line 18).

The RDEIR/SDEIS contains inadequate information to support this speculation regarding water quality impacts. A new Draft EIR/EIS must be prepared that models, analyzes, discloses and avoids or mitigates the impacts of the new alternatives and habitat restoration on water quality in the western Delta. The new Draft EIR/EIS must then be released for public review and comment.

Section 1: Introduction

Page 1-5, Line 34

The RDEIR/SDEIS discusses State CEQA Guidelines § 15088.5 which provides examples of disclosure that constitute "significant new information" for purposes of requiring recirculation of a revised EIR. Because the WaterFix RDEIR/SDEIS is so fundamentally and basically inadequate and conclusory in nature, meaningful public review and comment has been precluded. As found by the Delta Independent Science Board (September 30, 2015 review comments), the RDEIR/SDEIS is "sufficiently incomplete and opaque to deter its evaluation and use by decision makers, resource managers, scientists, and the broader public."
There are also feasible project alternatives considerably different from the two types of alternatives previously analyzed that would clearly lessen the environmental impacts of the proposed WaterFix project, but the project proponents have declined to consider or adopt them. Project components that increase Delta flows to restore and sustain fish populations (2010 Delta Flow Criteria), new storage to allow new water to be captured, stored, and conveyed to the California Aqueduct and Delta Mendota Canal, levee strengthening to protect the Delta and export water supply and water quality, and actions to reduce demand for water from the Delta should have been considered as part of a holistic solution. Most of these are identified in the July 2014 California Water Action Plan which DWR helped prepare, and some are required by the 2009 Delta Reform Act.

A new revised Draft EIR/EIS must be prepared that models, analyzes, discloses and avoids or mitigates the impacts of these feasible project components that will help rather than hinder achievement of the coequal goals. The new Draft EIR/EIS must then be released for public review and comment.

Page 1-20, Line 35
San Joaquin Delta Estuary Water Quality Control Plan (Bay-Delta WQCP).

The 2009 Delta Reform Act states that an order by the SWRCB approving any change petitions for the proposed project shall include appropriate Delta flow criteria and shall be informed by the analysis performed in Section 85086 of the Water Code (Cal. Water Code § 85086(c)(2)). The intent of the 2009 Delta Reform Act was that development of the BDCP and WaterFix project alternatives would also be informed by the Delta flow criteria developed by the SWRCB and Department of Fish and Wildlife.

It is not relevant to the environmental review in the RDEIR/SDEIS whether would be fully or only partially responsible for meeting new increased flow requirements, only that the flows in the Delta under the proposed project alternatives be consistent with the 2010 Delta Flow Criteria.

The RDEIR/SDEIS is totally inadequate because it fails to present alternatives compatible with, and including, increased Delta flow requirements consistent with the 2010 Delta Flow Criteria as required by State statutes. The legal reasoning for this is contained in the September 29, 2015

letter from NRDC et al. sent to Tom Howard at the SWRCB[1]. This letter is hereby incorporated into the County's comments by reference.

A new Draft EIR/EIS must be released that analyses and discloses the environmental benefits and impacts of alternatives that incorporate increased Delta flow requirements. The new Draft should then be released for public review and comment.

Page 1-35, Line 4
1.4.2 Additional Alternatives

The RDEIR/SDEIS states that other than revisions to Alternative 4 and new sub-alternatives, Alternatives 4A, 2D, and 5A, "*no other alternatives are included in the RDEIR/SDEIS because the original 15 action alternatives, along with Alternatives 4A, 2D, and 5A and the no action/no project alternative, meet CEQA and NEPA requirements to present and consider a reasonable range of alternatives to the proposed action*."

This is completely false. Of those 18 alternatives, only one is substantially different than the other, i.e., Alternative 9 for isolated through-Delta conveyance. The other 17 alternatives are merely variations on the same theme, a Peripheral Canal-like configuration of new intakes in the north Delta on the Sacramento River near Hood, with twin tunnels (rather than a single open channel) to convey the water to Clifton Court Forebay in the south Delta.

The 18 alternatives fail to achieve the coequal goals, fail to contribute to solving California's urgent water and ecosystem problems, and do not enough meet the lead agencies needs. The range of alternatives (i.e., two) is not reasonable and none of the alternatives analyzed are viable.

A new Draft EIR/EIS must be prepared that analyses new viable alternatives that will help achieve the coequal goals. The increased Delta flow requirements in SWRCB alternative (4H3 discussed in Appendix B), or something similar, must be incorporated into at least some of these alternatives. The new Draft must model, analyze, disclose and avoid or mitigate the impacts of these new alternatives. The new Draft EIR/EIS must then be released for public review and comment.

Section 2: Substantive Draft EIR/EIS Revisions

Page 2-6, Line 31

The sensitivity analyses conducted by the lead agencies are interesting but were performed at late long term (2060) rather than early long term (2025) which is the chosen future reference time for the WaterFix RDEIR/SDEIS. The sensitivity analyses were based on and relative to earlier

1 http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/early_petition_comments/docs/nrdc_obegi093015.pdf

modeling of BDCP Alternative 4 at late long term. This alternative is very different than the WaterFix preferred alternative and the earlier BDCP modeling has been determined to be flawed and the CALSIM II and DSM2 models have since been updated. The sensitivity analyses did not include these updates and corrections.

A new Draft EIR/EIS must be prepared that incorporates full model runs for the alternatives. The statewide importance of the proposed project and high level of controversy requires that the modeling results be disclosed in a new Draft rather than slipped into a Final EIR/EIS leaving little chance for serious regulatory agency and public review and discussion. The new Draft should then be released for public review and comment.

Page 2-8, Line 19

The RDEIR/SDEIS states that the "*SWP and CVP operations have relatively little influence on salinity levels at these locations, and the elevated salinity in south Delta channels is affected substantially by local salt contributions discharged into the San Joaquin River downstream of Vernalis.*" This is not correct. The SWP and CVP control operations in the Delta to maintain Delta water quality and they, therefore, control the quality of the water exported to farms in the San Joaquin Valley. Some of this water ends up as agricultural return flows in the San Joaquin River. This is acknowledged on page 8-227 of the RDEIR/SDEIS: "*Chloride concentrations would be reduced under all of the H1–H4 Scenarios in water exported from the Delta to the CVP/SWP Export Service Areas, thus reflecting a potential improvement to chloride loading in the lower San Joaquin River.*" This statement was intended to highlight possible benefits of the proposed project, but also acknowledges that the SWP and CVP do control to some extent the water quality at Vernalis.

The CVP also controls operation of Friant Dam and New Melones Dam on the Stanislaus River, both of which can and should be used to control water quality in the San Joaquin River and at Vernalis. The high salinities in the south Delta and the San Joaquin River downstream of Vernalis are affected by operations of both the CVP and SWP. By maintaining higher Delta outflows and San Joaquin flows (as is being considered by the SWRCB), the CVP and SWP can and should improve the quality of water diverted onto south and central Delta farms and avoid exceedances of the Old River at Tracy Bridge EC objective for the protection of agricultural beneficial uses and the other south Delta agricultural water quality objectives.

The DSM2 water quality model must be revised to better simulate water qualities in the south and central Delta and then be used to analyze new WaterFix alternatives involving increased Delta outflows and San Joaquin flows. A new Draft EIR/EIS should then be prepared and released for public review and comment.

Page 2-8, Line 2-9

It is not acceptable to merely <u>anticipate</u> that the new alternatives 2D, 4A, and 5A, will contain much lower acreage of tidal restoration, and therefore the new alternatives will not have significant impacts with respect to EC and chloride in Suisun Marsh. A range of reasonably

expected habitat restoration projects and acreages in the north Delta and Suisun Marsh under WaterFix and EcoRestore must be analyzed using full detailed model runs to quantify and disclose the potential significant adverse impacts to water quality in this region.

A new Draft EIR/EIS must then be prepared and released for public review and comment.

Page 2-10, Line 1

Climate change assumptions will alter the timing and magnitude of unimpaired runoff estimates. The RDEIR/SDEIS notes that 3 of the 16 water years in the simulation change their type in the late long term as a result of climate change. However, with the climate change it will also be necessary to change the form of the Sacramento 40-30-30 index. The first 30% represents the April-July runoff due to melting of the snow pack. With less snow pack in the future, that will be less representative of the water supply availability. A smaller percentage, say 20% might be more appropriate. Similarly, with more intense runoff, more flood control storage space will be needed and carryover storage from the previous water year may also be less representative of water supply. The Sacramento index in the future may need to be changed to, say, 60-20-20.

Any classification of wet, normal and dry years in the future should retain the original SWRCB percentages: 30% wet, 20% above normal, 20% below normal, 15% dry and 15% critical.

Page 2-13

The RDEIR/SDEIS claims that "*it is now known that the cause of the modeled increases in bromide in Barker Slough, which was driving the impact determinations for almost all alternatives, is assumptions regarding CM4 implementation, not operations in CM1.*" The RDEIR/SDEIS fails to perform full model runs to determine whether this is correct. It is also not sufficient to speculate that "*because the new alternatives (2D, 4A, and 5A) contain a lower acreage of tidal restoration, significant impacts with regards to bromide* <u>*are not expected*</u> *under these alternatives.*"

A new Draft EIR/EIS must be prepared that performs full model runs to analyze the range of possible habitat restoration that will occur under WaterFix and EcoRestore to determine the actual water quality changes when restoration is reduced and disclose whether the significant water quality impacts indeed shift from drier years to wetter years. The new Draft EIR/EIS must then be released for public review and comment.

<u>Section 4: New Alternatives: Alternatives 4A, 2D, and 5A</u>

Page 4.1-1, Line 35

The proposed new WaterFix conveyance facilities <u>will not</u> "*improve conditions for endangered and threatened aquatic species in the Delta while at the same time improving water supply reliability.*" Implementing the conveyance facilities alone <u>will not</u> "*help resolve many of the*

concerns with the current south Delta conveyance system" and would not "*help reduce threats to endangered and threatened species in the Delta.*"

As proposed in the RDEIR/SDEIS, the new dual conveyance system would increase exports in dry periods and fail to regularly capture more water for export in wet months (see Attachment C to this letter). It is therefore completely false to claim that the new conveyance system will "*align water operations to better reflect natural seasonal flow patterns by creating new water diversions in the north Delta equipped with state-of-the-art fish screens, thus reducing reliance on south Delta exports.*"

A new Draft EIR/EIS must be prepared that honestly assesses, clearly discloses and honestly characterizes the proposed project. The new Draft should then be released for public review and comment.

Page 4.1-10

The D-1641 export/inflow (E/I) ratio calculation was designed to protect fish from the significant adverse impacts of the inadequately screened SWP and CVP export intakes in the south Delta. Those impacts include entrainment of fish, drawing fish out of the Sacramento River system into the south Delta, and general ecosystem impacts that result from diverting too much of the inflow to an estuary. The new north Delta intakes will also impact the health of the Sacramento-San Joaquin Delta estuary by diverting inflow that otherwise would be available for fish, to restore water quality and otherwise reduce the impacts of Other Stressors. The SWRCB export inflow ratio must remain as defined in D-1641.

A new Draft EIR/EIS must be prepared that analyze alternatives that comply with the SWRCB's export/inflow standards as well as the existing Army Corps limits on inflow to Clifton Court and the San Joaquin inflow to export ratios in the biological opinions. Additional full model runs could still be included to disclose individually the impacts to the Delta ecosystem and water quality if those legal requirements were not met. The new Draft must then be released for public review and comment.

Page 4.2-4, Line 14
Change in Delta Outflow

The increase in Delta outflow in September and October in wet and above normal years is primarily due to increased outflow to meet Fall X2. However, as discussed in Attachment C to this letter, the outflows assumed to be required to meet Fall X2 with sea level rise are much higher than existing values. The justification for these high outflows needs to be included in a new Draft EIR/EIS, along with detailed plots of EC at Mallard Island and Collinsville during the Fall for each case. The new Draft must then be released for public review and comment.

Page 4.2-18 (see also Page 4.3.4-1)
4.2.7 Water Quality

The RDEIR/SDEIS states that: "*In general, the significance of this difference is the assessment of bromide, chloride and EC for the No Action Alternative (ELT), relative to Existing Conditions, likely underestimates increases in bromide, EC, and chloride that could occur, particularly in the west Delta. Nevertheless, there is notable uncertainty in the results of all quantitative assessments that refer to modeling results, due to the differing assumptions used in the modeling and the description of the No Action Alternative (ELT).*"

Because of the statewide importance of developing a Delta solution that achieves both coequal goals, the controversy surrounding the WaterFix project, the extremely high cost of the new intakes and tunnels, it is very important that the models and modeling be refined, e.g., by using daily rather than monthly time steps in the CALSIM II model, and the differing assumptions be reconciled to reduce the "*notable uncertainty*." A great deal of uncertainty was purposely created by choosing to use "*brief sensitivity analyses*" based on earlier flawed modeling runs instead of performing full model runs.

A new Draft EIR/EIS must be prepared that performs full model runs for all alternatives with refined models. The new Draft EIR/EIS must then be released for public review and comment.

Page 4.3.4-1
4.3.4 Water Quality

We agree that "*there is notable uncertainty in the results of all quantitative assessments that refer to modeling results, due to the differing assumptions used in the modeling and the description of Alternative 4A and the No Action Alternative (ELT).*" A new Draft EIR/EIS must be prepared that includes full model runs for each alternative. The new Draft EIR/EIS must then be released for public review and comment.

Page 4.3.4-17, Line 6 (see also Page 4.3.4-17, Line 14)

The RDEIR/SDEIS speculates that "*sensitivity analyses conducted of Alternative 4 Scenario H3 without restoration areas indicated lower chloride levels in the western Delta than with the restoration areas. It is <u>thus likely</u> that modeling of Alternative 4A that does not include restoration areas would show lower levels of chloride at Antioch in April, and at Contra Costa Pumping Plant #1 in September and October than is shown herein using the Alternative 4 (ELT) modeling.*"

The current RDEIR/SDEIS is woefully inadequate. A new Draft EIR/EIS must be prepared that relies on full revised model runs rather than sensitivity analyses and speculations of what is likely or "*not expected.*" The new Draft EIR/EIS must then be released for public review and comment.

Page 4.3.4-24, Line 4
Delta

The RDEIR/SDEIS notes the significant differences between Alternative 4A and the modeling conducted for Alternative 4 in the early long term. The RDEIR/SDEIS also claims "there are several factors related to the modeling approach that may result in modeling artifacts that show objective exceedance, when in reality no such exceedance would occur.

The County agrees with the subsequent statement that: "*The result of all of these factors is that the quantitative modeling results presented in this assessment is not entirely predictive of actual effects under Alternative 4A, and the results should be interpreted with caution*."

The rush to release the RDEIR/SDEIS without performing full model runs of the new alternatives or correcting the model runs for the earlier BDCP alternatives is unacceptable, inconsistent with good science, and contrary to the requirements of CEQA and NEPA. It is not acceptable to presenting tables of water quality impacts in Appendix B for Alternative 4A at early long term when no such analyses were actually performed.

A new Draft EIR/EIS must be prepared that relies on full revised model runs rather than sensitivity analyses and speculation. The new Draft EIR/EIS must then be released for public review and comment.

Section 5: Revisions to Cumulative Impacts Analyses

Page 5-2
5.1.2.2 California Water Action Plan

The WaterFix and BDCP alternatives do not contribute to achievement of the coequal goals. New alternatives must be developed that incorporate actions outlined in the January 2014 California Water Action Plan, such as "*expand water storage capacity and improve groundwater management.*"

A new Draft EIR/EIS must be prepared that analyses these new alternatives and fully discloses, mitigates or avoids any adverse environmental impacts. The new Draft EIR/EIS must then be released for public review and comment.

Page 5-2, Line 39

The RDEIR/SDEIS states that: "*Delta outflow requirements also are considered in the determination of the ability to divert water at the SWP and CVP south Delta intakes to minimize reverse flow conditions. Reverse flow conditions in Old and Middle Rivers occur when exports exceed the amount of inflow from the San Joaquin River. Limiting reverse flows in Old and Middle Rivers reduces fish exposure and entrainment at the south Delta intakes*."

The WaterFix and BDCP alternatives fail to minimize reverse flows sufficiently to restore and sustain key fish species (see Attachment C to this letter). In addition, the WaterFix proponents propose blocking the head of Old River for extended periods. The significant historical reduction in San Joaquin inflows to the Delta is also a major contributor to reverse flows in the south and central Delta. Blocking what little inflow there is from reaching the south Delta will further exacerbate reverse flows and increase entrainment of fish.

A new Draft EIR/EIS must be prepared that analyses alternatives that will actually minimize reverse flows in all months to protect fish species including not yet threatened resident species. The new Draft must fully disclose, mitigate or avoid any adverse environmental impacts. The new Draft EIR/EIS must then be released for public review and comment.

Page 5-38

Table 5.2.2.1-1. Effects on Water Supplies from Additional Plans, Policies, and Programs Considered for Cumulative Analysis

The proposed WaterFix preferred alternative will not be viable once the SWRCB has established higher flow requirements in the Delta under Phase 1 and 2. The very expensive new intakes and twin tunnels will not be able to be used as much as assumed in the RDEIR/SDEIS and these facilities will become a stranded asset.

A new Draft EIR/EIS must be prepared that assumes higher SWRCB flow requirements are in place and develop alternatives that are viable under those conditions, and also contribute to achieving the coequal goals, and improving water quality in the Delta. The new Draft must fully model, disclose, and mitigate or avoid any adverse environmental impacts. The new Draft EIR/EIS must then be released for public review and comment.

Page 5-54 and elsewhere

The RDEIR/SDEIS makes a number of claims regarding future projects and how they will or will not impact the Delta. Many of these future projects are included in the California Water Action Plan and are necessary components for a sustainable solution to the problems of the Delta ecosystem and California's water supply reliability. The WaterFix alternatives fail to meet the needs of the project and will hinder rather than help meet the needs of California.

New alternatives must be developed that incorporate these necessary elements of a viable solution, such as new storage. The cumulative analysis can instead include other very foreseeable actions such as shifting the compliance location of the Emmaton standard further inland.

A new Draft EIR/EIS must be prepared that includes alternatives that include the portfolio of elements described in the California Water Action Plan and suggested by many commenters on the BDCP. The new Draft must fully model these new alternatives and disclose, and mitigate or avoid, any adverse environmental impacts. The new Draft EIR/EIS must then be released for public review and comment.

Page 5-78, Line 23
Electrical Conductivity

The RDEIR/SDEIS claims that: "*Implementation of facilities operations and maintenance under these action alternatives, along with Mitigation Measure WQ-11, would not be expected to contribute substantially to this adverse cumulative condition for EC, because no additional exceedance of Bay-Delta WQCP EC objectives would be expected, and substantial long-term degradation with respect to EC would be avoided.*"

Degradation of water quality in the Delta cannot be judged in terms of exceedance of the SWRCB's Bay-Delta water quality standards. Significant impacts can occur to urban and agricultural water uses even when water quality standards are not exceeded. Farmers in the north Delta, e.g., have developed farming practices and crops that rely on very fresh water. Increasing salinities in this area will have a significant adverse impact on this senior beneficial use, even if SWRCB chloride standards are not exceeded.

The environmental documentation must be revised to acknowledge that increasing salinities (by say more than 5%) can still represent a significant adverse water quality impact.

RDEIR/SDEIS Appendix A

Appendix A, Chapter 8, Page 8-53
Real-Time Operations of the SWP and CVP

The RDEIR/SDEIS states that: "*Environmental conditions arise that cannot be foreseen or simulated in the model that can affect compliance with water quality objectives. These include unpredictable tidal and/or wind conditions, gate failures, operational needs to improve fish habitat/conditions, and prolonged extreme drought conditions, among others. At times, negotiations with the State Water Resources Control Board occur in order to effectively maximize and balance protection of beneficial uses and water rights. These activities are expected to continue to occur in the future. Thus, it is likely that some objective exceedances simulated in the modeling would not occur under the real-time monitoring and operational paradigm that will be in place to prevent such exceedances.*"

The 2009 Delta Reform Act and the State and Federal coequal goal statutes changed the responsibilities of the SWRCB, DWR, Reclamation and other agencies from merely balancing beneficial uses to helping to achieve the coequal goals. The WaterFix RDEIR/SDEIS is inadequate because neither of the two types of alternatives contribute to achieving either of the coequal goals. The SWRCB now has the responsibility of setting higher flow requirements for the Delta and reducing exports from the Delta in drier periods, which will render the new north Delta intakes and twin tunnels virtually inoperable and a stranded asset. The SWRCB permits

for the proposed project should also include terms that stop use of the new north Delta intakes if water quality standards are being exceeded.

It is not sufficient to speculate "*it is likely that*" some exceedances will not occur in reality. The additional flows or reduced exports necessary through real time operations to ensure the objectives are met, will increase exports and reduce flows in subsequent months which could cause adverse impacts that are not disclosed in the RDEIR/SDEIS.

The model analyses performed for the RDEIR/SDEIS environmental documents are so flawed and inadequate that it is also highly likely that actual WaterFix operations will be very different than simulated and other factors such as the amount and location of tidal habitat restoration will have greater adverse effects. It is then highly likely that objective exceedances will occur with the project, despite any real-time operations that might be in place.

The County requests that Delta interests be represented in an official, full voting, capacity, on any adaptive management and real-time operations entities that might be established for the proposed project. This should not be left under the water project and export contractor control.

The RDEIR/SDEIS is inadequate because it fails to analyze and disclose, using actual water quality model runs, the significant adverse impacts of the proposed project and provide reasonable estimates of the frequency of water quality objective exceedances, and disclose how the project will likely operate in real time.

A new Draft EIR/EIS must be prepared that carries out full modeling analyses of alternatives capable of helping to achieve both coequal goals and improve water quality in the Delta. The Draft EIR/EIS should also refine the Real Time Operations Team proposal and other management entities to include a full-voting representative from the Delta Counties and urban and agricultural water agencies in the Delta. The new Draft EIR/EIS should then be released for public review and comment.

Appendix A, Chapter 8, Page 8-54 et seq.

The RDEIR/SDEIS uses two methods to estimate chloride and bromide concentrations from DSM2 simulations of EC: Mass-Balance Method; and Regression Method for Chloride and Bromide. The latter approach uses two different regression equations depending upon whether seawater intrusion dominates (typically during low Delta outflow periods) or whether agricultural drainage conditions dominate (typically during wet periods). Sometimes the chloride and bromide concentration are influenced by both sources of salinity.

The DSM2 model can separately simulate the contributions to water quality from different sources of inflow to the Delta (seawater, Sacramento, Yolo, San Joaquin, eastside tributaries, and local agricultural drainage). This is often referred to as "fingerprinting." The fingerprinting data could be converted for each source using the appropriate EC to chloride regression equation and summed to estimate the chloride and concentrations. That would be more accurate than guessing which regression equation applies at each Delta location.

Appendix A, Chapter 8, Page 8-67, Line 31

The RDEIR/SDEIS states: "*Some of the EC objectives are dependent on water year type. It must be noted that 3 of the 16 water years in the simulation change in the late long term, as compared to Existing Conditions, as a result of climate change.*"

Climate change assumptions will alter the timing and magnitude of unimpaired runoff estimates. Because of climate change, it will also be necessary to change the form of the Sacramento 40-30-30 index. The first 30% represents the April-July runoff due to melting of the snow pack. With less snow pack in the future, that will be less representative of the water supply availability. A smaller percentage, say 20% might be more appropriate. Similarly, with more intense runoff, more flood control storage space will be needed and carryover storage from the previous water year may also be less representative of water supply. The Sacramento index in the future may need to be changed to, say, 60-20-20. The classification of wet, normal and dry years in the future should still retain the original SWRCB percentages: 30% wet, 20% above normal, 20% below normal, 15% dry and 15% critical. That will ensure, *e.g.*, that the transition from below normal to above normal actual occurs at the 50-percentile.

Appendix A, Chapter 8, Page 8-71, Line 30

The RDEIR/SDEIS states that "*there are several factors related to the modeling approach that may result in modeling artifacts that show objective exceedance, when in reality no such exceedance would occur in reality.*" This is another example of unsubstantiated optimism on behalf of the project proponents. The limited nature of the sensitivity analysis modeling runs and the major flaws in the Draft EIR/EIS runs on which they were based, also means that more exceedances could occur in the future than shown by the sensitivity analyses. Rather than speculating, CEQA and NEPA statutes require that full model runs be performed to identify, disclose, and avoid or mitigate all significant adverse impacts of the project such as degradation of water quality and exceedences of water quality objectives.

A new Draft EIR/EIS must be prepared based on full model runs and released for public review and comment.

Appendix A, Chapter 8, Page 8-110, Line 21

The RDEIR/SDEIS correctly notes that "*the timing, location, and specific design of habitat restoration will have effects on Delta hydrodynamics, and any deviations from modeled habitat restoration and implementation schedule will lead to different outcomes.*" A new Draft EIR/EIS must be prepared that makes reasonable estimates of the timing, magnitude and location of habitat restoration to be implement by both WaterFix and EcoRestore and models and discloses the significant adverse impacts of these actions on water quality, fish and other beneficial uses. It is not sufficient to simply argue, e.g., with respect to Barker Slough water quality, that "*the estimates are not predictive of the bromide levels that would actually occur in Barker Slough or elsewhere in the Delta.*"

This comment also applies to other sections within the RDEIR/SDEIS that refer to bromide, chloride and EC concentration increases at certain locations that could be substantial, depending on siting and design of restoration areas. The new Draft EIR/EIS must avoid or mitigate all significant adverse impacts and then be released for public review and comment.

Appendix A, Chapter 8, Page 8-219

The RDEIR/SDEIS discusses the effects of site-specific restoration areas proposed under CM4 on bromide concentrations in Barker Slough. The lead agencies state: "*It is anticipated that these efforts will be able to reduce the level of projected increase, though it is unknown whether it would be able to completely eliminate any increases.*" The RDEIR/SDEIS further states: "*If sufficient operational flexibility to offset bromide increases is not practicable/feasible under Alternative 4 operations, and/or siting and design of restoration areas cannot feasibly reduce bromide increases to a less than significant level without compromising the benefits of the proposed areas, achieving bromide reduction pursuant to this mitigation measure would not be feasible under this alternative.*"

If Mitigation Measure WQ-5 (Avoid, Minimize, or Offset, as Feasible, Adverse Water Quality Conditions; Site and Design Restoration Sites to Reduce Bromide Increases in Barker Slough) is insufficient to fully mitigate the significant adverse bromide impacts in the Barker Slough region, additional mitigation measures must be developed and incorporated into a new Draft EIR/EIS.

Appendix A, Chapter 8, Page 8-225
303(d) Listed Water Bodies–Relative to No Action Alternative

The RDEIR/SDEIS states that: "*Modeling results indicated that monthly average chloride concentrations at source water channel locations for the Suisun Marsh (Appendix 8G, Figures Cl-5, Cl-7 and Cl-8) would increase substantially in some months during October through May compared to the No Action Alternative conditions, but sensitivity analyses suggest that operation of the Salinity Control Gates and restoration area siting and design considerations could reduce these increases. However, the chloride concentration increases at certain locations could be substantial, depending on siting and design of restoration areas. Thus, these increased chloride levels in Suisun Marsh are considered to contribute to additional, measureable long-term degradation in Suisun Marsh that potentially would adversely affect the necessary actions to reduce chloride loading for any TMDL that is developed.*"

It is not sufficient to merely do sensitivity analyses, especially when even the sensitivity analyses indicate that the proposed project will cause significant adverse impacts to water quality in Suisun Marsh. These significant impacts must be avoided or fully mitigated. A new Draft EIR/EIS must be prepared that (a) carries out full model runs of the flows and exports in the Delta and corresponding water quality variations, and (b) incorporates mitigation measures that full mitigate for these avoidable water quality impacts. The new Draft EIR/EIS must then be released for public review and comment.

Appendix A, Chapter 8, Page 8-227, Line 12

The RDEIR/SDEIS states that "*chloride concentrations would be reduced under all of the H1–H4 Scenarios in water exported from the Delta to the CVP/SWP Export Service Areas, thus reflecting a potential improvement to chloride loading in the lower San Joaquin River.*" This is an attempt by the project proponents to claim additional WaterFix project benefits. However, it is also an acknowledgement that the SWP and CVP can and do affect water quality in the San Joaquin River and at the south Delta agricultural water quality compliance locations.

A holistic solution to the current acute problems with the Delta ecosystem and California's water supply must include improved flows in the San Joaquin River, including below Friant Dam, and improvement of water quality in the San Joaquin River and the Delta. Improvements in the San Joaquin watershed should also include new infrastructure to capture storm flows and increase recharge of the severely overdrafted aquifers. Most of these actions are within the control of DWR and Reclamation, and are called for in the January 2014 California Water Action Plan.

A new Draft EIR/EIS must be prepared that includes holistic alternatives that not only address the needs of the export contractors but also work to achieve the coequal goals. The new Draft EIR/EIS should then be released for public review and comment.

Appendix A, Chapter 8, Page 8-228

The RDEIR/SDEIS continues to propose water quality mitigation measures that postpone developing and specifying actual mitigation until after the project is completed. There are no commitments on behalf of the lead agencies that any mitigation will actually be implemented. Mitigation Measure WQ-7 (Conduct Additional Evaluation and Modeling of Increased Chloride Levels and Develop and Implement Phased Mitigation Actions) and Mitigation Measure WQ-7c (Consult with Delta Water Purveyors to Identify Means to Avoid, Minimize, or Offset for Reduced Seasonal Availability of Water That Meets Applicable Water Quality Objectives) are open ended and puts much of the onus on the impacted parties.

The significant water quality impacts of the proposed project must be avoided or fully mitigated by the project proponents at no financial or resource cost to the impacted parties. A new Draft EIR/EIS that incorporates measures to avoid or fully mitigate all adverse water quality impacts, and contributes to improvement of water quality in the Delta (Cal. Water Code § 85020) must then be released for public review and comment.

Appendix A, Chapter 8, Page 8-237

The revised language in the RDEIR/SDEIS states that: "*As discussed in Chapter 5, Water Supply, Section 5.3.1, Methods for Analysis, under extreme hydrologic and operational conditions where there is not enough water supply to meet all requirements, CALSIM II uses a series of operating rules to reach a solution that is a simplified version of the very complex decision processes that SWP and CVP operators would use in actual extreme conditions. Thus, it is unlikely that the Emmaton objective would actually be violated due to dead pool conditions.*

However, these results indicate that water supply conditions could be either under greater stress or under stress earlier in the year, and levels at Emmaton and in the western Delta may increase as a result, leading to EC degradation and increased possibility of adverse effects to agricultural beneficial uses."

It does not necessary follow that because the CALSIM II model is not able to handle extreme conditions that exceedances of the Emmaton objective are unlikely. Limitations in the CALSIM II model could result in exceedances being underestimated. Because of the statewide importance of finding a solution to the drastic problems of the Delta and the huge cost of the proposed project, it is imperative that the CALSIM II model be upgraded to better deal with extreme conditions, such as the current drought situation, and to simulate daily rather than monthly time steps. The adverse impacts to agricultural beneficial uses indicated by the results must also be fully mitigated. A new Draft EIR/EIS must be prepared that analyzes project operations using an upgraded CALSIM II model and full model runs for flow and export operations and water quality over the full simulation period, 1922-2003 (or better still, 2014). The new Draft EIR/EIS must then be released for public review and comment.

Appendix A, Chapter 8, Page 8-238

The RDEIR/SDEIS, in revised language, claims that the brief sensitivity analyses performed indicated that many of the exceedances of the south Delta agricultural standards are modeling artifacts, and modeling barrier installation assumptions consistent with historical dry year practices of installing barriers earlier in the year could resolve these additional exceedances.

The RDEIR/SDEIS also argues that SWP and CVP operations have relatively little influence on salinity levels at these locations, and the elevated salinity in south Delta channels is affected substantially by local salt contributions discharged into the San Joaquin River downstream of Vernalis.

SWP and CVP operations <u>do impact</u> water quality at the south delta agricultural water quality compliance locations. In fact, on page 8-227, Line 12, the RDEIR/SDEIS argues that improvements in the chloride concentrations of water exported from the Delta to the CVP/SWP Export Service Areas reflects a potential improvement to chloride loading in the lower San Joaquin River.

Historical export operations by the SWP and CVP have degraded water quality in the south Delta and that higher salinity water was then exported to farms in the San Joaquin Valley. That, and the failure to maintain instream flows downstream of the CVP's Friant Dam, combined with operation of the CVP's New Melones Dam, has contributed to degraded water quality in the lower San Joaquin River at Vernalis. The salinity of the water diverted onto islands in the south and central Delta by in-Delta farmers is directed affected by seawater intrusion and changes in residence time (controlled by the SWP and CVP) and the quality of the inflow to the Delta at Vernalis (controlled by the CVP and to a lesser extent by the SWP). That influences the salinity of the agricultural discharges back in to the Delta by the in-Delta farmers.

Barrier installations by DWR have not always been able to avoid exceedances of the south Delta water quality standards. The SWP and CVP can control and avoid these adverse water quality impacts by improving water quality generally in the Delta and in the San Joaquin River. The SWRCB's proposed Delta Flow Criteria and Phase 1 and 2 of the revision of the Water Quality Control Plan will help by increasing Delta and San Joaquin River flows. A new RDEIR/SDEIS must be prepared that avoids or fully mitigates the significant impacts to agricultural water quality in the south Delta, and released for public review and comment.

Appendix A, Chapter 19, Page 19-125

Mitigation Measure TRANS-1c: This section states that to mitigate the transportation impacts of each alternative, project proponents will undertake 'good faith' efforts to enter into mitigation agreements with local jurisdictions to verify the location, extent, timing, and fair share cost to be paid for reducing congestion to the identified roadway segments in the project area. However, the EIR states that "*if an improvement that is identified in any mitigation agreement(s) contemplated by Mitigation Measure TRANS-1c is not fully funded and constructed before the project's contribution to the effect is made, an adverse effect* (in the form of unacceptable LOS) *would occur.*" Details of good faith efforts should be identified to ensure that project proponents sufficiently engage with local jurisdictions when attempting to enter into mitigation agreements.

Mitigation Measure TRANS-1c: The body of this section has strikethroughs through the term 'enhance capacity,' and is replaced with 'reduce congestion,' to incorporate other congestion reduction strategies. However, the title still says 'Enhance Capacity' and should be replaced as well.

General Comments

Throughout the DEIR, construction activities, congestion, and other impacts are characterized as temporary. However, given the duration of these activities (5+ years), the intensity of the impacts, and the lasting effect on nearby communities, they should be characterized as permanent. (See *Hendler v. United States* for the definition of 'permanent.')

Since activities are considered permanent, the mitigation measures to be implemented should be more permanent in nature. For example, "*Use of flag people or temporary traffic signals/signage as necessary to slow or detour traffic*," would not be practical as a permanent solution.

Level-of-service (LOS) is an entirely inadequate measure of traffic impacts for this project. Extraordinary in its size and scope, this project would incur major and significant traffic impacts that an LOS analysis alone may not identify. A traffic impact analysis that incorporates other methods in addition to LOS that accurately captures the broader traffic impacts of this project may be more appropriate. (See *Mejia v. City of Los Angeles, City of Antioch v. the City Council of the City of Pittsburg,* and *Oro Fino Gold Mining Corporation v. El Dorado County* regarding fair argument for significant impacts vs. established traffic standards.)

In the previous version of the DEIR, it was stated that the project's construction period would be approximately nine years. In Alternative 4A, the duration was changed to five years, but no explanation was given for the drastic shortening of the construction time. It seems unrealistic that a project of this size and complexity could have a construction schedule cut in half without substantial changes or initial errors in the estimate in the schedule. The DEIR should identify the details of the five-year construction schedule and how it was reduced from nine years.

Comments from the Previous BDCP DEIR/DEIS that Remain Unaddressed

General Comments

The applicant shall include the County early in the planning and design process to coordinate property rights, agreements, and to coordinate this project with the County's adjacent capital improvement projects. DWR must address any impacts that could potentially increase costs or constrain the County's future capital road improvements.

The applicant will be required to execute an agreement, in addition to the road encroachment permit, that specifies the land rights to be acquired as well as fiscal compensation to mitigate for increased cost related to bridge and road maintenance. The agreement should identify work to be completed by DWR to address impacts to County facilities or how the County will be compensated for impacts related to disruption during construction. This includes subsequent impacts after construction related to the constraints of operating roadways over bridges or roadways with significant infrastructure bored under existing roadway improvements. Ample time should be provided to execute this agreement(s).

The agreement should specify the terms related to the use of county land and the California Department of Water Resources (DWR) responsibility for perpetual maintenance and inspection of the bridge structures and associated approaches that lead up to the bridge. The agreement between DWR and the County must specify the agency responsible for the perpetual operation and maintenance of the bridge, including assumption of all liability. If the County will accept perpetual maintenance and ownership, DWR must address the anticipated increase in maintenance cost that will be experienced by the County.

Construction of the bridges and adjacent roadways shall meet County standards and include standard bike lane and pedestrian access that meets the requirements of the Americans with Disabilities Act (ADA). The bridge structures should provide adequate width for ultimate roadway configurations as identified by the Contra Costa County Public Works Department.

Appendix 22B in Appendix A

Table's 22B-5 through 22B-8 (Appendix 22B) give a full comprehensive list (well over 100 pages) of hundreds of equipment types and their anticipated hours of use for the entire project. However, no information is provided regarding how many of each piece of equipment will be used and where exactly within the Plan Area, other than the type of project they'll be used for

(i.e. control structures, pipelines, forebays, etc.). Without this additional detail it is not possible to identify the impacts of the project and the EIR/EIS is therefore inadequate and incomplete.

Chapter 19 of Appendix A, Page 19-122 - Mitigation Measure TRANS-1a

The Traffic Mitigation Program (TMP) required under Mitigation Measure Trans 1-a will be "site-specific," and should consolidate the appropriate information from the referenced tables to indicate; 1) an estimate of how a specific site and transportation infrastructure in the vicinity will be affected, 2) by what types of equipment, and 3) to what degree (duration of days/hours, trips). It would not be reasonable to expect the reader to derive this information on their own based on what is presented in the referenced tables.

Appendix 3C in Appendix A - Construction Assumptions for Water Conveyance Facilities

The construction assumptions in Appendix 3C are very broad and do not give an indication as to what degree specific sites will be impacted (i.e. Byron and J4). Again, without this information detail it is not possible to identify the impacts of the project and the EIR is not complete.

Chapter 19 of Appendix A, Page 19-123, Line 26 - Mitigation Measure TRANS-1a

The DEIR/EIS Mitigation Measure TRANS-1a includes: *"Plans to relocate school bus drop-off and pick-up locations if they will be affected during construction."* Altering school circulation patterns would have to be reviewed but would generally only be feasible or reasonable on a temporary basis. Again, 9 years of impacts should be treated as permanent. An "avoid" mitigation measure is the only appropriate measure in this case. Compromising a community fixture such as a school on a longer term basis is entirely inappropriate and unacceptable.

Appendix 3B in Appendix A - Environmental Commitments, AMMs, and CMs

Since Appendix 3B does not contain environmental commitments specific to school circulation patterns. Assuming MM TRANS 1-a (develop a TMP) will cover this, consultation with County (Public Works and Conservation and Development Departments), the School District, the County Office of Education, and the Parent Teacher Association will be required in the development of the TMP.

Appendix A, Attachment 3B, Page 3B-2

The RDEIR/SDEIS discusses the California Court of Appeal decision in January 2014 known as Lotus v. Department of Transportation. The RDEIR/SDEIS states: "*In general, lead agencies must not simply assume, without analysis, that such project features will be effective in avoiding or minimizing significant environmental effects*."

Because the RDEIR/SDEIS includes no full model runs for the new WaterFix alternatives, DWR and Reclamation cannot simply assume or speculate about the environmental impacts of the preferred alternative. In addition, the lead agencies cannot assume that eliminating the originally

proposed habitat restoration will eliminate many of the previous significant and "unavoidable" adverse water quality impacts without fully modeling operation of the proposed project with a reasonably foreseeable range of actual habitat restoration projects. The RDEIR/SDEIS acknowledges in a number of places that the eventual placement of the WaterFix, and EcoRestore tidal habitat will greatly affect water quality.

The changes to the environmental impacts of the WaterFix project with full model runs and specific habitat restoration actions will be significant enough, and the statewide importance of the project, warrant preparation of a new Draft EIR/EIS. The new Draft EIR/EIS should then be released for public review and comment.

Chapter 19 of Appendix A, Page 19-123, Line 33

"*control for any temporary road closure...*" Please be aware that the road network in the East Contra Costa Area is limited with little redundancy. Again, independent, secondary project supportive infrastructure may be necessary due to the limited ability of the surrounding area to support this industrial activity.

Additional Comments

There are additional roads which the aqueduct will cross that are not discussed in the DEIR. At a minimum, the roads impacted by the project should be listed in the programmatic DIER. In the future, the project specific DEIR should address each road and the associated impact by the project.

The future project specific DEIR should include information on detours and temporary/bypass roadways established during the construction period. The applicant shall provide detour plans and public notices well in advance of any proposed road closures.

The project specific DEIR should include a drainage study to ensure that the aqueduct does not increase flooding in the area.

Delta Road from Main Street (old SR4) to Sellers Avenue is under the jurisdiction of the City of Oakley. Delta Road from Sellers Avenue to Byron Highway is under the jurisdiction of Contra Costa County Public Works Department. Revise all tables and other references to reflect the jurisdictional segments.

All applicable maps should be revised to reflect the location of the Byron Airport.

The project shall comply with the Contra Costa Airport Land Use Compatibility Plan (ALUCP), Countywide and Byron Airport Policies. The basic function of the ALUCP is to promote compatibility between County Airports and the land uses surrounding them. The BDCP proposes an industrial land use, and should demonstrate how the selected project within the Byron Airport Influence Area complies with the aforementioned policies.

Appendix A, Appendix 8G, Page 8G-1
8G.1 Chloride Methodology

New language in the RDEIR/SDEIS stresses that understanding the uncertainties and limitations in the modeling and assessment approach is important for interpreting the results and effects analysis, including assessment of compliance with water quality objectives. The RDEIR/SDEIS then states that "*in light of these limitations, the assessment of compliance is conducted in terms of assessing the overall direction and degree to which Delta chloride would be affected relative to a baseline, and discussion of compliance does not imply that the alternative would literally cause Delta chloride to be out of compliance a certain period of time. In other words, the model results are used in a comparative mode, not a predictive mode.*"

The RDEIR/SDEIS is inadequate because it fails to perform full model runs for the new alternatives, but also because it uses the results from earlier flawed model runs in a comparative mode. If, for example, the input flows to a CALSIM II run were too high then conditions would be wetter than they should be, changes in water quality due to operations of a new project would be underestimated. This error would then propagate into the subsequent DSM2 model run. There would be less seawater intrusion and a reduction in Delta outflow caused by the new project would have less effect on Delta salinity. Subtracting the with-project run from the without-project run in this case would underestimate the real impacts. Subtracting one erroneous run from another does not necessarily get rid of the inherent modeling errors.

If the DSM2 simulations of EC, chloride and bromide do not comply well with historical data, then the DSM2 model, and if necessary, the CALSIM II model, need to be corrected. If there are errors in the predictions of salinity at Barker Slough or at the south Delta agricultural compliance stations in the base case, looking at the results in a comparative mode will not correct those errors. Similarly, if the Rock Slough or Emmaton standards are exceeded in the base case, the predicted changes in salinity with the project will also be incorrect.

Because of the statewide importance of developing a solution to the Delta problems, it is not good enough to accept these large errors in the model predictions. The models and their input files must be revised, including using a daily rather than monthly time step in CALSIM II to eliminate the problems with standards that begin and end within months. A new Draft EIR/EIS should then be prepared with full updated model runs and released for public review and comment.

Appendix A, Appendix 8H, Page 8H-1

The RDEIR/SDEIS states that "*The sensitivity analysis modeling runs were limited to the Existing Conditions, No Action Alternative, and Alternative 4 Scenario H3, but the findings from these analyses can generally be extended to other scenarios of Alternative 4 and the other project alternatives.*" Because the sensitivity analyses were applied to Alternative 4 at late long term, they are not at all representative of the preferred alternative, Alternative 4A, at early long term, which has almost no habitat restoration and significantly less sea level rise and seawater

intrusion. A new Draft EIR/EIS must be prepared that carries out full model runs for Alternative 4A and the other alternatives at early long term and late long term.

The RDEIR/SDEIS also states that "*DWR and USBR have every intention of operating SWP and CVP facilities by fine tuning reservoir storage and exports in real time to meet D-1641 standards, and any changes to D-1641 as adopted by the SWRCB. Actual operations are continuously adjusted to respond to reservoir storages, river flows, exports, in-Delta demands, tides, and other factors to insure compliance to regulatory requirements to the extent possible.*" Because of the failure of the RDEIR/SDEIS to actually model the new alternatives and revise the flawed modeling for the November 2013 Draft alternatives, the proposed project operations could be different than, poorly, presented in the RDEIR/SDEIS. Exports may need to be reduced in a given month and made up in a subsequent month thereby shifting impacts to other more critical months. A new Draft EIR/EIS must be prepared that carries out full model runs for Alternative 4A and the other alternatives at early long term and late long term. The new Draft EIR/EIS must then be released for public review and comment.

Appendix A, Appendix 8H – Attachment 1, Page 3
BDCP EIR/EIS Water Quality Sensitivity Analysis

The Draft Technical Memorandum, included as an attachment to the RDEIR/SDEIS, states: *"DSM2 sensitivity runs listed above were simulated at LLT conditions. NAA DSM2 run at LLT accounts for 45 cm sea level rise at the Golden Gate Bridge. Alt4 H3 DSM2 runs at LLT account for 65,000 acres of restoration in addition to the 45 cm sea level rise. Even though the sensitivity analyses were performed at LLT, the factors identified to explain modeled salinity exceedances at LLT <u>are expected to be valid similarly</u> at Early Long-term (ELT) conditions."*

This speculation is not correct. The late long term conditions in the Delta will include a significant amount of additional seawater intrusion, especially at locations like Barker Slough (as shown by the sensitivity analyses). Comparing two simulations with a lot of seawater intrusion (subtracting one from the other) is very different from comparing two simulations under conditions with significantly less seawater intrusion (i.e., at early long term).

It is also incorrect to claim that "the Lead Agencies have determined that they may reasonably rely on the modeling conducted for Alternative 4 to accurately predict the environmental effects of Alternative 4A" (p*age 4.2-18).*

As was acknowledged in the RDEIR/SDEIS on page 4.3.4-24, "*..... the quantitative modeling results presented in this assessment is(sp) not entirely predictive of actual effects under Alternative 4A, and the results should be interpreted with caution.*"

The result presented in Appendix 8H, Attachment 1, are very interesting but they are no substitute for full model runs. A new Draft EIR/EIS should then be prepared with full updated model runs and released for public review and comment.

RDEIR/SDEIS Appendix B

Page B-1

The WaterFix preferred alternative (Alternative 4A) includes a new minimum flow criterion at Rio Vista from January through August consistent with Alternative 4. This was apparently required to constrain the CALSIM II simulations from causing unrealistically low flows in the Delta. The SWRCB as part of its water right permitting process will need to include this same minimum flow criterion in the WaterFix permits to ensure that real-time operations also do not cause unrealistically low flows in the Delta and reverse flows in the north Delta that would adversely impact fish.

The RDEIR/SDEIS also states that "Alternative 4A would not include operational elements associated with Fremont Weir modifications as they would be assumed to occur as part of the No Action Alternative as may be required by the existing NMFS (2009) BiOp." See also the related bullet on page B-2. This needs to be clarified. Does Alternative 4A not include Fremont weir modifications even though they are in the NAA?

A new RDEIR/SDEIS must be prepared that clearly states that the WaterFix real-time operations will also comply with these new proposed January through August Rio Vista flow requirements and whether the Fremont weir modifications will not be made if the WaterFix project is implemented. The new Draft EIR/EIS should then be released for public review and comment.

Page B-3

The RDEIR/SDEIS states that "*For the Alternative 4A sensitivity analysis Alternative 4 CALSIM II models from draft EIR/EIS were used as is, <u>without including any recent updates to the CALSIM II</u> since the draft EIR/EIS was completed, to remain consistent with the draft EIR/EIS modeling.*"

The environmental analyses and disclosures of impacts in the RDEIR/SDEIS are inadequate because of flaws identified for the earlier BDCP model runs and CALSIM II and DSM2 models, and the failure to include the recent updates to the models and revise the earlier modeling runs. The approach chosen by the lead agencies therefore did not allow any reliable verification of whether the draft EIR/EIS modeling could be used to inform Alternative 4A impact analysis in the REIR/EIS.

A new Draft EIR/EIS must be prepared that carries out full model runs for Alternative 4A and all other alternatives using updated and revised CALSIM II and DSM2 models. The new Draft EIR/EIS must then be released for public review and comment.

Appendix F: Supplemental Modeling Results at ELT for 3 Alternative 4 at H1 and H2

Page F-1

This RDEIR/SDEIS appendix presents the CALSIM water operations modeling results for Alternative 4 for operational scenarios referred to as "Scenarios H1 and H2" at early long term.

These two scenarios from the BDCP Draft EIR/EIS do not include the Fall X2 requirement in the biological opinions and found by the SWRCB to be necessary to restore and sustain recovery of fish species in the Delta. Recent court decisions confirmed the validity of the USFWS's biological opinion requirement to meet Fall X2 in wet and above normal years.

It is very difficult to comprehend why the lead agencies, who purport to be developing a project to improve conditions for key fish species, are continuing to promote SWP and CVP operations that do not include Fall X2 operation required under their biological opinions, and would continue to harm key fish species. This is also contrary to the state and federal requirements (Public Law 112-74) to contribute to achieving the coequal goals.

RDEIR/SDEIS Appendix G

Page G-5, Line 31
G.4.4 Reduce Reliance on the Delta through Improved Regional Water Self-Reliance

The RDEIR/SDEIS states that "*DWR supports Demand Management Measures (DMM) which are tools to reduce reliance on imported water.*" However, the RDEIR/SDEIS argues that the urban and agricultural water management plans and the water conservation provisions of Senate Bill x7-7 and Assembly Bill 1420 and other programs do not give DWR authority to mandate or impose conservation requirements on suppliers or regional agencies. The current drought emergencies has shown that the State can indeed impose conservation requirements on water users statewide. The 2009 Delta Reform Act requirement to reduce dependence on diversions of water from the Delta means that new Bay-Delta projects, especially WaterFix, must include binding commitments that DWR and Reclamation's export water contractors will reduce their water uses through water management and conservation actions. It is not sufficient to rely on suppliers becoming ineligible for state water management grant funds to reduce water demand.

A new Draft EIR/EIS must be prepared that includes holistic solution alternatives that include binding commitments for demand reduction and water conservation actions. The new Draft EIR/EIS should then be released for public review and comment.

Page G-6, Line 34
G.4.6 Delta Flow Objectives

The RDEIR/SDEIS states that "*DWR complies with Delta flow objectives by use of real time operating procedure and will continue to do so into the future when new objectives are set.*" If, as required by the 2009 Delta Reform Act, the SWRCB implements high Delta flow requirements, DWR and Reclamation may not be able to meet these new flow objectives without new infrastructure. The RDEIR/SDEIS is inadequate because it fails to analyze operation of CVP and SWP operations with existing Delta infrastructure and new flow objectives. It also fails to analyze alternatives that would allow the CVP and SWP to meet new SWRCB flow objectives and still meet water delivery goals to CVP and SWP water contractors.

A new Draft EIR/EIS must be prepared that assumes new SWRCB flow objectives will be in place in the immediate future and develops alternatives that are compatible with those new alternatives, e.g., holistic alternatives that include new storage to capture "new" water under high flow conditions in the Delta when flows are surplus to the needs of the Delta. The new Draft EIR/EIS should then be released for public review and comment.

Attachment C

Detailed Analysis Of WaterFix Project Impacts based on Water Fix Modeling and Sensitivity Analysis Data

The Delta Independent Science Board's (ISB) September 30, 2015 letter indicates in no uncertain terms that the BDCP/CWF is "*sufficiently incomplete and opaque to deter its evaluation and use by decision makers, resource managers, scientists and the broader public.*" The Delta ISB also found that the WaterFix RDEIR/SDEIS lacks "*concise summaries integrated with informative graphics.*" Contra Costa County agrees with these findings. The presentation of long-term averages without presentations of individual monthly flows and exports and daily water quality data hides many important details about the way the WaterFix preferred alternative could likely operate and misleads decision makers.

This attachment presents examples of the type of detailed graphics that must be included in the next Draft EIR/EIS, and discusses problems with preferred alternative 4A that these plots reveal. Contra Costa County presented similar attachments in our July 29, 2014 comments on the BDCP Draft EIR/EIS and in early comments to the BDCP proponents. Unfortunately, plots of these types were not incorporated into the RDEIR/SDEIS.

The Delta ISB has asked for over three years, for cogent summaries, clear comparisons, and informative graphics. We agree with the Delta ISB that "*three years is more than enough time to have developed them.*"

The graphical presentations in this attachment illustrate the inconsistencies between how the WaterFix project is portrayed in the RDEIR/SDEIS and how the CALSIM II and DSM2 simulations indicate it will more likely operate. For example neither the BDCP nor the WaterFix alternatives are capable of capturing water in the Delta during periods of high flow. This is not because of the Delta smelt or salmon biological opinions, but because there is no new infrastructure to store and convey the captured water to the California Aqueduct and Delta Mendota Canal. The graphs also indicate times when the computer models fail to meet the SWRCB water quality control plan standards and other regulatory requirements in the Delta.

Data Source

The data presented in this attachment were provided by DWR from the CALSIM II and DSM2 sensitivity analyses. As discussed in this comment letter, the sensitivity analyses do not actual represent the full details of the preferred alternative. The water quality data, in particular, were based on BDCP Alternative 4 at late long term, which included 65,000 acres of habitat restoration, and a shift in location of the Emmaton standard, whereas the preferred alternative 4A is evaluated at early long term (much less sea level rise) and has almost no habitat restoration. No actual full water quality model run was carried out for preferred alternative 4A. The water quality analyses were also only for 16-years which is insufficient to understand the full range of variability of Delta salinities resulting for project operations. Full water quality modeling should have been done for the full 82-year period (1922-2003) used for the CALSIM II operations analyses.

DWR included a Disclaimer with the data that says the DWR released these data as preliminary modeling data and makes no representations or guarantees as to the completeness, accuracy or correctness of the data. DWR further emphasized that sensitivity analyses are not full model runs.

WaterFix preferred alternative will increase exports in the driest months when the Delta ecosystem is most stressed

The California WaterFix proponents claim that one of the benefits of the WaterFix conveyance proposal is that it will reduce the damaging effect of exports from the south Delta on key fish species. There is general agreement amongst Bay-Delta stakeholders that the location of the south Delta export locations (Clifton Court Forebay and the Jones Pumping Plant) cause reverse flows that direct fish toward the export pumps and adversely impact fish populations.

The Bay Delta Conservation Plan (BDCP) and WaterFix proponents also claim that the project will operate according to a Big Gulp, Little Sip principle. This principle was one of the original planning principles of the BDCP Steering Committee (BDCP March 2009 "An Overview and Update") – "*Divert more water in the wetter periods and less in the drier periods*."

It is important to realize that "wetter periods" applies to periods of high runoff and high Delta flows, which occur on the order of weeks or months. Wet periods usually occur during the winter and spring. The summer and fall are typically dry periods. There can be wet periods, albeit brief, during dry water years just as there can be dry periods during wet water years.
An inspection of the monthly Delta export data from the WaterFix analyses suggest that neither of these alleged benefits of the BDCP and WaterFix is true.

Currently, the maximum rate of exports from the Delta during drier periods is about 11,280 cubic feet per second (6,680 cfs at the SWP export facility plus 4,600 cfs at the CVP pumps.). As shown in Figure C-1, the WaterFix data for Alternative 4A, Scenario H3 at early long term, suggest that in many dry months when Delta outflows are very low, the combined SWP and CVP exports from the south Delta would be as high as 14,900 cfs. This is an increase in south Delta pumping of 3,600 cfs or about 24%.

Rather than diverting less in dry periods and reducing the CVP and SWP's dependence on water from the Delta, the WaterFix project would increase exports.

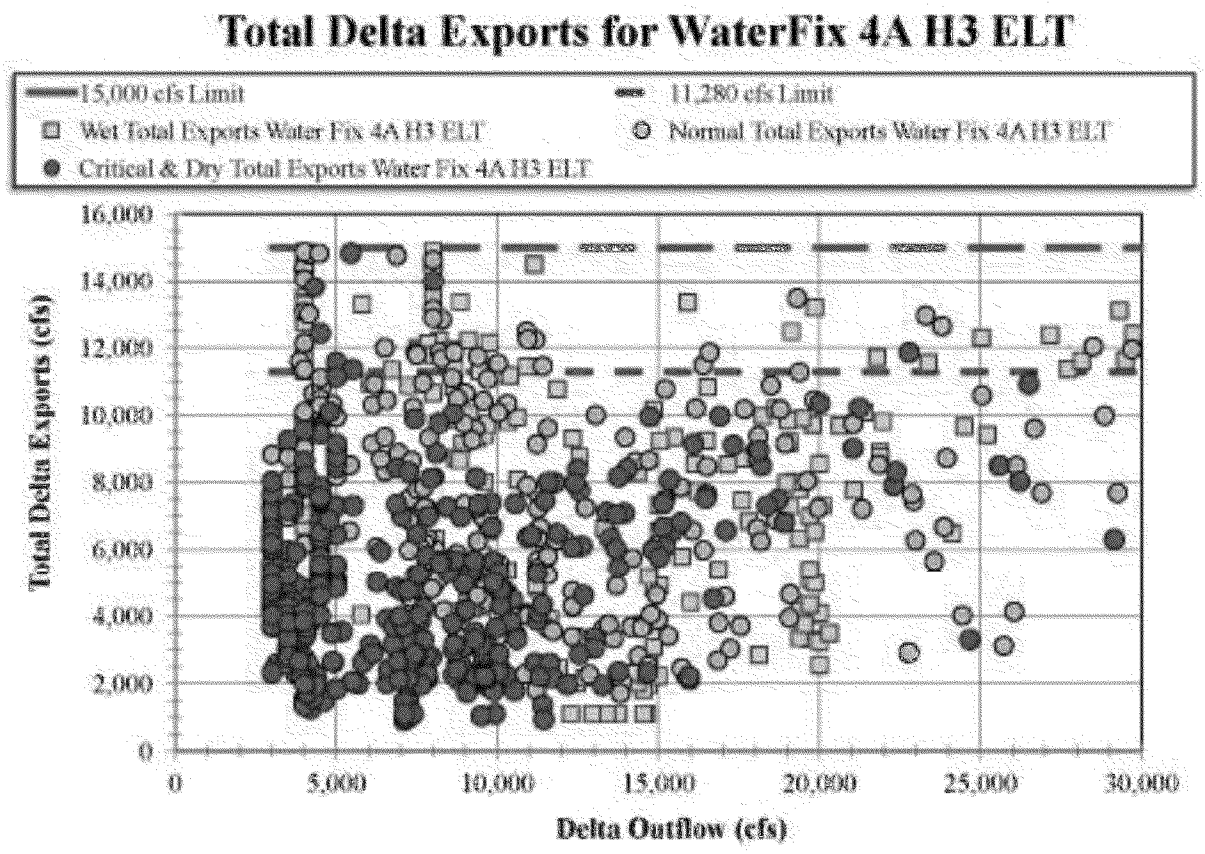

FIGURE C-1: *Monthly total Delta exports as a function of Delta outflow for the WaterFix preferred alternative (Alternative 4A, Scenario H3 at Early Long Term). Only months when outflows are less than 30,000 cfs are plotted.*

The same WaterFix operations simulations show that during periods of high Delta outflow (say 30,000 cfs or greater), when water surplus to the needs of the Delta could be available for export, the WaterFix preferred alternative often fails to increase in export diversions above existing levels (Figure C-2). In other words, without new storage in or close to the Delta, the WaterFix preferred alternative is unable to capture this surplus flow. During wet periods, farmers' fields and urban landscapes are soaked reducing demand for water. The existing south-of-Delta reservoirs fill and there is nowhere else to quickly store the more water. The WaterFix preferred alternative will be unable to regularly take a "Big Gulp."

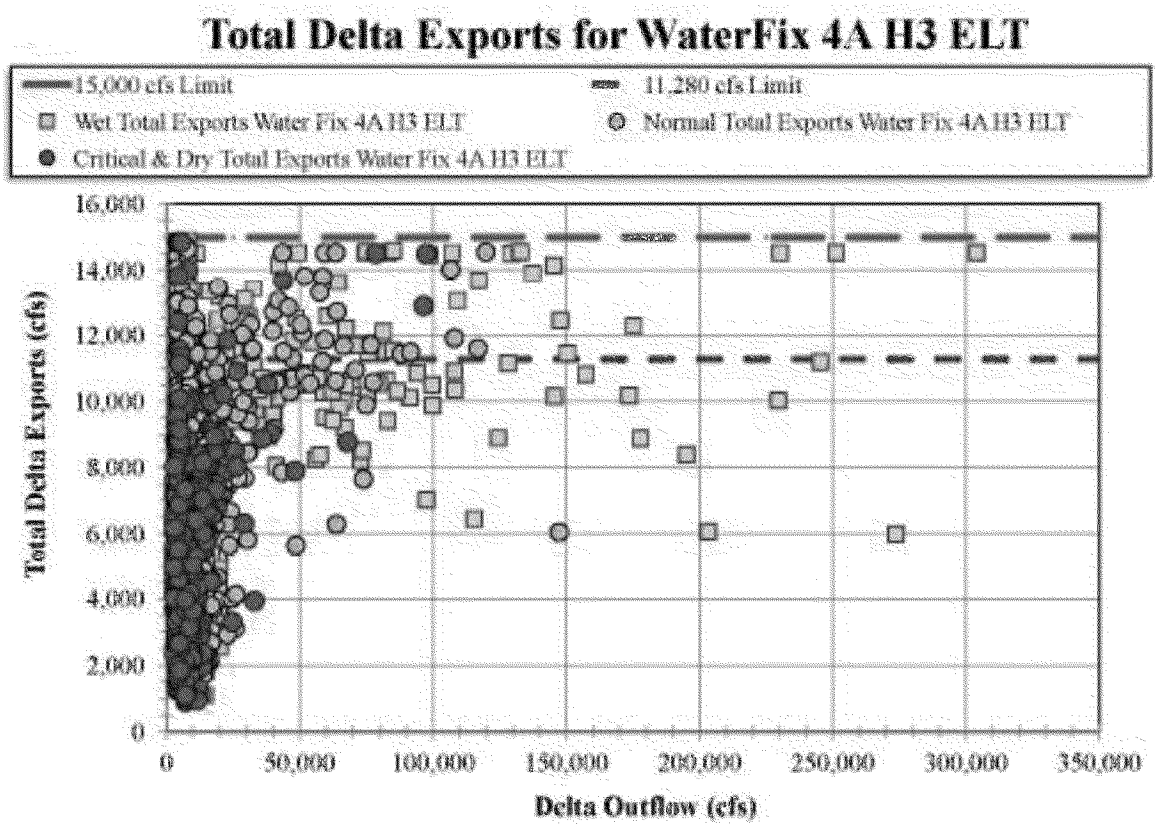

Figure C-2: *Monthly total Delta exports as a function of Delta outflow for the WaterFix preferred alternative (Alternative 4A, Scenario H3 at Early Long Term). All the months for the 1922-2003 simulation period are plotted. Without new storage, the WaterFix preferred alternative is unable to regularly capture water during wet periods.*

Increasing exports from the Delta in the dry months is in direct conflict with the 2009 Delta Reform Act (Water Code Section 85021), which states that the policy of the State of California is to reduce reliance on the Delta in meeting California's future water supply needs through a statewide strategy of investing in improved regional supplies, conservation, and water use efficiency. The BDCP proposed project includes no actions to improve regional self-reliance for water through investment in water use efficiency, water recycling, advanced water technologies, local and regional water supply projects, and improved regional coordination of local and regional water supply efforts.

The WaterFix preferred alternative will operate under conditions bracketed by Scenarios H3 and H4. Both include Fall X2 requirements in wet and dry years. Inconceivably, the RDEIR/SDEIS also indicates the lead agencies still desire to operate without Fall X2, i.e., Scenarios H1 and H2, which are analyzed and disclosed in Appendix F of the RDEIR/SDEIS.

To ensure that the WaterFix project actually operates as the lead agencies say it will, and to be consistent with the 2009 Delta Reform Act, it will be necessary for the fish agencies, the

SWRCB, and other regulatory agencies to impose an additional export limit that ensures less water will be exported during the driest periods.

Figure C-3 shows the same data as Figure C-1 but this figure also shows a limit on total CVP and SWP exports of the form: total exports = 1.5 x Delta outflow.

This would mean that in the fall when outflows are only 3,000 cfs, only 4,500 cfs can be exported. The CVP and SWP would not be able to increase exports above existing levels unless Delta outflow was 7,500 cfs or greater. The resulting loss of export water would have to be made up during periods of higher Delta outflow. That will not be possible though without new storage and other infrastructure in the Delta to capture more water during higher flow periods.

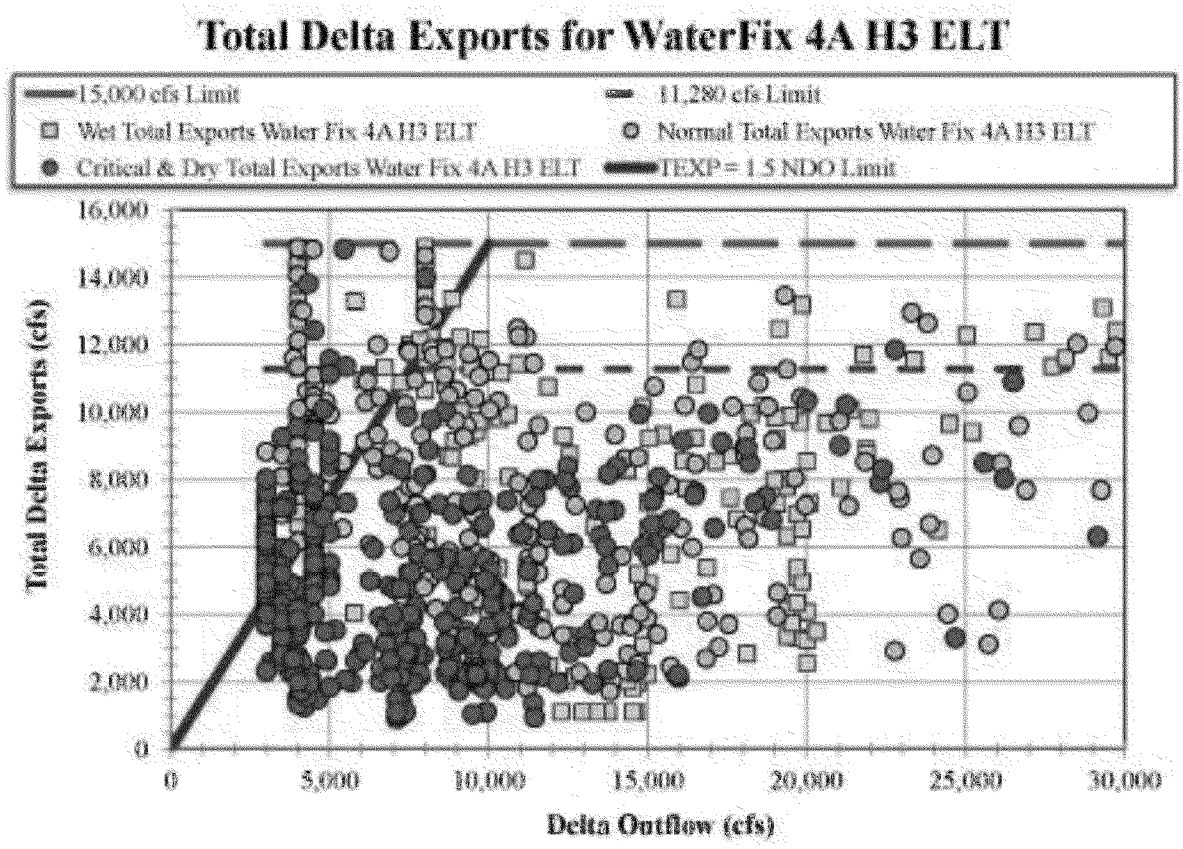

FIGURE C-3: *Monthly total Delta exports as a function of Delta outflow for the WaterFix preferred alternative (Alternative 4A, Scenario H3 at Early Long Term). The green diagonal line represents a limit on exports to ensure that less water is exported during dry months when Delta outflows are lowest.*

According to Appendix C of the RDEIR/SDEIS, the SWRCB requested that an additional alternative be analyzed (4H3) which would be operated to much higher Delta outflow

requirements specified by the SWRCB. Unfortunately, DWR and Reclamation did not modify the WaterFix infrastructure to adapt to these higher outflow requirements so the environmental benefits and viability (with respect to cost and water supply benefits) of a higher Delta flow alternative were not tested and disclosed. It is interesting, however, that the corresponding total exports versus Delta outflow graph for SWRCB Alternative 4H3 shown in Figure C-3 does represent less water being exported in drier periods. The reduced exports in this SWRCB alternative are consistent with the suggested low outflow export limit (total exports = 1.5 x Delta outflow).

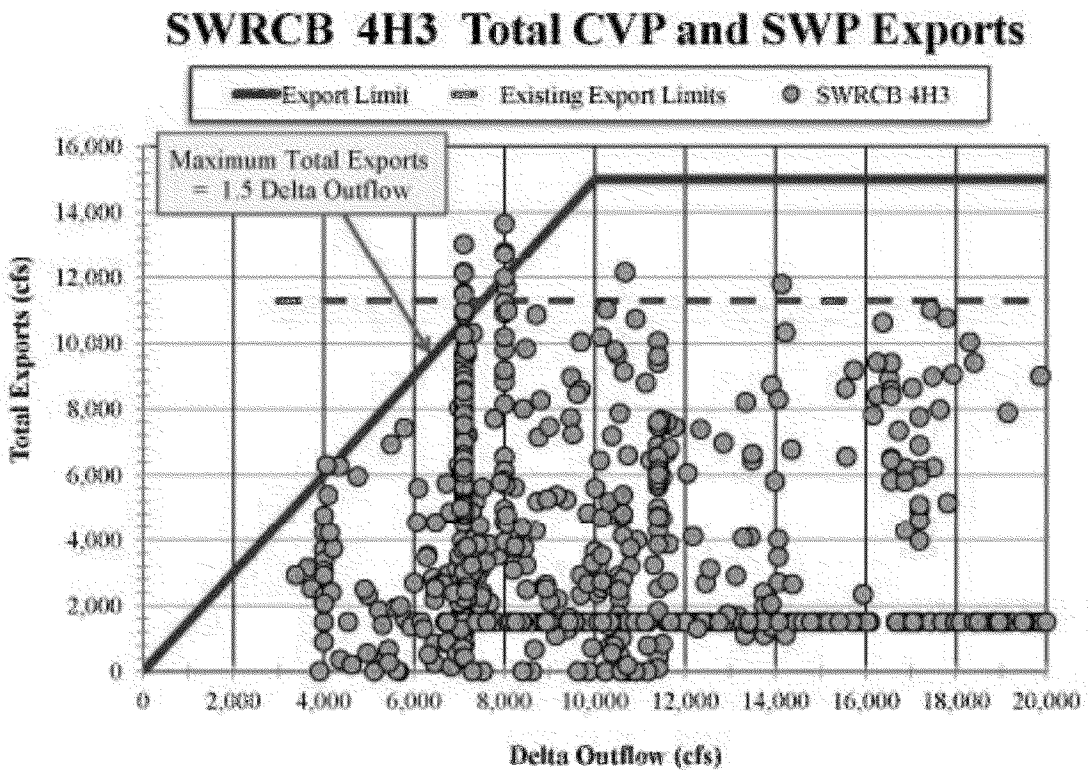

FIGURE C-4: *Monthly total Delta exports as a function of Delta outflow for the WaterFix preferred alternative (Alternative 4A, Scenario H3 at Early Long Term). All the months for the 1922-2003 simulation period are plotted. Without new storage, the WaterFix preferred alternative is unable to regularly capture water during wet periods.*

A new Draft EIR/EIS should be prepared that includes more holistic alternatives that reduce exports during drier months (*e.g.*, in a fashion similar to the suggested exports = 1.5 inflow limit) and are able to capture "new" water during periods of high Delta outflow. That would contribute to achieving the coequal goals as well as improving water quality in the Delta. The dismal WaterFix proposal hinders any progress to achieving these goals. The new Draft EIR/EIS should then be released for public review and comment.

WaterFix preferred alternative exceeds existing Army Corps limits on inflow to Clifton Court

A detailed review of the WaterFix sensitivity analysis data for Alternative 4A reveals that the monthly exports from the south Delta exceeded the U.S. Army Corps limits on inflow to Clifton Court Forebay from the south Delta. As described on page 5A-B6 of the BDCP Draft EIR/EIS, the Army Corps limits to daily diversion into Clifton Court Forebay to 6,680 cfs (specified as a three-day average daily diversion of 13,250 acre-feet). Higher inflows are permitted from mid-December to mid-March when the flow of the San Joaquin River at Vernalis exceeds 1,000 cfs. An additional 500 cfs is also permitted for July–September to reduce NMFS biological opinion impacts.

Figure C-5 shows the WaterFix analysis SWP South Delta export data for Alternative 4A, Scenario H3, at early long term, for April through November when the Army Corps limits of 6,680 cfs apply. The simulated inflows to Clifton Court (SWP through-Delta exports) are as high as 9,750 cfs with total south Delta export as high as 14,350 cfs. This is well in excess of the permitted values for this period, and is inconsistent with the WaterFix project claim of ecosystem benefits because exports from the south Delta will be reduced.

The WaterFix RDEIR/SDEIS is inadequate because it fails to clearly disclose to the public and to decision makers like the Army Corps that DWR is proposing to eliminate existing limits on the inflow to Clifton Court, and that the analyses to support the Army Corps application violates that limit.

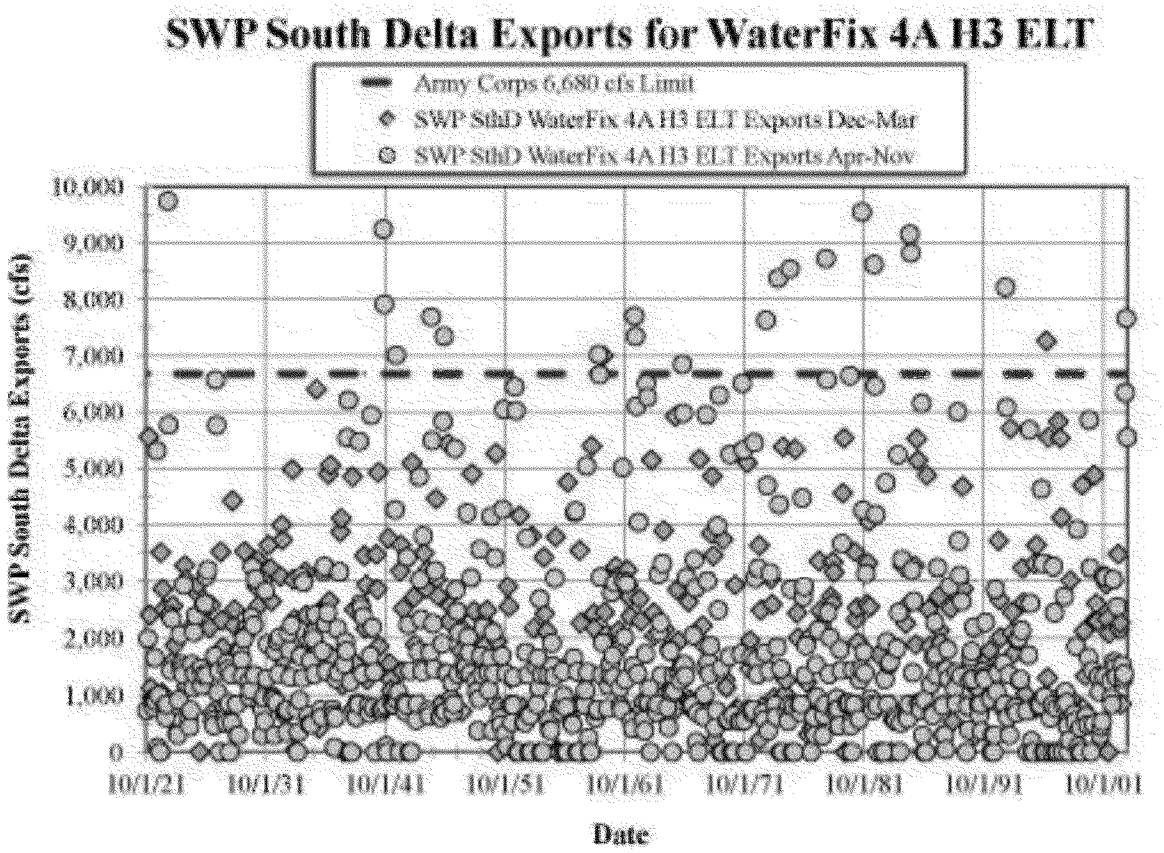

FIGURE C-5: *Monthly SWP exports from the south Delta for the WaterFix preferred alternative (Alternative 4A, Scenario H3 at Early Long Term) for the period October 1921 through September 2003. There are many exceedances of the Army Corps limit on inflow to Clifton Court. These were not disclosed in the RDEIR/SDEIS.*

Figure C-6 shows the same SWP south Delta export data as Figure C-5, but this time plotted as a function of Delta outflow. The violations of the Army Corps limits occur during drier months when Delta outflows are lower. This is again directly contrary to the principle of taking a "Little Sip" during drier periods, *i.e.*, reducing exports relative to existing levels.

During high outflow periods (outflows > 15,000 cfs), inflows to Clifton Court are well below the maximum permitted inflow.

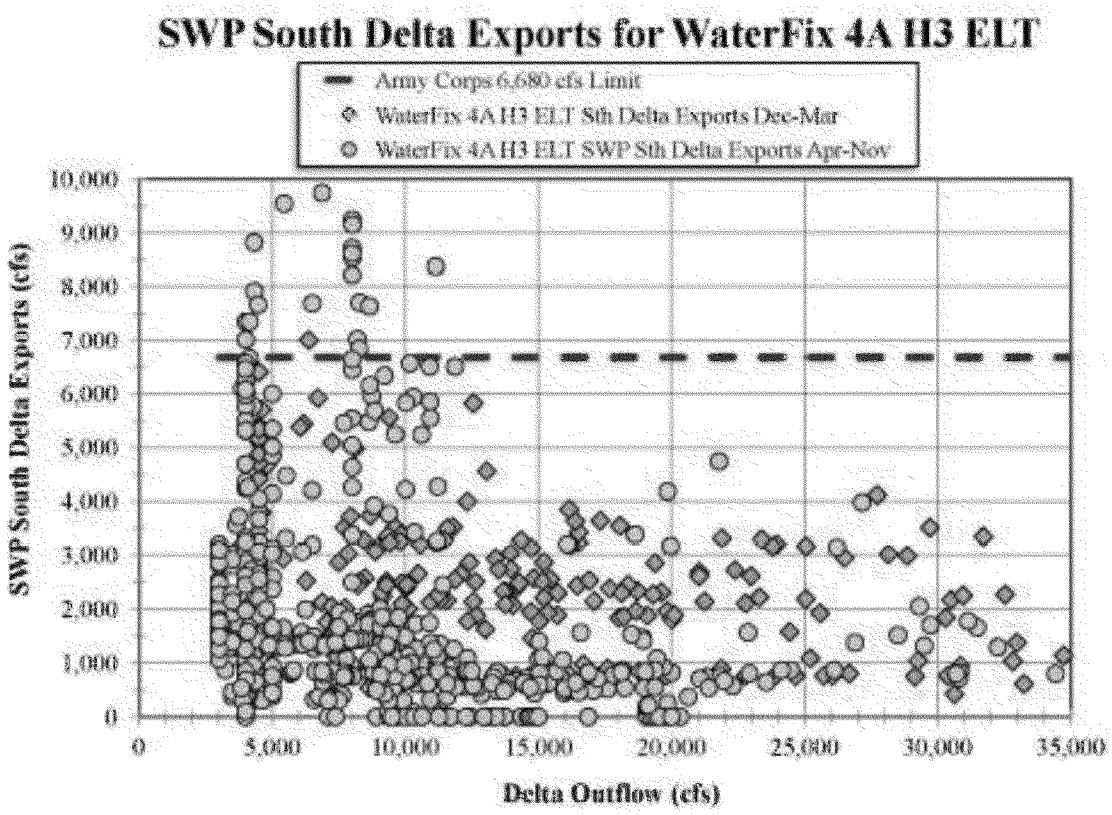

FIGURE C-6: *Monthly SWP exports from the south Delta as a function of Delta outflow for the WaterFix preferred alternative (Alternative 4A, Scenario H3 at Early Long Term). There are many exceedances of the Army Corps limit on inflow to Clifton Court. They occur during periods of lower Delta outflow.*

A new Draft EIR/EIS must be prepared that includes new alternatives that comply with the U.S. Army Corps of Engineers limits on inflow to Clifton Court Forebay, and other legal requirements set by the SWRCB and the biological opinion, and released for public review and comment.

The WaterFix analyses violate the SWRCB D-1641 minimum Rio Vista flow requirements

SWRCB Water Rights Decision 1641 requires minimum Rio Vista flows be met in the fall (September through December). As shown in Figure C-7, the monthly Rio Vista flows for September and October for the WaterFix preferred alternative (Alternative 4A, Scenario H3 at Early Long Term) fall well below the D-1641 requirements in a number of the drier years.

DWR and Reclamation's change of point of diversion petition to the SWRCB for the WaterFix project also fails to disclose to the SWRCB that the WaterFix proponents are either proposing to

selectively ignore certain D-1641 standards or that the analyses used to support the petition are flawed and not acceptable for decision making.

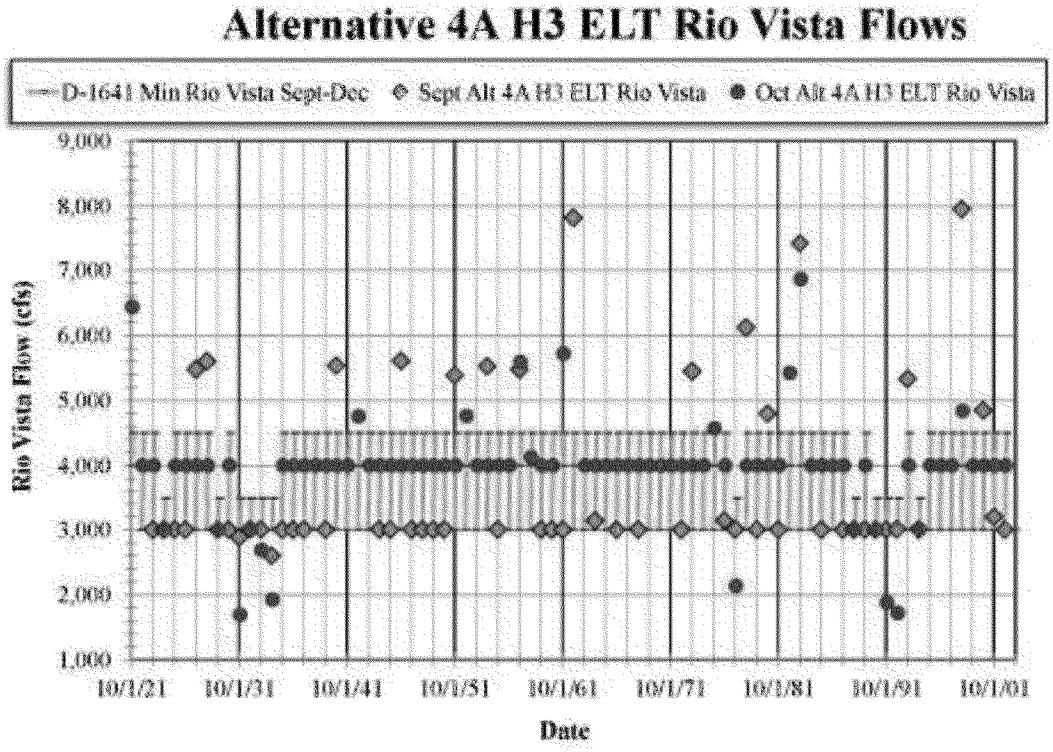

FIGURE C-7: *Times series of monthly Rio Vista flows for September and October for the WaterFix preferred alternative (Alternative 4A, Scenario H3 at Early Long Term) for water years 1922 through 2003. The CALSIM II model fails to meet the D-1641 minimum flow requirements in a number of drought years.*

The WaterFix RDEIR/SDEIS is inadequate because it fails to comply with the SWRCB minimum flow requirements at Rio Vista and fails to clearly disclose these significant violations to decision makers and the public. A new Draft EIR/EIS must be prepared which includes new alternatives that comply with all legal requirements including the Rio Vista minimum flow standards and then be released for public review and comment.

WaterFix project does not minimize reverse flows in the south Delta – Large reverse flows remain – OMR sometimes increases

The discussion of Old and Middle River flows (OMR) in the RDEIR/SDEIS fails to clearly disclose whether reverse flows in the south Delta remain large in some months (*i.e.*, are far from minimized) and whether the WaterFix project will actually increase reverse flows in other months.

Because the new north Delta intakes and isolated conveyance are being promoted as a providing ecosystem benefits by reducing the adverse impacts of SWP and CVP exports from the south Delta, the goal of the WaterFix project should be to eliminate reverse flows more negative than, say, -2,000 cfs, in all months.

There are resident fish in the Delta all year round that are not yet listed as threatened or endangered. Salvage of other species such as Striped bass, largemouth bass, white cat fish and Mississippi silversides is already large under existing conditions (see Grimaldo et al., "Factors affecting fish entrainment"). This is also likely to be a problem for sturgeon. http://swrcb2.swrcb.ca.gov/waterrights/water_issues/programs/bay_delta/deltaflow/docs/exhibits/sfwc/spprt_docs/sfwc_exh3_grimaldo.pdf

It is not sufficient to just improve OMR in a few key months when Delta smelt and other listed species are present and redirect reverse flow impacts to the subsequent months. If the months of July and August are in effect sacrificed with respect to control of reverse flows, the adverse impacts of Delta exports will shift to these two months and possibly September and new fish species are likely to decline. OMR has to be controlled in all months to avoid redirecting serious impacts to these months.

Figure C-8 shows simulated monthly Old and Middle River flows for the WaterFix preferred alternative (Alternative 4A, Scenario H3 at Early Long Term) compared to the OMR flows for the existing basecase, as a scatter plot. Many of the monthly reverse flows are very large in the base case (x-axis) and would remain large even with implementation of the WaterFix preferred alternative with its new north Delta intakes. Some of the existing large reverse flows would get even worse with WaterFix. OMR values of -12,000 cfs in the basecase would worsen to -14,000 cfs and harm resident fish in the Delta. The published claims that the RDEIR/SDEIS and the proposed project will minimize reverse flows are untrue, and could be viewed as disingenuous.

By claiming the north Delta intakes benefit fish by minimizing reverse flows, the BDCP and WaterFix proponents are acknowledging the current level of exports from the south Delta exports adversely impact fish species. For a proposed Bay-Delta project to be able to contribute to meeting the coequal goals and help restore and sustain fish species, the project operating rules will need to effectively eliminate reverse flows in the critical months for the key fish species, but also significantly decrease (not increase) reverse flows in the south Delta in all the other months.

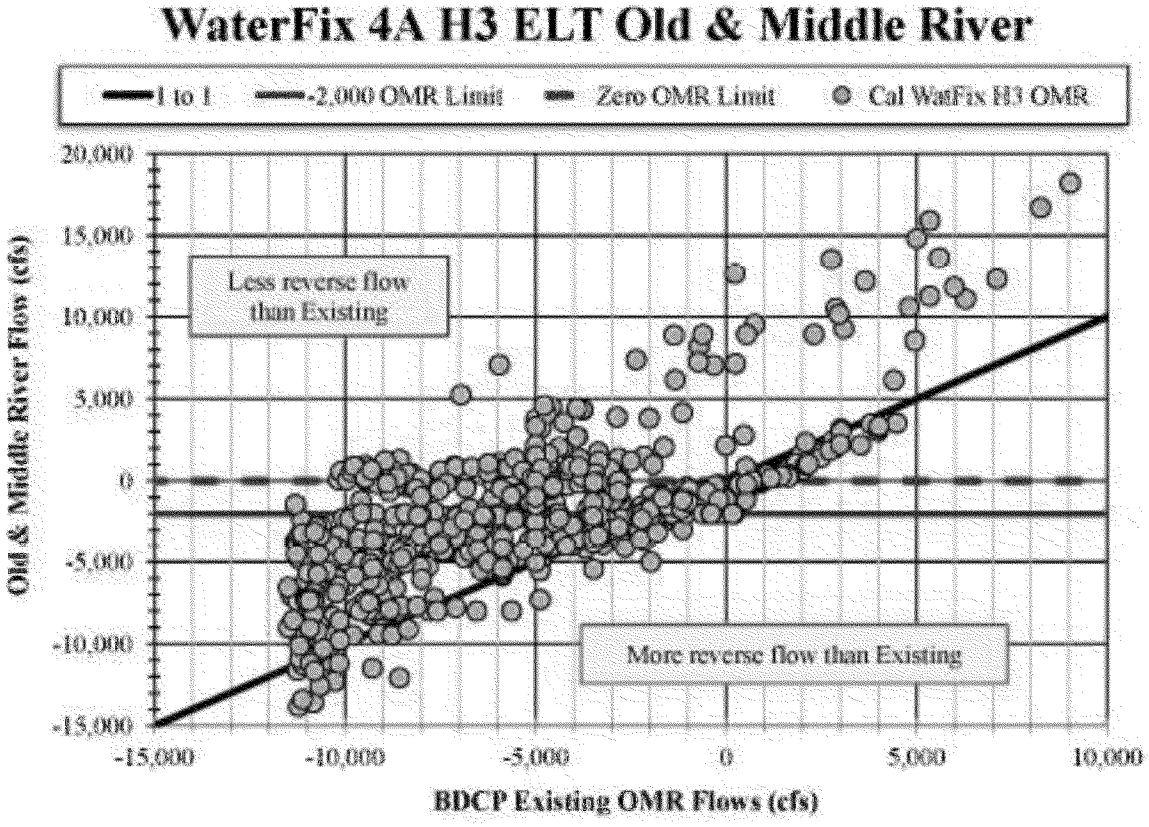

Figure C-8: *Monthly Old and Middle River flows for the WaterFix preferred alternative (Alternative 4A, Scenario H3 at Early Long Term) compared to the OMR flows for the existing basecase. Reverse flows still remain most of the time even with the proposed north Delta intakes. The most negative reverse flows get even worse with WaterFix.*

The WaterFix project and RDEIR/SDEIS is inadequate because it fails to minimize reverse flows in the Delta, and fails to clearly disclose these significant adverse impacts on fish in the Delta. A new Draft EIR/EIS must be prepared which includes new alternatives that significantly reduce or eliminate reverse flows and be released for public review and comment.

The Water Fix project fails to comply with the SWRCB Water Rights Decision 1641 export/inflow requirements.

The D-1641 export/inflow (E/I) ratio calculation was designed to protect fish from the significant adverse impacts of the inadequately screened SWP and CVP export intakes in the south Delta. Those impacts include entrainment of fish, drawing fish out of the Sacramento River system into the south Delta, and general ecosystem impacts that result from diverting too much of the inflow to an estuary. The new north Delta intakes will also impact the health of the Sacramento-San Joaquin Delta estuary by diverting inflow that otherwise would be available for fish, to restore water quality and otherwise reduce the impacts of Other Stressors. To restore and sustain the

Delta ecosystem and achieve the ecosystem coequal goal, it is important that the SWRCB export inflow ratio remain as defined in D-1641 and be met.

Figure C-9 shows the RDEIR/SDEIS simulations of monthly export/inflow ratios for the WaterFix preferred alternative (Alternative 4A, Scenario H3 at Early Long Term). The export ratios are computed according to the correct SWRCB Water Rights Decision 1641 definition (yellow circles), as well as the faulty definition used in the RDEIR/SDEIS (green diamonds). During periods when the export/inflow is required by D-1641 to be 0.35 or less, the WaterFix project would export almost 50% more water than permitted (E/I as much as 0.5). During periods when an export/inflow ratio of 0.65 is required under D-1641, the WaterFix preferred alternative E/I ratio is as high as 0.71.

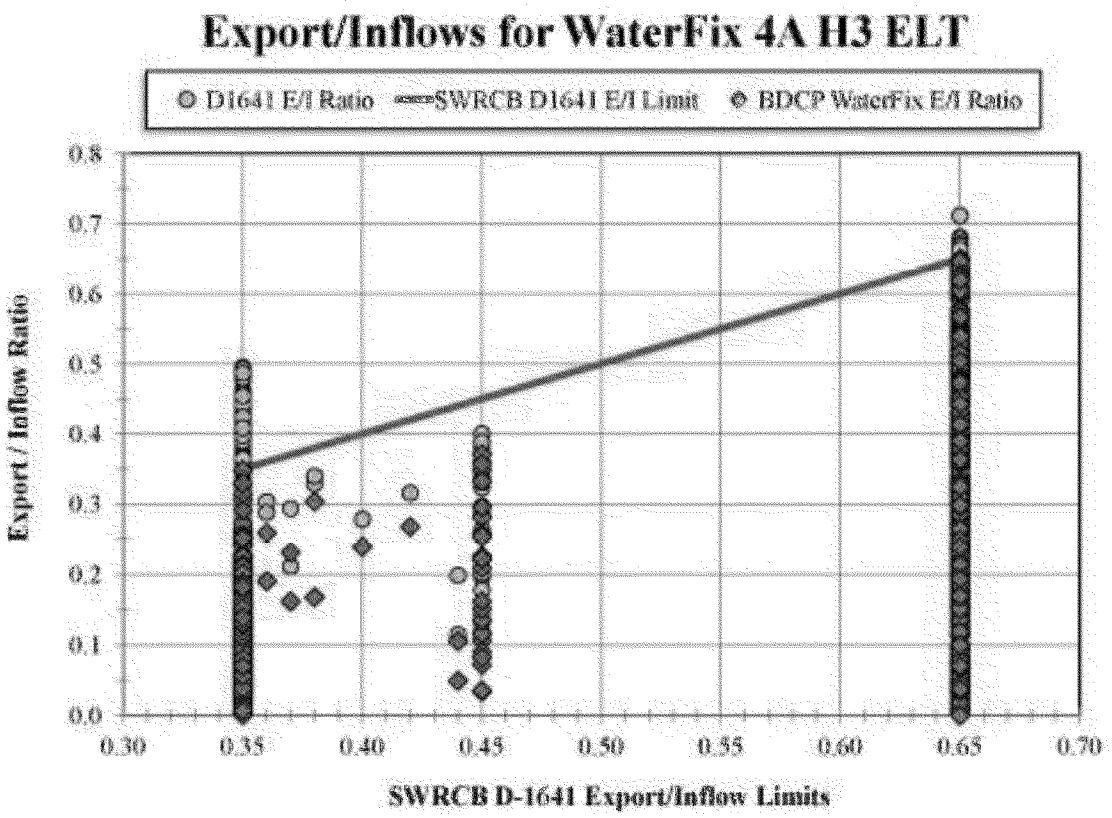

FIGURE C-9: *Simulations of monthly export/inflow ratios for the WaterFix preferred alternative (Alternative 4A, Scenario H3 at Early Long Term). The export ratios are computed using according to the SWRCB Water Rights Decision 1641 definition, as well as the definition used in the RDEIR/SDEIS. The ratios are plotted as a function of the D-1641 maximum allowable ratio*

A new Draft EIR/EIS must be prepared that analyze alternatives that comply with the SWRCB's export/inflow standards as well as the existing Army Corps limits on inflow to Clifton Court and the San Joaquin inflow to export ratios in the biological opinions. Additional full model runs could still be included to disclose individual impacts to the Delta ecosystem and water quality if

those legal requirements were not met. The new Draft must then be released for public review and comment.

The WaterFix preferred alternative fails to comply with existing limits on the ratio of San Joaquin inflow to South Delta exports.

The 2009 NMFS biological opinion sets limits on the ratio of San Joaquin inflow at Vernalis to south Delta exports in April and May. As was discussed in Contra Costa County's 2014 comments on the BDCP Draft EIR/EIS (Attachment F of that comment letter), modeling analyses for the BDCP proposed project failed to comply with this biological opinion requirement.

The RDEIR/SDEIS Appendix 8H, Attachment 1, confirms that the BDCP Draft EIR/EIS Alternative 4 did not include a requirement that the San Joaquin River inflow to export ratio action in the NMFS BiOp be met. However, the flawed BDCP modeling of Alternative 4 was the basis for the brief sensitivity analyses used in the RDEIR/SDEIS.

The RDEIR/SDEIS at page 6-20, Line 12 states: "Reverse flow conditions for Old and Middle River flows would be reduced under Alternative 4 on a long-term average basis except in May in scenarios H2 and H4 and in April and May in scenarios H1 and H3, compared to reverse flows under both Existing Conditions and the No Action Alternative, as shown in Figure 6-23. Compared to flows under the No Action Alternative, Old and Middle River flows would be less positive in April and May under scenarios H1 and H3 <u>because these scenarios do not include inflow/export ratio criteria for the San Joaquin River in those months</u>, although there are other criteria for Old and Middle River flows assumed in these scenarios."

The RDEIR/SDEIS is inadequate because the proposed project and analyses fail to comply with the San Joaquin inflow to export ratio. It is not up to DWR and Reclamation to decide not to bother to meet legal requirements and then fail to disclose these potential violations in the environmental documentation.

A new Draft EIR/EIS must be prepared that includes project alternative that meet all D-1641, and biological opinion and Army Corps inflow limit requirements. The new Draft EIR/EIS must also be clearly written with detailed graphs and tables so that it is clear to the public and decision makers what operating rules apply and whether some of these requirements are being exceeded or otherwise violated. The new Draft EIR/EIS must then be released for public review and comment.

Attachment D

Recent Contra Costa County Correspondence regarding BDCP and WaterFix

1) Letter to California Water Resources Control Board dated September 23, 2015, regarding "Petition for Change of Point of Diversion submitted by DWR and Reclamation for Cal. WaterFix";
2) Email to John Laird, Secretary, California Natural Resources Agency from Dr. Richard A. Denton, Water Resources consultant to Contra Costa County dated October 8, 2015
3) California Water Action Plan and the Cal. Water Fix, dated August 19, 2015
4) Major Problems with Cal. WaterFix Preferred Alternative, dated August 19, 2015

Department of
Conservation and
Development

Water Agency

30 Muir Road
Martinez, CA 94553

Phone: 925-674-7824

Contra Costa County

John Kopchik
Director

September 23, 2015

Mr. Tom Howard
Executive Director
State Water Resources Control Board
1001 I Street
Sacramento, California 95814

Sent via email: tom.howard@waterboards.ca.gov

Re: Petition for Change of Point of Diversion submitted by DWR and Reclamation for Cal. WaterFix

Dear Mr. Howard:

Contra Costa County has reviewed the Petition for a Change of Point of Diversion and of Rediversion submitted by the California Department of Water Resources (DWR) and U.S. Bureau of Reclamation (Reclamation) for the California WaterFix project. It is our understanding that the three new points of diversion would be at a different location than the existing Hood diversion point for the earlier Peripheral Canal project. The Petition seeks approval of the operation of three new large water export intakes on the Sacramento River in the vicinity of Clarksburg (Alternative 4A, the preferred alternative in the State's "California WaterFix" project.)

Contra Costa County is bounded on its western, northern and eastern sides by the San Francisco Bay and the Sacramento-San Joaquin Delta, and these natural features are the basis for not only the County's identity and quality of life but also our economic vitality. The availability of good quality water in the Delta is essential for municipal drinking water for the residents of Contra Costa County as well as agriculture, recreation, and industry in this region. As a local agency responsible for land use, flood protection, and other services vital for protecting the Delta, Contra Costa County has a direct interest in any proposed solution to the current problems afflicting the Delta.

Contra Costa County agrees with the detailed concerns regarding this premature and incomplete Petition raised in the letters sent to you by the Local Agencies of the North Delta and Central Delta Water Agency (dated August 31, 2015) and the City of Antioch (dated September 2, 2015).

Petition misleads public and SWRCB

The Petition contains claims and statements that are incorrect, mislead the public and the State Water Resources Control Board (SWRCB), or are unrealistically optimistic. This proposed project will not put the State on a course to achieve the coequal goals (as claimed on page 2 of the submission letter). Instead, the Cal. WaterFix preferred alternative will hinder the State's statutory intent to enhance the Delta ecosystem, improve water quality in the Delta, and protect the Delta as a Place. It also fails to increase water supplies for California.

Project will not improve conditions in the Delta ecosystem

The WaterFix preferred alternative would not result in substantially improved conditions in the Delta for threatened and endangered species (bottom of page 2 of the submittal letter). It would continue use of the unscreened Clifton Court Forebay intake and the poorly screened Jones Pumping Plant for half of the future exports of water from the Delta, add new north Delta intakes directly along the migratory pathway of key anadromous fish species, would fail to sufficiently increase flows for fish, and would increase exports from the Delta in the driest months when Delta outflows are very low (i.e., up to 15,000 cfs). The WaterFix project will increase reverse flows in the Delta in some months relative to existing conditions, and OMR values will remain less than -2,000 cfs, 55% of the time (based on a detailed analysis of DWR's monthly CALSIM output data). Even during November-June, the period that the SWRCB's 2010 Delta Flow Criteria Report deemed more critical for regulating OMR, the WaterFix project would cause OMR values less than -2,000 cfs, 44% of the time. The worst OMR with the project is -13,800 cfs which is worse than under existing conditions. In addition, the November 2013 Draft BDCP Executive Summary acknowledged that the direct effect of the north Delta intakes would adversely impact many key fish species.

Unscreened Clifton Court Forebay still used to export 27% of total exports

A supposed benefit of the WaterFix project is that south Delta diversions would be replaced by north Delta diversions through state-of-the-art fish screens (page 3). However, the existing intake to Clifton Court Forebay, which would still be used to export 27% of the total south-of-Delta exports would remain unscreened (based on DWR's CALSIM modeling of Alternative 4A, Scenario H3, at Early Long Term). In fact, half of the total exports would still be diverted from the south Delta, including from the inadequately screened Jones Pumping Plant.

Project would increase rather than decrease exports during dry periods

The Cal. WaterFix would not advance the State's water supply goals by improving the ability to capture water during wet years ("Big Gulp") and store it for use during dry years. The key to improving California's water supply is to be able to opportunistically capture water when it is available, i.e., during periods of high, surplus flow in the Delta and upstream of the upstream reservoirs. The focus should be on weeks and months rather than years. Unfortunately, the proposed project fails to capture any significant surplus flow during wet months because it does not include any new storage. Instead it relies on increasing exports from the Delta during dry

months when Delta outflows are very low (Figure 1, below), i.e., by taking advantage of the increase in maximum export capacity from 11,280 cfs under typical flow conditions and the existing Delta infrastructure, to 15,000 cfs with the proposed 9,000 cfs twin tunnels. This is contrary to the 2009 Delta Reform Act (Water Code section 85021) and threatens already stressed fish species.

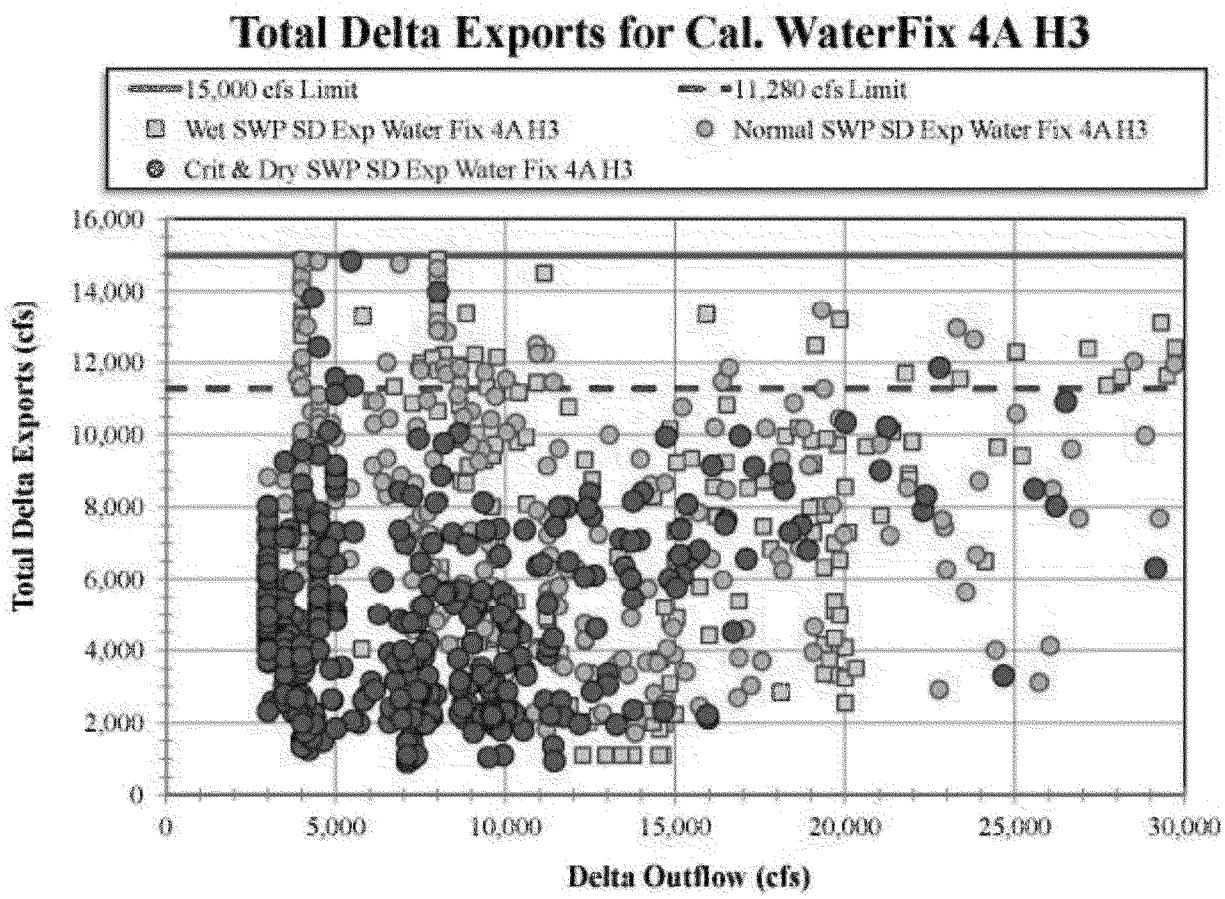

Figure 1: Monthly Total Delta exports (isolated facility and through-Delta) as a function of Delta outflow for outflows up to 30,000 cfs. These "sensitivity analysis" data for the California WaterFix Alternative 4A, Scenario H3, were provided to the County by DWR. The plotted data are categorized as (a) wet years, (b) above and below normal years, and (c) dry and critical water years. The Cal. WaterFix alternative 4A (9,000 cfs north Delta intakes plus through Delta) would allow exports up to 15,000 cfs. The existing limit on exports is typically 11,280 cfs. In drier periods (months) when Delta outflows are very low and the Delta ecosystem is stressed, the Cal. WaterFix alternative 4A would at times increase rather than reduce exports. This is the complete opposite of the ***Little Sip*** *concept). These dry period increases occur in all water year types. Even in wet years there are months that can be considered dry, and vice versa. Unfortunately, the Cal. WaterFix preferred alternative also fails to capture much additional water (i.e., export more than existing exports) when Delta outflows are high (the opposite of the* ***Big Gulp*** *concept).*

Potentially more viable alternatives have not been considered

DWR and Reclamation have also failed to consider an adequate range of alternatives, as required under Water Code section 85320(b)(2). What California needs is a project that can capture large quantities of water when it is available and truly surplus to the needs of the Delta and Bay ecosystem and water quality. Seventeen of the eighteen BDCP and Cal. WaterFix alternatives are basically the same alternative – north Delta intakes linked to south Delta export pumps by isolated conveyance. There are no components for increasing regional self-reliance, conservation, desalination, and water use efficiency, and no infrastructure to capture and store "new" water during periods of high Delta flow. The South Delta export intakes are bad for the Delta ecosystem but so are north Delta intakes. The Cal. WaterFix project is inadequate because it has failed to seriously analyze the possibility of other locations for new intakes, e.g., in the western Delta.

SWRCB requested alternative not given serious consideration

According to the RDEIR/SDEIS (Appendix C), the State Water Board requested supplemental modeling related to increased Delta outflows (Alternative 4H3). Just because the WaterFix project infrastructure was not sufficient to achieve both coequal goals with these SWRCB-suggested Delta flow requirements does not mean the SWRCB was not on the right track. A new infrastructure alternative capable of capturing and storing water when there is surplus flow in the Delta would be able to support restoring higher flows for fish, improving water quality in the Delta and improving water supply reliability for California. Water Rights Decision 1641 is not sufficiently protective of fish and wildlife beneficial uses (despite the statement on page 11 of the supplemental information) because the populations of key fish species continue to dramatically decline. The statement on page 12 of the supplemental information that "*(f)lows presented by Alternative 4A, beyond those required by D-1641, satisfy appropriate Delta flow criteria to be considered by the Board under 85086(c)(2)*" is also incorrect. Alternative 4A is inconsistent with the urgent need to restore flows in the Delta to sustain the Delta ecosystem.

Project fails to support State's comprehensive vision for the Delta

DWR and Reclamation attempt to justify their WaterFix preferred alternative as an integral part of the state's comprehensive vision for the Delta (e.g., pages 2 - 4 of the supplemental material). However, the legislation and reports they cite in support of this all call for new storage. The WaterFix preferred alternative does not include any new storage so is unable to capture surplus flows when they are available during wet months. Without additional storage and a conveyance infrastructure to divert and convey the water to new storage within or close to the Delta and then to increased groundwater and surface storage south of the Delta, the WaterFix proposal cannot help achieve either of the coequal goals and will fail to improve water quality in the Delta.

Project fails to minimize, and sometimes increases, reverse flows in the south Delta

DWR and Reclamation suggest that their proposal "*would minimize environmental impacts commonly associated with the SWP and CVP*" by addressing the real problem of reverse flows in the south Delta (pages 4 and 5 of the supplemental information). However, the operating rules of

the WaterFix preferred alternative and continued use of the south Delta export intakes for half of the SWP and CVP alternatives does not minimize reverse flows in the south Delta (see Figure 2 below). Fish are resident in the Delta year round. Salvage of other species such as Striped bass, largemouth bass, white cat fish and Mississippi silversides are already large under existing conditions (see Grimaldo et al., "Factors affecting fish entrainment"). This is also likely to be a problem for sturgeon[1]. The WaterFix project sets OMR limits for some of the year and will redirect impacts to July, August, September and October. Fish that are resident in the Delta year round may not be declining now, but they will if that period is subjected to increased reverse flows because of the WaterFix project.

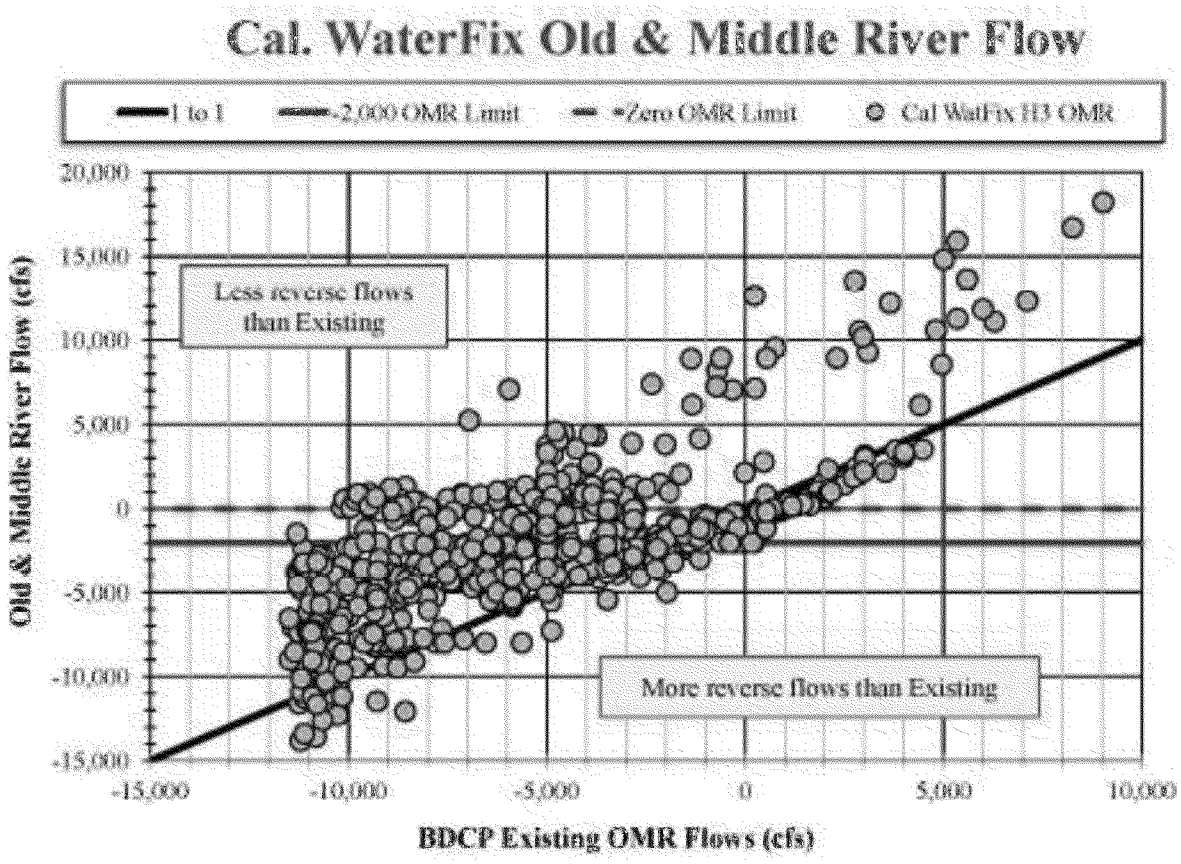

Figure 2: Old and Middle River (OMR) monthly flows for Cal. WaterFix Alternative 4A, Scenario H3, compared to monthly OMR data from the BDCP Existing Basecase. A stated benefit of the Cal. WaterFix project is to minimize reverse flows in the south Delta. With the Cal. WaterFix, reverse flows will remain in many months and in some cases get even worse. Even though there are specific months of the year when minimizing OMR is more crucial, there are resident fish in the Delta year round. Unless reverse flows are minimized in all months, the impacts of reverse flows will be redirected to other periods of the year and other Delta fish.

1 http://swrcb2.swrcb.ca.gov/waterrights/water_issues/programs/bay_delta/deltaflow/docs/exhibits/sfwc/spprt_docs/sfwc_exh3_grimaldo.pdf

SWRCB should encourage achievement of the State's coequal goals

The County encourages the SWRCB to use this opportunity and responsibly contribute to the **achievement** of the coequals goals. In the past, the SWRCB has considered that its role is to **balance** competing beneficial uses. However, this merely perpetuates a lose-lose situation. There is no incentive for DWR to develop projects that create new water if the SWRCB approves projects that merely compete for our existing, limited water supplies. Reclamation is also required to contribute to achieving the State's coequal goals (Public Law 112-74, December 2011).

The 2009 Delta Reform Act has set a new standard for all state agencies to follow to help achieve both co-equal goals, including the inherent objectives of improving water in the Delta. The SWRCB's 2010 Delta Flow Criteria Report established the kind of flow increases and reverse flow reductions that will be necessary to achieve the ecosystem goal. The January 2014 California Water Action Plan, which the SWRCB helped develop, sets out the approach that needs to be taken to develop a sustainable solution to California's water and Bay-Delta ecosystem problems. This approach requires water use efficiency and other demand reduction actions, strengthening Delta levees, as well as new storage to capture and store "new" water, all of which will help to achieve the goal of water supply reliability.

Creating "new" water allows water to be used to increase flows and reduce Delta exports in drier months, while providing more stored water for municipal and industrial and agricultural use, especially during periods of drought. Part of this solution should also be actions to recharge depleted groundwater basins throughout the state, including rerouting flood waters to recharge areas.

The bottom line is that this WaterFix proposal does none of this, and represents a significant step backwards. It will harm the Delta ecosystem, degrade Delta water quality, impact the Delta as a Place and provide very little benefit to California's water supply reliability. It will eventually lead to a very expensive stranded asset, and hinder California's ability to develop a real, sustainable, solution to California's water issues and the effects of climate change.

Contra Costa County asks that the SWRCB take a leadership role in addressing California's water and ecosystem issues. The 9-year WaterFix process has been funded by, and, therefore, led (astray) by the export water contractors, with the lead agencies taking a subservient role.

The Petition that is being considered by the SWRCB should be sent back to DWR and Reclamation with a request that new alternatives be developed and analyzed that can capture new water and get it to new surface and groundwater storage be studied (consistent with Water Code Section 1701.3). These new alternatives need to be compatible with increased flow requirements in the Delta, consistent with the 2010 Delta Flow Criteria and the 2009 Delta Reform Act (Water Code Section 85086(c)(2)). The new alternatives must of course help achieve both coequal goals, while improving water quality in the Delta and protecting the Delta as a Place.

The SWRCB should also request that any new petition be supported by actual modeling of the proposed project, and not "sensitivity analyses" based on the flawed modeling for the BDCP Draft environmental documents. The modeling data also need to be presented as time series of monthly flows and exports and daily water quality data, and correlations between such parameters as total monthly exports and monthly-averaged Delta outflows so that the SWRCB and other regulators can fully understand how the proposed project would actually operate. For example, the Cal. WaterFix preferred alternative:

> increases exports when Delta outflows are lowest,
> assumes the Army Corps limits on inflows to Clifton Court Forebay no longer apply,
> exports more water by redefining the SWRCB's D-1641 export/inflow limits (allowing more than 90% of total Delta inflow to be exported in many months), and
> makes reverse flows worse (more negative OMR) rather than better in some months.

None of these major flaws with the preferred alternative are easily discernible from the RDEIR/SDEIS or the modeling data presentations in the RDEIR/SDEIS.

If the SWRCB does decide to continue with the petition process, noticing of the petition and the deadline for submitting protests should be postponed until after detailed modeling of the preferred alternative has been completed and disclosed. We understand that this will not occur until a final, or preferable another revised Draft EIR/EIS, is released.

If you have any questions regarding this letter please contact me at (925) 674-7824.

Sincerely,

Ryan Hernandez
Manager
Contra Costa County Water Agency

Cc: Michael Lauffer, Chief Counsel, State Water Resources Control Board

> Sally Jewell, Secretary of Interior
> Estevan López, Commissioner, U.S. Bureau of Reclamation
> Dan Ashe, Director, U.S. Fish and Wildlife Service
> Dr. Kathryn D. Sullivan, NOAA Administrator
> Gina McCarthy, Administrator, U.S. Environmental Protection Agency
> John Laird, Secretary, California Natural Resources Agency
> Mark Cowin, Director, California Department of Water Resources
> David Murillo, Regional Director, U.S. Bureau of Reclamation

Senator Diane Feinstein
Senator Barbara Boxer
Congressman Mark DeSaulnier
Congressman Mike Thompson
Congressman Eric Swalwell
Congressman John Garamendi
Congressman Jerry McNerney
Congressman Jared Huffman
Congresswoman Nancy Pelosi
Contra Costa County Board of Supervisors
John Kopchik, Director, Department of Conservation and Development

From: Richard Denton
Sent: Thursday, October 08, 2015 10:08 AM
To: john.laird@resources.ca.gov ; secretary@resources.ca.gov
Cc: Karla Nemeth ; Mark.Cowin@water.ca.gov ; Chuck.Bonham@wildlife.ca.gov
Subject: Major problems with WaterFix proposal

Dear Secretary Laird,
In your October 6, 2015 reply to the Congressional Representatives, you declined to extend the comment period for review of the Cal. WaterFix environmental document.

I ask instead that please you give serious consideration to immediately withdrawing the Cal. WaterFix RDEIR/SDEIS as well as the petition to the SWRCB and Clean Water Act applications.

The current California WaterFix proposal will not contribute to achieving the coequal goals or solving the serious and urgent problems of the Delta ecosystem and California's water supply reliability. Worse still WaterFix will actually hinder achievement of these coequal goals.

Allowing the export contractors to pay for the BDCP and WaterFix planning efforts has meant that a project of California-wide and national importance has only focused on what are essentially only two alternatives that would only benefit export water quality and fails to even increase export water supplies.

Because the export contractors control spending on the environmental review process, and the existing budget was pretty much spent, the RDEIR/SDEIS was released with no new modeling and only brief sensitivity analyses. As a result, the RDEIR/SDEIS is inadequate for use by decision makers such as the SWRCB, U.S. Army Corps or even the lead agencies. The Delta ISB in its latest comments on the RDEIR/SDEIS found that presentation of the impact analyses is also inadequate and hides actual impacts from decision makers. This is not what the Natural Resources Agency should be helping to support and rush through.

It is important that you, as a key decision maker, understand the serious problems with the current WaterFix proposal and the model analyses and environmental documents that were supposed to support that proposal.

A detailed analysis of the flawed RDEIR/SDEIS modeling data indicates that the project would actually increase exports during the driest months when Delta outflows are very low and the Delta ecosystem is most stressed. The modeling data also indicates that the Army Corps limits on inflows to Clifton Court would be regularly exceeded. The RDEIR/SDEIS and the Army Corps application make no mention of this. Reverse flows in the south Delta are not minimized as the public outreach claims and remain significantly reversed (OMR < -2,000 cfs) 55% of the time. The water quality impact analyses for the RDEIR/SDEIS were unexplainably performed for late long term (2060) conditions rather than early long term (2025). As a result, the greater amount of seawater intrusion (at 2060) masks the actual WaterFix impacts on water quality.

The flawed "brief sensitivity analyses" done to support the RDEIR/SDEIS still show a strong dependence on exports from the south Delta, despite the construction of very expensive new intakes in the north Delta. Strangely, a recently posted WaterFix animation proudly states that most of the exports during dry years will be from the south Delta, i.e., when the Delta is most stressed.

There are many other problems with the RDEIR/SDEIS and too much time will be wasted if you wait till the end of the comment period, and review of yet another round of comment letters, before realizing that WaterFix is way off track.

The 2009 Delta Reform Act requires that the SWRCB develop new Delta flow criteria before BDCP can be approved. Strong legal arguments in support of this statutory requirement are laid out in the September 29 letter from NRDC et al. to Tom Howard. BDCP Alternative 8 and WaterFix Alternative 4H3 demonstrate that the preferred alternative infrastructure will not be viable with these necessary increased flow requirements. Once the SWRCB sets new flow requirements, the north Delta intakes and twin tunnels would become a very expensive stranded asset.

The Natural Resources Agency and DWR must reclaim their leadership role and responsibility to protect Delta water resources and the Delta ecosystem. As outlined in the California Water Action Plan, there are more viable alternatives that need to be considered that incorporate new storage and conveyance to capture and store water during periods of high Delta flow, allow increased Delta flows in all months for fish, as well as actions to reduce water demand and increase local water supply reliability. These alternatives must be given serious consideration, and as soon as possible.

The WaterFix proposal would harm rather than improve the Delta ecosystem and fails to provide any significant increase in water supply reliability. Contrary to State and Federal statutes (2009 Delta Reform Act, Public Law 112-74), it fails to contribute to achieving either of the coequal goals.

The situation in the Delta ecosystem is dire and an effective sustainable solution is needed now. As Interior Deputy Secretary, Michael Connor, said in the September 30 press release regarding the new report on "Challenges facing the Sacramento-San Joaquin Delta," we must adopt bold, new approaches and any necessary water infrastructure improvements should be accompanied by a portfolio of actions such as water conservation and efficiency measures, habitat improvements, and improved groundwater management and storage.

Just because the BDCP proponents have spent $250 million on the BDCP and WaterFix planning and environmental documents, and have "put a million hours into it" (Governor Brown, May 6, 2015), does not mean that WaterFix has not gone seriously off track. The last nine years have been largely wasted, with no meaningful stakeholder participation since 2010. It is not too late to do the right thing.

It is time to acknowledge "*the emperor has no clothes,*" and invite wide-spread stakeholder involvement in developing a real solution, one that actually achieves both coequal goals. No one wants the Delta smelt or any other of the key fish species to go extinct on their watch.

Detailed graphs of the WaterFix sensitivity analysis data and other useful documents that highlight serious problems with the WaterFix proposal can be found on the SWRCB WaterFix petition page
http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/early_petition_comments/

If you have any questions, please call me at (510) 339-3618.
Richard

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Natural Resources Agency Mission Statement: To restore, protect and manage the state's natural, historical and cultural resources for current and future generations using creative approaches and solutions based on science, collaboration and respect for all the communities and interests involved.

California Water Action Plan and the Cal. WaterFix

August 19, 2015

Released January 27, 2014
http://resources.ca.gov/docs/california_water_action_plan/Final_California_Water_Action_Plan.pdf

Agencies Involved

California Natural Resources Agency
epartment of Water Resources
Department of Fish and Wildlife
eltaStewardship Council
California Environmental Protection Agency
State Water Resources Control Board
California Department of Food and Agriculture

Proposed Actions

1. Make Conservation a California Way of Life
2. Increase Regional Self-Reliance and Integrated Water Management Across All Levels of Government

hieve the Co-Equal Goals for the Delta

4. Protect and Restore Important Ecosystems

anagemand Prepare for Dry Periods

pand Water Storage Capacity and Improve Groundwater Management

rovide Safe Water for All Communities

8. Increase Flood Protection
9. Increase Operational and Regulatory Efficiency
10. Identify Sustainable and Integrated Financing Opportunities

Water Action Plan Conclusions

All Californians have a stake in our water future

This is a path toward reliability, restoration, and resilience in California water.

Must adapt to this "new normal" and recapture California's resource management leadership and our economic and environmental resilience and reliability.

No silver bullets or single projects that will "fix the problem."

Must have a portfolio of actions to comprehensively address the challenges this state faces.

Some actions must be taken immediately to address current risks:

- looming drought
- inadequate safe drinking water

Over the next five years, must address fundamental changes in our approach to water resource management and be prepared for the changes the future holds.

Cal. WaterFix Disconnect From Water Action Plan

WaterFix lead agency DWR prepared this January 2014 Water Action Plan with help from DFW

BDCP and WaterFix have yet to respond to numerous requests from Delta Interests, members of Congress and environmental groups to study a portfolio of actions including additional storage, water conservation, reuse and demand reduction

DWR's Cal. WaterFix alternatives do not include these crucial Water Action Plan actions

Water Action Plan calls for restoration of important ecosystems – WaterFix would restore minimal Delta habitat as mitigation for its adverse impacts on species– Cal. EcoRestore only restores 30,000 acres of habitat, most of which is already required to mitigate past and present impacts and is long overdue

Delta interests have a key stake in California's water future but have not been included in development of BDCP or Cal. WaterFix, or in BDCP governance proposals

Major Problems with California WaterFix Preferred Alternative

August 19, 2015

Fails to achieve either of the co-equal goals

- Will only restore a minimal amount of Delta habitat in an attempt to mitigate the adverse project impacts
- Fails to deliver any increase in water supplies
- These are state and federal obligations under the 2009 Delta Reform Act and Public Law 112-74, respectively

DWR and Reclamation have allowed the export water contractors to develop a flawed project design that only benefits the exporters

- Agreed to export contractors' offer to pay because of state and federal budget crises
- Those who pay the bills run the business

DWR and Reclamation have failed to consider or analyze a reasonable range of alternatives

- No programs for increased regional self-reliance, conservation, desalination, and water use efficiency.
- No infrastructure to capture and store "new" water during periods of high Delta flow
- No analysis of new intakes in the western Delta instead of the north Delta
- The 17 of the 18 BDCP and Cal. WaterFix alternatives are basically the same alternative – north Delta intakes linked to south Delta export pumps by isolated conveyance

New North Delta intakes will adversely impact key fish species by reducing inflows to the Delta and causing reverse flows – just as bad as the south Delta intakes.

South Delta intakes will still be used for 51% of the total exports

Significant adverse water quality impacts in the BDCP Draft EIR/EIS have been assumed away

- Assume Emmaton compliance location will not be changed, but still intend to change it in the future (piecemealing under CEQA)

Cal. WaterFix preferred alternative would increase exports in dry periods when Delta fish are most stressed, and would fail to capture more water when Delta flows are high

- No new detailed modeling has been done for the Draft REIR/SEIS despite significant changes
  - Greatly reduced ecosystem restoration so major changes in relationship between outflow and salinity
  - No longer asking for compliance location for Emmaton water quality standard to be changed
  - Relied instead on Operations and Water Quality modeling for draft BDCP EIR/EIS which contained major errors
  - Used crude sensitivity analyses based on Late Long Term (2060) studies to estimate Early Long Term (2025) impacts
  - CEQA requires, and $15 billion cost demands, detailed modeling of each alternative
- Proposed $15 billion Cal. WaterFix project likely be rendered obsolete once the State Water Resources Control Board adopts more stringent flow requirements to protect fish and other beneficial uses
  - Full capacity of tunnels was seldom used under BDCP operational rule assumptions
  - North Delta intakes would be used even less frequently once flow requirements and export limits are made more stringent
  - A completely different alternative, as yet ignored by the BDCP proponents, would likely prove more viable

Bottom Line

DWR and Reclamation need to step up and promote alternatives that actually achieve both coequal goals and will benefit all of California rather than merely facilitating a flawed WaterFix project being proposed and paid for by the export contractors.

Adding new storage to capture water in wet periods when it is available, and adding demand reduction and local water supply projects discussed in the California Water Action Plan (January 2014) could result in a project that meets the needs of all of California, not just the export water contractors.

The new alternative requested by the State Water Resources Control Board (RDEIR/SDEIS Appendix C, page C-1) looks like a good starting point for developing a real Delta Fix that restores and sustains the Delta and Bay ecosystem and improves California's water supply reliability.

To: Johnson, Kathleen[Johnson.Kathleen@epa.gov]; Leff, Karin[Leff.Karin@epa.gov]
From: Goforth, Kathleen
Sent: Fri 10/30/2015 10:13:06 PM
Subject: FW: CALIFORNIA: Brown, critics trade blows over hot-button tunnel plan

FYI

CALIFORNIA: Brown, critics trade blows over hot-button tunnel plan

Debra Kahn, E&E reporter

Published: Friday, October 30, 2015

The public comment period of a controversial bid to revamp California's main water delivery system closed today with more salvos between Gov. Jerry Brown (D) and the plan's foes.

Opponents of the California Water Fix, Brown's proposal to build two 30-mile tunnels under the Sacramento-San Joaquin River Delta, held a press conference at the Capitol in Sacramento to announce they had delivered 30,000 letters against the plan.

The governor responded with a statement calling arguments against the plan "shameful."

Eight years in the making, the $15 billion plan is Brown's bid to ease reliance on the crumbling levees that route water from Northern to Southern California, supplying 25 million people and 3 million acres of farmland.

Critics -- including delta-area farmers and businesses, environmentalists, and a spate of Northern California House Democrats -- argue it would take too much water from the delta at the expense of regional economic interests and fish.

Sen. Cathleen Galgiani (D), who represents an agriculture-heavy part of the Central Valley, told reporters, "Notwithstanding the recent changes to the tunnel plan, I must remain opposed to it for both economic and environmental reasons. The research has convincingly demonstrated how the tunnel plan is not economically justified and is financially infeasible without a substantial taxpayer subsidy."

In May, Brown announced that the plan would pivot from a 2013 version by eliminating the restoration of about 100,000 acres of habitat for aquatic species, part of the state's commitment to "co-equal goals" of water supply reliability and environmental protection.

The new proposal reduces habitat restoration to just 2,100 acres, with another 30,000 acres done as part of pre-existing commitments. The plan is also being rebranded as the "California Water Fix," instead of the Bay Delta Conservation Plan (*Greenwire*, July 10).

A large group of agricultural districts in the San Joaquin Valley issued a statement echoing Galgiani's economic concerns but stopping short of opposing the plan.

"Additional work needs to be done before the California WaterFix will provide a dependable and affordable solution for public water agencies that receive water from the Central Valley Project," said the San Luis and Delta-Mendota Water Authority and Westlands Water District. "We believe that for the long-

term health of the State of California, a solution is necessary. Therefore, we hope that as the process continues, the operational criteria will be reflective of the needs of the entire state because the current path would result in tens of millions of dollars of investment with nothing to show for it."

But Brown said the tunnels would preserve water supply for farms as well as urban users and fish.

"The delta pipeline is essential to completing the California Water Project and protecting fish and water quality," he said. "Without this fix, San Joaquin farms, Silicon Valley and other vital centers of the California economy will suffer devastating losses in their water supply. Claims to the contrary are false, shameful and do a profound disservice to California's future."

To: Leff, Karin[Leff.Karin@epa.gov]
From: Goforth, Kathleen
Sent: Thur 10/29/2015 9:53:59 PM
Subject: WaterFix FW: BDCP-CWF REIR-SEIS Does Not Meet Federal Law and Regulations
BDCP-CWF Cmts PCL et al.pdf

FYI. More stakeholder comments.

Kathleen Martyn Goforth, Manager

Environmental Review Section (ENF-4-2)

U.S. Environmental Protection Agency, Region 9

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From: Foresman, Erin
Sent: Thursday, October 29, 2015 1:05 PM
To: Prijatel, Jean; Goforth, Kathleen; Johnson, Kathleen; Landers, Timothy; Brush, Jason; Siu, Jennifer; Gorke, Roger
Subject: FW: BDCP-CWF REIR-SEIS Does Not Meet Federal Law and Regulations

From: Patricia Schifferle [mailto:pacificadvocates@hotmail.com]
Sent: Thursday, October 29, 2015 12:13 PM
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Cc: 'Maria Rea' <maria.rea@noaa.gov>; 'Michael Tucker' <Michael.Tucker@noaa.gov>; 'Larry Rabin' <larry_rabin@fws.gov>; 'Lori Rinek' <lori_rinek@fws.gov>; 'David Murrillo' <dmurillo@usbr.gov>; 'Mary Lee Knecht' <mknecht@usbr.gov>; 'Patty Idloff' <pidlof@usbr.gov>; 'Deanna Harwood' <deanna.harwood@noaa.gov>; 'Amy L. Aufdemberge Esq.' <kaylee.allen@sol.doi.gov>; 'John Laird' <Kimberly.goncalves@resources.ca.gov>; Blumenfeld, Jared <BLUMENFELD.JARED@EPA.GOV>; Hagler, Tom <Hagler.Tom@epa.gov>; Vendlinski, Tim <vendlinski.tim@epa.gov>; Skophammer, Stephanie <SKOPHAMMER.STEPHANIE@EPA.GOV>; Foresman, Erin <Foresman.Erin@epa.gov>;

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Subject: BDCP-CWF REIR-SEIS Does Not Meet Federal Law and Regulations

The Honorable Secretary Jewell, Secretary Prizker, Administrator McCarthy, State and Federal officials:

On behalf of the Conservation, Fishing and Tribal groups signatory to the attached letter, please accept these comments on the BDCP-CWF DEIR-DEIS & REIR and SEIS. Fundamental flaws in these NEPA documents render them useless for federal decisions. Viable alternatives in keeping with federal statute and regulation exist, that are cost effective and less damaging to water quality and our iconic salmon heritage. These legally required and cost effective solutions have been ignored by the project proponents—a select group who are seeking to jump to the front of the line to receive federal benefits largely funded by the tax paying public.

Regards,

Patricia Schifferle

Director

Pacific Advocates

530 550 0219

PLANNING AND CONSERVATION LEAGUE
1107 9TH ST #901,
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October 29, 2015

Via Email and U.S. Mail

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Re: A New Draft EIR/EIS is needed to be useable for federal decision making--BDCP/CWF RDEIR/SDEIS Comments

Dear Secretary Jewell, Secretary Pritzker, Administrator McCarthy, Secretary Laird, Director Cowin, Regional Director Murillo, and Federal and California Agencies, Officers, and Staff Members Carrying out and Reviewing the BDCP/CWF:

I. Summary

The purpose of the Delta Tunnels Project is not Federally authorized & does not comply with Federal & State law. Therefore, it remains unsuitable for Federal decision making.

Planning and Conservation League, Sierra Club, California Sportfishing Protection Alliance, Winnemem Wintu Tribe, Save the American River, the Southern California Watershed Alliance and the Environmental Water Caucus (EWC) (a coalition of over 30 nonprofit environmental and community organizations and California Indian Tribes) find the RDEIR/SDEIS fails to comply with federal law and fails to include tribal interests and fishing rights.

Federal law does not authorize the Central Valley Project to be operated for the narrow stated purpose of the project: "*Restore and protect the ability of the SWP and CVP to deliver up to full contract amounts, when hydrologic conditions result in the availability of sufficient water, consistent with the requirements of state and federal law and the terms and conditions of water delivery contracts held by SWP contractors and certain members of San Luis Delta Mendota Water Authority, and other existing applicable agreements.*"[1]

The proposed project will take water from the Sacramento River before it reaches the Sacramento-San Joaquin River Estuary, for export and operations of the State Water Project (SWP) and federal Central Valley Project (CVP). Under federal law the coordinated operations of these projects are governed by the Coordinated Operations Act of 1986 (P.L. 99-546) and the Reclamation Act of 1937, as modified by the Central Valley Project Improvement Act (CVPIA) P.L 102-575 along with other laws and agreements. The proposed Delta Water Tunnels, requiring the construction of two 35-mile-long, 40-foot-wide tunnels, are designed to export more water South of the Delta estuary that current operations and will significantly harm Delta estuary water quality and beneficial uses, while boosting water quality and quantity to south of the Delta users. The purpose of the project ignores federal statutes governing these south of the Delta exports, such as the federally required provisions covered under the Coordinated Operating Agreement, the San Luis Project Act (P.L. 86-488), and the CVPIA and other federal statutes.[2] These provisions of federal law and associated regulations limit CVP exports from the Sacramento San Joaquin Delta Estuary and associated watersheds and require project yield to be reserved for fish and wildlife, tribal fishing rights and other environmental mitigation purposes.

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[1] ACE 404 Permit Application **& (73 Fed. Reg. 20326 (April 15, 2008)) first amended Notice of Intent** https://s3.amazonaws.com/californiawater/pdfs/5n2mg_Complete_Final_CA_Water_Fix_USACE_404_Permit_Application.pdf

[2] P.L. 86-488 authorizes CVP San Luis Unit water exports for only 500,000 acres to be irrigated in three counties: " ..five hundred thousand acres of land in Merced, Fresno, and Kings Counties, California, hereinafter referred to as the Federal San Luis unit service area.." Other statutes include: National Environmental Policy Act of 1969;Fish and Wildlife Coordination Act of 1958, Endangered Species Act of 1973, Clean Water Act of 1972 and the National Historic Preservation Act of 1960.

The Tunnel Project purpose of *"restore and protect the ability of the [State Water Project and Central Valley Project] to deliver up to full contract amounts"* to specified contractors is in conflict with these federal statutes, thus making the proposed NEPA compliance questionable and use for major federal actions unsuitable.[3]

II. Background

As noted by EPA[4], the stated purpose of the Tunnel Project has confusing meaning. A significant increase in exports out of the Delta is inconsistent with state legislation and it hinders the scope of alternatives necessary for federal decision making. Full deliveries on contract amounts have never occurred. EPA states "Combined, the SWP and CVP full contract amounts for Delta exports are around 7,432,883 AF. As noted....historical exports by the CVP and SWP almost never exceed 6 MAF, so it appears that the "full contract amount" of exports is at least 1 million acre feet more *than has ever been exported historically."*

EPA states further[5], "A significant increase in exports out of the Delta is inconsistent with recent state legislation. California Water Code Section 85021...states, in relevant part: "The policy of the State of California is to reduce reliance on the Delta in meeting California's future water supply needs through a statewide strategy of investing in improved regional supplies, conservation and water us efficiency. Federal Council on Environmental Quality regulations at 40 C.F.R. Section 1506.2(d) require that "[EISs] shall discuss any inconsistency of a proposed action with any approved State or local plan and laws (whether or not federally sanctioned.)" Further, under the Clean Water Act Section 404, the permit applicant must demonstrate that the chosen alternative is the "least environmentally damaging practicable alternative" (LEDPA) for meeting the overall project purpose pursuant to the CWA Section 404 (b) (I) Guidelines. In accordance with Army Corps of Engineers Standard Operating Procedures Regulatory Program, p 7, "The overall project purpose must be specific enough to define the applicant's needs, but not so restrictive as to preclude all discussion of alternatives."

EPA, citing the California Supreme Court, states clearly that significantly increasing exports out of a stressed Delta is the wrong policy. The California Supreme Court, when it evaluated appeals of the CALFED Bay Delta Program, noted that the Program was an experiment:

"The CALFED Program is premised on the theory, **as yet unproven**, that it is possible to restore the Bay-Delta's ecological health while maintaining and perhaps increasing Bay-Delta water exports through the CVP and SWP. If practical experience demonstrates that the theory is unsound, Bay-Delta water exports may need to be capped or reduced." In the Bay-Delta Programmatic Environmental Impact Report Coordinated Proceedings, 43Cal.4th. 1143 (2008)(emphasis added). Note that the Court was looking at a program that was developed during the 1990's. and adopted in 2000. The intervening ten years have not proved the theory accurate, and, in fact. seem to point the other way."[6]

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[3] Deference to action agencies is not unlimited. See, for example, Simmons v. U.S. Army Corps of Engineers, 120 F.3d 664, 666 (7th Cir. 1997) (Rejecting "single source" definition of project purpose for water supply, noting that "[i]f the agency constricts the definition of the project's purpose and thereby excludes what truly are reasonable alternatives, the EIS cannot fulfill its role."). See also Border Power Plant Working Group v. DOE, 260 F. Supp. 3d 997 (S.D. Cal., 2003)(Rejecting and broadening agency's definition of project purpose.); Similarly, Davis v. Mineta, 302 F.3d 1104 (loth Cir. 2002).

[4] EPA,Straus & Manzanilla, June 2010 letter to Glaser, Lohefener and McInnis Re "Purpose Statement for Bay Delta Conservation Plan (BDCP)

[5] Ibid.

[6] **Ibid** pg 5.

Congress limits CVP water exports, requires reservoir releases, and authorizes diversions sufficient to provide water to meet obligations to control salinity, protect water quality, and restore refuges. These requirements, along with the 800,000 acre feet of CVP water yield reserved to restore fish and aquatic habitat needs, are not clearly provided in the legal baseline for the project. Further, the proposed project purpose conflicts with federal CVP operational constraints laid out in federal statute and agreements. A review of the BDCP/CWF RDEIR/SDEIS (Delta Water Tunnels) documents finds a failure to disclose how the project purpose will comply with the federal statute and regulations that require mitigation for the environmental effects of the CVP along with the proposed additional exports from Delta Tunnels project, which seek to remove nearly ten million acre-feet of water from the watersheds of origin. The impacts of CVP exports from these watersheds have been significant. Current federal statute and regulation require water yield for these specific purposes. Water exports from north of the Sacramento River Delta to south of the Delta reduce the flow of water in the Sacramento River and its tributaries, with damaging effects on a large riparian ecosystem.[7] These statutory requirements for mitigation of these impacts include but are not limited to these provisions:

1. Water quality and flow standards (D-1641) imposed on CVP and SWP water rights
2. Sacramento River Temperature Control Operations
3. Fish and Wildlife and area of Origin Trinity River Minimum Release Requirement Increases
4. Sacramento River Winter-Run Chinook Salmon ESA Listing
5. CVPIA 3406(b)(2) and Refuge Water Supplies[8]
6. Delta Smelt ESA Listing
7. San Joaquin flow standards
8. Sacramento River Spring-Run Chinook Salmon ESA Listing,
9. Steelhead Trout ESA Listing
10. Doubling of anadromous fish.

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[7] CVPIA Section 3406(b) requires the Secretary to meet all obligations under the Endangered Species Act, 16 U.S.C. § 1531-1544, and all decisions of the California State Water Resources Control Board. In addition, § 3406(b)(1) requires by October, 1995, implementation of a plan to restore anadromous fish populations on all Central Valley rivers except the San Joaquin River at twice the average levels between 1967 and 1991. In addition § 3406(b) establishes specific guidelines for implementing and reviewing this plan. Section 3406(c) relates to restoration of the San Joaquin River. Section 3406(d) relates to rehabilitation of wetland wildlife habitats. An anadromous fish is one that hatches in a river, migrates to the 'ocean for maturity, then returns upriver to spawn. The primary anadromous fish in California are salmon, steelhead, striped bass, sturgeon, and American shad. *See* C.V.P. Improvement Act § 3403(a).

[8] Refuges within or near the Delta include:
• Stone Lakes National Wildlife Refuge
• Antioch Dunes National Wildlife Refuge
• Sacramento National Wildlife Refuge
• Delevan National Wildlife Refuge
• Colusa National Wildlife Refuge
• Sacramento River National Wildlife Refuge
• San Joaquin River National Wildlife Refuge
Refuges in or near San Francisco Bay and nearby coastal ocean include:
• San Pablo Bay National Wildlife Refuge
• Marin Island National Wildlife Refuge
• Don Edwards San Francisco Bay National Wildlife Refuge
• Farallon National Wildlife Refuge
Pursuant to CVPIA, refuge water is provided to National Wildlife Refuges South of the Delta

III. Compliance with the Central Valley Project Improvement Act requires a fundamental change in the proposed project purposes for the BDCP/CWF RDEIR/SDEIS to be useable by federal agencies and to comply with the "Least-Cost CVP Yield Increase Plan":

Central Valley Project. Section 2 of the 1937 Act was amended by the 1992 amendment as follows (italics show changes):

[T]he entire Central Valley Project . . . is hereby reauthorized and declared to be for the purposes of improving navigation, regulating the flow of the San Joaquin River and the Sacramento River, controlling floods, providing for storage and for the delivery of the stored waters thereof, ... for the reclamation of arid and semiarid lands and the lands of Indian reservations, *and mitigation, protection, and restoration of fish and wildlife,* and other beneficial uses.... And provided further, That the said dam and reservoirs shall be used, first for river regulation, improvement of navigation, and flood control; second, for irrigation and *domestic uses and fish and wildlife mitigation, protection, and restoration purposes;* and, third, for *power and fish and wildlife enhancement. The mitigation for fish and wildlife losses incurred as a result of construction, operation, or maintenance of the Central Valley Project shall be based on the replacement of ecologically equivalent habitat and shall take place in accordance with the provisions of this title and concurrent with any future actions which adversely affect fish and wildlife populations or their habitat but shall have no priority over them.*

Under the Act, new short-term, temporary, or long-term contracts are prohibited until the following events have occurred:

1. Fish and wildlife activities specified in section 3406(b)-(d) are carried out, including, among other activities, doubling the anadromous fish population in Central Valley rivers and streams, commencement of rehabilitation of the San Joaquin River, and commencement of waterfowl habitat restoration.
2. Completion by the California Water Resources Control Board of its review of Delta water quality standards required by *United States v. State Water Resources Control Board (182 Cal.App.3d 82 (1986 See below)*, and the EPA approves the Board's decision.
3. 120 days elapse after the Secretary of the Interior reports to relevant Congressional committees on how the CVP will meet its Bay Delta obligations to preserve water quality.

These required events have not been completed. Furthermore, contracts to pay for the proposed project are needed prior to construction and have not been forthcoming.[9] Before a project alternative can be determined as feasible, cost sharing and the feasibility of payment is needed. Extensive negotiations with State Contractors remain unresolved.[10] How the proposed project and each alternative will impact these federal requirements is

[9] Water Code §85089. Construction of a new Delta conveyance facility shall not be initiated until the persons or entities that contract to receive water from the State Water Project and the federal Central Valley Project or a joint powers authority representing those entities have made arrangements or entered into contracts to pay for both of the following: (a) The costs of the environmental review, planning, design, construction, and mitigation, including mitigation required pursuant to Division 13 (commencing with Section 21000 of the Public Resources Code), required for the construction, operation, and maintenance of any new Delta water conveyance facility. (b) Full mitigation of property tax or assessments levied by local governments or special districts for land used in the construction, location, mitigation, or operation of new Delta conveyance facilities.

[10] Extensive comments have been provided by PCL et. al. to identify existing costs to SWP contractors and resultant needs to raise revenues and issue debt. See comments regarding the State Water Project Contract extension and http://www.c-win.org/webfm_send/421

not disclosed in the REIR/SEIS. Needed comparisons for each alternative to the No Action alternative are vague summaries that are inadequately specified. Also, many of the scenarios of the Preferred Alternative "range" decrease Delta outflow despite the fact that several key scientific evaluations by federal and State agencies indicate that more outflow is necessary to protect aquatic resources and fish populations.[11] In addition, recent technical reports and emerging research raise questions about whether the proposed mitigation of tidal marsh is feasible[12], possible[13], or effective[14]. These are scientific questions about the assumptions used to support restoration proposals and projections of anticipated benefits to fish populations, while the costs to the environment and obligations by contractors to meet required environmental project yields remain vague and unclear. Without this information an informed decision cannot be made.

IV. Compliance with Federal Principles and Guidelines Requiring Comparison of Costs and Benefits is Absent.

Army Corps of Engineers and the Bureau of Reclamation require that new or existing Federal investments to construct new infrastructure, modify or replace existing infrastructure, or implement major changes to the operations of Federal assets comply with the Principles and Requirements for Federal Investments in Water Resources dated March 2013 and 1983. These requirements, along with Reclamation Manual Directives and Standards CMP09-02, require a clear distribution of all financial costs of a project among its authorized purposes. This is necessary to determine whether the project beneficiaries are capable of repaying the reimbursable costs assigned to them. The allocation provides the basis for establishing the repayment obligations specified in water-related contracts. Further P.L. 99-546 requires full CVP repayment and pay-off by Central Valley Contractors by 2030. The proposed project has been estimated in 2012 dollars to nominally cost more than $16 billion dollars, but ultimately cost some $67 billion with financing and operation and maintenance costs according to figures provided to the Westlands Water District Board.[15] Interior's Inspector General's audit indicates that, under current water rates, Contractors will likely fail to meet the repayment

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[11] [7] State Water Resources Control Board's, 2010 Flows Report, p.2.
"Interior remains concerned that the San Joaquin Basin salmonid populations continue to decline and believes that flow increases are needed to improve salmonid survival and habitat." USFWS May 23, 2011 Phase I Scoping Comments, available at: http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/bay_delta_plan/water_quality_control_planning/comment052311/amy_aufdemberge.pdf
"Inadequate flow to support fish and their habitats is directly and indirectly linked to many stressors in the San Joaquin river basin and is a primary threat to steelhead and salmon." NMFS February 4, 2011 Phase I Scoping Comments, available at: http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/bay_delta_plan/water_quality_control_planning/comment020811/010411dpowell.pdf
"…current Delta water flows for environmental resources are not adequate to maintain, recover, or restore the functions and processes that support native Delta fish." Executive Summary in 2010 CDFG Flow Criteria.
"a strong majority of scientists prioritizes habitat and flow management actions that would restore more natural processes within and upstream of the delta" (p. 2) http://www.ppic.org/content/pubs/report/R_413EHR.pdf

[12] NMFS Progress Assessment and Remaining Issues Regarding the Administrative Draft BDCP Document (04/4/2013), page 15.

[13] U.S. Fish and Wildlife Service Staff BDCP. The broad concern is that the tidal prism would be diminished over time by the large increases in tidal habitat.

[14] Lucas, L. V., and J. K. Thompson. 2012. Changing restoration rules: Exotic bivalves interact with residence time and depth to control phytoplankton productivity. Ecosphere 3(12):117. http://www.esajournals.org/doi/pdf/10.1890/ES12-00251.1. The issue raised is whether the increaseed prodcution of plankton by the restored wetlands would be offset by the increased consumption by exotic bivalves as they spread into the restored wetlands..

[15] http://www.mercurynews.com/ci_24795356/deltatunnels-plans-true-price-tag-much-67

deadline for **just existing CVP costs.**[16] How these additional costs will be repaid with construction spanning over a decade is not disclosed, and, thus, ratepayers, taxpayers and decision makers are left in the dark. The REIR/SEIS provides no such information on how these financial costs will be allocated. Nor is information provided as to how the project meets the "Least-Cost CVP Yield Increase Plan" pursuant to Title 34 P.L. 102-575 Section 3408(j).

In accordance with federal regulatory requirements[17], the following information is required for projects, studies, and/ or any projects with federal funding assistance, such as the proposed Delta Water Tunnels, in order to legally implement Executive Order 12322 Water Resources Projects and Principles, Requirements and Guidelines for Water and Land Related Resources Implementation Studies:

(1) how well the planning objectives are met;
(2) the economic justification;
(3) the validity of the scientific, technical, and design assumptions;
(4) the ability to construct a project, implement a non-structural plan, or both, according to Reclamation standards and practices, within the estimated cost and schedule;
(5) the reliability of the estimated costs and benefits;
(6) the reliability of the proposed construction schedule; and
(7) the capability and willingness of the project partner(s) to financially support the project

V. Insufficient Information Is Provided to Ensure NEPA Compliance To Determine the Least Environmentally Damaging Practicable Alternative Required Under the Clean Water Act.

On July 16, 2014, the U.S. Army Corps of Engineers found that: "the EIS/EIR is not sufficient at this time in meeting the Corps' needs under the National Environmental Policy Act (NEPA) . . . in particular with regard to the incomplete description of the proposed actions, alternatives analysis . . . and impacts to waters of the United States and navigable waters, as well as the avoidance and minimization of, and compensatory mitigation for, impacts to waters of the United States." (Letter p. 1). Additional Corps comments include the absence in the EIR/EIS of "an acceptable alternatives analysis" (comment 4); no demonstration of which alternative may contain the Least Environmentally Damaging Practicable Alternative (LEDPA) for section 404, Clean Water Act purposes (Comment 5); "the document needs a clear explanation of a reasonable range of alternatives and a comparison of such, including a concise description of the environmental consequences of each" (comment 19); and, "new conveyance was not a part of the preferred alternative for CalFed. Does this EIS/EIR describe why the reasons for rejecting new conveyance in CalFed are no longer valid?" (Comment 22).

The current REIR/SEIS does not remedy these fatal flaws. Furthermore, the undersigned attempted through a FOIA request to obtain specific information provided to the Army Corps by the project applicants, but the request for this information between two public agencies was denied.[18] Thus, the following information necessary to comply with federal statute remains hidden from the public and the piece-meal approach to providing such fundamental project information leaves the public and decision makers in the dark regarding the

[16] https://www.doioig.gov/sites/doioig.gov/files/WR-EV-BOR-0003-2012Public.pdf

[17] http://www.usbr.gov/recman/cmp/cmp09-02.pdf

[18] September 30, 2015, see correspondence A. L. Faustino District Counsel to Patricia Schifferle regarding Freedom of Information Act Request FA-15-0201 (Documents and Comments Related to BDCP_DHCCP, DCE or Cal Fix for the Water Tunnels Diversion Project.

full impacts from the proposed project and the alternatives. The identified deficiencies include but are not limited to:

1. A detailed hydraulic study per Corps' standards for Section 408 NEPA
2. A detailed level of engineering design, as well as a detailed level of analysis related to effects to the Corp's civil works projects and indirect hydraulic effects.

Applying for permits prior to an approved project for a pre-determined project outcome clearly indicates bias on the part of the lead agency to a pre-determined outcome. A 408 authorization and NEPA compliance is needed and in turn must be approved under Section 404 of the Clean Water Act or Section 10 of the Rivers and Harbors Act, but this is not possible until the 408 authorization is obtained. The Central Valley Project is operated as a whole. The public and decision makers need the complete environmental impact picture prior to any decision regarding the LEDPA alternative.

On August 26, 2014, the U.S. Environmental Protection Agency (EPA) issued its 40-page review of the Draft BDCP EIS finding in BDCP's case that:

"Operating any of the proposed conveyance facilities . . . would contribute to increased and persistent violations of water quality standards in the Delta, set under the Clean Water Act, measured by electrical conductivity (EC) and chloride concentrations. We recommend that the Supplemental Draft EIS include one or more alternatives that would, instead, facilitate attainment of all water quality standards in the Delta. Specifically, we recommend that an alternative be developed that would, at minimum, not contribute to an increase in the magnitude or frequency of exceedances of water quality objectives, and that would address the need for water availability and greater freshwater flow through the Delta. Such an alternative should result in a decrease in the state and federal water projects' contributions to the exceedance of any water quality objectives in the Delta. (*Id.*, p.2).

EPA further stated that "Data and other information provided in the Draft EIS indicate that all CM1 [Tunnels Project] alternatives may contribute to declining populations of Delta smelt, Longfin smelt, green sturgeon, and winter-run, spring-run, fall-run and late-fall run Chinook salmon." (p. 10). "We recommend that the Supplemental Draft EIS consider measures to insure freshwater flow that can meet the needs of those [declining fish] populations and ecosystem as a whole, and is supported by the best available science. We recommend that this analysis recognize the demonstrated significant correlations between freshwater flow and fish species abundance." (*Id.*). "Other reasonable alternatives could be developed by incorporating a suite of measures, including Integrated Water Management, water conservation, levee maintenance, and decreased reliance on the Delta." (*Id.* p. 3). In addition, EPA concluded that "The Draft EIS does not address how changes in the Delta can affect resources in downstream waters, such as San Francisco Bay, and require changes in upstream operations, which may result in indirect environmental impacts that must also be evaluated. We recommend that the Supplemental Draft EIS include an analysis of upstream and downstream impacts." (*Id.*).

In FOIA documents provided by the National Marine and Fishery Service, it is apparent that similar warnings to the project applicants regarding impacts to critical habitat, endangered species and required temperatures have been ignored in the REIR/SEIS, leaving mitigation measures and compliance with existing ESA Reasonable and Prudent Alternative up to some future date.[19]

VI. Conclusion

[19] See DOC-NOAA-2015-001768 to Patricia Schifferle found at: https://foiaonline.regulations.gov/foia/action/public/view/request?objectId=090004d2808890c5

The singular purpose of the Tunnels Project to export Sacramento River water before it reaches the Sacramento-San Joaquin River Delta and San Francisco Bay is a fundamental flaw that renders the NEPA documents by federal agencies unusable because the documents do not comply with federal statutes and regulations.

Our organizations have already communicated several times over the years with BDCP officials about the failure to develop a range of reasonable alternatives in the BDCP process.[20] Instead of complying with the Delta Reform Act, the ESA, the Clean Water Act, and applying the public trust doctrine, all of the so-called Delta Water Tunnels alternatives involve taking freshwater water essential to the health and beneficial uses of the Sacramento-San Joaquin Estuary and San Francisco Bay before the water reaches the estuary. Taking this essential water and adding additional fish-grinding pumps on the Sacramento River (in addition to the southern Delta pumps which will still operate) , while exacerbating fish kills, damaging flows, and degrading temperatures, water quality, and water supply to over 5 million people residing in surrounding municipalities and water dependent industries, is not authorized under the Central Valley Project.

The narrow purpose of the Tunnels Project to promote the delivery of imaginary 'paper water' to south of the Delta contractors first, above all other users, also will have significant financial impacts that have not been disclosed. Under NEPA Regulations, "This [alternatives] section is the heart of the environmental impact statement." The alternatives section should "sharply" define the issues and provide a clear basis for choice among options by the decision-maker and the public. 40 C.F.R. § 1502.14. Moreover, if "a draft statement is so inadequate as to preclude meaningful analysis, the agency shall prepare and circulate a revised draft of the appropriate portion. The agency shall make every effort to disclose and discuss at appropriate points in the draft statement all major points of view on the environmental impacts of the alternatives including the proposed action." § 1502.9(a). The Responsible Exports Plan and variants on it must be among those alternatives in a new Draft EIR/EIS for BDCP that helps to disclose, sharpen and clarify the issues.[21]

Reclamation and DWR have failed to produce an alternatives section that "sharply" defines the issues and provides a clear basis for choice among options as required by the NEPA Regulations, 40 C.F.R. § 1502.14. Again, those issues must include producing more Delta inflow and outflow through the estuary as habitat for listed fish species, and documenting the impacts on Delta ecosystems as called for in Water Code § 85021. The choice presented must include increasing flows by reducing exports, not just reducing flows by increasing the capacity for exports as is called for by ***all*** of the so-called "alternatives" presented in the BDCP Draft Plan, Draft EIR/EIS, and RDEIR/SDEIS. [22]

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[20] This letter follows previous comments from the undersigned groups including Friends of the River comment letter of May 21, 2014, joint May 28, 2014 and joint September 4, 2014 comment letters focused on the failure of the BDCP Draft plan and Draft EIR/EIS to identify and evaluate a range of reasonable alternatives that are the declared "heart" of both the NEPA and CEQA required EISs and EIRs. A detailed evaluation of the Draft EIR/EIS's inadequate alternatives analysis was provided by the EWC in its comment letter of June 11, 2014, accessible online at http://ewccalifornia.org/reports/bdcpcomments6-11-2014-3.pdf.

[21] The EIS alternatives section is to "Rigorously explore and objectively evaluate all reasonable alternatives, and for alternatives which were eliminated from detailed study, briefly discuss the reasons for their having been eliminated." § 1502.14(a).

[22] In *California v. Block,* 690 F.2 753, 765-769 (9th Cir. 1982), the project at issue involved allocating to wilderness, non-wilderness or future planning, remaining roadless areas in national forests throughout the United States. The court held that the EIS failed to pass muster under NEPA because of failure to consider the alternative of increasing timber production on federally owned lands currently open to development; and also because of failure to allocate to wilderness a share of the subject acreage "at an intermediate percentage between 34% and 100%." 690 F.2d at 766. Like the situation here where the BDCP agencies claim a trade-off involved between water exports and Delta restoration (RDEIR/SDEIS ES 4-6), the Forest Service program involved "a trade-off between wilderness use and development. This trade-off however, cannot be intelligently made without examining whether it can be softened or eliminated by increasing resource extraction and use from already developed areas." 690 F.2d at 767. Here, likewise, trade-offs cannot be

In short, the fundamental flaws in the alternatives sections in the BDCP Draft EIR/EIS, Chapter 9 of the BDCP plan, and the RDEIR/SDEIS, have led to NEPA and CEQA documents "so fundamentally and basically inadequate and of a summary nature that meaningful public review and comment were precluded."40 C.F.R. § 1502.9(a).

Least cost alternatives presented in EWC's Plan have been completely ignored so far by Reclamation and DWR. These alternatives fit into Congressional directives under the Central Valley Project Improvement Act to follow the "Least-Cost CVP Yield Increase Plan." Additionally these alternatives save ratepayer and taxpayers money while fitting the EPA's and the SWRCB's calls for alternatives that would increase freshwater flow through the Delta, as well as the Army Corps' call for an acceptable alternatives analysis. It is time to include increasing freshwater flows through the Delta by reducing exports among the range of reasonable alternatives required by law, and presented to the public for comment.. Consideration of this alternative approach is imperative. Extinction of species is forever.

Should you have any questions, please contact Conner Everts, Co-Facilitator, Environmental Water Caucus at (310) 394-6162 ext. 111 or Jonas Minton Planning and Conservation Leagues at (916) 719-4049.

Sincerely,

Sincerely,

/s/ Conner Everts
Co-Facilitator
Environmental Water Caucus

/s/ Jonas Minton
Senior Water Policy Advisor
Planning and Conservation League .

/s/ Kathryn Phillips
Director
Sierra Club California

/s/ Bill Jennings
Executive Director
California Sportfishing Protection Alliance

/s/ Chief Caleen Sisk
Spirtual Leader
Winnemen Wintu Tribe

/s/ Stephen Green
President
Save the American River Association

Additional Addressees, all via email:

Maria Rea, Assistant Regional Administrator
National Marine Fisheries Service

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intelligently analyzed without examining whether the impacts of alternatives reducing exports can be softened or eliminated by increasing water conservation, recycling, and eventually retiring drainage-impaired agricultural lands in the areas of the exporters from production. *Accord, Oregon Natural Desert Assn. v. Bureau of Land Management*, 625 F.3d 1092, 1122-1124 (9th Cir. 2010) (EIS uncritical alternatives analysis privileging of one form of use over another violated NEPA). Here, the BDCP alternatives analysis has unlawfully privileged water exports over protection of Delta water quality, water quantity, public trust values, and ESA values.

Michael Tucker, Fishery Biologist
National Marine Fisheries Service

Larry Rabin, Acting, Field Supervisor, S.F. Bay-Delta
U.S. Fish and Wildlife Service

Lori Rinek
U.S. Fish and Wildlife Service

Mary Lee Knecht, Program Manager
U.S. Bureau of Reclamation

Patty Idloff
U.S. Bureau of Reclamation

Deanna Harwood
NOAA Office of General Counsel

Kaylee Allen
Department of Interior Solicitor's Office

Jared Blumenfeld, Regional Administrator
U.S. EPA, Region IX

Tom Hagler
U.S. EPA General Counsel Office

Tim Vendlinski, Bay Delta Program Manager, Water Division
U.S. EPA, Region IX

Stephanie Skophammer, Program Manager
U.S. EPA, Region IX

Erin Foresman, Bay Delta Coordinator
U.S. EPA

Lisa Clay, Assistant District Counsel
U.S. Army Corps of Engineers

Michael Nepstad, Deputy Chief, Regulatory Division
U.S. Army Corps of Engineers

Zachary M. Simmons, Senior Regulatory Project Manager
U.S. Army Corps of Engineers

Diane Riddle, Environmental Program Manager
State Water Resources Control Board

To: Leff, Karin[Leff.Karin@epa.gov]
From: Goforth, Kathleen
Sent: Tue 10/27/2015 3:01:36 PM
Subject: Fwd: Request for NEPA compliance
10 26 15 pdf final adv impacts .pdf
ATT00001.htm

FYI. Note that Gina is among the addressees.

Sent from my iPhone

Begin forwarded message:

From: "Johnson, Kathleen" <Johnson.Kathleen@epa.gov>
Date: October 26, 2015 at 3:49:52 PM PDT
To: "Goforth, Kathleen" <Goforth.Kathleen@epa.gov>
Subject: FW: Request for NEPA compliance

Please forward to the team

Kathleen H. Johnson

Director, Enforcement Division

U.S. EPA - Region 9

75 Hawthorne Street ENF-1

San Francisco, CA 94015

415/972-3873

johnson.kathleen@epa.gov

From: Blumenfeld, Jared
Sent: Monday, October 26, 2015 3:34 PM
To: Johnson, Kathleen <Johnson.Kathleen@epa.gov>
Subject: Fwd: Request for NEPA compliance

Sent from my iPhone

Begin forwarded message:

From: Bob Wright <BWright@friendsoftheriver.org>
Date: October 26, 2015 at 2:00:53 PM PDT
To: "blumenfeld.jared@epa.gov" <blumenfeld.jared@epa.gov>
Subject: FW: Request for NEPA compliance

Dear Mr. Blumenfeld:

We discovered that we did not send our new comment letter on the BDCP/California Water Fix of today, October 26, 2015, to you even though you are an additional addressee of our letter. Attached please find our new letter in the BDCP Record as of this morning, and below is our transmittal cover email that was intended to go to you.

Sincerely,

Bob Wright

Senior Counsel

Friends of the River

Sacramento, CA

(916) 442-3155 x207

From: Bob Wright
Sent: Monday, October 26, 2015 11:13 AM
To: maria.rea@noaa.gov; Michael.Tucker@noaa.gov; larry_rabin@fws.gov; lori_rinek@fws.gov; mknecht@usbr.gov; pidlof@usbr.gov; deanna.harwood@noaa.gov; kaylee.allen@sol.doi.gov; hagler.tom@epa.gov; vendlinski.tim@epa.gov; skophammer.stephanie@epa.gov; Lisa.clay@usace.army.mil; diane.riddle@waterboards.ca.gov; Michael.G.Nepstad@usace.army.mil; Simmons, Zachary M SPK (Zachary.M.Simmons@usace.army.mil); Foresman, Erin (Foresman.Erin@epa.gov)
Subject: Request for NEPA compliance

Dear Federal Officers and Staff Members Carrying out or Reviewing the BDCP California Water Fix and/or the RDEIR/SDEIS:

Our attached joint letter of this date, October 26, 2015, requests the Bureau of Reclamation to comply with the National Environmental Policy Act (NEPA) and the California Department of Water Resources to comply with the California Environmental Quality Act (CEQA) in connection with the California Water Fix which is the Delta Water Tunnels. We seek your intervention in this matter the Bureau and the Department have been issuing Draft environmental documents for public review which falsely deny instead of honestly disclose the numerous significant adverse environmental impacts that taking water away for the Tunnels would have on San Francisco-Bay Delta water quantity, water quality, endangered species of fish and their designated critical habitats, and on public health in the Delta.

We request that you transmit our letter to everyone involved with approving or reviewing the BDCP/Water Fix project or its documentation pursuant to NEPA or CEQA. Our attached letter is already in the BDCP/Water Fix Record as of this morning and has already been transmitted electronically to all addressees on the cover page.

This letter follows our July 22, 2015 letter to you which addressed the related issues involving violations of the requirement for the Bureau and the Department to develop a range of reasonable alternatives to the Water Tunnels project, our letter of September 9, 2015 addressing the Endangered Species Act violations, and our letter of October 6, 2015 addressing the Clean Water Act violations. We would do our best to answer any questions that you may have.

Sincerely,

Bob Wright

Senior Counsel

Friends of the River

Sacramento, CA

(916) 442-3155 x207

FRIENDS OF THE RIVER
1418 20TH STREET, SUITE 100
SACRAMENTO, CA 95811

October 26, 2015

Via Email and U.S. Mail

The Honorable Sally Jewell
Secretary of the Interior
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1849 C Street, NW
Washington, D.C. 20240
exsec@ios.doi.gov

John Laird, Secretary
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Sacramento, CA 95814
Kimberly.goncalves@resources.ca.gov

The Honorable Penny Pritzker
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U.S. Department of Commerce
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Mark W. Cowin, Director,
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Mark.cowin@water.ca.gov

The Honorable Gina McCarthy, Administrator
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McCarthy.Gina@epa.gov

David Murillo, Regional Director
U.S. Bureau of Reclamation
2800 Cottage Way
Sacramento, CA 95825
dmurillo@usbr.gov

BDCPComments@icfi.com

Re: Refusal of Lead Agencies to Disclose in BDCP/California Water Fix Drafts Significant Adverse Environmental Impacts on Water Quality and Quantity and Fish and Fish Habitat Renders Drafts Useless for Informing Public about Water Tunnels Project

Dear Secretary Jewell, Secretary Pritzker, Administrator McCarthy, Secretary Laird, Director Cowin, Regional Director Murillo, and Federal and California Agencies, Officers, and Staff Members Carrying out and Reviewing the BDCP/California Water Fix:

Summary

Friends of the River (FOR) is a nonprofit public interest organization devoted to protecting and restoring our California rivers. Restore the Delta (RTD) is a grassroots campaign committed to saving the San Francisco Bay-Delta estuary for our children and future generations. The Environmental Water Caucus (EWC) is a coalition of over 30 nonprofit environmental and community organizations and California Indian Tribes. We seek compliance with our environmental full disclosure laws, the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA) during this ongoing Bay Delta Conservation Plan (BDCP)/California Water Fix process by which the lead agencies, the U.S. Bureau of Reclamation and the California Department of Water Resources (DWR) determine whether to approve the Delta Water Tunnels

The Delta Water Tunnels would divert enormous quantities of freshwater that presently flow through the Sacramento River, sloughs, and the Delta before being diverted for export from the south Delta. Due to the new points of diversion north of the Delta, freshwater flows that presently contribute to water quality, water quantity, fish, fish habitat, and public health by flowing through the Delta would instead flow through massive Tunnels no longer providing benefits within the lower river, sloughs, and the Delta. *This is obvious.*

But the Recirculated Draft Environmental Impact Report (RDEIR)/Supplemental Draft Environmental Impact Statement (SDEIS) actually claims there would be *no* adverse impacts under NEPA or CEQA from the Delta losing all that freshwater flow on water supply or water quality, or on fish and aquatic resources. (RDEIR/SDEIS Table ES-9, pp. ES-41-60; Appendix A, ch. 31, Table 31-1, pp. 31-3 through 31-8).[1] The BDCP/Water Fix Drafts are supposed to be environmental full disclosure documents.[2] Whether from project-consultant bias or orders from above, it is arbitrary and unreasonable to falsely claim that taking significant quantities of freshwater flows away from the Delta does not have significant adverse environmental impacts on Delta water supply, water quality, fish, and fish habitat. The freshwater *is* the water supply for the Delta and *is* the habitat for the endangered and threatened species of salmon and other fish.

As the Environmental Protection Agency (EPA) said in its August 26, 2014, review of the Draft BDCP EIR/EIS:

> Data and other information provided in the Draft EIS indicate that all CM1 [Tunnels project] alternatives may contribute to declining populations of Delta smelt, Longfin smelt, green sturgeon, and winter-run, spring-run, fall-run and late-fall run Chinook

[1] The Drafts do selectively admit some significant adverse environmental impacts on other issues that pose less of a threat to the Water Tunnels even being a lawful, let alone reasonable, alternative.

[2] NEPA and CEQA are both "environmental full disclosure laws." *Silva v. Lynn,* 482 F2d 1282, 1284 (1st Cir. 1973)(NEPA); *Communities for a Better Environment v. City of Richmond,* 184 Cal.App.4th 70, 88 (2010)(CEQA). Both laws require that an agency "use its best efforts to find out all that it reasonably can" about the subject project and its environmental impacts. *Barnes v. U.S. Dept. of Transp.* 655 F.3d 1124, 1136 (9th Cir. 2011)(NEPA); *Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova*, 40 Cal. 412, 428 (2007)(CEQA).

salmon. (EPA letter (p. 10). We recommend that the Supplemental Draft EIS consider measures to insure freshwater flow that can meet the needs of those [declining fish] populations and ecosystem as a whole, and is supported by the best available science. We recommend that this analysis recognize the demonstrated significant correlations between freshwater flow and fish species abundance. (*Id.*).

The sole exceptions to the blanket denial of numerous and obvious adverse environmental impacts on water quality from the operation of the preferred Alternative 4A Water Tunnels are WQ-11 "effects on electrical conductivity concentrations resulting from facilities operations and maintenance," and WQ-32 "effects on Microcystis Bloom Formation Resulting from Facilities Operations and Maintenance." (RDEIR/SDEIS Appendix A, ch. 31, Table 31-1, pp. 31-3, 31-4). However, in the Executive Summary, even these two water quality impacts are not admitted to be adverse. (RDEIR/SDEIS Table ES-9, pp. ES-44, 45). Two tiny bits of truth survived in the Appendix but were eliminated from the Executive Summary. In any event, the Draft EIR/EIS and RDEIR/SDEIS are completely worthless in terms of providing accurate information and analyses for informed public and decision-maker review.

Denial of the adverse impacts of taking freshwater flows away from the Delta for the Water Tunnels is absurd. *Fish need water.*

The Draft EIR/EIS and RDEIR/SDEIS are so Inadequate and Conclusory in Nature that Meaningful Public Review and Comment were Precluded

An interested person or organization, or decision-maker has been furnished 48,000 pages of documents with central features being the false, arbitrary denial instead of honest disclosure of adverse environmental impacts resulting from Water Tunnels operations on Delta water quality, water quantity, fish, and fish habitat. In our previous letters to you we have summarized some of the adverse impacts on these subjects either admitted in other portions of the environmental documents or pointed out by expert public agencies such as the EPA.[3]

CEQA defines "significant effect on the environment" to mean "a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including land, air, *water* . . . flora, fauna . . . and objects of historic or aesthetic significance." CEQA Guidelines, 14 Code Cal. Regs §15382 (emphasis added). To anyone but a project booster, taking away substantial freshwater flows from a Delta already in crisis is an adverse change in the physical conditions within the area affected by the project.

Also under CEQA, "substantial evidence" does *not* include: "Argument, speculation, unsubstantiated opinion or narrative, evidence which is clearly erroneous or inaccurate . . ." 14 Code Cal. Regs § 15384. In addition to the false RDEIR/SDEIS findings being nothing more than conclusory argument, there have also been such findings as the truthful EPA expert

[3] Our previous letters referenced above include the letters of July 22, 2015 (on absence of a range of reasonable alternatives), September 9, 2015 (on Endangered Species Act violations), and October 6, 2015 (on Clean Water Act violations).

determination that the Water Tunnels "would not protect beneficial uses for aquatic life, thereby violating the Clean Water Act. Total freshwater flows will likely diminish in the years ahead as a result of drought and climate change. Continued exports at today's prevailing levels would, therefore, result in even lower flows through the Delta in a likely future with less available water." (EPA Review of Draft BDCP EIS at p. 2, August 26, 2014). There is only conclusory argument, narrative, and inaccurate statements in the RDEIR/SDEIS about these impacts. There is not the supporting *substantial evidence* required by law.

Under CEQA, "Decision-makers must, under the law, be presented with sufficient facts to 'evaluate the pros and cons of supplying the amount of water that the [project] will need.'" *Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova*, 40 Cal.4th 412, 432 (2007). Here, in violation of law, the decision-makers and also the public have been provided with claimed pros but virtually none of the cons involved in supplying the enormous amounts of water that would be diverted away from the Sacramento River and Delta.

The NEPA Regulations provide guidance in determining whether an impact "significantly" affects the environment. "Significantly as used in NEPA requires considerations of both context and intensity . . ." 40 C.F.R. § 1508.27. Considerations of context include "the affected region, the affected interests, and the locality." § 1508.27(a). The Delta is recognized as being threatened by reductions in freshwater flows through the Delta. "[H]igher water exports" are among the factors the RDEIR/SDEIS admits "have stressed the natural system and led to a decline in ecological productivity." (RDEIR/SDEIS 1-10). Further, "There is an urgent need to improve the conditions for threatened and endangered fish species within the Delta." (Draft EIR/EIS ES-10; RDEIR/SDEIS ES-6). The RDEIR/SDEIS admits that "the Delta is in a state of crisis" and that "Several threatened and endangered fish species . . . have recently experienced the lowest population numbers in their recorded history." (RDEIR/SDEIS ES-1).

As just two of many examples of truthful, contrary information in chapter 4 of the RDEIR/SDEIS, the Water Tunnels "would degrade the quantity and quality of rearing habitat for steelhead relative to Existing Conditions" and "would reduce the quantity and quality of rearing habitat for larval and juvenile green sturgeon relative to Existing Conditions." (ch. 4, 4.3.7-22; 4.3.7-296). As just two of many examples of truthful, contrary information in chapter 5, "Effects Analysis" of the BDCP Draft Plan (December 2013), "Sacramento River attraction flows for migrating adult winter-run Chinook salmon will be lower from operations of the north Delta diversions under the BDCP" and "Plan Area flows have considerable importance for downstream migrating juvenile salmonids and will be affected by the proposed north Delta diversions . . . Because of the north Delta diversions, salmonids migrating down the Sacramento River generally will experience lower migration flows compared to existing conditions . . . As with winter-run Chinook salmon, it was assumed with high certainty that Plan area flows have critical importance for migrating juvenile spring-run Chinook salmon." (Plan, ch. 5, 5.3-29; 5, 5.4-17).

Considerations of intensity refer to the "severity of impact." 40 C.F.R. § 1508.27(b). Each of the ten subsections in § 1508.27(b) cry out that the impacts falsely denied by the lead agencies are significant, severe, and adverse. These ten subsections are addressed as follows:

"Impacts that may be both beneficial and adverse . . ." § 1508.27(b)(1). The claim that developing the new northern conveyance would reduce adverse impacts from the existing southern pumps on fish furnishes no excuse to evade disclosing the significant adverse impacts of the new conveyance on water quality, water quantity, and fish habitat throughout the Delta.

"The degree to which the proposed action affects public health or safety." § 1508.27(b)(2). As shown in our previous Clean Water Act (CWA)/water quality letter, the worsening of CWA violations would adversely affect public health and safety.

"Unique characteristics of the geographic area such as proximity to . . . prime farmlands, wetlands . . . or ecologically critical areas." § 1508.27(b)(3). The taking away of significant quantities of freshwater flows upstream from the Delta would pull in greater salinity from San Francisco Bay adversely impacting the prime farmlands of the Delta. The Delta consists of designated critical habitats for no fewer than five endangered and threatened fish species. California has determined by law that the Delta is "in crisis . . ." Water Code, § 85001(a).

"The degree to which the effects on the quality of the human environment are likely to be highly controversial." § 1508.27(b)(4). The Water Tunnels are the most controversial public works project in California history. This project in its previous form as the "peripheral canal" was voted down by a statewide referendum in June 1982. One reason the lead agencies falsely deny obvious adverse environmental impacts, hide alternatives increasing flows by reducing exports, and refuse to post contrary information and views from the public and other public agencies on the BDCP/Water Fix website is *because* this project is so controversial.

"The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks." § 1508.27(b)(5). The experts, for example, of the Delta Independent Science Board have commented on the degree of uncertainty in the environmental documents. (DISB comment letter, September 30, 2015).

"The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration." § 1508.27(b)(6). Whether the Delta Tunnels are approved will in significant part determine future Central Valley Project (CVP) and State Water Project (SWP) operations. The action also represents a decision in principle that flows through the Delta will not be increased by reducing exports. Billions of dollars would not be spent to build the Water Tunnels unless the intent is to use them for the purpose for which they are intended.

"Whether the action is related to other actions with individually insignificant but cumulatively significant impacts . . ." § 1508.27(b)(7). The Water Tunnels impacts must be considered together with impacts resulting from future CVP and SWP operations.

"The degree to which the action . . . may cause loss or destruction of significant scientific . . . resources." § 1508.27(b)(8). Endangered species are addressed in the next paragraph. One does not know ahead of time what species may contain the key to a cure for a disease.

"The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act [ESA] of 1973." § 1508.27(b)(9). In *Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova*, 40 Cal. 412, 449 (2007), the California Supreme Court determined that "We do not consider this response [similar to the denials of the obvious here] substantial evidence that the loss of stream flows would have no substantial effect on salmon migration. Especially given the sensitivity and listed status of the resident salmon species, the County's failure to address loss of Cosumnes River stream flows in the Draft EIR 'deprived the public . . . of meaningful participation [citation omitted] in the CEQA discussion."[4] The Court required recirculation of the Draft EIR. We have summarized in our earlier ESA and CWA letters some of the impacts Water Tunnels operations would have on at least five endangered or threatened fish species and their designated critical habitats. The conclusions are contradicted by other portions of the BDCP/Water Fix documents as shown above. Of course these impacts are significant adverse impacts. Yet the Executive Summary falsely concludes in all cases that they are not. (RDEIR/SDEIS Table ES-9, pp. ES-47 through 60, Aqua-NAA-1 through 16, Aqua-1 through 217). Until about April 2015, the claim being made in the Draft EIR/EIS had been that while there would be adverse impacts of Water Tunnels operations on the fish and their habitat, some of that would be mitigated by the provision of wetland restoration. Now however, the "65,000 acres of tidal wetland restoration" has been eviscerated down to "59 acres." (RDEIR/SDEIS p. ES-17). Yet impacts previously either determined to be adverse or undetermined are now determined to not be significant or adverse. With the National Marine Fisheries Service and U.S. Fish and Wildlife Service no longer being co-lead agencies, Reclamation and DWR have been freer to evade the law and the truth in the RDEIR/SDEIS.

"Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment." § 1508.27(b)(10). As shown in our previous letters, the action threatens violation of several laws imposed for protection of the environment including the ESA, CWA, and the Delta Reform Act.

We understand that the exporters want to take the water away from the Delta and that their submissive agencies, Reclamation and DWR, want to give them the water. But these desires afford no license to churn out Draft environmental documents under NEPA and CEQA that falsely deny instead of truthfully disclose the numerous adverse impacts that diversion of water for the Water Tunnels would have on Delta water quality, water quantity, endangered and threatened fish species, designated critical habitat, and public health.

The NEPA Regulations require that:

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4 The Court noted that a "potential substantial impact on endangered, rare or threatened species is per se significant." 40 Cal.4th at 449 citing Guidelines section 14 Code Cal. Regs §15065(a).

The draft statement must fulfill and satisfy to the fullest extent possible the requirements established for final statements in section 102(2)(C) of the Act. If a draft statement is *so inadequate as to preclude meaningful analysis,* the agency shall prepare and circulate a revised draft of the appropriate portion. . ." 40 C.F.R. § 1502.9(a)(emphasis added).

The Draft EIR/EIS and RDEIR/SDEIS with their arbitrary, false denials of numerous adverse environmental impacts resulting from Water Tunnels operations on the Delta are so inadequate as to preclude meaningful analysis. To comply with NEPA the lead agencies must either drop the Water Tunnels project or prepare and circulate a revised, honest Draft of the impacts analysis portions of the documents as well as the alternatives portions.

The CEQA Guidelines require that:

'Significant new information' requiring recirculation include, for example, a disclosure showing that:

(1) A new significant environmental impact would result from the project or from a new mitigation measure proposed to be implemented.
(2) . . .
(3) A feasible project alternative or mitigation measure considerably different from others previously analyzed would clearly lessen the significant environmental impacts of the project, but the project's proponents decline to adopt it.
(4) The draft EIR was *so fundamentally and basically inadequate and conclusory in nature that meaningful public review and comment were precluded.* 14 Code Cal. Regs § 15088.5(a)(1), (3), and (4)(emphasis added).

CEQA requires that unless the Water Tunnels project is dropped, a new Draft EIR/EIS sufficient to provide for meaningful public review and comment must be prepared and circulated.

Conclusion

Extinction is forever. Environmental full disclosure is imperative here. Arbitrary false denials of adverse environmental impacts resulting from new upstream diversion of large quantities of freshwater flows from a Delta already in crisis and from listed fish species and their designated critical habitats are unacceptable. The lead agencies must either drop the Water Tunnels project or provide an informative and honest Draft EIS/EIR that will afford a basis for meaningful public review and comment.

If you have any questions, please contact Robert Wright, Senior Counsel, Friends of the River at (916) 442-3155 ext. 207 or bwright@friendsoftheriver.org .

Sincerely,

/s/ E. Robert Wright	/s/Conner Everts	/s/Barbara Barrigan-Parilla
Senior Counsel	Co-Facilitator	Executive Director
Friends of the River	Environmental Water Caucus	Restore the Delta

Additional Addressees, all via email:

Maria Rea, Assistant Regional Administrator
National Marine Fisheries Service
Michael Tucker, Fishery Biologist
National Marine Fisheries Service
Larry Rabin, Acting, Field Supervisor, S.F. Bay-Delta
U.S. Fish and Wildlife Service
Lori Rinek
U.S. Fish and Wildlife Service
Mary Lee Knecht, Program Manager
U.S. Bureau of Reclamation
Patty Idloff
U.S. Bureau of Reclamation
Deanna Harwood
NOAA Office of General Counsel
Kaylee Allen
Department of Interior Solicitor's Office
Jared Blumenfeld, Regional Administrator
U.S. EPA, Region IX
Tom Hagler
U.S. EPA General Counsel Office
Tim Vendlinski, Bay Delta Program Manager, Water Division
U.S. EPA, Region IX
Stephanie Skophammer, Program Manager
U.S. EPA, Region IX
Erin Foresman, Bay Delta Coordinator
U.S. EPA
Lisa Clay, Assistant District Counsel
U.S. Army Corps of Engineers
Michael Nepstad, Deputy Chief, Regulatory Division
U.S. Army Corps of Engineers
Zachary M. Simmons, Senior Regulatory Project Manager
U.S. Army Corps of Engineers
Diane Riddle, Environmental Program Manager
State Water Resources Control Board

CEQ Number	Title
20150238	Silvio O. Conte National Fish and Wildlife Refuge Draft Comprehensive Co
20150231	Programmatic -Long Island Sound Dredged Material Management Plan
20150207	Northern Pass Transmission Line Project
20150269	Cross Harbor Freight Program
20150253	Caño Martín Peña Ecosystem Restoration Project
20150217	Arecibo Waste-to-Energy and Resource Recovery Project
20150262	Chincoteague and Wallops Island National Wildlife Refuge Final CCP
20150250	2016-2020 Fernow Experimental Forest
20150228	The Federal Bureau of Investigation Central Records Complex
20150264	Pellissippi Parkway Extension (State Route 162) from State Route 33 (Old
20150259	Southeast High Speed Rail, Richmond, VA, to Raleigh, NC
20150256	Southeast Market Pipeline Project
20150249	Gulf of Mexico OCS Oil and Gas Lease Sales: 2016 and 2017, Central Plann
20150243	Holden Beach Shoreline Protection Project
20150241	Everglades National Park General Management Plan / East Everglades Wil
20150240	Durham-Orange Light Rail Transit Project
20150215	Francis Marion Forest Plan Revision
20150251	Programmatic-Restoration Resulting from the Kalamazoo River Natural Re
20150255	Sabine Pass to Galveston Bay, Texas, Coastal Storm Risk Reduction and Ec
20150245	Gulf of Mexico OCS Oil and Gas Lease Sale 248
20150242	Southwest Jemez Mountains Landscape Restoration Project
20150246	Eastern Hills Drive and Connecting Roadways Pottawattamie County, Iowa
20150252	Rocky Mountain Arsenal National Wildlife Refuge
20150235	Chimney Rock National Monument Management Plan
20150234	Moab Master Leasing Plan and Draft Resource Management Plan Amendr
20150224	Breckenridge Multi-Season Recreation Projects
20150216	Monroe Mountain Aspen Ecosystems Restoration Project
20150210	Teton to Snake Fuels Management
20150193	Beaver Dam Wash National Conservation Area Red Cliffs National Conserv
20150109	Tongue River Railroad
20150274	Ala Wai Canal Project
20150271	South San Francisco Bay Shoreline Phase I
20150266	Programmatic - Apache-Sitgreaves National Forests Land Management Pla
20150265	North Valley Regional Recycled Water Program
20150261	PROGRAMMATIC - Hawaii Clean Energy
20150260	Central Valley Project Municipal and Industrial Water Shortage Policy
20150254	Arizona Passenger Rail Corridor Study: Tucson to Phoenix Tier 1 Draft Env
20150258	Panoche Valley Solar Facility
20150247	LEGISLATIVE - Renewal of Naval Air Weapons Station China Lake Public La
20150237	Bill Williams Mountain Restoration Project
20150236	State Route 79 Realignment Project: Domenigoni Parkway to Gilman Sprir
20150230	Coeur Rochester Mine Plan of Operations Amendment 10 Project (POA10

20150221	Bald Mountain Mine North and South Operations Area Projects
20150214	Coordinated Long-Term Operation of the Central Valley Project and State
20150209	Prescott National Forest Revision of Land and Resource Management Plar
20150200	South Bay Salt Pond Restoration Project, Phase 2
20150196	Bay Delta Conservation Plan/California Water Fix
20150088	Commonwealth of the Northern Mariana Islands (CJMT) Joint Military Tra
20150275	Motorized Vehicle Use on the Rogue River-Siskiyou National Forest Supple
20150272	Becker Integrated Resource Project
20150268	Clear Creek Integrated Restoration Project
20150267	Skokomish River Ecosystem Restoration
20150263	Draft Environmental Impact Statement Rasmussen Valley Mine
20150248	United States Air Force F-35A Operational Beddown - Pacific
20150223	Goose Project
20150218	Oregon Liquefied Natural Gas (LNG) and Washington Expansion Projects
20150257	Programmatic - Asian Longhorned Beetle Eradication Program
20159999	Supplement to the U.S. Department of Energy's Environmental Impact Sta
20150232	Carcass Management During A Mass Animal Health Emergency, Draft Prog
20150199	Stream Protection Rule
20150177	Phase 2 Fuel Efficiency Standards for Medium- and Heavy-Duty Engines ar

Type	Lead Agency	Region	State	Comment Due Date
Draft	USFWS	1	CT - MA - NH -	11/16/2015
Draft	USACE	1	CT - NY - RI	10/5/2015
Draft	DOE	1	NH	10/29/2015
Final	FHWA	2	NY	10/26/2015
Draft	USACE	2	PR	10/26/2015
Draft	RUS	2	PR	11/12/2015
Final	USFWS	3	VA - MD	10/19/2015
Draft	USFS	3	WV	10/19/2015
Draft Supplement	GSA	3	VA	10/5/2015
Final	FHWA	4	TN	10/19/2015
Final	FRA	4	NC - VA	10/19/2015
Draft	FERC	4	FL - AL - GA	10/26/2015
Draft Supplement	BOEM	4	AL - LA - MS	10/5/2015
Draft	USACE	4	NC	10/13/2015
Final	NPS	4	FL	9/28/2015
Draft	FTA	4	NC	10/13/2015
Revised Draft	USFS	4	SC - SC	11/11/2015
Draft	NOAA	5	MI	10/19/2015
Draft	USACE	6	TX	10/26/2015
Third Draft Supplem	BOEM	6	TX - LA	10/19/2015
Final	USFS	6	NM	10/5/2015
Final	FHWA	7	IA	10/5/2015
Final	USFWS	8	CO	10/5/2015
Final	USFS	8	CO	10/19/2015
Draft	BLM	8	UT	11/19/2015
Final	USFS	8	CO	9/28/2015
Final	USFS	8	UT	10/5/2015
Draft	USFS	8	WY	10/5/2015
Draft	BLM	8	UT	10/15/2015
Draft	STB	8	MT	9/23/2015
Draft	USACE	9	HI	11/9/2015
Final	USACE	9	CA	10/26/2015
Final	USFS	9	AZ	12/24/2015
Final	BR	9	CA	10/26/2015
Final	DOE	9	HI	10/19/2015
Final	BR	9	CA	10/19/2015
Draft Statement	FRA	9	AZ	10/30/2015
Draft	USACE	9	CA	10/26/2015
Final	USN	9	CA	10/5/2015
Final	USFS	9	AZ	10/2/2015
Draft Supplement	Caltrans	9	CA	10/5/2015
Draft	BLM	9	NV	10/5/2015

Bridge) to US 321/State Route 73/Lamar Alexander Parkway

Final Supplement 241 and 247, Eastern Planning Area Lease Sale 226

Draft Assessment

Draft Amendment to the St. Geroge Field Office Resource Management Plan

EPA-HQ-2016-004924

ED_000757_000010257-00003

Draft	BLM	9	NV	9/28/2015
Draft	BR	9	CA	9/29/2015
Final	USFS	9	AZ	11/5/2015
Second Draft	USFWS	9	CA	10/30/2015
Draft Supplement	BR	9	CA	10/30/2015
Draft	USMC	9	Other	10/1/2015
Final Supplement	USFS	10	OR	11/2/2015
Draft	USFS	10	ID	11/9/2015
Final	USFS	10	ID	10/26/2015
Final	USACE	10	WA	10/26/2015
Draft	BLM	10	ID	11/2/2015
Draft	USAF	10	AK	10/19/2015
Final	USFS	10	OR	10/1/2015
Draft	FERC	10	OR - WA	10/6/2015
Final	USDA	11	PRO	10/12/2015
Draft	NRC	11	NV	10/20/2015
Draft	APHIS	11	PRO	10/20/2015
Draft	OSM	11	Other - PRO -	10/26/2015
Draft	NHTSA	11	REG	10/1/2015

Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca M

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7/24/2015
6/26/2015

To: Leff, Karin[Leff.Karin@epa.gov]
Cc: Wright, Justin[wright.justin@epa.gov]; Roemele, Julie[Roemele.Julie@epa.gov]
From: Hessert, Aimee
Sent: Thur 8/20/2015 3:25:05 PM
Subject: FW: Briefing Materials for Meeting w/OECA/OW/R9 re: Bay Delta
BDCP SDEIS Briefing Paper 08.20.15.docx
ATT00001.htm

Justin will cover the meeting. Julie will also call in so she is informed if/when we receive the Bay Delta Habitat Conservation Plan EIS.

From: Leff, Karin
Sent: Thursday, August 20, 2015 9:23 AM
To: Hessert, Aimee
Subject: Fwd: Briefing Materials for Meeting w/OECA/OW/R9 re: Bay Delta

Can you get someone to cover this. It was supposed to be moved but wasn't.

Sent from my iPhone

Begin forwarded message:

From: "Skophammer, Stephanie" <SKOPHAMMER.STEPHANIE@EPA.GOV>
Date: August 19, 2015 at 5:30:03 PM EDT
To: "Wilson, Shari" <Wilson.Shari@epa.gov>, "Johnson, Kathleen" <Johnson.Kathleen@epa.gov>, "Leff, Karin" <Leff.Karin@epa.gov>, "Bromm, Susan" <Bromm.Susan@epa.gov>, "Kopocis, Ken" <Kopocis.Ken@epa.gov>, "Blumenfeld, Jared" <BLUMENFELD.JARED@EPA.GOV>, "Kao, Jessica" <Kao.Jessica@epa.gov>, "Kemmerer, John" <KEMMERER.JOHN@EPA.GOV>, "Goforth, Kathleen" <Goforth.Kathleen@epa.gov>, "Foresman, Erin" <Foresman.Erin@epa.gov>, "Hagler, Tom" <Hagler.Tom@epa.gov>, "Vendlinski, Tim" <vendlinski.tim@epa.gov>, "Gorke, Roger" <Gorke.Roger@epa.gov>, "Huffman, Linda" <Huffman.Linda@epa.gov>, "Quast, Sylvia" <Quast.Sylvia@epa.gov>, "Gaudario, Abigail" <Gaudario.Abigail@epa.gov>, "Giles-AA, Cynthia" <Giles-AA.Cynthia@epa.gov>
Subject: Briefing Materials for Meeting w/OECA/OW/R9 re: Bay Delta

Please see attached for the briefing paper that we will discuss tomorrow.

Stephanie Skophammer

U.S. Environmental Protection Agency, Region 9

Environmental Review Section (ENF-4-2)

75 Hawthorne St.

San Francisco, CA 94105

(415) 972-3098

To: Skophammer, Stephanie[SKOPHAMMER.STEPHANIE@EPA.GOV]; Hanf, Lisa[Hanf.Lisa@epa.gov]; Goforth, Kathleen[Goforth.Kathleen@epa.gov]; Kemmerer, John[KEMMERER.JOHN@EPA.GOV]; Woo, Nancy[Woo.Nancy@epa.gov]; Wright, Justin[wright.justin@epa.gov]; Leff, Karin[Leff.Karin@epa.gov]; Foresman, Erin[Foresman.Erin@epa.gov]; Vendlinski, Tim[vendlinski.tim@epa.gov]; Hagler, Tom[Hagler.Tom@epa.gov]
From: Johnson, Kathleen
Sent: Thur 7/23/2015 5:54:27 PM
Subject: RE: 60 Day Comment Period Extension for BDCP/CWF RDEIR/SDEIS- due Oct 30

Great! thank you.

Kathleen H. Johnson

Director, Enforcement Division

U.S. EPA - Region 9

75 Hawthorne Street ENF-1

San Francisco, CA 94015

415/972-3873

johnson.kathleen@epa.gov

From: Skophammer, Stephanie
Sent: Thursday, July 23, 2015 9:51 AM
To: Johnson, Kathleen; Hanf, Lisa; Goforth, Kathleen; Kemmerer, John; Woo, Nancy; Wright, Justin; Leff, Karin; Foresman, Erin; Vendlinski, Tim; Hagler, Tom
Subject: 60 Day Comment Period Extension for BDCP/CWF RDEIR/SDEIS- due Oct 30

Kathy and I will work together tomorrow to revise the review calendar.

From: Olson, Theresa [mailto:tolson@usbr.gov]
Sent: Thursday, July 23, 2015 9:30 AM
To: Cathy Marcinkevage; Dan Hytrek; Kaylee Allen; Knecht, Mary; Larry Rabin; luana.kiger@ca.usda.gov; Michael. Tucker; Michelle Banonis; Patricia Idlof; Ryan Wulff - NOAA Federal; Shelby Mendez; Stine, Ann; Susan S SPK Clark; Yvette Redler; Zachary M SPK

Simmons; Zachary M SPK Simmons; Foresman, Erin; Hagler, Tom; lori_rinek; Michael.G.Nepstad@usace.army.mil; mkshouse@usgs.gov; Siu, Jennifer; Skophammer, Stephanie; Vendlinski, Tim
Subject: 60 Day Comment Period Extension for BDCP/CWF RDEIR/SDEIS

Hi All, attached is the press release for the 60 day extension. If you have any questions, please let me know. Thanks, Theresa.

--

Theresa Olson
Conservation and Conveyance Division Chief
Bay-Delta Office
Bureau of Reclamation
Office: (916) 414-2433
Cell (916) 261-4893

To: Johnson, Kathleen[Johnson.Kathleen@epa.gov]; Hanf, Lisa[Hanf.Lisa@epa.gov]; Goforth, Kathleen[Goforth.Kathleen@epa.gov]; Kemmerer, John[KEMMERER.JOHN@EPA.GOV]; Woo, Nancy[Woo.Nancy@epa.gov]; Wright, Justin[wright.justin@epa.gov]; Leff, Karin[Leff.Karin@epa.gov]; Foresman, Erin[Foresman.Erin@epa.gov]; Vendlinski, Tim[vendlinski.tim@epa.gov]; Hagler, Tom[Hagler.Tom@epa.gov]
From: Skophammer, Stephanie
Sent: Thur 7/23/2015 4:51:28 PM
Subject: 60 Day Comment Period Extension for BDCP/CWF RDEIR/SDEIS- due Oct 30
MP-15-118 Public Comment Period on Revised Delta Conveyance Document Extended 60 Days.pdf

Kathy and I will work together tomorrow to revise the review calendar.

From: Olson, Theresa [mailto:tolson@usbr.gov]
Sent: Thursday, July 23, 2015 9:30 AM
To: Cathy Marcinkevage; Dan Hytrek; Kaylee Allen; Knecht, Mary; Larry Rabin; luana.kiger@ca.usda.gov; Michael. Tucker; Michelle Banonis; Patricia Idlof; Ryan Wulff - NOAA Federal; Shelby Mendez; Stine, Ann; Susan S SPK Clark; Yvette Redler; Zachary M SPK Simmons; Zachary M SPK Simmons; Foresman, Erin; Hagler, Tom; lori_rinek; Michael.G.Nepstad@usace.army.mil; mkshouse@usgs.gov; Siu, Jennifer; Skophammer, Stephanie; Vendlinski, Tim
Subject: 60 Day Comment Period Extension for BDCP/CWF RDEIR/SDEIS

Hi All, attached is the press release for the 60 day extension. If you have any questions, please let me know. Thanks, Theresa.

--

Theresa Olson
Conservation and Conveyance Division Chief
Bay-Delta Office
Bureau of Reclamation
Office: (916) 414-2433
Cell (916) 261-4893

Bureau of Reclamation
Mid-Pacific Region

California Department
of Water Resources

Media Contacts:
Bureau of Reclamation: Erin Curtis, 916-978-5100, eccurtis@usbr.gov
California Natural Resources Agency: Nancy Vogel, 916-653-9402, nancy.vogel@resources.ca.gov

For Release: July 22, 2015

Public Comment Period on Revised Delta Conveyance Document Extended 60 Days

Public Meetings in Sacramento and Walnut Grove Next Week

SACRAMENTO, Calif. – The California Department of Water Resources and the Federal Bureau of Reclamation announced today a 60-day extension of the public comment period for the joint Partially Recirculated Draft Environmental Impact Report (RDEIR)/Supplemental Draft Environmental Impact Statement (SDEIS) on the Bay Delta Conservation Plan/California WaterFix.

The public comment period began July 10. Originally scheduled to end on August 31, 2015, it is being extended to Friday, October 30, 2015.

The two-month extension gives the public, government agencies, and independent scientists more time to consider refinements and changes made since last summer to the plan that seeks to secure California's water supplies and improve ecosystem conditions in the Sacramento-San Joaquin Delta. The Delta is the West Coast's largest estuary and is the hub of the state's water distribution system. It provides water to 25 million of California's 38 million residents and three million of roughly nine million irrigated acres of farmland. The Delta also harbors several threatened and endangered fish species.

To view or download the RDEIR/SDEIS, or for a list of locations to access a DVD of the document, please go to www.baydeltaconservationplan.com. If you encounter problems accessing the documents, please call 916-978-5100 or email mppublicaffairs@usbr.gov.

Upcoming Meetings

Two public meetings are scheduled for next week in Sacramento and Walnut Grove. The open house-style meetings will allow those with questions about the revised documents to speak individually to technical experts. A court reporter will be available for those who would prefer to submit comments verbally rather than in writing.

Meeting information:

- Tuesday, July 28, from 3 p.m. to 7 p.m. at the Sheraton Grand Sacramento Hotel, Magnolia Room, 1230 J Street, Sacramento.

- Wednesday, July 29, from 3 p.m. to 7 p.m., Jean Harvie Senior and Community Center, 14273 River Road, Walnut Grove.

To Submit Comments

Written comments are due by close of business Friday, October 30, 2015. Comments should be mailed to BDCP/WaterFix Comments, P.O. Box 1919, Sacramento, CA 95812 or emailed to BDCPComments@icfi.com.

For additional information, please contact Theresa Olson, Reclamation, 916-930-5676 (TTY 800-877-8339) or Cassandra Enos-Nobriga, California Department of Water Resources, 916-651-0178.

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The mission of the California Department of Water Resources is to manage the water resources of California in cooperation with other agencies, to benefit the State's people, and to protect, restore, and enhance the natural and human environments. Visit DWR's website at www.water.ca.gov.

Reclamation is the largest wholesale water supplier and the second largest producer of hydroelectric power in the United States, with operations and facilities in 17 Western states. Its facilities also provide substantial flood control, recreation, and fish and wildlife benefits. Visit Reclamation's website at www.usbr.gov.

To: Leff, Karin[Leff.Karin@epa.gov]
Cc: Hessert, Aimee[Hessert.Aimee@epa.gov]
From: Goforth, Kathleen
Sent: Fri 6/19/2015 5:14:05 PM
Subject: BDCP briefing

Hi, Karin –

Following up on our biweekly call, I've asked Stephanie Skophammer to prepare a briefing to bring you up and Aimee to speed on the BDCP/Bay-Delta Water-fix project. We're expecting to receive the Supplemental DEIS on July 10th, so we'll need to do the briefing before then because Stephanie will be completely consumed by the review process once we receive the document. Based on schedules here, we're looking for an hour either toward the end of next week, or during the week of July 6th. What's the best way for us to set this up – should we just look for an open slot on your online calendar and send you an invitation, or is there someone in your office Stephanie should contact in order to do the scheduling? In addition to you and Aimee, we're thinking that it would probably be good to include Justin Wright, since he's the NCD liaison for BOR (correct?). Let me know if anyone else should be included.

Thanks –

-Kathy

Kathleen Martyn Goforth, Manager

Environmental Review Section (ENF-4-2)

U.S. Environmental Protection Agency, Region 9

75 Hawthorne Street

San Francisco, CA 94105

415-972-3521

To: Marshall, Tom[marshall.tom@epa.gov]
From: Leff, Karin
Sent: Tue 9/8/2015 9:29:42 PM
Subject: FW: Final Bay Delta Briefing Paper (Feb 10 2014)
BDCP Briefing paper Feb 7 2014.pdf

Karin Leff

Acting Director, NEPA Compliance Division

Office of Federal Activities

US EPA- OECA

202.564.7068 (w)

202.236.3669 (c)

From: Skophammer, Stephanie
Sent: Tuesday, September 08, 2015 5:08 PM
To: Johnson, Kathleen; Goforth, Kathleen; Vendlinski, Tim; Kemmerer, John; Foresman, Erin; Hagler, Tom; Wright, Justin; Bromm, Susan; Leff, Karin
Subject: FW: Final Bay Delta Briefing Paper (Feb 10 2014)

We prepared quite the detailed package last time!

From: Gorke, Roger
Sent: Friday, February 07, 2014 12:45 PM
To: Kopocis, Ken; Blumenfeld, Jared; Diamond, Jane; Vendlinski, Tim; Hagler, Tom; Goforth, Kathleen; Johnson, Kathleen; Bromm, Susan; Rader, Cliff; Giles-AA, Cynthia
Cc: Lousberg, Macara; Pendergast, Jim; Best-Wong, Benita; Goodin, John; Southerland, Elizabeth; Buffo, Corey; Behl, Betsy; Hisel-Mccoy, Sara; Metzger, Philip
Subject: Final Bay Delta Briefing Paper

All,

Attached is the final briefing document that will go in the Administrator's book for this weekend. The schedulers were threatening to cancel the briefing on Monday if they didn't get the document. So, here it is.

Thanks again for everyone's effort on such a short notice to get this done.

Let me know if you have any questions,

Roger

Roger Gorke

Senior Policy Advisor

Office of Water

U.S. Environmental Protection Agency

PH: 202-564-0470

FAX: 202-564-0500

gorke.roger@epa.gov

To: Hessert, Aimee[Hessert.Aimee@epa.gov]
From: Leff, Karin
Sent: Thur 8/20/2015 1:23:19 PM
Subject: Fwd: Briefing Materials for Meeting w/OECA/OW/R9 re: Bay Delta
BDCP SDEIS Briefing Paper 08.20.15.docx
ATT00001.htm

Can you get someone to cover this. It was supposed to be moved but wasn't.

Sent from my iPhone

Begin forwarded message:

From: "Skophammer, Stephanie" <SKOPHAMMER.STEPHANIE@EPA.GOV>
Date: August 19, 2015 at 5:30:03 PM EDT
To: "Wilson, Shari" <Wilson.Shari@epa.gov>, "Johnson, Kathleen" <Johnson.Kathleen@epa.gov>, "Leff, Karin" <Leff.Karin@epa.gov>, "Bromm, Susan" <Bromm.Susan@epa.gov>, "Kopocis, Ken" <Kopocis.Ken@epa.gov>, "Blumenfeld, Jared" <BLUMENFELD.JARED@EPA.GOV>, "Kao, Jessica" <Kao.Jessica@epa.gov>, "Kemmerer, John" <KEMMERER.JOHN@EPA.GOV>, "Goforth, Kathleen" <Goforth.Kathleen@epa.gov>, "Foresman, Erin" <Foresman.Erin@epa.gov>, "Hagler, Tom" <Hagler.Tom@epa.gov>, "Vendlinski, Tim" <vendlinski.tim@epa.gov>, "Gorke, Roger" <Gorke.Roger@epa.gov>, "Huffman, Linda" <Huffman.Linda@epa.gov>, "Quast, Sylvia" <Quast.Sylvia@epa.gov>, "Gaudario, Abigail" <Gaudario.Abigail@epa.gov>, "Giles-AA, Cynthia" <Giles-AA.Cynthia@epa.gov>
Subject: Briefing Materials for Meeting w/OECA/OW/R9 re: Bay Delta

Please see attached for the briefing paper that we will discuss tomorrow.

Stephanie Skophammer

U.S. Environmental Protection Agency, Region 9

Environmental Review Section (ENF-4-2)

75 Hawthorne St.

San Francisco, CA 94105

(415) 972-3098

To: Goforth, Kathleen[Goforth.Kathleen@epa.gov]
Cc: Hessert, Aimee[Hessert.Aimee@epa.gov]
From: Leff, Karin
Sent: Mon 6/22/2015 3:18:49 PM
Subject: RE: BDCP briefing

How about July 8

Karin Leff

Acting Director, NEPA Compliance Division

Office of Federal Activities

US EPA- OECA

202.564.7068 (w)

202.236.3669 (c)

From: Goforth, Kathleen
Sent: Monday, June 22, 2015 10:32 AM
To: Leff, Karin
Cc: Hessert, Aimee
Subject: Re: BDCP briefing

Next week is not good for us due to leave schedules. If this week does not work for you, July 8 or 9 would probably be best for us; and July 7 or 10 next best.

-Kathy

Sent from my iPhone

On Jun 22, 2015, at 5:41 AM, Leff, Karin <Leff.Karin@epa.gov> wrote:

> I would suggest just scheduling something. We're having calendar access issues. Aimee is only here Tues, Wed, Thurs. Can we try for next week?

Karin Leff

Acting Director, NEPA Compliance Division

Office of Federal Activities

US EPA- OECA

202.564.7068 (w)

202.236.3669 (c)

From: Goforth, Kathleen
Sent: Friday, June 19, 2015 1:14 PM
To: Leff, Karin
Cc: Hessert, Aimee
Subject: BDCP briefing

Hi, Karin –

Following up on our biweekly call, I've asked Stephanie Skophammer to prepare a briefing to bring you up and Aimee to speed on the BDCP/Bay-Delta Water-fix project. We're expecting to receive the Supplemental DEIS on July 10th, so we'll need to do the briefing before then because Stephanie will be completely consumed by the review process once we receive the document. Based on schedules here, we're looking for an hour either toward the end of next week, or during the week of July 6th. What's the best way for us to set this up – should we just look for an open slot on your online calendar and send you an invitation, or is there someone in your office Stephanie should contact in order to do the scheduling? In addition to you and Aimee, we're thinking that it would probably be good to include Justin Wright, since he's the NCD liaison for BOR (correct?). Let me know if anyone else should be included.

Thanks –

-Kathy

Kathleen Martyn Goforth, Manager

Environmental Review Section (ENF-4-2)

U.S. Environmental Protection Agency, Region 9

75 Hawthorne Street

San Francisco, CA 94105

415-972-3521

To: Goforth, Kathleen[Goforth.Kathleen@epa.gov]
Cc: Hessert, Aimee[Hessert.Aimee@epa.gov]
From: Leff, Karin
Sent: Mon 6/22/2015 12:41:26 PM
Subject: RE: BDCP briefing

I would suggest just scheduling something. We're having calendar access issues. Aimee is only here Tues, Wed, Thurs. Can we try for next week?

Karin Leff

Acting Director, NEPA Compliance Division

Office of Federal Activities

US EPA- OECA

202.564.7068 (w)

202.236.3669 (c)

From: Goforth, Kathleen
Sent: Friday, June 19, 2015 1:14 PM
To: Leff, Karin
Cc: Hessert, Aimee
Subject: BDCP briefing

Hi, Karin –

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BOR (correct?). Let me know if anyone else should be included.

Thanks –

-Kathy

Kathleen Martyn Goforth, Manager

Environmental Review Section (ENF-4-2)

U.S. Environmental Protection Agency, Region 9

75 Hawthorne Street

San Francisco, CA 94105

415-972-3521

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

OCT 30 2015

OFFICE OF THE
REGIONAL ADMINISTRATOR

David Murillo, Regional Director
Bureau of Reclamation, Mid-Pacific Region
2800 Cottage Way, MP-700
Sacramento, CA 95825

Subject: Supplemental Draft Environmental Impact Statement
Bay Delta Conservation Plan/California WaterFix CEQ# 20150196

Dear Mr. Murillo:

The U.S. Environmental Protection Agency has reviewed the Bay Delta Conservation Plan (BDCP)/California WaterFix Supplemental Draft EIS pursuant to the National Environmental Policy Act, Council on Environmental Quality regulations (40 CFR Parts 1500-1508), and our NEPA review responsibilities under Section 309 of the Clean Air Act. The San Francisco Bay/Sacramento-San Joaquin Delta is an important estuarine system, supporting over 750 species and supplying drinking water to 25 million people and irrigation water to 4 million acres of farmland.

Background

The WaterFix project evolved from the BDCP, which was proposed as a Habitat Conservation Plan (HCP) to support the issuance of a 50-year incidental take permit under Section 10 of the Endangered Species Act (ESA). A joint federal and state Draft Environmental Impact Statement/Draft Environmental Impact Report (DEIS/DEIR) for the BDCP was released on December 13, 2013, with the U.S. Fish and Wildlife Service (FWS), National Marine Fisheries Service (NMFS), and Bureau of Reclamation (Reclamation) as joint federal lead agencies for the DEIS, and the California Department of Water Resources (DWR) as the State lead agency for the DEIR. The BDCP included a major habitat restoration program, targeting over 150,000 acres, as well as a proposed new conveyance facility (tunnels) to transport water from the Sacramento River to existing pumps in the South Delta.

In August 2014, the federal and State lead agencies committed to supplement/recirculate the DEIS/DEIR in response to public comments received on that document, including those submitted by EPA on August 26, 2014. In a collaborative effort to resolve the issues that we had raised, EPA met frequently with DWR and the original federal lead agencies for several months after submitting our comments on the DEIS, and we appreciate the attention given to the analysis of the proposed project's impacts on specific water quality parameters.

In April 2015, Reclamation and DWR announced fundamental changes to the proposed project and changed its name from BDCP to the California WaterFix. The WaterFix project focuses on the construction and operation of proposed new water export intakes on the Sacramento River to divert water into a proposed 40 mile twin tunnel conveyance facility. Reclamation is now the sole lead federal agency. The proposed federal action has changed from implementing a Habitat Conservation Plan under

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Section 10 of the ESA to modifying operations of the federal Central Valley Project (CVP) in order to accommodate new water conveyance infrastructure.

Project Benefits

The proposed project and alternatives would provide greater water supply reliability for the users of exported Delta water and would reduce certain adverse impacts of the CVP and State Water Project (SWP) on fish. The SDEIS shows that transporting water in tunnels would reduce the risks to CVP/SWP exports in several ways. The proposed tunnel project would provide greater protection against sudden degradation of exported freshwater caused by the catastrophic failure of the earthen levees in the Delta and the consequent intrusion of saltwater that could foul supplies of water for municipal, agricultural and industrial consumption. Given the potential for earthquakes and floods in the region and the numerous earthen levees encircling the Delta islands, water supply security is a significant concern. Transporting water via tunnels would substantially address longer term threats to export water quality caused by sea level rise, with its concomitant salt water intrusion. The proposed project would also enhance CVP/SWP project flexibility by adding a northern diversion point. The current system, which relies solely on the southerly intakes, provides limited operational flexibility and at times results in reverse flows in Old and Middle Rivers which are associated with decreased survival of endangered fishes. Added flexibility would enable better real-time management of the export operations in response to observed movement of special status fish populations. Furthermore, the SDEIS predicts that flexible use of the proposed new intake facilities, combined with the establishment of biological criteria for operation, the installation of state-of-the-art fish screens, and the reduction of reverse flows in Old and Middle Rivers, would reduce the entrapment of certain fish species into poor habitats and the entrainment of fish into the CVP/SWP system. By making these physical and operational changes in the Delta, the proposed project would address some of the many identified stressors to aquatic resources in the Delta. In addition, although not part of the WaterFix project, the State of California has launched a separate EcoRestore initiative to pursue the restoration and stewardship of 30,000 acres of floodplains, riparian forests, and wetlands within the Delta over the next four years. As this significant conservation effort was not part of the SDEIS, it was not reviewed or rated as part of our NEPA review.

Project Purpose and Need

As stated in the SDEIS, the purpose and need for the WaterFix project, as was the case for the BDCP, is to advance the co-equal goals set forth in the Delta Reform Act of 2009. Those are (1) to provide a more reliable water supply for California, and (2) to protect, restore, and enhance the Delta ecosystem. EPA recognizes the crucial public health, economic, and ecological importance of both goals. The proposed project and the alternatives evaluated in the SDEIS support the water reliability component, but largely defer actions necessary to protect water quality and aquatic life to the future.

As has been discussed throughout the development of this project, the most essential decision for achieving the desired balance between water reliability and restoration of the Bay Delta ecosystem is how freshwater flows through the Delta will be managed. This key decision is not described in the SDEIS and is, instead, deferred to future regulatory processes administered by the State of California in consultation with federal resource and regulatory agencies. The decision by the State of California and Reclamation to defer these decisions means that the impacts of the WaterFix project on the Delta ecosystem cannot be fully evaluated at this time, and that any attempt to describe the environmental impacts of the project is necessarily incomplete. Once those decisions, described below, are concluded, the evaluation of possible impacts and consideration of alternatives can be completed.

Aquatic Habitat and Water Quality
As noted above, the project has been significantly revised since the initial DEIS, yet the SDEIS relies on modeling results that are based on the BDCP alternatives. Information in the SDEIS indicates that the modeling completed for the BDCP alternatives is not necessarily representative of the environmental effects resulting from the WaterFix alternatives. NMFS and FWS concluded in 2008 and 2009, respectively, that continued operation of the CVP/SWP would jeopardize the existence of delta smelt, winter-run Chinook salmon, green sturgeon and several other fish species. Even with the predictive limitations of the modeling, the SDEIS predicts a loss of valuable aquatic habitat for many fish species in the Delta and upstream tributaries due to the combined effects of the WaterFix project, CVP/SWP exports, climate change, and increased water diversions upstream of the Delta in the Sacramento River Basin. These species have experienced sharp population declines in the last decade and showed record low abundance over the last five years. Information presented in the SDEIS shows that the WaterFix project could reduce habitat conditions for delta smelt, winter-run Chinook salmon, green and white sturgeon, striped bass, and American shad, and result in a decline of longfin smelt abundance. For example, according to the SDEIS, winter-run Chinook salmon and sturgeon may be negatively impacted when migrating past new intakes, because significant volumes of freshwater flows are diverted at the intakes resulting in less water that is also of lower quality downstream of the intakes. The SDEIS also predicts that selenium concentrations in sturgeon would increase by 12-19% as a result of the proposed project, and would exceed the FWS and NMFS benchmark for adverse impacts to sensitive species.

The modeling results presented in the SDEIS show predicted exceedances of a salinity standard at both Prisoner's Point and Emmaton. The water quality modeling predicts that the Western Delta and Suisun Marsh will become saltier over time, which is likely to cause increased exceedances of chloride criteria near municipal water supply intakes. Mitigation actions are identified in the SDEIS to prevent exceedances, and the compliance history shows that salinity standards have rarely been exceeded in non-drought years. Nevertheless, if the proposed project operations contribute to a general increase in salinity in the Delta, the flexibility that Reclamation and DWR have to operate the system to ensure that water quality criteria are met will be seriously diminished, and the two agencies will have little room for error in operating the system to protect beneficial uses and achieve the co-equal goals.

While the impacts stated above may be mitigated by appropriately timed increased flows and habitat restoration, the WaterFix project does not propose additional flows in the Delta, nor does it propose significant habitat restoration (See EcoRestore above). CVP/SWP operation scenarios that propose additional outflow, such as BDCP Alternatives 7 and 8 from the DEIS, could provide substantially more water for resident and migratory fish and provide benefits to aquatic life; however, these were not evaluated as alternatives in the SDEIS.

Pending Regulatory Actions
Several pending regulatory actions are important to understanding the full impacts of the project. First, the State Water Resources Control Board (State Water Board) will be acting on Reclamation's and DWR's recent request to add points of freshwater diversion from the South Delta to the Sacramento River in the North Delta (at the northern end of the new conveyance facility). This State regulatory action is likely to include terms and conditions, including flow requirements, that could modify proposed WaterFix operations sufficiently to produce environmental and water supply effects that have not been analyzed in the SDEIS. Additionally, the State Water Board is in the midst of comprehensively updating water quality standards through the Bay Delta Water Quality Control Plan (Bay Delta WQCP). The updated standards could result in freshwater flow management provisions and corresponding changes to water supply diversions throughout the watershed that have not been analyzed

in the SDEIS. The Delta is listed as impaired for several water quality parameters under Section 303(d) of the CWA. EPA is working closely with the State Water Board to ensure that the revised standards are sufficient to address impaired water quality conditions in the Delta and reverse the declines in the fish species. The updated standards could result in altered environmental and water supply impacts that have not been analyzed in the SDEIS.

Second, ESA Section 7 consultation with FWS and NMFS regarding the construction and operation of new conveyance facilities is underway. We understand that the FWS and NMFS are not relying solely on the SDEIS for the Section 7 consultation process and that additional information is being generated to identify criteria for operating the new WaterFix facilities, to be included in the Biological Opinions and Incidental Take Permits. This information and such operating criteria could result in environmental impacts that have not been analyzed in the SDEIS.

Third, construction of WaterFix's new water intake and conveyance infrastructure would require authorization under Clean Water Act Section 404, as well as a Rivers and Harbors Act Section 14 modification of levees permit, from the U.S. Army Corps of Engineers. Water quality and aquatic life analyses in the SDEIS show that the proposed project may cause or contribute to violations of state water quality standards and significant degradation of waters of the U.S.; therefore, additional avoidance and minimization of environmental impacts and/or compensatory mitigation may be necessary in order to comply with CWA Section 404. It is also likely that additional information and analysis not included in the SDEIS will be required to support those permit decisions and that information and analysis will better inform the overall evaluation.

All of the above listed regulatory processes will develop new data and likely new compliance requirements beyond those provided in the SDEIS. EPA understands that these as yet incomplete regulatory requirements will be addressed through the pending actions by the State Water Resources Control Board, FWS, NMFS, and Corps of Engineers. These key decisions, and the analysis that will support them, are not yet done. Our statutory responsibility is to review the NEPA document that is in front of us at this time, however, the reality is that these future regulatory processes will have an important bearing on the project. Because these subsequent regulatory processes are likely to generate real world operational scenarios that are significantly different from the operations proposed in the SDEIS, the information is not yet available to reach definitive conclusions concerning the environmental impacts of the proposed project.

The tunnels that are discussed in detail in this draft NEPA document are an important improvement for water reliability, but the choices that will affect the operation of the tunnels, and thus the overall impacts of the project, will not be made until future regulatory actions are completed. These future decisions will supply the missing pieces necessary to determine the environmental impact of the entire project. The unusual circumstances of this project mean that the information is not yet available for a complete evaluation of environmental impacts – and for that reason a rating of *"3"(Inadequate)* for the SDEIS is required – but EPA expects that the project will continue to move forward, with those necessary additional pieces to be supplied as the later regulatory processes proceed. Under the unique circumstances of this case, the additional data, analysis and public input associated with these future regulatory processes are expected to provide the needed supplemental information to allow a full review of the environmental impacts without requiring another draft supplemental EIS. EPA will have the opportunity to support Reclamation, other federal agencies, and the State of California as they collectively continue to define an environmentally sound and effective project that would operate in a manner that simultaneously supports water supply reliability and enhances the Delta's ecosystem. EPA

believes that the upcoming actions by USFWS, NMFS, the State Water Board, and the Corps of Engineers will be critical next steps in the design and review of the project, and EPA looks forward to continuing to work with these agencies as the project moves forward.

If you have any questions, please contact me at 415-947-8702. Alternatively, your office may contact Kathleen Johnson, Enforcement Division Director. Ms. Johnson can be reached at 415-972-3873.

Sincerely,

Jared Blumenfeld

To: Peck, Gregory[Peck.Gregory@epa.gov]; Gilinsky, Ellen[Gilinsky.Ellen@epa.gov]
Cc: Bethel, Heidi[Bethel.Heidi@epa.gov]
From: Beauvais, Joel
Sent: Mon 11/16/2015 2:39:15 AM
Subject: Bay Delta

This is from Jared's weekly update. If I'm understanding correctly, I think this is actually two separate items - one on the triennial WQS review and a separate one on Bay Delta twin tunnels re 404. Let's discuss tomorrow am.

SF Bay Delta: we received a 60-day notice from various environmental NGOs regarding triennial review of California's water quality standards for the San Francisco Bay Delta, also asserting that Gov. Brown's 2014 Emergency Drought Proclamation was a modification of SF Bay Delta standards subject to EPA review and action. To preserve the option of higher-level review, this past week I sent a letter to the Army Corps identifying the proposed Bay Delta twin-tunnel project as a candidate for Corps and EPA HQ review. The CWA discharges associated with building the project could eliminate about 775 acres of wetlands in the Sacramento-San Joaquin Delta, and further degrade water quality and the aquatic ecosystem.

To: Penman, Crystal[Penman.Crystal@epa.gov]
Cc: Peck, Gregory[Peck.Gregory@epa.gov]; Gorke, Roger[Gorke.Roger@epa.gov]
From: Karen, Catherine
Sent: Fri 6/6/2014 8:43:11 PM
Subject: Meeting Request with Ken Kopocis with Westlands Water District

Hi Crystal,

I left a message on your voice mail as well. And my apologies to you in advance as we just today find out our client, Tom Birmingham, would be in town next week, instead of the week of June 23rd.

I am writing because I would like to request a meeting with Ken Kopocis and Tom Birmingham, who is the head and General Manager of the Westlands Water District. Tom met with Nancy Stoner and Ellen Gilinsky in the past but has not had an opportunity to meet with Ken. Westlands (WWD) is the nation's largest single agricultural water district, encompassing more than 600,000 acres of farmland in western Fresno and Kings counties or approximately 600 family owned farms. WWD supplies water to serve farmers who produce more than 60 high quality commercial food and fiber crops sold for the fresh, dry, canned and frozen food markets, both domestic and export, that generate more than $3 billion annually in agricultural-related activity.

The purpose of the meeting is introductory and also to discuss the most recent developments to the Bay Delta Conservation Plan and other water related issues of concern to Westlands.

Tom is in town next week and we would welcome a 30-45 minute meeting on Tuesday afternoon or anytime on Thursday, if possible.

Thank you in advance for your consideration.

Catherine Karen

CATHERINE KAREN
Counsel

Sidley Austin LLP
1501 K Street, N.W.
Washington, DC 20005
+1.202.736.8368
ckaren@sidley.com
www.sidley.com

SIDLEY AUSTIN LLP

IRS Circular 230 Disclosure: To comply with certain U.S. Treasury regulations, we inform you that, unless expressly stated otherwise, any U.S. federal tax advice contained in this communication, including attachments, was not intended or written to be used, and cannot be used, by any taxpayer for the purpose of avoiding any penalties that may be imposed on such taxpayer by the Internal Revenue Service. In addition, if any such tax advice is used or referred to by other parties in promoting, marketing or recommending any partnership or other entity, investment plan or arrangement, then (i) the advice should be construed as written in connection with the promotion or marketing by others of the transaction(s) or matter(s) addressed in this communication and (ii) the taxpayer should seek advice based on the taxpayer's particular circumstances from an independent tax advisor.
****
This e-mail is sent by a law firm and may contain information that is privileged or confidential. If you are not the intended recipient, please delete the e-mail and any attachments and notify us immediately.

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California's Drought Emergency of 2014

Talking Points

- EPA is working with other Federal agencies to help California and other impacted States prepare for and lessen the impact of the drought and develop and implement long-term strategies for conserving and managing water resources.
- EPA is identifying tools and incentives that can address drought-related needs, both to address short-term urgent needs while advancing permanent changes in the way water is managed in California. Some of these tools include EPA's WaterSense program, the Federal Green Challenge, EPA's Climate Change Adaptation Strategy, and the State Revolving Funds.
- At the same time, the EPA is an active participant in the National Drought Resilience Partnership, helping to coordinate federal efforts across the country and working with State and local governments and other partners to improve community preparedness and resilience to drought. The Partnership is playing a critical role in helping to respond to the California drought by helping to connect communities to the Federal assistance they need.

Current Status

- Agencies, water districts, and communities are responding in a variety of ways to the State of Emergency declared by Governor Brown.
- For years, EPA has been working on substantive measures to promote water conservation and recycling. The continuing drought has galvanized new interest in the conservation and recycling of surface water, groundwater, and wastewater; and EPA has an opportunity to scale-up and support efforts that have already proved effective.

Overview

- The 2013-2014 rainfall year is the driest year in recorded history, and, according to tree ring data, the driest year since 1580. Droughts are part of the natural climatological cycle in California. Data collected during the last two decades indicate that temperatures are increasing while precipitation levels are decreasing. The water content of the statewide snowpack measured January 30 by the California Department of Water Resources is just 12% of average.
- The State is in an extraordinarily weak position in this current drought, suffering from collapsing fisheries, depleted or polluted aquifers, and virtually no resiliency in the key water consumption sectors (agriculture, municipal, and industrial). Seventeen small communities are at risk of running completely out of water within 100 days, in addition to some of the smaller, poorer tribes in California, and irrigation deliveries to the San Joaquin Valley from the federal and State water projects are currently set at zero.
- The atmospheric ridge of high pressure that is pushing storms northward has also created inversion layers and led to high PM2.5 concentrations and seriously unhealthy air throughout California. Since November, a number of regions exceeded the PM2.5 NAAQS. The loss of hydropower from streams that flow out of the Cascade and Sierra Nevada ranges mean the State will need to switch to burning fossil fuels to satisfy energy demand during the dry season.
- In Congress, Members from the Bay Delta Region are seeking to advance conservation, recycling, and water storage efforts, while Representatives from the Central Valley wish to rescind water quality standards for the Bay Delta and the San Joaquin River Restoration Program. Senator Feinstein introduced a bill directing the Administrator to work with California State Water Resources Control Board to prioritize drought relief and water conservation/efficiency spending under the State Revolving Funds.
- Consistent with the President's Climate Action Plan, the National Drought Resilience Partnership (NDRP) is helping coordinate the federal response, while working closely with the State of California,

local government, agriculture and other partners. The NDRP is enhancing existing efforts among stakeholders to build resilience in areas currently experiencing drought.

To: Klasen, Matthew[Klasen.Matthew@epa.gov]
Cc: Gorke, Roger[Gorke.Roger@epa.gov]; Spraul, Greg[Spraul.Greg@epa.gov]; Maier, Brent[Maier.Brent@epa.gov]; Peck, Gregory[Peck.Gregory@epa.gov]
From: Davis, CatherineM
Sent: Wed 3/5/2014 4:08:28 PM
Subject: CA Drought Paper for Administrator's Policy Book for Budget Hearings
CA Drought.docx

Hi Matt,

Attached is the draft paper on the CA drought emergency for the Administrator's policy book. This should look pretty familiar to folks. It's based on briefing papers from Region 9; I just changed the formatting and rearranged a few things. Can you send me OW's edits by noon on Monday? I'm copying Brent Maier to keep R9 in the loop. Please let me know if you have any questions or need any additional information.

Regards,

Cathy Davis

Office of Congressional and

Intergovernmental Relations

202-564-2703

davis.catherinem@epa.gov

Send mail to:

US Environmental Protection Agency

1200 Pennsylvania Ave, NW

MC: 1305A

Washington, DC 20460

California's Drought Emergency of 2014

Talking Points

- EPA is working with other Federal agencies to help California and other impacted States prepare for and lessen the impact of the drought and develop and implement long-term strategies for conserving and managing water resources.
- For years, EPA has been working on substantive measures to promote water conservation and recycling. The continuing drought has galvanized new interest in the conservation and recycling of surface water, groundwater, and wastewater; and EPA has an opportunity to scale-up and support efforts that have already proved effective.
- EPA is identifying tools and incentives that can address drought-related needs, both to address short-term urgent needs while advancing permanent changes in the way water is managed in CA, these include EPA's WaterSense program, the Federal Green Challenge, EPA's Climate Change Adaptation Strategy, and the State Revolving Funds.

Current Status

Agencies, water districts, and communities are responding in a variety of ways to the State of Emergency declared by Governor Brown.

Overview

The 2013-2014 rainfall year is the driest year in recorded history, and, according to tree ring data (dendrochronology), the driest year since 1580. Droughts are part of the natural climatological cycle in CA. Data collected during the last two decades indicate that temperatures are increasing while precipitation levels are decreasing. The water content of the statewide snowpack measured JAN 30th by DWR is just 12% of average for this time of year. The State is in an extraordinarily weak position in this current drought, e.g., collapsing fisheries, depleted/polluted aquifers, and virtually no resiliency in the key water consumption sectors (i.e., agriculture, municipal, and industrial). Seventeen small communities are at risk of running completely out of water within 100 days, in addition to some of the smaller, poorer tribes in CA, and irrigation deliveries to the San Joaquin Valley from the federal and State water projects are currently set at zero.

The atmospheric ridge of high pressure that is pushing storms northward has also created inversion layers and led to high PM2.5 concentrations and seriously unhealthy air throughout California. Since Nov. 1, a number of regions were above the PM2.5 NAAQS. The loss of hydropower from streams that flow out of the Cascade and Sierra Nevada ranges mean the State will need to switch to burning fossil fuels to satisfy energy demand during the dry season.

In Congress, Representatives from the Bay Delta Region are seeking to advance conservation, recycling, and water storage efforts, while Representatives from the Central Valley wish to rescind water quality standards for the Bay Delta and the San Joaquin River Restoration Program. Senator Feinstein introduced a bill directing the Administrator to work with California State Water Resources Control Board to prioritize drought relief and water conservation/efficiency spending under the State Revolving Funds.

Consistent with the President's Climate Action Plan, the National Drought Resilience

Partnership (NDRP) is helping coordinate the federal response, while working closely with the State of California, local government, agriculture and other partners. The NDRP is enhancing existing efforts among stakeholders to build resilience in areas currently experiencing drought.

To: Peck, Gregory[Peck.Gregory@epa.gov]
From: Rader, Cliff
Sent: Thur 6/6/2013 1:41:19 PM
Subject: FW: BDCP: Major Concerns re: ADEIS
BDCP Top 10 for HQ 06 07 13 v2.docx

From: Goforth, Kathleen
Sent: Wednesday, June 05, 2013 6:26 PM
To: Rader, Cliff
Subject: BDCP: Major Concerns re: ADEIS

Cliff –

Pursuant to our discussion this morning, here's the summary of our major concerns at this point regarding the second ADEIS for the BDCP. Our "top ten" concerns are due to Reclamation by July 2nd. Our Water Division is sending this to Roger Gorke for his use in briefing Ken Kaposis tomorrow morning. I may try to call in from home.

-Kathy

Kathleen Martyn Goforth, Manager

Environmental Review Office (CED-2)

U.S. EPA, Region IX

75 Hawthorne Street

San Francisco, CA 94105

415-972-3521

To: Peck, Gregory[Peck.Gregory@epa.gov]
From: Rader, Cliff
Sent: Thur 6/6/2013 1:40:38 PM
Subject: FW: CEQ's involvement in Bay Delta Conservation Plan
Memo from Sutley re BDCP Environmental Review 05 24 13.pdf

From: Goforth, Kathleen
Sent: Tuesday, June 04, 2013 3:40 PM
To: Rader, Cliff
Cc: Hessert, Aimee
Subject: CEQ's involvement in Bay Delta Conservation Plan

Cliff –

We recently learned that CEQ is convening periodic meetings of senior agency officials to discuss the BDCP. The attached memo from Nancy Sutley came to me through a rather roundabout email chain late last week. Is OFA plugged into this? So far, it appears that the only connection between CEQ and the Region has been through Roger Gorke, a senior policy advisor in OW, who has provided some downloads to our Water Division and Regional Counsel. I learned yesterday that Roger had, via phone, asked our attorney for a summary of the Region's top issues with the BDCP ADEIS (which we are currently reviewing) in order to prep Perciasepe for a meeting at CEQ this Thursday. The attorney then passed the request on to me. Hardly the most efficient communication system for such a high profile NEPA/309 review. Let's discuss tomorrow during our bi-weekly call.

-Kathy

Kathleen Martyn Goforth, Manager

Environmental Review Office (CED-2)

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THE WHITE HOUSE

WASHINGTON

May 24, 2013

MEMORANDUM FOR THE SECRETARY OF THE INTERIOR, SECRETARY OF AGRICULTURE, ACTING SECRETARY OF COMMERCE, ACTING ADMINISTRATOR OF THE ENVIRONMENTAL PROTECTION AGENCY, AND ASSISTANT SECRETARY OF THE ARMY (CIVIL WORKS)

FROM: Nancy H. Sutley, Chair
Council on Environmental Quality

SUBJECT: California Bay-Delta Conservation Plan Federal Review

The purpose of this memorandum is to reaffirm the importance of the Bay Delta Conservation Plan (BDCP) as an Administration priority and to request your continued attention to prioritizing federal support for its development. Since 2009, your agencies have been involved to various degrees in working closely with California to develop the BDCP, which has the co-equal goals of improving California's water supply reliability and restoring the Bay-Delta ecosystem. Thank you for your engagement on this important effort. As we enter the next phase of its development, your continued attention to the issue is critical.

The San Francisco Bay/Sacramento-San Joaquin Delta (Bay-Delta) region of California is an ecosystem of national significance. It is also the hub of the nation's largest water delivery system – infrastructure that is the foundation for economic activity in the agricultural, industrial, and recreational sectors of the economy, as well as providing drinking water to a population of over 25 million Californians. At present, the Bay-Delta is in crisis. After decades of steep and increasingly rapid decline, the ecosystem is reaching a point of collapse, with highly imperiled fish species and threats from climate change, seismic risks, and other stressors underscoring the system's vulnerability. Further complicating the situation is the serious nature of an ongoing drought this year, with the January through April time period being the driest on record. There is a scientific and political consensus that failure to take action to address these problems and continuing the deteriorating status quo of the Bay-Delta is not viable, and can only lead to economic and environmental detriment for both California and the nation.

The State of California is the primary architect of the BDCP, which includes conservation measures for new water supply conveyance infrastructure and operational criteria, extensive habitat restoration, reducing pollutants, predation and invasive species and extensive adaptive management and monitoring and research programs. We recognize that the overall success of the BDCP depends largely on actions and commitments by the State of California and other entities within the state. As the State's proposal has taken shape, the primary Federal role has been to provide technical support intended to ensure that the Plan meets legal requirements under the National Environmental Policy Act (NEPA) and the Endangered Species Act (ESA).

Last July, Governor Brown and Secretary Salazar announced a number of major revisions to the BDCP intended to address issues associated with previous versions of the Plan, and underscored the joint state-federal commitment to address scientific uncertainties through a rigorous science program that focuses on monitoring and adaptive management.

At this point in time, the State is finalizing the draft of its Plan, as well as an administrative draft of the joint Environmental Impact Statement/Environmental Impact Report (EIS/EIR), which includes a full range of alternative proposals. The Bureau of Reclamation, U.S. Fish & Wildlife Service, and National Marine Fisheries Service are the federal lead agencies for the EIS/EIR, working with the State co-leads: the California Department of Water Resources (DWR) and California Department of Fish & Wildlife. The U.S. Army Corps of Engineers and Environmental Protection Agency are cooperating agencies under NEPA.

Given the ongoing decline of the Bay-Delta ecosystem and the associated impacts to reliable water supplies, completing the BDCP in a timely fashion is an increasingly urgent matter. Most immediate is the need to complete work and publish the draft EIS/EIR by October 1, 2013 for public review and comment. The complexity of this matter and the involvement of a large number of agencies will necessitate high-level agency awareness and commitment. It also requires ongoing coordination in order to meet this time frame. Finally, it requires attention to other management measures to support the BDCP goals, including actions to increase demand management and water use efficiencies, water supplies and storage, and mechanisms to move water supplies from place to place during times of shortage.

The Council on Environmental Quality asks the following:

1. Continue to prioritize this effort so that the Draft EIS/EIR can be completed for public release by October 1, 2013.

2. Coordinate with all Federal agencies involved in this effort. The Council on Environmental Quality and White House Office of Intergovernmental Affairs will periodically convene senior agency officials to monitor progress.

3. Continue efforts to develop or review the other management measures.

Thank you for the efforts of your respective agencies to date. Overall, we have made tremendous progress to this point as a result of the committed work of your staff. Nonetheless, this is a multi-year effort and we must plan accordingly to bring it to fruition.
Please let us know if you have any questions regarding this request.

From: Gorke, Roger
Location: Ken's Office 3219 (?) WJC East
Importance: Normal
Subject: Fw: CA Water and BDCP Administrator Briefing Prep
Start Date/Time: Thur 2/6/2014 3:00:00 PM
End Date/Time: Thur 2/6/2014 3:30:00 PM
BDCP Briefing paper Feb 4 2014.docx

Can you cover this by any chance???? Thanks

Please forward to the appropriate staff if you cannot attend. Attached is a briefing paper that R9 developed. It should serve as the starting point for the BDCP discussion.

From: Gorke, Roger
Sent: Wednesday, February 05, 2014 8:30:53 PM
To: Gorke, Roger; Kopocis, Ken; Bromm, Susan; Rader, Cliff; Magruder, DeMara; Penman, Crystal; Southerland, Elizabeth; Best-Wong, Benita; Evans, David
Subject: CA Water and BDCP Administrator Briefing Prep
When: Thursday, February 06, 2014 10:00 AM-10:30 AM.
Where: Ken's Office 3219 (?) WJC East

Please forward to the appropriate staff if you cannot attend. Attached is a briefing paper that R9 developed. It should serve as the starting point for the BDCP discussion.

From: Rader, Cliff
Location: 3216 WJC-South
Importance: Normal
Subject: Fw: NEPA Background Briefing for Gwendolyn Keyes-Fleming/Matt Fritz/Lisa Feldt/Arvin Ganesan w/OECA Cynthia Giles/Steve Chester/Susan Bromm/Cliff Rader
Start Date/Time: Mon 11/4/2013 3:00:00 PM
End Date/Time: Mon 11/4/2013 3:30:00 PM
NEPA Overview Briefing_10-31-13.pptx

When: Nov 4, 2013 10:00 AM-10:30 AM (GMT-05:00) Eastern Time (US & Canada)
Where: 3216 WJC-South

From: Giles-AA, Cynthia
Sent: Tuesday, October 22, 2013 12:16:04 PM
To: Giles-AA, Cynthia; KeyesFleming, Gwen; Ganesan, Arvin; Fritz, Matthew; Bromm, Susan; Rader, Cliff; Feldt, Lisa; Rupp, Mark
Cc: Hessert, Aimee
Subject: NEPA Background Briefing for Gwendolyn Keyes-Fleming/Matt Fritz/Lisa Feldt/Arvin Ganesan w/OECA Cynthia Giles/Steve Chester/Susan Bromm/Cliff Rader
When: Monday, November 04, 2013 10:00 AM-10:30 AM.
Where: 3216 WJC-South

From: Huffman, Linda
Location: 3216 WJC-South
Importance: Normal
Subject: NEPA Background Briefing for Gwendolyn Keyes-Fleming/Matt Fritz/Lisa Feldt/Arvin Ganesan w/OECA Cynthia Giles/Steve Chester/Susan Bromm/Cliff Rader
Start Date/Time: Mon 11/4/2013 3:00:00 PM
End Date/Time: Mon 11/4/2013 3:30:00 PM
NEPA Overview Briefing_10-31-13.pptx

From: Rader, Cliff
Location: 3216 WJC-South
Importance: Normal
Subject: Fw: NEPA Background Briefing for Gwendolyn Keyes-Fleming/Matt Fritz/Lisa Feldt/Arvin Ganesan w/OECA Cynthia Giles/Steve Chester/Susan Bromm/Cliff Rader
Start Date/Time: Mon 11/4/2013 3:00:00 PM
End Date/Time: Mon 11/4/2013 4:00:00 PM
NEPA Overview Briefing_10-31-13.pptx

When: Nov 4, 2013 10:00 AM-11:00 AM (GMT-05:00) Eastern Time (US & Canada)
Where: 3216 WJC-South

From: Giles-AA, Cynthia
Sent: Tuesday, October 22, 2013 12:16:04 PM
To: Giles-AA, Cynthia; KeyesFleming, Gwen; Ganesan, Arvin; Fritz, Matthew; Bromm, Susan; Rader, Cliff; Feldt, Lisa; Rupp, Mark
Subject: NEPA Background Briefing for Gwendolyn Keyes-Fleming/Matt Fritz/Lisa Feldt/Arvin Ganesan w/OECA Cynthia Giles/Steve Chester/Susan Bromm/Cliff Rader
When: Monday, November 04, 2013 10:00 AM-11:00 AM.
Where: 3216 WJC-South

To: Rader, Cliff[Rader.Cliff@epa.gov]
From: Gorke, Roger
Sent: Mon 3/16/2015 3:43:38 PM
Subject: FW: Army Corps BDCP Comments Public

Not that you care anymore but….;)

Roger Gorke

Senior Policy Advisor

Office of Water

U.S. Environmental Protection Agency

PH: 202-564-0470

FAX: 202-564-0500

gorke.roger@epa.gov

From: Gorke, Roger
Sent: Monday, March 16, 2015 11:41 AM
To: Kopocis, Ken
Cc: Gilinsky, Ellen; Shapiro, Mike; Lousberg, Macara
Subject: Army Corps BDCP Comments Public

In case you might have missed this…some NGOs FOIA'd comments on the draft BDCP. Ours were already public, we posted them on the R9 website.

They also reference the SWRCB comments that are similar to ours.

Roger Gorke

Senior Policy Advisor

Office of Water

U.S. Environmental Protection Agency

PH: 202-564-0470

FAX: 202-564-0500

gorke.roger@epa.gov

From: Hagler, Tom
Sent: Monday, March 16, 2015 11:10 AM
To: Gorke, Roger
Subject: Just in Case you missed it

From: maier.brent@epa.gov by E&E Publishing [mailto:email_this@eenews.net]
Sent: Friday, March 13, 2015 3:00 PM
To: Vendlinski, Tim; Hagler, Tom; Maier, Brent
Subject: From Greenwire -- WATER POLICY: Army Corps joins federal chorus opposing massive Calif. replumbing plan

This Greenwire story was sent to you by: maier.brent@epa.gov

AN E&E PUBLISHING SERVICE

WATER POLICY:

Army Corps joins federal chorus opposing massive Calif. replumbing plan

Debra Kahn, E&E reporter

Published: Friday, March 13, 2015

The Army Corps of Engineers is among the federal agencies strongly criticizing California's massive plan to retool its main water delivery hub, according to comments obtained under a Public Records Act

request.

The Bay Delta Conservation Plan (BDCP), in the works for the last eight years, would re-engineer the Sacramento-San Joaquin River Delta so that water would be delivered to the state's arid central and southern regions primarily via two large tunnels underneath the delta, rather than routed through the delta to pumps at the southern end.

The Army Corps filed comments last July saying that a draft version of the plan did not include enough information to determine whether it would comply with the National Environmental Policy Act or the Clean Water Act's rules governing discharges into waters of the United States.

The draft environmental impact statement and report, required under state and federal law, "is not sufficient at this time in meeting the Corps' needs under the National Environmental Policy Act (NEPA) and 404 (b)(1) Guidelines," **wrote** Col. Michael Farrell, commander for the corps' Sacramento District.

He cited a host of deficiencies, including an incomplete description of the project, incomplete analysis of the effects on federal navigation and flood control projects, and a lack of specificity regarding the effects on waters of the United States and how to compensate for them.

The documents were released yesterday by Friends of the River and Restore the Delta. The groups have loudly opposed the plan on the grounds that it would take too much water from the delta and that the work of writing the plan has been done out of the public eye, despite open houses around the state and two public comment periods, the latest spanning 228 days.

"Since the BDCP agencies are not airing both sides of the issues -- in the traditional American way -- Friends of the River is now doing the government's job of informing, as opposed to propagandizing, the public," said Bob Wright, FOR's senior counsel.

The aim of the BDCP is to increase the reliability of water deliveries, which have dwindled due to protections for endangered and threatened fish that inhabit the delta and are pulled into the pumps. The 50-year plan would also include restoration of thousands of acres of delta habitat, all for an estimated cost of $24.75 billion in 2012 dollars.

A spokesman for the state Department of Water Resources, the main agency in charge of the BDCP, pointed to the upcoming release this spring of a revised version of the plan, which he said would take the comments into account. After the new version of the draft plan is released for public comment, the state is aiming to finish the final version of the plan this year, as well.

The recirculated draft plan "will show very clearly the impact of the public comments," Richard Stapler said in an email. "Once the documents are final, we will publish all comments received in both circulation periods. Comments from both periods are public records and can be requested at any time."

The federal agencies would have to sign off on the plan's compliance with the National Environmental Policy Act, Endangered Species Act, Clean Water Act, and Rivers and Harbors Act, among other laws. The Army Corps, which shares jurisdiction over Clean Water Act permitting with U.S. EPA, detailed more than 100 issues with the draft plan in its July comments, on top of more than 400 previous criticisms the corps had identified in an earlier draft.

Many of the corps' comments highlighted parts of the plan that it found too broad, such as the conclusion that two proposed dredging projects in the Sacramento River and San Francisco Bay did not require analysis under NEPA.

"These ship channels are significant hydrologic and economic features of the Delta, and intersect with the

BDCP in numerous ways, including overlapping project mitigation and BDCP restoration areas, overlapping dredged material disposal and BDCP restoration areas, cumulative changes to salinity in the Delta, and the potential for beneficial reuse of dredged material," staff wrote.

One comment faulted an estimate of 15,876 cubic yards of waste removal for being too specific, however.

"Respectfully express skepticism at the level of exactness here when the document gives all other dimensions in very broad ranges," agency staff wrote.

EPA had published its own **comments** critical of the plan last year, the day after California announced it would withdraw its draft plan and resubmit it in 2015 (***Greenwire***, Aug. 29, 2014). Other agencies' comments had not been made public until now.

The State Water Resources Board, which regulates water rights and water quality, also issued extensive **comments** citing the lack of consideration of how reservoirs will operate under climate change and undue optimism about the effectiveness of habitat restoration and other measures.

"Significant negative impacts tend to be discounted and positive results tend to be inflated in the EIR/EIS and the BDCP," environmental program manager Diane Riddle wrote. "The assumed effectiveness of various conservation measures, for example, appear to be overly optimistic, especially with regard to the effectiveness of habitat restoration, where it is assumed that habitat restoration will be 100 percent effective."

Democratic members of Congress from Northern California also sent a **letter** highly critical of the plan.

"[T]he fatal flaws that we and others have identified -- repeatedly -- remain uncorrected in the documents available for comment, which confirms that the plan is legally deficient under NEPA, CEQA [California Environmental Quality Act], and several other statutes, and represents the wrong direction for the people of California," wrote Reps. Jared Huffman, George Miller, Mike Thompson, Doris Matsui, John Garamendi, Barbara Lee, Jackie Speier and Jerry McNerney.

Click here for the public comments.

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To: Skophammer, Stephanie[SKOPHAMMER.STEPHANIE@EPA.GOV]; Johnson, Kathleen[Johnson.Kathleen@epa.gov]; Hanf, Lisa[Hanf.Lisa@epa.gov]; Vendlinski, Tim[vendlinski.tim@epa.gov]; Hagler, Tom[Hagler.Tom@epa.gov]; Foresman, Erin[Foresman.Erin@epa.gov]; Rader, Cliff[Rader.Cliff@epa.gov]
From: Goforth, Kathleen
Sent: Mon 9/8/2014 7:09:26 PM
Subject: Sacramento Bee editorial re: BDCP

Note the encouraging quotes from Will . . .

Editorial: Brown needs to answer EPA on Delta tunnels

By the Editorial Board

By the Editorial Board

Last modified: 2014-09-06T05:34:19Z

Published: Sunday, Sep. 7, 2014 - 12:00 am

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Some scientists and environmentalists have been contending that water quality would suffer, pollution would increase and aquatic life would be harmed if California goes forward with plans to build twin tunnels in the Delta. Now, the U.S. Environmental Protection Agencyhas strongly reinforced those concerns and called for changes in the multibillion-dollar plan.

Gov. Jerry Brown and other proponents of the twin tunnels need to answer the EPA directly and publicly, and either debunk the agency's claims, or significantly alter the proposal.

As currently envisioned, the 40-foot-wide, 30-mile-long tunnels would draw water from the Sacramento River and pipe it to the southern part of the Delta. In its review of the Bay Delta Conservation Plan, the EPA said the tunnels "would contribute to increased and persistent violations of water quality standards" under the Clean Water Act.

The federal agency, in a recently released letter, recommended that an alternative plan be developed that would allow for "greater freshwater flows through the Delta." That's an unwelcomed analysis for water agencies south of the Sacramento-San Joaquin Delta that rely on water exports and already have ponied up millions for environmental studies as a prelude to building the tunnels.

Stressing that more water should pass through the Delta – resulting in less water for exports to farms and cities to the south – brings into question whether the $25 billion plan will pencil out for agricultural districts and municipal water agencies that would pay for the project.

The letter to the National Marine Fisheries Service, and submitted to the California Department of Water Resources, enumerated a variety of problems and recommended alternatives. It questioned whether plans to restore Delta habitat would help fish populations recover, and called for more analysis of the impacts upstream from the Delta and downstream to the San Francisco Bay.

"This is not the first time and likely won't be the last time that there is close scrutiny of the project," Richard Stapler, a spokesman for the California Natural Resources Agency, said in an interview. "This is part of the critical process."

Will Stelle, West Coast administrator for the National Marine Fisheries Service, said the letter responding to a draft environmental impact statement "raises genuine issues about water quality, strategy and compliance."

He also was confident about satisfying the EPA's concerns. "We will deal with those issues," he said in an interview. "It may require adjustments in operating terms. … The biggest challenge for this project is getting the details right on operations."

The Bay Delta Conservation Plan calls for tunnels to export water more directly to Central Valley farms and Southern California cities. The goals would be to help restore the Delta's collapsing ecosystem and provide a more reliable supply of fresh water to 25 million Californians and 3 million acres of farmland.

The EPA letter says that while the tunnel diversions would "improve the water quality for agricultural and municipal water agencies that receive water exported from the Delta, water quality could worsen for farmers and municipalities who divert water directly from the Delta."

The letter, signed by EPA regional administrator Jared Blumenfeld, recommended changes in the project to deal with potential increases in concentrations of salinity, chloride, bromide, mercury, pesticides and selenium. Blumenfeld suggested alternatives, such as better "integrated water management, water conservation, levee maintenance and decreased reliance on the Delta."

The California Department of Water Resources has delayed final environmental studies until next year.

In his debate on Thursday with Republican challenger Neel Kashkari, Brown said the tunnel project wasn't fully cooked. That clearly is true.

When Kashkari cited the EPA criticism, and noted it came from President Barack Obama's administration, Brown shot back: "That doesn't make it right, by the way." To satisfy skeptics, Brown will need to provide a far more detailed analysis about the affect on the ecological health of the Delta.

Read more here: http://www.sacbee.com/2014/09/07/6682725/editorial-brown-needs-to-answer.html#storylink=cpy

Kathleen Martyn Goforth, Manager

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EPA Region 9 (ENF-4-2)

75 Hawthorne Street

San Francisco, CA 94105

415-972-3521

To: Rader, Cliff[Rader.Cliff@epa.gov]
From: Goforth, Kathleen
Sent: Fri 8/29/2014 6:19:00 PM
Subject: Press coverage of our BDCP comments

LA Times: EPA says proposed Delta water tunnel would harm environment

Central Valley Business Times: EPA blasts governor's tunnels scheme

The San Luis Obispo Tribune: EPA says California's Delta water tunnel project could violate federal laws

---

EPA says California's Delta water tunnel project could violate federal law

BY MATT WEISER, MWEISER@SACBEE.COM

August 28, 2014 | Updated 7 minutes ago

SHARE

A great blue heron perches on a bridge in the Sacramento San Joaquin Delta, where the state plans to build two huge water diversion tunnels, a project that might violate federal law, according to the EPA.

The pair of giant water diversion tunnels proposed in the Delta could violate the federal Clean Water Act and increase harm to endangered fish species, according to the U.S. Environmental Protection Agency, which released its formal comment on the project Thursday.

In a 43-page letter sent Tuesday to the National Marine Fisheries Service and released publicly on the EPA's website Thursday, the EPA said its research found that by diverting freshwater from three new intakes proposed on the Sacramento River – further upstream from existing intakes – the project is likely to increase concentrations of salinity, mercury, bromide, chloride, selenium and pesticides in the estuary.

The letter was submitted as part of the formal comment process for the Bay Delta Conservation Plan, a $25 billion proposal by the state of California to re-engineer water diversions in the

Sacramento-San Joaquin Delta.

The most controversial element of the plan is a massive pair of tunnels, 40 feet in diameter and 30 miles long, that would divert a portion of the Sacramento River's flow at three intakes proposed near Courtland, routing the water to existing diversion pumps near Tracy. The goal is to avoid reverse flows in the estuary caused by the current diversion pumps, which are one source of ecological trouble in the Delta. The new intakes also would have modern fish screens, whereas the current intakes near Tracy do not.

The California Department of Water Resources had announced Wednesday that environmental studies for the project would be delayed so that certain portions could be rewritten. Officials at the department have not yet revealed what portions need more work. They had hoped to finalize the plan by the end of this year, but the delay is likely to push that timeline to mid-2015.

Richard Stapler, a spokesman for the state Natural Resources Agency, which oversees DWR, said the delay was not triggered by the EPA letter alone.

"As for the specifics, we're not ready to comment on them point by point," said Stapler. "There are a number of adjustments and improvements we're working on. We're going to continue to work with the EPA on improving the project."

In the EPA letter, the agency's regional administrator, Jared Blumenfeld, wrote: "While (the project) would improve the water quality for agricultural and municipal water agencies that receive water exported from the Delta, water quality could worsen for farmers and municipalities who divert water directly from the Delta."

The agency also notes that the project failed to analyze environmental effects both upstream and downstream of the Delta, particularly on San Francisco Bay. And it warns that overall harm to several native fish species, including endangered Delta smelt and longfin smelt, could increase relative to existing conditions because juvenile fish could become trapped by the new Sacramento River intakes or because their aquatic habitat could shrink.

The Bay Delta Conservation Plan proposes to offset these effects by restoring 150,000 acres of habitat for fish and other species. But the EPA notes there is no evidence that much land is available to restore, nor that restoration would be effective.

"We are concerned over the sole reliance on habitat restoration for ecosystem recovery," the letter states. "We recommend that the (environmental impact studies) consider measures to ensure freshwater flow that can meet the needs of those populations and the ecosystem as a whole."

The Bay Delta Conservation Plan has been in the works for more than seven years. It aims to stabilize water diversions and repair ecological health in the estuary, a source of freshwater for 25 million Californians and 3 million acres of farmland.

Call The Bee's Matt Weiser at (916) 321-1264. Follow him on Twitter @matt_weiser.

Kathleen Martyn Goforth, Manager

Environmental Review Section

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415-972-3521

To: Rader, Cliff[Rader.Cliff@epa.gov]; Skophammer, Stephanie[SKOPHAMMER.STEPHANIE@EPA.GOV]; Hagler, Tom[Hagler.Tom@epa.gov]; Foresman, Erin[Foresman.Erin@epa.gov]; Vendlinski, Tim[vendlinski.tim@epa.gov]
From: Goforth, Kathleen
Sent: Fri 8/29/2014 12:33:18 AM
Subject: FW: Bay Delta Conservation Plan in the news

FYI. Coverage of the announcement to Supplement.

From: Keener, Bill
Sent: Wednesday, August 27, 2014 4:20 PM
To: Skadowski, Suzanne; Hanf, Lisa; Goforth, Kathleen; Johnson, Kathleen
Cc: Zito, Kelly
Subject: RE: Bay Delta Conservation Plan in the news

Thanks, Suzanne…

Bill Keener

Office of Public Affairs

U.S. EPA - Region 9

San Francisco, CA

Phone: (415) 972-3940

From: Skadowski, Suzanne
Sent: Wednesday, August 27, 2014 4:19 PM
To: Hanf, Lisa; Goforth, Kathleen; Johnson, Kathleen
Cc: Keener, Bill; Zito, Kelly
Subject: Bay Delta Conservation Plan in the news

This morning's Bay Delta Conservation Plan e-newsletter may not have been the press release we were expecting, but it is being covered by news media today:

State says more time needed to refine delta tunnel proposal (LA Times)

California officials delay massive Delta water tunnel project (Sacramento Bee)

Governor's Tunnel Scheme Hits a Snag (Central Valley Business Times)

To: will.stelle@noaa.gov[will.stelle@noaa.gov]
Cc: ren_lohoefener@fws.gov[ren_lohoefener@fws.gov]; dmurillo@usbr.gov[dmurillo@usbr.gov]; Ryan Wulff - NOAA Federal[ryan.wulff@noaa.gov]; Johnson, Kathleen[Johnson.Kathleen@epa.gov]; Hanf, Lisa[Hanf.Lisa@epa.gov]; Skophammer, Stephanie[SKOPHAMMER.STEPHANIE@EPA.GOV]
From: Goforth, Kathleen
Sent: Wed 8/27/2014 8:33:19 PM
Subject: BDCP DEIS: Corrections and Additional Editorial Recommendations

Will, Ryan –

Yesterday, I sent you EPA's major comments on the BDCP DEIS. During our review of the DEIS, we also identified a number of corrections that are needed, as well as some missing information that would improve the document's usefulness. These are listed below. In our role as a Cooperating Agency, we request that you also address the following in the Supplemental Draft EIS:

•□□□□□□□□ Potential funding sources shown on page 8-105 of the BDCP are not valid. The table in the BDCP shows EPA's 2011 budget being spent on conservation measures under the BDCP. The text states that "Funding for this program [California Bay-Delta Restoration appropriations] is assumed to continue and to support natural community restoration under BDCP" (p.8-106 of the BDCP). EPA has not committed any funding towards the construction and implementation of the BDCP and any future funds that are available for projects in the San Francisco Bay Delta are subject to EPA's future budget, legislative mandates, and agency discretion. Please remove the section of the BDCP that indicates that EPA funding is assumed to continue and support restoration components of the BDCP for 50 years.

•□□□□□□□□ There are errors in the Draft EIS describing multiple Clean Water Act programs including the CWA 404 Regulatory Program. In addition, the CWA Section 404 Program is described differently in different chapters. Please make the following corrections:

o Correct language on page 8-114 that states that CWA Section 404 is implemented "via the issuance of National Pollutant Discharge Elimination System permits." The NPDES program comes from Section 402 of the CWA. The words "NPDES" permits should be replaced with "Section 404 permits." The following sentence in the Draft EIS accurately states that the "USACE is authorized to issue Section 404 permits."

o Correct language on page 8-113 (lines 4-6) that states California "administers the

CWA through the Porter-Cologne Act." Section 303 of the CWA gives the states the authority to establish water quality standards, subject to EPA approval, and the NPDES Program is delegated to the State of California under CWA Section. California administers these CWA programs **and** the Porter-Cologne Act.

o The following sentence in the Draft EIS on page 8-114 is not correct and should be removed: "If a federal agency is a partner in the implementation of a project, the proposed action/project must be recognized as the LEDPA." A proposed action is not the LEDPA simply because a federal agency is a partner and chooses that proposed action as its preferred alternative. Federal agencies are required to comply with the 404(b)(1) Guidelines and their preferred alternative must meet the restrictions to discharge outlined at 40 CFR 230.10.

•□□□□□□□□ Table 3-3 (p.3-19) "Summary of Proposed BDCP Conservation Measures of All Action Alternatives" is the only complete Conservation Measure (CM) summary table provided in the entire Draft EIS. While it is helpful to the extent that it lists all of the CMs in one place, it is lacks key information such as acreage targets.

•□□□□□□□□ CM2 is not included in the list of Conservation components for Alternative 1A on p. 3-49. The Draft EIS states that CM2 is included in all of the Alternatives considered.

•□□□□□□□□ CM2 is not included in the description of CM3 Natural Communities Protection and Restoration (page 3-129).

•□□□□□□□□ Table 8-1 Designated Beneficial Uses for Water Bodies in the Study Area identified Estuarine Habitat as an "Additional Beneficial Use of the Delta" suggesting the Delta is the only group of water bodies with the Estuarine Habitat beneficial use. The San Francisco Bay and its component water bodies, including Suisun Bay and Marsh also have the Estuarine Habitat beneficial use and they are part of the BDCP "Plan Area."

•□□□□□□□□ The 2012 Pulse of the Delta was finalized in October 2012. Delete the word "draft" in reference to the *2012 Pulse of the Delta* on Page 8-48, line 39.

•□□□□□□□□ Figure 8-7 shows the compliance locations commonly discussed in Chapter 8 with so many labeled locations that the reader cannot see their location precisely.

•□□□□□□□□ It is very helpful to readers to provide citations when “available evidence” is referred to in the Draft EIS. For example, page 8-457, line 7, states “available evidence suggests that restorations activities establishing new tidal and non-tidal wetlands, new riparian and new seasonal floodplain habitat could potentially lead to new substantial sources of localize DOC loading within the Delta.”

•□□□□□□□□ Existing Conditions and No Action Alternative values are slightly different in Tables 11-1A-5 (p. 293) and 11-4-4 (page 1302). The tables rely on the same entrainment analysis at south Delta pumps, but one is for Alternative 1A and the other is for Alternative 4. The Existing Conditions and No Action Alternative numbers are very similar, but should be identical, and it is not clear why they are different. This occurs again for the North Bay Aqueduct Analysis (p. 11-295 Table 11-1A-7 v. page 11-4-6 page 11-1304).

•□□□□□□□□ The list of local habitat conservation plans and natural community conservation plans in the Delta includes plans that are adjacent to the Delta is missing the south Sacramento HCP (page 11-176).

•□□□□□□□□ Page 11-160: There is very little description of Section 10 and Section 7 of ESA. The Revised or Supplemental Draft EIS should include a description of basic regulatory requirements and targets that are applicable to the BDCP such as “contribute to recovery” for Section 10 and “avoid jeopardy” for Section 7.

•□□□□□□□□ Page 11-166: CWA Section 303(c) Water Quality Standards and protection of beneficial uses should be discussed in this section.

•□□□□□□□□ Page 11-175: The need for a change in point of diversion to D1641 should be discussed in this section.

•□□□□□□□□ Page 11-183: Table 11-3, please discuss options for soft stabilization along river banks near the intake structures.

•□□□□□□□□ Table ES-11 and its associated text describe changes in average Delta outflow, total exports, and south Delta pumping for the BDCP alternatives in the late long term (2060); however, the baseline for this comparison should be specified.

•□□□□□□□□ The change in total exports from the No Action Alternative to Alternative 1 is listed in Table ES-11 as 1,025 thousand acre feet however, subtracting the value of No Action Alternative total exports (4441 TAF) from that of Alternative 1 total exports (5459 TAF) yields a difference of 1018 TAF. Similar small potential errors are present in the rest of the Total Exports Change column.

•□□□□□□□□ The average Delta outflow and export values in Table ES-11 do not match average Delta outflow and export values in Table 5-4 Water Supply Summary Tables. Many of the values are very close to one another, but are not the same. The true values are important for determining compliance with Delta outflow water quality standards.

•□□□□□□□□ Selenium effects and thresholds vary between the EIS and the appendices (see p. 8-167 (table 8-55) and page 8M-9 (table 8M-3)).

•□□□□□□□□ Language used to describe Total Maximum Daily Loads in the Plan Area and Study area for Chapter 8 could be misinterpreted. Table 8-4 and the text in lines 13-15 on page 8-24 state that a number of TMDLs are “complete”, which could be read as suggesting that TMDL water quality targets have been achieved, which is not accurate for most TMDLs. Many of these TMDLs are *adopted* and water quality is improving as a result, but is not yet meeting the TMDL quantitative targets. Replace the word “complete” with “adopted” in reference to TMDLs in this section.

•□□□□□□□□ Table 22-5 should be updated to identify the annual PM2.5 NAAQS as 12 micrograms per meter cubed ($\mu g/m^3$).

•□□□□□□□□ Table 22-3 provides ambient air quality monitoring data, in terms of standards exceedances, for the relevant air basins from 2008 to 2010. This table should be updated to provide monitoring data from 2010 to 2012.

•□□□□□□□□ The data used to describe organophosphate pesticides on page 8-85, Tables 8-23 and 8-24 do not characterize existing conditions. More recent data show that diazinon is rarely detected in Delta waters in recent years and chlorpyrifos detections and exceedences have substantially declined. Update the pesticide discussion using more recent data. These data are available at http://www.ceden.org.

•□□□□□□□□ In Table 30-2, it is unclear how much of the environmental water is also used by agriculture and urban users. Separate tables by water year type would be more informative.

Thank you for your consideration of these recommendations. If you have any questions, please contact me.

-Kathy

Kathleen Martyn Goforth, Manager

Environmental Review Section

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Cc: Dunning, Connell[Dunning.Connell@epa.gov]
From: Goforth, Kathleen
Sent: Tue 8/26/2014 7:30:58 PM
Subject: FW: BDCP DEIS: EPA's comments
BDCP DEIS EPA Cover ltr and Detailed Comments.pdf

Attached is a copy of the final letter and Detailed Comments on the BDCP DEIS that we sent to NOAA, FWS, and BOR today. We understand that they intend to issue a press release later this week to announce their recent decision to prepare a Supplemental Draft EIS. **Please treat the attached as a "close hold"** and do not proactively share it with anyone until after that press release is issued.

Many thanks to all of you who have worked so diligently and with such dedication, focus, and integrity over the past year to help us prepare these very articulate comments. This was a humongous undertaking by a very small core group of people. We recognize that all of you have many other things on your plates (as do we!), and we greatly appreciate your expertise, institutional knowledge, creativity, and patience. As a result of your individual and collective efforts, EPA now has an excellent framework for constructive discussion with the lead agencies about key issues that must be resolved for the BDCP to be successful.

-Kathy

Kathleen Martyn Goforth, Manager

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From: Goforth, Kathleen
Sent: Tuesday, August 26, 2014 11:55 AM
To: 'will.stelle@noaa.gov'
Cc: 'ren_lohoefener@fws.gov'; 'dmurillo@usbr.gov'; 'Ryan Wulff - NOAA Federal'
Subject: BDCP DEIS: EPA's comments

Will –

Attached are EPA's comments on the Draft EIS for the Bay Delta Conservation Plan. The signed original is being sent to you today via regular mail. We look forward to continuing to work with NOAA, FWS, and BOR to resolve the issues identified in our comments.

- Kathy

Kathleen Martyn Goforth, Manager

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OFFICE OF THE
REGIONAL ADMINISTRATOR

AUG 26 2014

Will Stelle,
Regional Administrator
West Coast Region National Marine Fisheries Service
650 Capitol Mall, Suite 5-100
Sacramento, CA 95814

Subject: Draft Environmental Impact Statement for the Bay Delta Conservation Plan, San Francisco Bay Delta, California (CEQ# 20130365)

Dear Mr. Stelle:

The U.S. Environmental Protection Agency has reviewed the Bay Delta Conservation Plan (BDCP) Draft EIS pursuant to the National Environmental Policy Act (NEPA), Council on Environmental Quality regulations (40 CFR Parts 1500-1508), and our NEPA review authority under Section 309 of the Clean Air Act. The Draft EIS explores options for a comprehensive conservation strategy to restore and protect the Sacramento–San Joaquin Delta's ecosystem health, water supply, and water quality.

As you know, the San Francisco Bay/Sacramento-San Joaquin Delta Estuary is one of the largest and most important estuarine systems on the Pacific Coast of the United States, supporting over 750 species. It is the hub of California's water distribution system, supplying drinking water to 25 million people and irrigation water to 4 million acres of farmland. The decline of aquatic resources in the Estuary, along with the corresponding impacts on urban and agricultural water districts that rely on water exported from it, present significant challenges. Recent circumstances have only underscored the importance of working together on these issues, as California is experiencing severe drought and water shortages. We believe the NEPA process is well-suited to bring all of these considerations together, including the consideration of the environmental impacts of reasonable alternatives to the BDCP as it is currently proposed. We appreciate the effort to prepare the Draft EIS, and we support your recent decision to prepare a Supplemental Draft EIS to take a closer look at these issues.

EPA fully supports the stated purpose of the BDCP effort: to produce a broad, long-term planning strategy that would meet the dual goals of water reliability and species recovery in this valuable ecosystem, and we recognize the potential benefits of a new conveyance facility. However, we are concerned that the actions proposed in the Draft EIS may result in violations of Clean Water Act water quality standards and further degrade the ecosystem.

Our comments are consistent with those we have made in conversations that have taken place over the last few years among the agencies involved in managing the Delta. Many of our comments have also been made by others, both formally and informally, throughout the process, and we believe that they reflect a developing consensus within the scientific and regulatory communities. We are committed to continuing to work with you and other stakeholders toward a project proposal that meets the dual goals

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of water reliability and species recovery in the Bay Delta, and toward a well documented EIS that adequately informs decision-makers and the public, as required by NEPA.

Clean Water Act Water Quality Standards

The Draft EIS shows that operating any of the proposed conveyance facilities, which constitute Conservation Measure 1 (CM1), would contribute to increased and persistent violations of water quality standards in the Delta, set under the Clean Water Act, measured by electrical conductivity (EC) and chloride concentrations. We recommend that the Supplemental Draft EIS include one or more alternatives that would, instead, facilitate attainment of all water quality standards in the Delta. Specifically, we recommend that an alternative be developed that would, at minimum, not contribute to an increase in the magnitude or frequency of exceedance of water quality objectives, and that would address the need for water availability and greater freshwater flow through the Delta. Such an alternative should result in a decrease in the state and federal water projects' contributions to the exceedance of any water quality objectives in the Delta.

We also note that, while CM1 would improve the water quality for agricultural and municipal water agencies that receive water exported from the Delta, water quality could worsen for farmers and municipalities who divert water directly from the Delta. In that regard, we recommend that the Supplemental Draft EIS consider measures to ensure that the project would not increase concentrations of bromide around the intake for the North Bay Aqueduct at Barker Slough. In addition, we recommend consideration of whether additional measures, such as operational modifications both upstream and downstream, are needed to avoid increasing mercury and selenium concentrations and bioavailability in the Delta.

The Draft EIS indicates that CM1 would not protect beneficial uses for aquatic life, thereby violating the Clean Water Act. Total freshwater flows will likely diminish in the years ahead as a result of drought and climate change. Continued exports at today's prevailing levels would, therefore, result in even lower flows through the Delta in a likely future with less available water. We recommend that the Supplemental Draft EIS consider modified operational scenarios for CM1 alternatives that would have beneficial effects on covered fish populations during all life stages and attain water quality standards in the Bay Delta.

Habitat Restoration

The Draft EIS describes a general proposal to restore approximately 150,000 acres of wetlands, uplands, grasslands, and riparian areas in and around the Delta to offset the adverse impacts of the continued operations of the water projects. However, the Draft EIS does not indicate whether suitable acreage is available or whether restoration alone would be sufficient to recover fish populations. We are concerned over the sole reliance on habitat restoration for ecosystem recovery, recognizing that existing freshwater diversions and significantly diminished seaward flows have played a significant role in precluding the recovery of Bay Delta ecosystem processes and declining fish populations. We recommend that the Supplemental Draft EIS consider measures to ensure freshwater flow that can meet the needs of those populations and the ecosystem as a whole, and is supported by the best available science. We recommend that this analysis recognize the demonstrated significant correlations between freshwater flow and fish species abundance. We also recommend that the Supplemental Draft EIS include gradients of partial success for each habitat type to be restored, as supported by available science. The impacts

could be re-evaluated relative to each alternative (CMs2-11) in light of these gradients and the likely success rates for each habitat restoration type.

Alternatives

The Draft EIS defines the alternatives in terms of the design and capacity of the proposed conveyance structure. Each alternative is paired with a particular operational scenario. EPA agreed with this organizational construct early in the BDCP process, expecting that the Draft EIS would present a range of fully evaluated alternatives that clarifies the environmental and water supply tradeoffs being considered. The Draft EIS, however, focuses primarily on Alternative 4. It appears that the environmental impacts of certain other alternatives would be reduced if those alternatives were matched with more optimal operational criteria (for example, Alternative 5 with Operational Scenario F). Other reasonable alternatives could be developed by incorporating a suite of measures, including Integrated Water Management, water conservation, levee maintenance, and decreased reliance on the Delta.[1] Such alternatives would be consistent with the purpose and need for the project, as well as with the California Bay Delta Memorandum of Understanding among federal agencies[2] and the Delta Reform Act of 2009.

Project-level Analysis

The Draft EIS states that it includes a *project-level* analysis of environmental effects associated with CM1 (the conveyance facilities, which define the alternatives), and a *programmatic-level* analysis of 21 other Conservation Measures, including a suite of habitat restoration and aquatic stressors management initiatives. Programmatic-level inputs were used in some of the "project-level" analyses. We recommend that the Supplemental Draft EIS include project-level information and analyses for the conveyance tunnels, including the information necessary for permit decisions, to support the federal decision.

Upstream/Downstream Impacts

The federal and State water management systems in the Delta are highly interconnected, both functionally and physically. The Draft EIS does not address how changes in the Delta can affect resources in downstream waters, such as San Francisco Bay, and require changes in upstream operations, which may result in indirect environmental impacts that must also be evaluated. We recommend that the Supplemental Draft EIS include an analysis of upstream and downstream impacts.

NEPA Effects Determination

The Draft EIS presents *NEPA Effects Determinations,* but does not describe the decision rules that were used to make those determinations from the analytical information presented for each impact category. We recommend that the *NEPA Effects Determinations* and thresholds -- quantitative when possible – be provided for each category so that it is clear why some estimated impacts result in one *NEPA Effects Determination* over another. We also recommend that the Supplemental Draft EIS explain whether all metrics are considered equal in the analysis or some are weighted. Please clarify whether negative impacts in one metric category translate into an adverse determination, regardless of the other metrics. Lastly, it would be helpful to include summary tables for each impact category so that the public and decision-makers can understand the metrics and their results and how they compare among alternatives.

[1] The "Portfolio Approach" developed by a diverse set of stakeholders is one attempt to place Delta water management into the larger context of facilities investments and integrated operations. http://www.sdcwa.org/sites/default/files/files/news-center/top-issues/portfolio-based-bay-delta-conceptual-alternative_1-16-13.pdf

[2] http://www2.epa.gov/sites/production/files/documents/baydeltamousigned.pdf

Adaptive Management

The Draft EIS explains that the adaptive management program is a work in progress. The specific approach for an adaptive management program and its effect on environmental consequences is fundamental to the success of the BDCP and should be addressed during the NEPA process. We recommend that a more detailed adaptive management program be provided in the Supplemental Draft EIS, since the goal of species recovery relies significantly on an effective adaptive management program. As you develop the plan, include detailed information on the plan's objectives, explicit thresholds, alternative hypotheses, responsive actions, and designated responsible parties.

Conclusion

EPA remains committed to working with the federal and state lead agencies to develop an environmentally sound, scientifically defensible, and effective plan for restoring the Bay Delta ecosystem and achieving greater water supply reliability. Please note that, because you are preparing a Supplemental Draft EIS, which we anticipate will address many of the issues raised about this Draft EIS, including the issues we have outlined here, EPA will defer our rating until the Supplemental Draft is circulated for public review and comment. We have also enclosed more detailed comments and recommendations for your consideration.

We are available to discuss our comments and recommendations. Please send one hard, and one electronic, copy of the Supplemental Draft EIS to this office at the same time it is officially filed with our Washington D.C. Office. If you have any questions, please contact me at 415-947-8702. Alternatively, your office may contact Kathleen Johnson, Enforcement Division Director. Ms. Johnson can be reached at 415-972-3873.

Sincerely,

Jared Blumenfeld

Enclosure

cc: Ren Lohoefener, Regional Director, Pacific Southwest Region, U.S. Fish and Wildlife Service
David Murillo, Regional Director, Mid Pacific Region, U.S. Bureau of Reclamation

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I. Water Quality Impacts

A. Adverse Impacts

Chapter 8 indicates that all project alternatives would result in adverse, significant, unmitigated effects to water quality and one or more beneficial uses within the affected water bodies. For example:

- The proposed changes in water management would measurably exacerbate impairment of agricultural and aquatic life beneficial uses in the South Delta and Suisun Marsh (p. 8-439);
- Bromide, chloride, dissolved organic carbon, and electrical conductivity (EC) are expected to increase due to changes in hydrodynamics as a result of the implementation of the CM1 Alternative 4 (pp.8-420, -428, -454, and -439). In addition, the feasibility of mitigation actions for EC is uncertain (p. 8-441); therefore, the net effect to overall salinity levels is unclear;
- Mercury, pesticide, and selenium exposure levels may increase and be cumulatively significant (p. 8-446, -767, -768); and
- Water quality degradation resulting from the increased pumping of freshwater from the North Delta could cause increases in water treatment costs (p. 8-420).

All Bay Delta Estuary waters are impaired due to numerous contaminants, including pesticides, manufacturing compounds, metals (including selenium), pathogens, nutrients/low dissolved oxygen, invasive species, salinity, and toxicity from unknown sources. Without adequate mitigation, these impairments would be exacerbated by any of the alternatives evaluated in the Draft EIS. Poor water quality in the Bay Delta Estuary and its tributaries adversely affects terrestrial and aquatic ecosystems, drinking water, recreation, industry, agriculture, and the local, state, and interstate economy.

Recommendation: *Discuss mitigation measures that would reduce the projected adverse impacts on water quality, and discuss whether the proposed actions would contribute to impairments of beneficial uses or further degrade water quality.*

B. Salinity (Electrical Conductivity, Chloride) and Bromide

1. Water Quality Standards Exceedances and Degradation

The Bay Delta Water Quality Control Plan (WQCP) contains EC objectives for the Delta to protect agricultural and fish and wildlife beneficial uses, and chloride objectives to protect municipal and industrial water supply beneficial uses. Bromide, a significant precursor to brominated disinfection byproducts, is subject to CALFED Drinking Water Program goals (p. 8-42). The Draft EIS estimates that EC, chloride and bromide concentrations would increase under CM1 Alternative 4, relative to the No Action Alternative and Existing Conditions for Delta locations. The document predicts increased exceedances of numeric water quality standards, which suggests that CM1 Alternative 4 would result in a loss of protection for municipal, agricultural, and aquatic life beneficial uses. Specifically, CM1 Alternative 4 would result in:

- A 17% increase in days out of compliance with the agricultural EC standard at Emmaton (p. 8-252 lines 6-7). The EC objective at Emmaton is intended to protect agricultural beneficial uses, but also has ancillary benefits to aquatic life. Increasing noncompliance days would further contribute to existing EC water quality impairments in the western Delta, and degrade beneficial use protection for agricultural and aquatic life beneficial uses.

- A 7% increase in days exceeding the municipal chloride standard (250 milligrams per liter (mg/L) mean daily maximum) at Contra Costa Canal Pumping Plant #1 (p. 8-243 line 26) and "substantial degradation during the months October through December when average concentrations would be near, or exceed, the objective" (p. 8-243 lines 33-34 and Appendix 8G, 27 Table Cl-9).

- A doubling of the frequency of exceeding the lower municipal chloride standard at Antioch and Contra Costa Canal Pumping Plant #1: "All of the Alternative H1-H4 Scenarios would result in substantially increased chloride concentrations in the Delta such that frequency of exceeding the 150 mg/L Bay-Delta WQCP objective would approximately double" compared to Existing Conditions (p. 8-429) and the No Action Alternative (Appendix 8G Table Cl-64).

- Increased EC levels in Suisun Marsh, exacerbation of the existing EC water quality impairment, and degradation of aquatic life beneficial use protection (p. 8-438 and Appendix 8H-27). "The most substantial EC increase would occur at Beldon Landing with long-term average EC levels increasing by 1.3-6.0 milliSiemens per centimeter (mS/cm), depending on the month and operations scenario, at least doubling during some months the long-term average EC relative to Existing Conditions" and the No Action Alternative (p. 8-438).

- Higher quality water to those receiving the exported water, but adverse impacts on those who rely on water directly from the Delta: "the operations and maintenance activities under Scenario H1-H4 of Alternative 4 would cause substantial degradation to water quality with respect to bromide at Barker Slough... and could necessitate changes in water treatment plant operations or require treatment plant upgrades" (p.8-420).

The EC and chloride analyses in the Draft EIS provide some confusing results. For example, the 16-year average EC concentration (mass balance) at Emmaton is 887 micromhos per centimeter (µmhos/cm) for CM7, and 935 µmhos/cm for CM8, even though outflow (an indicator of freshwater flow to the estuary) is twice as high for CM8. Similarly, chloride concentrations predicted for CM7 (mass balance and EC-chloride relationship) at Antioch on the San Joaquin River are slightly lower than those for CM8.

The water quality chapter of the Draft EIS does not evaluate the alternatives against the full suite of Water Quality Objectives for Fish and Wildlife Beneficial Uses, which are found in Table 3 of the Bay Delta WQCP. The Delta outflow objective is discussed in Chapter 5 Water Supply, and a brief discussion of Delta outflow objective is in the HCP for only the CEQA Preferred Alternative 4.

Recommendations: *Describe mitigation measures that would prevent the proposed project from resulting in increased exceedances of water quality objectives in the already-degraded Delta. These measures may include reducing exports to provide more outflow and mitigate salinity intrusion.*

Explain the differences in the predictions among CM1 alternatives, including why twice as much outflow would result in higher salinity concentrations for Alternative 8 relative to Alternative 7. Disclose the confidence intervals for the mass-balance and EC-chloride relationship approaches for predicting future concentrations of EC and chloride.

Evaluate all CM1 alternatives with respect to all water quality standards listed in Tables 1-3 of the Bay-Delta WQCP, and indicate whether each standard would be met under each alternative.

2. **Mitigation Effectiveness**
Appendix 8H "Electrical Conductivity" states that, although the modeling results show exceedences of water quality D-1641 standards, the project proponents "intend" to operate the State Water Project and Central Valley Project facilities by fine tuning reservoir storage and exports in real time to meet the standards (p. 8H-1). The water quality objectives that would be met in this manner are not specified, nor is an estimate provided of the impact of this measure on water supply. Furthermore, the Draft EIS includes the caveat that "if sufficient operational flexibility to offset chloride increases is not feasible under Alternative 4 operations, achieving chloride reduction pursuant to this mitigation measure would not be feasible under this Alternative" (p.8-430). A similar caveat is stated regarding bromide (p. 8-422). These statements suggest that the water supply exports that define the Alternative 4 operational scenario would be given higher priority than meeting water quality standards, thus rendering that scenario potentially inconsistent with the protection of beneficial uses.

Recommendations: *Clearly identify the water quality objectives that the proponents intend to meet by fine-tuning reservoir storage and exports in real time, and clearly state this intention as an enforceable commitment. Reconcile the conflicting caveats regarding operational flexibility with this commitment.*

Provide an estimate of the amount of water that would be needed to meet water quality standards during periods when the modeling predicts exceedances, and describe how the use of water for this purpose would impact water diversions for upstream and downstream users. Include a comparison against drought years.

Provide historical data to illustrate how D-1641 standards have been met in the past, including the number of times that DWR has submitted Temporary Urgency Change Petitions with the State Water Board requesting modification of requirements of D-1641 because of drought conditions.

3. **Mitigation Relationship to Water Quality Standards**
EPA understands that the modeling for the water quality analysis was based on an assumption that the Emmaton EC water quality standard compliance point would be moved four miles upstream to Three Mile Slough, as DWR is anticipated to request. We also understand that DWR will request that the State Water Resources Control Board include this compliance point change as part of the Phase II update to the Bay Delta WQCP. The State Board will review this request, as will the EPA. We are concerned that the intended mitigation for the water quality violations at Emmaton relies on a change in the compliance point. We consider the movement of the compliance point to Three Mile Slough a relaxation of the EC standard because it would potentially permit four miles of additional salinity intrusion into the upper estuary, which could have negative impacts on multiple beneficial uses.

Recommendations: *Explain the technical, scientific, and policy reasons for using Three Mile Slough in DSM2 modeling for assessing EC compliance at Emmaton. Describe how EC was estimated at Emmaton under the No Action Alternative and for Existing Conditions if it was not directly estimated using DSM2; and interpret the comparison of EC at Three Mile Slough in CM1 operational scenarios to EC at Emmaton.*

Identify all of the water quality standards, including EC at Emmaton, which the BDCP assumes will be modified. Disclose the process for obtaining a modification of a water quality standard.

4. Impacts of Changes to the Salinity Gradient (X2)

The salinity gradient, approximated by X2[1], has an inverse relationship with many diverse bay and estuarine fishes, including the threatened and endangered species that are the conservation targets of the BDCP. As X2 decreases (i.e., moves out to sea) habitat conditions for some species improve and relative abundance increases[2]. Because the location of X2 is closely tied to freshwater flow through the Delta, the proposed project would have a strong influence on this parameter, yet the Draft EIS does not analyze each alternative's impacts on aquatic life in the context of this relationship.

Examination of the predicted changes in monthly average X2 for each CM1 operational scenario, A through G, would help determine how the quantity and quality of estuarine habitats and relative fish abundance would change under those scenarios for multiple fish species. It would also be useful to estimate the range of monthly average X2 values (and/or monthly Delta outflow) for each alternative and compare it to the pattern of freshwater flows and salinity gradients that characterized a reference time period when resident and migratory fish populations were in comparatively better condition. The operational scenarios that more closely mimic the reference period freshwater flow and salinity gradient pattern could be expected to produce aquatic conditions and habitats that benefit native and migratory fishes and support important food web processes at all ecosystem levels.

Freshwater flow may be one of the best tools available in the short term to improve fish populations and protect aquatic life beneficial uses prior to the completion of planned restoration projects, given its widely cited importance to ecosystem recovery. Relative fish abundance responses to freshwater flow can be estimated using regression equations provided in peer reviewed literature and government reports.[3] The equations do not directly include the effects of tidal marsh and floodplain restoration on fish populations; therefore, in their current form, they would be most useful for evaluating the impacts of flow variations prior to the completion of restoration projects. We anticipate that the ability to measure the benefits of restoration projects will improve after the projects are started and measurements and monitoring data become available.

The Draft EIS does not evaluate potential downstream effects of CM1 alternatives on San Francisco Bay fish populations. The description of impacts to San Francisco Bay from Delta Outflow changes (p. 11-132) stops at Suisun Bay even though outflow affects relative abundance of San Francisco Bay fishes such as Bay shrimp, starry flounder, and Pacific Herring. Some of these populations may be negatively affected by reduced outflows associated with CM1 alternatives, and the effect of restoration CMs (2-12) on these fish populations may or may not be beneficial.

Recommendations: *Describe the estuarine salinity gradient and how it defines important aquatic habitats, including marine, low salinity zones, and migratory corridors for target fishes. Describe its relevance to important aquatic life communities, including phytoplankton and zooplankton.*

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[1] X2 refers to the distance from the Golden Gate up the axis of the estuary to the point where daily average salinity is 2 parts per thousand at 1 meter off the bottom (Jassby et. al. 1995).

[2] Jassby AD, Kimmerer WJ, Monismith SG, Armor C, Cloern JE, Powell TM, Schubel JR, Vendlinski TJ. 1995. Isohaline position as a habitat indicator for estuarine applications. Ecological Applications 5(1): 272-289;
Kimmerer, W. J. 2002. Effects of freshwater flow on abundance of estuarine organisms: Physical effects or trophic linkages? Marine Ecology Progress Series 243:39-55;
Kimmerer WJ, Gross ES, MacWilliams ML. 2009. Is the response of estuarine nekton to freshwater flow in the San Francisco Estuary explained by variation in habitat volume? Estuaries and Coasts 32: 375-389.

[3] United States Fish and Wildlife Service, September 27, 2005, Recommended Streamflow Schedules To Meet the AFRP Doubling Goal in the San Joaquin River Basin (FWS 2005), pp. 27 *available at:*
http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/bay_delta_plan/water_quality_control_planning/docs/sjrf_spprtinfo/afrp_2005.pdf;
Jassby AD, Kimmerer WJ, Monismith SG, Armor C, Cloern JE, Powell TM, Schubel JR, Vendlinski TJ. 1995. Isohaline position as a habitat indicator for estuarine applications. Ecological Applications 5(1): 272-289;
Kimmerer, W. J. 2002. Effects of freshwater flow on abundance of estuarine organisms: Physical effects or trophic linkages? Marine Ecology Progress Series 243:39-55;
Kimmerer WJ, Gross ES, MacWilliams ML. 2009. Is the response of estuarine nekton to freshwater flow in the San Francisco Estuary explained by variation in habitat volume? Estuaries and Coasts 32: 375-389.

Describe the Delta outflow objective in the Water Quality Chapter, including a description of the "X2" concept, recognizing that the "X2" concept provides the foundation for the Delta outflow objective and is the basis for protecting springtime estuarine habitat for resident and migratory fishes, which are the targets of the BDCP.

Include a year-round salinity gradient and/or Delta outflow analysis for each CM1 alternative. This can be accomplished using information already generated for the BDCP EIS.[4] *Compare the results to a defined and supported reference period to determine how closely each scenario may mimic the salinity gradient and/or monthly outflow pattern. Alternatively, use three-dimensional modeling that maps the salinity gradient within the estuary on a monthly time step for all CM1 alternatives. This would make it possible to estimate the size and location of salinity zones, such as the low salinity zone, under different operational scenarios; however, it is not clear if this approach could be easily compared to a reference period using the same modeling tools.*

Include at least one-dimensional salinity gradient and Delta outflow analyses for the fish species evaluated in Chapter 11. Define and support an agreed upon relative reference period for the analyses.

Use the referenced flow-abundance tools to predict a range of potential fish abundance changes under each operational scenario for CM1. The Kimmerer 2002 relationships should be used to evaluate potential downstream impacts to Bay fish populations. Provide the results of these analyses and explain that they do not include benefits of habitat restoration or entrainment reductions from minimizing use of south Delta pumping facilities when they cause the most harm for salmonids.[5]

C. Potential Increases in Methylmercury Formation and Transport

EPA agrees that restoring wetlands and floodplains in and near the Delta is an essential component of reviving the Estuary's health; however, nearly all the locations targeted for habitat restoration in the Delta have been, or are at risk of being, contaminated with mercury from historical mining sources and ongoing air deposition from industry. Sport fish in the Delta are already burdened with higher concentrations of mercury than anywhere else in the State,[6] and the presence of this powerful neurotoxin in the food web poses a threat to public health and the ecosystem as a whole. For this reason, health advisories have been issued for the Delta and several upstream rivers.

The BDCP relies heavily on proposed restoration in Yolo Bypass to mitigate for the adverse impacts of the CM1 alternatives on fish populations, noting that the Bypass is one of the places in the Delta that shows the most potential for providing floodplain benefits for fish, including salmon (BDCP p. 2-80). The Draft EIS, however, says that the Yolo Bypass may contribute up to 40% of the total methylmercury production in the entire Sacramento watershed (p. 25-63). The State Water Board has also observed that, when the Yolo Bypass is flooded, it becomes the dominant source of methylmercury to the Delta, and that restoration activities could exacerbate the existing mercury problem.[7] While EPA strongly supports restoration of aquatic habitat in the Delta, caution must be exercised to ensure that it

[4] Information needed to support salinity gradient and Delta outflow analyses appears to have been developed by completed modeling efforts for BDCP. The salinity gradient and low salinity zone are discussed in the HCP; X2 and Delta outflow are CALSIM outputs; a 3-dimensional model (UnTRIM) was used in Appendix 5A (Part D, Attachment 3 "Evaluation of Sea Level Rise Effects using UNTRIM San Francisco Bay-Delta Model") to predict salinity gradient changes in climate change scenarios; and a spring Delta outflow comparison was provided for the longfin smelt analysis in the Draft EIS. The longfin smelt analysis in Chapter 11 includes a comparison of average monthly spring Delta outflow between CEQA and NEPA baselines and the H1 – H4 operational scenarios.

[5] For more information, see EPA's comments to the State Water Resources Control Board regarding the State's effort to improve aquatic life beneficial use protection by modifying and/or adopting new water quality standards for flow in the Delta. See letter from US EPA to SWRCB, December 11, 2012, available at http://www2.epa.gov/sites/production/files/documents/sfdelta-decpost-workshopltr-dec2012.pdf; EPA presentation to SWRCB available at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/docs/wrkshp2/erinforesman.pdf

[6] SWAMP- Surface Water Ambient Monitoring Program http://www.waterboards.ca.gov/water_issues/programs/swamp/rivers_study.shtml

[7] P. 29 Periodic Review of the 2006 Water Quality Control Plan, State Water Resource Control Board http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/periodic_review/docs/periodicreview2009.pdf

does not result in unintended consequences that adversely affect water quality. Minimizing the formation and mobilization of methylmercury in wetlands is critical. Given the already high levels of mercury in the system, restoration in certain locations should be avoided if methylmercury production cannot otherwise be reduced or mitigated. For this reason, the BDCP's restoration acreage goals may not be attainable.

The DEIS underestimates the potential impacts of methylmercury on covered species and public health. Quantification of the methylmercury contributions from the proposed restoration were not provided in the document (this is acknowledged on p. 8-260), and the methylmercury NEPA Effects determinations rely on the success of unproven mitigation methods (CM12) that are currently under development to minimize formation and transport of methylmercury from Yolo Bypass, Cache Slough Complex, and the Cosumnes River Restoration Opportunity Areas (p.3-154). In the AQUA-8 "Effects of Contaminants Associated with Restoration Measures" evaluation of the impact of methylmercury, selenium, and other contaminants on delta smelt, the analysis of Alternative 1A concludes that methylmercury impacts to Delta smelt and winter-run Chinook salmon are "uncertain" (p. 11-277, 11-343). The analysis for Alternative 1A (and subsequent alternatives)[8] states that restoration actions (CM2, CM4–CM7, and CM10) may increase production, mobilization, and bioavailability of methylmercury in the aquatic system, but that many effects are unknown at this time.

Research studies in the Yolo Bypass that were conducted by the US Geological Survey found methylmercury production values in Yolo Bypass managed wetlands and agricultural lands to be "among the highest ever recorded in wetlands."[9] The Yolo Bypass mercury bioaccumulation study[10] reported that all caged and wild fishes sampled had methylmercury fish tissue concentrations greater than the small fish tissue objective in the Delta Methylmercury TMDL (0.03 micrograms per kilogram (µg/kg) wet weight).[11] In addition, 59% of wild fishes and 82% of caged fishes had methylmercury concentrations greater than 0.20 µg/g wet weight, which is a threshold above which fish health is impaired.[12] Finally, 52% of caged fish and 26% of wild fish had fish tissue concentrations greater than observed thresholds that reduce bird reproduction[13] and greater than the large fish tissue objective (intended to protect human health and wildlife consumers). These results suggest that increasing production, transport, and bioavailability of methylmercury through restoration actions could result in adverse effects to human health and the environment.

The Environmental Justice Chapter of the Draft EIS provides conflicting information and conclusions regarding whether or not the BDCP alternatives would create conditions conducive to increased bioaccumulation of mercury in Delta fish species, and whether such bioaccumulation would be cumulatively significant for increasing the body burden (pp. 28-22, 25, 103) in fish. The USGS Yolo

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[8] Analyses for subsequent alternatives refer back to the analysis for Alternative 1A.

[9] Alpers, C.N., Fleck, J.A., Marvin-DiPasquale, M., Stricker, C.A., Stephenson, M., and Taylor, H.E., Mercury cycling in agricultural and managed wetlands, Yolo Bypass, California: Spatial and seasonal variations in water quality: Science of The Total Environment, Volume 484, 15 June 2014, Pages 276–287 http://dx.doi.org/10.1016/j.scitotenv.2013.10.096.

[10] Ackerman, J. "Agricultural Wetlands as Potential Hotspots for mercury bioaccumulation: experimental evidence using caged fish" Environmental Science and Technology 2010, 44, 1451-1457.

[11] The Delta Mercury and Methylmercury TMDL contains two fish tissue objectives that target specific beneficial uses. The average methylmercury concentrations shall not exceed 0.08 and 0.24 mg methylmercury/kg, wet weight, in muscle tissue of trophic level 3 and 4 fish, respectively (150-500 mm total length). These objectives are protective of (a) people eating 32 g/day (eight ounces, uncooked fish per week) of commonly eaten, legal size fish, and (b) all wildlife species that eat large fish. Small fish (less than 50 mm in length) – 0.03 mg methylmercury/ kg, wet weight, in muscle. The average methylmercury concentrations shall not exceed 0.03 mg methylmercury/kg, wet weight, in whole fish less than 50 mm in length. Large fish (150 – 500 mm total length) – 0.08 and 0.24 mg methylmercury/ kg, wet weight, in muscle. These objectives target protection of sensitive wildlife that eat fish. http://www.swrcb.ca.gov/centralvalley/board_decisions/adopted_orders/resolutions/r5-2010-0043_res.pdf.

[12] Frayer, W. E.; Peters, D. D.; Pywell, H. R. Wetlands of the California Central Valley status and Trends: 1939 to mid-1980's; U.S. Department of the Interior, Fish and Wildlife Service: Washington, DC, 1989.

[13] Albers, P. H.; Koterba, M. T.; Rossmann, R.; Link, W. A.; French, J. B.; Bennett, R. S.; Bauer, W. C. Effects of methylmercury on reproduction in American kestrels. Environ. Toxicol.Chem.2007, 26, 1856–1866; Burgess, N. M.; Meyer, M. W. Methylmercury exposure associated with reduced productivity in common loons. Ecotoxicology 2008, 17, 83–91, as cited in Ackerman, J. "Agricultural Wetlands as Potential Hotspots for mercury bioaccumulation: experimental evidence using caged fish" Environmental Science and Technology 2010, 44, 1451-1457.

Bypass bioaccumulation study referenced above showed that the majority of wild and caged fishes had methylmercury tissue levels above the public health threshold for trophic level 3 fish and very close to the public health threshold for trophic level 4 (large) fish. Although the Delta is posted with fish advisories, people who rely on fishing for subsistence may consume more than the advisory recommends. Although the Draft EIS acknowledges that "restoration actions are likely to result in increased production, mobilization, and bioavailability of methylmercury in the aquatic system" (p. 25-64), it concludes that there would be no adverse effects on public health to any populations (p. 25-64, p. 28-22). This conclusion is inconsistent with the potential for increased methylmercury production, bioaccumulation, and effects to Environmental Justice communities, and the proposed mitigation actions described do not address the potential for significant negative effects to human health.

Recommendations: *Acknowledge that particular areas may not be suitable for restoration or that the acreages of proposed restoration may need to be reduced if such areas prove to be large contributors of methylmercury to the Delta ecosystem.*

Summarize recent research and current literature relevant to the potential for methylmercury impairment under existing conditions and future conditions; the potential impacts on covered fishes that use the Yolo Bypass; and the potential for bioaccumulation impacts to higher order species and human health.

Describe the existing methods that show potential for reducing formation and transport of methylmercury, and the CMs to which they could be applied. Further describe the range of potential reductions that could be expected from CM12 methods for minimizing methylmercury formation and transport.

Reconcile the Draft EIS's conflicting conclusions regarding the likely impact of the BDCP alternatives on the conditions conducive to bioaccumulation of methylmercury, and provide the basis for these conclusions.

Describe and commit to water column and fish and invertebrate tissue monitoring for mercury and methylmercury to support adaptive management actions. Include a commitment to ensure that adequate warning signs are posted in appropriate languages regarding the risks of consuming fish caught in the Delta, and provide further outreach to minority populations about these risks. Such outreach should include meaningful involvement by the affected populations.

D. Selenium

Soils on the west side of the San Joaquin Valley are high in selenium. As a result, it is present in agricultural drainage and enters the Delta in the San Joaquin River at Vernalis. When mobilized in the environment and transformed to organic, bioavailable forms, selenium is highly bioaccumulative and can be toxic to organisms at very low levels of chronic exposure. The BDCP proposes to bring additional reliable water to the west side of the San Joaquin Valley. This would result in a greater volume of water and greater loads of selenium being discharged to the San Joaquin River. Although available data show that the maximum selenium concentration at Vernalis is not exceeding the current water quality objective of 5 micrograms per liter (μg/L)[14] (p. 8-96), the operations of the proposed project would contribute significantly more selenium-laden San Joaquin River water to the Delta (p. 8-226). In addition, EPA is in the process of updating its national recommended chronic aquatic life criterion for selenium in freshwater to reflect the latest scientific information, which indicates that toxicity to aquatic life is driven by dietary exposures. As of this writing, a peer review draft of the

[14] 4-day average for above normal and wet year types and a monthly mean for dry and below normal water year types.

updated criterion is undergoing public review, with comments due to EPA in July 2014. Following consideration of comments received, the draft criterion will be revised, as appropriate, and released as a draft criterion for public review.

EPA is concerned that the potential effects of selenium on covered species, especially green sturgeon, are underestimated in the Draft EIS. The analysis discusses increased residence time of selenium in Suisun Bay and concludes that the impacts of the proposed restoration measures on green sturgeon are "not adverse"; but does not discuss the south Delta, which would receive increased loads of selenium under all CM1 alternatives (p. 11-526). The increased loads, combined with increased residence time, could lead to greater selenium absorption in clam tissue, which is a primary food item of sturgeon (p. 11-257). Adverse effects of elevated selenium on early life stages of green sturgeon have been documented[15].

Likewise, impacts of increased selenium loads to salmonids are not adequately addressed in the Draft EIS. Although salmonids do not eat clams, they are sensitive in all their life stages (figure 12 in Presser, Luoma 2010).[16] One objective of the San Joaquin River Restoration Project (SJRRP) is to manage the river to restore salmon migration. The increased drainage of selenium-enriched water from the West side of the San Joaquin Valley that would likely result from the BDCP could compromise this effort.

Recommendations: *To mitigate for the project's impacts to selenium levels in the estuary as a result of the BDCP operations, consider reviving and funding the Bureau of Reclamation's Land Retirement Program[17] to remove from cultivation and irrigation large areas of selenium laden lands on the West side of the San Joaquin Valley. This would save irrigation water, reduce discharges of selenium into the San Joaquin River basin, and advance attainment of selenium reduction targets[18] set by EPA and the Central Valley Regional Water Quality Control Board. Evaluate the extent to which restoration of these "retired" lands to the native plant community could also contribute to the recovery of threatened and endangered plants and animals listed by FWS. Consider analyzing the cost/benefit of implementing treatment technologies vs. land retirement. Although cost/benefit analyses are not required under NEPA, such an analysis may be useful to decision makers and the public in this case.*

Reanalyze the proposal to develop wetlands as part of the conservation plan, taking into account the increased amount of agricultural drainage water from selenium-enriched lands that would enter these areas in the Delta as a result of BDCP operations, and the potential for selenium build-up and availability.

Discuss hydrodynamics and increased residence time of selenium in the San Joaquin River in the southern Delta and its potential impact on clam uptake of selenium, bioaccumulation in sturgeon, and the potential for population effects.

Reference and summarize the available literature regarding the impacts of selenium on sturgeon, especially with respect to early life stages, and consider such impacts in the analysis of increased selenium loading.

The evaluation of the Alternatives should consider the objectives of ongoing or proposed projects and programs that are intended to improve Bay Delta water quality and fish and aquatic resources. Disclose

[15] Linares, J., Linville, R. Eenennaam, JV, Doroshov, S. 2004 Selenium effects on health and reproduction of white sturgeon in the Sacramento-San Joaquin estuary. Final Report for Project No. ERP-02-P35.
[16] Presser TS and Luoma SN 2010 Ecosystem-Scale Selenium Modeling in Support of Fish and Wildlife Criteria Development for the San Francisco Bay-Delta Estuary, California USGS Administrative Report.
[17] http://www.usbr.gov/mp/cvpia/3408h/index.html
[18] http://www.gpo.gov/fdsys/pkg/FR-2000-05-18/html/00-11106.htm

potential conflicts with such projects or programs, as well as ways in which such conflicts could be avoided or minimized. In particular, the potential for competing management objectives between the BDCP and the SJRRP should be comprehensively analyzed and described.

E. Additional Water Quality Impacts

The conclusion that there would be no impact to dissolved oxygen concentrations in reservoirs (p. 8-192, lines 6-15) is unsupported given that three major reservoirs are predicted to experience a 10% increase in dead pool under the No Action Alternative.

Recommendation: *Describe how predicted dead pool conditions in reservoirs may impact dissolved oxygen concentrations and other contaminant concentrations that may increase in these extreme conditions, and revise the impact conclusions, as appropriate.*

It is not clear whether residence time was considered in the impact assessment of water quality contaminants such as pesticides and metals. It appears that southern Delta residence times would increase due to increased use of the north Delta pumps (and decreased use of south Delta pumps), limiting freshwater inputs to, and movement of water in, the south Delta. These conditions could increase residence time of water moving through the southern Delta, which would increase aquatic life exposure to contaminants such as pesticides and selenium.

Recommendation: *Explicitly state whether or not residence time was included in assessments of contaminant impacts on aquatic life and other beneficial uses in the water quality analysis. If residence time was not considered, explain why it was not included and how increasing residence time could increase negative effects of contaminants as a result of CM1 operations.*

II. Fish and Aquatic Resources

A. Aquatic Resources Beneficial Uses

Data and other information provided in the Draft EIS indicate that that all CM1 alternatives may contribute to declining populations of Delta smelt, Longfin smelt, green sturgeon, and winter-run, spring-run, fall-run and late-fall run Chinook salmon. Impact analyses in Chapter 11 show that entrainment, rearing, and migration conditions for these species are estimated, for many of the action alternatives, to be similar to, or worse than, existing conditions and sometimes worse than the future no action condition. Some of the NEPA effects that are described as "not determined" for some alternatives are very similar to effects that are described as "adverse" for other alternatives. Data regarding the impacts on fish is provided in various tables, and the summary statements made in the text do not always accurately reflect the information in those tables.

1. Longfin Smelt Abundance

Long-term and recent sharp declines in fish abundance have been cited by the lead federal agencies, their partners, and EPA as evidence of collapse in the Bay Delta ecosystem. Longfin smelt relative abundance is estimated to decline for all but one of the CM1 alternatives in most water year types (and in the average of all water year types) when compared to *Existing Conditions*.[19] Alternative 8 is the only alternative that has a predicted relative abundance increase for Longfin smelt relative to *Existing Conditions*. In comparison to the *No Action* Alternative, four CM1 alternatives are predicted to result in declines in the Longfin smelt abundance index, while five CM1 alternatives are predicted to result in positive changes to that index. Despite these predictions, the Draft EIS concludes that the

[19] Table 11-1A-8 page 11-297 "Estimated differences between scenarios for longfin smelt relative abundance in FMWT or Bay Otter Trawl,", Table 11-2A-7 page 11-764, Table 11-3-7 page 11-1097, Table 11-4-8 page 11-1308; Table 11-5-7 page 11-1742; Table 11-6-8 page 11-1951; Table 11-7-7 page 11-2227, Table 11-8-8 page 11-2492; Table 11-9-8 page 11-2768.

impact on Longfin smelt abundance would be "not determined" for all CM1 alternatives for the NEPA effects determination. This conclusion disregards the predicted differences among the alternatives in comparison to the *No Action Alternative*, and the predominantly negative impacts in comparison to *Existing Conditions*.

2. **Entrainment of Juvenile Delta Smelt**
The summary table on page 11-55 of the Draft EIS states that Alternative 4's flow-related effects on fish would lead to "beneficial impacts" with respect to entrainment of Delta smelt. While the prediction for Alternative 4 shows somewhat less entrainment in comparison to the No Action Alternative, the predicted difference is much smaller for juveniles than for adults, and Alternatives 1, 2, 7, and 8 are predicted to result in substantially less entrainment at all life stages. Compared to Existing Conditions, Alternative 4 is predicted to result in *increased* entrainment of Delta smelt, especially juveniles. It is unclear how increases in juvenile entrainment would result in overall beneficial impacts. Entrainment estimates provided in the Draft EIS show reductions in adult entrainment, but increases in juvenile entrainment for all Alternatives except Alternatives 7 and 8, compared to Existing Conditions, and for Alternatives 3 and 5, compared to the No Action Alternative. The discussion in the text provides the caveat that "entrainment is expected to remain at or below the levels currently experienced by fish… there are very few instances where there would be increases, but these are substantially offset by decreases during other periods" (p.11-53).The analysis does not describe the relative importance of reducing entrainment of each life stage (adult and juvenile) to the overall population. No comparison among alternatives is provided, nor does the Draft EIS explain why some alternatives, such as Alternatives 7 and 8, show much larger reductions than other alternatives in both juvenile and adult entrainment.

3. **Impacts on Delta Smelt Rearing Conditions**
The Draft EIS forecasts changes to rearing conditions for Delta smelt by estimating the change in available fall abiotic habitat with and without estimated habitat restoration benefits relative to the two baselines: Existing Conditions and No Action Alternative. CM1 alternatives with "Fall X2" operational criteria are predicted to increase fall rearing habitat relative to the No Action Alternative. These include CM1 Alternatives 2, 4 H4, and 5-9. Alternatives 6 (isolated facility, eliminates south Delta exports) and 7 (enhanced flows) show the highest predicted increases in fall rearing habitat. The absolute values of fall rearing habitat or significance thresholds are not provided.

Recommendations: *Modify operational scenarios for CM1 alternatives to develop at least one alternative that would have more certain and beneficial effects on covered fish populations during all life stages.*

Present the predicted impacts to each of the covered fish species and impact categories (entrainment, spawning, rearing, migration), for all the alternatives and baselines in comparative form, sharply defining the issues and providing a clear basis for choice among options by the decision-makers and the public (40 CFR 1502.14).

Provide absolute value estimates and proportional changes, in addition to relative changes from baselines, for predictions under each CM1Alternative.

Describe the scientific basis of, and uncertainty associated with, any assumptions made in the analysis, including in the development of the No Action Alternative. This may include, for example, data regarding current entrainment levels of all covered fish species at all life stages in all water year types.

B. NEPA Effects Determinations

The NEPA Effects Determinations provided in the Draft EIS are not always consistent with the impacts described. We list a few examples below.

- **Alternative 1 AQUA-5: Effects of Water Operations on Rearing Habitat for Delta Smelt:** The description of impacts reports a 22% loss of rearing habitat (p. 11-265), which suggests that the impact should be considered adverse if proposed habitat restoration does not produce anticipated benefits. Instead, Table 11-1A-SUM2 (page 11-16) lists the NEPA Effects Determination as "Not Determined." The NEPA Effects discussion on page 11-265 does not explicitly state that the NEPA Conclusion is "not determined."
  Alternative 1 AQUA-21 Effects of Water Operations on Entrainment of Longfin Smelt: The description of impacts shows that entrainment is estimated to increase for juvenile Longfin smelt in dry (14%), below normal (46%), and above normal (33%) water year types (Table 11-1A-6), and the ***Summary*** text on page 11-295 states, "It is concluded that these changes in Longfin smelt entrainment would be adverse under Alternative 1A." The subsequent ***NEPA Effects*** statement comes to a different conclusion, "The overall effect of the Alternative 1A operations scenario would not be adverse to Longfin smelt." Table 11-1A-SUM2 also lists the NEPA conclusion for entrainment of Longfin smelt as "not adverse."
- **Impact AQUA-22: Effects of Water Operations on Spawning, Egg Incubation, and Rearing Habitat for Longfin Smelt.** The NEPA Effects discussion predicts reductions of 8 to 10 percent in relative abundance of Longfin smelt for Alternative 1A, suggesting an adverse impact on this species from Alternative 1A. No NEPA conclusion is explicitly stated in this section (p. 11-295); however, Table 11-1A- SUM2 (page 11-16) lists the NEPA conclusion as "not determined."

Furthermore, throughout the document, different NEPA Effects Determinations are provided for similar impact descriptions. For example, in the discussion of "Effects of Water Operations on Migration Conditions for Winter-Run Chinook Salmon", the Draft EIS concludes that Alternatives 1 and 8 would have "adverse" NEPA Effects and Alternatives 7 and 4 would have "not determined" NEPA Effects, even though the estimated NEPA effects are quantitatively similar for the multiple metrics evaluated. It is not apparent how the lead agencies decided that one impact was beneficial and another adverse.

Recommendations: *Describe the decision making process and decision rules used to make NEPA Effects Determinations from the analytical information presented for each impact category. Define the NEPA Effects Determinations and provide thresholds -- quantitative when possible -- for each category so that it is clear why some estimated impacts result in one NEPA Effects Determination over another. Explain whether all metrics are considered equal in the analysis or some are weighted. If negative impacts in one metric category translate into an adverse conclusion, regardless of the other metrics, this should be disclosed. Include summary tables for each impact category so that the reader can see the metrics and their results and how they compare among alternatives.*

Compare the NEPA Effects Determinations with the narrative text describing the metrics and NEPA Effects among all alternatives for each impact category (e.g., AQUA-42 above) to ensure that decision rules and methods are used consistently.

III. Analytical and Presentational Issues

A. Defining the Project Proposal

The proposed project evaluated in the Draft EIS is not fully defined. EPA is aware that interagency discussions with the project proponents regarding key aspects of the proposed project are ongoing. Many of the undefined aspects of the BDCP are fundamental to the potential environmental impacts of

the proposal. For example, it is EPA's understanding that potential agreement, in advance, to a certain range of exports is under consideration in the HCP discussions. While an Implementation Agreement has been released for public comment, it is incomplete and is still being discussed by the involved parties. The Implementation Agreement's financing and decision making elements are important for public disclosure because they affect the likely implementation and success of mitigation and environmentally beneficial activities, yet these effects are not described for public review in the DEIS.

In addition, given the large scale nature of the construction activities associated with the BDCP, "minor" changes in proposed project design or operation can make a significant difference in the potential environmental impacts.

Recommendation: *Fully describe the proposed project and reasonable alternatives, including information that is integral to decisions that are being made about the proposed project design and operations.*

The Draft EIS explains that the adaptive management program is a work in progress (p. 3D-9, BDCP p. 3.4-32). The specific approach for an adaptive management program and its effect on environmental consequences is a fundamental issue that should be addressed during the NEPA process. Given that species recovery depends largely on the success of the adaptive management program, it is essential that a more fully formulated adaptive management program be described in the EIS.

Recommendation: *Describe the adaptive management program in detail, including clear objectives, explicit thresholds, alternative hypotheses, and designated responsible parties. In addition, explain any limitations imposed on the adaptive management program by the Implementation Agreement, and explain how those limitations affect the integrity of the adaptive management program.*

B. Alternatives Analysis

The Draft EIS states that alternatives in the document are "evaluated at an equal level of detail, as required by NEPA" (p. 3-5); however, the lead federal agencies' Progress Assessments indicate that the operational components of the alternatives were subjected to different levels of analysis. For example, iterative modeling runs were conducted for Operational Scenario H (solely associated with the CEQA Preferred Alternative 4) that were not run for other Operational Scenarios.

The Draft EIS defines the Alternatives in terms of the design and capacity of the proposed conveyance structure. Each alternative is then paired with a particular operational scenario. EPA agreed with this organizational construct early in the BDCP process, expecting to see a range of alternatives that could present the environmental and water supply tradeoffs being considered. Instead, the DEIS focuses primarily on Alternative 4. It appears that the environmental impacts of certain other alternatives would be reduced if those alternatives were matched with more optimal operational criteria (for example, Alternative 5 with Operational Scenario F); however, the DEIS does not attempt to optimize the other alternatives for environmental and water supply benefits. Other reasonable alternatives could be developed by incorporating a suite of measures, including water conservation, levee maintenance, and decreased reliance on the Delta.[20] Such alternatives would be consistent with the purpose and need for the project, as well as with the California Bay-Delta Memorandum of Understanding among federal agencies[21] and the Delta Reform Act of 2009.

[20] The "Portfolio Approach" developed by a diverse set of stakeholders is one attempt to place Delta water management into the larger context of facilities investments and integrated operations.

[21] http://www2.epa.gov/sites/production/files/documents/baydeltamousigned.pdf

Recommendations: *Work with State and federal partners to modify and further analyze the proposed Operational Scenarios to improve the precision and utility of the aquatic life analyses for all the operational alternatives.*

If differences in the level of analysis remain among the Alternatives, disclose, and explain the reason for those differences.

Evaluate the environmental impacts of pairing each Alternative with more optimal operational criteria.

C. Comparison of Alternatives

The Draft EIS does not clearly present the alternatives and their respective environmental impacts in a clear and comparative manner. Because technical results are not synthesized and displayed in a comparative format, it is difficult for the reader to compare the predicted effects of CM1 alternatives.

Further compounding the difficulty is the fact that the Draft EIS uses two very different baselines (Existing Conditions and No Action), pursuant to CEQA and NEPA regulations, and neither baseline is clearly defined. The assumptions that inform the baseline descriptions are spread throughout the document (Chapter 4, Appendix 4D, Appendix 5A, and Appendix 3A). Although Chapter 4 attempts to summarize the baselines, the summary is confusing, and references appendices that are hundreds of pages long. The baseline assumptions form the basis for all impact assessments; therefore, their lack of clarity creates an underlying uncertainty in the document's analyses and conclusions.

The Draft EIS considers many other types of uncertainties, including those related to long-term climate change and human behavior, however, the treatment of uncertainty is confusing and exhibits a strong tendency to assume outcomes favorable to the proposed project. Uncertainties are expressed by "non-determined" NEPA conclusions, but they are not explicitly detailed in the body of the Draft EIS. EPA has repeatedly raised concerns about the treatment of uncertainty in the Draft EIS, and the Delta Independent Science Board and an independent panel commissioned by the Delta Science Program recently expressed similar critiques.[22] Notably, the Panel concluded that the Effects Analysis of the BDCP (as incorporated by reference into the EIS) is "fragmented in its presentation, inconsistent with its technical appendices, and... inadequately conveys the fully integrated assessment that is needed to draw conclusions on the Plan due to incomplete information."

Recommendations: *Include, in the body of the document, summary tables comparing the effects of all CM1 alternatives and the No Action Alternative to the applicable water quality standards and other relevant environmental impact indicators, and compare and contrast the alternatives with respect to one another in the text. This discussion should inform potential mitigation strategies by identifying which alternatives would need more or less mitigation to comply with environmental objectives.*
Clearly explain the underlying assumptions inherent in the baselines. We suggest that this be presented in Chapter 4.

Explicitly acknowledge uncertainties encountered in the analyses, explain what has been or could be done to eliminate or reduce those uncertainties, and disclose any assumptions made in the face of uncertainties that could not be eliminated.

[22] Delta Independent Science Board Review: http://deltacouncil.ca.gov/sites/default/files/documents/files/Cover-letter-v.4.pdf
Independent Science Panel Review: http://deltacouncil.ca.gov/sites/default/files/documents/files/Delta-Science-Independent-Review-Panel-Report-PHASE-3-FINAL-SUBMISSION-03132014_0.pdf

D. Scope of Impact Analysis

The scope of analysis in the Draft EIS does not fully consider upstream and downstream impacts of the proposed actions in the Delta. As evidenced by the intergovernmental response to California's ongoing drought, the state and federal water projects are functionally and physically interconnected. For example, actions that Central Valley Project (CVP) operators take from the Trinity River have implications for South of Delta CVP and SWP deliveries, and operational changes in the Delta require upstream adjustments in project operations. Based on EPA's ongoing discussions with the federal lead agencies, we understand that the U.S. Bureau of Reclamation is continuing to evaluate its broad operational response to the proposed changes in the Delta, for both near term and longer term operations. Upstream operational changes caused by BDCP implementation could have significant environmental and water supply impacts in the upstream areas, and these impacts must be disclosed in the DEIS. Similarly, the BDCP activities are expected to have impacts on downstream aquatic resources in San Pablo and San Francisco Bay, primarily by changing the magnitude and timing of outflow and by altering the mix of contaminant inputs from upstream (see discussion of selenium, above.)

Recommendation: *Explicitly recognize the integrated nature of the watershed and the water supply projects operating in the watershed, and analyze the upstream and downstream impacts, in particular to water supply and aquatic resources.*

E. Integrated Water Management

The BDCP effort has been ongoing since 2006. Initially, its broad goals were (a) the preparation of an HCP for continued operation of the state and federal water projects, and (b) a change in the mode of conveyance of export water through the Delta. As evidenced by the Alternatives Screening Criteria, as well as Water Supply Chapter 5 of the Draft EIS, there is now also a strong water supply *enhancement* component to the BDCP. That is, the project proponents appear to be anticipating that the CEQA Preferred Alternative 4 of the BDCP would result in the same or greater water exports (ranging from a decrease of 1% to an increase of 18%) than would be available in the absence of the BDCP (Table 5-9). Since the goals of a project drive the scope of the alternatives that must be evaluated in the NEPA process (as well as in the subsequent CWA Section 404 permitting process), EPA believes that a more robust discussion and evaluation of the water supply component of this project is warranted in the EIS.

California is moving quickly towards integrated water management, yet it is not clear how, as currently drafted, the BDCP conveyance component is consistent with this approach. Although the Draft EIS acknowledges California's progress in Demand Management in Appendix 1C, demand management is not incorporated into the project alternatives. Alternatives, such as the Portfolio Alternative, that proposed a more comprehensive and integrated approach to meeting the stated dual goals of the BDCP, were not evaluated.

Recommendations: *Explain how the proposed changes in conveyance and exports fit within the larger integrated water management plan for California. Include a more comprehensive consideration of, and response to, suggested alternatives such as the "Portfolio Alternative" and discuss the demand scenario driving the Delta export facilities. Include a consideration of the significant water conservation efforts Statewide and in the export areas.*

F. Habitat Restoration

We are concerned that the analysis assumes a 100 percent success rate for habitat restoration, which is not consistent with our experience, or supported by restoration ecology and conservation biology academic literature and scientific investigation. The potential adverse impacts of CM1 operations would be greater than projected in the DEIS in the likely event that restoration of the Bay Delta ecosystem is not 100 percent successful.

***Recommendations**: Discuss restoration methods, performance metrics, and documented success rates for each habitat restoration type proposed.*

Work with the federal and state wildlife agencies to develop analytical methods to evaluate gradients of partial success for each habitat type. Re-evaluate the impacts of each Alternative (CMs2-11) in light of these gradients and the likely success rates for each habitat restoration type. Incorporate the results into final conclusions about the impacts of BDCP alternatives.

G. Aquatic Species Recovery

Although not explicitly stated in the Draft EIS, the primary premise of the BDCP appears to be the hypothesis that endangered and threatened fish populations in the San Francisco Estuary can be protected from further degradation by habitat restoration without increasing freshwater flow to the Estuary. As noted in the Executive Summary, restoration of more than 150,000 acres of habitat is proposed under most BDCP alternatives. Only moderate changes in freshwater flows (Delta outflow) to the Estuary are proposed under any of the alternatives. In particular, all sub-alternatives for CEQA Preferred Alternative 4) would result in less Delta outflow compared to the No Action Alternative (DEIS Table 5-9).

The habitat restoration-only premise is inconsistent with broad scientific agreement, reflected in EPA's Delta Action Plan[23], that existing freshwater flow conditions in the San Francisco Estuary are insufficient to protect the aquatic ecosystem and multiple fish species, and that *both increased freshwater flows and aquatic habitat restoration* are needed to restore ecosystem processes in the Bay Delta and protect native and migratory fish populations.[24]

The Draft EIS acknowledges the importance of freshwater flow to fish species abundance, but is inconsistent in describing its analyses of the benefits of habitat restoration versus increased freshwater flow. For example, page 11-202, lines 24 to 28 state that "although it is recognized that there are statistically significant correlations between freshwater flow and abundances of several fish species (e.g., Kimmerer 2002, FWS 2005), these correlations were not used in the EIR/EIS analysis to estimate fish population responses to alternatives because they do not directly include the effects of tidal marsh and floodplain restoration on fish populations." Elsewhere (e.g., p. 11-297), the document states that the Kimmerer 2002 model *was* used for the analysis. Correlations that do not include the effects of restoration were rejected for some analyses, but not for others.

***Recommendation:** A consistent approach that recognizes the demonstrated significant correlations between freshwater flow and fish species abundance should be used to analyze all of the Alternatives. Describe the analytical approach and provide the rationale for, and implications of, any deviations from it.*

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[23] http://www2.epa.gov/sites/production/files/documents/actionplan.pdf

[24] This broad scientific agreement is illustrated in the following reports: (a) Public Policy Institute of California (2013) Scientist and Stakeholder Views on the Delta Ecosystem "a strong majority of scientists prioritizes habitat and flow management actions that would restore more natural processes within and upstream of the delta" (p. 2). http://www.ppic.org/content/pubs/report/R_413EHR.pdf
(b) State Water Resources Control Board (2010) Development of Flow Criteria for the Sacramento-San Joaquin Delta Ecosystem Flows Report, p.7. "Both flow improvements and habitat restoration are essential to protecting public trust resources [defined as "native and valued resident and migratory species habitats and ecosystem processes" p. 10].
(c) National Academy of Sciences Natural Resource Council Committee on Sustainable Water Management in California's Bay-Delta (2012) Report: Sustainable Water and Environmental Management in California's Bay-Delta "...sufficient reductions in outflow due to diversions would tend to reduce the abundance of these organisms ["these organisms" = 8 Bay Delta aquatic species at various trophic levels]." Page 60 and "Thus, it appears that if the goal is to sustain an ecosystem that resembles the one that appeared to be functional up to the 1986-93 drought, exports of all types will necessarily need to be limited in dry years, to some fraction of unimpaired flows that remains to be determined." Page 105
(d) California Department of Fish and Wildlife (2010) Quantifiable Biological Objectives and Flow Criteria "...current Delta water flows for environmental resources are not adequate to maintain, recover, or restore the functions and processes that support native Delta fish." Page 1 in Executive Summary

H. Project-level Decision-making

The Draft EIS indicates that it provides a *project level* analysis of the proposed changes in conveyance (CM1) and a *programmatic* analysis of other BDCP elements. The level of engineering detail provided for the tunnels is not commensurate with the level of site-specific information typically provided in an EIS for a project that would require federal permits. For example, actions that would result in impacts to aquatic resources (e.g., grading, dredging, trench and fill, boring, spoils piling, levee work, excavation, etc.) are not detailed or quantified at a project-level of detail (e.g., limited information is provided regarding acres and/or linear feet of estimated impacts to waters of the US, the volume of sediment proposed for disposal sites, or the size and length of intakes, p. 3-92; 3C-3). Where reusable tunnel material sites are estimated for the pipelines and the forebays, they are estimated only for the preferred alternative and "may" be on the order of thousands of acres (p. 3-96). We do not believe the information provided in the Draft EIS is adequate to support a full assessment of the project-level impacts and mitigation opportunities, or to determine whether the project, as proposed, would satisfy requirements for requisite authorizations and permits. Given the lack of project-level information, EPA agrees with the Corps that supplemental NEPA review will be needed before a section 404 permit or CWA section 408 "Letters of Permission" could be issued.[25]

The use of programmatic inputs to project-level analyses in the Draft EIS also substantially limited the predictive power of evaluations that were intended to provide project-level precision. For example, Section 8.4.1.7 "Constituent-Specific Considerations Used in the Assessment" states that the modeling to predict water quality effects (salinity) of CM1 operational scenarios relied on estimates of impacts from implementation of other conservation measures, specifically CM2 (Yolo Bypass Floodplain Restoration) and CM4 (tidal marsh restoration), which are evaluated in the Draft EIS at a programmatic level (p. 8-153). A representative estimate of the location and amount of tidal marsh restoration was used to predict water quality effects under each CM1 operational scenario. The programmatic nature of the CM4 input, which is based on an assumed 100 percent success rate, represents only one potential future configuration of tidal marsh restoration. The actual success rate and physical location(s) of tidal marsh restoration will have varying impacts on water quality elements such as salinity. The representative locations and amounts of CM4 and CM2 that were used for CM1 water supply modeling were not disclosed in the Draft EIS, nor has any feasibility analyses been cited that describes the availability of suitable sites in the restoration opportunity areas. The uncertainties introduced by the use of CM4 programmatic estimates raises concerns over the reliability of water quality modeling results, and whether the analysis presented in the Draft EIS is sufficient to support federal permit decisions.

Despite the substantial impact that the physical location of tidal marsh habitat restoration may have on water quality elements such as salinity, the Draft EIS does not describe how the locations for CM4 estimates were chosen or how likely it is that CM4 would result in the targeted amount of restoration (65,000 acres). A tidal marsh restoration success rate of less than 100 percent may yield very different results for predicted salinity values under each CM1 operational scenario. Typical success rates for wetland restoration have been reported to be substantially lower, e.g., on the order of 20-60 percent, and full restoration may require decades[26], yet this underlying uncertainty associated with the predicted salinity values is not characterized in the Draft EIS.

The envisioned CM-1 tunnels would require one of the largest construction projects in the nation, which would occur in the upper portion of a sensitive estuary. The proposed structure includes elements (e.g.,

[25] See Corps comments on the Draft EIS July 16, 2014 and July 29, 2014

[26] J.L. Lockwood and S.L. Pimm (1999), When Does Restoration Succeed? (Chapter 13 in Ecological Assembly Rule: Perspectives, Advances, and Retreats; and Angel Borja & Daniel M. Dauer & Michael Elliott & Charles A. Simenstad (2010) Medium- and Long-term Recovery of Estuarine and Coastal Ecosystems: Patterns, Rates and Restoration Effectiveness, Estuaries and Coasts (2010) 33:1249-1260.

intake facilities and fish screens) that have never been constructed in the Sacramento River at this scale, yet the Draft EIS provides only a qualitative analysis of construction-related water quality impacts. This is inconsistent with the intent of the Draft EIS to support project-level decision making, which necessitates project-level analysis. Assessment of construction-related impacts is a basic element of project-level analysis, yet the Draft EIS provides no quantitative estimates of the amounts of soil, sediment, and contaminants that would be discharged to water bodies during CM1 construction, nor a rationale for not including such estimates. The qualitative description of best management practices does not provide an adequate basis for a lead federal agency to write permit conditions that would be effective in minimizing the water quality impacts of constructing CM1.

Additionally, on page 8-293, in lines 35 to 38, the Draft EIS states that "Alternative 1A would result in similar potential contaminant discharges to water bodies and associated water quality effects to those discussed above for the no action alternative." It is not clear how the impacts on water quality from construction-related activities of building a 35-mile twin tunnel facility, with 5 screened on-bank intakes, would be the same as not building it.

Recommendations: *Provide quantitative information regarding project footprints and estimates of soil, sediment and contaminant discharges during construction, as well as the impacts of those discharges and measures that would mitigate those impacts.*

Provide the level of detailed information necessary to support project-level analyses and permit and authorization decision making, or specify and commit to the additional detailed work and appropriate supplemental NEPA analysis that will need to be done prior to project-level decision making.

Provide confidence intervals around predicted water quality effects of CM1 operational scenarios. Describe the methods used to identify tidal marsh habitat locations for estimating water supply effects of CM1 operational scenarios, and explain the reasons for choosing these locations. Disclose the tidal marsh habitat locations that were used to estimate water supply effects of CM1 operational scenarios. Evaluate water supply effects of CM1 scenarios using several configurations and success rates of CM4 and disclose methods and results.

Provide a summary of tidal marsh habitat success rates reported in academic literature and restoration industry reporting. Include a description of elements that drive restoration success, including location characteristics and restoration actions.

Describe the locations in Restoration Opportunity Areas that exhibit the location characteristics that optimize restoration success, would provide salinity gradient habitat benefits for pelagic native fishes and would protect municipal water supply intakes.

I. Energy Infrastructure

The Draft EIS indicates that DWR will conduct a five-to-seven year Systems Impact Study (SIS) to evaluate the electrical transmission and power needed for conveyance facilities (p. 21-22). This study is projected to be completed in time to procure the necessary power to support construction and operation of the facilities. Based on the Draft EIS, it is not clear whether the SIS could affect the conclusions summarized in the EIS, of the energy needed for the system (Table 21-11 p. 21-34) or to what extent it may influence the procurement and placement of future transmission and associated infrastructure.

Recommendations: *Provide additional details on the purpose of the SIS and how it may affect the assessment of the BDCP's energy needs as well as the procurement and placement of future transmission and associated infrastructure.*

In the absence of the SIS, disclose the assumptions made regarding electrical transmission placement and energy needs for the proposed conveyance facilities and whether the SIS could affect the analysis of environmental impacts.

Clarify, particularly with respect to impacts on terrestrial species, the level of uncertainty involved with future placement, and associated impacts, of the transmission line and related infrastructure pending the completion of the SIS.

Discuss whether the SIS would provide an opportunity to focus procurement of a guaranteed source of 100% renewable energy (e.g., contractually binding agreement) for the BDCP.

J. No Action Alternative

The No Action Alternative assumes that no BDCP actions would be undertaken, and that climate change and sea level rise would occur and water demands and diversions north and south of the Delta would increase, resulting in reduced freshwater flows into the Delta (p. 5-57). Under the No Action Alternative described in the Draft EIS, no action would be taken in response to the impacts of climate change and sea level rise on the Delta.

EPA supports the Draft EIS's recognition that climate change and sea level rise would likely result in decreased freshwater flows into and through the Delta and increased salinity intrusion; however, the assumption that, in the face of diminished overall water supply due to climate change, diversions north of the Delta would be allowed to increase seems unrealistic. Similarly, maintaining existing reservoir operations and meeting existing water supply demands is unlikely with the predicted effects of sea level rise and climate change. Comparing the CM1 alternatives to a "No Action" Alternative that assumes that no actions would be taken by *any* party to address climate change-induced reductions in overall water availability has the potential effect of exaggerating the benefits of the CM1 alternatives to the project proponents.

The Draft EIS appears to contradict itself by stating that some of the water supply delivery differences between CM1 alternatives and the No Action Alternative in the year 2060 are "*solely* attributable to sea level rise and climate change, and not to the operational scenarios themselves (emphasis added, p. 5-47, lines 20-23)." This overlooks the significant impact of the CM1 project operational scenarios, which propose exporting volumes of water approximately equal to, or greater than, those exported under existing conditions, regardless of overall water availability. In a future affected by climate change and sea level rise, with less fresh water to allocate among <u>all</u> water users, exports of such magnitude would further reduce water availability for other uses and users.

Recommendations: *Consider and incorporate into the No Action Alternative predictable actions by other parties to address the anticipated effects of increased north of Delta demands, climate change, and sea level rise on water availability. This should include consideration of any measures that would likely be taken to reduce demands both north and south of the Delta.*

Clarify that the comparisons of CM1 alternatives to the No Action Alternative isolate the effects that would be attributable to CM1, and that such effects would occur in the context of increased north of Delta demands, sea level rise, and climate change, not "in the absence of" the effects of those stressors.

K. Impacts to Wetlands

At this time, no Clean Water Act (CWA) Section 404 permit application has been submitted for discharges of dredged or fill material into waters of the United States, including wetlands, associated

with projects described in the BDCP. EPA and the Corps encourage lead agencies to proactively integrate CWA Section 404 regulatory requirements into the NEPA process to streamline environmental review by using NEPA documents for multiple permitting processes. With this in mind, EPA and the Corps met with the lead and federal state agencies multiple times over the past several years in the interest of using the BDCP EIS/EIR to inform Corps' CWA 404 regulatory decisions. Although constructive and informative, those meetings did not result in an agreement to coordinate the NEPA and CWA 404 permit reviews.

Information provided in the Draft EIS and through meetings with the lead agencies illustrate that there are substantial challenges to finding that discharges associated with Alternative CM1 are consistent with the CWA Section 404(b)(1) Guidelines. In addition, the Draft EIS acknowledges that additional analyses for NEPA may be required to support Corps CWA Section 404 permit decisions for CM1 and that additional NEPA work will be done for other conservation measures (p.1-13). The Corps also submitted comments on the Draft EIS verifying that the Draft EIS does not provide the site-specific information necessary to form the basis for a permit decision, and we agree with that comment.[27]

Recommendation: *Demonstrate that the proposed project would meet the requirements for a CWA section 404 permit.*

Wetland Extent and Jurisdiction (Section 12.3.4)
The accuracy of the CWA jurisdictional determination and estimates of impacts to jurisdictional waters need to be improved for project-level analysis. The Draft EIS is intended to provide project-level information for CM1. However, the BDCP applicants were not able conduct field delineations of wetlands and waters of the U.S. Instead the extent of wetlands and other waters in the study area was determined primarily using aerial photography interpretation in a GIS with limited (26 sites) field delineations (p. 12-146). However, the Draft EIS does not provide an estimate of GIS-based mapping accuracy as compared to the on-the-ground mapping. The Draft EIS also states that the extent of impacts to jurisdictional wetlands and other waters is likely an overestimate because actual construction footprints will be smaller than presented in the document and because some mapped wetlands and waters could be non-jurisdictional (p. 12-147). However, in some areas, when compared for other projects (e.g., Delta Wetlands project EIS) the extent of potential wetlands and waters mapped for BDCP is substantially lower. While the extent of ground disturbance may be overestimated in the document, it is likely that the extent of wetlands and waters have been substantially underestimated.

Recommendations: *In Section 12.3.2.4, clearly describe how the GIS-based mapping compared to the field delineations and provide an estimate of GIS mapping accuracy. Use available approved wetland delineations from other projects to supplement the GIS mapping.*

Identify a schedule for improving delineation methods completing wetland delineations on sites where DWR has access or can reasonably obtain access. Estimate direct fill impacts and secondary effects to waters using engineering drawings and cross sections.

L. Air Quality Impacts

General Conformity
The Draft EIS discloses that this project would generate emissions within multiple air basins that are federally designated as nonattainment for ozone, PM2.5 (particulate matter smaller than 2.5 microns), and/or PM10 (particulate matter smaller than 10 microns); as well as designated maintenance areas for

[27] See Corps comments on the Draft EIS July 16, 2014 and July 29, 2014

carbon monoxide (CO; p. 22-13, Table 22-4). The Draft EIS states that general conformity to the State Implementation Plan (SIP), with regard to all of these pollutants except CO, would be demonstrated through the use of a combination of mitigation measures and the purchase of offsets. For CO, conformity would need to be demonstrated through the use of local air quality modeling analyses (i.e., dispersion modeling).

The availability of sufficient offsets to demonstrate conformity for the BDCP may be limited. EPA is aware that other construction projects scheduled to take place in the BDCP project area during the BDCP's proposed construction time frame also include the purchase of offsets to demonstrate conformity. For example, two segments of the California High Speed Rail project scheduled to be constructed in the San Joaquin Valley Air District are currently pursuing a significant amount of offsets for several criteria pollutants.

The Draft EIS is not clear as to whether the federal lead agencies have made a general conformity determination. To the extent there is information regarding conformity, the Draft EIS also appears to rely on qualitative, not quantitative information. EPA interprets the general conformity rule as including all direct and indirect emissions from the federal action; therefore, the emissions from all conservation measures required as part of this federal action should be quantified and evaluated in the general conformity determination.

Recommendation: *Demonstrate that all direct and indirect emissions of the federal action, including all required conservation measures, would conform to the applicable SIPs and not cause or contribute to violations of the National Ambient Air Quality Standards (NAAQS).*

Continue to work closely with the local air districts to secure legally binding offset agreements and complete the general conformity determinations.

Include the Draft General Conformity Determination either as a detailed summary or as an appendix, and the previously referenced "Conformity Letters."

IV. Additional Issues

A. Alternatives

The reason for including maximum pumping capacity (10,600 cfs) for the State Water Project's Banks Pumping Plant in all CM1 alternatives that include north Delta intakes is not clear. The existing pumping restriction for Banks Pumping Plant for the gates of Clifton Court Forebay is intended to minimize erosive forces. Section 5.2.1.3 refers to the Corps of Engineers' Public Notice for the Bank Pumping Plant, which states that that additional permitting for the SWP's diversions would not be required so long as the SWP did not exceed a diversion of 13,250 acre feet (daily and 3-day running average). It is not clear that the Corps' goal of minimizing erosion would be met by full pumping capacity operation.

Recommendations: *Describe the Corps of Engineers' pumping restriction for the Banks Pumping Plant. Describe the circumstances under which the Banks pumping plant would be able to pump at maximum capacity, and why erosion would no longer be a significant effect from pumping.*

The description of CM2 (Yolo Bypass fisheries enhancement) in Section 3.6.2.1 (p. 3-122) does not contain information about the amount and location of planned restoration activities, disclosure of targeted flood frequency, or a description of how CM2 differs from what is already required of the Bureau of Reclamation by the 2009 NMFS Biological Opinion, Section I.6.1 (page 34 in the 2009

Biological Opinion with 2011 amendments). That Biological Opinion requires Reclamation to "provide significantly increased acreage of seasonal floodplain rearing habitat, with biologically appropriate durations and magnitudes, from December through April, in the lower Sacramento River basin, on a return rate of approximately one to three years, depending on water year type." The Biological Opinion indicates that the amount of floodplain restoration should range between 17,000-20,000 acres (excluding tidally-influenced areas), with appropriate frequency and duration.

It is EPA's understanding that CM2 is evaluated programmatically and subsequent NEPA document(s) will further define aspects of this alternative. Indeed, the Bureau has already collected scoping comments for the development of an EIS specific to CM2. It is not clear how programmatic information from this Conservation Measure was used to inform project-level impact determinations for Chapter 5 through Chapter 11 in the current Draft EIS.

Recommendations: *Provide additional available information about the planning of CM2, including floodplain acreages, frequency and duration of estimated inundation, and maps of potential locations of restoration sites.*

Summarize the potential overlap between CM2 and Section I.6.1 of the 2009 Biological Opinion so that the reader is informed about the existing requirements under Section 7 of ESA and how actions taken or proposed pursuant to the Biological Opinion may be modified by the BDCP.

Indicate whether additional water would be needed to flood the Yolo Bypass and, if so, where the water would come from.

Explain how programmatic information drawn from this Conservation Measure was used to inform project-level impact conclusions for water supply and water quality.

Recent floodplain habitat loss over the last few decades is listed as one of the reasons for proposing CM2, however, floodplain habitat loss has been occurring for more than a few decades.

Recommendations: *Provide a broader description of long-term floodplain habitat loss over a 100 year timeframe and describe how it has affected fisheries populations, with appropriate citations.*

It does not appear that a feasibility analysis was conducted to determine the availability of lands for restoration within the Restoration Opportunity Areas for CMs 2, 4-11. We understand that much of this information is confidential; however, there are multiple other draft HCP efforts moving forward that overlap with the project area, creating the potential for restoration planning conflicts on the same parcel of land.

Recommendation: *Conduct an analysis of areas that support each type of proposed habitat restoration in each of the Restoration Opportunity Areas and develop criteria for prioritizing acquisition based on potential restoration success and availability. Consider the other draft HCP efforts that overlap or are immediately adjacent to the project area to identify potential conflicts on restoration areas.*

The Draft EIS does not include a comprehensive description of the CVP and SWP with and without new north Delta intake facilities or through-Delta operations. Such information is needed to assist the reader in understanding how the water delivery system operates under Existing Conditions and how it would change under CM1 alternatives.

Recommendation: *Include a description of existing CVP and SWP operations in the Chapter 3 discussion of the No Action alternative, including how operations would change or remain static under each proposed alternative.*

The North Delta Bypass rules are difficult to understand and should be more clearly explained, particularly in the context of how flows occur currently (p. 3-181-3-209). Listing the rules does not enable the reader to understand how the new facilities would operate within the CVP and SWP system and, subsequently, how the new rules could modify the Sacramento River where new intakes would be placed and operated.

Section 3.6.4.2 provides only an annual average of how often the north Delta intakes would be used versus the south Delta intakes. For the reader to understand how the system would work, information about the potential timing, frequency, and duration of operation of each of the pumps throughout the year would be more useful.

Recommendations: *Provide information and references that describe current CVP and SWP operations. Describe modifications to reservoir operations to avoid dead pool conditions for all alternatives.*

Clearly state that BDCP's North Delta Bypass rules are intended to protect flows from only one storm pulse or, potentially, two storm pulses if the first storm arrives before December 1st. Explain that subsequent storm pulses (that are important fish cues for migration) can be exported after BDCP's new operational rules have been met.

Provide information about the potential timing, frequency, and duration of operation of each of the pumps throughout the year, including when and the conditions under which each pump would be used alone or simultaneously with the other.

Provide information about Sacramento River flows to put the North Delta Bypass rules in context. For example, describe how often flows are at the levels used as thresholds in the bypass rules to help the reader to generally understand how much flow would remain in the river versus be diverted into the new intakes. Also provide exceedance curves of Sacramento River flows and the Post Pulse Water Operations for each CM1 alternative, and consider including a chart that summarizes information in Table 3-16 (p. 3-183) describing Post Pulse Water Operations, and include Sacramento River flows for comparison.

The Export/Import ratio (also known as Export Limits in Table 3 of the Water Quality Control Plan) does not necessarily solely apply to the south Delta or explicitly exclude new points of diversion. The description of how the export/import ratio from the 1995 Bay-Delta WQCP is included in operational requirements and impacts from the CM1 alternatives (p. 3-32) may not be consistent with the description of the E/I ratio as interpreted by NMFS.[28]

Recommendation: *Describe how the E/I ratio was used in evaluations of each operational scenario for the alternatives. If the approach ultimately used in the analysis differs from the D-1641 approach, explain the reason(s) for, and implications of, using the different approach.*

[28] See NMFS Progress Assessment p. 10
http://baydeltaconservationplan.com/Libraries/Dynamic_Document_Library/NMFS_Progress_Assessment_Regarding_the_BDCP_Administrative_Draft_4-11-13.sflb.ashx

State whether or not project proponents will request that the State Water Board modify the existing E/I water quality standard so it does not apply to the north Delta intakes and describe the process for having that modification approved.

Information that provides context for the Fremont Weir and Yolo Bypass Operational Criteria should be provided in the section that generally describes these operational criteria (p. 3-187). In the absence of context, it is unclear how the rules would change. For example, with no information about how often Sacramento River flows at Freeport are expected to be greater than 25,000 cfs, it is unclear how often the 17.5 and 11.5-foot elevation gates would be open and how often the Yolo Bypass floodplain restoration work would provide benefits to aquatic life using these resources.

Recommendations: *Provide cumulative distribution curves that show expected flows at Freeport under each CM1 alternative for each type of water year. Discuss the curves in the text and identify the median frequency at which Sacramento River flows at Freeport are expected to be greater than 25,000 cfs.*

Provide maps showing Yolo Bypass inundation of 3,000 to 6,000 cfs.

The Fremont Weir is described as a necessary component of CM1; however, the Draft EIS states that "CM2 is a programmatic element that will be further developed and analyzed in future technical and environmental reviews." The impacts associated with this element are not estimated and disclosed in the Draft EIS. For example, although Fremont Weir gate operational rules were developed for the purposes of modeling, the impacts of the proposed operation of the Fremont Weir do not appear to have been analyzed. Without such analysis, the impacts of CM1 cannot be fully evaluated.

Recommendation: *Describe the updates to Fremont Weir that would take place under all of the Alternatives.*

The Rio Vista Minimum Instream Flow Criteria shown on p. 3-188 are substantially different from the Rio Vista flow criteria in the 2006 Bay-Delta WQCP, which are implemented through water right permit D-1641. It is not clear how the BDCP process would result in a change to the Bay-Delta WQCP water quality standards and the water right permit.

Recommendations: *Describe the Rio Vista flow criteria in the 2006 Bay-Delta WQCP and the D-1641 permit requirements. Describe the difference in flows proposed by the BDCP and explain how they would be attained.*

If it is anticipated that water quality standards would be modified subject to a request connected to the implementation of BDCP, describe the process by which the modification would be requested and processed by the State Water Board.

The discussion in Section 5.2.2.2 "The Revised Water Quality Control Plan (2006)" does not reflect substantial work the State Water Board has completed or undertaken relevant to the 2006 Bay Delta WQCP, including the 2009 Triennial Review and its conclusions, the 2010 Flow Criteria Report, and the Phase I and Phase II Updates to the 2006 Bay-Delta WQCP. These updates include potential modifications to San Joaquin River tributary and lower San Joaquin River flows, Delta outflow objectives, export/inflow objectives, Delta Cross Channel Gate closure objectives, Suisun Marsh objectives, potential new reverse flow objectives for Old and Middle Rivers and potential new floodplain habitat flow objectives. Under recent state legislation, the State Water Board will also be evaluating changes to outflow requirements for major Delta tributaries. Although the outcome of these

State Water Board regulatory processes is unknown at this time, it is reasonable to expect that all will have significant impacts on BDCP planning and implementation.

Recommendation: *Summarize the current status of the State Water Board's update to flow objectives, including export limits and minimum Delta outflows. Updated objectives should be considered in the impacts analyses, and the document should describe how any proposed or pending updates to flow standards may affect the analyses and the implementation of the BDCP. Describe the mechanisms that would be in place in the BDCP, the Implementation Agreement or other BDCP agreements to assure implementation of future SWRCB water quality and water rights actions.*

B. Water Supply

We are concerned that the "Overview of California Water Demand" discussion in Section 5.1.1.3 provides an incomplete summary of water demand in California. For example, population growth is discussed as a reason for increasing urban water demand (p. 5-4); however, there is no reference to the statewide mandate to increase water efficiency 20% by the year 2020 for urban water uses, which is discussed in appendices to other chapters. Details are not provided regarding the rate of urban water demand growth or estimated urban water demand and use, and no basis other than population growth is provided for the conclusion that water demands will increase. Similarly, the importance of water to the agricultural economy is discussed (p. 5-4); however, there is no discussion about the importance of water to other economic sectors.

Municipal and industrial (M & I) demand north of the Delta was estimated by assuming full build out of facilities associated with water rights and contracts north of the Delta, primarily to meet projections of increasing urban water demand (p. 5-57). It is not clear whether the 81% estimated increase under the No Action Alternative, compared to Existing Conditions, takes into consideration the required water efficiency efforts for municipal and industrial water use (see table 5-8). This is important because "increased system demands by water rights holders, especially in El Dorado, Placer, and Sacramento counties" is identified as a reason for projected decreases in reservoir storage and CVP and SWP deliveries under the No Action Alternative (p. 5-61 through 5-64). An overestimation of M & I demand would result in exaggerated projected decreases in water availability for those other uses.

Recommendations: *Modify Table 5-1 to include sectors of consumptive water use, average water use in each category, and estimated rates of growth in each category.*

Summarize the information in Table 5-1 in the text of Section 5.1.1.3.

Provide an overview of water demand in California that summarizes water use by sector (e.g., urban, agricultural, industrial), discloses the economic value generated by each sector, and estimate the rates of water demand growth in each sector.

Clarify whether or not the 2010 urban water efficiency mandate of a 20% reduction in M & I water use by 2020 is included in estimates of future water demand. If it is not included in water demand estimates, explain why it is excluded in the context of the potential impact of overestimating demand on BDCP estimates of water supply effects.

Evaluate water supply effects of CM1 scenarios using several configurations and success rates of CM4, and disclose methods and results.

C. Groundwater

The Draft EIS describes beneficial impacts on groundwater resources for some alternatives as a result of CM1 (p. 7-54). It states that for all alternatives, increases in surface water supplies as a result of BDCP would result in diminished use of groundwater (p.7-84); however, no documentation is provided to support this assumption.

The Draft EIS states that groundwater use in the San Joaquin River area is estimated to be between 730,000 and 800,000 acre-feet per year, which exceeds the basin's estimated safe yield of 618,000 acre-feet per year and that each groundwater basin has experienced some overdraft (p.7-18). The Draft EIS also states that the estimated overdraft is between 1 and 2 million acre-feet annually, with many basins in Tulare Lake Basin in critical condition (p.5-4). The Draft EIS assumes that these overdrafts would stop after implementation of the BDCP. On the contrary, we believe it is reasonable to expect that provision of more water could result in more water being used, including as much groundwater as allowed, rather than in strict substitution of surface water for groundwater. Without management of groundwater resources, it is not clear that the pressure on groundwater resources would be diminished as a result of the BDCP.

Recommendations: *Explain the basis for the assumption that increases in surface water supplies would result in diminished use of groundwater. The likelihood and potential impacts of increased use of surface water supplies for aquifer storage and recovery should be discussed.*

Consider development of a mitigation measure to address management of groundwater resources in the southern San Joaquin Valley.

D. Water Quality

Reporting methods for the chloride and EC analyses may partially obscure conclusions about the predicted range of salinity intrusion, chloride, and EC concentrations for existing conditions, the No Action Alternative, and CM1 alternatives. The chloride modeling analysis (Appendix 8G) provides a 16-year average of estimated chloride concentrations, a 5-year drought average chloride concentration, and a percent exceedence of the minimum health objective of 250 mg/L chloride. Combining 16 years of water quality data and reporting the average omits the predicted range of maximum mean daily chloride concentrations predicted for each of the compliance points under various alternatives compared to their baselines. Averages can mask the severity of chloride and EC concentrations by allowing wet years with lower salinity (chloride and EC) levels to balance dry years with higher salinity concentrations. The 5-year drought average provides some indication for time periods when increased salinity concentrations are expected; however, elevated EC and chloride concentrations at certain compliance points may also occur in above normal and below normal years following dry years.

The reason for, and consequences of, constraining the water quality analysis by using a 16-year hydrology modeling period is not described in the Draft EIS nor its appendices. The 16-year hydrology period extends from 1975 to 1991 and includes a drought period and the highest water year recorded in recent decades (1982). If this hydrology period is different than other periods that could have been chosen or the entire 82-year period available for modeling, results of the water quality analysis may be inaccurate.

Recommendation: *Explain why the 16-year period was used and the 82-year period was not used, and describe the potential impacts on the precision of the water quality effects predicted by the modeling exercise reported in the Draft EIS Chapter 8 appendices and summarized in the text of the Draft EIS. Compare the 16-year hydrology period (1975-1991) to the entire hydrology period available, disclose*

that comparison to the public and decision-makers, and explain how the smaller time period may influence water quality predictions.

The assertion that water demand will go down in the Tulare basin, in the face of large increases in population, is not thoroughly supported (p. 30-31). This is stated to be the expected result of a decrease in agriculture (now using 82% of the water p. 30-32), but it is not a given that the acreage in agriculture would decrease when additional water resources become available as a result of BDCP. Rather, increases in both population and agriculture are plausible.

Recommendations: *Include a discussion of growth that considers the potential for increases in both urbanization and agricultural development in response to increased reliable water supplies, and that addresses the entire San Joaquin Valley. Include an explanation of why additional water resources are needed (p. 5-4) if projected urbanization would use less water (p. 30-11).*

Water Quality Impact Conclusion WQ-26 (effects on selenium concentrations resulting from restoration activities) lists impacts before mitigation, as "Less Than Significant." After mitigation, conclusions are "Less Than Significant" and "Not Adverse." Analysis of residence time for planned remediation efforts is not quantitative and, therefore, lacks sufficient resolution to substantiate impact conclusions.

Recommendation: *Re-analyze Impact WQ-26 based on quantitative measures of residence time and selenium bioaccumulation that: (1) include specificity of locations and species, and (2) reflects current science that assesses the Delta as one interconnected system physically and biologically.*

Consider making the environmental commitments for selenium in restored areas a high priority by addressing these impacts within the main water quality and aquatic resources part of the EIS. Clearly identify the potential impacts of using water supplies containing selenium for wetlands with high residence times and selenium risks to fish and wildlife.

Selenium bioaccumulation modeling for sturgeon is shown in Appendix 8M2, but an impact conclusion is not listed within the category of impacts to white and green sturgeon (e.g., AQUA-136). Other identified species considered of concern in terms of selenium effects, for which no conclusions are provided, are diving ducks (scoter and scaup), clapper rail, salmonids (Chinook salmon, steelhead) and splittail.

Recommendations: *Provide an impact analysis for these species, and add impact conclusions for these species to the category of Fish and Aquatic Resources impacts.*

Illustrate and conceptualize mixing of selenium sources. Document representativeness of sites to selenium modeling to enable coordination of site locations to modeling predictions.

Perform selenium bioaccumulation modeling to specifically address the potential for (1) less Sacramento River flow (i.e., less estuary dilution and increased residence times), and (2) more San Joaquin River flow (increased Se loads or concentrations) entering the Plan Area. Perform an analysis that is both species-specific and location-specific, and develop habitat-use and life-cycle diagrams to inform the selenium modeling. Identify the times and places of greatest ecosystem sensitivity to selenium as outcomes of the modeling and relate the outcome to the entire plan area. Add selenium bioaccumulation modeling of additional fish and bird species to identify the predators with the greatest selenium exposure within fish and bird communities. Development of a comprehensive set of enrichment factors to relate dissolved selenium concentrations to suspended particulate material selenium concentrations would address the uncertainty in this step of selenium modeling.

The data sets that were used to model selenium in sturgeon and derive impacts are not spatially and temporally matched. Locations in the western Delta are ecologically and hydrologically disconnected from the Bay, where effects to sturgeon are known to be greatest.[29]

Recommendation: *Consider comprehensive sturgeon habitat and cumulative effects in selenium modeling and impact analysis.*

The multiple times that eutrophication is mentioned on page 8-70 (Section 8.2.3.1.0 Nitrate/Nitrite and Phosphorous) may suggest to some readers that the San Francisco Estuary is suffering from large-scale eutrophication. Currently, eutrophication is not one of the major stressors negatively affecting the open waters of the San Francisco Estuary.

Recommendations: *Clarify that monitoring shows that the open waters of the San Francisco Estuary do not show signs of large-scale eutrophication and that anoxic waters and sediment are not commonly reported in the Estuary. Identify the sites with demonstrated low dissolved oxygen problems and describe the extent to which nutrients, subsequent algal blooms, and microbial respiration contribute to low DO problems in the Estuary.*

Discuss the lack of diatom algal blooms as a stressor in the Estuary and the relationship between nutrients and the composition of the algal community and subsequent frequency of desired algal blooms. This can be a short summary in a few sentences and can refer to other locations in the document where nutrients and algal community composition is discussed in more detail. See http://www.sfestuary.org/pea-soup/ for more information.

E. Fish and Aquatic Resources

The temperature analysis does not provide biologically meaningful temperature estimates for Chinook salmon and, potentially, other fishes. The majority of temperature estimates are calculated using models that predict monthly average temperatures which can obscure the occurrences of daily temperatures fluctuating above life stage impairment and lethal thresholds for Chinook salmon and other fishes. Daily temperatures are estimated for the mainstem of the upper Sacramento River in the segment downstream of Keswick dam because a model with a daily time unit of analysis is available for this exercise (Sacramento River Water Quality Model). Temperature models with a daily time unit are not yet available for the Feather, American, lower Sacramento, and Trinity Rivers, but we understand Bureau of Reclamation is developing daily temperature models as part of the OCAP Biological Opinion remand process. Completion of these models should be prioritized and used in any additional analyses to provide meaningful estimates of temperature impacts to fishes.

Recommendations: *Estimate potential temperature impacts when updated models become available. Identify temperature thresholds for specific life stages based on NMFS recommendations and other available guidance; for example, EPA temperature criteria. Identify mitigation measures that would minimize adverse temperature conditions.*

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[29] (1) Linares, J., Linville, R. Eenennaam, JV, Doroshov, S. 2004 Selenium effects on health and reproduction of white sturgeon in the Sacramento-San Joaquin estuary. Final Report for Project No. ERP-02-P35.
(2) Linville RG 2006 Effect of excess selenium on the health and reproduction of white sturgeon (*Acipenser transmontanus*): Implications for San Francisco Bay-Delta. Ph.D. dissertation, University of California, Davis, CA 232 pp.
(3)Beckon, WN & Maurer, TC, 2008 Species at Risk from Selenium Exposure in the San Francisco Estuary. Final Report to the US EPA IAA No. DW14022048-01-0.
(4) Presser TS and Luoma SN 2010 Ecosystem-Scale Selenium Modeling in Support of Fish and Wildlife Criteria Development for the San Francisco Bay-Delta Estuary, California USGS Administrative Report.

EPA Region 10 developed EPA Guidance Criteria for Water Temperature[30] to assist States and Tribes in adopting water quality standards for the protection of coldwater salmonids. The guidance criteria provide an averaging period for temperature targets and would be an appropriate benchmark against which to evaluate estimated impacts from CM1 alternatives, in addition to the evaluated criteria summarized in Table 11-1A-11.

Recommendation: *Compare impacts from CM1 and other CMs with the potential to impact water temperatures to EPA Guidance Criteria for Water Temperature to provide an additional metric for estimated impacts to Chinook salmon.*

The Draft EIS assumes that state-of-the art fish screens would function in a way that results in minimal to zero entrainment, but provides no evidence that these screens would completely or almost completely prevent entrainment of larval, juvenile, or adult covered fishes. No details are provided regarding the design or operation of the proposed fish screens.

Recommendation: *Explain how the proposed fish screens would prevent entrainment of all life stages of covered fishes. Describe the entrainment thresholds that would trigger reduced pumping at the North Delta Diversion intakes, and mitigation strategies for minimizing entrainment if the fish screens do not function as anticipated.*

The construction analysis relies on Best Management Practices for concluding that potential impacts to aquatic species would not be adverse. The construction is estimated to span ten years, coffer dams are expected to be constructed simultaneously, and potentially increasingly severe weather conditions during the ten-year construction period are likely to challenge the most effective Best Management Practices. Additionally, some of the equipment that would need to be constructed (including the dual 40 foot wide tunnel boring machines) would be some of the largest in the world and the Best Management Practices that have been designed for more conventional construction projects may not be applicable or effective as anticipated.

Recommendation: *Describe options for minimizing construction impacts in the event that BMPs do not perform as anticipated or completely fail, given the size and scale of the construction.*

NEPA effects determinations used in Chapter 11 include: beneficial, not adverse, adverse, and no determination. These terms are not defined nor are thresholds for selecting among them identified. The reader is not provided with an indication or description of the magnitude of estimated positive or negative impacts or uncertainty associated with each conclusion.

Recommendation: *Define the NEPA conclusions and provide thresholds -- quantitative when possible -- for each category so that it is clear why some estimated impacts result in a NEPA conclusion.*

Multiple indicators are used to evaluate impact and derive NEPA Effects determinations; however, the Draft EIS does not describe how each indicator was used to support the NEPA effects determination. For example, AQUA-42 Effects of Water Operations on Conditions for Chinook salmon (Winter-Run ESU) uses nine indicators to determine the overall effect of CM1 alternatives on adult and juvenile migration for winter run Chinook salmon. We have summarized key information from this section in the following table:

[30] http://www.epa.gov/region10/pdf/water/final_temperature_guidance_2003.pdf

AQUA-42 Effects of Water Operations on Conditions for Chinook salmon (Winter-Run ESU)

Migration Indicators	Alt 1	Alt 4	Alt 7	Alt 8
Upstream of Red Bluff flow during juvenile emigration period (Nov – August)	Similar to No Action Alternative (NAA) July & October + 36% Aug, Sept, & Nov -44%	Similar to NAA November 5-18% lower	Similar to NAA November -14%	Flows 26% lower than NAA
Monthly mean temperature between Keswick and Bend Bridge (Nov – Aug)	Less than 5% difference in monthly mean T relative to NAA	Less than 5% difference in monthly mean T relative to NAA	Less than 5% difference in monthly mean T relative to NAA	Less than 5% difference in monthly mean T relative to NAA
Flow during adult migration (Dec – Aug)	Similar to NAA; August flows could be 19% lower.	Similar to NAA but May & June +12%	Similar to NAA or greater w/ few (unstated) exceptions.	Similar to NAA but up to 18% lower in July and August
Monthly mean T btw Keswick and Bend Bridge (Dec – Aug)	Less than 5% difference in monthly mean T relative to NAA	Less than 5% difference in monthly mean T relative to NAA	Less than 5% difference in monthly mean T relative to NAA	Less than 5% difference in monthly mean T relative to NAA
Through-Delta Monthly mean flows downstream of NDD	10-31% lower than NAA	11-23% lower than NAA	25% lower than NAA	15% lower than NAA in November
Predation at intakes % of annual juvenile production (2 methods)	9%-3% 18.5%	0.02 – 0.30% 12%	0.02 – 0.30% 12%	0.02 – 0.30% 11.6%
Habitat loss at intakes	19,000 linear feet 22 acres of habitat	6360 linear feet 12.3 acres	6360 linear feet 12.3 acres	6360 linear feet 12.3 acres
DPM analysis of % survival through the Delta to Chipps	Wet – 45.5% Dry – 26% All – 33.3%	Wet – 45-46% Dry – 25-27% All – 33-35%	Wet – 45% Dry – 26% All – 33%	Wet – 44% Dry – 27% All – 33.5%
Adult migration -- % of Sacramento River-origin water at Collinsville	December – 63% January – 71% February – 67%	December – 66% January – 73% February – 68%	December – 65% January – 73% February – 67%	Results not provided for Alt 8 but a range of 58–71%
NEPA Effects Determination	**Adverse**	**Not Determined**	**Not Determined**	**Adverse**

It is not clear whether all nine indicators are considered equal when identifying the NEPA effect determination for migration overall. The monthly mean temperatures do not substantially vary among alternatives, so that indicator appears to be less useful than the others in differentiating between the alternatives. Some indicators show improved conditions relative to the No Action Alternative, while others show relatively worse conditions. For some indicators, the level of detail that is provided in the text differs from one alternative to another. The narrative descriptions of the multiple indicators in the NEPA Effects paragraphs often highlights different indicators when discussing the NEPA Effects determination, suggesting that some indicators are more important than others, depending on the alternative being evaluated. The reader sees only the summarized results of multiple indicators but cannot ascertain how the information was used to determine NEPA effects.

Recommendation: *Explain how each metric was used, and how the metrics were used in combination, to derive the NEPA Effects determinations, including whether the metrics were weighted in any way. Thresholds that were used to determine the appropriate NEPA Effects conclusion should be disclosed.*

The description of Clean Water Act programs in the Water Quality Regulatory Setting Section 8.3.1.1 (p. 8-112-114) contains a number of errors. For example, it appears to indicate that EPA has delegated its CWA oversight responsibility to the State of California. A useful description of CWA programs and how they operate in the San Francisco Bay Estuary can be found in the US EPA Advance Notice of Proposed Rule-making for Water Quality Challenges in the San Francisco Bay/Sacramento San Joaquin Delta, available at http://www2.epa.gov/sites/production/files/documents/baydeltaanpr-fr_unabridged.pdf pages 11-18.

Recommendation: *Review the description of CWA programs in the San Francisco Bay Delta Estuary and California.*

It appears from the Draft EIS that there could be significant impacts to vernal pools from implementation of CM1 and CM4. Impacts and mitigation for vernal pools are only presented as "vernal pool complex" and it is not clear from the document what percentage of this habitat is vernal pool wetlands (wetted surface area).

The Draft EIS states that implementation of CM4 may result in the loss of 372 acres of vernal pool complex habitat and CM1 could result in up to an additional 37 acres of loss (depending on alternative). With the information in the Draft EIS we cannot assess what proportion of these impacts are to wetlands. The document also states that AMM12 limits removal of "vernal pool crustacean habitat" to 10 wetted acres. However, it is not clear if all vernal pool wetlands are being considered "crustacean habitat." According to the document, these 10 wetted acres of crustacean habitat equates to approximately 67 acres of "vernal pool complex" habitat. The 67 acres of impact allowed by AMM12 is significantly less than the 372 acres of potential loss identified for CM4.

Because the Draft EIS only presents theoretical footprints for tidal marsh restoration under CM4, it is unclear whether CM4 can be fully implemented while limiting vernal pool loss to 10 wetted acres as called for under AMM12. As the Draft EIS acknowledges, vernal pools are a highly sensitive community that has experienced significant loss in California. Yet, only 40 acres of restoration and 400 acres of protection are proposed in the near-term under the plan. Given the potential direct loss identified for CM1 and CM4, and the potential functional loss identified from implementation of CM2, the proposed vernal pool restoration may not be sufficient to meet mitigation needs under CWA Section 404. Mitigation needs cannot be fully assessed until project level information is available for all CMs.

Recommendations: *Clearly state what percentage of the vernal pools complex habitat may be vernal pool wetlands (by wetted surface area). Clarify whether AMM12 applies to all vernal pool wetlands or only vernal pool wetlands occupied by special status crustaceans.*

Clearly state how many acres of vernal pool wetlands may be lost from implementation of CM1 and CM4. Clarify whether it is feasible to fully implement CM4 while limiting vernal pool losses to 10 wetted acres and if there is a tradeoff, please disclose and discuss.

Quantify the potential functional loss to vernal pool habitat from changes in inundation and acknowledge that compensatory mitigation may be required for loss of function even if there is no net loss in area. Acknowledge and address that compensatory mitigation requirements under CWA Section 404 maybe greater than the vernal pool complex restoration and protection proposed under the plan.

Appendix 3B details dredged material (DM) and reusable tunnel material (RTM) disposal and reuse commitments, among other environmental commitments. Neither Appendix 3B nor Chapter 3 details how much DM and RTM will be generated by each alternative; however, Chapter 12 identifies potentially significant impacts to wetlands and waters from disposal of this material. Impacts to jurisdictional wetlands and waters must be avoided and minimized to the maximum extent practicable consistent with the 404 Guidelines. Furthermore, the Draft EIS does not address the Delta Long Term Management Strategy (LTMS)[31] goal to maximize beneficial reuse of DM by setting specific reuse targets for both DM and RTM. Appendix 3B states that material will be placed in multiple storage locations and reused in BDCP projects to the extent feasible, however, there are potentially many other construction and restoration projects in the Delta that could use the DM and RTM. If material will be placed in waters either temporarily or permanently, sediment testing will need to be coordinated with the Corps, EPA, and Regional Water Quality Control Boards.

Recommendations: *Include the volume of DM and RTM in Chapter 3 and Appendix 3B. In Appendix 3B clearly state that placement of DM and RTM must comply with the CWA 404(b)(1) Guidelines, in addition to meeting to BDCP goals.*

Discuss beneficial reuse goals for DM and RTM, including whether material will be made available for reuse in projects within and outside the BDCP.

Discuss whether placement of DM and RTM on peat soils, either temporarily or permanently, will further subsidence and undermine levee stability.

Clearly identify accessibility of placement sites and commit to promoting beneficial reuse of DM and RTM both within and outside BDCP projects.

For any material placed in waters, clarify that sediment testing must be coordinated with the USACE, EPA, and RWQCB.

F. Energy

The Draft EIS states that conveyance facility energy requirements are moderate and would not result in any substantial impacts (p. 21-25). The cumulative impacts analysis concludes that, while the cumulative energy demands of the BDCP, in combination with ongoing and reasonably foreseeable

[31] The San Francisco Bay Long-Term Management Strategy (LTMS) is a cooperative effort of EPA, the US Army Corps of Engineers, the San Francisco Regional Water Quality Control Board, the San Francisco Bay Conservation and Development Commission, and stakeholders in the region to develop a new approach to dredging and dredged material disposal in the San Francisco Bay area. The LTMS serves as the "Regional Dredging Team" for the San Francisco area, implementing the National Dredging Policy in cooperation with the National Dredging Team.http://www.epa.gov/region9/water/dredging/ltms/index.html

future projects, may affect regional resources, the increase attributable to any alternative is not cumulatively considerable, compared to statewide use (300,000 gigawatt-hours) (p. 21-61). A comparison only to statewide use does not provide sufficient context for decision makers and the public to understand the new energy demands associated with the BDCP alternatives and evaluate their potential effects on local and regional energy supplies.

Recommendations: *Include a table showing the current overall energy usage by the CVP and SWP to supply water to the end users, compared to the projected overall energy demand by the CVP and SWP to do the same under the No Action and each of the BDCP build alternatives. Separately, for additional context, compare these projections to recent and reasonably foreseeable development projects, including the High Speed Rail project. Include an evaluation of the effects of each alternative on peak and base period demands, as well as effects on local and regional energy supplies, as recommended by the State CEQA Energy Conservation Guidelines (Appendix F).*

EPA supports the use of gravity-fed tunnels to transport water to minimize net energy use for conveyance to the greatest extent possible. Alternative 4 is designed to take greater advantage of gravity than the other alternatives. According to the Draft EIS, the Department of Energy has estimated that construction of two 40-foot tunnels (Alternative 4) would require about 78% more electrical energy than would be needed for alternatives requiring two 33-foot tunnels (p. 21-31 and Table 21-9); however, since Alternative 4 would eliminate the need for an intermediate low-head pumping plant for flows of more than 9,000 cfs (p. 21-31), Alternative 4 would be able to 'recover' the extra energy used during construction in 25 years. It is not clear why the 33-foot tunnel alternatives do not include gravity-fed designs.

Recommendations: *Discuss the practicability of increasing the energy head (difference in water elevation) between the intermediate Forebay at the north of the Delta and the Clifton Court and Byron Forebays to allow for greater gravity-fed flow through the 33-foot tunnel alternatives. Discuss whether 9,000 cfs could be achieved without the need for intermediate low-head pumping through 33-foot tunnels.*

Consider alternate locations for the intakes, including upstream of the Sacramento Regional Wastewater Treatment Plant, and evaluate whether an increase in the energy head between the alternative north end intake locations and the south end of the proposed conveyance system could decrease net energy use for each alternative.

Include a table that demonstrates, for each alternative, the time that would be needed to 'recover' the energy used during construction. Incorporate into the table any additional alternatives that would minimize net energy use, and the time to 'recover' energy used during their construction. As part of the same table, include the overall energy for construction and operation of the BDCP for the total expected life of the project.

EPA strongly supports the goal, stated in the Draft EIS, to power the BDCP's average 270 megawatt (MW) construction load and 57 MW permanent load with 100% renewable energy (p. 21-33). This would avoid emissions of greenhouse gases and other pollutants associated with the generation of energy from fossil fuels. We find, however, that the Draft EIS defers much of the necessary analysis of renewable energy benefits, challenges, and opportunities to the future development of other documents, and lacks clear commitments regarding procurement of renewable energy. For example, regarding construction, Mitigation Measure AQ-15 in Chapter 22 includes a suite of greenhouse gas emission reduction strategies that would be utilized to develop a future GHG Mitigation Program to reduce construction related GHG emissions to net zero (p. 22-75). At this time, it is unclear which strategies

would comprise the program and whether a commitment would be made to enter into a purchase agreement for 100% renewables (Strategy 1) or temporarily increase renewable energy purchases to offset BDCP construction emissions (Strategy 12).

Regarding operations, Chapter 21 of the Draft EIS explains that the energy needed for pumping water would be provided from a mix of hydro, power purchase contracts, power exchanges and power markets (p. 21-22). The Draft EIS notes that 60% of the State Water Project's (SWP) 2010 load was met by hydro resources, while the remainder of the load was met by a mix of coal power and real-time purchases from the California Independent System Operator's (CAISO) energy market (p. 21-7). According to Chapter 21, the potential for new or expanded electrical power generation facilities is not discussed in the Draft EIS because it will be addressed through SWP power purchase programs (p. 21-33). Similarly, new energy sources to support the potential increased load from the Central Valley Project (CVP) are not discussed in the Draft EIS. It is unknown what type of power source (e.g., renewable, natural gas) would be substituted for the CVP-generated electricity that would be consumed by the project, itself, or to what extent some of additional energy required would be made up with higher efficiency (p. 22-198).

The Draft EIS references DWR's Climate Action Plan, which established near-term (by 2020) and long-term (by 2050) goals of reducing emissions of greenhouse gases throughout DWR's operations -- including those of the SWP -- in part, by increasing the use of renewable energy sources. Similarly, the President's June 2013 Climate Action Plan established a goal for the federal government of consuming 20 percent of its electricity from renewable energy sources by 2020.

Recommendations:
Identify opportunities to power the BDCP conveyance system with renewable energy for the life of the project to demonstrate how the stated goal of powering the anticipated construction and operations energy loads with 100% renewable energy could be met. Consider committing to power construction and/or the conveyance system operations with 100% renewable energy, similar to the CA High Speed Rail (HSR) Authority's commitment to use 100% renewable energy for operation of the HSR. At minimum, commit to ensure that construction and operation of the BDCP facilities are powered by renewable energy sources to the greatest extent feasible.

Discuss whether DWR's Renewable Energy Procurement Plan (REPP) would provide a mechanism to secure 100% renewable sources for construction and operations of the BDCP prior to project approval. Consider adopting an approach similar to the California High Speed Rail Authority's partnership with the National Renewable Energy Laboratory to create and implement a strategic energy plan for the BDCP. Outline the steps that would need to occur, the barriers that would need to be overcome and the potential for partnerships with entities in the vicinity of the Delta that are aiming to achieve similar goals.

Quantify how securing new,100% renewable energy sources for construction and operations of the BDCP would assist DWR in achieving its Climate Action Plan (CAP) goals. Discuss the extent to which hydropower resources will be used to meet the 2020 and 2050 goals in the CAP, and whether larger hydropower generators would qualify.

Discuss the extent to which the CVP is currently being used to meet California's renewable energy goals. To reduce potential indirect effects from substitute electricity for any new CVP energy usage, consider a commitment to ensure that new, renewable sources are secured to compensate for any use of CVP electricity for the BDCP.

Under the "NEPA Effects" section for each alternative in Chapter 21.3.3, the Draft EIS indicates that the use of Best Management Practices will ensure that only high-efficiency equipment is utilized during construction and that all feasible control measures to improve equipment efficiency and energy use are included. Similarly, it is noted that operation of the water conveyance facilities would be managed to maximize efficient energy use, including off-peak pumping and the use of gravity and, therefore, would not result in a wasteful or inefficient energy use. These conclusions are identical for every tunnel conveyance alternative.

Recommendations: *Explain how all of the energy efficiency mitigation measures and Best Management Practices referenced in Chapter 21 would be made an enforceable part of the project's implementation schedule. We recommend implementation of applicable mitigation measures prior to or, at a minimum, concurrently with, commencement of construction of the project.*

With regard to solicitations for future contracts for project construction and operations, consider including the following as energy efficiency requirements:

- *The use of energy- and fuel-efficient fleets;*
- *For construction, the utilization of grid-based electricity and/or onsite renewable electricity generation, to the extent possible, rather than diesel and/or gasoline powered generators;*
- *Using lighting systems that are energy efficient, such as LED technology;*
- *Recycling construction debris to maximum extent feasible;*
- *Planting shade trees in or near construction projects where feasible;*
- *Giving preference to construction bids that use Best Available Control Technology, particularly those seeking to deploy zero emission technologies;*
- *Employing the use of alternative fueled vehicles;*
- *Using the minimum feasible amount of GHG-emitting construction materials that is feasible;*
- *Use of cement blended with the maximum feasible amount of flash or other materials that reduce GHG emissions from cement production; and,*
- *Use of lighter-colored pavement where feasible.*

G. HCP Monitoring and Assessment

The BDCP is a project of such significance, with a reliance on extensive monitoring and technical information, that its development and approval represents an opportunity to advance aquatic resource monitoring for the entire state of California. For several years, EPA and partner state and federal agencies have been advancing a comprehensive monitoring program that supports integration of federal and state aquatic resource permitting for Habitat Conservation Plans (HCPs) and Natural Community Conservation Plans (NCCPs). When implemented as a monitoring program, the framework that has been established will generate information to evaluate site specific and regional outcomes of habitat conservation and aquatic resource mitigation activity. This framework has been created in consideration of the Clean Water Act (CWA) Mitigation Rule (33 CFR Parts 325 and 332; 40 CFR Part 230), the "Five Point Policy" (Addendum to the HCP Handbook), Tenets of a State Wetland and Riparian Monitoring Plan (CA Water Quality Monitoring Council 2010)[32], and Designing Monitoring Programs in an Adaptive Management Context for Regional Multiple Species Conservation Plans[33].

[32] Tenets of a State Wetland and Riparian Monitoring Program. 2010. California Water Quality Monitoring Council (CA Wetland Monitoring Workgroup). (http://www.waterboards.ca.gov/mywaterquality/monitoring_council/wetland_workgroup/docs/2010/tenetsprogram.pdf).

[33] Atkinson, A. J., P. C. Trenham, R. N. Fisher, S. A. Hathaway, B. S. Johnson, S. G. Torres and Y. C. Moore. 2004. Designing Monitoring Programs in an Adaptive Management Context for Regional Multiple Species Conservation Plans. U.S. Geological Survey Technical Report. USGS Western Ecological Research Center, Sacramento, CA. 69 pages. (http://www.dfg.ca.gov/habcon/nccp/publications.html).

At the state level, the 2007 MOU signed by the Secretaries of the California Environmental Protection Agency (Cal/EPA) and the California Natural Resources Agency (Resources Agency) establishes the Water Quality Monitoring Council. The Council now requires the boards, departments and offices within Cal/EPA and the Resources Agency to integrate and coordinate their water quality and related ecosystem monitoring, assessment, and reporting. The Monitoring Council is further aligning state aquatic resource monitoring programs with their federal counterparts in order to develop an integrated monitoring program that addresses the needs of the HCP/NCCPs while providing CWA monitoring data and information that will satisfy the Corps of Engineers, EPA, and the Water Boards.

The primary goal of such a program is to develop a fully integrated monitoring framework (covering ESA, CESA, CWA, and the Porter-Cologne Act) that provides the best available information on the extent of impacts from permitted activities and progress toward achieving conservation targets using common databases to facilitate the sharing of this information across eco-regions and among local, regional, state and federal programs.

The monitoring design for this comprehensive federal/State monitoring program is based on the EPA tiered monitoring approach (http://water.epa.gov/type/wetlands/outreach/upload/techfram_pr.pdf), which has also been adopted by the State, is increasingly used by programs across the country, and is consistent with the tiered approach described by Atkinson et al. (2004)[34]. The Delta Science Plan (dated 12/30/2013 and found at http://deltacouncil.ca.gov/science-program/delta-science-plan) describes a process by which this monitoring approach could be developed and implemented, including sections on adaptive management, data management, modeling, and communication. EPA strongly supports the recommendations in the Delta Science Plan.

Recommendation: *Discuss how the BDCP mitigation monitoring and reporting program will be consistent with the federal and State efforts discussed above.*

[34] Ibid

To: Rader, Cliff[Rader.Cliff@epa.gov]
Cc: Hanf, Lisa[Hanf.Lisa@epa.gov]; Goforth, Kathleen[Goforth.Kathleen@epa.gov]
From: Johnson, Kathleen
Sent: Mon 8/25/2014 3:47:47 PM
Subject: FW: Request for Extension of Time to Comment on BDCP DEIS

Here is the notification. I left you a vmail. At this point, we plan to issue the comments end of today and post to our web on Thursday. I should hear back from jared today with any comments on the letter.

Kathleen H. Johnson

Director, Enforcement Division

U.S. EPA - Region 9

75 Hawthorne Street ENF-1

San Francisco, CA 94015

415/972-3873

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From: Ryan Wulff - NOAA Federal [mailto:ryan.wulff@noaa.gov]
Sent: Monday, August 25, 2014 8:24 AM
To: Goforth, Kathleen
Cc: mbanonis@usbr.gov; lori_rinek@fws.gov; letty_belin@ios.doi.gov; Blumenfeld, Jared; Kopocis, Ken; Johnson, Kathleen; Diamond, Jane; Hagler, Tom; Hanf, Lisa; Skophammer, Stephanie; Foresman, Erin; Giles-AA, Cynthia; Bromm, Susan; Ren Lohoefener; David Murillo; Bezdek, John; Peg Romanik; Deanna Harwood; Will Stelle - NOAA Federal
Subject: Re: Request for Extension of Time to Comment on BDCP DEIS

Dear Kathleen,

I am writing to formally notify you that the state and federal lead agencies will publish a Recirculated Draft BDCP, Supplemental EIR/EIS, and revised Implementing Agreement in early 2015. The scope of the partially recirculated draft and supplemental documents will be announced in approximately 6 to 8 weeks, as the agencies are still reviewing comments received during the public review period. A press release announcing all of these points will also go out this Thursday, August 27th and be posted on the BDCP website.

Please let me know if you have any questions, comments or concerns.

Regards,
Ryan

On Mon, Jul 28, 2014 at 9:43 AM, Will Stelle - NOAA Federal <will.stelle@noaa.gov> wrote:

Dear Kathleen,

We have received your request to allow EPA to have another 30 days to submit your comments on the draft Bay Delta Conservation Plan and associated draft Environmental Impact Statement/ Environmental Impact Report. On behalf of the the three co-lead federal agencies, we are writing to notify you that your request has been granted. We look forward to receiving your comments by August 28, 2014. Should you have any further questions or concerns, please don't hesitate to contact us.

Sincerely,

Will Stelle on behalf of NOAA, FWS and the BOR

On Fri, Jul 25, 2014 at 3:24 PM, Goforth, Kathleen <Goforth.Kathleen@epa.gov> wrote:

Mr. Wulff:

Thank you for the opportunity to meet yesterday in Sacramento to discuss the major issues that EPA has identified in our review of the Draft Environmental Impact Statement for the Bay Delta Conservation Plan. As discussed during that meeting, there are a number of matters that we would like to follow up on with you and the other federal lead agency representatives. Accordingly, EPA requests an extension of 30 days to submit our comments on the Draft EIS.

We appreciate your consideration of this request and look forward to hearing from you on Monday.

Kathleen Martyn Goforth, Manager

Environmental Review Section

EPA Region 9 (ENF-4-2)

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--

William W. Stelle, Jr.

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*

July 29, 2014

Ryan Wulff
National Marine Fisheries Service
650 Capital Mall, Suite 5-100
Sacramento, CA 95814

Sent via U.S. Mail and via email to BDCP.Comments@noaa.gov

RE: Comments on the Draft Bay Delta Conservation Plan and DEIS/DEIR

Dear Mr. Wulff:

On behalf of Defenders of Wildlife, the Natural Resources Defense Council, and the Bay Institute, and our combined membership and activists, we are writing to submit comments on the draft Bay Delta Conservation Plan ("Draft Plan") and associated Draft Environmental Impact Report and Draft Environmental Impact Statement ("DEIS/DEIR").

As you know, our organizations have dedicated countless hours over the past 8 years working on the Bay Delta Conservation Plan ("BDCP"). Our organizations supported the 2009 Delta Reform Act, which we continue to believe establishes a road map for a successful plan for achieving the co-equal goals of a more reliable water supply and protecting and restoring the health of the Delta ecosystem in a manner that protects and enhances the Delta's unique cultural, agricultural, and other values as an evolving place. And in early 2013, our organizations proposed and requested that the DEIS/DEIR analyze a Portfolio Alternative that included new conveyance in the Delta and new storage south of the Delta, in combination with significant investments in local and regional water supplies.

Unfortunately, as we discuss on the pages that follow, we find that the Draft Plan and DEIS/DEIR fail to meet the standards established in the Delta Reform Act and other applicable state and federal laws. In particular, our review finds that:

- The DEIS/DEIR and Draft Plan both fail to use the best available science, as numerous agency comments demonstrate and independent scientific reviews have concluded;

- The Draft Plan fails to conserve the health of the Bay-Delta estuary and its wildlife and fisheries, and instead the Draft Plan is likely to cause significant environmental impacts to the estuary, its wildlife and fisheries, and the people and communities that depend on its health, including significant water quality impacts to farmers and cities, reduced survival of salmon migrating through the Delta, and declining populations of salmon and other native fisheries;
- The DEIS/DEIR fails to accurately inform the public and decisionmakers of the likely environmental impacts, fails to consider a reasonable range of alternatives, and fails to adequately analyze cumulative impacts; and,
- The Draft Plan fails to reduce reliance on the Delta, fails to ensure that biological objectives are likely to be achieved, fails to ensure funding for plan implementation, provides unlawful water supply assurances, and otherwise violates the Delta Reform Act of 2009 and other state and federal laws.

Our organizations remain committed to working to achieve the co-equal goals and other requirements of the Delta Reform Act. A successful plan for the Delta must be based on the best available science, must reduce reliance on water supply from the Delta and invest in conservation and regional water supply solutions, and must achieve the requirements of state and federal law. We respectfully request that state and federal agencies to substantially revise the Draft Plan and DEIS/DEIR consistent with these comments.

Thank you for consideration of our views. Please feel free to contact us at your convenience if you have any questions regarding these comments.

Sincerely,

Doug Obegi
Natural Resources Defense Council

Kim Delfino
Defenders of Wildlife

Jon Rosenfield, Ph.D.
The Bay Institute

John McManus
Golden Gate Salmon Association

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I. THE DEIS/DEIR AND DRAFT PLAN FAIL TO MEET MINIMUM LEGAL STANDARDS UNDER THE NCCPA, ESA, CEQA, NEPA, AND RELATED ENVIRONMENTAL LAWS

The Draft Plan and supporting analyses do not meet the stated intent to (1) minimize and mitigate for the effects of the activities proposed in this Plan, (2) provide for the conservation of covered species, or (3) meet the standards of the Delta Reform Act of 2009. Draft Plan at 1-1 to 1-2. Nor do the Draft Plan and DEIS/DEIR use the best available scientific data or otherwise comply with the minimum legal standards of several state and federal laws that it is required to meet, including CEQA and NEPA. The Draft Plan and DEIS/DEIR must be substantially revised and recirculated to meet these minimum requirements.

A. The Draft Plan Violates the Natural Community Conservation Planning Act

As NRDC, Defenders, and TBI explained in a letter to DFW Director Bonham on July 10, 2013 (and incorporated here by reference),[1] the Natural Community Conservation Planning Act ("NCCPA") provides the foundational elements for a successful BDCP. As Director Bonham explained in an op-ed, the NCCPA (Cal. Fish & Game Code § 2800 *et seq.*) is a "cutting edge" law that sets a high bar for species protection, and that requires the BDCP to "provid[e] for the conservation and management of . . . 57 species." Charlton H. Bonham, Op-Ed., Plan could help fisheries, water supply, *S.F. Chron.*, June 6, 2013. Unfortunately, the Draft Plan does not meet this laudable standard.

Fundamentally, the Draft Plan fails to comply with the NCCPA by: (1) failing to include conservation measures that are likely to be adequate to conserve covered species in the Plan Area; (2) failing to establish biological objectives that are consistent with the NCCPA standard;[2] (3) providing regulatory assurances that are not "commensurate with long term conservation assurances," preclude effective adaptive management, and are otherwise inconsistent with the NCCPA;[3] and, (4) failing to ensure adequate funding needed to implement the Draft Plan.

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[1] A copy of this letter as well as many of our organizations' prior comment letters and memorandums, as well as the scientific studies, modeling analyses, independent scientific peer reviews, and other documents relied on and incorporated by reference in these comments are included on a CD submitted with the hardcopy of these comments.

[2] *See infra* for the discussion of the adequacy of biological objections in sections III and IV of these comments.

[3] *See infra* for the discussion of regulatory assurances in section I(C) of these comments.

1. The Draft Plan Fails to Provide Measures Necessary to Achieve Conservation (Recovery) in the Plan Area, as Required by the NCCPA

To comply with the NCCPA, a natural community conservation plan must provide for measures necessary to recover covered species within the Plan Area. This is evident from the definition of "natural community conservation plan" in the statute, which requires that a plan "shall identify and provide for those measures necessary to conserve and manage natural biological diversity within the plan area while allowing compatible and appropriate economic development, growth, and other human uses." Cal. Fish & Game Code § 2805(h). The NCCPA defines the terms "conserve," "conserving," and "conservation" as "the use of, methods and procedures within the plan area that are necessary *to bring any covered species to the point at which the measures provided pursuant to [the California Endangered Species Act ("CESA")] are not necessary*, and for covered species that are not listed pursuant to [CESA], to maintain or enhance the condition of a species so that listing pursuant to [CESA] will not become necessary." *Id.* at § 2805(d) (emphasis added).[4] Thus, for species listed as endangered or threatened under the CESA, an NCCP must, within the Plan Area, identify and provide for those measures necessary to recover the species to the point where it is no longer considered endangered or threatened and no longer needs to be on the endangered species list. For unlisted species, the Draft Plan must provide measures, within the Plan Area, that keep the species from declining to the point at which it would need to be listed under CESA.

The Draft Plan fails to "provide for those measures necessary to conserve" listed species within the Plan Area. First, for a species that exists exclusively within the BDCP plan area, the BDCP must provide for all of the measures necessary for the species' recovery within the Plan Area. Such species include endangered delta smelt and longfin smelt. Merely contributing to these species' recovery is inadequate when the species occurs entirely within the Plan Area. This requirement is clear from several statutory provisions that require the Department to make specific findings regarding whether the Plan contains specific measures to "conserve" the

[4] In addition to the arguments raised in our 2013 letter, this conclusion regarding the recovery standard is further supported by the text and legislative history of the 2009 Delta Reform Act. First, provisions of the Delta Reform Act require BDCP to include "operational requirements and flows **necessary for recovering the Delta ecosystem and restoring fisheries** under a reasonable range of hydrologic conditions." Cal. Water Code § 85320(b)(2)(A) (emphasis added). Second, the November 4, 2009 Assembly Floor analysis of the Delta Reform Act 2009, which states that with respect to the NCCPA standard, "While some agencies have asserted that BDCP would be an NCCP, the December 2006 planning agreement specifically provided that the signatories were not committed to achieving **the higher ecosystem recovery standard for an NCCP. This bill sets the higher NCCP standard ("the gold standard")** as the threshold for state funding of the public benefits of BDCP activities, while relying on existing law." Nov. 4, 2009 Assembly Floor Analysis of SB 1 X7 (Simitian and Steinberg), available online at: http://leginfo.ca.gov/pub/09-10/bill/sen/sb_0001-0050/sbx7_1_cfa_20091104_035148_asm_floor.html (emphasis added).

covered species within the Plan Area. *See* Cal. Fish & Game Code § 2805(h) (Plan "shall identify and provide for those measures necessary to conserve . . . within the plan area); *id.* at § 2805(d) (defining conservation as recovery); *id.* at § 2820(a)(4) (requiring Plan to contain "measures in the plan areas . . . as needed for the conservation of species"); *id.* at § 2820(a)(6) (requiring plan to contain "specific conservation measures that meet the biological needs of covered species"); *id.* at § 2835 (authorizing the Department to issue a take permit for a covered species if they find that the covered species' "conservation and management is provided for in a [Plan]"). As discussed below, the Draft Plan fails to provide for those measures necessary to conserve delta smelt and longfin smelt, and instead predicts significant declines in the abundance of these species as a result of BDCP, CVP/SWP operations, and other cumulative impacts (including climate change) in the Plan Area.

Second, the Draft Plan unlawfully limits the magnitude of the Plan's required contribution to a species' recovery by the extent of the Plan's impacts on that species. The NCCPA does not permit this artificially truncated contribution to recovery. Rather, the NCCPA takes a far more expansive view of conservation measures, which includes, but is not limited to, taking into account the impacts of covered activities on the covered species. *See* Fish and Game Code § 2820(a)(6) ("The plan contains specific conservation measures that meet the biological needs of covered species **and** are based on the best available information regarding the status of the species and the impacts of permitted activities on those species.") (emphasis added). But the Draft Plan indicates that the BDCP will not provide for sufficient measures to achieve recovery in the Plan Area if a species is imperiled by non-Plan impacts. BDCP Draft at 3.A-19 (explaining that BDCP did not strive to meet species' recovery plan goals, and noting that BDCP's goal-setting "process did not assume that BDCP would be solely responsible for recovery of [covered] species"). For species that exist solely in the Plan Area, this approach is not legally defensible because it ignores the NCCPA's focus on what is necessary to recover a species as opposed to simply addressing the impacts of covered activities. This approach also attempts to excuse the proponents from responsibility for multiple indirect effects of the Draft Plan. If plan developers ignore threats within a plan area that undermine the achievement of recovery of a covered species, the NCCPA's goal of delisting species would be impossible to achieve in most cases. As explained below, the Draft Plan fails to require measures necessary for the conservation of covered species within the Plan Area, in part, because it fails to address impacts beyond those directly caused by the proposed permitted activities. That approach is unlawful.

Third, the manner in which the BDCP's proposed "contribution to recovery" standard is linked to species' geographic range is also inconsistent with the NCCPA. The Draft Plan limits the magnitude of the Plan's contribution to recovery for species with a range that extends beyond the BDCP's plan area. Draft Plan at 3.A-18 ("For species that have a substantial portion of their range outside the Plan Area, the BDCP's potential contribution to recovery is necessarily limited."); BDCP Planning Agreement at 8 (magnitude of contribution to recovery determined,

in part, by "the scope of the BDCP Planning Area in relation to the geographic range of the Covered Species."). While it is clear that the NCCPA does not intend for a plan's conservation measures to occur in a species' range *outside* of the Plan Area,[5] the conservation measures within the Plan Area must be adequate to support recovery within that area. The Draft Plan fails to meet this requirement.

The latter flaw is especially relevant to covered salmonids, which spend a portion of their life-cycle within the Plan Area and a portion in other areas. There are a variety of approaches possible when developing a conservation plan for salmonids:

> (1) Providing for measures within the Plan Area sufficient to recover the population;
> (2) Providing for all of the measures within the Plan Area necessary for and consistent with a recovery plan or strategy that encompasses the entirety of the species or range;
> (3) Providing for measures within the Plan Area that contribute to the recovery of population that spends part of its life cycle within the Plan Area in a manner proportional to the portion of the population's life cycle that is spent within the Plan Area.

Of these approaches, only the second application of the NCCPA's conservation standard is legally defensible. The first approach, which requires the Plan to provide for all of the measures necessary for the recovery of any covered species that enters the Plan Area, is unrealistic. If animals are subject to take outside of the Plan Area, there may be little that plan participants could agree to do within the Plan Area to recover the species. In contrast, the third option is inadequate to meet the statutory standard because the amount of time spent in a geographic area is not reflective of the importance of the area. To the extent the Draft Plan limits its contribution to recovery so that the contribution is proportional to the *time* an anadromous fish spends in the Plan Area versus outside of the Plan Area, or to the *size* of the Plan Area compared to the other areas the fish spends its life, the BDCP is adopting the third standard, which fails because it is insufficiently protective.

Finally, as we discuss below, the proposed upstream operations of the CVP and SWP, which are integrally linked to and driven in large part by proposed operations in the Plan Area under the Draft Plan, in combination with climate change, are likely to result in potential extirpation and extinction of several salmon runs. *See, e.g.,* National Marine Fisheries Service 2013, NMFS

[5] It is important to note that other legal requirements apply to the draft BDCP's impact on species outside of the Plan Area. For example, CVP/SWP operations proposed under the Draft Plan will have a significant impact on the operation of upstream reservoirs of the CVP and SWP. Those reservoir operations, in turn, may have a significant and adverse impact on the survival and recovery and listed fisheries below the reservoirs, including salmonids. Those impacts must be addressed, avoided and mitigated under a myriad of requirements, including section 7 of the Endangered Species Act, CEQA, NEPA, the Central Valley Project Improvement Act, and other state and federal laws.

Progress Assessment and Remaining Issues Regarding the Administrative Draft BDCP Document, 4/4/13 ("NMFS 2013 Progress Assessment") at 12-13. This outcome is the opposite of the NCCPA's goal of recovery, and appears likely to result in a jeopardy opinion under section 7 of the Endangered Species Act. Ultimately, the operations and CVP and SWP must adapt to climate change, not only for ecosystem protection, but also to manage water supply. The water projects cannot take the approach that there is no duty to adjust operations to account for climate change. It is difficult to imagine how the agencies could even consider approving a conservation plan under either the NCCPA or the ESA that predicts the likely extinction of several listed salmon runs.

2. The Draft Plan Fails to Ensure Adequate Funding for Implementation of the Plan, as Required by the NCCPA

Like the federal ESA, the NCCPA requires that the plan "ensure" adequate funding. *See* Cal. Water Code §§ 2820(a)(10), (b)(8). The Draft Plan and associated documents fail to meet this requirement. *See* discussion *infra* regarding the similar standard to ensure funding under the ESA.

In discussing the ESA and NCCPA standards, the Delta Stewardship Council, which has review authority over DFW's review of BDCP's compliance with the NCCPA, recently noted that,

> Although there are no cases interpreting the 'ensured funding' requirement under the NCCPA, there are a number of federal cases, and one state case, interpreting the very similar 'ensured funding' requirements for issuance of incidental take permits under the federal Endangered Species Act and the California Endangered Species Act. In general, these cases conclude that meeting this requirement cannot rely on speculative future actions by other parties, but requires the applicant's guarantee of adequate funds to carry out the plan.

Delta Stewardship Council, October 24, 2013 staff report, Agenda Item 9, page 2, available online at http://deltacouncil.ca.gov/sites/default/files/documents/files/Item_9_8.pdf. The Draft Plan proposes to rely on speculative future funding actions, and fails to provide such guaranteed funding.

B. The Draft Plan Violates the Endangered Species Act

The federal Endangered Species Act ("ESA," 16 U.S.C. § 1531 *et seq.*) provides another foundational set of requirements on the adequacy of the Draft Plan, which is intended to act as a Habitat Conservation Plan ("HCP") under section 10 of the ESA. As described in the Draft Plan, the BDCP must satisfy at least the following criteria to qualify as an HCP:

- The applicant will ensure that adequate funding for the Plan will be provided;
- The applicant will, to the maximum extent practicable, minimize and mitigate the impacts of any taking that is incidental to an otherwise lawful activity;
- The taking will not appreciably reduce the likelihood of the survival and recovery of the species in the wild.

Draft Plan at 1-8; 16 U.S.C. § 1539(a)(2)(B). As we discuss below, the Draft Plan and accompanying documents fail to meet these requirements. Equally important, as we discuss extensively in sections III and IV of these comments, the Draft Plan fails to use the best available science as required by the ESA. *See* 16 U.S.C. § 1536(a)(2). In addition, as we discuss in section I(C) of these comments, the Draft Plan and Draft Implementation Agreement propose to provide regulatory assurances that violate the requirements of the ESA, including the 5 Point Policy.

1. The Draft Plan and Draft IA Fail to Ensure Adequate Funding for Plan Implementation

As currently drafted, the Draft Plan and draft Implementation Agreement fail to comply with the funding provisions of the NCCPA and ESA. The Endangered Species Act is clear that the plan must "ensure" funding over the lifetime of the permit. 16 USC § 1539(a)(2)(B)(iii); HCP Handbook at 3-33 to 3-34; *National Wildlife Federation v. Babbitt*, 128 F.Supp.2d 1274, 1294-95 (E.D. Cal., 2000); *Southwest Center for Biological Diversity v. Bartel*, 470 F.Supp.2d 1118, 1155 (S.D. Cal., 2006). Of particular note, the HCP Handbook is explicit that a HCP cannot rely on unappropriated federal funding to "ensure" funding of the plan in light of the "Anti-Deficiency Act and the availability of appropriated funds." HCP Handbook at 3-33 to 3-34. In addition, a HCP must provide "remedies for failure to meet funding obligations by signatory measures." *National Wildlife Federation*, 128 F.Supp.2d at 1294-95. And it is black letter law that a HCP "cannot rely on speculative future actions of others" for funding, and that the HCP effectively must be backed by a guarantee by the applicant to ensure funding for all plan elements. *Bartel*, 470 F.Supp.2d at 1155. The *Bartel* case is directly on point regarding the possibility of relying on funding from a future bond requiring voter approval, and in that case the Court noted that "the uncertainty of these ideas is readily apparent," that such funding is speculative in light of future voter approval requirements, and that relying on future bonds does not meet the requirement to ensure funding of an HCP under the ESA. *Id.* The HCP Handbook also emphasizes that,

> Whatever the proposed funding mechanism is, failure to demonstrate the requisite level of funding prior to permit approval or to meet funding obligations after the

> permit is issued are grounds for denying a permit application or revoking or suspending an existing permit, respectively.

HCP Handbook at 3-35 (emphasis in original).

In contrast to these requirements, Chapter 8 of the Draft Plan explicitly states that it does not provide a financing plan and instead only provides estimates of potential funding sources:

> It is important to note that this chapter is not a financing plan for the state or federal water contractors or any other party. Separate financing plans, funding agreements, legislative authority, and other documents will be needed to enable the use of certain funding sources. This chapter provides an overview of potential funding sources to support the implementation of the BDCP as well as the level of past financial support at the state and federal level for similar Delta activities.

Draft Plan at 8-64. Despite this language, Chapter 8 also claims that these "potential funding sources" demonstrate that "adequate funding to implement BDCP has been assured." Draft Plan at 8-120. This conclusion is unlawful and unsupported by the text of Chapter 8.

First, the text of chapter 8 assumes that funding from future water bonds would be used for BDCP. *See* Draft Plan at 8-64 to 8-65, 8-84 to 8-85. Although it is true that one or more future water bonds could fund BDCP, it is unlawful to assume that future water bonds provide assured funding for BDCP. *Bartel*, 470 F.Supp.2d at 1155.

Second, the text of Chapter 8 assumes that billions of dollars in future federal funding could be dedicated to BDCP. *See* Draft Plan at 8-99 to 8-118. However, none of these federal funding sources are dedicated to BDCP, and all are subject to future appropriations by Congress. As such, these funds cannot be relied upon to ensure funding for BDCP. HCP Handbook at 3-33 to 3-34.

Third, Chapter 8 fails to provide adequate remedies to ensure funding if there is a shortfall of initial funding sources for plan implementation. The only remedy identified in the document appears to be reduction in habitat restoration or other conservation measures required under the Draft Plan. Draft Plan at 8-122. This is unlawful; as the court concluded in *National Wildlife Federation v. Babbitt*,

> It is not clear that a funding mechanism that is not backed by the applicant's guarantee could ever satisfy the requirement of § 1539(a)(2)(B)(iii) that the applicant "ensure" funding for the Plan. Assuming, however, that a cost shifting mechanism "ensures" funding within the meaning of § 1539(a)(2)(B)(iii), in these

> circumstances, where the adequacy of funding depends on whether third parties decide to participate in the Plan, the statute requires the applicant's guarantee…
>
> In the face of the City's refusal to "ensure" funding, the Secretary's (B)(iii) finding with respect to the City's ITP is either at odds with the evidence in the record or is based on the City's untenable reading of the statute. In either case, while the Service's (B)(iii) finding is not arbitrary with respect to the Plan as a whole, it is arbitrary and capricious with respect to the City's Permit

128 F.Supp.2d at 1294-95. That court specifically rejected the argument that permit revocation was an adequate remedy to ensure funding. *Id.* The same is true here; BDCP must have some financial backstop or guarantee to ensure that the plan is fully implemented.

The draft Implementation Agreement ("Draft IA") includes similarly unlawful statements and conclusions regarding the assurance of funding under the Draft Plan. *See* Draft IA at 11, 16, 45-48. For instance, the Draft IA states that, "The Parties acknowledge that such assurances do not require that all necessary funds be secured at the time of permit issuance, but rather establish that such funding is reasonably certain to occur during the course of Plan implementation." Draft IA at 45. This is wholly inconsistent with the requirement to "ensure" funding for the plan. *See Bartell*, 470 F.Supp.2d at 1155; *Babbitt*, 128 F.Supp.2d at 1294-95. In addition, the document states that, "Furthermore, as described in Chapter 8 of the Plan, the State and federal governments have committed to provide additional funding to implement the plan." Draft IA at 45. This is contradicted both by the text of Chapter 8 of the Draft Plan, which disclaims any firm commitment of funding by state or federal sources, and by the text on page 46. *See* Draft IA at 46 ("While the United States has been engaged in the development of this draft Agreement, there is no federal position as of this time regarding potential funding obligations of the United States.").

Finally, we note that the Draft Plan improperly proposes that the public pay for restoration of the Yolo Bypass (CM2), despite the fact that restoration of the Yolo Bypass is required under existing permits as a mitigation measure. *See* Draft Plan at 8-74 (excluding CM2 from list of measures for which the contractors will pay any portion of costs). It is unclear how the allocation of costs was made in Chapter 8 between the public (state and federal taxpayers) and USBR/DWR (and their ratepayers), but in light of the fact that the draft plan fails to achieve the standards of the NCCPA, the conclusion that these measures are in excess of mitigation requirements of the project proponents and should be borne by the public appears unsupportable.

2. The Draft Plan Fails to Minimize and Mitigate Takings to the Maximum Extent Practicable

The ESA requires that an HCP minimize the take of covered species to the "maximum extent practicable." 16 U.S.C. § 1539(a)(2)(B)(ii). State law provides even more protection to species listed under CESA. Under CESA, the take must be "minimized and fully mitigated," and under both CESA and the NCCPA, the measures required to minimize take must be roughly proportional to the amount of take. Fish & Game Code §§ 2081(b)(2), 2820(b)(3)(b), (b)(9); 14 Cal. Code Regs. § 783.4. There is no question that the CVP and SWP are significant sources of harm (which is encompassed within the definition of take) and mortality for most of the fish species covered by the Draft Plan. *See, e.g.*, *NRDC v. Kempthorne*, 506 F.Supp.2d 322 (E.D. Cal., 2007). Project-related take occurs not just through entrainment and salvage at export pumps, but throughout the integrated operation of the Projects as a whole, including, for example, by failing to provide adequate coldwater habitat for fish below terminus dams, failing to provide sufficient attraction flows to prevent straying into dead-end sloughs and channels, and by creating channel blockages or altering flows in a manner that increases covered species' exposure to predation, invasive species, and toxics. *See, e.g., San Luis & Delta-Mendota Water Authority v. Jewell,* 747 F.3d 581, 627 (9th Cir. 2014) ("CVP/SWP operations 'have … played an indirect role in the delta smelt's decline by creating an altered environment in the Delta that has fostered the establishment of nonindigenous species and exacerbates these and other stressors that are adversely impacting delta smelt.'"); *id.* at 628-29 (discussing Projects' indirect effects on limiting food supply); *id.* at 629-30 (discussing Projects' role in exacerbating water pollution); *id.* at 630-34 (noting Projects' role in promoting the exposure of native species to harmful predators and the expansion of exotic species in the Delta). The extent of take associated with these activities is directly related to Project operations, including those proposed as part of the Draft Plan.

The Draft Plan fails to minimize and mitigate takings anticipated under the Plan to the maximum extent practicable, as required by the ESA. First, the Plan fails to minimize and mitigate takings associated with the Draft Plan's proposed operations that occur upstream of the Delta, instead claiming that the Projects do not have to modify their upstream operations to adjust to projected temperature increases because the Projects do not control water temperatures. This is incorrect. Those foreseeable effects must be addressed and minimized and mitigated. Second, where the Plan proposes mitigation, it is so uncertain as to be unreliable, and fails to meet the requirements of the ESA.

As we discuss in sections III and IV of these comments, the Draft Plan anticipates that the populations of several covered species – particularly, salmon, sturgeon, and steelhead stocks – will *decline* over the life of the Draft Plan, potentially to the point of extirpation, because of proposed operations and water temperatures below Project-operated dams will be too warm to

sustain spawning and rearing. These adverse effects have been confirmed in numerous independent reviews. *See, e.g.,* NMFS 4/4/13 comments at 1.17 ("the cumulative effects of the project when combined with effects of climate change and other baseline conditions is showing the potential extirpation of mainstem Sacramento River populations of winter-run and spring-run chinook salmon over the term of the permit"); *id.* at 2.8 ("Keswick release strategies between the ESO and EBC will result in increased egg mortality upstream. Lower flows in key summer and fall months increase egg mortality for winter-run and spring-run Chinook salmon and potentially other runs. SacEFT habitat results show significant impacts on spawning and rearing habitat for winter-run that are above and beyond effects of climate change…. The analysis shows that ESO criteria could result in riskier operations relating to stranding risk for juveniles (over two times more low risk years under EBC."); *id.* at 2.9 ("While the high spring-time Feather River flows modeled in HOS could attract sturgeon into the Feather River from the Sacramento River, summertime releases are decreased compared to EBC2 to provide for end-of-September storage requirements. The decreased summertime river flows increase water temperatures in the high-flow channel; the resulting temperatures reported in the effects analysis would be lethal to sturgeon eggs and embryos.") The Plan declines to mitigate for this take, even though the Projects could be re-operated to improve the extent and duration of cold-water habitat for these species. But the Draft Plan declines to address this take or propose measures to mitigate it, claiming that the increasing water temperature is not an effect of the Plan, but primarily a result of externally-induced climate change. That is incorrect; operations of these dams and reservoirs strongly affect downstream water temperatures and are driven by water delivery demands, including operations in the Delta.

The Projects have the ability to expand the cold-water pools in Project-controlled reservoirs; adjust reservoir releases to match the temperature and timing needs of cold-water species; construct, repair or maintain lower outlets to better access cold water behind dams (particularly relevant to Oroville Dam); and install other measures such as temperature control curtains to control downstream temperatures to protect cold water habitat in response to these changes. *See, e.g.,* DWR, "Reconnaissance Study of Potential Future Facilities Modifications," Oroville Facilities Settlement Agreement Implementation FERC Project No. 2100 (Dec. 2006) (acknowledging improved ability to meet cold-water species temperature requirements with improvements to the Oroville Dam River Valve) (incorporated herein by reference). Moreover, the Projects have the obligation to do so – there is nothing in the law that excuses the agencies from their obligations to avoid jeopardy and to protect and restore salmon and other cold-water fish simply because external factors contributed to the problem, particularly in a plan that purports to conserve and recover covered species.

Here, the Draft Plan essentially ducks the problem by attempting to claim the Projects are powerless to mitigate for increasing water temperatures. That is simply false. "Normally, an agency rule would be arbitrary and capricious if the agency has ... entirely failed to consider an

important aspect of the problem." *Motor Vehicle Manufs. Ass'n v. State Farm Automobile Ins. Co.,* 463 U.S. 29, 43 (1983). Here, the Draft Plan fails to consider the many feasible ways in which it could mitigate for the increased upstream take resulting from proposed Project operations in light of increasing water temperatures. As stated in the Service's HCP Handbook:

> [P]articularly where adequacy of mitigation is a close call, the record must contain some basis to conclude that the proposed program is the maximum that can be reasonably required by that applicant. This may require weighing the benefits and costs of implementing additional mitigation, the amount of mitigation provided by other applicants in similar situations, and the abilities of that particular applicant.

The Draft Plan's approach also violates the requirement that proponents must address the impacts of the *whole of the action* in analyzing impacts and associated mitigation. *See, e.g., Connor v. Burford,* 848 F.2d 1441, 1457–58 (9th Cir.1988).[6] As explained by the Ninth Circuit in *Southwest Ctr. for Biological Diversity v. Bartel:*

> The ESA "does not permit the incremental-step approach" of consultation because "biological opinions must be coextensive with the agency action." *Conner*, 848 F.2d at 1457–58; accord *Center for Biological Diversity v. Rumsfeld*, 198 F.Supp.2d 1139, 1155 (D.Ariz.2002); *Greenpeace v. National Marine Fisheries Serv.*, 80 F.Supp.2d 1137, 1143–45 (W.D.Wash.2000). "[T]he ESA requires that all impacts of agency action—both

[6] It is no excuse to claim that Project operations upstream of the Delta are driven by considerations beyond those contemplated in the Draft Plan. Even if it were possible to segregate Project operations in this manner (which it is not), the Draft Plan must be accompanied by a system-wide ESA consultation to obtain necessary take permits. For example, the Draft Plan explains that it is intended "to support the issuance of a joint BiOp under Section 7 by USFWS and NMFS authorizing the incidental take associated with BDCP actions undertaken by Reclamation and CVP contractors within the Plan Area. That joint BiOp will also address the decision by USFWS and NMFS to issue Section 10 permits to the Authorized Entities." Draft Plan at 1-8. In addition, the coordinated operations of the CVP and SWP and its infrastructure (including any modifications proposed by BDCP) must undergo a section 7 consultation under the ESA. *See* 74 Fed. Reg. 7257, 7258 ("in a parallel yet separate process, Reclamation will be required to reinitiate Section 7 consultation on the long-term operation of the CVP, as coordinated with the SWP, to the extent that such coordinated operations may be modified to effectively be integrated with any operational or facility improvements that may occur from implementation of the BDCP."). That consultation must consider the coordinated operations of the projects as a whole, not merely any changes proposed by BDCP, and the consultation must consider all federal, state, private and other actions that may affect listed species, including nondiscretionary actions, to ensure that the proposed project will not cause jeopardy to the survival and recovery of the species or adversely modify its critical habitat. *NWF v. NMFS,* 524 F.3d 917, 928-931 (9th Cir. 2008).

> present and future effects on species—be addressed in the consultation's jeopardy analysis." *American Rivers v. United States ACOE*, 271 F.Supp.2d 230, 255 (D.D.C.2003). This rule ensures that the ESA is enforced in an effective manner because "impermissible segmentation would allow agencies to engage in a series of limited consultations without ever undertaking a comprehensive assessment of the impacts of their overall activity on protected species." *Id.* (emphasis added).
>
> The lesson of *Conner* applies to this case because the ESA's policy of "institutionalized caution," *Tennessee Valley*, 437 U.S. at 194, 98 S.Ct. 2279, "can only be exercised if the agency takes a look at all the possible ramifications of the agency action." *Conner*, 848 F.2d at 1453 (quotation and citation omitted). Though FWS chose not to evaluate the cumulative impact of the implementation of the MSCP and Subarea Plan on the vernal pool species, it fixed the ameliorative measures for the fifty-year life of the ITP to those contemplated in 1997. Ironically, this structure diminishes the value of one of the primary strengths of regional conservation planning—enabling jurisdictions to plan and implement protections for an entire ecosystem. E.g., AR 6780–82, 23189–90, 28100–01, 39463. By the time FWS undertakes its incremental site-specific consultations it may have lost the opportunity to protect the vernal pool species from extinction. Conner, 848 F.2d at 1454–58 (requiring comprehensive information and review "to avoid piecemeal chipping away of habitat"). The flaw is fatal in the context of this case because all vernal pool habitat outside of the San Diego region has been destroyed. E.g., AR 26236 ("The loss of vernal pool habitat is nearly total in Los Angeles, Riverside, and Orange counties"); 63 Fed.Reg. at 54983–84; 58 Fed.Reg. at 41387 (otay mesa mint). The vernal pool species have narrow and strict habitat requirements. E.g., 58 Fed.Reg. at 41388 (Riverside fairy shrimp); 62 Fed.Reg. at 4929 (San Diego fairy shrimp). The remaining habitat is found within the area covered by the MSCP (and lands controlled by the military). Because the MSCP controls the fate of the remaining vernal pool habitat throughout all of its range, it is particularly important to comply with the purpose and spirit of the ESA to seek to prevent the extinction of these species.

470 F. Supp. 2d 1118, 1142-43 (S.D. Cal. 2006). Here, the Draft Plan puts on blinders and pretends that Project operations proposed under the 50-year Plan have no effect on water temperatures or habitat or species viability below Project dams, when it undeniably does. The fact that climate change is an exacerbating factor is not an excuse for the proponents to avoid grappling with this aspect of Project operations. As explained by CDFW in the attached Memorandum dated October 15, 2009 insisting that Caltrans mitigate for impacts related to sea level rise and climate change:

> Based upon … climate change and SLR [sea level rise] data and the project's size, location, design life, and reasonable foreseeable adaptation strategy, there is a fair

> argument this project could have [significant] …impacts on the Humboldt Bay ecosystem.
>
> …
>
> [T]he project's … facilities should provide adequate channel or flow capacity based upon calculations using current SLR and climate change projections.
>
> …
>
> DFG recommends this project's Final EIR evaluate how this project will adapt to SLR. While adaption options are reasonably foreseeable, they need not be undertaken in the current project. However, given that potentially significant indirect environmental impacts from such adaptations are reasonably foreseeable, they should be evaluated during the current environmental review for this project.

Comments of CDFG to CA Dept. of Transp. re: Eureka-Arcata Corridor Improvement Project, Draft EIR/EIS SCH #200192035, October 15, 2009, at 8, 11-12. The Draft Plan must be revised to evaluate impacts from reasonably foreseeable adaptation changes to Project operations and facilities during the life of the Project required to maintain adequate cold water temperatures for species viability, address this critical aspect of the "whole of the action," and identify mitigation measures to minimize and avoid, where possible, associated take.

Under the ESA, mitigation measures must be "reasonably specific, certain to occur, and capable of implementation; they must be subject to deadlines or otherwise-enforceable obligations; and most important, they must address the threats to the species in a way that satisfies the jeopardy and adverse modification standards." *Ctr. for Biological Diversity v. Rumsfeld,* 198 F.Supp.2d 1139, 1152 (D.Ariz.2002) (citing *Sierra Club v. Marsh,* 816 F.2d 1376 (9th Cir.1987)); *see also NWF v. NMFS,* 481 F.3d 1224 at *12 & n. 16 ("Although the record does reflect a general desire to install structural improvements [to benefit fish] where feasible, it does not show a clear, definite commitment of resources for future improvements."). While adaptive management tied to clearly enforceable biological objectives and actions may fit within this paradigm, "overly flexible adaptive management may be incompatible with the requirements of the ESA." *NRDC v. Kempthorne*, 506 F. Supp. 2d at 352. "[A]t a minimum, a mitigation strategy must have some form of measurable goals, action measures, and a certain implementation schedule; i.e., that mitigation measures must incorporate *some* definite and certain requirements that ensure needed mitigation measures will be implemented." *Id.* at 355 (citing *Rumsfield*, 198 F.Supp.2d 1139 (D. Az. 2002)). Many of the Draft Plan's proposed conservation and mitigation measures fall into the latter category, requiring only process rather than a slate of specific, certain and feasible measures to protect species and their habitat.

Several critical aspects of the Draft Plan are not reasonably certain to occur and cannot be relied on under the ESA. First, as we discuss in section II of these comments, the flows required under the High Outflow Scenario are not likely to occur in a significant percentage of years because of

arbitrary operational limitations. Second, as we discuss in section II of these comments, modeled operations that are more protective than the operational rules are not reasonably likely to occur. Third, reliance on adaptive management generally and on the biological objectives specifically is not reasonably likely to occur, because: (a) the Draft Plan proposes that implementation of the conservation measures, not achievement of the biological objectives, is the measure of the plan; and, (b) the adaptive management structure, including the regulatory assurances, eliminate effective adaptive management that would require additional water. Fourth, the Draft Plan cannot lawfully rely on purchases of water to meet minimum instream flows, *see, e.g.*, Draft Plan at 3.4-356, but must ensure that in the absence of adequate funding or lack of available water transfers the minimum flows will be implemented.[7]

3. The Draft Plan Fails to Demonstrate that Taking will not Appreciably Reduce the Likelihood of Survival in the Wild

Finally, as explained above and more extensively in sections III and IV of these comments, the Project operations proposed by the Draft Plan will lead to increased take of covered species. The Draft Plan and DEIS/DEIR demonstrate that this increased take will appreciably reduce the likelihood of survival of listed species in the wild and in combination with other reasonably foreseeable factors, will jeopardize the continued existence and recovery of several listed species, anticipating the potential extirpation and substantial decline in abundance of longfin smelt and several stocks of salmon and steelhead. This result is prohibited under section 10 of the ESA, and prevents the Plan from satisfying the minimum requirements of an HCP or NCCPA.

C. The Regulatory Assurances Proposed in the Draft Plan and Draft Implementation Agreement Violate the NCCPA and ESA

In the following key respects, the regulatory assurances identified in the Draft Plan and Draft Implementation Agreement (Draft IA) violate the ESA, NCCPA, Delta Reform Act, and other state and federal laws:

1) The Draft Plan and Draft IA provide assurances that are inconsistent with the best available science and effective adaptive management, particularly in light of the State's

[7] Although the Draft Plan briefly mentions this concept, it is not a covered activity under the Draft Plan, the effects of such a program are not analyzed in the Draft Plan or the DEIS/DEIR, and there is no funding provided to implement such a program. Prior effects to acquire environmental flows, such as the EWA, have been abject failures, and it is not clear how such a program would ensure that public funds were not being used to pay for private mitigation obligations (such as meeting minimum flow requirements), which would likely constitute an unlawful gift of public funds.

admission of scientific uncertainty and the evidence showing that the Draft Plan is unlikely to achieve key biological goals and objectives;

2) The Draft Plan and Draft IA provide assurances that are not commensurate with conservation assurances as required by the NCCPA, and otherwise violate state law;
3) The Draft Plan's provisions regarding changed circumstances are unlawful;
4) The Draft Plan and Draft IA provide assurances that are inconsistent with the requirements of the ESA, including the Services' 5 point policy;
5) The Draft Plan and Draft IA cannot provide assurances any regarding upstream operations of the CVP and SWP; and,
6) The Draft Plan and Draft IA provide assurances to CVP contractors and to USBR in violation of the No Surprises Rule, which prohibits providing No Surprises assurances to federal agencies.
7) CVP and SWP Contractors are Not Qualified as Permittees, and Thus Cannot Obtain Regulatory Assurances

Each of these points is discussed in turn.

1. Proposed Assurances are Inconsistent with the Best Available Scientific Information and Effective Adaptive Management

The scope of regulatory assurances and how they impact effective adaptive management has been a key issue throughout the development of BDCP. In our 2008 scoping comments, we stated that,

> As both the ESA and NCCPA recognize, adaptive management is a necessary element of an ecologically sustainable HCP/NCCP. Fish & Game Code § 2820(a)(2), (8), (b)(5), (f)(1)(G); HCP Handbook at 3-24; *see* 50 C.F.R. § 17.22(b)(2)(C), (b)(5).… The NCCPA requires that the level of assurances provided by a NCCP be "commensurate with long-term conservation assurances and associated implementation measures pursuant to the approved plan." Fish & Game Code § 2820(f). A critical component in determining the level of assurances is "[t]he degree to which a thorough range of foreseeable circumstances are considered and provided for under the adaptive management program." *Id.* § 2820(f)(1)(8); *see also* 50 C.F.R. §§ 17.22(b)(5), 222.307(g) (regulatory assurances with respect to changed and unforeseen circumstances under the ESA). In addition, we note that California law requires suspension or revocation of the NCCP if take of the species under the plan will jeopardize the continued existence of the species. *See* Fish & Game Code § 2823. Thus all parties have an incentive in ensuring that the HCP/NCCP achieves its goals and avoids jeopardy to any listed species.… As such, the flexibility required for the

> BDCP to succeed precludes any inflexible guarantees or complete regulatory assurances regarding water supplies and exports…. Instead, the BDCP must retain sufficient flexibility to respond to changed conditions and continue to conserve and restore listed species and the health of the Delta ecosystem.

See Scoping comments at 4-5. Unfortunately, the proposed assurances (including the provisions of "water supply neutral" adaptive management) eliminate the necessary flexibility for the Draft Plan to be likely to achieve the Plan's biological goals and objectives, are inconsistent with the NCCPA's statutory criteria for assurances, and fail to adequately address changed circumstances.

First, the Draft IA makes clear that the BDCP biological objectives are not enforceable, and that implementation of the conservation measures – not achievement of the biological objectives – is the only obligation of the plan proponents and permittees:

> Through the implementation of the Plan, including adjustments made through the adaptive management process, Permittees will satisfy their obligation to achieve the biological goals and objectives. Unless otherwise specified in the Plan or this Agreement, failure to achieve a biological goal(s) and/or objective(s) shall not be a basis for a determination by the Fish and Wildlife Agencies of non-compliance with the Plan or for suspension or revocation of the Permits, provided the Permittees are properly implementing BDCP and are in compliance with this Agreement and the terms and conditions of the Permit.

Draft IA at 24 (Section 10.1) The Draft IA also makes clear, consistent with language in the Draft Plan, that adaptive management must be 'water supply neutral,' stating that, "The Parties agree that any potential adaptive management change to the Conservation Measures, either individually or cumulatively, shall not require the commitment of resources, including land, water or money, in excess of those specifically provided for under these strategies, including the Supplemental Adaptive Management Fund, or alter the financial commitments of Plan Participants, as set out in Chapter 8." Draft IA at 36; *see* Draft Plan at 3.4-354 to -357.

However, contrary to statements in the Draft IA, the Draft Plan fails to demonstrate that it is likely to achieve many of the biological objectives, many of the objectives are not consistent with the requirements of the NCCPA, ESA, and other laws, and the Draft Plan is unlikely to achieve many of these critical biological objectives. The Draft IA asserts that, "The Conservation Measures are expected to be sufficient to achieve the biological goals and objectives of the Plan during the 50-year timeframe for Plan implementation." Draft IA at 24 (section 10.2). This statement is not supported by the Draft Plan or the independent scientific and agency reviews. As discussed in sections III and IV of our comments, although the Draft Plan and DEIS/DEIR fail to analyze consistency with most of the biological objectives, the best

available scientific evidence shows that the Draft Plan is unlikely to achieve the Plan's biological objectives and that the objectives are not legally adequate, including:

- Salmon survival objective: The Draft Plan is likely to reduce survival of salmon migrating through the Delta and there is no scientific evidence that the survival objectives are likely to be achieved. NMFS has admitted that, "A rough examination of this issue in the current draft indicates that it may be difficult to meet the through-delta survival objectives for salmonids under the proposed operational criteria." NMFS 2013 Progress Assessment at 22. The salmon survival objectives also fail to meet the requirements of the NCCPA and other laws.
- Delta Smelt entrainment objective: The Draft Plan and DEIS/DEIR demonstrates that entrainment under the Draft Plan is likely to exceed this objective, and the objective is not consistent with the existing incidental take statement required under the ESA.
- Longfin Smelt abundance and productivity objectives: The Draft Plan and DEIS/DEIR demonstrate that longfin smelt abundance is predicted to significantly decline under the Draft Plan, that the objectives are not likely to be achieved, and that the objectives are not consistent with ESA and NCCPA requirements.
- Upstream water temperature objectives: the Draft Plan and DEIS/DEIR demonstrate that operations will not be consistent with this objective, nor will operations comply with existing temperature requirements under the ESA. Modeling in the DEIS/DEIR and Draft Plan indicate that abundance of numerous salmon and steelhead runs will decline, and several may go extinct.

As we discuss extensively in our comments, numerous independent scientific reviews and agency reviews have identified failures to use the best available science in the Draft Plan, and they have emphasized the need for an effective adaptive management program in BDCP because of scientific uncertainty.

However, providing assurances that restrict adaptive management to being "water supply neutral" is not consistent with the best available science regarding the effectiveness of the proposed conservation measures in achieving these biological objectives. [8] Such assurances make it substantially less likely that the Draft Plan will achieve the biological objectives, as they

[8] In addition, the Draft IA and Draft Plan establish additional measures that reduce the effectiveness of adaptive management. For instance, the Draft IA appears to allow the implementation Office to change conservation measures through adaptive management without the approval and concurrence of the fishery agencies, even if such measures reduce protections for covered fish and wildlife species. Draft IA at 32. The Draft IA also impedes adoption of adaptive management measures that affect water supply, *id.* at 35, and create procedural roadblocks to effective adaptive management through the dispute resolution process, *id.* at 36.

prevent BDCP from requiring measures to improve flow conditions and address some of the most important stressors on these populations.

2. The Proposed Assurances are not Commensurate with Conservation Assurances as Required by the NCCPA, and Otherwise Violate State Law

Under the NCCPA, regulatory assurances are required to be "commensurate with long-term conservation assurances and associated implementation measures." Cal. Fish and Game Code § 2820(f). The NCCPA requires the Department to consider certain criteria in determining the "level of assurances" to be provided, including: the level of knowledge of the status of species; the adequacy of the analysis of the impact of take on covered species; the use of the best available science and the reliability of mitigation strategies; the range of foreseeable circumstances provided for under the adaptive management program; and the duration of the plan. *Id.*

Unfortunately, the assurances proposed in the Draft Plan and Draft IA are not commensurate with long-term conservation assurances, nor are they adequate in light of the existing scientific information regarding the likelihood that the proposed conservation measures will not achieve the biological objectives, the failure to use the best available science, the lack of meaningful adaptive management responses to changed circumstances, and the 50 year duration of the Draft Plan. For instance, there effectively are no "long-term conservation assurances," as the Draft Plan and Draft IA make clear that the biological objectives are not enforceable and that a failure to achieve these objectives will not result in additional restrictions on water supply, despite the available scientific evidence about the likelihood that proposed conservation measures will not achieve the Draft Plan's biological objectives. Similarly, numerous independent and agency scientific reviews have concluded that the Draft Plan and DEIS/DEIR fail to use the best available science, contrary to the requirements of section 2820(f). The available scientific information demonstrates that the Draft Plan is unlikely to achieve many of the biological objectives as currently designed, and that several salmon runs and other covered species may in fact go extinct during the duration of the Draft Plan. The extensive length of the draft permits (proposed for 50 years, with the possibility of extension) strongly indicates that assurances should be more limited. And as discussed below, the Draft Plan's provisions regarding foreseeable circumstances, particularly climate change, are significantly flawed and inconsistent with legal requirements. As a result, the proposed assurances are not consistent with the NCCPA.

In addition, the proposed assurances, particularly to the extent that they prevent adaptive management and real time operations from achieving biological objectives, also violate the Delta Reform Act. *See* Water Code § 85321 ("The BDCP shall include a transparent, real-time operational decisionmaking process in which fishery agencies ensure that applicable biological

performance measures are achieved in a timely manner with respect to water system operations.").

3. The Draft Plan's Provisions Regarding Changed Circumstances, Particularly Foreseeable Circumstances such as Climate Change, are Unlawful

Both the NCCPA and ESA generally require the Draft Plan to address changed circumstances, including foreseeable circumstances. *See* Cal. Fish and Game Code §§ 2805(c), 2820(g); 50 C.F.R. §§ 17.22(b)(5), 222.307(g); HCP Handbook at 3-28. The Draft Plan identifies a number of clearly foreseeable circumstances, such as levee failures, climate change, drought,[9] and nonnative species. Draft Plan at 6-32. However, the Draft Plan generally proposes no additional measures to address these foreseeable circumstances, and precludes any measures to adapt to these changed circumstances that would require additional commitments of water or funding from the water contractors. *See* Draft Plan at 6-30.

These proposed provisions are not compatible with the requirements of state and federal law, particularly regarding the effects of climate change. Climate change is a foreseeable circumstance, and is likely to result in substantial adverse effects on aquatic and terrestrial ecosystems and species in combination with CVP/SWP operations (including BDCP) absent additional changes beyond those proposed in BDCP, including reductions in Delta inflows and outflows, increased air and water temperatures.[10] Yet the Draft Plan proposes that "no additional actions will be required to remediate climate change effects on covered species and natural communities in the reserve system." Draft Plan at 6-43. This is legally inadequate.

Despite acknowledging significant effects of climate change in the Draft Plan and DEIS/DEIR, the Draft Plan repeatedly disclaims any responsibility to address the adverse effects of climate change, repeatedly distinguishing adverse effects as the result of climate change (rather than the effect of the Draft Plan). *See, e.g.*, Draft Plan at 5.5-3, 5.5-11, 5.3-20, 5.5.3-45 to -47. The Draft

[9] The Draft Plan states, however, that drought is only a foreseeable circumstance with respect to the terrestrial reserve system, and that "the expected effects of droughts on the aquatic natural communities are not considered a changed circumstance." Draft Plan at 6-37. This is inappropriate; the scope of a future drought could certainly exceed that modeled in the Draft Plan, and in such circumstances, additional measures will be needed to protect fish and wildlife. If drought conditions truly are addressed in the Draft Plan and no additional measures will be required,, then the Draft Plan must also prohibit any regulatory changes to respond to drought that weaken operational protections for fish and wildlife, such as Temporary Urgency Changes that reduce Delta outflow requirements under D-1641 or relaxation of ESA protections.

[10] BDCP modeling projects little change in inflows on the Sacramento River, *see* Draft Plan at 5.A.2-101, increased Delta salinity, *id.* at 5.A.2-107, and increased extinction risks and reduced habitat for numerous covered species, *id.* at 5.A.2-101-107.

Plan and DEIS project substantial population declines, and possible extinction, as a result of BDCP and climate change. Yet the Draft Plan makes no provisions to mitigate the impacts of CVP/SWP operations in light of climate change, particularly in terms of upstream operations. As we discuss above, the Draft Plan must be revised to evaluate impacts from reasonably foreseeable adaptation changes to Project operations and facilities during the life of the Project required to maintain adequate cold water temperatures for species viability, address this critical aspect of the "whole of the action," and identify mitigation measures to minimize and avoid, where possible, associated take.

Federal agencies have previously concluded that "the range of adaptive responses available to address those changed circumstances is far too narrow and limiting." NMFS 2013 Progress Assessment at 22; USFWS 2013, U.S. Fish and Wildlife Service Staff BDCP Progress Assessment, April 3, 2013 ("USFWS 2013 Progress Assessment") at 29. We strongly concur. The Draft Plan must be revised to incorporate additional measures to address the impacts of CVP/SWP operations in light changed circumstances, particularly climate change, including operations upstream.

4. The Proposed Assurances are Inconsistent with the ESA, Including the Services' Five Point Policy

NMFS and USFWS adopted an addendum to the HCP Handbook in 2000, which is referred to as the Five Point Policy. *See* 65 Fed. Reg. 35242 (June 1, 2000). In 2010, the Federal agencies issued a white paper on application of the Five Point Policy to BDCP. It states in pertinent part that,

> The BDCP is a complex, landscape scale, long-term HCP with a high degree of uncertainty as to how close the initial conservation measures will come to achieving the plan's biological goals and objectives. It falls into the category of plans that will be a mixture of the two strategies, with initial prescriptions associated with adaptive management, and specific biological outcomes defining the ultimate success of the plan. This type of plan will allow management flexibility so the permittee may institute actions necessary to achieve the plan's goals while providing boundaries for future expectations and commitments. In addition, a results-based plan will address uncertainty in the ecosystem and provide the conservation assurances required by the Act. The Services will be challenged to make the findings required for permit issuance if the plan does not include clearly defined and scientifically supported biological goals and objectives, an adaptive management plan that tests alternative strategies for meeting those biological goals and objectives, and a framework for adjusting future conservation actions, if necessary, based on what is learned.

Federal Agencies White Paper on Application of the 5-point Policy to the Bay Delta Conservation Plan, April 29, 2010 at 1 ("BDCP 5-Point Policy Memo"), available online at: http://baydeltaconservationplan.com/Libraries/Dynamic_Document_Library_-_Archived/5_20_10_BDCP_SC_HO_5_pt_policy_BDCP_white_paper.sflb.ashx. This memo also states that, "An agreement to simply implement specific actions is not sufficient to support the finding unless the analysis demonstrates at the outset a reasonable likelihood that the actions will be successful." *Id.* at 1.

Both NMFS and USFWS have reaffirmed these principles more recently. For instance, NMFS' April 4, 2013 Progress Assessment concludes that,

> Implementation of the conservation measures as initially described in the plan does not constitute the extent of the responsibilities of the Authorized Entities. Achieving the outcomes described in the objectives is the primary responsibility of those implementing the plan.

NMFS 2013 Progress Assessment at 20. That document also states that, "Continuing to achieve objectives is necessary for progress toward recovery of covered species and in many cases will be required for compliance with the terms of the BDCP permit." *Id.* at 19. The U.S. Fish and Wildlife Service provided similar comments in its 2013 Progress Assessment, reaffirming the 2010 memo and stating that,

> In an outcome-based plan, biological objectives provide targets that conservation measures are expected to reach, thereby contributing to the conservation outcomes required by the permit. If the objectives have been appropriately crafted, their achievement assures that a project is doing what it can to contribute to the accomplishment of the ultimate biological goals of the plan. If the CMs fail to achieve the biological objectives around which they are designed, then the plan must provide the means (adaptive management) to change the conservation measures to achieve the outcomes.
>
> We are concerned about the ability of the draft BDCP to successfully facilitate adaptive management.

USFWS 2013 Progress Assessment at 25-26. In addition, the document states that, "the plan needs to clearly articulate that achieving biological objectives is the whole basis of the conservation plan. Achieving and continuing to achieve objectives will be necessary for progress toward the biological goals and recovery of covered species, and may be required for compliance with the HCP permit." *Id.* at 25.

In virtually every respect, the proposed assurances violate the 5 Point Policy and these conclusions of the federal fishery agencies. The Draft IA proposes that the implementation of conservation measures – rather than achievement of biological objectives – shall be the only obligation of the plan proponents and Permittees. *Compare* Draft IA at 24 *with* BDCP 5-Point Policy Memo at 1; *see* NMFS 2013 Progress Assessment at 19, 20. As discussed extensively in sections III and IV of these comments, while BDCP has developed draft biological goals and objectives, the Draft Plan and Draft IA are unlikely to achieve these biological objectives. By establishing a wholly action based HCP, despite the fishery agencies' conclusions regarding scientific uncertainty of conservation measures and the likelihood that the Draft Plan fails to achieve key biological objectives, the proposed assurances violate the ESA.

5. The Draft Plan and Draft IA Cannot Provide any Assurances Regarding Upstream Operations of the CVP and SWP

Even though the CVP/SWP are operated as an integrated unit from upstream reservoirs to operations in the Delta, BDCP proposes to limit the geographic scope of the Draft Plan largely to the legal Delta, excluding upstream operations from covered activities. In our initial scoping comments, we strongly recommended that BDCP revise the geographic scope to include upstream operations, to no avail. Given the adverse impacts of climate change and CVP/SWP operations, particularly upstream reservoir operations, upstream operations of CVP/SWP facilities will have to be substantially changed from that modeled in BDCP in order to avoid causing jeopardy to listed species (either in the near term, or in the future). Because BDCP does not include upstream operations in the proposed project as a covered activity, the Draft Plan and Draft IA cannot legally provide any assurances regarding upstream reservoir operations, even if changes to upstream operations substantially reduce Delta exports in the future. The Draft Plan and Draft IA must be revised to specifically recognize that there are no assurances under the ESA or NCCPA provided regarding upstream operations of the CVP and SWP, and that changes to upstream CVP/SWP operations may result in substantial reductions in water supply under BDCP as compared to that modeled in the Draft Plan.

6. The Draft Plan and Draft IA Provide Assurances to CVP Contractors and to USBR in Violation of the No Surprises Rule, which Prohibits Providing No Surprises Assurances to Federal Agencies

As we previously discussed in our March 2011 memorandum to the state and federal agencies, the ESA prohibits providing "No Surprises" assurances to the Bureau of Reclamation:

> Critically, 50 CFR Sec. 17.22(b)(5), which codifies HCP regulation, states expressly that No Surprises assurances "**cannot be provided to Federal**

> **agencies**." (Emphasis added.) When promulgated, the federal government stated that it was issuing the revised rules in part to clarify that No Surprises assurances "do not apply to Federal agencies who have a continuing obligation to contribute to the conservation of threatened and endangered species under section 7(a)(1) of the ESA." 63 Fed. Reg. 8867 (Feb. 23, 1998). In addition, the notion that the FWS and/or NMFS would be precluded from imposing on a federal agency additional terms and conditions designed to minimize or mitigate excessive take conflicts with the obligation to reinitiate consultation under Section 7(a). Thus, the law expressly prohibits Reclamation and federal water contractors from obtaining Section 10 "No Surprises" assurances and prohibits the FWS/NMFS from approving permits that are structured to undermine the agencies' Section 7 obligations.

Memorandum from EDF, Defenders of Wildlife, and NRDC to the Resources Agency and U.S. Department of the Interior regarding Permittee Status for Water Contractors in BDCP, March 23, 2011 ("2011 Permittee Memo"), at 3; 50 C.F.R. § 17.22(b)(5). However, despite this explicit prohibition under the "No Surprises" rule, the Draft IA attempts to provide regulatory assurances to Reclamation:

> In light of Reclamation's integral role in the BDCP, it is appropriate to provide to Reclamation a degree of certainty regarding its obligation to fund Conservation Measures, and to provide durability and reliability regarding BDCP implementation. In that regard, USFWS and NMFS agree that once the Integrated Biological Opinion has been issued: (1) to the maximum extent allowed by law, Reclamation's ongoing responsibilities for Associated Federal Actions under Section 7(a)(2) of the ESA will be fulfilled through Reclamation's participation in the BDCP, including through the obligations it has assumed under the adaptive management and the Changed Circumstances provisions of the Plan; and (2) USFWS and NMFS agree that Reclamation will not be required to provide additional commitments or measures for Associated Federal Actions beyond those set forth in the BDCP without first attempting to resolve issues through the review process in Section 15.8, if invoked by an Authorized Entity, and exhausting processes set forth in Section 22.5 of this Agreement.

Draft IA at 50-51. This is wholly inconsistent with section 7(a)(1) of the ESA and the "No Surprises" rule, and is unlawful. In order to fulfill its continuing obligations under the ESA, Reclamation must have the ability to provide additional water or money to meet the conservation needs of covered species.

Equally important, the Draft Plan and Draft IA unlawfully propose to extend No Surprises assurances to Federal water contractors, in violation of the No Surprises Rule. Such assurances would not only limit the resources Federal water contractors will be required to contribute to the Draft Plan, but such assurances would effectively limit the water and other resources the Bureau of Reclamation could contribute to the Draft Plan. That is inconsistent with section 7(a)(1) of the ESA and the No Surprises rule, as we made clear in our November 2011 comments on the draft first amendment to the BDCP Memorandum of Agreement.

Under the ESA, Federal agencies operate under Section 7, which does not contain any assurances similar to Section 10. The distinction between private landowners and Federal agencies reflects the latter's legal duty under section 7(a)(1) of the ESA, which provides that Federal agencies are under a "continual obligation to contribute to the conservation of threatened and endangered species." 63 Fed. Reg. 8859, 8867 (Feb. 23, 1998). Providing Federal CVP water contractors with Section 10 assurances contravenes the same continuing obligation placed on Federal agencies because it limits the water and other resources Reclamation will be expected to provide to the Plan. The Draft Plan and Draft IA fail to explain how Reclamation can comply with its continuing obligations under section 7(a)(1) of the ESA, particularly the continuing duty (if needed) to provide additional water to meet environmental needs of listed species, if BDCP provides assurances to CVP contractors that there will be no additional impacts to CVP water supply: it is the same water, and the rights to that water are held by Reclamation. As such, the Draft Plan and Draft IA must be revised to avoid providing regulatory assurances to Reclamation and/or CVP contractors.

7. CVP and SWP Contractors are Not Qualified as Permittees, and Thus Cannot Obtain Regulatory Assurances

In addition to violating the No Surprises Rule, neither SWP nor CVP contractors are appropriate permittees who could obtain Section 10 assurances. *See* Permittee Memo. In addition, according to the HCP Handbook, "[t]he permittee must therefore be capable of overseeing HCP implementation and have the authority to regulate the activities covered by the permit." HCP Handbook at 3-2. Similarly, as part of the USFWS ITP application, applicants are required to sign a notice which certifies that they

> own the lands indicated in this application, or have sufficient authority or rights over these lands to implement the measures of the Habitat Conservation Plan (and Implementing Agreement if applicable) covered by the Incidental Take permit. Further, upon receipt of the Incidental Take permit, [the signatories] agree to conduct the activities as specified in the Habitat Conservation Plan (and Implementing Agreement if applicable) according to the terms and conditions of the Incidental Take permit and its supporting documents.

Department of the Interior: U.S. Fish and Wildlife Service, Incidental Take Permit Associated with a Habitat Conservation Plan Application Form (Rev. October 2013) at 12, available online at http://www.fws.gov/forms/3-200-56.pdf. This provision ensures that permittees will have sufficient authority to implement the HCP's conservation measures.

However, the state and federal water contractors lack sufficient authority over either the land or operations of the CVP and SWP to qualify as a permittee under the ESA. *See* Permittee Memo. The existing CVP and SWP facilities are owned by the State and Federal Governments, and any new water conveyance infrastructure will be owned and operated by the Department of Water Resources (DWR). *See* Draft Plan at 8-70. Furthermore, the water rights associated with the BDCP, SWP, and CVP will not be held by the water contractors, and are instead held by DWR and USBR. *See, e.g.,* Water Rights Decision 1641 (December 29, 1999) at 146-149. And state and federal agencies, not the water contractors, control operations of diversion facilities, consistent with existing law. *See, e.g., id.* at 132 ("Only the DWR and the USBR can implement the objectives for operational constraints in the 1995 Bay-Delta Plan. The objectives for export pumping rates are the responsibility of each of the two projects at their respective facilities. The objectives for Delta Cross Channel operation are the sole responsibility of its owner, the USBR."); Permittee Memo at 4-5.

Because the state and federal water contractors do not have adequate authority to implement the Draft Plan, including lacking any authority to implement conservation measures relating to CVP/SWP operations and/or affecting CVP/SWP water rights as well as lacking any authority over lands in the Delta, they do not qualify as permittees and they cannot therefore obtain No Surprises assurances.[11]

D. The Draft Plan Fails to Comply with the Central Valley Project Improvement Act, Bay Delta Water Quality Control Plan, and Provisions of the Fish and Game Code Regarding Salmon Doubling

Despite the fact that our organizations have reiterated for years that any lawful BDCP must meet salmon doubling requirements in state and federal law, the Draft Plan fails to acknowledge the applicability of these requirements. *See, e.g.,* Letter to Lori Rinek, USFWS, from NRDC, TBI, Defenders of Wildlife, EDF (May 14, 2009) (incorporated herein by reference). The Draft Plan's omission indicates a failure to meet these requirements, but does not lessen the requirement that the Plan provide for salmon doubling. *Cf.* Draft Plan at 1-6 to 1-20.

[11] The same logic extends to permits and assurances provided under the NCCPA.

The federal Central Valley Project Improvement Act imposes an anadromous fish doubling goal on operations of the CVP that is long overdue.[12] The CVPIA directs DOI to develop and implement a program that makes "all reasonable efforts" to ensure and sustain on a long-term basis a doubling of the number of naturally produced anadromous fish in Central Valley rivers and streams, using the average levels attained during the period of 1967-1991 as the baseline. P.L. 102-575, § 3406(b)(1). The plan was due by 1995, and the doubling goal was supposed to have been met by 2002. It has not been met. *See, e.g.,* CVPIA Independent Fisheries Review Panel 2008, "Listen to the River: An Independent Review of the CVPIA Fisheries Program," ("CVPIA Fisheries Review 2008") available online at http://www.usbr.gov/mp/cvpia/docs_reports/indep_review/FisheriesReport12_12_08.pdf, incorporated by this reference.

As the CVPIA Independent Science Panel noted, DOI has yet to take on its environmental mission with the same "zeal" that it brings to its water supply responsibilities. The CVPIA Fisheries Review 2008 states that "After 16 years of implementation the CVPIA anadromous fish program is not close to its stated doubling goal, nor has it solved the problems that led to the listing of several species of salmon and steelhead under the ESA." The report concludes that DOI:

- Has not developed a proper conceptual foundation and framework for the program;
- Has organized and managed the program in a compartmentalized way rather than an integrated, systematic and scientific way;
- Has not addressed key fisheries problems at the systems level;
- Has failed to prioritize and address effectively the problems in the Delta;
- Has substantially underutilized CVPIA authorities, especially with regard to water management and the issues in the Delta.

The Panel was particularly severe in discussing DOI's reticence to use its Section 3406(b)(2) authority to make more water available for salmon:

> An excellent example of the agencies' constrained approach to their authorities is how the agencies have implemented Section 3406(b)(2)....When viewed in combination with the broad directive in Section 3406(b)(1)(B) to "modify Central Valley Project operations

[12] In addition, the Draft Plan fails to incorporate Level 4 water deliveries to the wildlife refuges, despite the requirements of the CVPIA. *See* P.L. 102-575, § 3406(d). As discussed infra, the DEIS/DEIR and Draft Plan also omit Level 4 refuge water supply from the environmental baseline.

> to provide flows of suitable quality, quantity, and timing to protect all life stages of anadromous fish," for which the 800 kaf is one explicit tool, the panel expected to find that implementation of 3406(b)(2) had occurred in this way: The agencies identify 800 kaf of dedicated storage in the system – essentially, a water volume budget – and then consistent with an identified system-wide flow regime to improve conditions for anadromous fish, Reclamation would release this stored water in requested amounts at the call of the fish managers and then protect that amount of altered flow through the rivers, through the Delta, and into the bay.
>
> We were flabbergasted to learn this is not how the agencies implement this provision. The agencies have not identified a system-wide flow regime and set of system flow objectives. Worse, Reclamation does not dedicate and manage 800 kaf of water from headwaters storage through the Delta. Instead, Reclamation releases approximately *400* kaf from CVP storage each year, aimed at supporting the needs of particular life stages at particular locations. These augmented amounts are then *diverted out of the system* at a later point. The 800 kaf accounting then includes approximately 400 kaf realized in pump restrictions in the Delta. **This approach seems fundamentally at odds with the intent and language of the legislation.**

Id. (emphasis in original). The Ninth Circuit Court of Appeals has similarly and repeatedly made clear that DOI has failed to implement this mandate, which it is required to meet by law, holding in *San Luis & Delta Mendota Water Authority v U.S.*, 672 F.3d 676 (9th Cir. 2012) that:

- The CVPIA establishes its own "restoration mandate" distinct from the environmental protections provided for in other statutes.
- The concept of primary purpose cannot be "untethered" from CVPIA's restoration mandate.
- The CVPIA distinguishes between the "primary restorative purpose (on the one hand) and those of water quality protection and meeting other legal obligations such as the ESA (on the other)." This distinction: "clearly demonstrates that an action taken to meet water quality criteria and/or ESA requirements does not, by itself, fall within the category of a (b)(2) primary purpose."
- It is improper for DOI to relegate "water needed for implementation of the Improvement Act's restoration mandate" to a secondary role.
- Crediting of ESA/WQCP releases to the (b)(2) account is only appropriate when such releases "predominantly" overlap with actions taken for the primary (b)(2) purpose.
- DOI's December 2003 Guidance is invalid in its characterization of the 1995 WQCP.
- Not every measure taken to protect some species of fish and wildlife automatically becomes a primary purpose under (b)(2). Thus, merely because a water quality release is

made for some environmental purpose does not mean that it qualifies as a (b)(2) primary purpose action: "primary purpose is narrower than the 2003 Guidance Memo suggests. It consists… only of those restoration measures which are specifically enumerated in Section 3406(b)(2) of the CVPIA."

- DOI could have limited confusion and controversy by implementing a more coherent set of accounting procedures after it became aware of the Jan. 2004 9th Circuit Decision.

The Bay-Delta Water Quality Control Plan likewise imposes a water quality objective requiring that,

> Water quality conditions shall be maintained, together with other measures in the watershed, sufficient to achieve a doubling of natural production of chinook salmon from the average production of 1967-1991, consistent with the provisions of State and federal law.

See State Water Resources Control Board, Final Water Quality Control Plan for the San Francisco Bay San Joaquin River Delta, December 13, 2006, at 14, available online at: http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/wq_control_plans/2006wqcp/docs/2006_plan_final.pdf (and hereby incorporated by reference). The State Water Resources Control Board's review of BDCP must demonstrate that the Draft Plan is consistent with achievement of this objective. *See also* Water Code §§ 13050(j)(3), 13242(a); *In re State Water Resources Control Board Cases*, 136 Cal.App.4th 674, 775 (2006). Likewise, Salmon doubling is also a stand-alone requirement of State law. Section 6902 of the Fish and Game Code establishes as State policy that the State shall "double the current natural production of salmon and steelhead trout resources" and that existing salmon and steelhead habitat shall not be further diminished. Similarly, section 5937 of the Fish and Game Code is a long-standing provision of State law that requires the operator of any dam, including state and federal governments, to provide sufficient water at all times to pass over or around the dam to restore and maintain naturally-producing populations of native fish in good condition. *See, e.g., Natural Resources Defense Council v. Patterson*, 333 F.Supp.2d 906 (E.D. Cal. 2004).

The Draft Plan can and must be revised to address these long-overdue requirements, include salmon doubling as an achievable biological objective, and address how DOI and DWR will meet their salmon doubling obligations in the context of BDCP.

E. The Draft Plan Fails to Comply with Water Quality and Water Rights Requirements Under State Law

The Draft Plan acknowledges that the State Water Resources Control Board has extensive independent authority to determine legal obligations that directly affect BDCP. These include the SWRCB's ongoing (and long overdue) update of the Bay Delta Water Quality Control Plan, including flow standards necessary to protect the fish, aquatic, and wildlife resources, and agricultural and domestic supply in the Delta; and review and permitting of the Plan's proposed change in point of diversion, which may not cause injury to any legal user of the water involved, including fish and wildlife. Draft Plan at 1-19 to 1-20. The Draft Plan asserts that the "State Water Board's participation in the development of the BDCP and in the environmental review process is intended to ensure consistency between the actions described in the BDCP and those required by the State Water Board." Draft Plan at 1-20. Despite this assertion, the Draft Plan utterly fails to address or account for anticipated changes under an updated water quality control plan and change in point of diversion review. This is most apparent in the Plan's failure to adequately incorporate and address the Board's recognition of the need for significantly increased flows into and through the Delta, as indicated by its 2010 public trust flows report and numerous comments provided during BDCP development. *See* Water Code § 85086(b) and (c) (public trust flow criteria should inform the BDCP and related Delta planning decisions); State Water Resources Control Board, Final Report, Development of Flow Criteria for the Sacramento-San Joaquin Delta Ecosystem, August 3, 2010 ("SWRCB 2010 Flow Report"), available online at: http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/deltaflow/docs/final_rpt080310.pdf. Instead of acknowledging this input and providing for increased flows at critical times of the year for imperiled fish, the Draft Plan asserts without adequate justification that exports cannot be reduced to a level sufficient to protect and restore fish and wildlife. But the Plan bases this false conclusion on its failure to adequately consider alternative sources of water supply available to exporters, which would enable diversions from the Delta to be significantly reduced while maintaining a reliable and adequate water supply.[13]

The Draft Plan must be revised to assess the proposed project's ability to meet the significantly increased flows necessary to protect and restore covered species in light of the abundant and

[13] The Draft Plan's failure to consider alternative water supply and demand reduction measures in export areas violates several other legal requirements, as well, including the failure to consider an adequate range of alternatives, failure to comply with requirements of the Delta Reform Act of 2009, and failure to consider alternatives to take, to name just a few. This failure is especially egregious in light of the fact that the Draft Plan proposes these very same alternative water supply and demand reduction measures for in-Delta diverters as a proposed form of mitigation for imposing degraded water quality conditions on those water users. DEIS/DEIR Appendix 3B at 3B-43.

affordable alternative water supply sources available to exporters. *See, e.g.,* NRDC and the Pacific Institute, "The Untapped Potential of California's Water Supply: Efficiency, Reuse, and Stormwater," June 2014, available online at http://www.nrdc.org/water/ca-water-supply-solutions.asp (incorporated herein by reference); 2013 update to bulletin 160 at http://www.waterplan.water.ca.gov/previous/b160-98/TOC.cfm (incorporated herein by reference); USBR, CVP Integrated Resource Plan (2014) at http://www.usbr.gov/mp/SSJBasinStudy/documents/cvp_integrated_resource_plan_summv2.pdf (incorporated herein by reference).

Even if it is beyond the scope of the Draft Plan to analyze these alternative water supply options in detail, the Plan may not simply pretend that these planned future investments and options do not exist and fail to consider them, especially in light of the state policy to reduce reliance on Delta water exports by investing in efficiency, recycling, advanced water technologies, local and regional water supply projects. *See* Water Code § 85021. Indeed, the Draft Plan itself proposes to reduce adverse water supply impacts for in-Delta water users imposed by the Plan's adverse water quality impacts by:

> **Develop[ing] demand management and/or conservation/recycling projects to extend available water supplies (municipal uses).** Facilitation and development of additional demand management, water conservation, and wastewater recycling projects would help reduce use of Delta diversion facilities when water quality is poor allowing for more efficient use of other existing water supplies.

DEIS/DEIR Appendix 3B at 3B-43. Of course, these measures would also "help reduce use of Delta diversion facilities" by export water users to enable reduced diversions from the Delta to meet ecosystem and species protection needs. Moreover, DWR and DOI have already acknowledged that they can choose to include and analyze the impact of measures taken outside of the Delta in this BDCP analysis. 74 Fed. Reg. 7257 (Feb. 13, 2009) ("it may be necessary for the BDCP to include conservation actions outside of the Statutory Delta that advance the goals and objectives of the BDCP within the Delta.... The EIS/EIR project area for which impacts are evaluated may be different than the BDCP geographic scope."); DWR NOP (Feb. 13, 2009) ("The EIR/EIS project area for which impacts are evaluated may be different that the BDCP geographic scope."). There is no reasonable excuse to artificially limit the scope of the analysis in the manner chosen by the Draft Plan.

Further, as noted in the attached analysis by the University of Southern California, "Water Supply Scarcity in Southern California: Assessing Water District Level Strategies," the expensive price tag of the currently proposed BDCP is likely to negatively affect the ability of local water districts and others to invest in efficiency, recycling, advanced water technologies, and other local and regional water supply projects. University of Southern California Center for

Sustainable Cities, Water Supply Scarcity in Southern California: Assessing Water District Level Strategies, 2012, available online at http://sustainablecities.usc.edu/research/publications.html (incorporated by reference). That report finds that "[w]ith a projected costs of $23.7 Billion to be paid by user fees, this project could foreclose other water supply options for Southern California." *Id.* at page x. Without a financing plan that explains how users will finance the proposed project, the Draft Plan does not and cannot accurately assess the impact of the proposed project on user fees in the future or the effect of that increase on other needed investments to meet state policy. This omission is significant, since "[t]he increasing price of imported water is [already] a major factor in local water agency efforts to conserve water and to invest in new water supply sources." *Id.* at page xi. As the report concludes, "Some investments, such as SWP proposed tunnels will preclude others due to financial constraints. Trade-off analysis and full-accounting … should be included in such analyses." *Id.* at pages xxvi-xxvii.

In addition, as we discuss in section II, the Draft Plan proposes to violate existing water quality standards protecting fish and wildlife, and the Draft Plan identifies significant degradation in water quality for other users, including agricultural and municipal and industrial uses, and fails to propose adequate mitigation for such degradation, *see* DEIS/DEIR at ES-63 to ES-65 and Chapter 8 (identifying significant and unavoidable impacts to water quality from methylmercury, bromide, chloride, electrical conductivity, organic carbon, pesticides, and selenium). Many other commentators have identified significant flaws with the DEIS/DEIR's modeling of water quality impacts. The DEIS/DEIR and Draft Plan must propose operational changes and other feasible mitigation measures to address these significant impacts.

As currently drafted, the analysis fails to provide information or analysis sufficient to support the State Board's change in point of diversion permit or to address the reasonably foreseeable impact of strengthened flow standards under an updated Bay-Delta water quality control plan.

F. The Draft Plan Violates the State's Obligations under the Public Trust Doctrine

The Draft Plan fails to adequately consider and protect against the Plan's adverse impacts on public trust resources, as it must. As discussed above, the Draft Plan does an insufficient job of addressing and incorporating the public trust flow criteria developed by the State Board in 2010, despite the fact that the Legislature specifically called for these flow criteria to be developed to inform the BDCP, any change in point of diversion permit, and other Delta planning decisions. Water Code § 85086(b) and (c). This renders the Plan's analysis insufficient to support the State Board's subsequent issuance of a change in point of diversion permit. However, the failure to adequately consider and protect public trust resources is also a violation of DWR's independent obligation to do so as a trustee state agency. "The State can no more abdicate its trust over property in which the whole people are interested … than it can abdicate its police powers."

Illinois Central Railroad Co. v. Illinois, 146 U.S. 387, 452 (1882). Indeed, DWR and other state agencies have "an affirmative duty to take the public trust into account … and to protect public trust uses whenever feasible." *Nat'l Audubon Soc'y v. Superior Court,* 33 Cal. 3d 419, 446 (1983)

The State holds title as trustee of the public trust for the benefit of the People of California. *Colberg, Inc. v. State*, 67 Cal.2d 408, 416 (1967). The State also has a duty to supervise and administer the trust so that the public may continue to use navigable waterways, like the Delta, for public trust purposes. While the obligation extends to preserving public trust uses where feasible, the failure to adequately assess alternative water supply options means that the Plan utterly fails to assess the feasibility of significantly reducing exports from the Delta over the next 70 years (50-year plan duration plus approximate permitting and construction period). The Draft Plan violates DWR's and other state agencies' public trust obligations and must be modified to incorporate feasible protections sufficient to protect and restore native fish and other public trust resources.

G. <u>The Draft Plan Fails to Comply with the Delta Reform Act</u>

The 2009 Delta Reform Act established several requirements that BDCP fails to comply with. First, the Act prohibits any public funding for BDCP unless it complies with the NCCPA, CEQA, and specific provisions of the Act. Cal. Water Code § 85320(b). However, because the Draft Plan violates the NCCPA, *see supra*, and violates CEQA, *see infra*, approval of the Draft Plan and provision of any public funding would violate the Delta Reform Act. Second, as discussed extensively in these comments, BDCP fails to identify the "operational criteria and flows necessary for recovering the Delta ecosystem and restoring fisheries under a reasonable range of hydrologic conditions, which will identify the remaining water available for export and other beneficial uses." Water Code § 85320(b)(2)(A). Third, BDCP fails to comply with the Delta Reform Act's requirement to reduce reliance on the Delta:

> The policy of the State of California is to reduce reliance on the Delta in meeting California's future water supply needs through a statewide strategy of investing in improved regional supplies, conservation, and water use efficiency. Each region that depends on water from the Delta watershed shall improve its regional self-reliance for water through investment in water use efficiency, water recycling, advanced water technologies, local and regional water supply projects, and improved regional coordination of local and regional water supply efforts.

Cal. Water Code § 85021. Appendix 3I of the DEIS/DEIR, which addresses BDCP compliance with the Delta Reform Act, wholly omits any discussion of section 85021 of the Delta Reform

Act. At a minimum, the Draft Plan and DEIS/DEIR fail to demonstrate how BDCP complies with this mandate.

Fourth, as discussed above, the Draft Plan and Draft IA do not require achievement of the Draft Plan's biological objectives, instead only requiring implementation of the conservation measures. This is inconsistent with the requirements of the Delta Reform Act, which requires that the fishery agencies "ensure" that biological performance measures "are achieved." *See* Water Code § 85321 ("The BDCP shall include a transparent, real-time operational decisionmaking process in which fishery agencies ensure that applicable biological performance measures are achieved in a timely manner with respect to water system operations.").

H. <u>The DEIS/DEIR Violate CEQA and NEPA</u>

The fundamental purpose of CEQA and NEPA is to ensure that agencies consider, mitigate, and disclose to the public potentially significant adverse impacts on the environment before approving or implementing a project. Their requirements are not mere hoops to jump through, but are intended "to afford the fullest possible protection to the environment within the reasonable scope of the statutory language." *Friends of Mammoth v. Board of Supervisors*, 8 Cal.3d 247, 259 (1972). As articulated by the legislature, CEQA is designed to prevent public agencies from approving projects if "feasible" alternatives or mitigation measures would substantially lessen the significant environmental effects." Pub. Res. Code § 21002. Another key goal is to inform decisionmakers and the public about the potentially significant environmental effects of proposed projects. *See, e.g.,* 14 Cal. Code Regs. §15002. Finally, CEQA and NEPA both require consideration of a reasonable range of alternative actions that might achieve similar goals with less environmental impact. *See, e.g.,* 40 C.F.R. §1502.14. In several key respects, the DEIS/DEIR violate fundamental provisions of CEQA and NEPA. First, the DEIS/DEIR uses flawed environmental baselines which understate the environmental impacts of the Draft Plan and Alternatives and fail to inform the public and decisionmakers of the actual impacts. Second, the DEIS/DEIR fail to include a reasonable range of alternatives, and rely on unreasonably narrow purpose and need statement to exclude reasonable alternatives. Third, the DEIS/DEIR fails to adequately analyze cumulative impacts. Fourth, the geographic scope of the DEIS/DEIR violates CEQA by excluding analysis of impacts to San Francisco Bay. Finally, as we discuss extensively in sections II, III and IV of these comments, the DEIS/DEIR fails to use sound science and provide accurate information to the public and decisionmakers regarding potential impacts of the State's proposed plan (Alternative 4), and the DEIS/DEIR's conclusions regarding several impacts are not supported by substantial evidence and understate the true environmental impacts. Because feasible mitigation measures are available, including changes to CVP/SWP operations and investments in local and regional water supplies that reduce reliance on the Delta, the DEIS/DEIR must be revised to incorporate such mitigation measures.

1. The DEIS/DEIR Use an Illegal Baseline that Understates the Likely Adverse Environmental Impacts of the Draft Plan and Alternatives

Both NEPA and CEQA require that the Project be analyzed against the existing environmental conditions (the "environmental baseline"), in order that the Project's environmental impacts can be meaningfully analyzed and compared to alternatives. 40 C.F.R. § 1502.15; CEQA Guidelines § 15125(a); *see County of Amador v. El Dorado County Water Agency*, 76 Cal.App.4th 931, 952 (1999); *Neighbors for Smart Rail v. LA County Metropolitan Transit Authority*, 57 Cal. 4th 310, 315 (2013). Under CEQA, the DEIR must "delineate environmental conditions prevailing absent the project, defining a 'baseline' against which predicated effects can be described and quantified." *Neighbors for Smart Rail*, 57 Cal.4th 439, 447 (2013) (*citing Communities for a Better Environment v. South Coast Air Quality Dist.*, 48 Cal.4th 310, 315 (2010)). The purpose is to provide a "realistic baseline that will give the public and decision makers the most accurate picture practically possible of the project's likely effects." *Neighbors for Smart Rail*, 57 Cal.4th at 449 (*citing Communities for a Better Environment*, 48 Cal. 4th at 322, 325, 328).

In three distinct ways, the environmental baseline used in the draft BDCP and DEIS/DEIR fails to accurately assess the impacts of the proposed project, misleading decisionmakers and the public of the potential environmental impacts of the proposed project and alternatives in violation of NEPA and CEQA. First, the environmental baseline in the DEIS/DEIR omits implementation of floodplain habitat restoration in the Yolo Bypass and associated changes to weirs and infrastructure, despite existing permit requirements to implement these actions by 2020 as a mitigation measure for existing CVP/SWP operations. These habitat restoration projects will be implemented if no action is taken on BDCP, yet they are not included in the no action alternative. As a result, the DEIS/DEIR overstates the environmental benefits of the proposed project as compared to no action, and it substantially understates the environmental impacts of the proposed project as compared to no action. Second, the environmental baseline in the DEIR (but not the DEIS) omits implementation of the "Fall X2" action required under the 2009 Delta smelt biological opinion. This creates further confusion by creating two separate environmental baselines under NEPA and CEQA, and it results in the DEIR overstating the environmental benefits of the proposed project as compared to the no action alternative, and understating the environmental impacts of the proposed project as compared to the no action alternative. Third, the draft BDCP uses a completely manufactured environmental baseline for Chapter 9 of the draft plan, which causes further confusion and is inconsistent with the baselines used in the DEIS/DEIR.[14] Taken together, these flaws confuse the reader, undermining the

[14] In addition, the Draft Plan and DEIS/DEIR use an improper baseline for water deliveries to CVPIA wildlife refuges, failing to incorporate any Level 4 deliveries in the baseline. *See* DEIS/DEIR Appendix 3D at 3D-6.

intent of NEPA and CEQA, and result in the DEIS/DEIR overstating the environmental benefits and understating the environmental impacts of the proposed project.

i. The DEIS/DEIR and Draft Plan Provide Misleading Information Because they Fail to Include Required Habitat Restoration, Including Yolo Bypass Restoration, in the Environmental Baseline

First, the document violates NEPA and CEQA by failing to include required habitat restoration projects, including floodplain habitat restoration in the Yolo Bypass, in the environmental baseline in the DEIS/DEIR. These habitat restoration measures are required by the existing permits for SWP and CVP operations as a mitigation obligation, and they are required to be implemented regardless of whether BDCP moves forward. *See, e.g.*, 2009 NMFS Biological Opinion; 2008 USFWS Biological Opinion; Draft Yolo Bypass Salmonid Habitat Restoration and Fish Passage Implementation Plan, September 2012;[15] Notice of Intent, Draft Environmental Impact Statement / Environmental Impact Report for Yolo Bypass Salmonid Habitat Restoration and Fish Passage, California, 78 Fed. Reg. 14117 (March 4, 2013). The 2009 NMFS biological opinion includes specific criteria that must be achieved with respect to modifications to Freemont and Lisbon weirs, the amount of acreage that must be inundated as a result of restoration, and specific timelines for implementation. NMFS 2009 Biological Opinion at 607-611.

Despite these existing legal requirements, the DEIS/DEIR does not include these measures in the no action alternative or in the environmental baseline for BDCP. *See* DEIS/DEIR at 3-44 to 3-45; Draft Plan at 5.2-6 to 5.2-8. Yet the document also identifies significant environmental benefits from the Yolo Bypass restoration action, benefits that do not appear in the no action alternative despite the fact that these habitat restoration measures are required to be implemented regardless of the outcome of BDCP. *See, e.g.*, DEIS/DEIR at 11-19, 11-278 to 11-281, 11-343, 11-345, 11-487 to 11-488; Draft BDCP Plan at 5.5.3-2 to 5.5.3-7, 5.5.3-41 to 5.5.3-47 (effects analysis of proposed project on winter-run Chinook salmon, concluding in particular that Yolo Bypass restoration under BDCP is highly beneficial for salmon).[16] For instance, the draft plan

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[15] The draft plan and associated letters between the Bureau of Reclamation and National Marine Fisheries Service are available online at: http://www.usbr.gov/mp/BayDeltaOffice/Documents/yolo.html. These documents are incorporated by reference.

[16] Confusingly, and without any analysis, the DEIS/DEIR claims that the Yolo Bypass restoration measures proposed under BDCP "go beyond those in the 2008 NMFS BiOp actions." DEIS/DEIR at 3-45. In contrast, Chapter 9 of the Draft Plan states that, "There is significant overlap in Yolo Bypass improvements between the NMFS 2009 BiOp and the USFWS 2008 BiOp and CM2. The CM2 estimate was reduced to 75% to account for this overlap." Draft Plan at 9-42. It appears that the Draft Plan includes the costs of implementing these habitat restoration requirements in the different baseline used in Chapter 9, even though they were not included in the baseline in the DEIS/DEIR or in other chapters of

concludes that, "The BDCP will provide improved adult and juvenile salmonid passage at Fremont Weir, increase the inundation period of the bypass, and enhance habitat conditions across the bypass itself." Draft Plan at 5.5.3-42. However, the 2009 NMFS biological opinion requires each of these actions on a shorter time frame than BDCP. As a result, the exclusion of Yolo Bypass restoration from the environmental baseline is highly misleading and fails to accurately assess the environmental impacts of the proposed project and alternatives, including the no action alternative.

For purposes of NEPA, the no action alternative in the BDCP DEIS/DEIR provides the environmental baseline, and "The No Action Alternative, sometimes referred to as the future no action condition, considers No Action to include continuation of operations of the SWP and CVP as described in the 2008 USFWS and 2009 NMFS BiOps and RPAs and other relevant plans and projects that would likely occur in the absence of BDCP actions." DEIS/DEIR at 4-5. Yet despite the fact that Yolo Bypass and other habitat restoration requirements of the 2008 USFWS biological opinion and 2009 NMFS biological opinion will "likely occur in the absence of BDCP actions," inexplicably, the DEIS/DEIR does not include the Yolo Bypass and other habitat restoration requirements of the biological opinions in the no action alternative. By failing to include the Yolo Bypass and other habitat restoration requirements in the No Action alternative, the DEIS overstates any environmental benefits of BDCP and understates the environmental impacts of BDCP. This fundamentally violates NEPA's purpose of informing the public and decisionmakers of the environmental consequences of a proposal and its alternatives. In order to comply with NEPA, the DEIR should be revised to include the Yolo Bypass and related requirements of the 2009 NMFS biological opinion and the habitat restoration requirements of the 2008 USFWS biological opinion in the no action alternative.

For purposes of CEQA, the environmental baseline generally is the existing conditions at the time of the NOP. 14 Cal. Code Regs. § 15125. However, the state Supreme Court's decision in *Neighbors for Smart Rail v. Exposition Metro Line* explains that this rule is not absolute, and "A departure from this norm can be justified by substantial evidence that an analysis based on existing conditions would tend to be misleading or without informational value to EIR users." 57 Cal. 4th 439, 457 (2013). The fundamental goal is to ensure that, "CEQA analysis employ a realistic baseline that will give the public and decision makers the most accurate picture practically possible of the project's likely impacts." *Id.* at 449. Footnote 5 of the court's opinion

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the draft plan. By omitting the Yolo Bypass restoration requirements of the 2009 NMFS biological opinion from the No Action Alternative, the DEIS/DEIR fails to provide the public and decisionmakers with the analysis to show the potential environmental consequences of CM2 versus the 2009 NMFS biological opinion requirements and to accurately demonstrate the environmental impacts of the proposed project and alternatives. In addition, as noted above, it appears that BDCP proposes to have the public pay for CM2 (Yolo Bypass restoration), despite the fact that this is a mitigation obligation of the CVP and SWP under existing biological opinions.

cited an example where use of the existing conditions as the environmental baseline could be misleading:

> Amicus curiae South Coast Air Quality Management District provides a hypothetical example of factual conditions in which use of an existing conditions baseline would arguably mask potentially significant project impacts that would be revealed by using a future conditions baseline. In this illustration, an existing industrial facility currently emits an air pollutant in the amount of 1,000 pounds per day. By the year 2020, if no new project is undertaken at the facility, emissions of the pollutant are projected to fall to 500 pounds per day due to enforcement of regulations already adopted and to turnover in the facility's vehicle fleet. The operator proposes to use the facility for a new project that will emit 750 pounds per day of the pollutant upon implementation and through at least 2020. An analysis comparing the project's emissions to existing emissions would conclude the project would reduce pollution and thus have no significant adverse impact, while an analysis using a baseline of projected year 2020 conditions would show the project is likely to increase emissions by 250 pounds per day, a (presumably significant) 50 percent increase over baseline conditions.

Id. at 453, fn. 5.

As in this example from the court's opinion, in the draft BDCP exclusion of the requirement to restore floodplains in the Yolo Bypass from the environmental baseline misleads the public of the potential environmental effects. By omitting these existing mitigation requirements, an analysis comparing the project to existing habitat conditions in the Yolo Bypass would show significant increases in habitat, whereas using a baseline that includes the 2009 NMFS biological opinion requirements relating to the Yolo Bypass would presumably show there would be little change from the baseline. This is critically important, as the DEIR claims that Yolo Bypass actions would have significant benefits for fish that may offset some of the impacts of other elements of BDCP (CM1); because Yolo Bypass restoration would necessarily occur with or without BDCP, this measure cannot offset impacts from CM1.[17] The environmental baseline in

[17] As an example of how this misleads the public, at least one independent review of the Draft Plan and DEIS/DEIR have identified Yolo Bypass restoration as a mitigation measure to offset the impacts to salmon and other native fisheries, whereas a clear presentation of the Yolo Bypass restoration as part of the environmental baseline would not have mislead reviewers. Jeffrey Mount, William Fleenor, Brian Gray, Bruce Herbold, Wim Kimmerer. September 2013, Panel Review of the Draft Bay Delta Conservation Plan: Prepared for The Nature Conservancy and American Rivers ("Mount and Saracino et al. 2013"), at 2, 38-41, available online at: https://watershed.ucdavis.edu/files/biblio/FINAL-BDCP-REVIEW-for-TNC-and-AR-Sept-2013.pdf (noting that their review of the BDCP documents shows that BDCP will increase the frequency of inundation of the bypass and that the duration of inundation in the bypass would not change under the No Action Alternative). While we agree with many of the modeling

the DEIR should be revised to include the requirements of the 2009 NMFS biological opinion relating to the Yolo Bypass (RPA Actions I.6.1 and I.7) and habitat restoration requirements of the 2008 USFWS biological opinion.

ii. The DEIR Provides Misleading Information because it Fails to Include Fall X2 Requirements in the Environmental Baseline

Second, the DEIR improperly justifies the exclusion of the Fall X2 action of the 2008 USFWS biological opinion from the environmental baseline in light of the state Supreme Court's decision in *Neighbors for Smart Rail v. Exposition Metro Line*. DEIS/DEIR at 4-4 to 4-5. Because the NEPA baseline appropriately includes the Fall X2 action from the 2008 USFWS biological opinion, the document unnecessarily confuses the public and decisionmakers with two separate baselines for comparison. Equally important, just as in the prior discussion of excluding the habitat restoration requirements of the biological opinions from the environmental analysis, this too is a case where excluding the Fall X2 action from the baseline leads to highly misleading analysis. At the time of the NOP (as well as today), the Fall X2 requirement of the 2008 USFWS biological opinion was required to be implemented in every wet and above normal water year type by allowing greater outflow during the fall months than was previously required, in order to mitigate impacts of the CVP and SWP operations on Delta smelt. Yet by omitting the Fall X2 action from the DEIR, the document makes it appear that BDCP results in the same or higher outflow in the fall months than under the status quo, and makes it appear that alternatives that do not include the Fall X2 action are similar to the status quo (rather than causing significantly increased environmental impacts, given the environmental benefits of the Fall X2 action). *See, e.g.*, DEIS/DEIR at 11-1295 to 11-1298 (discussing different findings of the effects of Alternative 4 on delta smelt rearing habitat under NEPA and CEQA, concluding that, "The NEPA analysis is a better approach for isolating the effect of the alternative from the effects of sea level rise, climate change, future water demands, and implementation of required actions such as the Fall X2 requirement."). As with exclusion of the habitat restoration requirements of the two biological opinions, exclusion of the Fall X2 action from the CEQA baseline in the DEIR is misleading and confusing to the public and decisionmakers, and the DEIR should be revised to include the Fall X2 action in the CEQA baseline.

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and biological critiques in this report, we disagree in particular with the flawed legal analysis in Chapter 2 of that review.

iii. The Draft Plan Provides Misleading Information because it Includes a Wholly Unjustified Baseline for Economic Impacts and Benefits

Third, Chapter 9 of the Draft Plan includes two new, wholly invented baselines for comparison of economic impacts and benefits. *See* Draft Plan at 9.A-1 to 9.A-4; Draft Plan at 9-40 to 9-42. This is problematic both because it provides a grossly misleading assessment of the potential economic benefits of the proposed project and because it creates significant confusion for the public and decisionmakers about BDCP's effects more generally.

The baselines used in Chapter 9 of the Draft Plan are called the "Existing Conveyance High Outflow Scenario" and the "Existing Conveyance Low Outflow Scenario," and they are only used in Chapter 9 and related appendices. *See id.* These two alternatives result in very substantial reductions in Delta exports as compared to other alternatives, including the No Action Alternative (despite the fact that the Draft Plan does not, in fact, compare them to the No Action Alternative). *See id.* The Draft Plan provides no justification for using a radically different baseline for the economics analysis (Chapter 9) from the rest of the draft plan.

The baseline used in Chapter 9 of the Draft Plan is wholly misleading and without foundation. There is no justification for providing a separate baseline for the economic analysis from that used for the environmental analysis; the document should use a consistent baseline. By using this imaginary baseline that significantly reduces water exports, Chapter 9 estimates significant economic benefits relating to water supply that presumably would not occur when compared to an accurate baseline. *Compare* Draft Plan at 9.A-44 (Table 9.A-7, showing expected water supply benefits) with Draft Plan at 9.A-4 (Table 9.A-2, showing net benefits and costs).[18] Chapter 9 should be revised to be consistent with the baseline recommended in these comments In these three distinct ways, the Draft Plan and DEIS/DEIR use flawed environmental baselines that provide materially misleading information to the public and decisionmakers about the economic and environmental costs and benefits of the BDCP and alternatives. The documents must be revised to provide a consistent, legally adequate baseline in order to fulfill CEQA and

[18] In addition to the flawed baseline, Chapter 9 includes many other substantial flaws, including: calculating economic costs and benefits out to 2075, even though proposed permits only run to 2065, *see* Draft Plan at 9.A-4; calculating water supply based on Early Late Term (2025) export levels, rather than the lower export levels resulting in the Late Long Term (2060), *see* Draft Plan at 9-16; failing to assign the cost of Yolo Bypass restoration to the water contractors as a mitigation measure, and unreasonably assigning the vast majority of costs associated with CM 2-21 to the public, *see* discussion *supra*; and by using inflated estimates of water demand in Southern California and inflated costs of alternative water supplies, as other commentators have argued. Each of these flaws tends to overstate the economic benefits of the proposed project, providing decision-makers and the public with misleading information. Accurately assessing economic costs and benefits are also important with respect to determining what alternatives are feasible. *See* 14 Cal. Code Regs. § 15126.6(f)(1).

NEPA's fundamental purpose of informing the public and decisionmakers of the likely environmental consequences of BDCP and its alternatives.

2. The DEIS/DEIR Fails to Analyze a Reasonable Range of Alternatives

CEQA and NEPA both require that a reasonable range of alternatives to the proposed project be considered in the environmental review process, including a no project alternative. Cal. Pub. Res. Code §§ 21002, 21061, 21100; tit. 14, Cal. Code Regs. ("CEQA Guidelines") § 15126.6; 42 U.S.C. § 4332; 40 C.F.R. §§ 1502.14, 1508.25(b). Unfortunately, the DEIS/DEIR fails to include a reasonable range of alternatives, particularly because it (a) fails to include a range of alternatives that achieve the standards of the ESA, NCCPA, and other environmental laws, consistent with BDCP objectives, and (b) includes no alternatives that include investments in water conservation, recycling, and other local supplies to improve water supply reliability and reduce reliance on the Delta. An alternative that includes both improved flows and investments in local water supplies is likely to result in substantial environmental benefits and improved water supply reliability, consistent with the overarching goals of BDCP, and the failure to include such an alternative violates CEQA. *See Citizens of Goleta Valley v. Board of Supervisors,* 52 Cal.3d 553, 566 (1990) (EIR must consider a reasonable range of alternatives that offer substantial environmental benefits and may feasibly be accomplished).

Indeed, as discussed elsewhere in these comments, the proposed project fails to meet the standards of the ESA, NCCPA, and other environmental laws. This is a fundamental objective of BDCP. *See* DEIS/DEIR at 2-2 to 2-3. Because the Draft Plan and most alternatives fail to achieve these standards, the range of alternatives must include more alternatives that reduce exports from the Delta in order to provide the improved flows needed to comply with these standards. The State Supreme Court's 2008 decision reviewing the CALFED EIR is instructive:

> As the CALFED PEIS/R itself recognizes, Bay–Delta ecosystem restoration to protect endangered species is mandated by both state and federal endangered species laws, and for this reason water exports from the Bay–Delta ultimately must be subordinated to environmental considerations. The CALFED Program is premised on the theory, as yet unproven, that it is possible to restore the Bay–Delta's ecological health while maintaining and perhaps increasing Bay–Delta water exports through the CVP and SWP. If practical experience demonstrates that the theory is unsound, Bay–Delta water exports may need to be capped or reduced. At this relatively early stage of program design, however, we conclude that CALFED properly applied the rule of reason when it decided to consider in the PEIS/R only alternatives that have the potential to both achieve ecosystem restoration goals and meet current and projected water export demands, and that

> will provide balanced progress in all four of the program areas. Failure to include a reduced exports alternative thus was not an abuse of discretion.

In re Bay-Delta Programmatic Environmental Impact Report Coordinated Proceedings, 43 Cal.4th 1143, 1168 (2008). Unlike in 2008, practical experience (e.g., numerous court orders, new biological opinions and other permits, independent and agency scientific reviews, and the SWRCB 2010 Flow Report) has demonstrated that Bay-Delta water exports need to be reduced in order to achieve the ecosystem recovery requirements of the NCCPA and other state and federal laws.

Similarly, the DEIS/DEIR excludes consideration of the fishery agencies' more protective operational proposal for BDCP known as CS5. *See* Resources Agency, Background on Proposed Project and Operational Rules, March 14, 2013, at 4, available online at: http://baydeltaconservationplan.com/Libraries/Dynamic_Document_Library/Background_on_BDCP_Proposed_Project_and_Operational_Rules_3-14-13.sflb.ashx (explaining that CS5 was not incorporated into the Draft Plan or DEIS/DEIR "given the geographic scope of BDCP (limited to the Delta itself)."). CS5 operations provided substantially increased Delta outflow as compared to the Draft Plan and most of the alternatives analyzed in the DEIS/DEIR, resulting in reduced environmental impacts, yet it was excluded from analysis. The DEIS/DEIR should be revised to include alternative operational proposals, such as the operational proposal developed by state and federal fishery agencies in 2013 (known as "CS5"), that provide improved flows (particularly winter/spring Delta outflow) and achieve the requirements of the NCCPA, ESA, and other environmental laws.

Second, in our 2008 scoping comments, we requested that the draft environmental documents include alternatives that improve Delta outflow and reduce water exports from the Delta, while also including investments in water conservation, recycling, and other local supplies to improve water supply reliability. In January 2013, our organizations identified a so-called "Portfolio Alternative," which includes a new conveyance in the Delta, a single tunnel, investments in levee stability and new storage, and significant investments in water conservation, recycling, stormwater capture, and other local water supplies, and requested that it be analyzed in the DEIS/DEIR. *See* attachment.[19] More than 30 members of the State legislature, more than 10 members of Congress, several water districts, other local governments, and numerous newspaper editorial boards all requested or recommended that this alternative be analyzed in the DEIS/DEIR. *Id.* DWR performed some CALSIM modeling of the operational rules proposed in this alternative, including with various conveyance sizes. *Id.* However, the agencies refused to

[19] Information relating to the Portfolio Alternative is included on the attached CD.

analyze the Portfolio Alternative, or any other alternative that includes investments in local water supplies, in the DEIS/DEIR.[20]

To the extent that the State argues that the purpose and need for the project exclude alternatives with water supply elements outside of the Delta, the purpose and need statement is inconsistent with California law[21] because it ignores the mandate of State policy to reduce reliance on the Delta and invest in regional and local water supplies, including water conservation, recycling, and similar projects, in order to improve water supply reliability. *See* Water Code § 85021. Although Chapter 2 of the DEIS/DEIR discusses the Delta Reform Act, it wholly omits discussion of this mandate of the Act.[22] It is irrational to exclude all alternatives that include investments in water conservation, water recycling, and other local and regional water supplies to improve water supply reliability. These water supply tools can provide substantial new sources of water for CVP and SWP contractors, and in combination with reduced exports from the Bay-Delta in order to improve flows and environmental outcomes, such an alternative can provide greater water supply reliability and improved environmental outcomes. Development of local water supplies is consistent with the additional project objectives under CEQA and NEPA. DEIS/DEIR at 2-3 ("To develop projects that restore and protect water supply and ecosystem health and reduce 36 other stressors on the ecological functions of the Delta in a manner that creates a stable 37 regulatory framework under the ESA and NCCPA.").

In addition, we note that the CALFED Bay-Delta program (which was approved as a Natural Community Conservation Plan) included significant investments in water conservation and other supplies in all of the alternatives, including the adopted alternative. *See* CALFED Record of Decision at 12, 19-20, 59-63; CALFED Bay-Delta Program Natural Community Conservation

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[20] While the state included a 3,000 cfs conveyance alternative in the DEIS/DEIR and in Chapter 9 of the draft plan, neither are consistent with the Portfolio Alternative because: (1) the 3,000 cfs alternative in the DEIS/DEIR fails to use the operational rules proposed in the Portfolio Alternative, which increased Delta outflow and reduced exports; (2) the 3,000 cfs alternative in Chapter 9 assumes two tunnels under the Delta, dramatically increasing the cost by nearly $6B, as compared to a single tunnel alternative, as the State has previously admitted, *see* http://baydeltaconservationplan.com/news/blog/13-11-12/Revised_Capital_Cost_for_3_000_cfs_Single_Bore_Tunnel.aspx; and (3) the 3,000 cfs alternative in Chapter 9 does not include analysis of additional investments in local and regional water supplies, an essential element of the Portfolio Alternative.

[21] The purpose and need statement and objectives are also inconsistent with the requirements of the NCCPA because they wholly misstate that conservation standard of that Act, as discussed in section I(A)(1) of these comments. In addition, the purpose and need statement is unlawfully narrow by attempting to limit the geographic scope of BDCP to the Delta, as we discuss. In addition, to the extent that the reference to water supply goals and "full contract amounts" in the purpose and need statement screen out alternatives that reduce water exports, this would be unlawful.

[22] The Draft Plan omits any mention of section 85021 in its discussion of the Delta Reform Act, and fails to demonstrate whether and how BDCP is consistent with this section of the Act. *See* Draft Plan at Chapter 2, Appendix 3I. As currently drafted, the State's proposed project is fundamentally inconsistent with this section of the Delta Reform Act.

Plan Determinations at 9-10, 22-25, 52. In the context of BDCP, such investments can be analyzed at the program level, with established criteria identifying potential water supply costs and yields, without proscribing how particular water contractors achieve these targets. This is similar to the approach taken for most of the conservation measures in the Draft Plan and DEIS/DEIR, which are analyzed at the program, not project, level. Doing so would not require that the State actually take over implementation of these projects, but instead provides a framework for ensuring that the targets and criteria are achieved. To the extent that the State argues that these sources are not cost-effective, the way to demonstrate that is through analysis in the DEIS/DEIR, not through unsupported conclusory statements.

Third, the proposed project and other alternatives analyzed in the DEIS/DEIR will result in significant environmental impacts, including significant impacts to native fisheries and water quality, as well as cumulatively significant impacts. However, alternatives such as the Portfolio Alternative are likely to be feasible alternatives that would result in lower environmental impacts. The failure to meaningfully consider such alternatives precludes the agencies from adopting an alternative that results in significant environmental impacts. *See* Cal. Pub. Res. Code § 21081; *California Clean Energy Committee v. City of Woodland*, 225 Cal.App.4th 173, 203 (2014).

As currently drafted, the DEIS/DEIR fails to include a reasonable range of alternatives, and the documents should be revised to include analysis of the Portfolio Alternative and/or one or more other alternatives that achieve the standards of the NCCPA and other environmental laws as well as increasing investments in regional and local water supplies.

3. The DEIS/DEIR Fails to Adequately Analyze Cumulative Impacts

In several respects, the DEIS/DEIR's analysis of cumulative impacts is significantly flawed, understating the potential environmental impacts of BDCP in combination with other state and federal projects and programs.

First, the DEIS/DEIR fails to include several CALFED reservoir storage projects in its cumulative impacts analysis, despite the fact that notices of preparation, and in some cases, NEPA/CEQA documents, have been released for these projects. These include the Shasta Lake Water Resources Investigation,[23] North of Delta Offstream Storage Investigation,[24] and Upper

[23] *See, e.g.*, Shasta Lake Water Resources Investigation Draft Environmental Impact Statement, June 2013, available online at: http://www.usbr.gov/mp/nepa/nepa_projdetails.cfm?Project_ID=1915. Notice of the DEIS for this project was published in the Federal Register on July 1, 2013. *See* 78 Fed. Reg. 39315 (July 1, 2013). Prior to that, the draft feasibility report was released in 2012, and the Notice of Intent was published in the Federal Register in 2005. 70 Fed. Reg. 58744 (October 7, 2005). BDCP is

San Joaquin River Basin Storage Investigation.[25] The DEIS/DEIR mentions the Shasta Lake Water Resources Investigation and Upper San Joaquin River Basin Storage Investigation, but does not include either of these potential new reservoirs in the cumulative impacts analysis. DEIS/DEIR at Appendix 3D-90, 3D-92. The DEIS/DEIR claims that the North of Delta Offstream Storage Investigation is included in the cumulative impacts analysis, DEIS/DEIR at Appendix 3D-91, but it appears that all of the cumulative impact analysis is qualitative and fails to include the potential reservoir projects in CALSIM modeling, despite the CALSIM modeling available for these projects. *See, e.g.*, DEIS/DEIR at 11-3006 ("This analysis [Cumulative Effects on Fish and Aquatic Resources] is qualitative in nature.").

In combination with BDCP, these storage projects have the potential to significantly reduce Delta outflow and increase Delta exports, particularly as compared to modeled conditions in the DEIS/DEIR, which would be likely to cause cumulatively significant environmental impacts. The failure to analyze these and other storage projects (such as expansion of San Luis Reservoir or further expansion of Los Vaqueros Reservoir, both of which are being analyzed by the federal government) results in the DEIS/DEIR underestimating the cumulative environmental impacts. These projects also will cause cumulative impacts on water supply. *See* DEIS/DEIR at 5-153 to 5-154 (excluding these reservoir projects from the cumulative impacts analysis).[26]

For instance, with additional storage south of the Delta, operations in the Delta could result in greater water exports, which could increase entrainment, increase negative Old & Middle River (OMR) flows, or reduce outflow, particularly as compared to modeled conditions.[27] Appendix

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included in the cumulative impacts analysis in the DEIS. *See, e.g.,* Shasta Lake Water Resources Investigation Draft Environmental Impact Statement at 3-13, 3-27 to 3-28.

[24] *See, e.g.*, North-of-the-Delta Offstream Storage Investigation, 2013 Progress Report, available online at: http://www.usbr.gov/mp/nodos/docs/NODOS_Progress_Report_12.26.2013.pdf.

[25] The Upper San Joaquin River Basin Storage Investigation draft feasibility report was released in January 2014, and is available online at: http://www.usbr.gov/mp/sccao/storage/docs/index.html. The Notice of Intent to prepare an EIS was published in the Federal Register in 2004. *See* 69 Fed. Reg. 5184 (February 3, 2004). The Upper San Joaquin River Basin Storage Investigation draft feasibility report includes a discussion of BDCP (see esp. pages 6-31 to 6-32), and it states that, "Increasing surface water storage in the upper San Joaquin River Basin could allow for increased system flexibility and further use of new Delta conveyance facilities, providing for even greater increases in water supply reliability." Draft feasibility report at 1-37; *see id.* at 6-6 (stating that water supply benefits are expected to increase in combination with BDCP). That report also concludes that modeling studies will be updated to account for BDCP. *Id.* at 3-8.

[26] The DEIS/DEIR also fail to adequately explain and justify the increase of 443TAF in upstream diversions, which reduce export water supply. *See* DEIS/DEIR at 5-67.

[27] As an example, the CALSIM modeling relied on in the DEIS/DEIR assumes that OMR will be less negative than required by the proposed operational rules. However, providing additional storage could result in increased inflows to the Delta and increased export pumping that could increase negative OMR as compared to the CALSIM modeling, increasing environmental impacts as compared to that in the

1B of the DEIS/DEIR admits that preliminary BDCP modeling shows that increased South of Delta storage could increase water exports under BDCP by approximately 150TAF per year, with the majority of pumping increases in wet years. DEIS/DEIR at 1B-12. Inexplicably, this preliminary modeling and analysis is not included in the cumulative impacts analysis, only this conclusory statement.

Appendix 1B claims that all of these potential surface storage projects are neither "a probable future project" nor a "reasonably foreseeable future action." DEIS/DEIR at 1B-1. This conclusion is wholly inconsistent with the existing draft feasibility studies, notices of preparation, and draft NEPA / CEQA documents referenced herein. Further demonstrating that additional storage is a reasonably foreseeable future project under NEPA, in 2013 the State wrote that, "And [BDCP] is about establishing the improved conditions to set the stage for additional future storage improvements north and south of the Delta." *See* www.baydeltaconservationplan.com/news/blog/13-05-16/Making_Storage_Work.aspx. Likewise, the National Marine Fisheries Service has concluded that, "There is a high likelihood that south-of-delta storage capabilities will be increased over the 50-year term of this permit. There is also the potential for such an increase in storage capacity to result in water operation parameters (pumping rates/timing, OMR flows, I/E ratios, etc.) that differ from those modeled in the current analysis." NMFS 2013 Progress Assessment at 18. And the Delta Stewardship Council, in their June 24, 2014 comment letter on BDCP, stated that new storage should be included in the cumulative impacts analysis. In light of the availability of CALSIM modeling for many of these proposed reservoir projects, the likelihood that new storage projects (particularly South of the Delta) will occur, the existing NEPA/CEQA documents and draft feasibility studies for CALFED storage projects, and the State's statement that BDCP "set the stage" for new surface storage, the failure to include these projects in the modeling and analysis of cumulative impacts violates CEQA and NEPA.

Second, the DEIS/DEIR fails to include Phase I and Phase II of the State Water Resources Control Board's (SWRCB) update of the Bay Delta Water Quality Control Plan. *See* Attachment 3D-A (not listing either Phase I or Phase II in the description of projects and programs included in the cumulative impacts). The SWRCB has publicly noticed both phases of these proceedings,[28] and in late 2012 the SWRCB issued a draft Substitute Environmental Document

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DEIS/DEIR. Such differences between modeled conditions and actual operations have occurred frequently in recent years, including under CALFED and under prior biological opinions.

[28] The Notice of Preparation for Phase I was issued on February 13, 2009, and is available online at: http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/bay_delta_plan/environmental_review/docs/nop2009feb13.pdf. The supplemental Notice of Preparation related to Phase II was issued on January 24, 2012, and is available online at: http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/bay_delta_plan/environmental_review/docs/notice_baydeltaplancompreview.pdf.

for Phase I (lower San Joaquin flows).[29] The potential increase in flows from the San Joaquin River in Phase I of these proceedings would significantly affect operations of the CVP and SWP under BDCP, and could potentially result in increased export pumping, entrainment, outflow, residence time, and other changes in water quality in the Delta. At a minimum, the DEIS/DEIR should include modeling of SWRCB alternatives in its analysis of cumulative impacts. These proceedings began in 2009.

Third, the DEIS/DEIR fails to include planned investments in local water supply development and water conservation, particularly in Southern California. *See* Attachment 3D-A. New water conservation, water recycling, stormwater capture, and similar projects to increase regional water supplies can reduce the need for water exports from the Delta, and help increase water supply reliability. For instance, in late 2012 the San Diego County Water Authority identified more than 1.2 million acre feet in planned conservation and other water supply projects in Southern California (in addition to "650,000 AF of planned and state-mandated conservation"), the vast majority of which were not included in the 2010 Urban Water Management Plan prepared by the Metropolitan Water District of Southern California. *See, e.g.,* http://www.sdcwa.org/sites/default/files/files/board/2013_agendas/2013_01_13_FormalBoardPacket.pdf (*see* pages 161-285). While some of these projects were analyzed in Chapter 9 of the BDCP,[30] they were not analyzed in the DEIS/DEIR.

Finally, the analysis in DEIR under CEQA fails to adequately account for the impacts of climate change, in contrast to the NEPA analysis. *See* DEIS/DEIR at 4-6. At a minimum, the effects of climate change in combination with BDCP and other probable future projects must be analyzed as cumulative impacts under CEQA.

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[29] The 2012 draft SED for Phase I is available online at: http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/bay_delta_plan/water_quality_control_planning/2012_sed/. The SWRCB is currently revising the SED in response to comments, and plans to release a revised draft SED later this year.

[30] According to text in Chapter 9A, BDCP relied on MWD's IRPSIM model in calculating local water supplies and conservation available to retail agencies. *See* Draft Plan at 9.A-6 and FN 1. As such, it would have failed to include many of these planned projects in Southern California, thus substantially overstating demand for water from the Delta and potential water shortages. For instance, Chapter 9A estimates that recycled water increases by only 100TAF/year by 2035, *see* Draft Plan at 9.A-7, whereas SDCWA's review of existing UWMPs has identified more than 248,000 acre feet of new water supply from water recycling by 2035. *See* http://www.sdcwa.org/sites/default/files/files/board/2013_agendas/2013_01_13_FormalBoardPacket.pdf (page 283). In addition, although Chapter 9A assumes shortages in water supplies in dry years in urban areas, MWD's 2010 UWMP identified surpluses in 2035, under both single critically dry year (1977) and multiple dry year (1990-1992) hydrology. *See id.* (reproducing tables from MWD's 2010 UWMP).

4. The Geographic Scope of the DEIS/DEIR is Unlawful

CEQA requires that an EIR's analysis of significant environmental effects describe all significant direct and indirect changes in the physical environment caused by the proposed project over time. *See, e.g.,* 14 Cal. Code Regs. § 15126. An artificially truncated project description does not excuse the failure to analyze the full scope of impacts, but instead reflects a flawed project description and a flawed impact analysis. *See, e.g., Santiago County Water Dist. v. County of Orange*, 118 Cal. App. 3d 818 (1981); *San Joaquin Raptor Rescue Ctr. v. County of Merced*, 149 Cal. App. 4th 645 (2007).

Here, the draft EIS/EIR excludes analysis of potentially significant adverse impacts of the proposed project on the environment downstream of Chipps Island and in San Francisco Bay. The EIS/EIR must be revised to address these impacts.

The BDCP Plan Area's downstream boundary is at Chipps Island, excluding Suisun Bay, Suisun Marsh, and San Francisco Bay. But that does not mean that the Plan's impacts cease at that boundary. Indeed, independent analyses have identified significant impacts downstream of the Plan's boundaries that are not assessed in the draft EIS/EIR. *Cf.* National Research Council, A Review of the use of Science and Adaptive Management in California's Draft Bay Delta Conservation Plan, 2011 ("NRC Review 2011"), at 2-3, 17.

There has been no analysis of BDCP's flow, sediment, food, temperature, and DO effects on water bodies downstream of Suisun Marsh. However, the Plan reveals that "the greatest difference in the mean DO value for any day of the year was 0.95 mg/L in Suisun Marsh during March." Draft Plan at 5.3-23. With no analysis of impacts farther downstream, potentially significant impacts to San Francisco Bay remain undisclosed. The March 2014 Delta Science Program Independent Review Panel agreed: "The current Effects Analysis does not consider the influence of shifting timing of withdrawals on San Francisco Bay circulation patterns and ecology. This is a significant omission with ecologically important implications." Delta Science Program Independent Review Panel Report, BDCP Effects Analysis, Phase 3, March 2014, available online at: http://deltacouncil.ca.gov/sites/default/files/documents/files/Delta-Science-Independent-Review-Panel-Report-PHASE-3-FINAL-SUBMISSION-03132014_0.pdf ("DSP Independent Science Review Panel Report 2014") at 14 (incorporated by reference).

The State Water Resources Control Board has also expressed concern that the projected increase in Suisun Marsh salinity will degrade conditions for fish and wildlife. SWRCB, Comments on the Second Administrative Draft Environmental Impact Report/Environmental Impact Statement for the Bay Delta Conservation Plan, July 5, 2013 ("SWRCB 7/5/13 BDCP Comments") at 13. The DEIS/DEIR summarily states that BDCP will contribute to "measurable long term degradation," DEIS/DEIR at 8-426, and "would contribute substantially to the adverse water

quality effects," *id.* at 8-428. But the effect of these adverse impacts on the downstream ecosystem, including San Francisco Bay, are not analyzed or disclosed in the draft EIS/EIR. In addition to potentially significant salinity impacts downstream of the BDCP Plan Area, the draft EIS/EIR fails to assess impacts on turbidity and sediment supply to the Bay. The March 2014 Delta Science Program Independent Review Panel Report states:

> …this isn't a conservation plan, but rather a conservation menu that generally fails to describe how major uncertainties will be resolved. For instance, while the Effects Analysis recognizes that suspended sediment has been declining in the Sacramento River and that the new diversions would remove an additional 8-9%, all analyses used a high and constant amount with no mention of downstream sediment effects on either Suisun or San Francisco Bay.

DSP Independent Science Review Panel Report 2014 at 13. The Delta Stewardship Council and other reviewers have also noted this flaw in the geographic scope of the effects analysis and DEIS/DEIR. *See* Delta Stewardship Council, Comments on the Bay Delta Conservation Plan Draft Environmental Impact Statement/Environmental Impact Report, June 24, 2014, at 12, available online at:
http://deltacouncil.ca.gov/sites/default/files/documents/files/BDCP%20Comments%20Cover%20Letter%20and%20Final%20BDCP%20EIR-S%20Comments.pdf ("DSC BDCP Comments June 2014").

The Draft Plan also admits that there may not be sufficient sediment for marsh restoration, or even maintenance of existing tidal marsh, but it fails to analyze such impacts on tidal marsh habitats in Suisun Marsh and other areas downstream of the Plan Area. *See, e.g.*, Draft Plan at 5.3-24 to -25 ("The initial effect of tidal restoration is to decrease sediment supply downstream of the Plan Area…"). It states that BDCP's in-Delta ROAs "could also lead to greater water clarity in downstream areas such as Suisun Bay," and that there is "potential for lower water clarity in the LLT under the BDCP in portions of the Suisun Bay and West Delta subregions." *Id.* These short-term reductions and uncertain long-term sediment conditions, when combined with long-term sea level inundation of existing and restored marsh areas, could result in significant losses of marsh habitat in and downstream of the Delta. Yet the BDCP fails to analyze these potential impacts, and it proposes no mitigation measures to address such impacts. DEIS/DEIR figure 8-49 shows low turbidity in 2006 downstream of the major dams on the Sacramento River and Feather River. Missing from the DEIS/DEIR are turbidity values upstream of these dams or on tributaries that have a less-impaired sediment flow to the valley floor. Clearer water in San Francisco Bay as a result of BDCP could allow sunlight to penetrate the water column further. This could change the Bay's response to nutrient input, causing increased algal blooms and degraded water quality. *See* Delta Independent Science Board, Review of the draft EIS/EIR for the Bay Delta Conservation Plan May 15, 2014 ("Delta ISB 2014"), at B-12,

available online at: http://deltacouncil.ca.gov/sites/default/files/documents/files/Attachment-1-Final-BDCP-comments.pdf. Yet as the Delta ISB and other reviewers have noted, the Draft Plan and DEIS/DEIR fail to analyze and disclose the nature and extent of these likely environmental impacts.

I. The Draft Plan Fails to Adequately Define the Elements of Governance and Adaptive Management Associated with Plan Implementation and Fails to Meet Applicable Legal Standards

The governance structure and the Adaptive Management Plan are critical components of the BDCP. Governance sets forth who will implement the Draft Plan and how, providing assurances to plan participants as well as the public that the Draft Plan will be implemented fairly, transparently, and consistent with existing statutory and regulatory requirements. Adaptive management is widely recognized as a necessary element of an ecologically sustainable HCP/NCCP. Fish & Game Code § 2820(a)(2), (8), (b)(5), (f)(1)(G); HCP Handbook at 3-24; *see* 50 C.F.R. § 17.22(b)(2)(C), (b)(5). In the Services' Five Point Policy Guidance, the Service states that "[a]daptive management is an integrated method for addressing uncertainty in natural resources management." 65 Fed. Reg. at 35252.

As discussed below, the current version of the governance chapter and Adaptive Management Plan in the Plan and Draft IA has numerous problems.

1. The Adaptive Management Plan Lacks the Necessary Details to Support the Required Findings for Permit Issuance

Given the broad complexities of the BDCP, the Adaptive Management Program is an essential and critical part of this plan. Indeed, the Services acknowledged this in a white paper on the application of the Five Point Policy to the BDCP, in which they stated that,

> [t]here is substantial uncertainty regarding the effects on listed species of a new water conveyance system and of water withdrawal, combined with effects of other human activities and natural phenomena that are reasonably certain to occur, over a time period as long as 50 years. This uncertainty is compounded by both the complexity of the Delta ecosystem and the predicted future increases in temperature and climate variability.

BDCP 5-Point Policy Memo at 1.

In order for the Adaptive Management Program to work and for the Services to be able to make their required findings for permit issuance, the Draft Plan must include "an adaptive management

plan that tests alternative strategies for meeting those biological goals and objectives, and a framework for adjusting future conservation actions, if necessary, based on what is learned." *Id.* at 2; *see also* HCP Handbook; 65 Fed. Reg. at 35252.

Despite the fact that there are entire sections of the BDCP devoted to the discussion of Adaptive Management, the Plan lacks a great deal of details on how the Adaptive Management Plan will be designed. In its review of the Draft BDCP, the Delta Independent Science Board commented that the "adaptive management process is not fully developed" and is "left to a future Adaptive Management Team." Delta ISB 2014 at 3, 8-9, 11; *see id.*, Appendix A at A-13 to A-23. This lack of detail led the Delta ISB to conclude that they "have *substantial misgivings* about how well the proposed adaptive management process, as proposed, will actually function as a key component of BDCP." *Id.* at 9 (emphasis added).

i. There is no Basis to Conclude that the Adaptive Management Plan will Result in the Achievement of the Plan's Biological Goals and Objectives

As discussed supra in section I(C), the Plan and Draft IA makes clear that the BDCP biological goals and objectives are not enforceable and not a part of the permit requirements. This lack of enforcement undermines the credibility of the BDCP's Adaptive Management Plan. According to the Federal Agency White Paper, the BDCP is intended to be a "results-based" HCP, which means that the permittees will be given flexibility in managing the plan "as long as [the permittees] achieve the intended result (i.e., the biological goals and objectives)." BDCP 5-Point Policy Memo at 1; *see also* 65 Fed. Reg. at 35351. However, if the BDCP's biological goals and objectives are not enforceable, there is no guarantee that the Draft Plan, through the implementation of the Adaptive Management Program, will result in the achievement of these goals and objectives. In order to cure this problem, the BDCP biological goals and objectives should be made a part of the permit requirements, guaranteeing that they are reasonably certain to occur through the Adaptive Management Program.

ii. The Plan Fails to Adequately Describe how Operations or other Actions will be Modified Based on new Information as part of the Adaptive Management Plan.

The Adaptive Management Plan is lacking a large number of details, including how the Draft Plan will modify operations in light of new information. For example, the Delta ISB commented that the Draft BDCP lacked "measures needed to evaluate actions and make adjustments," including a failure to identify "'trigger points' at which adaptive management procedures would be initiated." Delta ISB 2014 at 8. Indeed, the Delta ISB commented in its letter that it agreed with the Delta Science Program's Independent Panel's review of Chapter 5 (Effects Analysis),

which, among other things, criticized the BDCP for "[c]haracteriz[ing] adaptive management as the default solution to unresolved issues and uncertainties, without clear description of how adaptive management will actually be implemented or tied to monitoring." *Id.* at 10.

At the heart of the Adaptive Management Plan is the need to make changes to the Draft Plan's implementation, including operations, if new information indicates that changes are necessary to continue to achieve the Draft Plan's biological goals and objectives. Currently, the Decision Tree is at odds with effective adaptive management as it creates brackets that inappropriately limit the potential range of operations to preclude necessary improvements in outflows, fails to identify how the agencies would decide which of the Decision Tree operational alternative should be used, and fails to explain default or starting operations under the Decision Tree. *See* Draft Plan at 3.4-24 to -26. Many scientific reviewers have criticized the adaptive management framework for these and other reasons. Delta ISB 2014 at 3, 8-9, 11; *see id.*, Appendix A at A-13 to A-23; Mount and Saracino et al. 2013 at 3, 83-84, 86-87, 99-105; DSP Independent Science Review Panel Report 2014 at 8-9, 15-16, 18, 20, 41-44. This bracketing creates limits in how adaptive management will be used to achieve biological goals and objectives. If the BDCP is committed to using best available science and adaptive management, the Draft Plan must not set artificial boundaries that limit operations where those operational limits are unlikely to result in the Draft Plan achieving its biological objectives, as demonstrated *infra*.

2. The AMP Lacks Scientific Independence

The Adaptive Management Team (AMT) is chaired by the BDCP Science Manager and has primary responsibility for the administration of the Adaptive Management Program. The AMT consists of representatives from DWR, Reclamation, federal water contractors, state water contractors, DFW, USFWS, and NMFS, all of which are voting members. The IEP Lead Scientist, the Delta Program lead scientist, and the Director of the NOAA Southwest Fisheries Science Center will serve as non-voting members of the AMT. In addition, the Science Manager is hired by the Program Manager, who is directed by the Authorized Entity Group (AEG), which is comprised of federal and state water contractors, DWR and Reclamation.

The current make-up and structure of the AMT blurs the distinction between regulated entities, scientists and regulators. Moreover, the Adaptive Management Program could be perceived as essentially run by the regulated entities since the Science Manager is hired by the Program Manager, who is overseen by the AEG.

Further, there is nothing in the Draft Plan demonstrating any kind of independent oversight of the BDCP Adaptive Management Program. There is some mention of coordinating with the Delta Science Program, but as noted by the Delta Science Program's Independent Panel, the Draft Plan lacks any clarity about the coordination with the Delta Science Program. Delta ISB 2014 at A-

20. It is absolutely critical that the BDCP Science Program and Adaptive Management Program contain a clear structure for independent science oversight.

Finally, it appears that the AMT may be allowed to operate almost entirely outside of public view. There is no requirement for AMT meetings to be open to the public in any meaningful way. Instead, the Draft IA states that the AMT shall open its meetings to the public "[o]n a periodic basis." Draft IA at 30. In order to foster transparency and credibility with the public, the AMT and its discussions must be more open to the public.

3. The Draft Plan's Governance Structures and Rules, Including those Governing the Adaptive Management Program, Violate State and Federal Law, and are Likely to Result in Paralysis

The Draft Plan and Draft IA detail a complex set of rules and structures for the implementation of the Plan, including the Adaptive Management Program. The Authorized Entity Group, the Permit Oversight Group, the Program Manager, the Science Manager, the Adaptive Management Team, and the Real Time Operations Team are at the core of the governance structure. The Plan details conflict resolution processes for each of these groups or teams as it pertains to specific types of decisions.

The Authorized Entity Group (AEG) will include four members: A representative from the state water contractors, a representative from the federal water contractors, the Director of DWR, and the Regional Director for Reclamation. The state and federal water contractors are likely to be members of the AEG as the Draft Plan and Draft IA anticipate making them permittees. There are no fish and wildlife agencies on the AEG. The AEG has numerous duties and responsibilities, including hiring the Program Manager, implementation and administration of the program, implementation and oversight of the implementation of the conservation measures (except for water operations), compliance monitoring and reporting, the production and approval of the Annual Work Plan, the production of the Annual Program Report, Annual Water Operations Report, and Five Year Comprehensive Review. The AEG also is involved in the selection of the Science Manager and heavily engaged in the decision-making of all aspects of the Adaptive Management Program. *See* Draft Plan Chapters 6 and 7.

The Permit Oversight Group (POG) will be comprised of the Regional Director of the USFWS, the Regional Administrator of NMFS, and the Director of DFW. The POG is involved in a variety of implementation and oversight duties involving the Program Manager, AEG and the Adaptive Management Plan. Of particular importance, the POG has input into the Annual Delta Water Operations Plan, but does not have any ability to require changes to that plan. *Id.*

The Program Manager will be hired by the AEG and essentially manages the implementation of the BDCP Program except for water operations. The Science Manager is hired by the Program Manager and chairs the Adaptive Management Team.

Finally, the Real Time Operations Team is in charge of real time operation of Conservation Measure 1. The Real Time Operations Team is comprised of one representative each from USFWS, NMFS, CDFW, Reclamation and DWR. The team will also include a representative each from the state and federal water contractors, but those two representatives will be non-voting members of the team.

As discussed below, the lines of authority and final decision-making are complicated and, for some decisions and groups, contradictory to current law or standards of transparent and effective decision-making.

i. The Governance Structure and Adaptive Management Program Violate the Delta Reform Act Requirement that the Fish Agencies Ensure the Achievement of the Biological Performance Measures with Respect to Water System Operations.

The Delta Reform Act requires that the fish agencies must be in a position to ensure that the biological performance measures in the BDCP's water operations are achieved.[31] However, under the Plan the fish agencies (as the POG) do not have approval rights for some of the key plans and decisions that would affect biological performance of the BDCP as it pertains to water operations. First, in the case of the Real Time Operations Team, it is not clear that the fish agencies have final decision-making authority if there is a dispute. According to the Plan, the Regional Director of the relevant fish agency may only have final decision-making authority if "the Director of the project agency concurs that the change is within their authority." Draft Plan at 3.4-27. If the Director of the project agency disputes that the fish agencies have authority to make the change, there does not seem to be any recourse other than the status quo. This approach does not meet the Delta Reform Act standard.

Second, the fish agencies are not in a position to ensure that biological performance measures in the BDCP's water operation will be achieved with respect to the Annual Water Operations Plan. Practically speaking, DWR and Reclamation have final authority and approval over those plans. While it appears that the POG may find that the Annual Water Operations Plan is unacceptable, it is in DWR and the Bureau's discretion to make changes to that plan and even after the dispute

[31] The Delta Reform Act provides that, "[t]he BDCP shall include a transparent, real-time operational decision-making process in which fishery agencies ensure that applicable biological performance measures are achieved in a timely manner with respect to water system operations." Cal. Water Code § 85321.

resolution process, DWR and the Bureau have final decision-making authority. Draft IA at 72. This approach does not meet the Delta Reform Act standard.

Third, the fish agencies do not have approval rights over the Annual Work Plans or Budgets other than providing written concurrence that the "draft adequately sets forth and makes adequate provision for the implementation of the applicable joint decisions of the Authorized Entity Group and Permit Oversight Group or decisions of the agency within the Permit Oversight Group with authority over the matter." Draft Plan at 7-12; Draft IA at 71. This language is a departure from the finding that the POG is supposed to make regarding the Annual Water Operations Plan. For that plan, the POG must ensure that it is consistent with the BDCP, Implementing Agreement, and regulatory requirements. Draft Plan at 6-23; Draft IA at 71. At a minimum, the POG should be required to make a similar finding for the Annual Work Plan. The lack of the fish agencies' ability to affect changes to the Annual Water Operation Plan is troubling since that plan is likely to include funding and staffing decisions and action that could affect biological performance measures with respect to water system operations.

Finally, the Plan currently shifts responsibility for a key part of adaptive management to the Adaptive Management Team with no decision-making authority by the fish agencies under the guise of "routine or administrative matters." Draft IA at 30-32. The IA defines "routine and administrative matters" as "reassessment of and modification to problem statement sand conceptual models." *Id.* at 30-31. However, a change to a problem statement or conceptual model is hardly a "routine or administrative" matter. At the beginning of the Plan's Adaptive Management chapter, conceptual models are listed as a key part of adaptive management. Draft Plan at 3.6-2, 3.6-15. Conceptual models link the biological objectives to proposed actions. By allowing the AMT to make changes to conceptual models and problem statements, the Plan removes the fish agencies from effectively ensuring that biological performance measures will be achieved. This is not only in violation of the Delta Reform Act, but it undermines the credibility of the Adaptive Management Program in its entirety.

ii. The Governance Structure and Adaptive Management Program Appear to Improperly Delegate Operation of the CVP

Numerous state and federal laws, such as the Central Valley Project Improvement Act (CVPIA), require that the SWP and CVP be operated by the state and federal governments, respectively. *See* Permittee Memo. Federal law prohibits delegating the Secretary's policymaking role and authority. *Id.* (citing *National Park and Conservation Association v. Stanton*, 54 F. Supp. 2d 7 (D.D.C. 1999)).

While the Plan appears to attempt to disentangle DWR and Reclamation from the state and federal water contractors for purposes of CVP and SWP operations, as detailed above, the very

structure of the AEG (in which two of the four voting members are water contractors), with the presence of federal and state water contractors in the Real Time Operation Team as well as on the Adaptive Management Team creates a situation in which the water contractors will have special and undue influence in CVP and SWP water operations decision-making on a day-to-day basis and for the 50 year length of the permits.

In addition, there is some confusing language in Chapter 7 in which the Implementation Office structure is described as "contemplate[ing] that DWR and Reclamation will maintain their historical roles as operators of the SWP and CVP, but provides flexibility for changing those roles if so directed by Congress, the California Legislature, or through administrative process." Draft Plan at 7-22. While it is clear that Congress and the California Legislature may change the laws regarding who can operation the CVP and SWP, respectively, it is unclear what "administrative process" would allow for such a delegation of authority.

Finally, as discussed supra in section I(C), the state and federal contractors are legally unqualified to serve as permittees, and such status would inevitably influence the operation of the CVP and SWP. Permittees have an entirely different legal relationship to the BDCP than non-permittees.

iii. The Adaptive Management Team's Requirement of Consensus is Unworkable and a Barrier to Effective Adaptive Management

The AMT is required to operate by consensus, which means that if any one member of the group objects to a decision, there is no consensus of the team. Lack of consensus triggers a drawn-out process detailed in Chapter 7.1.6. This AMT structure is unwieldy and may result in delay. Delta ISB 2014 at 8 ("the organization structure may delay rather than expedite needed adjustments"); *id.* at A-19 ("Overall, this decision-making arrangement does not seem to bring enough authority and resources for adaptive management to be implemented decisively and in a timely way. With this structure, each cycle of adaptive management would probably occur very slowly, if at all.").

iv. The Dispute Resolution Process is Unclear and could lead to Decision-Making Paralysis or Purposeful Delay Tactics

The Governance Chapter and Draft IA detail a dispute resolution process that is vague and time-consuming. Draft Plan at 7-17; Draft IA at 66-67. First, in reviewing the details of this process, it appears that the process could take as little as six weeks or may have no end in sight. While the process details various 14 day deadlines, there does not appear to be any specified deadline in which the parties submit written positions to the panel and the panel is convened. In addition, since the decisions of the panel are non-binding, the real heart of this process is determining which entity has decision-making authority over which decision. While Table 7-1 provides some

details for some of the bigger decision-making points/plans, this dispute process could be triggered on any number of other decision points. At a minimum, this process needs to be detailed and clarified.

In addition, there is some question as to the utility of the dispute resolution process including the process-laden panel. A positive view of this process is that it provides an additional forum to air differences. A negative view is that this could result in abuse by certain parties in an attempt to delay decisions and actions. In any event, this process could become a costly and time-consuming process if appropriate sideboards are not included in this section.

II. SIGNIFICANT MODELING FLAWS IN BDCP UNDERSTATE LIKELY ENVIRONMETNAL IMPACTS AND MUST BE CORRECTED TO PROVIDE ACCURATE IMPACT ASSESSMENTS

A. The Water Operations and Delta Hydrodynamics Modeling for BDCP Contains Errors and Faulty Assumptions, Which are Used as Input Data for Other Analyses, Resulting in Flawed Conclusions in the DEIS/DEIR.

The flawed use of the CALSIM II and DSM2 models for BDCP understates environmental impacts. The BDCP DEIS/DEIR warns: "Given the relatively generalized representation of the RPAs assumed for CALSIM II modeling, much caution is required when interpreting outputs from the model." DEIS/DEIR at 5A-B199. The CALSIM II model results are not just used for water operations, but are the basis for many other analyses, including Delta hydrodynamics, water temperature, fisheries (habitat, production, and survival), terrestrial habitat, economics, power generation and use, and recreation. There is often no disclosure of how much caution was used when CALSIM II input was used in these analyses. The BDCP Independent Scientific Review Panel also expressed concern over a "lack of consideration of propagation of errors or sensitivity analysis in linked models," and suggested a methodology for assessing uncertainty in linked models. DSP Independent Review Panel Report 2014 at 40-41.[32]

These CALSIM II model results that require "much caution" to interpret, *see* DEIS/DEIR at 5A-B199, are presented and used in other analyses at a level of specificity that is not cautious, propagates errors, and overstates certainty. According to DWR,

> CALSIM II provides a reasonable planning level simulation of existing project operations, recognizing that the operating environment and regulatory

[32] The report is available online at: http://deltacouncil.ca.gov/sites/default/files/documents/files/Delta-Science-Independent-Review-Panel-Report-PHASE-3-FINAL-SUBMISSION-03132014_0.pdf and is included with the supplementary and supporting materials we have included on a CD with our written comments.

> requirements for the projects are in a constant state of transition and change. Since CALSIM II is not a detailed operations model, it does not capture many of the complexities of forecasted and actual operations of project facilities.

See California Department of Water Resources website at: http://baydeltaoffice.water.ca.gov/modeling/hydrology/CalSim/Downloads/CalSimDownloads/CalSim-IIStudies/Benchmark/index.cfm. These limitations of the CALSIM II modeling of the BDCP means that the Draft Plan and DEIS/DEIR are not capable of reproducing actual historic operations or likely future operations at the timescale and accuracy required to adequately analyze the environmental effects of the project.

The BDCP DEIS/DEIR states "The CALSIM II model is most appropriately applied for comparing one alternative to another and drawing comparisons between the results. This is the method in which CALSIM II is applied for the BDCP." DEIR/DEIS at 5A-A15. If the value of the modeling results is relative, with unknown or undisclosed relation to actual outcomes, then the BDCP DEIS/DEIR cannot accurately assess whether biologically relevant thresholds of significance are likely to be achieved, or how projected outcomes can be related to goals and objectives. With only relative modeling results presented in a way that fails to disclose context and uncertainty, it is difficult to assess the accuracy of the evaluation of whether the BDCP alternatives are likely to achieve the BDCP's biological objectives.

In numerous locations the CALSIM II and other physical model results are presented as if they were likely to be actual, not relative, results. Conclusions are commonly drawn without regard to the warnings cited above and they are not qualified with confidence intervals or reference to the level of uncertainty inherent in model outputs. This makes it hard to trust any of the modeling output. Examples of this lack of disclosure of uncertainty include:

- Relative to the NAA, average annual Delta exports under Alternative 4 Scenario H4 (HOS) are expected to decrease by 27 TAF. DEIS/DEIR at 11-52. This is equivalent to just 0.6% of the average annual export. There is no context provided for interpreting whether such a tiny deviation will actually materialize. There is no discussion of what the margin of error is for the modeled results—an important piece of information, given all the cautionary statements about use of model results. It is thus not possible to distinguish this extremely small projected decrease in exports under the HOS from a potentially substantial 18% increase in exports under the LOS.
- At times, multiple hydrodynamic models were compared, each generating unique results. Yet these differing results are often described in vague terms, with just a few selected examples. For example, DSM2 models ROAs (Restoration Opportunity Areas) as channels or reservoirs. It does not allow dry channels or reservoirs, *see* DEIS/DEIR Appendix 5A

Section D Attachment 4 at 6, and sets the depth of all ROAs to -10.1 feet to prevent drying. This extra volume has the potential for increased dilution of salinity and other constituents in ROAs. Despite adjusting channel roughness in DSM2 to match the tidal and flow range in the RMA model, *see* DEIS/DEIR Appendix 5A Section D Attachment 4 at 10, there is not good agreement between the models at Prisoners Point and there is a "slight" underprediction of flows toward the Sacramento River in DSM2 at Three Mile Slough. *Id.* at 11. Differences due to the ROAs are "considered to be within acceptable limits for the purpose of this analysis," *id.*, however the acceptable limits are not disclosed, and without peer review, this statement lacks both specificity and credibility.

- UnTRIM-model-predicted salinity at Jersey Point was 20% below observed values and DSM2 was about 20% higher than observed. UnTRIM underpredicts salinity in central and south Delta while DSM2 did "well," so UnTRIM was used here only to corroborate trend with sea level rise. DEIS/DEIR Appendix 5A Section D Attachment 4 at 13. No information is given why UnTRIM underpredicted salinity in these areas, and whether the flaw affecting salinity might also affect sea level rise predictions. The reason why the 2002-2003 period was chosen for corroboration was not explained—was there adequate variation during this period representative of the variation predicted with the project, including potential ROA configurations and sea level rise?
- The range of outcomes from TRIM/RMA versus DSM2 and CALSIM II is limited to only one potential set of Restoration Opportunity Area (ROA) configurations. *See* DSP Independent Science Review Panel Report 2014 at 41. The ROA configuration significantly influences hydrodynamics in the Delta, *id.*, yet details of the ROA configuration are not provided, nor is a sensitivity analysis to other potential ROA configurations. The result is poor model agreement when the Delta Cross Channel is open, and more uncertainty in the results of all related analyses, including salinity distribution and attainment of water quality standards.

If modeling studies are to characterize that multiple environmental objectives of the BDCP can be met, modeling assumptions must adhere to the same principles as the operating criteria. This is not the case with the physical models used by BDCP, where many unjustified or incorrect assumptions have been made. Unrealistic modeling assumptions (we expand upon these below) include:

- Generalized representation of RPAs (in CALSIM II) resulting in unreliability of model output used for other analyses;
- Use of X2 estimates from CALSIM II that are unusable for comparison with actual historic operations and conditions , resulting in a lack of disclosure of the likely pattern of water management or the ability to attain other objectives;

- The BDCP version of CALSIM II underestimates north Delta exports, overestimates south Delta exports, overestimates net Delta outflow, and underestimates total exports, resulting in flawed input to every analysis that uses CALSIM II flows and exports in the Delta.
- Use of physically unjustified dispersion coefficients in DSM2-QUAL resulting in inconsistent model performance and unreliable results spatially and temporally;
- Failure to account for full residence time of particles diverted and returned to Delta waterways by agricultural diversions (in DSM2) resulting in a lack of disclosure of likely longer residence times and associated water quality impacts;
- Incorrect assumption that components in the particle tracking model (DSM2-PTM) act in a conservative manner throughout the system resulting in the failure to properly characterize the transport and residence time of water quality constituents;
- No changes in upstream reservoir management in CALSIM II based on downstream river temperatures, resulting in a lack of disclosure of likely reservoir operations and releases or ability to attain water quality and other objectives;
- Failure to properly modify operations enough to eliminate or reduce EC exceedances, resulting in a lack of disclosure of the water management required to achieve compliance or ability to attain water quality and other objectives;
- Failure to account for reasonably foreseeable water supplies and conservation opportunities, resulting in unrealistic operations.

In addition to the inability to convert modeling results into likely real-world impacts (their "relative nature") and the false precision accorded to some, but not all, of these outputs, the results of the BDCP modeling analyses are at times simply incorrect. For example, the X2 results in CALSIM II are not consistent with other studies, rendering them unusable for comparison. The ANN model approximates DSM2 model-generated salinity, and is used in CALSIM II to calculate X2. DEIS/DEIR at 5A-A7. But X2 calculated by CALSIM II using the ANN model differs substantially from that determined by the relationship with Delta outflow as calculated by Jassby et. al. 1995. *See* Mount and Saracino et al. 2013 at 48. The Jassby equation has been used by previous studies of X2-fish relationships, is used by DWR in the DAYFLOW program, and is the equation recommended by the Interagency Ecological Program. *See* Delta Science Program, Panel Report, Workshop on Delta Outflows and Related Stressors, May 2014 ("DSP Outflows Review Panel Report 2014"), at 8, available online at http://deltacouncil.ca.gov/sites/default/files/documents/files/Delta-Outflows-Report-Final-2014-05-05.pdf.[33] No explanation is given why the BDCP analysis fails to provide a calibration of the CALSIM II methods with the Jassby methodology or with actual X2. As presented, the X2 results in the DEIS/DEIR cannot be compared to numerous other studies that have documented Delta outflow needed to produce specific benefits in this ecosystem. As a consequence, the

[33] This review also found substantial discrepancies between modeled and actual X2 locations, particularly when X2 is seaward of 56 km or landward of 81 km. *Id.* at 12.

DEIS/DEIR presents contextually confusing X2 results that make it difficult for the public and decision-makers to adequately evaluate the DEIS/DEIR's outcomes and conclusions. This information is then used to arrive at a potentially erroneous and inadequate assessment of the environmental consequences of BDCP. A proper approach would be to calibrate the two X2 models with observed data and reveal in the EIR-EIS how the models differ and the implications of those differences for different analyses that depend upon CALSIM II X2 output.

Another example of incorrect results from the CALSIM II modeling is due to a flaw that was not fixed in the BDCP-modified CALSIM II model. An independent effort found that the BDCP version of the CALSIM II model underestimates the north Delta diversions by 700,000 acre-feet per year, and overestimates the south Delta diversions by 500,000 acre-feet per year. *See* MBK Engineers 2014.[34] Their review concluded that BDCP would result in 34% less Delta outflow and 41% more export than is disclosed in the BDCP DEIS/DEIR. This 200,000 acre-foot overestimate of net Delta outflow in the BDCP version of the model results in an unrealistically rosy picture of Delta outflow in the DEIS/DEIR, and thus the DEIS/DEIR understates the environmental impacts on species dependent on Delta outflow. *See also* Mount and Saracino et al. 2013 at 48, 64-66. At times the expected Delta outflow won't actually materialize under BDCP because the water can be exported or stored upstream. The incorrect proportion of exports between north and south in the BDCP model is also a problem because it results in flawed conclusions about changes in residence time, Old and Middle River flows (OMR) and entrainment, Sacramento River flows (and salmonid survival rates), and other effects of the north Delta diversions. Residence time in the south Delta will be much greater than BDCP discloses, and the effects of the north Delta diversions (on flow, entrainment, sediment, etc.) will be much greater than disclosed. These errors also affect the water supply analysis in the DEIS/DEIR, since the timing of diversions will differ from the timing derived from BDCP modeling. This has cascading effects on all of the other analyses that depend on CALSIM II, including the analysis of upstream reservoir operations and of export timing and magnitude, as well as Delta hydrodynamics and fisheries impacts. BDCP must revise the CALSIM modeling to correct this significant error, which propagates through virtually all of the environmental analyses. Without such revisions to the models, the entire BDCP Effects Analysis fails to accurately assess likely environmental impacts and is inadequate.

In addition, the lack of adequate validation and calibration of the DSM2 model leads to it overestimating salinity in the summer and fall and underestimating salinity in the winter and spring, which has significant environmental impacts that are not identified in the document. We

[34] Walter Bourez of MBK Engineers gave an initial presentation of their modeling results to the Delta Stewardship Council's Independent Science Board on January 17, 2014. That presentation is available online at: http://deltacouncil.ca.gov/get-document/7219. We understand that a more detailed review will be submitted as formal comments to BDCP.

have previously noted the failure to properly validate and peer review the BDCP-altered CALSIM II and DSM2 models. *See* TBI, EDF, CCWD 12/21/11 letter at 10-11. In their efforts to update the DSM2-QUAL model, BDCP modelers failed to calibrate and validate the model appropriately for prediction of EC. This results in spatial and temporal unreliability, under and overestimates of the amount of certain types of habitats, the false attainment or non-attainment of water quality standards, and incorrect estimates of the amount of freshwater flow needed to attain those targets.

DSM2 consists of three linked models: HYDRO, QUAL, and PTM. The DSM2-HYDRO model predicts hydrodynamics in the Delta. The BDCP-modified DSM2-QUAL model predicts EC (a measure of salinity, which is a key attribute of environmental conditions for most aquatic organisms) and other water quality parameters in the Delta under the BDCP alternatives. DSM2-QUAL was last calibrated in 2000 prior to the BDCP calibration. To calibrate the model, channel dispersion factors (increased dispersion causes greater salinity transport) were changed. In contrast to the much better performance (i.e. model output more closely matches observed data) of DSM2-HYDRO (hydrodynamics) compared to the 2000 calibration, changes in DSM2-QUAL model performance (EC) are inconsistent, and "the EC results indicate slightly worse performance compared to the previous calibration." DEIS/DEIR Appendix 5A, Section D, Attachment 1 at 6-2, 6-4. Problems with the EC calibration include:

- Dispersion coefficients were changed in an ad hoc manner to get better performance (model matches to the observed data) at Emmaton (a compliance point), however this resulted in worse performance at Old River at Holland Cut, South Delta export locations, and Rio Vista compared to the 2000 calibration. This also resulted in a low point in dispersion coefficients at Rio Vista, which according to the DEIS/DEIR "may not be justifiable from a physics standpoint and should be addressed in subsequent analyses." DEIS/DEIR Appendix 5A, Section D, Attachment 1 at 6-2. No subsequent analysis was performed for the DEIS/DEIR. DEIS/DEIR Appendix 5A Section D Attachment 1 Table 6-1 shows the dispersion factors that were changed—but it does not disclose which changes are physically justifiable in the real world. Using unjustifiable dispersion coefficients means that water quality results and conclusions drawn from DSM2-QUAL outputs for individual stations are suspect and may not be representative of the likely conditions under BDCP. Given these flaws, the DEIS/DEIR states that the lower Sacramento River stations should be viewed as a group. DEIS/DEIR Appendix 5A, Section D, Attachment 1, Table 6-3. However the results are not presented as a group, and instead BDCP inappropriately focuses on results at individual stations, such as the Emmaton compliance point.
- BDCP modelers failed to use a different validation period than the calibration period. Use of a separate validation period is a standard modeling practice that ensures the model calibrations are relevant to other time periods. Using the same calibration and validation

periods is flawed because model assumptions may not be correct during different periods of time. This calibration used the eight years 2001-2008 based on a discussion with DWR staff that concluded there was a need for a long period with dry years. Unfortunately, the decision to use this long calibration period resulted in an invalid validation, since development of a separate validation period (a standard practice) did not occur due to lack of EC data outside of that period. DEIS/DEIR Appendix 5A, Section D, Attachment 1, Section 6. Without validating the model against another time period, the unjustified calibrations discussed above enable the model to match the 8-year calibration period chosen but their relevance to other time periods is unknown. As a probable consequence, DSM2-QUAL overestimates salinity in summer-fall and underestimates salinity in winter-spring. DEIS/DEIR Appendix 5A Section D Attachment 1 at 6-2, 6-3. It also performs worse outside of dry and critical years. DEIS/DEIR Appendix 5A, Section D, Attachment 1 at 7-1.

- EC boundary conditions at the upstream and downstream edges of the modeled area were not verified, but flow and stage verified with 2001-2004 data, and mismatches were corrected to use observed flows. DEIS/DEIR Appendix 5A, Section D, Attachment 1 at 2-4. The need for flow and stage corrections during the 2001-2004 verification period indicates that mismatches outside of that period should have been corrected as well, yet no verification outside that period occurred. No explanation for the differences is given, leaving the impression there is a lack of understanding of why the model differs so much from reality during the verification period: Mokelumne River 9% of the time, Calaveras River 2% of the time, Sacramento River 1% of the time. Presumably mismatches occur outside the verification period at the same rate. The implications of the mismatches on model accuracy and the lack of corrections outside the verification period cast doubt on modeled results and on the quality of the analysis of the environmental impacts of BDCP.

The DEIS/DEIR concludes that, "the channel dispersion factors were modified to simulate EC accurately." DEIS/DEIR Appendix 5A, Section D, Attachment 1, Section 7-1. Yet this is not the case since performance is often worse, and the changes were not justified, and the validation failed to use a different period than the calibration period.[35]

Despite the improved ability of the BDCP version of the DSM2-HYDRO model to predict hydrodynamics, the BDCP DEIS/DEIR identifies problems noted a decade and a half ago that remain unfixed in the hydrodynamics modeling. The DSM2-HYDRO model could have a datum problem at Rio Vista, where tidally-averaged stage is .7 feet lower than the observed water

[35] Calibration and validation have been defined by the American Society of Testing and Materials, as follows (ASTM, 1984. Standard Practice for Evaluating Environmental Fate Models of Chemicals. Designation E978-84. American Society of Testing Materials. Philadelphia, PA. 8 p.): Calibration - a test of the model with known input and output information that is used to adjust or estimate factors for which data are not available. Validation - comparison of model results with numerical data independently derived from experiments or observations of the environment.

levels. This is similar to the error observed during the 2000 calibration effort. No additional investigation appears to have occurred and there is no mention of the feasibility of fixing this error. Due to this error, "tidally-averaged metrics were not used as the key metric in assessing the stage calibration." DEIS/DEIR Appendix 5A, Section D, Attachment 1 at 4-5. However the implications of the lack of access to a reliable tidally-averaged metric are not explained. The possible relationship of this error in DSM2-HYDRO to the physically unjustified low point in dispersion coefficients at the same location in DSM2-QUAL is also not discussed. These seem likely to be related, and perhaps a simple resurvey of the datum used at Rio Vista would solve both errors. This is important because an error in the DSM2 model known for over a decade was not fixed when it was potentially feasible to do so, there was no disclosure of the steps needed to fix the error, and that error is in a location that has an important influence on tidal flows, salinity, and freshwater outflow. Failure to fix a basic error propagates that error in all the scenarios modeled. In a system with so much uncertainty, and so many important resources at stake, BDCP modelers must attempt to fix errors where they are identified, and identify why it is infeasible to fix errors when it is difficult to do so. The presence of such an error, even if limited in scope and significance, is an example of how BDCP's flawed modeling approaches have resulted in other errors we have discussed here. These compounded errors and faulty assumptions make the BDCP modeling an unreliable foundation for all the analyses discussed in the DEIS/DEIR.

The particle tracking model, DSM2-PTM, as used in the DEIS/DEIR Chapter 8 water quality analysis (and described in DEIS/DEIR 5A-A54) likely underestimates residence time, resulting in an underestimate of BDCP's impacts on water quality. Particles are removed from the system when they are diverted by agricultural intakes within the Delta, reducing residence time. Many constituents are not consumed by agriculture, so when the water is discharged back to Delta channels, the constituents return to Delta channels, concentrated by consumptive use. We stated previously, *see* 12/21/11 TBI, EDF, CCWD letter, at 13-14, that the analysis should be modified to properly account for the true residence time in the system. NMFS agreed that the DEIS/DEIR Chapter 8 water quality analysis is flawed. In a July 5, 2013 letter, NMFS stated:

> CALSIM and DSM2 were used for all constituents (with additional organism tissue models for selenium and mercury). However, DSM2 only directly models electrical conductivity (EC) and dissolved organic carbon (DOC). Other constituents were modeled as relationships to EC or using mass-balance calculations and outputs from CALSIM and DSM2 with the assumption that the constituents act in a conservative manner throughout the system, which is not universally applicable and could lead to inaccurate results. This method also results in a hybrid analysis which produces numerical output (seemingly quantitative) that is actually intended to be considered "qualitative" for several very important parameters such as DO, nitrogen, phosphorus and turbidity [see

> Table 8-61]. This approach also does not take into account the likely interaction of constituents, such as that between DO and DOC, or DO and temperature.

NMFS 2013, "Big Picture" Issues for the 2013 Admin Draft BDCP EIR/EIS, at 6, available online at:
http://baydeltaconservationplan.com/Libraries/Dynamic_Document_Library/Federal_Agency_Comments_on_Consultant_Administrative_Draft_EIR-EIS_7-18-13.sflb.ashx.

The DEIS/DEIR acknowledges problems with DSM2-QUAL as well, cautioning that, "[s]ignificant uncertainty exists in flow and EC input data related to in-Delta agriculture, which leads to uncertainty in the simulated EC values. Caution needs to be exercised when using EC outputs on a sub-monthly scale." DEIS/DEIR Appendix 5A, Section D, Attachment 1 at 7-2. Yet elsewhere the DEIS/DEIR incautiously claims that DSM2 can show daily or less time steps, "which can help understand how salinity moves within the system with more accuracy than CalSim." DEIS/DEIR Appendix 5A, Section D at 5A-208. The limited sub-daily accuracy of the model, when combined with the flawed water quality analysis, casts doubt on the value of the results. A proper approach would be, as suggested by NMFS, to explore additional analytical methods that can better characterize anticipated water quality conditions in the system, or to use smaller-scale models that focus on particular areas of concern.

TBI and others have discovered the modeling flaws cited above. It is entirely possible that there are additional unknown flaws and errors in the CALSIM II and DSM2 modeling. We and others have commented before that the models, including the recent modifications, need to be fully documented and properly validated and should undergo a peer review. 12/21/11 TBI, EDF, CCWD letter, at 10-11; *see also* "Comments on CALSIM II" from the Environmental Defense Fund, September 14, 2001. The modeling tools (described in DEIS/DEIR Appendix 5A) that simulate statewide operational changes for the SWP and CVP (CALSIM II) and hydrodynamics and transport within the Delta (DSM2) have known limitations in forecasting water supply and water quality conditions in the current configuration of the Delta. These same model tools have undergone numerous changes by the BDCP project team to implement the new OCAP BiOps under current conditions and to forecast conditions in a radically altered Delta. Although long overdue, the additional documentation provided in the public draft is welcome. However, proper validation and peer review are still missing.

B. Certain Water Quality Modeling Assumptions are Inconsistently Applied between Alternatives, Fail to Comply with D-1641 Requirements, and Fail to Reflect Likely Management during Droughts

In addition to some of the salinity problems identified above, the DEIS/DEIR and Draft Plan also contain additional modeling problems and assumptions regarding compliance with existing water quality standards.

First, D-1641 water quality standards require salinity compliance at Emmaton. BDCP proposes to move this compliance location to Three Mile Slough. The document also uses an inconsistent EC compliance point—Emmaton for Existing Conditions and the No Action Alternative, and Three Mile Slough for the proposed project. Due to this inconsistency, BDCP fails to adequately disclose the effects of moving the compliance point, since they aren't presented separately from the effects of BDCP's proposed water management and restoration. This proposal would reduce Delta outflow and harm fish and wildlife. Yet all of the alternatives—including the No Action Alternative--result in modeled exceedances at both locations, meaning all of the alternatives generate estimates that D-1641 standards will not be met, during some year types, for some of the required durations. DEIS/DEIR Appendix 8H, at Tables EC-1 through EC-20. The document claims that "many" of these are model anomalies, *see* DEIS/DEIR Appendix 8H, at 8H-1, but as a result of these repeated anomalies in the data, a meaningful evaluation is impossible.

BDCP not only proposes (without any scientific justification) to eliminate the Emmaton EC compliance point, but it conflates this location with Three Mile Slough. The presentation of Emmaton EC and Three Mile Slough EC as equivalent in the BDCP DEIS/DEIR is misleading. DEIS/DEIR Appendix 8H tables EC-1 through EC-20 show exceedances of Water Quality Control Plan objectives for each alternative. The State Water Board previously recommended using Emmaton as the compliance location in the modeling for all of the alternatives, SWRCB 7/5/13 BDCP Comments at 21-22, yet the BDCP DEIS/DEIR fails to do this: the first row of each table (except EC-11) compares the effects on EC at Three Mile Slough under the alternatives to EC at Emmaton under Existing Conditions and the No Action Alternative. This juxtaposition of the two locations implies they are equivalent, however the second row of each table shows that EC exceedances at Emmaton are expected to occur a much greater percentage of the time than at Three Mile Slough under all scenarios evaluated. This comparison reveals that it is incorrect and misleading to say that EC at Three Mile Slough is the same as EC at Emmaton under any alternative, including No Action and Existing Conditions, and the first row of each table conflating the two locations should be deleted or modified. Since the model appears to be capable of estimating the difference in EC between the two locations under each alternative,[36]

[36] As stated above, the EC analysis is substantially flawed. The DEIS/DEIR admits that water quality results and conclusions drawn from DSM2-QUAL outputs for individual stations are suspect and may not

the table should be modified with actual model output for the Existing Conditions and No Action alternatives at Three Mile Slough. The DEIS/DEIR cannot conflate results for Emmaton and Three Mile Slough. The tables beginning at EC-12 show color-coded results from analyses that were performed on the erroneous comparison—in addition to deleting this top row, any results and conclusions from it that were used elsewhere should be deleted as well.

The actions of DWR and USBR this year demonstrate that the EC differences between Emmaton and Three Mile Slough are real and that results for the two sites should not be conflated. For instance, the April 9, 2014 Temporary Urgency Change request to the Water Board proposed that while emergency drought barriers are in place, "The compliance location for the D-1641 Agricultural Western Delta Salinity Standard at Emmaton (14-day running average of 2.78 millimhos per) is moved to Three Mile Slough on the Sacramento River." DWR and USBR, April 9, 2014, request for Temporary Urgency Change, at 5, available online at: http://www.swrcb.ca.gov/waterrights/water_issues/programs/drought/docs/tucp/031814order_urgchg_swcv/20140409_petitioners_request.pdf (incorporated by reference). DWR and USBR further explained:

> These two forecasts show a gain of 149,000 AF in cumulative end of September carryover storage between all reservoirs as a result of implementing the emergency drought barriers. However, as described below, this savings in storage would only be achieved if the D-1641 Agricultural Western Delta Salinity Standard at Emmaton is set aside while the emergency drought barriers are in place. If hydrologic conditions warrant that sufficient water is available in upstream reservoirs to maintain this Emmaton standard, or a modification of the standard that would move the compliance point to Three Mile Slough on the Sacramento River, emergency drought barriers would not provide any savings in Delta outflow needs or end of September carryover storage in upstream reservoirs.

Id.[37] The models are "trained" to modify operations to meet the EC standard, although the training is never perfect and generally a few exceedances are found in planning model runs.

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be representative of the likely conditions under BDCP, and therefore the lower Sacramento River stations should be viewed as a group. DEIS/DEIR Appendix 5A, Section D, Attachment 1, Table 6-3. Given that the numbers in the tables are incorrect, our discussion here focuses on the misleading presentation of the results, and not the likely erroneous results themselves.

[37] This and other elements of the 2014 Temporary Urgency Change Petitions and Orders raise additional concerns regarding future compliance with water quality and other regulatory standards during dry and drought conditions. BDCP provides no information regarding how often TUCs like this one would be requested, and does not analyze the impacts of such requests. This is yet another undisclosed impact of BDCP. DEIS/DEIR Appendix 8H-1 is misleading where it states that "DWR and USBR have every

However, the BDCP runs show far more frequent and extreme exceedances than has been commonly observed in previous planning studies. Tables EC-1 through EC-20 show greatly varying exceedances at Emmaton and Three Mile Slough for each alternative. The DEIS/DEIR Appendix 8H-1 (additional descriptions of the model limitations related to the water quality modeling results are found in Appendix 5A) states that "many" exceedances of D-1641 standards are model anomalies, and "DWR and USBR have every intention of operating SWP and CVP facilities by fine tuning reservoir storage and exports in real time to meet D-1641 standards, and any changes to D-1641 as adopted by the SWRCB." DEIS/DEIR Appendix 8H at 8H-1. This statement, when combined with the prevalence of exceedances in the model results, raises many unanswered questions:

- What proportion of the exceedances are anomalous? Which of the EC exceedances are model anomalies, and which are expected to occur under BDCP?
- Is the ability to meet water quality standards more achievable under some alternatives than others?
- If the intent is that each alternative will result in exceedances 0% of the time, and all cases of exceedance are model anomalies: 1) why is there so much variance in the anomalies; 2) what is the purpose of presenting the anomalies without more context, such as error bars; 3) how were these results used in the analysis; 4) what evidence is there to show that there will be no exceedances under any alternative; and 5) under what conditions would exceedances be unavoidable and how often would this situation occur?
- If the intent is that exceedances will be minimized, but real differences in EC compliance exist between the alternatives, then the anomalies should be better-characterized so that only the real differences between the alternatives are presented. The way the results are presented combined with the disclaimer, the analysis is not useful, and does not enable a decision maker or the public to answer any of the questions posed above.

The DEIS/DEIR states that, "If necessary, comparisons of model results against threshold or standard values should be limited to comparisons based on cumulative probability distributions." DEIS/DEIR Appendix 5A, Section C, at C6. Yet the exceedance of a standard should result in probabilities close to zero, and the lack of such output indicates that the models are inaccurate.

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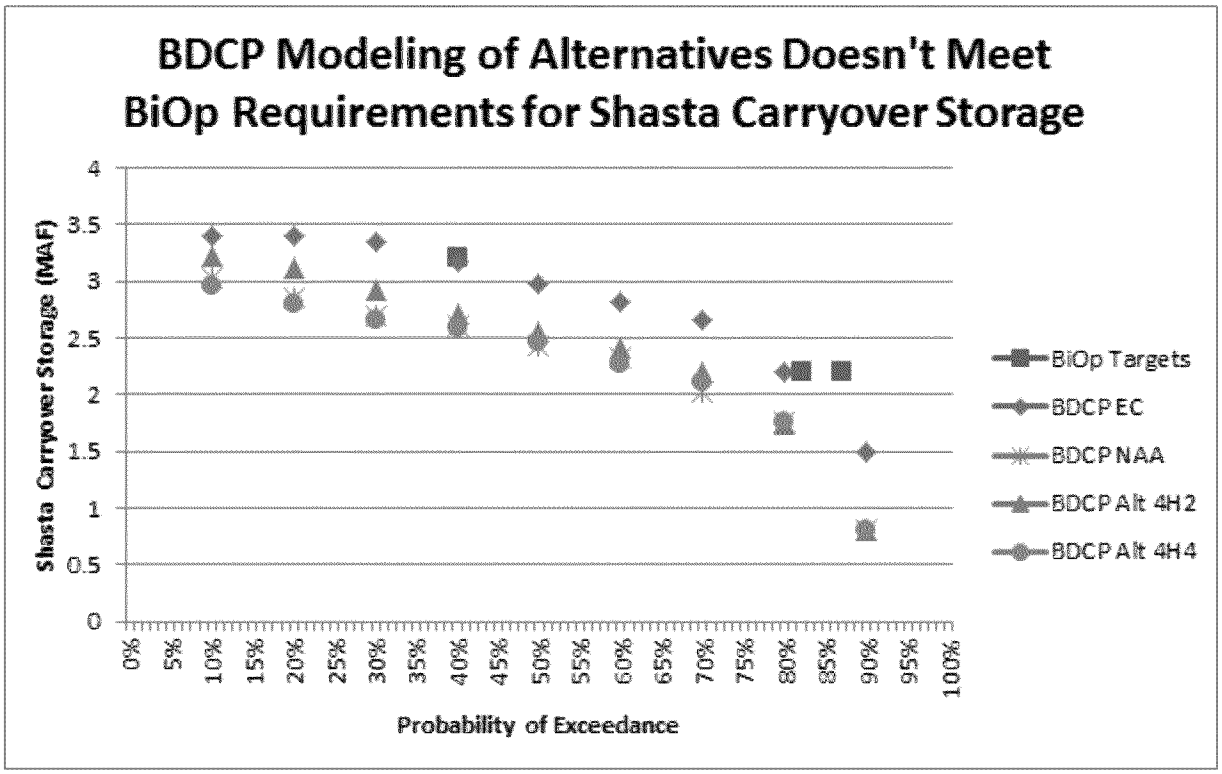
intention" of meeting D-1641 standards. This does not seem to be the case in certain dry years such as 2013 and 2014, and the effects of similar relaxations of water quality standards and other environmental requirements in the future are not analyzed or disclosed in the DEIS/DEIR, despite the fact that such changes are reasonably foreseeable. According to the 2014 independent panel review of delta outflow and other stressors, "The average measured Delta outflow during fall 2013 was approximately 2,000 cfs, which failed to meet the Board's minimum outflow requirement of 3,000 to 3,500 cfs for fall months of a critically dry year." DSP Outflows Review Panel Report 2014 at 15. Likely future waivers and relaxations of standards modeled in BDCP are yet another example of how the modeling of BDCP fails to accurately assess likely environmental impacts.

Second, D-1641 sets limits on south Delta exports based on Delta inflow, known as the export:inflow ratio (E/I ratio), during certain months of the year. The inconsistent application of the allowable E/I ratio to the different alternatives and scenarios, *see* DEIS/DEIR at ES34-ES35, is a long-standing problem with the BDCP modeling. BDCP defines the D-1641-E/I ratio—except in scenarios H2 and H4—to ignore both the inflow to the Delta being exported by the proposed north Delta intakes and those exports, thus exempting the north Delta intakes from compliance with the D-1641 export/inflow requirement. In contrast, the intent of the D-1641 E/I ratio is to limit pumping by the CVP/SWP to a fraction of Delta inflow, regardless of where the CVP/SWP intakes are located. The sensitivity analysis memo (DEIS/DEIR at 5A-D148) characterizes the approach taken in H2 and H4—the NMFS approach—as minimally different from the BDCP approach, and if this is the case, then it is unclear why a single approach was not universally followed for clarity and simplicity. Using an inconsistent E/I ratio introduces complexity, confusion, and obfuscation where there is no need for it, hampering the transparent and concise disclosure of impacts to decision makers and the public.

C. The DEIS/DEIR Fails to Incorporate CVP/SWP Legal Constraints on Upstream Water Temperature in its CALSIM II Modeling, Resulting in a Failure to Adequately and Accurately Assess the Effects of Current and Proposed Operations Both Upstream and in the Delta

The BDCP CALSIM II modeling fails to accurately model how reservoirs would be operated to adapt and minimize the effects of climate change and project operations on listed species and water supply, leading to inaccurate modeling results that likely underestimate environmental impacts of BDCP in the Delta. Once again, the documents offer yet another modeling disclaimer, noting that the model results may be unlikely to actually occur: "…the BDCP does not change Shasta Reservoir and upper Sacramento River operating criteria, so that changes in upstream areas derived from modeling, be they positive or negative, may not be fully reflective of the nature of actual changes that could occur." Draft Plan at 5.5.3-45. The modeling appendix shows markedly decreased end-of-year storage in Shasta Reservoir under the proposed project late long-term scenario (and even under the No Action Alternative). DEIS/DEIR 5A-C42 to 5A-C45. BDCP CALSIM II model projections for carryover storage at Shasta Reservoir do not attain those required by the NMFS 2009 Biological Opinion (RPA Action 1.2.1 at 592). In particular, as the graphic below shows (based on information in the DEIS/DEIR), the that the carryover storage targets of 2.2 MAF in 82% and 87% of years and 3.2 MAF in 40% of years in the 2009 biological opinion are not attained.[38]

[38] The DEIS/DEIR fails to demonstrate whether operations will achieve the 2009 NMFS biological opinion's performance measures for temperature compliance points on the Sacramento River, but it would



The NMFS RPA prescribed these carryover storage targets as the minimum necessary to protect winter-run Chinook salmon (and other listed salmonids) spawning in the Sacramento River. They also provide ancillary protection to fall run Chinook salmon spawning in the same rivers. Modeled operations for all BDCP alternatives lead to significantly worse operational effects upstream on salmon than the minimum required under existing biological opinions.

In contrast, modeling of existing conditions comes close to achieving the NMFS carryover storage targets for Shasta, and the independent effort by MBK Engineers appears to have used CALSIM II to correctly model BDCP with the required NMFS 2009 Biological Opinion exceedances. Modeling in BDCP needs to be revised to achieve these carryover storage requirements of the 2009 biological opinion, as these other efforts demonstrate that such modeling is feasible and has already been prepared.[39]

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appear unlikely given the failure to achieve carryover storage targets. 2009 NMFS Biological Opinion at 592.

[39] In addition, modeling BDCP operations that fail to achieve the carryover storage requirements of the 2009 NMFS biological opinion is not consistent with the objectives of the Draft Plan. *See, e.g.*, Objective WRCS3.1 for winter-run Chinook salmon, which states that the BDCP will, "Implement covered activities so as to not result in a reduction of the primary constituent elements of designated critical habitat for winter-run Chinook salmon upstream of the Plan Area).

Unrealistic reservoir management (even under the No Action Alternative) is another significant modeling flaw that makes analyses of downstream operations and environmental impacts inaccurate and unreliable. In order to meet existing reservoir carryover storage targets, BDCP likely will have to reduce reservoir releases as compared to modeled operations, which will have cascading impacts on downstream operations (e.g., Delta outflow, Delta inflow, and exports) and on environmental impacts to fish and wildlife.

In addition, these same flawed modeling assumptions also result in additional drawdowns of Trinity Reservoir, *see* DEIS/DEIR Appendix 5A at C10, which would affect that river's Coho and Chinook salmon populations at well as its steelhead. As with the Shasta Reservoir modeling, these drawdowns occur even under the No Action Alternative. These impacts should not and are unlikely to be allowed to occur. As a result, the modeling is unrealistic and misrepresents likely water management and likely environmental impacts under BDCP.

D. Modeling of Operations Relating to the High Outflow Scenario are Flawed, and Demonstrate that the High Outflow Scenario is Not Reasonably Certain to Occur in Many Years

BDCP's assumption that outflows sufficient to meet the High Outflow Scenario (HOS) will occur when needed is flawed, and the current approach to achieving the HOS does not appear reasonably certain to occur. BDCP plans to release the enhanced spring outflow in the Alternative 4 High Outflow Scenario from Oroville Reservoir in order to avoid impacting storage in other reservoirs. However if end-of-May Oroville storage is projected to be less than 2 MAF, additional flow is not released, nor is flow released above the 17,000 cfs power house capacity. In drier years, only export curtailment is used to achieve the HOS spring outflow, unless exports would be less than 1500 cfs. The DEIS/DEIR does not clearly document how often these combined limits are expected to prevent the HOS spring outflow from occurring. The end-of-May storage offramp is expected to occur 30% of the time, *see* DEIS/DEIR, Appendix 5A, at C73, and the 1,500 cfs export offramp is expected to occur as much as 40% of the time, *see* DEIS/DEIR, Appendix5A, at C320. As such, it appears that the BDCP HOS will not be achieved a significant portion of the time, contrary to the assumptions in the environmental analyses.[40]

In addition, the proposed reoperation of Oroville Reservoir to achieve the High Outflow Scenario should be peer reviewed. NMFS has commented in the past that:

[40] The 2014 review of BDCP modeling by MBK Engineers also found significant flaws in the modeling of the High Outflow Scenario.

> the potential temperature compliance point included in the Dec 2012 Settlement Agreement for Licensing of the Oroville Facilities… would require compliance to 64° F from May-September in the high flow channel, and the Robinson Riffle criteria for protection of spring-run Chinook in the low flow channel, which could be affected as a result of changes in end of May storage and resulting diminishment of the cold water pool. Because of the potential biological importance of re-operation of Oroville, we recommend that the entire set of decisions and effects analysis be submitted for independent peer review to further assist in predicting these effects.

NMFS 2013 Progress Assessment at 21. In addition to the failure to properly model the reoperation of Oroville Reservoir or the temperature constraints downstream of it and other reservoirs, the way the temperature model output is presented renders the analysis invalid. One of the appendices states:

> There would be small to moderate reductions in May storage and small to moderate increases in September storage under the HOS relative to the ESO. Despite these changes, year-round water temperatures in the Feather River would not substantially [sic] changed by HOS or LOS scenarios, because mean monthly water temperatures would not differ by more than 4% from those under ESO regardless of month or water-year type (Table 5C.5.2-154 through Table 5C.5.2-157).

Draft Plan, Appendix 5C, at 5C.5.2-292. This temperature analysis is fundamentally flawed and will likely result in significantly greater environmental impacts than identified in the documents, because:

First, a percentage change in temperature is meaningless and an invalid means of determining impacts or comparing alternatives; instead, the focus should be whether the changes exceed biologically important thresholds. Thresholds are biologically more important than absolute differences (or percentage differences). An increase in temperature that crosses a biological threshold is more significant than a larger increase that stays below the threshold. The 3.5% maximum increase predicted for September of Below Normal years under HOS, *see* Draft Plan, Appendix C, at Table 5C.5.2-156, appears to be based on a 2.1 degree Fahrenheit increase over a temperature of 61 degrees, *see* Draft Plan, Appendix C, at Table 5C.5.2-154.[41] This same increase when measured on the Celsius scale is 7.5%. Regardless of each percentage increase being correct and misleading without additional context, a 2.1 degree F increase in water

[41] This does not match the other table, even when rounding is considered.

temperature can have significant lethal and negative sub-lethal effects on salmonid and non-salmonid species.

Second, mean monthly water temperatures are a poor indicator of biological conditions – salmon and other native fish and wildlife respond immediately and dramatically to actual temperature conditions, and lethal and sub-lethal temperature thresholds are frequently measured as daily, 3-day, or 7-day averages. However, a monthly average temperature will frequently be exceeded on a weekly or daily basis – the frequency and magnitude of the exceedances are inversely related to the length of the relevant timestep. Summertime peaks, daily fluctuation, and exceedance curves for important biological thresholds would provide more accurate assessment of environmental impacts.

E. The DEIS/DEIR Fails to Adequately Analyze Environmental Impacts in the Early Long Term (ELT)

The DEIS/DEIR generally only provides modeling results for the Late Long Term (LLT – 60 years from now), and it states that, "For the purpose of BDCP EIR/EIS impacts evaluation, Alternatives' modeling results at LLT phase are considered." DEIS/DEIR Appendix 5A at A-4. The lack of modeling and analysis of operations and environmental impacts in the Early Long Term (ELT, which includes climate change effects in 2025) prevents a meaningful analysis. ELT results are needed to help distinguish the effects of climate change from project operations and to demonstrate the impacts during the first several decades of operations. There are significant changes in operations, flows, and environmental impacts between the ELT and LLT; for instance, this table below shows changes in exports between the ELT and LLT.

Average Annual Exports	ELT	LLT
Alternative 4 HOS	4,705 cfs	4,413 cfs (-6%)
Alternative 4 LOS	5,591 cfs	5,255 cfs (-6%)

Source: Draft Plan, Chapter 5, at Tables 5.3.2 – 5.3.3. HOS is the High Outflow Scenario and LOS is the Low Outflow Scenario.

The DEIS/DEIR Appendix 5A Section C (CALSIM II and DSM2 Modeling Results) presents LLT modeling results only. We echo the comment previously made by the Delta Stewardship Council that BDCP needs to provide modeling results for ELT, not just LLT, in the DEIS/DEIR. Delta Stewardship Council, Responsible Agency Comments, 2013 Administrative Draft, Bay Delta Conservation Plan Environmental Impact Report/Environmental Impact Statement, July 11, 2013 ("DSC 2013 BDCP Comments"), at 17, available online at: http://deltacouncil.ca.gov/sites/default/files/documents/files/DSC_Letter_on_BDCP_Review.pdf (incorporated by reference).

F. The Presentation of Average Results (Including Flows and Temperatures) Obscures and Understates Likely Environmental Impacts

As the DEIS/DEIR repeatedly warns, model output for a single point in time is not necessarily reliable, and therefore proper use of results requires "much caution" and is limited to a general comparison of relative averages and exceedances on a monthly basis. *See* DEIS/DEIR Appendix 5 at 5A-A15, 5A-B199, 5A-C5, and 5A-C6. Although some sub-monthly modeling was conducted for the north Delta intakes, and some hydrodynamic modeling used sub-daily flows, BDCP generally used monthly average flows in its hydrologic modeling. At times, annual or year-type averages are presented in the Draft DEIS/DEIR. While use of averages can at times be helpful, it is not always the proper tool for use in assessing impacts, and without proper context, it can obscure potential impacts, especially in biological systems where outcomes are often determined by threshold and extreme values, more than by average conditions. Average results from physical models were presented in the BDCP DEIS/DEIR in the following ways that obscure potential impacts:

- In the in the DEIS/DEIR Appendix 5A Section C, BDCP exports are shown as year-type averages. There can be significant year-to-year variability in exports. Averaging fails to convey that variability and the associated variability in export-related impacts. For example, conditions that produce the highest entrainment values may control outcomes in future years, more than the average, long-term condition (an extreme example would be that an extinction or near-extinction event in one year will not be mitigated by improved conditions in subsequent years). More information than just the average needs to be presented.
- The averaging period proposed for OMR flows is undisclosed in the Alternative 4 Decision Tree Scenarios. Table B-13 from the DEIS/DEIR, Appendix 5A, Section B lists monthly average flows, yet states that USFWS and NMFS OMR criteria would be met, which require compliance on a 14 day average basis. Without presenting the most-negative flows, the DEIS/DEIR fails to disclose the full impacts to the Delta ecosystem and fails to demonstrate that operations would comply with the biological opinions.[42]
- The averaging period proposed for Sacramento River bypass flows is undisclosed in the Alternative 4 Decision Tree Scenarios. Table B-13 from the DEIS/DEIR, Appendix 5A, Section B does not state if it is a daily average or an instantaneous flow. The SWRCB has expressed concern that reverse flows at Freeport would become more common July-

[42] In addition, neither Table B-13 or any other information in the DEIS/DEIR or Draft Plan explains how OMR rules based on water year type will actually be implemented (given the inability to precisely forecast water year type, particularly early in the year), what method of forecasting will be used, and how that may differ from modeled operations and thus modeled environmental impacts. The same is true for other operational parameters that are based on water year type.

November if BDCP fails to apply the bypass flow on an instantaneous basis. SWRCB 7/5/13 BDCP Comments at 13. The impacts of the proposed averaging period on biological resources must be disclosed.

- The DEIS/DEIR appendices do not appear to analyze the effect of changed residence time but rather draw a conclusion based on the average change in residence time over all time periods. DEIS/DEIR Appendix 5C. Residence time is presented for a limited number of time periods of the model simulation period to represent a variety of hydrologic conditions. Residence time in the Delta changes dramatically in response to hydrology and operations. *See* DSP Independent Science Review Panel Report 2014 at 65. Changes in residence time would be expected to alter primary productivity, pH, and temperature, and thus alter transformations of constituents, with longer residence times likely to negatively impact water quality and ecosystem function. However, average change is not relevant to any processes and thus not important to any covered species. This analysis should be expanded and the results should be integrated into other areas of Appendices C and D.
- ESO flows could be as much as 6500 cfs less than EBC2 flows (in November) when months are evaluated individually, and not grouped by month and water year type.[43]

In a comment letter on the administrative draft Plan and DEIS/DEIR, NMFS stated:

> The results of these models signal a need for further investigation to determine why they are not what are "expected". It seems that upstream releases between ESO and EBC2 do not match as well as thought, as seen in Plan Table C.A-47 and EIR-EIS Tables C-15-5,6,7,8.[44] Some summertime and fall months in drier years are very different, which may be what is causing the biological models to show a negative egg survival response. The table below shows the results of month-to-month comparisons of flows out of Keswick for LLT. It indicates that the ESO flows could be as much as 6500 cfs less than EBC2 flows (November) when months are evaluated individually, and not grouped by month and water year type.

NMFS 2013 Progress Assessment at 12.

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[43] In addition, BDCP modeling shows delta outflow in October of many years in excess of BDCP's proposed operational requirements. *See* Mount and Saracino et al. 2013 at 48, 52, 64-66. They concluded that these modeled outflows, which would substantially benefit delta smelt, are unlikely to occur. *Id.*
[44] This reference is to Table C.5.2-2 in the Administrative Draft Plan, entitled "Difference and Percent Difference in Flows in the Sacramento River at Keswick, Year-Round." For reasons that are not explained, this Table has been removed from the public draft documents, and the Draft Plan and DEIS/DEIR fail to explain whether and how this discrepancy was resolved.

The Plan and DEIS/DEIR often analyze averages when averages are not the proper tool for assessing impacts, however the inverse problem occurs with the use of physical model results in other models. If BDCP were to heed its own warnings about the proper use of these results, then it would only use averages and statistical representations of the model output as input to other models. Since averages are often not the proper tool for assessing impacts, this approach would leave biological models lacking input data. But the public BDCP documents appear to be scrubbed of non-averaged data, yet those detailed data were still used in biological models inappropriately. This results in documents that hide potential impacts from the public, and present overly-confident biological model results. A proper, more consistent and informative approach would be to allow use of detailed physical model results—both in other models and the public documents—on a case by case basis based on a detailed understanding of model accuracy and errors, and to prohibit use of potentially erroneous results on a case by case basis as well. This would maximize the value of the modeling and minimize the propagation of errors.

III. BDCP FAILS TO USE A SCIENTIFICALLY SOUND APPROACH TO SETTING BIOLOGICAL OBJECTIVES, IDENTIFYING AND EVALUATING STRESSORS, AND DESIGNING CONSERVATION MEASURES

Our organizations have been involved with the planning of BDCP's conservation strategy (Conservation Strategy) for several years. Throughout that time, we have emphasized the need for a planning and evaluation process and a project description that clearly articulate the project's goals and its specific biological outcomes (objectives) and that clearly links those targets to the factors that impair the ecosystem and covered species in the Delta today (stressors). The Draft Plan should then describe extent that stressors must be ameliorated (stressor reduction targets) in order to achieve its objectives; this description of the problem sets the context for designing actions (conservation measures) that the Draft Plan will undertake to alleviate stressors. Finally, the intended outcomes (projected effects) of the individual conservation measures should be tabulated and explicitly compared to the Draft Plan's stressor reduction targets and, ultimately, its objectives, so that the public can clearly understand the need for and relationship among various Plan elements as well as the adequacy of and logic behind the Conservation Strategy. In numerous letters, memoranda, and meetings with all BDCP parties, we described the structure of this "Logic Chain" and the importance of such a transparent explanation of the Conservation Strategy both for (a) evaluation of the project proposal in the permitting phase (i.e. is the Plan sufficient to accomplish the needed ecosystem improvements?), and (b) the post-implementation, adaptive management phase (i.e. have Plan components produced the anticipated benefits or is there a need to adjust the suite of measures or their implementation?).[45]

[45] *See, e.g.*, Letter from TBI, EDF, and DOW to BDCP Steering Committee, December 20, 2009; Letter from American Rivers et al. to BDCP Steering Committee, November 3, 2010; Memorandum to J. Meral and D. Nawi from J. Cain et al. re: Necessary analytical steps for completing a successful BDCP

We have persistently encouraged BDCP to utilize criteria for viable populations (McElhany et al. 2000; Lindley et al. 2007) to identify and address important conservation needs and opportunities of the covered species. *See, e.g.,* Letter from TBI, EDF, and DOW to BDCP Steering Committee December 20, 2009. This approach emphasizes that viable populations simultaneously display adequate levels of four key attributes of viability: abundance, productivity, spatial distribution, and life-history or genetic diversity. The essential nature of these attributes of viability is generally accepted throughout the conservation science literature. Meffe and Carrol 1994. We review the Draft Plan and DEIS/DEIR through this lens because, even though the attributes influence each other, actions in the Plan may impact species viability by altering one or more of these attributes, independent of effects on other attributes. The assessment of Plan impacts on covered species should address positive and negative effects to each attribute of viability. We briefly review the meaning of each of these attributes of viability here.

Abundance: The number of organisms in a population is a common and obvious species conservation metric. For instance, endangered species recovery plans (USFWS 1996; NMFS 2014) and conservation programs such as the Anadromous Fish Restoration Program (AFRP) generally identify abundance targets against which conservation success may be measured. Populations or species with low abundance are less viable and at higher risk of extinction than large populations for reasons that include environmental variation, demographic stochasticity, genetic processes, and ecological interactions. Abundance is also correlated with and contributes to other viability characteristics including spatial extent, diversity, and productivity. In itself, however, simply increasing abundance of organisms (or any other single viability characteristic) is not sufficient to guarantee viability into the future.

Productivity: The ability of populations to grow when conditions are suitable is essential to conservation success. Species or populations that display persistent negative population growth, as well as populations with limited ability to respond positively to favorable environmental conditions, are less viable and at higher risk of extinction. As we use them here, productivity parameters are expressed as rates (such as survival rate, offspring per adult female, etc.) and, refer to the ability of organisms to survive to reproduction and their reproductive success in the absence of density-dependent factors. Desirable population growth rates are commonly determined by identifying an abundance target and a date in the future by which that abundance should be attained; the population growth rate is then calculated as the minimum population

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Environmental Effects Analysis (EA) and NEPA/CEQA document, July 11, 2011; Memorandum to J. Meral et al. from TBI, EDF, and Contra Costa Water District re: Review of Appendices C and D, December 21, 2011; Memorandum to J. Meral from J. Rosenfield re: "Review of BDCP Effects Analysis Appendix G" December 22, 2011; Memorandum to J. Meral et al. from J. Rosenfield re: "Preliminary Review of BDCP Effects Analysis Appendix F", February 9, 2012.

growth needed to achieve the desired abundance in the available time frame. This approach does not always provide adequate productivity as it may result in population growth rates representing impaired productivity for a given species (for instance, if the abundance target could be achieved in less time by a more "healthy" population). While population growth rates vary, depending on environmental conditions, demographic conditions, and how abundance relates to local carrying capacity, species are often characterized as having "intrinsic" population growth rates that reflect their life history and demographic characteristics (age at first reproduction, fecundity, survival, and sex ratio). The reproductive success rates and life-stage specific survival rates observed under good conditions in the field, and in the absence of density-dependent limitations, are valid reference points for determining adequate productivity of managed populations.

Spatial Distribution: Maintaining or restoring spatial distribution of fish and wildlife species is a critical component of protecting these species and maintaining the public trust. The notion that spatial distribution is inversely proportional to extinction risk is axiomatic to modern conservation biology. MacArthur and Wilson 1967; Meffe and Carrol 1994; Laurance et al. 2002. Populations or species with limited or less varied geographic distributions are more vulnerable to catastrophic events, such as an episode of lethally elevated water temperature, disease, a toxic spill, drought, or other localized disturbances. The effect of geographic distribution on extinction risk is also apparent in the geographic attributes of extant freshwater fish species. Rosenfield 2002. Increased spatial distribution reduces susceptibility to localized catastrophes, predator aggregations, and disease outbreaks while simultaneously increasing the probability that at least some dispersing individuals will encounter habitat patches with favorable environmental conditions. The need to maintain adequate spatial distribution is regularly acknowledged in regulatory planning and decision-making regarding the Delta and its environs. *See, e.g.,* NMFS 2014.

Life-History and Genetic Diversity: Natural diversity needs to be protected both within populations of specific public trust species and within the ecosystem as a whole. Natural diversity (life history patterns) allows organisms to adapt to and benefit from environmental variability. In addition, variability among individuals in a population increases the likelihood that at least some members of the population will survive and reproduce regardless of natural variability in the environment. Diversity across a population is especially important in highly variable ecosystems such as the Delta. Although only genetically based traits are subject to evolution and not all diversity is genetically-based, it is a trait itself (genetically based or not) that confers the ability to survive and reproduce in different environments. Thus, in a conservation sense, both genetically-based diversity and phenotypic diversity that is a response to the environment (eco-phenotypic diversity) are important and must be conserved. Many of the native fish species in the San Francisco Estuary demonstrate high levels of life-history diversity that is believed to reflect the evolutionary history of success in environments that changed, unpredictably from year-to-year. Bennett 2005; Williams 2010; Rosenfield 2010; Miller et al.

2010. Thus, differential impacts to particular life history types (e.g. early migrants, late-spawning individuals, slow growing individuals, etc.) should be avoided to maintain viability of covered species.

In the logic chain planning framework, species-specific objectives are always expressed in terms of desired levels of these attributes of viability – objectives define the parameters that reflect viability for each species concerned. Lower levels of the logic chain (e.g., stressors, stressor reduction targets, conservation measures) articulate hypotheses regarding how the conservation strategy may attain these desired levels of abundance, productivity, spatial distribution, and diversity. Even though the Draft Plan provides a description of the attributes of viability as applied to the covered species, Draft Plan at 5.2-26, it frequently confounds these basic metrics of desired outcome with "habitat" conditions it believes will produce improved viability. In so doing, it improperly substitutes a hypothetical means of achieving success (such as "habitat restoration") for a definition of success for conserving species in the Plan Area (SMART targets for each attribute of viability) and that substitution changes the definition of success from conserving viable populations to providing specified quantities and qualities of "habitat." Furthermore, the Draft Plan generally fails to identify SMART objectives for covered species related to each of the four attributes of viability; when it does identify objectives reflecting the attributes of viability, the Draft Plan and the DEIS/DEIR fail to analyze the conservation strategy and operational alternatives in terms of their ability to attain these foundational targets.

As currently drafted, the BDCP repeatedly fails to adequately articulate or identify in a logical, transparent, and consistent manner the connection between its goals, objectives, stressors, stressor reduction targets, and conservation measures; in many cases, the explanation of one level of the Plan's logic chain contradicts the rationale provided for the level above or below it (e.g. conservation measures do not address presumed stressors, or stressor reduction targets are clearly inadequate to attain the Plan's stated objectives). Adequately described Plan objectives (those that would be useful in evaluating the draft Plan and in adaptively managing implementation of a final Plan) must be specific, measureable, achievable, relevant to a particular goal, and time-bound; most of the draft Plan's objectives do not include all of these essential elements. To the extent that objectives are adequately described, many of them are clearly inadequate to attain species-specific goals or the larger goal of ecosystem restoration. The DEIS/DEIR fails to rigorously evaluate many intended outcomes of the Conservation Strategy in even a qualitative fashion and many of the outcomes that are evaluated are not compared to the desired outcomes described in the biological goals and objectives or stressor reduction targets. Furthermore, the Plan overstates the benefits arising from the Conservation Strategy; the outcomes described in the DEIS/DEIR do not match those the Plan needs to attain, as described by its own biological goals and objectives (*see* Chapter 3 Conservation Strategy). Finally, numerous inadequacies and potential biases in the analyses of conservation measure outcomes are addressed below.

The importance of, and functions served by, well-defined desired biological outcomes of the Plan (biological goals and objectives) are adequately described at the outset of the Conservation Strategy, which states:

> Biological goals and objectives are the foundation of the Conservation Strategy and are intended to provide the following functions.
>
> - Describe the desired biological outcomes of the conservation strategy and how those outcomes will contribute to the long-term conservation of covered species and their habitats.
> - Provide, where feasible, quantitative targets and timeframes for achieving the desired outcomes.
> - Serve as benchmarks by which to measure progress in achieving those outcomes across multiple temporal and spatial scales.
> - Provide metrics for the monitoring program that will evaluate the effectiveness of the conservation measures and, if necessary, provide a basis to adjust the conservation measures to achieve the desired outcomes.

Draft Plan at 3.1-3. In order for objectives to provide adequate guidance to project planners, decision-makers, and the public and, in order to realize the functions the Plan identifies for them, BDCP's objectives must be specific, measureable, attainable, relevant to the goal they describe, and time-bound ("SMART"). The requirements for SMART objectives are well-developed in the business planning literature, and BDCP purports to provide SMART objectives. *See* Draft Plan at 3.3-3. However, as we discuss, most of the objectives in the Plan do not meet the SMART criteria.

The Conservation Strategy describes numerous biological goals and objectives (a welcome advance over previous versions of the Plan that we have reviewed); however most of the objectives fail to satisfy the intended functions of Biological objectives described above. Many of the goals and objectives are not adequate to produce the level of benefits to ecosystem processes and covered-species that are required by an HCP/NCCP and most of the objectives are not adequately defined. Of equal concern, the Plan's approach (its Conservation Strategy) for attaining objectives largely or completely ignores certain key stressors that are believed to inhibit the ecosystem today and the conservation measures do not match with the stressors that are identified as driving ecological decline/preventing ecological restoration in the Project Area. Finally, analysis of outcomes anticipated to result from the Conservation Strategy (in both the Plan and DEIS/DEIR) are either not compared to the stated objectives and/or stressor reduction Targets or demonstrate that the Plan will not attain its objectives and stressor reduction Targets.

A. Many of the Biological Goals and Objectives are not Legally Adequate

Numerous objectives in the BDCP Conservation Strategy merely codify the status quo; in some cases they allow for further deterioration of covered species' populations and ecosystem elements. As we have previously emphasized and discuss elsewhere in these comments, because the BDCP is intended to serve as the basis for regulatory compliance with the NCCPA, the Draft Plan must provide for the conservation and management of Covered Species within the Planning Area. For species that exist exclusively within the BDCP Plan Area, the BDCP must provide the measures necessary for the species' conservation (recovery). For species that migrate through the BDCP Plan Area, BDCP must provide measures necessary for the species' conservation in the Plan Area. *See* Letter from Defenders of Wildlife, TBI, and NRDC to Chuck Bonham dated July 10, 2013; *see* discussion *supra* in section I(A). Beyond simply mitigating impacts of the Plan, conservation measures must be drafted to deal with both covered activities' impacts and to achieve conservation of the covered species in the Plan Area. Because the NCCPA defines conservation with respect to species' status and biological needs, as opposed to simply analyzing and mitigating for the Plan's impacts on the covered species, a Plan's conservation measures must be designed to be consistent with what is necessary to "conserve" or recover a covered species and only activities "compatible" with conservation are permitted.

1. The Biological Objective for Longfin Smelt Productivity is Inadequate

One of the BDCP's objectives for longfin smelt (Objective LFSM1.1) states that BDCP will "Achieve longfin smelt population growth", such that "Future indices of annual recruitment [...] are equal or exceed expected levels based on the 1980–2011 trend in recruitment relative to winter-spring flow conditions." Draft Plan at 3.3-120. The Conservation Strategy provides a specific definition of annual recruitment and explains that the objective will be met: "...if, after year 10, 50% (5 of each 10 consecutive years) or more of future indices... " reflect higher abundance than would be predicted based on the 1980-2011 relationship of longfin smelt abundance with Delta outflow. Draft Plan at 3.3-124.

This objective is specific, measureable, and time-bound, however, the objective falls short of the biological outcome necessary to meet BDCP's legal requirements to restore longfin smelt; thus, it is not adequate to the goal of restoring this species.

i. The Objective Improperly Assumes that the Plan will do little to Restore the Species and Predicts Continued Decline of Longfin Smelt

The "Global goal" for productivity of this species (i.e. the target that the Plan suggests would represent full recovery of species productivity) is defined as:

> Achieve productivity (abundance indices) equal to or greater than predicted for 5 of 10 years based upon a regression of **1967 to 1987** abundance on December through May mean outflow (or X2).

Draft Plan at 3.3-119 (emphasis added). The Draft Plan's target of matching productivity to 1980-2011 period is much less than the global productivity goal as longfin smelt productivity per unit flow is well-known to have declined (probably more than once) during the 1980-2011 period. Kimmerer 2002; Rosenfield and Baxter 2007; Thomson et al. 2010. The productivity objective will not achieve the goal for this species; the USFWS Draft Recovery Plan target for longfin smelt recovery called for restoration of population dynamics (i.e. the mean and variance associated with both abundance and productivity) typical of the 1967-1984 period. USFWS 1996. This productivity objective for longfin smelt is, in fact, a codification of an inadequate and undesirable status quo for this species. In the period from 1980-2011, the longfin smelt population index should have exceeded its average (on a flow-corrected basis) in approximately 50% of years and it should have dropped below its average in approximately 50% of years-- that is the nature of a mathematical average; thus, all the Draft Plan's longfin smelt productivity objective requires is to match productivity that has occurred recently, not the much higher productivities that occurred earlier in the historical data series. The Draft Plan's objective for longfin smelt productivity improperly defines success as maintaining the level of productivity that occurred after this species' productivity was severely compromised. Therefore, this objective does not satisfy one of the primary functions of defining biological objectives: to describe how the desired biological outcome of the conservation strategy will achieve the long-term conservation of covered species.

ii. The Biological Objective Ignores the Importance of Longfin Smelt Overall Abundance to Conserving this Population; Setting a Productivity Objective that is "Flow Corrected" Effectively Eliminates What the Best Available Science Indicates is a Strong Relationship between Delta Outflow and Longfin Smelt Abundance

The Plan must develop objectives for each attribute of viability, *see* McElhany et al. 2000, for each covered species and measure projected outcomes against these desired outcomes. The Draft Plan has no specific objective for longfin smelt *abundance*. Productivity is an important metric of viability, *see id.*, but even an objective that defined an adequate level of productivity cannot substitute for other important attributes of viability, such as abundance. The attributes of viability are inter-related (e.g., sustained high productivity will produce higher abundance) but they are not redundant of each other. So although it is important that the Estuary's productivity is restored with respect to production of longfin smelt per unit of flow, that is a different measure from the (equally important) total abundance of longfin smelt.

Though no abundance objective for longfin smelt is set by the Draft Plan, it does suggest an intent to maintain longfin smelt abundance at index levels that were common between 1990 and 2000. *See* Draft Plan at 3.3-124. This is clearly inadequate; longfin smelt abundance indices during this period were low enough to prompt filing of a petition to list longfin smelt as a federally endangered species (in 1993), and the species was ultimately listed under CESA in 2009 and the U.S. Fish and Wildlife Service determined in 2012 (responding to a petition filed in 2007) that listing of the species under the ESA was warranted but precluded. The average longfin smelt index in the first three years of the Draft Plan's target period (1990-1992 average: 151) was less than one fifth of the average in the three years leading up to filing of the successful ESA petition for this population in 2007 (2004-2006 average: 756.3). Given that population abundance indices of longfin smelt reached lows during the 1990-2000 period that were a fraction of the levels observed when the population was eventually listed as a threatened species, the 1990-2000 period cannot represent a "recovery" for longfin smelt. The average longfin smelt index (as measured by CDFW's Fall Midwater Trawl) for the 1987-2011 time frame was 4,920 or approximately 30.4% of the 1967-1987 average (16,210) anticipated under the USFWS 1996 Draft Recovery Plan for this population.

Implicit in the Draft Plan's wording of its productivity objective is that longfin smelt abundance in a given year is largely a function of ecological conditions related to freshwater flow rates (or X2 position) in the winter and spring. For decades, researchers have detected statistically significant relationships between freshwater flow and longfin smelt abundance; these relationships hold over orders in magnitude in both flow and indices of longfin smelt abundance. Stevens and Miller 1983; Jassby et al. 1995; Kimmerer 2002; Rosenfield and Baxter 2007; Kimmerer et al. 2009; Mac Nally et al. 2010; Thomson et al. 2010. In addition, there are well-known relationships between various other stressors on the population and freshwater Delta outflow. *See* Rosenfield 2010 (e.g., pelagic food web productivity, entrainment, etc.). The productivity objective defines the expectation for abundance *with respect to flow*; by "correcting" longfin smelt abundance for Delta outflow, this objective does not account for total abundance as a factor contributing to longfin smelt viability – the objective focuses on changes in abundance due to anything *except* flow.

iii. Delta Outflow is Significantly Affected and Reduced by CVP/SWP Operations in Many Years

In addition to its inadequate productivity objective, failure to set an abundance objective, and tepid expectations for abundance, the Draft Plan's longfin smelt productivity objective is also flawed because it ignores the effects of CVP/SWP operations on Delta outflow. Given that Delta outflow explains an extraordinarily large fraction of long-term variability in the longfin smelt population index and water management operations under the BDCP will differ from operations

under the status quo (i.e., operations under BDCP affect actual Delta outflow relative to available runoff), the metric associated with this objective should be scaled to some measure of annual hydrology (e.g., unimpaired runoff) not to a measure of hydrology that will be modified by the operations in the Plan. As the Conservation Strategy notes, the CVP and SWP have a major effect on *actual* Delta outflow because those two projects control releases of water into the Delta and exports of water from the Delta. Therefore, because the metric employed by this productivity objective calibrates annual longfin smelt abundance to reflect whether it is above or below a value based on *actual* Delta outflow, BDCP operations that result in lower actual Delta outflow also simultaneously reduce the target value for longfin smelt abundance. As a result of setting a productivity objective that measures performance after removing the effect of flow, it is possible that if (when) the BDCP results in reduced Delta outflows (i.e. X2 moves upstream), then the productivity metric could be satisfied even as total abundance declines. Such an outcome is clearly at odds with restoring longfin smelt viability, yet the Plan clearly anticipates reductions in freshwater outflow during the December-May period (particularly over the longer term).

The Draft Plan's intent in choosing an objective of flow-corrected productivity is to remove the climatically driven part of the freshwater flow effect on longfin smelt recruitment:

> The primary purpose of [the longfin smelt productivity] metric is to remove the <u>climatically driven</u> part of the freshwater flow effect on longfin smelt recruitment. This effect is best reflected in winter flows, because <u>outflow during other seasons is more strongly influenced by the SWP/CVP</u> operations. As described above, the correlation of the composite index with spring flow is nearly as strong as the correlation with winter flow, so the conceptual preference for basing the subobjective metric on the winter outflow regression equation is to some extent academic.

Draft Plan at 3.3-123 (emphasis added). The choice to measure productivity against *actual* outflow (which is a product of human management and which will be influenced by the BDCP itself) rather than some measure of annual precipitation (e.g. full natural flow; runoff into the rim station reservoirs) wholly ignores the effect of SWP/CVP operations on Delta outflow. If BDCP results in greater exports of water during some years (an outcome that is expected), then actual Delta outflows will be lower than they are currently under analogous hydrological conditions; this would effectively "lower the bar" needed to satisfy the longfin smelt productivity objective because *actual* outflow forms the denominator of the metric envisioned in this objective. As currently constructed, the longfin smelt productivity metric would be informative about the efficacy of non-flow related conservation measures in restoring longfin smelt populations (because the influence of *actual* flow is effectively "removed" by the flow correction). But a metric that incorporates unmodified hydrology (e.g., full natural or unimpaired flow) during a given year is necessary to allow an apples-to-apples comparison among BDCP alternatives and performance of longfin smelt under the current water management regime because it would

retain the very important effect of water operations under human control on longfin smelt abundance.

iv. The Objective Improperly Assumes Only a Small Fraction of the Responsibility for Restoring Longfin Smelt Productivity

The Plan's objectives must be based on the biological outcomes that are consistent with its legal requirements. By contrast, the Conservation Strategy explains that its rationale for benchmarking this longfin smelt objective to the 1987-2011 period was "…because this is the entire period for which all three individual survey indices [used in the metric for this objective] are currently available." Draft Plan at 3.3-120. It is impermissible to define Plan objectives by an arbitrary decision regarding data availability (i.e. adding in information from two shorter data series that are less suitable to understanding progress towards the objective). By allowing data availability (in this case, availability of less desirable data) to dictate the desired biological conditions that reflect recovery of longfin smelt, the Conservation Strategy sets on its head the logical progression from goals to objectives to stressor reduction targets to conservation measures to Metrics used to evaluate efficacy and adaptively manage implementation of the Conservation Strategy.

Similarly, the Plan fails to justify why the BDCP does not take full responsibility for improvements needed to attain the global objectives for longfin smelt. Although some longfin smelt live outside of the Plan Area for at least part of their life cycle, Rosenfield and Baxter 2007, the Draft Plan's rationale for relying on the unknown and perhaps non-existent potential for restoration actions outside the Plan Area to restore longfin smelt is unjustified by the current scientific information-base for longfin smelt. By assuming only a small fraction of responsibility for the total improvement in longfin smelt productivity (and by failing to set an adequate abundance objective) that will be required to restore longfin smelt (e.g., to levels described by the USFWS 1996 Draft Recovery Plan for Delta fishes), the BDCP Conservation Strategy implicitly assumes that additional substantial restoration is possible (and will occur) for this species outside the Plan Area. By contrast, for Chinook salmon and steelhead, the Conservation Strategy is very specific in its allocation of conservation responsibility within the Delta (BDCP's responsibility) and outside of the Delta, *see* Draft Plan at 3.3-140 and Appendix 3.G; the Plan assumes that 50% of the needed improvement in Central Valley salmonid productivity will be occur within the Delta, by BDCP. Yet, the biological objective for improving longfin smelt productivity is far less than half of what is needed to restore this species, despite the facts that longfin smelt:

- Delta outflow (and X2) is persistently correlated with the vast amount of variation in longfin smelt abundance over the past 45 years of sampling. Jassby et al. 1995; Kimmerer

2002; Rosenfield and Baxter 2007; Kimmerer et al. 2009; Thomson et al. 2010; Mac Nally et al. 2010; Rosenfield 2010; and,

- Some fraction of the population may spend its entire life within the Plan Area and most or all of the population spends most of its life cycle in areas where ecological conditions are strongly affected by Delta outflow. Rosenfield and Baxter 2007; Rosenfield 2010.

v. The Plan Anticipates Long Term Declines in Longfin Smelt Abundance and Productivity Relative to the Status Quo and Offers no Description or Expectation of Additional Restoration Activities Inside or Outside the Plan Area that Would Lead to Restoration of the Species' Abundance or Productivity

Because the conservation standard implied by the longfin smelt productivity objective and the Draft Plan's expectations of future abundance are inappropriately low, the Conservation Strategy fails to incorporate conservation measures that are necessary (in either number or magnitude of effect) to adequately enhance the species' population. For example, longfin smelt populations are projected to decline from unacceptably low levels on average and under most of year types in alternatives 1-7 as evaluated in the DEIS/DEIR. *See, e.g.,* DEIS/DEIR at Tables 11-1A-8, 11-2A-7, 11-3-7, 11-4-8, 11-5-8. It is difficult to imagine actions outside of the Plan Area that are available to federal and state trustee agencies, that could accomplish restoration of longfin smelt, much less the majority of the necessary restoration (the gap between the Plan's flow-corrected productivity standard and the flow-corrected productivity global objective or the gap between recent abundances and historical abundances that represent a healthy population) that the Plan apparently assumes will occur. The failure to identify actions inside or outside the Plan Area with a reasonable likelihood of significantly improving longfin smelt productivity or abundance is more egregious given that most of the water management scenarios considered in the DEIS/DEIR reduce winter-spring Delta outflows compared with the current baseline – a Delta outflow baseline that state water and fish and wildlife management agencies consider to be inadequate for this species. *See, e.g.,* CDFG (2010) at 94 ("Recent Delta flows are insufficient to support native Delta fishes in habitats that now exist in the Delta"); SWRCB 2010 Flow Report at 5 ("Recent Delta flows are insufficient to support native Delta fishes in today's habitats").

To the extent that the BDCP does rely on undescribed future actions when it assumes only a small fraction of the responsibility for restoration of longfin smelt, the Plan highlights additional problems with its description of this objective. This objective does not satisfy the Plan's need for objectives to serve as a "… benchmark […] by which to measure progress in achieving […] outcomes across multiple temporal and spatial scales"; nor does it provide a "… metric […] for the monitoring program that will evaluate the effectiveness of the conservation measures and, if necessary, provide a basis to adjust the conservation measures to achieve the desired outcomes."

See Draft Plan at 3.1-3. There is no way of differentiating the effects of BDCP actions from recovery actions taken outside the BDCP on longfin smelt's flow-corrected productivity (i.e. no way to distinguish progress towards the 1980-2011 productivity pattern from progress towards the higher global objective (population dynamics similar to those in the 1967-1984 period; USFWS 1995) for this species.

vi. The Plan Sets an Unacceptably Long Timeline for Attaining its own Inadequate Targets for Longfin Smelt Productivity

Finally, the time frame set for achieving the BDCP's productivity objective (20 years after implementation begins) is unacceptably long. Here, the timeline for attaining biological outcomes seems to be a product of the timeline for conservation measures identified in the Conservation Strategy. This is contrary to the purpose and function of setting Biological objectives; the timeline for conservation measures (and the mix of Conservation Strategy itself) should be designed to produce the desired biological outcome within a timeframe that is appropriate for conservation needs. Even assuming the specified level of productivity for longfin smelt were acceptable (and it is not), it is indefensible to wait twenty years to produce this "improvement" in productivity, especially for a species that has declined as dramatically as longfin smelt. Waiting 20 years (10 generations of longfin smelt) before this sub-par level of productivity will be achieved condemns this species to linger indefinitely at population levels that merited its listing as an endangered species.

2. Biological Objectives for Delta Smelt are Inadequate

i. The Entrainment Objective is Inadequate

One objective for Delta smelt (objective DTSM1.2) states the Plan's intention to:

> Limit entrainment mortality associated with operations of water facilities (i.e., CVP and SWP) in the south delta to ≤5% of the delta smelt population, calculated as a 5-year running average of entrainment for subadults and adults in the fall and winter and their progeny in the spring and summer.

Draft Plan at 3.3-108. Because the Delta smelt geographic range is completely contained within the Plan Area, BDCP has responsibility for attaining global and BDCP objectives for this species – the two types of goals and objectives are one and the same for this species. The Global objective for this species regarding entrainment (Global objective 1.2) is to: "Maintain a cumulative entrainment of equal to or less than 5% per year across all life stages." Draft Plan at 3.3-107. By calculating the proportional entrainment of Delta smelt as a 5-year running average, the Plan allows potentially devastating impacts to the population in any one year. This objective

could be satisfied if 25% of the population were entrained in any one year, as long as entrainment was not detected in previous years. Thus the BDCP objective is not consistent with the Global objective for this species. By expressing the Objective only as a 5-yr running average (without also specifying annual limits), the objective is significantly weaker than the existing incidental take limit for this species, which prohibits take of adult Delta smelt that would exceed 5% of the population in any year. *See* USFWS 2008 Biological Opinion at 387.

ii. Delta Smelt Objectives are not Adequately Described to Inform Plan Development or Adaptive Management

Many of the Conservation Strategy's biological objectives are inadequately defined and, as a result, they cannot be of use in design of conservation measures, assessment of the Conservation Strategy as whole, or post-implementation performance evaluation of the Plan. Most of the objectives in the Plan do not meet the SMART criteria. For example, no time-frame is given for attainment of the Delta Smelt entrainment objective, so this objective is not clearly defined and thus neither it, nor the actions designed to attain it, can be fairly evaluated. Another BDCP objective for Delta smelt (objective DTSM1.1) is also inadequately defined to be of much use. The objective states:

> Increase fecundity of delta smelt over baseline conditions as measured through field investigations and laboratory studies conducted through year 10 and refined through adaptive management.

Draft Plan at 3.3-108. Although the intent here is laudable, there is no indication of what it means to "increase" fecundity (how much is enough?). Also, the objective does not indicate by when the (undefined) target will be met (in other words, it is not time bound; we assume that the phrase "through year 10" refers to the period during which the baseline will be defined). As a result, this objective does not adequately describe the conservation standard for Delta smelt, nor can it be used to assess whether the Plan's conservation measures are adequate to achieve that conservation standard. In essence, this statement regarding the Plan's intent to increase delta smelt fecundity is equivalent to having no intent to increase Delta smelt fecundity.

The final part of objective DTSM1.2 ("Assure that the proportional entrainment risk [to delta smelt] is evenly distributed over the adult migration and larval-juvenile rearing time periods") is ill-defined. There is no definition of "evenly distributed" entrainment risk and no indication of when this objective will be attained. These are crucial omissions as the objective's intent (to protect life history diversity of delta smelt by preventing repeated and disproportionate impacts to certain segments of the species' temporal distribution) is essential for conservation and restoration of this species. *See* Bennett 2005. As a result, this objective cannot be used to assess the adequacy of conservation measures (pre-implementation) or to measure the Plan's efficacy in

restoring endangered species (post-implementation). This is a common problem for the objectives in the Draft Plan as the Effects Analysis (Draft Plan Chapter 5) acknowledges that this and similar (and equally important) BDCP objectives are not adequately described; for instance, in describing why the Plan's likelihood of attainment is not evaluated for objectives intended to protect life history diversity (timing of migration) within Chinook salmon runs (WRCS3.2, SRCS3.2, FRCS3.2, STHD3.2), the Effects Analysis states: "The biological objective requires further refinement in order to establish the metrics by which it could be assessed." Draft Plan at 5.2.-41.[46]

It is possible for the Draft Plan to describe these important objectives to limit life history impacts in measureable terms. For example, BDCP could set limits on Delta smelt entrainment and salmonid mortality during migration that occur on a smaller time-step, within the limits already described in other objectives, so that all of the allowable entrainment/mortality does not impact one particular life history variant (early vs late spawners/migrants, smaller vs. larger spawners/migrants, etc.) disproportionately. Attaining the clear intentions of Delta smelt objective DTSM1.2 (to reduce total entrainment mortality and to reduce the entrainment impact in any given time period) would require a set of objectives that are tiered over different time scales. Setting an annual limit (not averaged over 5 years) on entrainment at 5% of the Delta smelt population makes sense; if entrainment is approaching 5% within any given year, corrective actions (that should be specified in the Plan), would be required. But, protection of life-history diversity within the Delta smelt population calls for a limit on entrainment at shorter time steps. Delta smelt salvage is generally recorded within the 6 month (26 week) period from mid-December through mid-June; thus, allowing for a maximum of 0.5% of the population to be entrained in any two-week period would complement the annual limit, while also providing protection for temporally, defined segments of the population within a year. Similarly, a time-step greater than 1 year could be applied to prevent repeated occurrence of maximum annual entrainment limits – 5% entrainment every year is not desirable and may lead to jeopardy for Delta smelt. For example, a threshold of 3% entrainment as a 5-year running average would be consistent with the other temporally-defined entrainment objectives described here, while increasing protection for the species.

[46] Notwithstanding these limitations, as we discuss below, available scientific information indicates that the Draft Plan is unlikely to achieve many of the draft biological objectives.

3. Biological Objectives for Sturgeon are Inadequate

i. Objectives are Not Adequately Described to Inform Plan Development or Adaptive Management

Similarly, objectives for green and white sturgeon are too poorly defined to provide guidance regarding necessary or effective management actions or regarding the success or failure of any actions that are taken under the BDCP. For example, one green sturgeon objective (GRST1.1) is to:

> Increase juvenile green sturgeon survival (as a proxy for juvenile abundance and population productivity) throughout the BDCP permit term and increase adult green sturgeon survival (as a proxy for adult abundance and productivity) by year 15.

Draft Plan at 3.3-190. An analogous objective exists for white sturgeon. We agree that juvenile survival of green sturgeon must be improved to conserve these two Central Valley fish species. Israel and Klimley 2008; Israel et al. 2008. However, the BDCP objective is not specific enough to be actionable or enforceable: What does "increase" mean? How much improvement is enough? At what level of survival should the Plan's efforts be declared a success? The Effects Analysis acknowledges:

> Current spawning-to-adult abundance is unknown, so evaluating an increase as a result of the BDCP is not currently feasible. The capacity to meet this objective will be a topic of the adaptive management program.

Draft Plan at 5.2-46. NMFS previously commented on the inadequacy of Draft Plan objectives for sturgeon species, writing: "The biological objectives for sturgeon abundance and productivity (under GRST1) are vague and rely too much on "documenting the current distribution" and future studies." NMFS 2013 Progress Assessment at 15.

There are numerous ways to set meaningful conservation objectives for sturgeon survival despite a perceived lack of desired information. If current survival rates for these two species in the Central Valley are unknown, the Plan could set objectives that are tied to survival estimates in river systems where sturgeon populations are relatively stable or increasing. Alternatively, the Plan could have set survival objectives for sturgeon that are consistent with population growth, given survival estimates from other stages of these species' life cycles (as it does for salmonid survival objectives). If that information is not available or adequate, the Plan could have set an objective regarding biological parameters that are closely related to survival rates (e.g. growth rate, condition factor, hatching success, etc.). By establishing an objective as an unspecified

improvement over an unknown value, the BDCP limits its ability to develop a Conservation Strategy that is adequate to produce desired biological outcomes or to evaluate that strategy (e.g. in the Effects Analysis). Moreover, the Draft Plan's claim that this will be a topic of Adaptive Management discussions is feeble. Adaptive management is an approach that allows managers to adjust the strategy for attaining desired outcomes (for example, under what circumstances would the Plan allocate more or less effort to certain conservation measures to adaptively manage towards an objective?); adaptive management is not a technique that allows one to determine what the desired outcome is for the Plan. The Draft Plan habitually an incorrectly relegates to "adaptive management" any decision that is inconvenient to make now – these are simply failure to plan that will lead to paralysis of adaptive management in the future.

As currently developed, the BDCP does not set a target for sturgeon survival that is consistent with conservation of these species. By failing to identify any measure of current sturgeon survival against which an improvement can be measured, the Plan calls into question whether it has an adequate grasp of the conservation challenges facing these or other species. It is not acceptable to permit a Plan with objectives for covered species survival rates that only lead to extinction at a slightly later date than without the Plan.

4. Biological Objectives for Through-Delta Salmon Survival are Inadequate

The Plan describes through-Delta survival objectives for Central Valley steelhead and each temporally-defined run of Central Valley Chinook salmon and separate objectives for fall-run Chinook originating from the San Joaquin River Valley and those originating from the Sacramento River Valley. These targets were calculated by estimating the total increase in survival, throughout each population's life-cycle, necessary to attain certain Cohort Replacement Rates (CRR: the quotient of a given generations abundance divided by the abundance of the generation that produced it) that are assumed to contribute significantly to recovery. Half (50%) of the total needed improvement in survival was allocated to improvements in through-Delta survival that would be entirely the responsibility of the BDCP; the other half of the improvement in steelhead and Chinook salmon survival would be accomplished by non-BDCP actions that occur outside of the Plan Area.

i. The Objectives are Inadequate as the Timeframes for Achieving the Biological Objectives are Arbitrary and Too Long to Generate any Reasonable Expectation of Recovery

Although we applaud the transparency and detail of the methodology presented in the technical appendix, Draft Plan Appendix 3G (Proposed Interim Salmonid Delta Survival objectives), some of the assumptions embedded in this approach lead to through-Delta survival targets that are insufficient to support recovery of these salmon populations. For example, the technical

appendix describes its approach to incremental improvement in steelhead and Chinook salmon CRRs and survival as follows:

> Using average fish generations (3-years) as the unit of time, we identified intermediate time steps at BDCP Year-19 (three generations past dual conveyance) and a CRR target of 1.2; another intermediate time step at Year-28 (another three generations) and a CRR target of 1.3; and a final time step at Year-40 (four more generations) and a CRR target of 1.4, for spring-run, fall-run, and late fall-run Chinook salmon and steelhead. CRR targets of 1.3, 1.4, and 1.5 at the same respective time steps were used for winter-run Chinook salmon based on recognition of their endangered status. These CRR targets were selected to put the covered salmonids on a population growth trajectory to achieve the previously published BDCP Global goals (BDCP 2012) identified in Table 4.

Draft Plan, Appendix 3G at 7. Table 4 in this Appendix reveals that the desired CRR's were chosen in order to attain global goals of population abundance sometime in the 40-50 year, post-implementation time frame. *Id.* at 21. The global goals used here for population abundance are lower than those expected under the Anadromous Fish Restoration Program (AFRP) of the Central Valley Improvement Act (CVPIA) in some cases (such as winter-run Chinook salmon). Attainment of the AFRP's targets for salmonid abundance is already long overdue pursuant to both state and federal law. *See* P.L. 102-575, § 3406(b)(1); Cal. Fish and Game Code § 6902. There is no justification for planning to not attain the AFRP targets or to attain them only after waiting for an additional 40 years or more, given the ability to make additional efforts to achieve these targets.

The NMFS targets for CRRs (and the Delta survival estimates they derive from these CRR's) are abnormally low for a recovering Chinook salmon population. In fact Table 4 of the technical appendix shows that populations of <u>all</u> salmonids are expected to drop initially from current levels, because current survival rates are so low, and remain below these starting levels for over 20 years. As modeled in the Appendix, the Draft Plan anticipates extirpation of all San Joaquin salmonid populations (fall-run Chinook salmon, spring-run Chinook salmon, and steelhead) within the first 10 years of the BDCP (though they are artificially resurrected in year 10 to allow continued modeling). Application of the methodology provided in Appendix 3.G for calculating salmonid survival objectives will lead the BDCP to accept worse conditions for San Joaquin River fall-run Chinook, spring-run Chinook, and steelhead – including possible extinction in the next decade. Even if conditions do improve in the future under BDCP, allowing a prolonged decline in populations of covered species in the "short term" greatly increases their risk of extirpation and is inconsistent with the BDCP's purposes and authorizing legislation.

Although such low population growth rates might be acceptable as an average over a long time-period, there is no justification for targeting recovery of Central Valley salmonids over 40 years, or 13 generations, in the future. Normal Chinook salmon and steelhead populations have the intrinsic (and demonstrated) potential to grow from current levels to the desired abundance targets (the overarching goals for abundance in the Central Valley, identified in Table 4 of the Appendix) in less than 4 generations.[47]

The assumption that a species' recovery timeline is tied to the expected implementation of a particular conservation measure is improper and arbitrary. Whereas, objectives must be attainable (the "A" in a SMART objective) this does not mean that the timing of that particular conservation measure should drive the timing of the desired outcome. Such an approach represents a failure to consider conservation actions not included in the Conservation Strategy or expediting timelines for conservation actions that are included in the Conservation Strategy in a way that would lead to attainment of biological outcomes in a desirable time-frame. Again, objectives (and the time bounds for attaining these desired outcomes) should drive development of the Draft Plan, not the other way around. The Draft Plan's failure to first determine conservation needs of covered species, and then design a Conservation Strategy to meet those needs leads to troubling outcomes. For example, the first target for improvement in salmonid survival is at year 19 of the Plan; this interval was chosen because it is ~3 Chinook salmon generations after the expected implementation of the dual conveyance in year 10. Draft Plan, Appendix 3G at 10. Thus, the Draft Plan uses the conservation measure to set the objective, rather than setting an objective and devising a Conservation Strategy to attain that objective. In tying the objectives' time frame to completion of the new conveyance, the Plan exposes each of the 5 covered salmonid populations to grave risk if completion of the dual conveyance is delayed. Indeed, the Plan and technical appendix assume that Central Valley salmonids will continue to decline in the first 10 years of the Plan. *Id.* at 20.

Accelerating the improvement in attainment of desired salmonid survival rates would not require a potentially infeasible construction schedule for the dual conveyance element of the BDCP (Conservation Measure 1). There are other measures available (e.g., increased Delta through-flow, reduced export pumping in the South Delta, Yolo Bypass restoration) for which there is strong scientific evidence that they are likely to improve salmonid survival through the Delta,

[47] From a biological perspective, Cohort Replacement Rates (CRR) of 1.2 to 1.4 represent anemic growth in populations of Pacific salmon. If we assume that males are as abundant as females in a spawning cohort, we can use Quinn's (2005) findings from numerous populations to estimate Cohort Replacement Rates of Chinook salmon. This procedure produces CRR's that range from ~>3-9 for Chinook salmon and from ~4.6-13.0 for steelhead. We have clarified with that author that the freshwater and ocean survival rates used to calculate the CRR's were derived from a numerous populations of each species and none of those populations would be considered "pristine" or unimpacted by human activity. Quinn 2014 personal communication. Other authors studying multiple Chinook salmon populations have found similarly high freshwater survival rates. Healey 1991; Bradford 1995.

and other actions that the Plan asserts can improve survival (such as targeted predator removal) that could be implemented more aggressively until the dual conveyance is operational. Also, the technical appendix does not explain why it would take 9 years (approximately 3 Chinook salmon generations) to attain desired interim survival levels *after* dual conveyance operations begin. Survival through the Delta in one year is not in any way affected by survival in previous years – it is not a cumulative effect. If the dual conveyance is, as the Technical Appendix assumes, the key to improved through-Delta survival for Central Valley salmonids, then the benefits of such a conveyance ought to accrue immediately upon completion and operation of the new diversion facility (e.g. year 10).

ii. The Survival Objectives for San Joaquin Basin Salmonids are Flawed Because the Methodology for Determining Survival Objectives Produces Inconsistent Targets for Chinook Salmon Entering the Delta from the San Joaquin and Sacramento Rivers at the Same Time of Year

Although the methodology for calculating necessary improvements for salmonid through-Delta survival is the same for all populations considered, the methodology produces inconsistent outcomes that reflect an inadequate Conservation Strategy. For example, because overall survival rates differ between Sacramento and San Joaquin populations of fall-run Chinook salmon (San Joaquin survival being much lower), the methodology for calculating necessary improvement in through-Delta survival produces lower future survival for San Joaquin fall-run Chinook salmon than it does for fall-run emanating from the Sacramento River. The objective states:

> Objective FRCS1.1: For fall-run Chinook salmon originating in the San Joaquin River and its tributaries, achieve a 5-year geometric mean interim through-Delta survival objective of <u>27% by year 19</u> (from an estimated 5%), <u>29% by year 28,</u> and <u>31% by year</u> <u>40</u>, measured between Mossdale and Chipps Island. For fall-run Chinook salmon originating in the Sacramento River and its tributaries, achieve a 5-year geometric mean interim through-Delta survival objective of <u>42% by year 19</u> (from an estimated 40%), <u>44% by year 28</u>, and <u>46% by year 40</u>, measured between Knights Landing and Chipps Island. …

Draft Plan at 3.3-158 (emphasis added).

The Draft Plan simply adopts these two different targets without offering any rationale as to why juveniles of the same sub-species, that enter the Delta at approximately the same size and in the same season, would experience such radically different survival rates. While BDCP is required to achieve conservation in the Plan Area for salmon (not recovery *per se*, but measures in the

Delta that are sufficient to achieve recovery in combination with actions outside of the Plan Area) the proposed objectives lock in the current disparity between north and south delta habitat suitability (which results in lower survival for salmon and other species) for which CVP/SWP operations play a major role. This outcome is inconsistent with global and BDCP objectives that seek to increase spatial distribution of covered species by restoring populations that spawn or rear in the southern Delta and San Joaquin Valley. Objectives for San Joaquin salmon survival need to be strengthened and revised to ensure they are compatible with existing legal obligations.

5. Objectives for Community and Ecosystem Conservation are Inadequate

The Conservation Strategy identifies numerous landscape scale objectives (related to a reserve system, ecological process, increased fish and wildlife movement, and increased habitat suitability for covered species) as well as well as for numerous natural communities (e.g. tidal mudflat, tidal brackish emergent, tidal perennial aquatic, vernal pool complex, etc.). Inclusion and attainment of such broad scale objectives for the Draft Plan are essential to ensure that the Draft Plan achieves the requirements of the NCCPA. *See* Fish and Game Code §§ 2820(a)(3), (4).

i. Objectives are not Adequately Described to Inform Plan Development or Adaptive Management

Unfortunately, none of the community and ecosystem conservation objectives identified are sufficiently well-defined to serve the functions of SMART objectives. Without this level of specificity, it is impossible to know whether the objectives are sufficient to the larger goals and legal requirements of an HCP/NCCP and it is not possible to judge whether the actions specified in the conservation strategy will produce the necessary level of benefit. For example, while goal L.1 is an excellent aspiration for the BDCP, there is no way to know whether the associated objectives will allow the Draft Plan to attain it. Goal L1 reads:

> A reserve system with representative natural and seminatural landscapes consisting of a mosaic of natural communities that is adaptable to changing conditions to sustain populations of covered species and maintain or increase native biodiversity.

Draft Plan at 3.3-35. None of the objectives associated with this goal are time-bound – there is no way to tell whether the goal will be satisfied early or late in the Plan's permit term (if at all). While the objectives are somewhat specific regarding acreage to be restored, there is little specificity regarding the desired final condition or location of these acres. For example, objective L1.6 ("Increase the size and connectivity of the reserve system by acquiring lands adjacent to and between existing conservation lands") does not define what is meant by "increased size" and

"connectivity" – how will we know when or if this target is attained? Also, this objective's call for increased biological connectivity is simplistic, as not all connectivity is desirable; in this particular ecosystem, "connectivity" has resulted in the damaging spread of invasive predators and competitors and ecosystem architects such as clams and *Egeria*. Clearly, objectives like L1.4 ("Include a variety of environmental gradients (e.g., hydrology, elevation, soils, slope, and aspect) within and across a diversity of protected and restored natural communities") are far too vague to meet the Plan's stated purpose for objectives, which are to serve as "the foundation of the conservation strategy" and to provide descriptions of: desired biological outcomes; how those outcomes will contribute to the long-term conservation of covered species and their habitats; benchmarks by which to measure progress in achieving those outcomes across multiple temporal and spatial scales; metrics for the monitoring program that will evaluate the effectiveness of the conservation measures. Draft Plan at 3.1-3. There is no imaginable circumstance where such a general statement could provide a basis to adjust the conservation measures to achieve the desired outcomes.

Similarly, the objectives associated with goal L.2 ("Ecological processes and conditions that sustain and reestablish natural communities and native species," Draft Plan at 3.3-40) do not provide guidance on critical questions like "how much?", "where?" and "by when?" – the answers to these questions are essential for objectives to perform the functions identified for them by the Plan; as a result, these objectives are merely sweeping statements that do not allow planners, permit-granting agencies, or the general public to understand the intent of the Draft Plan or analyze whether the conservation strategy is likely to accomplish these ends (and by when).

6. Conclusion: Draft Biological Objectives are Inadequate

In summary, although we applaud the effort to include biological goals and objectives into the Draft Plan, we find that most of the objectives identified:

- Do not meet the standards required by the NCCPA or ESA; and/or,
- Are not articulated to the degree that they can guide development of either the Plan's Conservation Strategy or its Adaptive Management plan.

The Draft Plan's objectives are inadequate to attain the conservation standard in the Plan Area for most species. Recovery of species means that they display sufficient levels of all attributes of viability, including abundance, productivity, spatial distribution, and diversity, *see* McElhany et al. 2000; the Draft Plan does not include objectives for each of these attributes for any of the covered species. As described above for longfin smelt, the failure to identify specific desired outcomes for each of these attributes of viability (e.g. "abundance" for longfin smelt) means that

implementation and adaptive management of the BDCP will not respond to continued degradation of those characteristics of covered species.

The inadequacy or absence of key biological objectives becomes apparent immediately as the Conservation Strategy moves down the logic chain to identify stressors that impede attainment of those objectives (stressors are described in more detail below). Although numerous stressors are mentioned or implied throughout the various documents, there is only spotty and disjointed analysis of the relative or absolute importance of different stressors on different organisms (or life history stages) and what analysis is presented is often internally inconsistent. As a result, in many cases, the Conservation Strategy is not designed to ameliorate the stressors that are most important for attaining the desired biological outcomes (objectives) necessary for restoration of covered species' populations. Projected benefits of the Conservation Strategy will not emerge if the stressors the Plan addresses are not those that actually limit species' viability. Furthermore, the failure to link conservation measures to the most important stressors means that some claims that conservation measures will benefit a species do not reflect the Plan's biological objectives – unless the Plan's intended benefits to species are captured by its stated objectives, there is no way to evaluate the Plan's projections of benefits to covered species (prior to adoption of the Plan), or to evaluate the success or failure of conservation measures, or to manage the Conservation Strategy adaptively (post-implementation).

B. <u>The Draft Plan and DEIS/DEIR Fail to Evaluate Biological Outcomes Against Biological Goals and Objectives</u>

The Draft Plan and DEIR/DEIS fails in most cases to measure projected outcomes of the Conservation Strategy and water operations against the desired biological outcomes described in the objectives. The first recommendation of the Delta Science Program Independent Review Panel (2014) was that the "Analysis of biological effects needs more consistency and specificity." DSP Independent Science Review Panel Report 2014 at 12. Commenting on the Draft Plan's own evaluation of its ability to evaluate the Conservation Strategy's biological objectives that review panel wrote:

> Approximately 72% of the objectives for covered fish could not be fully evaluated at this time due to insufficient information. The overall net effects conclusion for each species seemed to be based on the judgment of the authors, rather than a systematic ranking of attribute importance, change in response to the BDCP, and uncertainty in the rankings … A systematic approach for synthesizing the net effect on each Covered Species was not used even though a ranking system was described that could have been used as a semi-quantitative scoring approach. Instead, professional judgment was used to assess the overall net effect.

DSP Independent Science Review Panel Report 2014 at 22.

The failure to generate expected outcomes in terms that would be comparable to the objectives is not solely due to technical challenges or lack of modeling capacity. For example, the expected outcomes for Delta smelt entrainment under different alternatives (*see* Figures 11-1A-1, 11-1A-2, 11-2A-1, 11-2A-2, 11-3-1, 11-3-2, 11-4-1, 11-4-2, 11-5-1, 11-5-2, 11-7-1, 11-7-2, 11-8-1, 11-8-2) are reported in the same terms as objective DTSM1.2 (e.g. the mean proportion of the adult and larval/juvenile population, respectively, lost to entrainment-related mortality each year). These analyses clearly demonstrate that alternatives 1 through 5, at least, are not projected to attain the relevant biological objective for Delta smelt in most year types (making it extremely unlikely that any of these alternatives would meet the 5 year running average target). Despite having produced the relevant analysis, the DEIS/DEIR fails to connect the dots between the biological objectives that were supposed to have driven development and review of alternatives and operations, and the projected outcomes of those alternatives and operations so that readers could understand which of the alternatives studied offered the best chance of meeting the stated objective.

This same failure to compare projected outcomes to desired outcomes occurs throughout the DEIS/DEIR. For each Alternative studied, Chapter 11 provides a table entitled, "Estimated Differences Between Scenarios for Longfin Smelt Relative Abundance in the Fall Midwater Trawl or Bay Otter Trawl." *See, e.g.,* DEIS/DEIR at 11-2492 (Table 11-8-7). These tables clearly display that longfin smelt populations are expected to decline as compared to current conditions in most year types of each Alternative studied, except for Alternative 8. *Id.* Objective LFSM1.1 declares that the Plan's intention is to *increase* population productivity (relative to freshwater flow) compared to current conditions. The comparison between expected and desired outcomes show that most (and perhaps all) of the alternatives studies are inadequate to achieve the Plan's own conservation standards.

The failure to compare expected outcomes in the DEIS/DEIR to the biological objectives set in the Plan's Conservation Strategy undermines the purposes for setting biological objectives in the first place (as described in the Draft Plan at 3.1-3). Development of the Conservation Strategy must be guided by specific, measureable, achievable, relevant, and time bound targets to allow evaluation of the relative benefits of conservation measures and suites of conservation measures in achieving those targets. Because the Effects Analysis does not describe expected outcomes that can be compared to the Plan's objectives, there is no way to know whether the Conservation Strategy is adequate and there is no way to compare the relative merits of different alternative Conservation Strategies and their interactions with different operational regimes.

C. The Draft Plan and DEIS/DEIR Fail to Accurately Identify, Prioritize, or Analyze Key Stressors that will be Addressed to Assure Attainment of Desired Outcomes (Objectives), and as a Result the Draft Plan and DEIS/DEIR Overemphasizes the Benefits of Certain Actions and Underestimates the Adverse Impacts

In order for the BDCP to realize the objectives and goals it defines (much less those that are required to actually accomplish its legal responsibilities), it is vital for the Plan to accurately characterize what forces prevent attainment of desired biological outcomes currently ("stressors") and the level of stressor reduction needed to promote attainment of the objectives. Obviously, focusing on unimportant or less important stressors will lead to inefficient, slow, and perhaps incomplete attainment of biological objectives. Development and prioritization of specific conservation actions is premature until there is adequate description of the Plan's objectives and a science-based assessment and ranking of the key stressors that prohibit attainment of the objectives.

The Plan's description of stressors is ad-hoc, incomplete, internally inconsistent, and its justification of stressor reduction lacks scientific rigor. For example, Appendix 5F (Biological stressors on Covered Fish) opens by declaring: "Biological stresses can result from competition, herbivory, predation, parasitism, toxins, and disease." Draft Plan, Appendix 5F at 5.F-i. Stressors such as habitat loss or direct export-related mortality (salvage) by SWP and CVP export operations receive almost no attention in this Appendix – curious given that the Conservation Strategy's focuses on restoring habitat and attempting to significantly reduce export-related mortality. Furthermore, this Appendix pays no attention to the driving effect of reductions in freshwater flow into, through, and out of the Delta on most of the stressors affecting covered fish species dynamics; this is a major and grave omission because freshwater flow reductions are widely acknowledged to be one of the most important stressors for numerous native species in this ecosystem. *See, e.g.*, SWRCB 2010 Flow Report; CDFW 2010. Ineffective and inefficient migration of aquatic species is one of the many effects of altered/reduced freshwater flows; although the Plan identifies these effects as key stressors for certain covered species, they are not analyzed or compared to other stressors in this Appendix on the biological stressors to covered fishes. Instead, the Appendix focuses exclusively on four "key biological stressors:" invasive aquatic vegetation, predation, invasive mollusks, and *Microcystis*. Draft Plan, Appendix 5F at 5.F-i.

D. The Draft Plan Uses Inconsistent and Scientifically Unsupported Estimations of the Relative Importance of Stressors

Both the Draft Plan and DEIS/DEIR are internally inconsistent regarding the estimation of the relative or absolute importance of stressors. The documents frequently fail to provide any

support for their assertion that certain stressors are actually limiting population viability or ecosystem productivity. In many cases, the Draft Plan and DEIS/DEIR documents ignore evidence of stressor importance, even when those documents acknowledge the existence of the stressor.

1. The Draft Plan and DEIS/DEIR are Internally Inconsistent and Fail to Use the Best Available Science Regarding the Importance of Entrainment as a Stressor

The problem is particularly vexing with regard to known stressors such as entrainment. Despite the best available science demonstrating that entrainment-related mortality can be a significant stressor on many covered species, both the Draft Plan and the DEIR/DEIS fail to accurately acknowledge this. Instead, they maintain that current entrainment rates have only minor effects on covered species. In part, this erroneous conclusion stems from a persistent focus on "average" (mean) entrainment across years in the Draft Plan and DEIS/DEIR. The mean is an inappropriate and misleading metric because (a) covered species do not experience persistent "average" conditions, they experience individual years with either high entrainment of low entrainment, and (b) the impact of entrainment mortality is believed to vary substantially with different annual (or seasonal) environmental conditions; thus, entrainment impacts (and many other kinds of negative impacts) to covered species are periodically (not continually) severe. *See, e.g.*, Kimerrer 2008; Kimmerer 2011; Rosenfield 2010. Both the Draft Plan and DEIS/DEIR repeatedly underplay the importance of current entrainment levels. But the Draft Plan identifies entrainment-related mortality as a stress for each of the aquatic covered species and both the Draft Plan and DEIS/DEIR commit considerable space to analysis of both the reduction of this stressor that will presumably arise from moving the point of water diversion (Conservation Measure #1; CM1) and the "operational flexibility" that will be gained from CM1. By emphasizing that current entrainment rates are not a significant stressor on covered species, the Draft Plan demonstrates that construction and operation of its primary conservation measure (adding an additional point of diversion; CM1) will have minimal environmental benefits and that the environmental impacts from operation of CM1 are likely to worsen conditions for salmon and other covered species.

Entrainment-related mortality has been studied more intensively than most, if not all, of these other stressors. While the precise impact of this stressor, in terms of its incremental contribution to extinction risk, is unknown (and perhaps, unknowable), species-specific, and varies with regard to year-type and population status; the relative impact of this stressor on covered fish species and ecosystem productivity is well established. For example, Kimmerer 2008 found direct entrainment-related mortality of winter-run Chinook salmon to be approximately 10% of the juvenile winter-run population, on average, at the highest export flows recorded and that

these were "higher than expected based on management targets for the Delta"; he further cautioned that indirect, entrainment-related mortality could be high as well and he concluded:

> From a population maintenance standpoint, the calculated loss rate at the export facilities would be a significant component of direct anthropogenic mortality.

Kimmerer 2008 at 24.

With regard to Delta smelt, numerous studies that have estimated the relative effect of putative stressors on this population found that entrainment-related mortality was one of the more important stressors. Kimmerer 2008, 2011; Mac Nally 2010; Thomson 2010; Maunder and Deriso 2011; Rose et al. 2013a,b.[48]

It is simply not credible for the Plan and DEIS/DEIR to suggest that the impacts of south Delta export operations on the BDCP's covered aquatic species might be small. In addition to the quantitative analyses of entrainment-related mortality described above, the California Department of Fish and Wildlife's life history conceptual models for Chinook salmon (Williams 2010), Delta smelt (Nobriga and Herbold 2009), white sturgeon (Israel et. al. 2009), and longfin smelt (Rosenfield 2010) conclude that mortality arising from CVP and SWP water export operations in the south Delta are one of the more important stressors on covered species. In addition to these syntheses of scientific information on entrainment-related impacts to covered species, the USFWS 2008 and NMFS 2009 biological opinions identify entrainment as an important stressor and attempt to minimize that impact so as to avoid jeopardy to Delta smelt and endangered anadromous species; entrainment-related mortality is also the primary stressor addressed by the SWP's incidental take permit for longfin smelt. CDFG 2009.

For both Delta smelt and winter-run Chinook salmon, the Draft Plan and DEIS/DEIR repeatedly overstate the uncertainty surrounding the level of impact caused by entrainment and the threat posed by this stressor despite the:

- wealth of recent, detailed studies of the importance of entrainment to many covered species
- strong conceptual support for addressing entrainment as a priority stressor, and
- the Draft Plan's own emphasis on reducing entrainment through its primary conservation measure (creation of a new point of water diversion)

[48] The Plan and DEIS/DEIR documents incorrectly assert that Maunder and Deriso 2011 did not find evidence of adult entrainment impacts on the Delta smelt population. Maunder and Deriso's results clearly identify adult Delta smelt entrainment as an important impact to Delta smelt abundance, though their interpretation of this result downplays its importance for reasons that are not clear. In fact, Rose et al. (2013b) recently argued that Maunder and Deriso's interpretation of their own analyses improperly downplayed the magnitude of the entrainment-related mortality impact.

For example, regarding Delta smelt entrainment, the Plan states:

> Changing the primary point of diversion to the north Delta will contribute to further reducing the already low levels of entrainment of delta smelt (averaged across all water-year types) currently required under the USFWS (2008) BiOp. The entrainment levels required under the BiOp, which are much lower than historical levels, will be met or further reduced under the BDCP, depending on the water-year type.

Draft Plan at 3.3-100 (emphasis added). Similarly, the DEIS/DEIR declares:

> Despite the number of delta smelt that have been entrained by the State Water Project (SWP) and Central Valley Project (CVP) export facilities … the direct effects of water diversions on the overall population dynamics of delta smelt are not well understood and there is disagreement among experts about the magnitude of these effects (Bennett 2005; Kimmerer 2008; Kimmerer 2011; Miller 2011).

DEIS/DEIR at 11A-11. Similarly, the Draft Plan lists entrainment as an "important" threat and stressor for the winter-run Chinook salmon population, but then immediately downplays this determination, declaring:

> These facilities [including the SWP and CVP water export pumping facilities] also change the hydrodynamics in Delta channels and directly or indirectly increase vulnerability to entrainment at unscreened diversions. However, the effects of entrainment mortality on the population dynamics and overall adult abundance of winter-run Chinook salmon are not well understood.

Draft Plan at 3.3-128. And, after identifying entrainment-related mortality as an "important threat and stressor" to winter-run Chinook salmon, the DEIS/DEIR concludes:

> No quantitative estimates have been developed to assess the potential magnitude of entrainment losses for juveniles migrating through the rivers and Delta, or the effects of these losses on the overall population abundance of returning adult Chinook salmon. The effect of entrainment mortality on the population dynamics and overall adult abundance of winter-run Chinook salmon is not well understood.

DEIS/DEIR at 11A-56. Finally, we note that the Draft Plan and DEIS/DEIR do not discuss the "uncertainties" regarding impacts of other stressors to nearly the same extent as they focus on what is unknown about entrainment-related mortality. The Delta Independent Science Board

emphasized this uneven treatment of uncertainties as a major problem with the current Draft Plan and DEIS/DEIR, finding:

> Uncertainties are inconsistently and incompletely addressed … Uncertainties accompany every action and consequence discussed in the DEIR/DEIS, ranging from the designations of habitats for individual species, to projections of entrainment, to modeling results used in the analyses. When combined, these uncertainties will be compounded and propagate. Although the Draft BDCP discusses some of these uncertainties, they are treated inconsistently in the DEIR/DEIS and are largely ignored in the Executive Summary … If the outcomes of an action are considered too uncertain or speculative, it is sometimes argued in the documents that this uncertainty is sufficient reason not to address the issue of uncertainty at all.

Delta ISB 2014 at 5.

2. Example: Spawning Habitat Limited by SAV

i. Stressors that do not relate to species' objectives

Often times, the Draft Plan's identification of stressors appears to be a post-hoc justification of proposed conservation measures rather than an effort to alleviate barriers to attainment of desired outcomes (objectives). For example, Appendix 5F claims that: "Removal of invasive SAV is expected to increase the availability of freshwater spawning habitat for longfin smelt in the Delta." Draft Plan Appendix 5F at 5.F-iii. As described above, the Draft Plan inappropriately fails to identify improvements in longfin smelt abundance or longfin smelt spatial distribution as desired biological outcomes (objectives) of the BDCP; the Plan also fails to identify spatial distribution or abundance objectives for Delta smelt. Thus, the Conservation Strategy must anticipate that increased availability of spawning habitat will improve longfin smelt and Delta smelt productivity, which are identified objectives of the Draft Plan. However, the specific micro-habitats that longfin fish use for spawning are unknown, *see* Rosenfield 2010, so there is little or no support for the claim that SAV removal will increase availability of spawning habitat for longfin smelt. Similarly, the Appendix states that: "There is no indication … that the delta smelt population is limited by the amount of suitable spawning habitat area because they spawn throughout the Delta in different years." Yet despite this acknowledgement, and the acknowledgment that "[s]pawning habitat for Delta smelt in the wild is unknown," the Conservation Strategy and the incredibly confusing summary of Delta smelt conceptual models located in the Effects Analysis nevertheless asserts that the extent of tidal marsh habitat is of

"moderate" importance for the success of Delta smelt egg deposition.[49] Draft Plan at 3.3-100; Draft Plan at 5.5.1-7. Despite the statement cited above from Appendix 5F, the DEIS/DEIR claims that one of the main purposes of BDCP's tidal marsh restoration (CM4) is to increase suitable spawning habitat for Delta smelt, DEIS/DEIR at 11-278, and the DEIS/DEIR claims benefits to Delta smelt spawning from removal of submerged aquatic vegetation, DEIS/DEIR at 11-283. So, the Plan, its technical appendices, and the DEIS/DEIR are ultimately confused and inconsistent with regard to the limitations imposed on smelt species' abundances by spawning habitat limitations.

Ironically, while neither the benefits of increasing total spawning habitat acreage nor the efficacy of the proposed mechanism to accomplish that (SAV removal[50]) are obvious, it is very clear that both smelt species are jeopardized by the increasingly narrow spatial distribution of available spawning habitat. The loss of access to spawning habitat, particularly along the San Joaquin River and in the Central Delta, confines Delta smelt and longfin smelt spawning to a very small area and this represents a significant risk to both species' viability. *See* Rosenfield 2002; Rosenfield 2010. This stressor (limited spatial distribution of spawning habitat) is not identified in the Draft Plan. This is yet another example of how the BDCP's failure to identify the most important stressors results from its failure to thoroughly and adequately describe biological objectives for each attribute of viability. If the Draft Plan had identified an objective for the "spatial distribution" attribute of viability for Delta smelt and/or longfin smelt, that desired outcome would naturally have led to a focus on the stress presented by limited spatial distribution of available spawning habitat (as distinct from total acreage of spawning habitat) and the Draft Plan might then have targeted the relevant stressor with appropriate conservation measures.

3. The Draft Plan Fails to Document the Impact of the Presumed Illegal Harvest Stressor

In another example of failure to adequately evaluate stressors, the Plan's emphasizes "Illegal Harvest" as a stressor on numerous covered fish species. Although the Plan expresses great faith that it will reduce the illegal harvest stressor for all the covered salmonid and sturgeon species, there is a big difference between reducing a presumed stressor and that progress leading to attainment of a desired (or required) outcome – if the stressor is not that important in limiting population viability, reducing the it will not lead to improved population viability. The problem statement for CM17 provides no assessment of the extent of illegal harvest, citing only one reference to published literature (a paper dealing with green sturgeon) and reference to the memo that describes CM17. We do not dispute that increasing staffing at CDFW's anti-poaching units

[49] The DEIS/DEIR notes that agency opinion is that this attribute is of "low" importance.
[50] However, it is important to note that removal of SAV may have other benefits for covered species.

may lead to a reduction in sturgeon poaching and it is possible that reduced poaching of adult sturgeon will help attain productivity targets for these two species. But neither the Effects Analysis nor the Conservation Strategy explains their ranking of the impact of this stressor relative to other stressors affecting sturgeon species.

The Conservation Strategy provides absolutely no basis for its expectation of benefits to salmonids from reduction in the illegal harvest of juvenile salmon, and the suggestion that reductions in the illegal harvest of juvenile salmon will have a favorable impact on salmon populations is inexplicable. Illegal harvest (or "poaching") of juvenile salmon is not mentioned as a significant stressor to these populations in the DRERIP conceptual life history model for salmonids. Williams 2010. Illegal harvest of these fish may occur; but does it actually affect abundance or productivity of Central Valley salmonids? And if so, is it a threat on the same level as other stressors to these populations? The Conservation Strategy is strangely unambiguous about the need to reduce the illegal harvest stressor, stating "any reduction in illegal harvest of covered fish species, whether inside or outside the Plan Area, is expected to contribute to the achievement of the biological goals and objectives for the covered fish species." Draft Plan at 3.4-319. This strong statement is in stark contrast to the Plan's equivocality and uneven treatment of entrainment-related mortality as a priority stressor discussed above, even though entrainment (in terms of salvage and expanded salvage) is a somewhat quantifiable impact for each of the covered species and poaching of juveniles is not. Though illegal harvest is unquantified in all cases and the numbers of juvenile salmon that are taken in illegal harvest almost certainly pales before the tens of thousands of Chinook salmon that appear in salvage (a small fraction of the number that are entrained in the SWP and CVP south Delta diversion infrastructure; *see* TBI 2012, the Plan strongly implies that illegal harvest of salmon juveniles is a more important stressor on salmonids than other potential stressors, including entrainment-related mortality. This implication is not credible.

Even if poaching of adults is a significant problem for some salmonid populations, the degree of the problem is likely to vary across the different salmon populations based on factors that affect their susceptibility to poaching (i.e. the duration and timing of their presence in the Central Valley and the size of the waterways in which they are found). In his 398-page tome on Central Valley salmonids, Williams mentions "poaching" or "illegal harvest" of adult salmon twice (an indication of the relative importance of this stressor). Williams 2006. He acknowledges that though is difficult to quantify illegal harvest impacts, there are "some indications that it may be significant" for spring-run Chinook salmon. *Id.* at 248. However, no similar statement is made with regard to winter-run, Sacramento or San Joaquin fall-run or late-fall run Chinook salmon, or Central Valley steelhead. Both the Draft Plan and Williams 2006 suggest that spring-run Chinook salmon populations may be relatively more susceptible than other populations to poaching because they hold in small streams for weeks or months during the summer before spawning. Draft Plan at 3.4-322. However, this is immaterial to the Draft Plan's illegal harvest

stressor reduction target for spring-run Chinook salmon (and all other populations), which specifies that poaching will be reduced "in the Plan Area," Draft Plan at 3.3-151-152, which is not in the habitat (upstream) where spring-run are believed to be more susceptible to illegal harvest. Furthermore, susceptibility to poaching is not an evaluation of the impact of illegal harvest in absolute or relative terms. The Effects Analysis (Chapter 5) inexplicably asserts that winter-run Chinook salmon are also susceptible to poaching, Draft Plan at 5.5.3-37, even though these fish hold in fresh water for a much shorter period than spring-run Chinook salmon and exhibit this behavior in a much bigger river that is much more easily patrolled than the high mountain streams used by spring-run.

In sum, the Conservation Strategy and Effects Analysis assert, without analysis or supporting data, that illegal harvest "in the Plan Area" on adult sturgeon and both juveniles and adults of all Central Valley salmonid populations and that any reduction in that stressor will translate to meaningful progress towards attainment of related species-specific objectives. There is simply no support for these assumptions and many, particularly those regarding covered salmonid populations, are not likely to be true.

4. The Draft Plan Fails to Adequately Describe, Evaluate and Address Delta Outflow and Other Known Flow Stressors

The Conservation Strategy fails to identify entrainment-related mortality or Delta outflow rates as stressors to longfin smelt despite the fact that two longfin smelt-specific objectives specifically incorporate these stressors. For example, one longfin smelt productivity objective uses flow-corrected abundance as its measure (LFSM1.1) and the other productivity objective sets a limit on entrainment-related mortality rates at the CVP and SWP (LFSM1.2). However, in the same tables that identify these desired biological outcomes, only "lack of food resources" is identified as a stressor for longfin smelt. As described in our critique of objective LFSM1.1, there is overwhelming evidence that Delta outflow is strongly correlated with stressors on longfin smelt populations in this Estuary. Jassby et al. 1995; Kimmerer et al. 2002; Rosenfield and Baxter 2007; CDFG 2009; Kimmerer et al. 2009; Mac Nally et al. 2010; Rosenfield 2010; CDFG 2010; Thomson et al. 2010. Delta outflow may be a direct stressor on both population abundance and distribution, as it affects larval transport and subsequent spatial distribution. Kimmerer 2002b; Dege and Brown 2004; Rosenfield 2010. The Department of Fish and Wildlife's life history conceptual model for longfin smelt describes "Delta outflow" and "salinity" (which is directly related to Delta outflow) as "important" stressors with "medium" to "high" certainty of impact and it explicitly links another important stressor, entrainment-related mortality, to Delta outflow rates. Rosenfield 2010 at 30. The Plan's failure to identify these two factors as major stressors on longfin smelt populations is inexplicable, especially since both freshwater flow and CVP/SWP operations also affect the "lack of food resources" that the

Conservation Strategy identifies as the sole stressor it will attempt to address. Jassby et al. 1995; Kimmerer 2002; Rosenfield 2010.

In contrast to stressors like "lack of food resources" or "predation" or "illegal harvest", the reduction of which are consistently identified by the Plan as means for attaining numerous biological objectives, significant reductions and alterations to the timing of freshwater flow into, through, and out of the Delta are inconsistently identified as stressors. However, numerous state and federal agencies concur that reduced or otherwise altered patterns of flow into, through, and out of the Delta are among the most important stressors to native organisms and communities in the Delta. We have described this major shortcoming of the BDCP approach in numerous previous letters and communications; for example, regarding an appendix to a previous version of the Draft Plan, we wrote:

- ..a panel of experts convened by the SWRCB for its flow hearings (SWRCB 2010) found "[F]low modification is one of the few immediate actions available to improve conditions to benefit native species";
- the State Board (2010) itself specifically addressed the BDCP stating: "…this [Public Trust Flow] report highlight[s] the need for the BDCP to develop an integrated set of solutions, to address ecosystem flow needs, including flow and non-flow measures. …One cannot substitute for the other; both flow improvements and habitat restoration are essential to protecting public trust resources";
- the DRERIP conceptual life-history models for Delta smelt, longfin smelt, and salmonids (for instance) each clearly identify water exports and fresh water flow (or the position of X2) as important drivers of population response;
- the Final Recovery Plan for Central Valley salmonids (NMFS 2014) repeatedly emphasizes the need to improve fresh water flow conditions in the Delta and to reduce entrainment at water exports;
- the Delta Science Council's Independent Science Board (DSC 2011) found that both "Changed hydrograph; reduced inflow and outflow" and "Entrainment at pumps & other diversions" were key stressors in the Delta (the former was listed in three different stressor categories)…"

Memorandum to J. Meral from J. Rosenfield re: Review of BDCP Effects Analysis Appendix G December 22, 2011 (emphasis added).

Even though they are not explicitly identified as key stressors, the Draft Plan and DEIS/DEIR strongly imply that decreased and altered flow patterns are a major force affecting many of the

covered aquatic species. For instance, increased flows are a key difference between the "High Outflow" and "Low Outflow" scenarios of Alternative 4 and, the High Outflow scenario performs better than many other Alternative 4 scenarios (though still inadequately) with regard to several of the biological objectives for aquatic species (such as OBAN escapement predictions for winter-run Chinook salmon, *see* Draft Plan Appendix 5G at Table 5.G-19). But, because the Draft Plan's treatment of freshwater flow as a stressor that impedes attainment of numerous biological objectives is inconsistent, the Conservation Strategy fails to consider flow augmentations as a specific conservation measure that would reduce these stressors. Even Alternative 4 produces no flow-related effects that are considered "beneficial" under both a NEPA and CEQA standard, *see* DEIS/DEIR at 11-55 (Table 11-4-SUM1) because flow levels under this alternative do not constitute a substantial improvement over the status quo.[51]

Specific examples abound of the Draft Plan's failure to treat flow as an important stressor that can and should be addressed by the BDCP. The Draft Plan states that "altered migration flows" are a stressor for each of the covered salmonid populations, but, when it sets stressor reduction targets for these species, the Conservation Strategy seeks only to prevent further degradation to these migration flows. For instance, for winter-run Chinook salmon, the migration flow stressor target is: "Ensure that north Delta intake operations do not increase the incidence of reverse flows in the Sacramento River at the Georgiana Slough junction." Draft Plan at 3.3-139; *see also* Draft Plan at 3.3.151; 3.3.159, 3.3.169 (stressor reduction targets for spring-run Chinook, fall-run Chinook, and steelhead respectively). In other words, even where it does identify flow impairment as a major stressor to several species, the Conservation Strategy seeks only to maintain the status quo, rather than seeking to reduce this stressor directly compared to current conditions.

Given such strong indication of the importance of flow modifications to sturgeon, it is indefensible that "altered flows" are not identified in the "assumed stressors" associated with biological objectives for either of the sturgeon species (perhaps more alarming, none of the stressor reduction targets identified for sturgeon species are specific, measureable, or time-bound, so it is not clear what, if anything, BDCP will do to actually address species-specific stressors). The National Marine Fisheries Service, commenting on an earlier version of the Draft Plan's biological objectives, requested greater emphasis on the need for adult attraction flow for sturgeon species. NMFS 2013 Progress Assessment at 15. Indeed, the Conservation Strategy

[51] One exception to the Draft Plan's failure to improve freshwater flow conditions is its provision of flows through Fremont Weir and the Yolo Bypass, both of which result from physical modifications to the landscape, rather than alterations in flow volumes. However, as we discuss elsewhere in these comments, both of these "improvements" are actually an example of BDCP's flawed baselines as both of these actions are already required under the NMFS 2009 biological opinion, even if BDCP is not approved and implemented.

identifies "Flow Operations" as an important "threat and stressor" to both white sturgeon and green sturgeon populations, stating:

> River flows influence white sturgeon spawning, habitat availability, and prey resources, and have been shown to be related to YOY abundance. Modifications of flow rates have the potential to provide an unnatural cue for spawning, which could result in lowered reproductive success. The dispersal of larval white sturgeon is dependent on high spring river flows, which optimally consist of multiple large flow pulses. Reduced seasonal flows or flows mismatched ecologically with sensitive early life stages may reduce dispersal of these life stages when they are most vulnerable to native and nonnative predation. Flow reductions may serve to reduce or eliminate YOY survival even if spawning was successful. Outflow influences YOY, juvenile, and adult white sturgeon bay and delta habitats by influencing salinity. Tagging data demonstrate white sturgeon move upstream when saline waters encroach eastward in dry years, while white sturgeon expand use of bay habitat when brackish water is pushed westward in wet years (Israel et al. 2009).

Draft Plan at 3.3-197; *see also id.* at 3.3-183 (green sturgeon).

Thus, the Plan clearly identifies the negative and important effects of altered freshwater flows and then either refuses to identify them as important stressors or fails to set targets for alleviating the stress caused by freshwater flow alterations, or both. This is a major inadequacy of the Draft Plan that defeats the point of clearly:

- linking species-specific biological outcomes (objectives) to forces that currently prevent the attainment of those objectives (stressors);
- describing reductions in those stressors to a degree (stressor reduction targets) that will facilitate attainment of the objectives;
- and then, designing conservation measures of appropriate type and magnitude to produce the specific desired effects.

E. The Draft Plan Fails to Describe how Proposed Conservation Measures Match, in Either Type or Scope, the Stressors it Identifies and the DEIS/DEIR Fails to Analyze how Outcomes of these Conservation Measures Address the Draft Plan's Desired Outcomes (Stressor Reduction Targets and Biological Objectives). As a Result the DEIS/DEIR and Draft Plan Fail to Adequately Evaluate the Adequacy or Efficacy of the Conservation Strategy

The National Research Council criticized a previous version of the Bay Delta Conservation Plan as "…a post-hoc rationalization of the water supply elements contained in the BDCP" and "a list but not a synthesized plan for the restoration activities." NRC 2010. Unfortunately, this remains an apt description of the Draft Plan in many respects. The conservation measures presented in the BDCP do not appear to be designed achieve specific reductions in stressors that are necessary in order to achieve desired outcomes (SMART biological objectives); instead, they are incompletely described actions whose benefits are assumed to provide benefits. There is no evaluation of how different levels of investment in a particular conservation measure might provide different levels of benefit; neither is there an evaluation of how different conservation measures interact with each other to produce positive or negative synergies. Very often, the Plan, EA, and DEIS/DEIR simply assume that the conservation measures work perfectly as described, with no analysis given to how outcomes might differ if the conservation measures are less than 100% successful. The Delta Independent Science Board identified this as the first of its "major concerns" with the Draft Plan, stating:

> Expectations for the effectiveness of conservation actions are too optimistic.—Throughout the DEIR/DEIS, the BDCP actions, as supplemented by Avoidance and Minimization Measures and Mitigation Measures, are assumed to produce the anticipated benefits when they are needed to offset any impacts of BDCP actions. In essence, it is often argued that Conservation Measures (CM) 2–22 will have sufficient positive benefits for covered species to counterbalance any negative impacts of water diversions and changes in flow caused by proposed alternatives (CM1). This is an implausible standard of perfection for such a complex problem and plan…. It would be better to begin with more realistic expectations that include contingency or back-up plans.

Delta ISB 2014 at 5; *see also* DSP Independent Science Review Panel Report 2014 at 45, 57.

1. The Draft Plan makes Unfounded and Unanalyzed Assertions Regarding the Efficacy of the Illegal Harvest Reduction Measure (CM17) and Fails to Evaluate Whether the Conservation Measure is Appropriately Scaled to the Magnitude of the Problem they are Intended to Address.

The Conservation Strategy offers conservation measure 17 (CM17 – additional investment in anti-poaching law enforcement teams) as a response to the Illegal Harvest stressor. Both the green sturgeon and white sturgeon DRERIP conceptual life history models, Israel and Klimley 2008; Israel et al. 2009, which are not referenced, mention illegal harvest of these species as an important (though unquantifiable) stressor, and we do not dispute that reducing illegal harvest of sturgeon in the Delta is worthwhile pursuit. However, the Plan's analysis of the problem and rationale for its proposed solution (CM17) appears limited to the following statement: "California has a population of approximately 37 million people (U.S. Census Bureau 2012), but has fewer than 200 field wardens. This is the lowest game warden-to-population ratio of any state in the nation." Draft Plan at 3.4-318.

Despite an acknowledged lack of information on the extent of the problem, the Draft Plan vastly overstates claims regarding the likely impact of illegal harvest for salmonids and the likelihood that CM17 will solve those problems. The Effects Analysis simply asserts, "The BDCP will help reduce illegal harvest of adult winter-run Chinook salmon." Draft Plan at 5.5.3-22. Again, this confuses efficacy of the conservation measure with importance of the stressor. In this case, the Effects Analysis assumes that illegal harvest is of moderate importance to the population and that there is moderate certainty of that effect. Draft Plan at 5.5.3-22. In fact, there is no certainty at all of the effect of poaching on the winter-run Chinook salmon population or any salmonid population, *see* Williams 2006, Williams 2010, and it is unlikely that poaching is a large impact on most of these populations. Nonetheless, the Effects Analysis claims: "… with high certainty that there will be a high positive change to the illegal harvest attribute for adult winter-run Chinook salmon, as well as for foraging and migrating juveniles." Draft Plan at 5.5.3.23.

Similar conclusions are drawn for spring-run Chinook salmon. The conclusions of high impact are over-inflated and neither the Conservation Strategy, Effects Analysis, nor the DEIS/DEIR offers supporting evidence to support this "high" level of certainty. This finding is attributed to the opinion of one agency biologist who wrote the memorandum describing the conservation measure and its costs – this hardly represents a rigorous or independent review of conservation measure effects and reveals no effort to compare the relative merits of different conservation measures.

Conclusions regarding illegal harvest reductions of steelhead are also overstated and are not supported by the available scientific information. The Effects Analysis states:

> "… it was assumed with <u>low certainty (based on relatively little information)</u> that illegal harvest of steelhead juveniles and adults is an attribute of <u>low importance</u>. It is concluded that there will be a <u>high positive change to the illegal harvest attribute for steelhead under the BDCP, with high certainty</u> based on the analysis

> presented by Roberts and Laughlin (2013) that is discussed further in the winter-run Chinook salmon analysis."

Draft Plan at 5.5.6-10.

However, the memorandum by Roberts and Laughlin presents no analysis whatsoever regarding the extent of illegal harvest of steelhead or winter-run Chinook salmon. There is no information in Roberts and Laughlin's memo that justifies a high certainty of high positive change resulting from reductions in steelhead poaching; there is also no information presented that can square these high expectations with the *low importance* of the stressor to begin with.

Because there is not even a qualitative estimate of the scope of the illegal harvest problem, the Conservation Strategy provides no way to evaluate whether CM17's proposed increase in enforcement staffing is adequate, too much of an investment, or too little. Also, the Draft Plan fails to evaluate whether this conservation measure's efficacy will be reduced by effectiveness of other conservation measures, such as the effort to reduce migration delays at the Fremont Weir (CM2). The Conservation Strategy relies heavily on a memo from CDFW regarding the cost for this action, but that memo provides no estimate of the benefits anticipated from CM17 or whether more benefits could be expected from an even larger effort. Roberts and Laughlin 2013.

The Draft Plan states that, "increased enforcement as part of CM17 will be focused on the Bay-Delta area and its waterways; however, increased enforcement outside of the Plan Area may occur as part of CM17." Draft Plan at 3.4-319. But the Draft Plan then states: "spring-run Chinook salmon are expected to experience the greatest benefit, because their over-summer holding and ease of locating may make them more susceptible to poaching than other runs." *Id.* at 3.4-322. Most current spring-run Chinook salmon holding habitat is far from the Delta in streams that drain the slopes of Mt. Lassen; staff time allocated to enforcing anti-poaching regulations for over-summering spring-run Chinook salmon will clearly not be available for in-Delta enforcement efforts. Similarly, the Effects Analysis suggests that reduced winter-run Chinook salmon poaching will occur due to enforcement efforts upstream on the Sacramento River holding grounds of this species. Draft Plan at 5.2-40. This holding habitat is approximately 2.5 hours or more from Fremont Weir; thus, staff that conduct anti-poaching efforts in winter-run holding habitat are not available for in-Delta efforts at that time. Also, winter-run Chinook salmon hold in the mainstem of the Sacramento River where they are less susceptible to poaching than, for example, spring-run Chinook salmon, *see* Williams 2006, and where anti-poaching efforts may be more challenging than in areas with fewer river access-egress options. Furthermore, the Effects Analysis suggests that anti-poaching efforts from CM17 will extend into the San Joaquin River drainage. Draft Plan at 5.5.5-54. Neither the Plan not the DEIS/DEIR describe how all of these divergent presumed benefits from the conservation measure (and the Plan describes others, not mentioned here) will be realized.

2. The Draft Plan Makes Unfounded and Scientifically Inaccurate Assertions Regarding the Efficacy of Tidal Marsh Restoration (CM4; Presumed Food Web Benefits)

The BDCP Conservation Strategy focuses heavily on restoration of food web productivity in the Plan Area. Indeed, increases in the availability of prey is identified as a stressor reduction target for longfin smelt (Draft Plan at 3.3-120), and salmonids, splittail, delta smelt, and sturgeon (Draft Plan at 5.E-149 (Table 5.E.4-39)). The main proposal for addressing limited food web productivity is to restore thousands of acres of tidal and shallow sub-tidal habitat (CM4). The plan describes two principal purposes of this action: (1) to provide habitat for covered species, and (2) "To enhance the ecological functions and services of the Delta especially in regard to the Delta foodweb that supports many covered fish species." Draft Plan Appendix 5E at 5.E-ii.

As we have stated repeatedly, our organizations generally support tidal and shallow sub-tidal habitat restoration in the Bay-Delta as a means of improving the quantity and quality of habitat for numerous wildlife species (especially, migratory waterfowl) and fishes that use these habitats extensively (e.g., Sacramento sucker), but, the BDCP must provide benefits to the fish and wildlife species that are covered by the Plan; ancillary benefits to other native species are welcome, but they cannot be the basis for permitting and implementing an HCP or NCCP. *See, e.g.,* EDF, NRDC, TBI, and DOW "BDCP: Performance Assessment from the Conservation Perspective" September 2011; Memorandum to J. Meral et al. From J. Rosenfield re: "Preliminary Review of BDCP Effects Analysis Appendix F" February 9, 2012. Contrary to the Draft Plan's assumptions and assertions in the DEIS/DEIR, there is little scientific evidence indicating that that restoration of the type and extent discussed in BDCP is likely to stimulate food production that will substantially benefit most of the covered species; there is no evidence that any increase in food availability will extend far beyond the immediate vicinity of the restoration projects to benefit life stages of covered species that do not frequent the restored habitat (*see below*).

i. The Draft Plan Misrepresents Cited Scientific Literature with Regard to the Potential Efficacy of Proposed Tidal Marsh Restorations to Covered Species

In comments on earlier versions of the BDCP, we documented the misrepresentation of scientific literature in BDCP documents regarding the likely effects of tidal marsh restoration. *See* "Partial Review of 2011 Draft of the BDCP Effects Analysis, April 4, 2011; Memorandum to J. Meral et al. from J. Rosenfield re: "Preliminary Review of BDCP Effects Analysis Appendix F" February 9, 2012. These mischaracterizations have not been corrected in the Draft Plan and thus the claims

that specific benefits from proposed tidal marsh restorations are likely to accrue to covered species remain misleading and/or overstated.

The large uncertainties and potential negative effects to numerous fish species of restoring tidal marshes in the San Francisco Estuary were well-articulated by Brown (2003); he summarized the situation as follows: "… there is a high degree of uncertainty regarding the benefits of tidal wetland restoration for native fishes, including special status species such as delta smelt (*Hypomesus transpacificus*), chinook salmon (*Oncorhynchus tshawytscha*), steelhead rainbow trout (*O. mykiss*) and splittail (*Pogonichthys macrolepidotus*). Brown 2003 at 3. However, the Draft Plan cites Brown 2003 repeatedly as evidence that tidal marsh restoration will be good for a variety of covered fish species, *see, e.g.,* Draft Plan at 3.4-119, even though there is nothing in Brown 2003 that would support that conclusion as the paper focuses on the rather large uncertainties and potential pitfalls of that position.[52]

The Draft Plan cites the 2009 DRERIP Evaluation conducted for BDCP (Essex Partnership 2009) in a way that implies that these reviews supported the notion that restoration in the Cache Slough ROA would "Increase rearing habitat area for Chinook salmon (Sacramento River runs), splittail, and sturgeon." Draft Plan at 3.4-121. However, that preliminary DRERIP review rated potential benefits to sturgeon and most Sacramento River Chinook salmon runs as "low" (at best) with low to minimal certainty (fall-run Chinook salmon were seen as possibly experiencing "moderate" benefits from this restoration, but again certainty was rated "low" for this potential outcome); on the other hand, potential negative outcomes from this restoration effort were judged to be of "medium" magnitude (at worst) for all the covered species. Essex Partnership 2009 (2009 DRERIP Evaluation).

As we stated in our review of earlier BDCP efforts to justify the Draft Plan's tidal marsh restoration proposal, references to "Healy 1991" and "Kjelson 1982" are misleading; Healy (1991) is a 20+-year old book chapter that describes Chinook salmon behavior across the coast throughout their life cycle – it provides no support for the notion that BDCP's proposed restoration of Suisun Marsh habitats will benefit Chinook salmon. Kjelson et al. 1982 (also the source of most of the information about salmon in this system in Healy 1991) provides no support for the notion that BDCP's proposed restoration of Suisun Marsh habitats will benefit Chinook salmon.

[52] Similarly, the Draft Plan cites "Siegel (2007)" as supporting claims regarding the benefits of tidal marsh restoration for numerous covered species, Draft Plan at 3.4-121, but this document is a "first draft" that clearly states that it is: "incomplete and not fully vetted" and that "…the very short time frame for development of this first draft means it is neither complete nor subjected to adequate scrutiny as a complete package." Seigel 2007 at 5.

Similarly, Hobbs et al. 2006 is referenced as supporting the notion that Suisun Marsh restoration will benefit longfin smelt and delta smelt, but this paper does not reference the potential effect of marsh restoration on either of these covered smelt species – in fact, the words "marsh", "Suisun Marsh", "wetlands", and "restoration" do not occur at all in that paper, whereas the importance of the low salinity zone for rearing of both species is repeatedly emphasized. The Draft Plan cites "Moyle 2008" and "Fresh 2006" in support of a claim of benefits to covered species from proposed restoration of tidal marsh in the Suisun Marsh and Cache Slough ROAs. Draft Plan at 3.4-121. However, because these papers are not listed in the literature cited section of this document, it is not possible to review their relevance to the claims made in the Draft Plan.

ii. The Draft Plan fails to match conservation measures to the presumed drivers of ecosystem stress they are intended to address

Approaches to ameliorate limited food web productivity should either address the causes of food supply limitations (i.e., produce stressor reduction) or circumvent those forces that currently result in reduced food supplies. The point of clearly identifying and characterizing stressors is to ensure that conservation measures are designed specifically to attack these problems. Thus, it is surprising that the stressors the Plan and DEIS/DEIR identify as limiting food supplies for covered species are <u>not</u> those that would be ameliorated by increased tidal marsh restoration. The Plan argues variously that invasive clam species (which graze on phytoplankton) and altered estuarine chemistry (both nutrients and toxins), and other stressors are the likely forces that drive the decline in this estuary's food web productivity. For example, in its rationale for setting the food web stressor reduction target relevant to its longfin smelt objective, the Conservation Strategy explains:

> Researchers have hypothesized that a major factor in the decline of longfin smelt abundance is related to invasion by *Potamocorbula* and its subsequent disruption of the foodweb (Carlton et al. 1990; Alpine and Cloern 1992; Orsi and Mechum 1996; Kimmerer 2002a; Baxter et al. 2008:36). There is evidence that the disruption of the foodweb is the most significant change in the estuary's carrying capacity for other fishes (e.g., Kimmerer et al. 2000; Kimmerer 2006).
> …
> Total ammonia levels may be another factor affecting covered fish species by inhibiting primary productivity (Ballard et al. 2009; Dugdale et al. 2007; Dugdale et al. 2012 in Parker et al. 2012; Glibert 2010; Glibert et al. 2011; Parker et al. 2012; Wilkerson et al. 2006), altering the phytoplankton species assemblage (Baxter et al. 2010; Glibert 2010), or altering the role of invasive species (Ballard et al. 2009). The primary source of total ammonia in the Delta is effluent discharged from wastewater treatment plants, and the primary contributing facility is the Sacramento Regional Wastewater Treatment Plant. The frequency, severity,

> and distribution of effects from total ammonia levels are the subject of ongoing research, but current science indicates a high likelihood that decreasing loading of total ammonia from the Sacramento Regional Wastewater Treatment Plant would have beneficial consequences for phytoplankton productivity and thus the productivity of the pelagic foodweb in and downstream of the Sacramento River in the Plan Area. Section 3.5.1, Ammonia Load reduction, describes the analysis underlying this conclusion.

Draft Plan at 3.3-126. Assuming that these food supplies are currently limited by stressors such as invasive clams, altered aquatic nutrient ratios, *Microcystis*, or contaminants, then any food supply benefit of the BDCP's habitat restoration will be substantially reduced by these very same problems.

Despite the Plan's focus on non-habitat related stressors as the drivers of decline in foodweb productivity, the Conservation Strategy does not identify measures to directly combat these stressors. Instead, the Conservation Strategy focuses on inundation of low-lying habitats under the expectation that these will generate food for covered species. The Plan does not describe why it believes that food produced by these "restored" wetlands and floodplains would not be subject to the same negative impacts (clam grazing and/or altered water chemistry) that it contends drive the current limits on food web productivity. Indeed, the Conservation Strategy at times acknowledges that its description of benefits likely to arise from tidal marsh and floodplain inundation are highly uncertain because of the risk that food produced on the restored areas will be consumed by invasive clams. The Effects Analysis states:

> Translation of the potential production implied by the prod-acre index into food for covered fish species is complicated by biological and physical conditions… In particular in shallow areas <u>grazing rates of clams can exceed phytoplankton production rates resulting in no augmentation of zooplankton or other food sources for covered fish species</u> (Lucas et al. 2012). Hydrodynamics can affect water residence time and the movement of food from sources to potential fish feeding areas. Because clam grazing rates and hydrodynamics vary across the Delta, the potential of primary production changes in Table 5.E.4-39 and Figure 5.E.4-86 to effectively convert to food for covered fish species will likely vary significantly among and within subregions and will depend greatly on local conditions and by large scale drivers of conditions such as flow, salinity and temperature."

Draft Plan, Appendix 5.E, at 5.E-147. The Plan does not seem to acknowledge that, if estuarine chemistry is limiting productivity (as the Conservation Strategy suggests), then restoration of shallow water habitats will do nothing to address that limitation.

In its confusing, and ultimately unresolved, portrayal of some of the stressors that may affect estuarine food supplies for covered species, the Effects Analysis states:

> In a precursor to the broader work by Glibert et al. (2011), Glibert (2010:229) concluded the following.
>
> > *"[A] clear management strategy* [for managing food web impairments] *is the regulation of effluent N discharge through nitrification and denitrification. Until such reductions occur, other measures, including regulation of water pumping or manipulations of salinity, as has been the current strategy, will likely show little beneficial effect."*
>
> This suggests recognition that other attributes (stressors) such as entrainment may also be of importance, albeit secondary importance [to estuarine stoichiochemistry], according to Glibert (2010).

Draft Plan at 5.5.1-4 (emphasis added).

We and many other independent scientific reviews are skeptical of the analyses and nutrient management approach to foodweb stimulation promoted by Glibert (2010; Glibert et al. 2011). *See, e.g.,* Cloern and Jassby 2012; Cloern et al. 2014; DSP Outflows Review Panel Report 2014. However, we agree that management actions should respond to (or at least not be blind to) the root causes of the problems they are intended to address.[53] Ironically, though the Effects Analysis cites this argument, it does not acknowledge that restoration of tidal marsh and sub-tidal habitat do not respond to, and would be impaired by, the stressors the Draft Plan cites as driving food web productivity declines.

Meanwhile, the BDCP Plan and DEIS/DEIR documents do not analyze the documented effects of:

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[53] This paper was the subject of a scathing re-analysis by Cloern et al. 2012 which showed that:

> …CUSUM-transformed variables often have an apparent statistically significant correlation even if none exists between the original untransformed series. Moreover, even if a statistically significant relationship could be established between CUSUM-transformed variables, there is no proven basis for inferring relationships between the original variables. … As a real example, Glibert (2010) inferred a strong negative association between delta smelt abundance and wastewater ammonium from regression of CUSUM- transformed time series. However, the Pearson correlation ($r = -0.096$) between the time series … is not significant, even under the naive IID assumptions ($p = 0.68$). In short, correlations between CUSUM-transformed variables should not be used as a substitute for analysis of the original untransformed variables.

Cloern et al.2012.

- Increased freshwater flow rates (and the related position of the salinity field, "X2") on production of zooplankton species that covered fish species eat. Jassby et al. 1995; Kimmerer 2002;
- Increased freshwater flow rates on the alleged food web effects arising from unbalanced nutrient concentrations. Dugdale et al. 2007, 2012, 2013;
- Reduced south Delta exports (and associated hydrodynamic modifications) on food web productivity. Jassby et al. 2002; Cloern and Jassby 2012; and
- Freshwater flow management on the susceptibility of this ecosystem to invasion by disruptive, non-native species. Winder et al. 2011.

iii. The Draft Plan's Analysis of CM4 Fails to Use the Best Available Science and is Inconsistent with Numerous Peer Reviews

Many of the purported benefits of CM4 are unsupported by the BDCP Effects Analysis and/or they are contradicted by previous analyses and published literature. Although at times the document acknowledges uncertainty, by and large the Effects Analysis reiterates assertions made throughout the document regarding the presumed benefits of BDCP's tidal marsh restoration efforts, stating:

> Restored tidal marshes are expected to provide increased phytoplankton production, which will benefit zooplankton such as copepods that are an important prey item for listed fish (e.g., delta smelt, longfin smelt, and splittail), other estuarine fish, and other aquatic organisms. Substrates in restoration areas will provide habitat for macroinvertebrates which will also result in beneficial food web effects.

Draft Plan at 5.4-11. The Effects Analysis fails to support this claim with a specific analysis relating its conservation measures to the attainment of stressor reduction targets. For example, the Conservation Strategy identifies the following stressor reduction target for longfin smelt:

> Increase the average late-winter and early-spring (late February to April) density of zooplankton (target of 7,000/m3 of calanoid copepods) in the Cache Slough ROA, West Delta ROA, and Suisun Marsh ROA and/or supply adequate transport flows (sustained or pulse flows) to move longfin smelt larvae to areas with adequate food resources (target of 7,000/m3 of calanoid copepods). Achieve this target by year 15. Increasing food abundance will contribute to increased longfin smelt juvenile survival immediately following yolk-sac absorption by providing food resources suitable for juvenile longfin smelt within the Plan Area.

Draft Plan at 3.3-120.

We approve of the specificity of this stressor reduction target (though we do not comment here on its adequacy), but the point of providing such targets is to guide the Effects Analysis and DEIS/DEIR to evaluate whether such targets will be met by the Conservation Strategy, as proposed. Neither the Effects Analysis not the DEIS/DEIR delivers an analysis of food web effects that are comparable to the target above.

The presumption that tidal marsh restoration will substantially improve food production for most or all of the covered fish species ignores the weight of scientific and agency opinion which indicates that the expectation of food exports are highly uncertain and too small to significantly benefit pelagic fish species even if the amount of food web stimulation that the Plan anticipates actually occurs. For example, in 2012 the U.S. Fish and Wildlife Service stated that, "The plan's ultimate conclusions regarding the outcome of creating such large new areas of tidal marsh remain more positive and certain than the literature and scientific authorities suggest they should be. U.S. Fish and Wildlife Service, FWS BDCP Effects Analysis red flags for March, 2012 ("USFWS Red Flags 2012") at 8-9. In its 2013 comments on proposed habitat restoration under the BDCP, the Delta Stewardship Council noted that, "[s]ome suggest enhanced flow may also provide more reliable benefits to the ecosystem than marsh restoration, the benefits of which are less certain and not yet well documented." DSC 2013 BDCP Comments. Similarly, in its review of the Effects Analysis' estimation of food web impacts resulting from physical habitat restoration under the BDCP, the Delta Science Program's Independent Review Panel wrote "…the BDCP analyses are ambiguous and conclusions and estimates of net effects overestimate the net positive impacts of conservation measures. DSP Independent Science Review Panel 2014 at 59. Regarding habitat restoration in particular, they wrote

> Restoration of tidal wetlands (and other communities) is highly uncertain and at least an extremely long process. <u>The Effects Analysis does not adequately justify the critical assumption of the benefit of tidal wetland restoration as a food web subsidy for covered pelagic fish given the uncertainties of tidal wetland restoration itself</u>. A critical issue is the implicit expectation that restoration activities will result in increases in abundance of lower trophic levels, but it is uncertain whether the resulting increased production will result in food web pathways supporting covered species. The presentation of phytoplankton-based and tidal wetland macrophyte detritus-based food webs as alternative ecosystem processes, rather than as an integrated system, also significantly complicates the interpretation of the potential benefit of BDCP restoration. For foraging salmonids, the Effects Analysis did not evaluate the reduced extent to which salmonids would have access to rehabilitated habitat when the north Delta intakes are operating and flows are reduced.

Id. at 7-8. In addition, they wrote that,

> …there is great uncertainty associated with the restoration of the wide range of ecosystems slated for restoration. Many of these systems have a poor record of achieving restoration, especially in short-to-moderate time periods. This range of ecosystems also varies considerably in the degree of difficulty of restoring functions. Nonetheless, the outcomes for conservation measures and their interaction and effectiveness are glossed over and uncertainties are not apparent in conclusions and summary discussions.

Id. at 37. Furthermore, that panel found that the Draft Plan and DEIS/DEIR frequently failed to assess the potential negative impacts of conservation measures, such as habitat restoration, stating:

> With respect to food webs, wetland and aquatic systems restoration are assumed to be effectively restored and functional immediately or in a short time frame and meet the biological objectives of the BDCP. This result is based on a number of additional assumptions, all of which contain considerable uncertainty. Similarly, while potentially negative impacts on the success of restoration are considered in passing, e.g., invasive bivalves, none of their potential effects are incorporated into their analyses or conclusions. The simplest effects perspective of the BDCP is that it edits out all potential outcomes except for the most favorable one.

Id. at 57. A separate review by a different assemblage of independent experts concluded that many of the BDCP's assessments of impacts "… hinge on overly optimistic expectations about the feasibility, effectiveness, or timing of the proposed conservation actions, especially habitat restoration." Delta ISB 2014 at 3.

Another review of BDCP conducted by experts in ecosystem processes and aquatic ecology of the Bay-Delta ecosystem (this one commissioned by The Nature Conservancy and American Rivers) reached a similar conclusion, noting that "The BDCP is overly optimistic about the likely benefits of tidal marsh restoration to the smelt species, particularly the extent of food production." Mount and Saracino et al. 2013 at 70-71 (emphasis added). They conclude:

> The BDCP is overly optimistic about the potential benefits to delta and longfin smelt of physical habitat restoration. Longfin smelt do not appear to use marshes as habitat to any great extent. Delta smelt are also considered pelagic but their persistent abundance in the Cache Slough complex, and greater abundance in shallow rather than deep water, suggests some potential benefit to their population

> of expanded marsh in that area. The magnitude of this benefit is impossible to predict, as is the degree to which marsh and floodplain restoration might cause an increase, or reverse the decline, in the delta smelt population. Under these conditions it is premature to assert that the restoration activity will have such an effect, until studies including pilot projects and even some smaller full-scale restoration projects can show whether an effect is to be expected.
>
> The idea that restored marsh and floodplain will export substantial amounts of zooplankton to the open waters of the estuary is not tenable. The ecology of shallow waters suggests that shallow areas are more likely to be sinks for zooplankton. Even if they were sources, simple mass-balance considerations indicate that the resulting export would produce at most a small enhancement of extant zooplankton of the open waters. This idea should be dropped from discussions of BDCP.

Mount and Saracino et al. 2013 at 82. In general, scientific reviews of the potential for large-scale tidal marsh restoration to produce significant benefits to pelagic fish species in the Bay Delta (e.g. via enhanced food web productivity) have concluded that such effects are speculative and unlikely to be realized to the extent expected by the BDCP Effects Analysis. For example, the National Research Council in 2010 concluded that, with respect to the USFWS 2008 biological opinion's habitat restoration action in the RPA,

> The tidal habitat management action in the RPA requires creation or restoration of 8,000 acres of intertidal and subtidal habitat in the delta and in Suisun Marsh. This action has not been controversial because it does not affect other water users. The committee finds that the conceptual foundation for this action (Action 6) is weak <u>because the relationship between tidal habitats and food availability for smelt is poorly understood</u>. … The committee recommends that this action be implemented in phases, with the first phase to include the development of an implementation and adaptive management plan (similar to the approach used for the floodplain habitat action in the NMFS biological opinion), but also to explicitly consider the sustainability of the resulting habitats, especially those dependent on emergent vegetation, in the face of expected sea-level rise. In addition, there should be consideration of the types and amounts of tidal habitats necessary to produce the expected outcomes and how they can be achieved and sustained in the long term. The committee supports the monitoring program referred to in Action 6, and appropriate adaptive management triggers and actions.

NRC 2010 at 6.

A recent review by nine authors with vast experience in fisheries and shallow sub/inter-tidal habitats of the Bay-Delta (Herbold et al. 2014) concluded:

> Movement of plankton from a tidal marsh (beyond the immediate area of tidal exchange) is likely to be limited and to decrease strongly with distance. Even under ideal circumstances, plankton in water discharged from tidal marsh cannot greatly affect the standing crop of plankton in large, deep channels. Feeding by clams and other introduced species can further reduce contributions of marsh plankton to open-water foodwebs.

Herbold et al. 2014 at 1-2 (emphasis added). These authors also found that, "In the modern San Francisco estuary, tidal wetlands can be important habitats for many fishes, but likely will have little effect on the export of food available to fish at any significant distance." *Id.* at 3. And they state:

> Restored tidal wetlands are unlikely to have much effect on food webs in the upper estuary's open waters. The shallow depth and small volume of water on tidal wetlands compared to the vast volume of open water in the Delta channels and Suisun Bay means that the flux of wetland phytoplankton and zooplankton would be inconsequential to pelagic food webs. We are unaware of reports from the worldwide literature in which substantial quantities of zooplankton are exported from marshes to open waters, whereas several studies show net import of zooplankton to fish consumption on site.

Id. at 4.[54]

These conclusions echo findings of BDCP's own earlier review of six tidal marsh restoration measures considered in the BDCP; for the most part, these tidal marsh restoration measures have been retained in the current BDCP Conservation Strategy. In our review of this earlier effects analysis (the 2009 DRERIP evaluation, *see* Essex Partnership 2009), which considered a variety of conservation measures in addition to tidal marsh restoration proposals (but no alternative water management regimes), we found that "… covered species are expected to receive only "Minimal" or "Low" benefits from most of the proposed conservation measures" and "…a substantial portion of the positive results are characterized by "Low" to "Minimal" certainty.

[54] While publication of this paper occurred after publication of the BDCP documents and the DEIS/DEIR, each of the authors has been available to the BDCP planning team and several of the authors have been engaged in the planning and technical analyses of BDCP components. Their conclusions are not new results, but represent longstanding perspectives of experts in the Bay-Delta ecosystem's aquatic foodwebs.

Thus, the actual outcome of many of these actions is likely to be significantly less than projected, based on magnitude scores alone. TBI letter to BDCP Steering Committee, August 17, 2009 at 3-4.

iv. The Draft Plan and DEIS/DEIR assume benefits accrue to species that are unlikely to benefit from the Conservation Measure, even when the presumed benefit is not related to a previously identified stressor.

The Draft Plan and DEIS/DEIR tend to claim that projected benefits from conservation measures will benefit numerous species even when the presumed benefit does not alleviate an identified stressor on the species' population. For example, with regard to habitat restoration, the Effects Analysis claims repeatedly that species such as steelhead may benefit from the anticipated increase in potential rearing habitat associated with tidal marsh restorations; this expectation is contradicted by the Habitat Restoration Appendix's acknowledgement that "steelhead are generally thought to move quickly through estuarine habitats because of their larger size at outmigration." Draft Plan, Appendix 5E, at 5.E-116. Similarly, the conceptual model for Central Valley salmonids concludes "Spring Chinook, or at least the Butte Creek population, pass quickly through the Delta, so habitat restoration there seems unlikely to do much for them. The same is probably true for late fall Chinook, and for steelhead." Williams 2010 at 41.

In fact, an expert panel convened by the BDCP planning process (the 2009 DRERIP evaluation) to review the potential benefits of tidal marsh measures found that, with the exception of effects to Sacramento splittail (a species that does well in marsh habitats), five of the six tidal marsh measures evaluated were expected to generate "minimal" to "low" benefits, at best, for the covered fish species and the likelihood of these small benefits was "minimal" to low" in most cases. By contrast, each of the six regional tidal marsh restoration efforts studied in detail by the expert panel was expected to generate negative effects of "moderate" to "high" magnitude (with "medium" to "low" certainty) for covered species. These negative impacts included the potential for restored wetlands to harbor or facilitate impacts from invasive competitor and predator species. For both positive and negative impacts, the magnitude of effects generated by tidal marsh restoration was acknowledged to depend on site-specific considerations among other uncertainties. Essex Partnership 2009. In their more recent review, the Delta Science Program Independent Review Panel emphasized similar concerns, stating:

> Migrant life histories are less likely to benefit from habitat restoration activities, which are a key focus of the BDCP conservation measures. This implies that spring Chinook and steelhead may experience less benefit from BDCP actions than other salmonid species, or they may even experience a negative net effect in response to reduced spring flows. The key question, which deserves more

> attention in the BDCP, is whether the migrant life history will sufficiently benefit from conservation measures to offset moderate negative impacts related to reduced spring flows.

DSP Independent Science Review Panel Report 2014 at 30; *see id.* at 57-58.

v. The Draft Plan makes the unfounded assumption that all planned restorations will occur when and to the extent planned and will be 100% successful.

In addition to the lack of scientific evidence that the Bay-Delta food web is likely to be substantially improved by restoring tidal marsh habitats, there is great uncertainty regarding the assumed effectiveness of marsh restoration measures – that is, even if tidal marsh restoration supports the Bay-Delta food web in the manner anticipated by the Draft Plan, there is no certainty that each individual restoration will be maximally effective in producing these results. If some of the restoration actions are less effective at producing food for covered species (or more effective at supporting invasive competitor or predator species) than the Plan assumes, then the overall benefit of this measure will be reduced. The State Water Resources Control Board identified this general concern, in its July 5, 2013 comment letter, which states "The fishery and aquatic resources impact analysis does not appear to analyze scenarios in which conservation measures are not 100% successful." SWRCB 7/5/13 BDCP Comments at 32.

Similarly, there are growing concerns that physical and economic limitations (including the lack of willing sellers) may prevent BDCP from achieving the overall restoration acreage. Reviews from NMFS (2013), USFWS (2013), SWRCB (2013) and the Delta Science Program Independent Review Panel (2014) have raised the concern that the physical characteristics of the Estuary cannot support the tidal marsh restoration. For instance, the State Water Resources Control Board, commenting on the 2013 Administrative Draft of the BDCP, wrote:

> The BDCP relies on habitat restoration to provide adequate ecosystem conditions to achieve the biological goals and objectives of the project. Available tidal energy, and the associated tidal exchange, might be attenuated as restoration projects begin to be constructed and put into operation. The reduction in tidal exchange might reduce the export of phytoplankton and reduce turbidity. Both of these effects might reduce the effectiveness of existing and future restoration areas.

SWRCB 7/5/13 BDCP Comments at 5. The Board also expressed concern that the Administrative Draft of the BDCP did not "appear to analyze the effects of changes in tidal energy exchange that may result after construction and implementation of habitat restoration

projects, and how those changes in tidal energy might affect transport of food and turbidity to locations where pelagic species are present." *Id.* The current public draft of the BDCP still fails to analyze the effects of habitat restoration on tidal energy and vice versa.

The Delta Science Program Independent Review Panel points to another potential physical limitation on the BDCP's ability to effectively restore tidal marsh habitats:

> *The issue is sediment supply for these restorations. The BDCP assumes a constant* sediment concentration for the time period of the plan (Appendix 5.E, pp. 43-44: turbidity held constant in models and interpretations), yet they indicate that sediment concentration has been declining over the past 50 years (p. 109) and that the BDCP conservation measures will further reduce the sediment supply by an additional 8-9%. <u>While in their discussion of sediment supply, they also conclude that declining sediment concentration and the impact of CM1 will mean much lower sediment supply, these issues have no impact on the BDCP analysis and inference</u>. Yet the loss of sediment supply creates great uncertainties in the rate and potential for restoration of these habitats, while <u>only the most optimal circumstances are modeled or estimated</u>.

DSP Independent Science Review Panel Report 2014 at 58 (emphasis added).

In a related problem, any benefits of tidal marsh habitat restoration can only materialize *after* the restoration projects are implemented. The implementation schedule for CM4 indicates that less than half of the total "tidal wetland restoration will be completed by year 15 (the end of the so-called "Early Long-term" period). Draft Plan at 6-5. Thus, most of the presumed benefits provided by tidal marsh restoration actions (assuming there are net benefits) to covered species will only become apparent decades into the BDCP permit term, and the full benefits described in the Plan cannot materialize until after the permit-term is completed, assuming that the schedule is accurate and restorations are not significantly delayed. The Effects Analysis and DEIS/DEIR also tend to assume that benefits of tidal marsh restoration materialize as soon as the restoration occurs, despite the scientific consensus that such restorations evolve over long time periods. DSP Independent Science Review Panel Report 2014; Herbold et al. 2014; Delta ISB 2014. The DEIR/DEIS offers no alternative strategy for conserving and restoring covered species (such as accelerated or more aggressive implementation of other conservation measures or temporary improvements to freshwater flow regimes) during the long implementation horizon for CM4. The long delay in the Plan's effort to provide benefits to covered species is asymmetrical to the timing of actions intended to provide water supply reliability benefits. *See* Draft Plan at 6-3 (North Delta conveyance operations could begin as early as year 11). This asymmetric approach is inconsistent with the NCCPA's requirement for conservation and mitigation measures to be

implemented roughly proportional in time and extent" to the impacts under the Draft Plan. *See* Cal. Fish and Game Code § 2820(b)(3)(B).

The Delta Science Program Independent Review Panel's Phase 3 review of BDCP summarizes many of our concerns with the DEIS/DEIR's analysis of food web impacts arising from the BDCP:

> An overarching assumption is that conservation measures have rapid and positive impacts. With respect to food webs, wetland and aquatic systems restoration are assumed to be effectively restored and functional immediately or in a short time frame and meet the biological objectives of the BDCP. This result is based on a number of additional assumptions, all of which contain considerable uncertainty. Similarly, while potentially negative impacts on the success of restoration are considered in passing, e.g., invasive bivalves, none of their potential effects are incorporated into their analyses or conclusions. The simplest effects perspective of the BDCP is that it edits out all potential outcomes except for the most favorable one.

DSP Independent Science Review Panel 2014 at 57 (emphasis added).

IV. THE DRAFT PLAN AND DEIS/DEIR FAIL TO USE THE BEST AVAILABLE SCIENCE IN ASSESSING THE EFFECTS OF PROPOSED ACTIONS

Given the failure to identify legally adequate restoration outcomes for BDCP, the logical shortcomings of the Conservation Strategy's design, the failure to apply the best available science to analysis of ecological stressors and problems in the Bay-Delta ecosystem, and the failure to explain or justify many of the conservation measures in terms of their contribution to success, it is not surprising that the DEIS/DEIR and Draft Plan predict that the biological outcomes anticipated from implementation will not achieve the biological goals and objectives, let alone achieve legally adequate outcomes. In addition, the Draft Plan's Effects Analysis inappropriately overlooks, de-emphasizes, or underestimates potential negative impacts to the covered species and the ecosystem attributes resulting from Plan implementation. The Draft Plan and DEIS/DEIR frequently identify high "uncertainty" surrounding projected outcomes or model predictions, but, despite this acknowledgement, they proceed to draw conclusions that are usually favorable to the BDCP – we interpret the large uncertainties as a lack of credible evidence that the hypothetical positive results of the Draft Plan are likely to arise and/or that potentially severe negative outcomes will be avoided. Furthermore, the Plan's estimation of ecosystem and species-specific benefits are routinely biased in a way that is overly optimistic about the magnitude and certainty of likely impacts. Even when scientific information demonstrates the biological objectives are unlikely to be achieved or that species or ecosystem

attributes of viability will continue to decline (even to the point of potential extinction during the duration of the BDCP) the Draft Plan concludes that the BDCP will successfully contribute to the recovery of covered species.[55] Finally, the methods and results applied towards analyzing likely plan impacts are inadequate and frequently biased in a way that favors permitting of the Plan.

This is not the first time we have raised our serious concerns with the analysis or interpretation of the Plan's likely effects, and numerous independent scientific reviews have repeatedly emphasized serious deficiencies in the analysis and interpretation of Plan impacts. For instance, the Delta Science Program's Independent Review Panel found that the BDCP Effects Analysis "tends to overreach conclusions of positive benefits for covered fish species, given the inability to quantify the over-all net effects and the realization of high uncertainty," DSP Independent Science Review Panel Report at 25, and that it:

> … does not adequately acknowledge the extensive uncertainty associated with the BDCP's assumptions and predictions. In its current form, at the level of detail conveyed, in the models used, and in the verbal assessments and conclusions, the level of uncertainty is often downplayed. Within appendices sometimes more explicit discussion of uncertainties can be found, but there is a disconnect between the summary pages with the conclusions drawn in Chapter 5. In situations in which an array of outcomes may be possible, only the more beneficial outcomes are used in conclusions about the BDCP. Communication of uncertainty would be improved by consideration of a range of potential outcome values in models."

Id. at 8 (emphasis added). The Delta Independent Science Board concurred with the Independent Review Panel's conclusions regarding the Effects Analysis and had a similarly harsh critique of the DEIS/DEIR, concluding that, "We find, however, that the science in this BDCP effort falls short of what the project requires," Delta ISB 2014 at 1, and they also find that, "the DEIS/DEIR currently falls short of meeting this 'good enough' scientific standard" of the best available science," Delta ISB 2014 at 3. In particular, they concluded that:

> 1. Many of the impact assessments hinge on overly optimistic expectations about the feasibility, effectiveness, or timing of the proposed conservation actions, especially habitat restoration.
> 2. The project is encumbered by uncertainties that are considered inconsistently and incompletely; modeling has not been used effectively to bracket a range of uncertainties or to explore how uncertainties may propagate.

[55] As we emphasize elsewhere, this is not the correct legal standard under the NCCPA.

> 3. The potential effects of climate change and sea-level rise on the implementation and outcomes of BDCP actions are not adequately evaluated.
> 4. Insufficient attention is given to linkages and interactions among species, landscapes, and the proposed actions themselves.
> 5. The analyses largely neglect the influences of downstream effects on San Francisco Bay, levee failures, and environmental effects of increased water availability for agriculture and its environmental impacts in the San Joaquin Valley and downstream.
> 6. Details of how adaptive management will be implemented are left to a future management team without explicit prior consideration of (a) situations where adaptive management may be inappropriate or impossible to use, (b) contingency plans in case things do not work as planned, or (c) specific thresholds for action.
> 7. Available tools of risk assessment and decision support have not been used to assess the individual and combined risks associated with BDCP actions.
> 8. The presentation … makes it difficult to compare alternatives and evaluate the critical underlying assumptions.

Id. at 3. We concur with and reiterate these conclusions of both the Delta Independent Science Board and the Independent Science Review Panel's assessments of the Draft Plan and DEIS/DEIR. In addition, we find that both documents repeatedly fail at the analytical level, in multiple other ways, including:

- Failing to analyze impacts with regard to each attribute of viability (i.e. abundance, productivity (survival), spatial extent of spawning habitat, and life history diversity; McElhany et al. 2000 *and described above*) for each covered species;
- Selectively presenting positive results of analyses when the same analyses also reveal negative outcomes;
- Dismissing modeling results (or entire models) that indicate the Draft Plan and operational alternatives are likely to have negative outcomes relative to baseline conditions (as modeled in the future under the assumption of climate change);
- Selectively applying "uncertainty" as an excuse to dismiss modeling outcomes that reflect negatively on the Draft Plan and operational Alternatives, but ignoring model variance wherever modeling results are deemed to reflect positively on the Draft Plan and Operational Alternatives;
- Incorrectly measuring uncertainty (when it is addressed at all) to reach conclusions of "no difference" between Alternatives and the appropriate baseline, when a valid comparison of results would likely reveal significant differences between Alternatives and NAA;

- Failing to demonstrate that the Draft Plan is likely to achieve its biological objectives, and that the modeling and other analyses show that the Draft Plan is unlikely to achieve these goals and objectives;
- Failing to demonstrate that the Draft Plan would improve upon or even maintain current conditions for covered species, many of which are designated as threatened or endangered;
- Using average values (and, worse "mean" values) across all years to reflect likely effects of modeled alternatives rather than analyzing the range (maximum and minimum) and median of effects modeled within different year-types – the modeling outputs results are far more reflective of the conditions that will affect conservation and restoration outcomes (i.e. the "mean" condition will not occur uniformly, rather different year-type conditions will occur in unpredictable sequences);
- Dismissing the importance of a negative impact by applying arbitrary, capricious, and opaque standards regarding the threshold magnitude at which an effect would be considered important (often the Draft Plan accepts a positive result as having a beneficial "effect" while dismissing as unimportant, or "small", an analogous negative result of greater magnitude);
- Dismissing entire stressors (including those identified by the Draft Plan and/or in agency management documents and those managed in current regulations) as unimportant whenever analyses show that the Draft Plan and operational alternatives will cause and increase in this stressor;
- Discounting its own modeling of inputs (e.g. flows, temperatures, reservoir storage) and outputs (population responses to modeled changes in condition) such that it is impossible to tell which, if any, analyses in the Draft Plan and DEIS/DEIR the reader is expected to believe.

Below, we illustrate the Draft Plan's shortcomings on a species-by-species and ecosystem-as-a-whole basis. To standardize and streamline our synthesis of inadequacies in the Draft Plan and DEIS/DEIR, we describe how deficiencies in the logic chain for each species, and the ecosystem-as-a-whole lead to inadequate protections for biological resources and also identify where the analysis and interpretation of BDCP outcomes found in the Effects Analysis and/or DEIS/DEIR are deficient, fail to incorporate the best available science, or are internally inconsistent with the modeling prepared for these documents. Some of this material will be covered with reference to examples given above; such redundancy is necessary in order to describe systematic problems with the Draft Plan and DEIR/DEIS (above) and their consequences for specific ecological resources (below).

A. Longfin smelt

1. Draft Plan Objectives for Longfin Smelt are Inadequate to Attain the NCCPA (and ESA) Standard for this Species

The Draft Plan's Biological objectives for longfin smelt as outlined in the Conservation Strategy are inadequate. The Draft Plan offers no targets for improvement (objectives) or actions to alleviate the threat this population experiences from human activities that lead to reduced spatial distribution, curtailment of life history diversity, or reduced absolute abundance, all of which are major concerns for this species (Rosenfield 2010). And, as described above, The Draft Plan's targets for longfin smelt productivity plainly do not guide the BDCP towards recovery of this species. One objective for longfin smelt productivity (LFSM1.1) assumes, without a specific rationale, that only a small fraction of the global goal and objective for longfin smelt will be attained via BDCP actions, even though the bulk of this population spends most of its life cycle in areas that are affected by freshwater flow through and out of the Plan Area and the species population displays long-term, statistically significant, high magnitude positive correlation with Delta outflow, which the BDCP will alter. The other objective for longfin smelt productivity –a proposed limit on entrainment mortality (LFSM1.2) -- is inadequate as it permits potentially catastrophic rates of entrainment mortality in any one year and does not specify how entrainment impacts to life history diversity in this species will be limited.

2. The Draft Plan Fails to Accurately Identify and Address the Correct Stressors on this Species

The Draft Plan is ultimately confused and inconsistent as to its strategy for restoring longfin smelt productivity and abundance as revealed by its inconsistent and inaccurate identification of stressors that currently affect this population. The Draft Plan claims that "The conservation strategy for longfin smelt focuses on the same three primary stressors discussed for delta smelt (food, predators, and entrainment)." Draft Plan at 3.3-115. But, "lack of food resources" is the only stressor listed in the table describing species-specific objectives and stressor reduction targets for longfin smelt. *Id.* at 3.3-120. Commenting on a stressor (limited spawning habitat) that was identified in an earlier version of the Draft Plan, USFWS recommended that the BDCP "…provide a plausible prediction of marginal longfin smelt benefits that will be realized by enhancing extent of spawning habitat or delete the corresponding stressor reduction target. USFWS 2013 Progress Assessment at 10. Apparently, that advice was accepted as there is no mention of a spawning habitat limitation for longfin smelt in the current draft Conservation Strategy (Chapter 3) and the Draft Plan's Effects Analysis tersely and accurately states that: "spawning habitat for longfin smelt in the Delta is unknown." Draft Plan at 5.5.2-8. It is therefore surprising that the Draft Plan's Effects Analysis proceeds to analyze potential benefits to longfin smelt spawning anticipated to arise from the construction of new tidal habitats. The

Effects Analysis presents results of a "Habitat Suitability Index", despite its admission that there is no information on longfin smelt spawning micro-habitat requirements. The Effects Analysis claims that there would be "considerably more" tidal habitat available for longfin smelt egg deposition (10% more in the Late Long Term) and that tidal marsh habitat restoration will be of "high" benefit to longfin smelt. Given the lack of knowledge about the extent of spawning habitat, the lack of evidence that longfin smelt spawning habitat limits population abundance or productivity (*see* Rosenfield 2010; USFWS 2013 Progress Assessment), and the Draft Plan's own statements, the finding of benefit from the estimate of BDCP's creation of "new" spawning habitat simply lacks scientific support. Even if that projected increase in spawning habitat were somehow correct, it likely would have little or no impact on the population since there is no reason to believe (and the Draft Plan does not contend) that spawning habitat limitation limits the population currently.

In contrast, the Conservation Strategy does not identify as a stressor on longfin smelt either "altered migration flows" (as it does for each covered salmonid species) or "flow operations" (as it does for sturgeon species. *See* Draft Plan at 3.3-183, 3.3-197. The failure to identify Delta outflow as a significant stressor on longfin smelt abundance is inexplicable given the fact that the relationship between longfin smelt abundance and freshwater outflow from the Delta has been strong, statistically significant, and durable over the past four decades of fish community sampling in this ecosystem. Jassby et al. 1995; Kimmerer 2002; Rosenfield and Baxter 2007; Sommer et al. 2007; Kimmerer et al. 2009; Rosenfield 2010; Thomson et al. 2010; Mac Nally et al. 2010. Through Delta flow and Delta outflow are also believed to drive longfin smelt distribution, Dege and Brown 2004, in ways that affect longfin smelt entrainment, Grimaldo et al. 2009; Rosenfield 2010, and to stimulate production of key longfin smelt food items, *see* Jassby et al. 1995; Kimmerer 2002; Rosenfield 2010. Elsewhere in its Effects Analysis, the Draft Plan appears to agree that freshwater flows are important to this species, stating that, "Current science indicates that the decline in longfin smelt relative abundance observed from monitoring has been a result of foodweb changes, and that longfin smelt relative abundance is strongly correlated with winter-spring outflow from the Delta." Draft Plan at 5.5.2-7. Indeed, the method used by both the Draft Plan and the DEIS/DEIR to estimate changes in longfin smelt populations in the future relies entirely on changes in the position of X2 (an indicator of freshwater flows). It is therefore inexplicable that the Draft Plan does not identify the driving effect of low freshwater flows on longfin smelt and take direct action to ameliorate this important stressor to this species and the ecosystem as a whole.

Similarly, the Plan does not identify entrainment-related impacts as a known stressor for longfin smelt despite the facts that (a) the Conservation Strategy identifies an entrainment reduction objective for longfin smelt, (b) the CDFW conceptual model of longfin smelt life history (Rosenfield 2010) identifies entrainment as a stressor to this population (in certain year types), and (c) the California Department of Fish and Wildlife has issued an incidental take permit to the

State Water Project (CDFW 2009) with terms that are intended to limit entrainment mortality for this species.

These statements and omissions are inconsistent with the best available science. As described above, the Conservation Strategy, Effects Analysis, and DEIS/DEIR are inconsistent in their evaluation and weighting of stressors, stating that certain stressors are important in one place, but then reaching a different conclusion regarding the importance of the same stressors elsewhere. Thus, despite the overwhelming wealth of scientific evidence regarding the impact of freshwater flows on the productivity of longfin smelt, the Effects Analysis says there is uncertainty regarding the role of outflow. *See, e.g.*, Draft Plan at 5.5.2-29. And, disregarding the fact that the Conservation Strategy sets a target intended to limit entrainment-related mortality, the Effects Analysis claims: "… entrainment of adult longfin smelt is no longer considered to be an attribute of importance as a constraint to the longfin smelt population." Draft Plan at 5.5.2-19. This failure to identify and evaluate two of the most important stressors on the longfin smelt leads to the Plan's failure to design adequate conservation measures for this species and the failure to properly interpret clear impacts to the longfin smelt population that will arise from implementation of the Draft Plan.

3. Conservation Measures do not Adequately Address Known Stressors for this Species and/or their Impacts are Overstated

i. The Failure to Provide for Adequate Winter-Spring Freshwater Flows in the Conservation Strategy for Longfin Smelt is Unacceptable and Leads to the DEIS/DEIR's Projection of Declining Longfin Smelt Populations Under the Draft Plan and the Inability to Attain Necessary Conservation Targets

We have repeatedly emphasized the need for the BDCP to consider operational alternatives that result in increased Delta outflows in the winter and spring months as a means to improve the abundance and productivity of longfin smelt. *See, e.g.,* Letter from five conservation NGOs to John Laird and David Hayes, September 30, 2011; Memorandum to Jerry Meral from The Bay Institute, Environmental Defense Fund and Contra Costa Water District, December 21, 2011, RE: "Review of Appendices C and D"; Letter from six conservation NGOs to Gerald Meral, March 1, 2012, RE: "BDCP Draft Effects Analysis"; Memorandum to J. Meral et al. from J. Rosenfield re: "Preliminary Review of BDCP Effects Analysis Appendix F," February 9, 2012. Despite the extremely strong and long-lasting correlations between longfin smelt abundance and winter-spring freshwater outflow from the Delta (a relationship that the Draft Plan and DEIR/DEIS repeatedly acknowledge implicitly), the Draft Plan does not contemplate increases to freshwater flow as a conservation measure for longfin smelt or other species and most of the operational alternatives considered in the DEIS/DEIR actually reduce Delta outflows below

current, unacceptably low levels. The SWRCB criticized a previous version of the DEIS/DEIR for its failure to consider alternatives that resulted in increased Delta outflows, stating:

> Compared to the no-project alternative … it appears that all of these operational scenarios decrease total Delta outflow (see Attachment 1: State Water Board analysis) in the late-long term. The justification for this limited range of Delta outflow scenarios is not clear given that there is strong information on the possible need for more Delta outflow for the protection of aquatic resources and the uncertainty that other conservation measures will be effective in reducing the need for flow. Specifically, recent research indicates that restoration of tidal marsh may not be feasible, possible, or effective. Accordingly, it appears appropriate to include a broader range of Delta outflows under the decision tree process.

SWRCB 7/5/13 BDCP Comments at 5. Similarly, the USFWS recommended that the previous version of the BDCP "… acknowledge that spring Delta outflow is a well-established driver of longfin smelt abundance, and formulate a stressor reduction target that provides spring Delta outflow in accordance with the Service's standing recommendation." USFWS 2013 Progress Assessment at 10. Despite these powerful and direct recommendations that the BDCP provide improved Delta outflows for covered species like longfin smelt and for improved estuarine functions, the problem remains unaddressed in the current Draft Plan.[56]

Speaking to the utility of increasing Delta freshwater flows rates to protect estuarine fish (like longfin smelt), fish habitat, and other ecosystem processes, a recent independent science review panel wrote:

> There is <u>very strong (even unequivocal) evidence that specifying outflow requirements and objectives specific to seasons (specific months) is a rational and scientifically justified approach</u>. As summarized in SWRCB (2010 – Development of Flow Criteria), <u>there is solid evidence that high outflows during various combinations of winter-spring months benefit a variety of species</u>. … High winter-spring flows into the Bay-Delta (low X2) have been shown or argued to act as cues for fish spawning migrations, to improve reproductive success, and to increase survival of juvenile anadromous species migrating seaward. <u>High</u>

[56] Alternative 8 in the DEIS/DEIR does provide an increase in winter/spring Delta outflow as recommended by the SWRCB, but the State's proposed project fails to provide increased winter/spring Delta outflow, despite the comments from the SWRCB and other agencies. The so called "high outflow scenario" (HOS) largely maintains the status quo of winter/spring outflow, and the both the Draft Plan and DEIS/DEIR fails to analyze the "CS5" operations developed by the fishery agencies in 2012 to provide increased outflow and improve other flow conditions for fish and wildlife.

> winter-spring outflows also benefit a variety of species through early-life-stage dispersal, access to floodplain habitat, and reduced entrainment.

DSP Outflows Review Panel Report 2014 at 62 (emphasis added).

ii. The Draft Plan and DEIS/DEIR's Expectation of Large Benefits to the Longfin Smelt Population Resulting from the Restoration of Shallow Sub-Tidal Habitats is Scientifically Unsupported, as Numerous Independent Scientific Reviews have Found

Rather than take action to address the primary documented stressor (and driver of other stressors) with known, high-order effects on longfin smelt (Delta fresh water outflows), for which scientifically credible and feasible measures exist to address the stressor (improve outflows during winter/spring months) the Draft Plan proposes to reduce (or maintain currently inadequate) Delta outflows during key seasons and year-types,[57] and relies on completely speculative habitat restoration measures under the theory that these will bolster food supplies for longfin smelt and that improved food supplies can counter the negative effects of reduced Delta outflows. Although many reviews refer to the potential benefits of habitat restoration in general as "highly uncertain", with regard to their potential to bolster longfin smelt abundance or productivity, these measures are actual quite certain to produce negligible benefits to longfin smelt. The Conservation Strategy and DEIS/DEIR repeatedly assert BDCP benefits to longfin smelt from increased prey production that is supposed to occur as a result of habitat restoration. *See, e.g.,* DEIS/DEIR at 11-34; Draft Plan at 5.5.2-25, -29. In the BDCP's own 2009 review of tidal marsh restoration proposals (which are quite similar to the proposals in the Draft Plan), a team of experts on local fish ecology and estuarine dynamics rated the potential for these measures to benefit longfin smelt as "low" to "marginal" (at best), with "low" to "marginal" certainty (at best), in every case but one. For all but one proposed tidal marsh restoration area, at least one foreseeable negative impact to this species was rated "high", with "low" to "medium" certainty; for example, shallow sub-tidal habitat restoration in the West Delta ROA was judged to run the risk of "establishment of undesirable species" (such as Centrarchid bass (predators) or *Corbula* clam (competitors), which would be a "high" negative impact. Essex Partnership 2009 (2009 DRERIP Evaluation, Appendix D). The recent Delta Science Program Independent Review Panel identified the same two potential negative outcomes of habitat restoration measures and suggested that they were relatively certain to arise, questioning only whether they could be controlled when they did arise. DSP Independent Science Review Panel Report 2014. On page 11-20, the DEIS/DEIR mentions the potential for invasion by *Corbula* clams of habitats restored under CM4 as a potential negative impact to Delta smelt (but not to longfin smelt), but

[57] *See* Draft Plan, Appendix 5C at 5C.5.3-348 (Table 5C.5.3-189); *id.* at 5C.5.3-350 (Table 5C.5.3-190). This is also true with respect to the cumulative impacts of BDCP and climate change.

does not mention the potential for invasion/foraging by invasive piscivorous fish (e.g., Centrarchids). Similarly, the Draft Plan's appendix on habitat restoration (Appendix 5E) barely acknowledges the potential risks associated with colonization of restored habitats by non-native species, including predatory fish, simply declaring that "Marsh channels and levee breaches will be designed to maintain flow velocities that minimize conditions favorable to the establishment of nonnative submerged aquatic vegetation (SAV) and floating aquatic vegetation (FAV) and habitat for nonnative predatory fish." Draft Plan, Appendix 5E at 5.E-47 (emphasis added). The Draft Plan's appendix on fish stressors (5F) does identify the risk of predation on covered species in the restored habitats described by the Draft Plan, but it is similarly non-specific regarding control or prevention of this problem (relying on vaguely-described removal of invasive aquatic vegetation, which would not guarantee elimination of the problem) and non-committal regarding the likely outcome of this response. Draft Plan Appendix 5F at 5.F-iv.

Since the publication of the 2009 DRERIP Review, additional independent reviews have assessed the potential for habitat restorations to benefit pelagic fish species, like longfin smelt, in the manner anticipated by the Draft Plan. As described in detail above, the overwhelming consensus of independent scientists is that BDCP's assumption of benefits are vastly overstated and unlikely to materialize. DSP Independent Science Review Panel Report 2014; Delta ISB 2014; Herbold et al. 2014; Mount and Saracino et al. 2013; NRC 2010. The assumption that restored habitats will enhance prey production, to the extent necessary to support species' global biological objectives is particularly poorly supported for longfin smelt. This is because longfin smelt occupy pelagic environments, typically in or near deep-water channels. Rosenfield and Baxter 2007; Rosenfield 2010. These habitats are furthest from the location of proposed shallow water habitat restoration meaning the benefit of any food web export from restoration sites will be attenuated (via dispersal and consumption by other species) before it can reach longfin smelt. Reviewing the specific question ("Is the analysis of food web benefits to longfin smelt from habitat restoration appropriate?"), the Delta Science Program's Independent Review Panel concluded that both the mechanism and magnitude described for increased production of longfin smelt prey resulting from habitat restoration was "highly uncertain" and that the contribution to increased plankton abundance available for longfin smelt was "basically hypothetical because of the uncertainties of primary consumption within the restoring ecosystems, especially by non-indigenous clams, and whether these systems would be sources or sinks for any increased production." DSP Independent Science Review Report 2014 at 60-61.

Despite the consensus of the scientific community that this effect is tenuous and extremely small at best,[58] Figure 5.5.2-5 reveals that the Draft Plan assumes "moderate" benefit (with low

[58] However, as we have noted repeatedly, there are likely to be benefits to some other species and ecosystem processes from tidal marsh habitat restoration projects, and we encourage implementation of restoration projects in an adaptive management process. *See also* footnote 80, *infra*.

certainty) from enhanced zooplankton production for juvenile longfin smelt. The figure is contradicted by the Draft Plan's accompanying text, which indicates a "low" benefit of enhanced zooplankton production from its restoration projects. Draft Plan at 5.5.2-13. There is very little, if any, empirical support for a finding of even "low" benefit. And, even if the benefits of habitat restoration for longfin smelt were as "low" or "moderate" as the Draft Plan alternately claims, there is no way for such benefits to materialize until well into the Plan's Late Long Term (LLT) because most restoration activity will not be complete until that time and benefits of marsh restoration typically require substantial time to evolve post-restoration. *See, e.g.*, Herbold et al. 2014.

iii. The Conservation Hatchery Proposal is Unacceptable as part of a Conservation Strategy for Longfin Smelt under an HCP/NCCP

Certain conservation measures described in the Plan and DEIS/DEIR as beneficial to longfin smelt are inadequate and/or irrelevant to the conservation standard for this species. For example, a hatchery's function is to increase the number of larvae that survive per female spawner. Providing a hatchery for longfin smelt would not address the problems the Draft Plan or other sources identify as stressors for longfin smelt. Food limitations, inadequate transport flows, etc. all arise *after* the egg incubation/early larval stage – producing and releasing more small longfin smelt into an environment that is not expected to support them does not address or circumvent the problems facing longfin smelt and is not likely to achieve conservation of this species in the Plan Area. Furthermore, the Draft Plan does not identify or address any of the myriad known problems with hatchery production of other fish species (e.g. salmon) as a conservation method. We have raised this issues numerous times. *See* Letter from TBI, EDF, DOW to BDCP Steering Committee December 20, 2009; J. Rosenfield letter to Meral et al. dated February 9, 2012. Conservation hatcheries for smelt (CM18) do not address the primary stressors on longfin smelt. The Fish and Wildlife Service has commented that "CM18 is linked to wild population goals and objectives for delta and longfin smelts. This is inappropriate and contrary to the Service's present policy for these species." USFWS 2013 Progress Assessment at 10.

Also, as described above, removal of invasive submerged aquatic vegetation to "increase the availability of freshwater spawning habitat for longfin smelt in the Delta," *see* Draft Plan Appendix 5F at 5.F-iii, does not address threats to longfin smelt abundance because (a) there is no indication that the abundance of longfin smelt spawning habitat limits abundance or productivity of this species (though it may be limiting a different attribute of longfin smelt viability: spatial distribution) and (b) there is no indication that longfin smelt will spawn in areas where SAV has been removed – very little is known about longfin smelt preferred micro-habitats for spawning. Rosenfield 2010.

4. The Draft Plan and DEIS/DEIR's Assessment of Effects on Longfin Smelt are Inaccurate and do not Attain the Conservation Standard for this Species. In addition, Presentation of these Results is Biased, Internally Inconsistent, and Confusing

Despite the Draft Plan's claims that it would contribute to recovery of longfin smelt and would have beneficial effects on the species, and the Draft Plan's objectives that (though inadequate) attempt to define improved biological outcomes, the Draft Plan and DEIR/DEIS both demonstrate that BDCP is likely to result in large declines in longfin smelt abundance, is unlikely to achieve the biological objectives for the species, and that the proposed project would cause additional negative impacts on the species. These declines are due, in large part, to the projected declines in the winter-spring Delta outflows under the BDCP as compared to the environmental baseline, shown in Table 11-4-7 and Table 11-4-9, that tend to drive longfin smelt population abundance. The Draft Plan and DEIS/DEIR portray these large declines as benefits because their modeling suggests that populations under BDCP will be slightly larger than without BDCP (though the magnitude of modeled change is likely not statistically significant and therefore unlikely to materialize). As we discuss elsewhere the DEIS/DEIR uses the wrong baseline and the significant reduction in outflow under the Draft Plan as a result of BDCP and other projects and effects cumulatively (including the effects of climate change) will cause significant environmental impacts, including cumulative impacts.

i. Draft Plan and DEIS/DEIR Misuse and Misinterpret Models to Project Longfin Smelt Abundance and Fail to use the Best Available Scientific Information

Despite the Draft Plan's claim of "uncertainty" that Delta freshwater outflows drive longfin smelt abundance (*see, e.g.,* Draft Plan at 5.5.2-29), the DEIS/DEIR project future longfin smelt abundance based solely on a model derived from the well-documented relationship between X2 (an indicator of Delta fresh water outflow rates) and longfin smelt abundance indices (i.e., Kimmerer et al. 2009). The fact that no other quantitative tools are used to provide a robust estimate of the effect of BDCP on longfin smelt population size reveals the differential strength of evidence underlying the Draft Plan's two conceptual models for longfin smelt: one that attributes population size to levels of Delta freshwater flow (as identified in numerous peer reviewed papers and quantitative models, including that used in the DEIS/DEIR) and the second that attributes population size to unidentified levels of prey abundance.

As discussed elsewhere, the relationship between Delta outflows (or X2) and longfin smelt abundance is among the best-documented, durable, statistically significant ecological relationships in this Estuary. *See, e.g.*, SWRCB 2010 Flow Report; DSP Outflows Review Panel Report 2014. Kimmerer et al. 2009, like numerous other research papers, clearly demonstrates

that freshwater flows (as represented by X2) remain strongly and significantly correlated with longfin smelt abundance. However, additional, more recent models should be used for projecting longfin smelt populations in futures with and without BDCP, because:

1) The model used by BDCP does not incorporate any effect of previous population size; thus, any given X2 value always predicts the same longfin smelt abundance index, regardless of whether the previous (parental) generation had high abundance or low abundances. Models that incorporate historical longfin smelt population size (or "stock") have been developed. TBI/NRDC 2010 Exhibit 2; USFWS Progress Assessment April 3, 2013. These models show a significant effect of historical population size on current population size (i.e., models with both Delta outflow and recent population size predict current population size better than models with flow alone). Indeed, the Draft Plan claims to analyze BDCP effects on longfin smelt abundance using a model that incorporates stock, *see* Draft Plan at 5.C.0-5, but such a model is not present in the Effects Analysis or the DEIS/DEIR. The DEIS/DEIR should utilize one of the recent models that incorporates both flow and prior-abundance to estimate future abundance of longfin smelt. As a result of applying the very simple Kimmerer et al. (2009) relationships without accounting for the effect of current population sizes that are close to their historic lows, the DEIS/DEIR likely overestimates the size of future longfin smelt populations;
2) The model will only predict population extinction when X2 is such that the equation solves for "y" (longfin smelt index value) = 0. Any X2 that is marginally below (better than) this critical threshold will predict retention of the population and, even if the critical value of X2 is reached in one generation, the equation will predict a "resurrection" of the population the next time X2 is better than the critical value (*see* issue #1 above). This is a critical flaw in a model that is being used to evaluate the conservation status of a population in the future as it is quite blind to the risk of persistently low populations and the fact that, if the longfin smelt population is locally extirpated, it will be very difficult or impossible to restore;
3) The Kimmerer et al. 2009 relationship accounts for two different flow-abundance relationships corresponding to periods pre- and post-1987; it is not clear which time period the analyses uses to project longfin smelt abundance into the future. However, there is evidence to indicate that a second decline in the flow-abundance relationship may have occurred, creating a third relationship from the early-2000's to the present. Thomson et al. 2010. Thus, the relationship between flow and abundance used in the DEIR/DEIS likely overstates the longfin smelt abundances that will result from Delta outflows under the BDCP.

In addition, the way the Draft Plan and DEIS/DEIR apply modeled Delta outflow results as inputs to the longfin smelt abundance-X2 relationship is inappropriate. The numerous inadequacies with the flow modeling employed by the Draft Plan and DEIS/DEIR are documented elsewhere in this comment letter. All of the biases and uncertainty associated with the Draft Plan and DEIR/DEIS flow model outputs are relevant here and many are magnified in the longfin smelt analysis by the addition of uncertainties and biases inherent in the approach to modeling longfin smelt impacts. And as discussed in our comments on the flow modeling, it is not clear that the HOS flows are likely to actually occur.[59]

Furthermore, it is not clear that the analyses reflect accurately the Kimmerer et al. 2009 methodology or that the analyses reflect the Draft Plan's own conceptual model relating Delta outflows (and/or X2) on longfin smelt abundance. The Kimmerer et al. 2009 model uses X2 values averaged over the January-June period. But the Draft Plan states its belief that flows in the March-May period affect longfin smelt abundance. Draft Plan at 5.5.2-8. But then the DEIS/DEIR states, "Relationships between December through May X2 position and log longfin smelt abundance … were used to determine how the changes in winter-spring X2 position described above might influence longfin smelt abundance the following fall." DEIS/DEIR at 11-1305. There is no explanation for the mismatch of months used in the analysis and those used by Kimmerer et al. 2009 or those assumed to be important in the BDCP conceptual model.

Using the average X2 position from December through May means that the analysis ignores variations within that 6-month period as they are eliminated by averaging. In 2013 USFWS stated that, "The effects analysis did not use the best available longfin smelt statistical models to support its net effects conclusion." USFWS 2013 Progress Assessment at 18. It then quotes the USFWS 2012 Red Flags as follows:

> The older regression models that were used in the effects analysis are published, but can easily be shown not to perform as well as the newer models. The older models also average the flow influence on longfin smelt across half a calendar year, which likely affects conclusions about the reduction in springtime outflow seen in modeling outputs for the Preliminary Proposal.

Id. Kimmerer et al. 2009 averaged X2 values over winter-spring because that is generally when longfin smelt are spawning and rearing in or near the Delta; they had no *a priori* or statistical reason to consider smaller time periods for X2, and they were not trying to model differential

[59] In addition, the Projects' frequent practice of requesting and receiving Temporary Urgency Changes to Delta outflow requirements under Dry and Critically Dry conditions (such as those that were requested and granted in WY 2014) strongly suggests that flow conditions projected in the Draft Plan and DEIS/DEIR for Dry and Critically Dry years overestimate the actual amount of flow that will occur in some of those years and that the analysis thus overestimates the indices of longfin smelt during drier years.

impacts to longfin smelt resulting from alterations to the historical hydrological relationships among months in the winter and spring (flows in those months are strongly correlated). However, for many of the potential mechanisms by which X2 might control longfin smelt productivity (population growth or decline; *see* Kimmerer 2002b), changes in X2 or flow within the winter-spring period would be as or more important than the "average" value for the whole period.

Kimmerer et al. 2009 do not suggest and certainly do not demonstrate that mean X2 position for the 6-month winter-spring period is the best indicator of flow related effects on longfin smelt abundance – their results could also mean that a critical flow related effects occur in a shorter time window within the January-June time frame or that minimum or maximum flows in that period controlled the population response. For example, the Draft Plan suggests that March-May may represent the critical period for flows – so why not study flows and X2 in the March-May period? Even within that smaller time window, the analyses should focus on the potential for extreme flows (high or low) and corresponding X2's to drive outcomes for longfin smelt rather than the mean flow. It is at least as likely that the largest or smallest value of X2 in the winter-spring drives the population response of longfin smelt as it is that the mean value of X2 controls population levels.

It is also possible that flows (or X2) in a narrower time window than January-June have the greatest influence on the population, as more recent models suggest. Just because Kimmerer 2009 uses a six month average does not mean that average flows over that entire period are driving the effect. Flows in a narrower window, or maximum or minimum flows during that period, are likely to be the variable that longfin smelt populations respond to. The Draft Plan and DEIS/DEIR should be aware of these possibilities (we and others have made this comment before) and should present, in addition to effects based on mean winter-spring flow, estimates of effect on the longfin smelt population if flows in a narrower window or maximum or minimum flows during winter-spring actually drive the population. If mean X2 is not the most relevant flow variable for predicting longfin smelt population (as opposed to a maximum or minimum) or the most important time frame for X2 position is a subset of the months used in the Kimmerer et al. 2009 relationship, then the usefulness of the Kimmerer et al. 2009 relationship for predicting longfin smelt populations in the future would be reduced in a situation where the timing of flows across months is different than it has been historically (as would occur under BDCP and climate change). Since extreme values (high or low X2) may be what actually controls the overall pattern described by Kimmerer et al. 2009 and, because the BDCP will change the relative distribution of those flows in months within the Jan-June period (*see* DEIS/DEIR at Table 11-4-7, Table 11-4-9), the Kimmerer et al. 2009 relationship may not be the most sensitive to the real effects on longfin smelt populations represented by the altered hydrograph anticipated under the Draft Plan and DEIS/DEIR. This is not the first time we have warned that BDCP draft documents: "…presents the flow-abundance relationships for the longfin smelt population in this Estuary in a

way that will tend to lead to underestimation of potential impacts to this species." Memorandum to J. Meral from TBI, EDF, and Contra Costa Water District re: Review of Appendices C and D December 21, 2011. Fortunately, having calculated X2 for January-June and, using the Kimmerer et al. relationship, the associated longfin smelt abundance index for each year in the record, the Effects Analysis and the DEIS/DEIR must have the data necessary to calculate the alternate outputs we suggest (i.e. maximum and minimum longfin smelt estimates based on max and min X2 for any month in the January-June period). We have requested this analytical approach before. The Bay Institute, 2013 comments on Administrative Draft Appendices C and D, at 7-8.

ii. Even with the Flawed Modeling Biased Towards more Positive Outcomes, the DEIS/DEIR Projects Substantial Declines in the Abundance of Longfin Smelt from Recent Unacceptably low Levels under most Alternatives

Relative to longfin smelt abundances seen in recent years (abundances that are lower than those that warranted listing under the California and federal Endangered Species Acts), the Draft Plan and DEIS/DEIR project significant declines in longfin smelt abundance in the future. The alleged benefits to longfin smelt abundance claimed in the Draft Plan (*see* Table 5.5.2-2) and DEIS/DEIR (*see* Table 11-4-8.) are meager and result reflect only a comparison to a modeled future baseline in which spring outflows (and longfin smelt) decline significantly.

With respect to longfin smelt abundance, the relevant question is: "Will the longfin smelt population increase (display higher abundance indices) from current levels to levels that are consistent with conservation of this species in the Plan Area?" The Draft Plan Technical Appendix 5C addresses these questions in tables such as 5C.5.4-39 where it compares EBC2 modelled in the present day ("EBC2") to conditions under the BDCP in the late long term (ESO_LLT). This comparison shows that longfin smelt populations are expected to decline 22%-33% from current levels (as predicted by the Draft Plan's modification of the Kimmerer et al. 2009 relationship). *See* Draft Plan Appendix 5C at Table 5C.5.4-39. Table 5C.5.4-41 and Table 5C.5.4-43 provide a similar comparison, for two different sampling programs, and they show slightly larger declines. Thus, the BDCP's Technical Appendix anticipates very significant proportional declines in longfin smelt abundance over the BDCP permit term. The CEQA/NEPA conclusions in AQUA-23 and AQUA-24 that there will not be significant impacts are not supported by the substantial evidence, and the modeling shows that Alternative 4 and other alternatives will cause significant impacts and cumulatively significant impacts.

The DEIS/DEIR (Table 11-4-8) and Draft Plan (Table 5.5.2-2) rely on a misleading and erroneous comparisons to claim that BDCP will improve longfin smelt abundance. In addition to showing the large relative and absolute declines in longfin smelt abundance projected to arise

under the Draft Plan, these tables present a comparison of ESO_LLT to EBC2_LLT, which suggests that conditions under the BDCP will be marginally better than under current operations applied to modeled future conditions. It is unclear whether any of the reported differences are statistically significant because the error bounds of the Draft Plan or DEIS/DEIR estimates (i.e., the variance associated with the Kimmerer et al. 2009 model combined with those related to modeled Delta outflow) are not reported. This comparison is misleading because it assumes that operations do not adapt to climate change. However, given that these assumptions regarding changing environmental conditions lead to projections of very significant declines in longfin smelt abundance, the Draft Plan should not assume that either current operating rules or those envisioned in the BDCP alternative will be permissible. So, while the modeling seems to indicate some very small benefits to longfin smelt abundance of BDCP operations compared to status quo operations, there is no reason to expect that either operation will result in conservation or restoration of longfin smelt.

There are feasible measures to address anticipated baseline freshwater flow rates that are under control of the Projects, in order to avoid or reduce the negative impacts that threaten the continued existence of covered species. We – and many other agency and independent scientific reviewers – have repeatedly recommended substantial increases in Delta outflow to avoid these predicted outcomes. For instance, Alternative 8 in the DEIS/DEIR includes increases in spring outflow as recommended by the SWRCB.

With regard to its own productivity objectives, which are inadequate (*see* above), the relevant question for evaluating the Draft Plan's progress towards attaining the co-equal goals is: "Will abundance relative to winter-spring hydrology (i.e., flow corrected abundance, or "productivity") increase to levels consistent with conservation and restoration of the species?" The DEIS/DEIR does not compare outcomes projected under the Plan to those targeted by its productivity objectives. And, because the productivity objectives are "flow corrected," the DEIS/DEIR has not developed information that would allow evaluation of whether non-flow related activities (such as CM4, CM6, etc.) will produce improvements in flow corrected abundance. However, it is abundantly clear from the results in the Draft Plan's Technical Appendix and Effects Analysis that the BDCP is not likely to "restore" flow corrected abundance to 1980-2011 levels (the Conservation Strategy's inadequate target) or 1967-1984 levels (the USFWS 1995 Draft Recovery Plan target) because absolute abundances are predicted to decline substantially from current levels (which are already below those implied by the productivity objective) in each water-year type category. Thus, even the flawed and biased analyses in the DEIS/DEIR and Draft Plan demonstrate that BDCP likely will not attain critical conservation targets for this covered species.

iii. Draft Plan and DEIS/DEIR Rely on "Average" Results for Longfin Smelt Populations in Different Year Types, Which Understates Likely Environmental Impacts to the Species

Similarly, the DEIS/DEIR rely on "average" projected flow conditions (and changes in flow conditions) to predict longfin smelt outcomes in the future. The analysis does incorporate reasonably foreseeable changes in the frequency of year-types experienced by the longfin smelt or magnitude of flows in different year types, in the future. The use of average flows is particularly inappropriate for analyses of semelparous organisms with discrete generations; longfin smelt will respond to actual conditions within a given year, not to the long-term average, so if several low outflow years occur in sequence, then population will decline and may be extirpated. The use of the long-term average conditions to gauge longfin smelt response is also misleading because the average depends on the frequency distribution of different hydrological year types (and conditions in each year type) and this distribution is likely to change (i.e. due to normal or human induced climate changes).

Like Delta smelt, longfin smelt are believed to be semelparous (die soon after spawning the first time) and have largely distinct spawning classes. This means that the population response to any set of annual conditions is not tempered by overlapping generations or the capacity for mature fish to delay spawning in bad years. Thus, for the BDCP analysis, conditions in individual years and the frequency of good and bad conditions are more important than are "average" conditions over many years. The Draft Plan and DEIS/DEIR's presentation of "average" change in the population (depicted under the heading "All") is deceptive and confusing in a way that paints an inappropriately optimistic view of aggregate effects on longfin smelt populations. For example, if conditions in a particular year were such that a population experienced a 100% decline ("extinction"), it would not matter what the "average" condition was in a given year type or across all year types. The Draft Plan and DEIS/DEIR should present results and comparisons between scenarios that anticipate a series of years with poor environmental conditions in a row (as in the 1987-1994 drought or the 2012-current drought) because those are conditions that the covered species actually experience; at a minimum, the Draft Plan and DEIS/DEIR should compare the worst case conditions in each year-type between modeled scenarios – differences in the worse-case conditions will better reflect the likelihood of conserving the population in the Plan Area. As a result of modeling "average" conditions, the Draft Plan likely understates the potential environmental impacts to the species, and overstates likely abundance.

The Draft Plan misrepresents its likely impact on freshwater flow rates in a manner similar to those made in its presentation of longfin smelt population impacts. In addition to the fact that "average" conditions are not as relevant to conservation efforts as the frequency and magnitude of extreme conditions (*see* above), presenting flows in the "average" year assumes some distribution of water year types (here, flow conditions) affecting the population which may or

may not occur – if the future brings a long series of "dry" years, all that will matter is how the fish populations perform under BDCP during "dry" years compared to how they would perform in "dry" years without a BDCP. With regard to Delta outflow, the Plan assumes that Wet, Above Normal, Below Normal, Dry, and Critical years types occur in 32%, 15%, 17%, 22%, and 15% of years respectively. Draft Plan at 5.2-16. If these conditions do not hold in the future, then the "average" result of that hydrological distribution will not occur either. This could occur under climate change, *see* Null and Viers 2013, and would also occur when/if human water management changes the frequency or "wetness", as experienced by the Bay-Delta ecosystem, of different year types. For example, as we discuss with respect to cumulative impacts, if water users develop greater water storage capacity (e.g., greater reservoir capacity, on or off-river, or greater groundwater storage) then humans will capture more of the available runoff in wetter year types. This will make the wetter year types less frequent and likely make all year types less wet from the perspective of organisms and processes that rely on Delta outflow.

The Draft Plan and operational alternatives modeled in the DEIS/DEIR clearly produce low flows in many years. Even under the "High Outflow Scenario", outflows lower than the status quo are expected in drier years. These are years when the longfin smelt population is particularly vulnerable. *See* Rosenfield 2010. According to our calculations, the "low outflow scenario" (LOS) will result in Delta outflows during March through May that are lower than recent historic (1970-2003) outflows in approximately 70% of years. The "high outflow scenario" (HOS) will only generate Delta outflows that are higher than recent historic flows (between Jan and June) during the Below Normal Year-type in the late long term. All other year-type average display a 0.4% to 1.8% decrease in NDO compared to the No Action Alternative. As a result of these projected declines (or minor increases) in Delta outflow, longfin smelt abundances are projected to decline significantly in the early and late-long term of the BDCP compared to current conditions.

iv. The Draft Plan's Presentation of Projected Outcomes for Longfin Smelt Abundance and Productivity is Confusing and Prevents the Average Reader from Comprehending the Impact of BDCP

The Draft Plan creates unnecessary confusion by presenting model outcomes based on input of three different longfin smelt sampling programs. The Effects Analysis technical appendix alone presents at least 11 different tables showing projected changes in longfin smelt abundance. The Draft Plan's technical appendix (Appendix 5.C.) demonstrates that each of the three longfin smelt sampling programs it employs to model projected outcomes produces nearly the same results. The most relevant sampling program for projecting the relationship between longfin smelt abundance and X2 is the Fall Midwater Trawl (FMWT) sampling program as (a) that is data set used by Kimmerer et al. 2009 to develop the model the Draft Plan relies on for forecasting longfin smelt populations; (b) the FMWT program samples intensively in the areas

most immediately affected by BDCP, whereas the other sampling programs sample the entire Bay Estuary diffusely; and (c) the FMWT sampling program data series is substantially longer than the record for the other sampling programs. Kimmerer et al. 2009 and Rosenfield and Baxter 2007 both found substantial concurrence among the different data sets of longfin smelt sampling that are used in the Draft Plan and DEIS/DEIR analyses. Thus, while presentation of separate results for three different sampling programs compounds the confusion for readers, it is not clear that any additional information is gained by presenting separate analysis of the data from three different longfin smelt sampling programs.

Furthermore, the projected outcomes of BDCP on longfin smelt abundance presented in the DEIS/DEIR do not match those found in the Draft Plan's technical appendix. The DEIS/DEIR summary is inconsistent with the Draft Plan's associated technical appendix. *Compare* DEIS/DEIR at 11-1308 (Table 11-4-8) *with* Draft Plan at 5C.5.4-104 to –109. Many of the results presented in the DEIS/DEIR are not displayed in the technical appendix, and the DEIS/DEIR does not reveal how it arrived at estimates that differ from those found in the technical appendix; thus, it is challenging to review and compare the two documents and to evaluate the DEIS/DEIR.

v. The Draft Plan is Unlikely to Achieve the Entrainment Objective for Longfin Smelt, and Entrainment will Continue to Harm the Species. The Presentation of Results is Confusing, Biased Towards Positive Outcomes, and Internally Inconsistent

The presentation of entrainment impacts on longfin smelt within and across the Draft Plan's Effects Analysis, Entrainment Appendix (Appendix 5B), DEIS/DEIR, and the DEIS/DEIR Summary of Effects are confused and contradictory, and the conclusion of no significant impacts (AQUA-21) is not scientifically justified. As described above, the Draft Plan clearly identifies an objective intended to reduce entrainment of longfin smelt (though it is not written in a manner that will necessarily accomplish such a reduction) and to distribute entrainment evenly across the winter-spring in order to eliminate differential impacts to longfin smelt life history variants (though, again, it is inadequate to affect that intent). Contrary to the intent of the entrainment-related objective for longfin smelt, entrainment of longfin smelt is projected to remain unchanged or even increase during dry years, when most longfin smelt entrainment occurs. For example, during Dry and Critically Dry water year types, entrainment of juvenile longfin smelt is expected to increase or remain unchanged during the early and late long term in April. Draft Plan at Table 5.B.6-163 and Table 5.B.6-164. The Draft Plan acknowledges that during Dry water year types, when most entrainment of juvenile longfin smelt would occur, entrainment loss under evaluated starting operations (ESO) compared to current conditions would increase by 4% in the early long term. Draft Plan at 5.B-231.

Despite the Effects Analysis' findings that juvenile longfin smelt entrainment will increase from current levels in drier years (years when the population already suffers poor recruitment) during the early long-term, it concludes that the BDCP will generate a "low" *positive* effect on juvenile longfin smelt entrainment and "very low" positive effects on larval longfin smelt. Draft Plan at Figure 5.5.2-5. The DEIS/DEIR does not convey changes in entrainment rates in the early long term, *see, e.g.,* DEIS/DEIR at Table 11-4-5, but increased entrainment in drier years is a negative effect in the early long term. Given the precarious state of the longfin smelt population, this may translate to a long-term effect that impacts any anticipated benefit in the late long term. Again, we note that average changes in entrainment rates modeled over many years are immaterial to fish that are semelparous (have only one chance to reproduce) and live for only two years – multiple generations of longfin smelt may experience only the higher entrainment expected under drier years and an extended period (i.e. a drought) of such high entrainment could do significant and possibly irreparable damage to the population.

The Draft Plan does not directly compare the predicted changes in longfin smelt entrainment to the Draft Plan objective of limiting longfin smelt entrainment. However, neither the Effects Analysis nor the DEIS/DEIR indicate that longfin smelt entrainment will be reduced to levels less than 5% of the population per year, as required by objective LFSM1.2. Entrainment rates for each life stage of longfin smelt vary substantially based on water-year type; it is well-known that entrainment rates for this species increase dramatically in drier year types and can be negligible in wetter year types. Sommer 2007; CDFW 2009; Grimaldo et al. 2009; Rosenfield 2010. Entrainment rates also vary based on the assumed distribution of longfin smelt spawning (when more longfin spawn closer to the pumps, more of the subsequent larval population is entrained). For example, the Effects Analysis projects that in drier year types, if 15% of longfin smelt spawn in the South Delta, then up to 19.1% of the larval longfin smelt population may be entrained under BDCP operations. Under these conditions, projected entrainment of larval longfin smelt exceeds the 5% *total* entrainment maximum set in objective LFSM1.2 in more than one quarter of the years analyzed in the Early Long Term period. Draft Plan at Table 5.B.6-151. This analysis does not account for cumulative effects of entraining other life history stages (juvenile or adult).[60]

These findings reveal that:

[60] Modeling of the entrainment risk for longfin smelt and other species is highly reliant on the modeling of Delta flows and in-Delta hydrodynamics and is thus subject to the quality of the assumptions used to perform that modeling and the uncertainty inherent in such modeling. Flaws and high uncertainties associated with the BDCP's hydrological and hydrodynamic modeling are described, at length, in our comments. Here, it is important that the reader understand that the modeled entrainment risks are extremely uncertain and may be higher than modeled in some cases and that the modeling itself lends itself to an underestimation of entrainment risks.

- entrainment of juvenile longfin smelt is expected to be quite high now under certain conditions (the BDCP cannot achieve large reductions in longfin smelt entrainment if entrainment is not high to begin with)
- entrainment is expected to increase in certain year types under BDCP operations in the early long term; and,
- the risk of entrainment will not be "evenly distributed over the adult migration and larval-juvenile rearing periods" as required by objective LFSM1.2.

The DEIS/DEIR treatment of entrainment as a stressor to longfin smelt is inconsistent and internally contradictory. For example, in reporting higher entrainment levels that would be expected under Alternative 1A, the DEIS/DEIR declares:

> The salvage density approach for March-June entrainment suggested that overall entrainment loss would be similar or slightly increased (by up to 25%) under Alternative 1A. Although there were considerable increases in entrainment rate (over 100% in some cases) under Alternative 1A in below-normal years, the actual number of fish involved were very low… Higher numbers of entrained fish were estimated in dry water years. In these years, entrainment under alternative 1A was 14-44% higher than NAA. In critical years, there were modest decreases of 5-20% in entrainment under Alternative 1A relative to NAA"

DEIS/DEIR at 11-200.

The DEIS/DER does not explain why an increase of "up to 25%" in longfin smelt entrainment would be considered a "slight" increase, or why, in the same paragraph a smaller decrease in entrainment of 5-20% would be considered a "modest" improvement (which implies an impact that is greater than "slight"). It is also not clear how the 25% increase in entrainment statement squares with those that follow, predicting increases in entrainment of "over 100%" or "14-44%" in some cases. Rather than acknowledge and address the failure of Alternative 1 operations to reduce entrainment as the Draft Plan intends, the DEIS/DEIR undermines the rationale for declaring that objective at all, stating: "Entrainment at the SWP and CVP facilities is not believed to be an important stressor influencing survival of longfin smelt larvae, as they are generally encountered in substantial numbers at the south Delta facilities only in dry years (approximately one-third of all water years). Consequently the population-level impact of this stressor on longfin smelt larvae is believed to be low." DEIS/DEIR at 11-200.[61] The DEIS/DEIR

[61] It is entirely unclear how the DEIS/DEIR can downplay the importance of entrainment as an impact based on the frequency of encountering "substantial numbers" of larval longfin smelt at the south Delta facilities since larval smelt were not identified (much less enumerated) at the salvage facilities prior to 2008. CDFW 2009 Incidental Take Permit for the SWP at 6.

goes on to state that, "Based on the limited potential for a population-level effect on longfin smelt and the minor to moderate change in the entrainment expected under Alternative 1A, the effect of entrainment would not substantially change for juvenile longfin smelt." DEIS/DEIR at 11-200 (emphasis added). This analysis of potential negative effects for one set of BDCP operations (Alternative 1) stands in contrast to its interpretation of alleged positive effects for another operational alternative 4. Although the proportional magnitude of positive effects are similar, the positive effects anticipated under Alternative 4 operations are judged to be "substantial," DEIS/DEIR at 11-1304, while the negative effects under Alternative 1 are termed "low." The DEIS/DEIR rationale for downplaying negative effects to longfin smelt entrainment under Alternative 1 exemplifies its flawed approach to evaluating impacts. The DEIS/DEIR argues that the anticipated negative entrainment effects to longfin smelt are minor because such impacts "only" occur in about 1 of every 3 years. This is scientifically unjustified. As we have described before, longfin smelt are short-lived (~2 years) and semelparous; as a result the longfin smelt population is very sensitive to conditions that occur in individual years and less sensitive to "average" conditions. Thus, an action that increases a known impact to the population by 14-100% (the range of increases identified in the DEIS/DEIR) should be modified, even if the effect occurs "only" in a fraction of years. Moreover, the impact of high entrainment rates on longfin smelt in drier years is important because longfin smelt experience lower recruitment in dry years; to quote the CDFW's incidental take permit for the SWP, "the mortality associated with entrainment would be highest when the population already faces adverse recruitment conditions attributable to low outflow." CDFW 2009 at 7.

In general, the Draft Plan and DEIS/DEIR take the inaccurate position that the impact of entrainment on longfin smelt have been reduced in recent years, though the Entrainment Appendix acknowledges that longfin smelt salvage has been high "in some years." Draft Plan at 5.B-1. The Draft Plan and DEIS/DEIR presumably refer to implementation of SWP/CVP export controls under the biological opinion for Delta Smelt as reducing salvage of longfin smelt. Yet, entrainment is a known stressor on, and threat to the Bay-Delta's longfin smelt population. Rosenfield 2010; CDFW 2009. In addition, the documents' assumption regarding recent reductions in this impact are not supported by recent entrainment levels; relative to the measured index of longfin smelt abundance, entrainment rates of longfin smelt have been higher since the species' 2009 listing under the state Endangered Species Act than they were before the listing. The Bay Institute and Center for Biological Diversity letter to C. Bonham, CDFW April 27, 2012; *see* The Bay Institute, Center for Biological Diversity, NRDC, and Defenders of Wildlife letter to C. Bonham, CDFW July 10, 2013.

vi. The Draft Plan Fails to Adequately Model Likely Entrainment Rates, Underestimating Likely Entrainment

The Effects Analysis obscures the impact of entrainment on longfin smelt by reporting longfin smelt entrainment rates separately for different life stages: larval, juvenile, and adult. Even if data availability requires different modeling approaches for different life stages, there is only one longfin smelt population and thus, the effects of stressors on multiple life stages must be summarized into a single cumulative impact. A summation of this type would be aided by a numerical life cycle model for the species, but such a model is not required to accurately report the relative impacts of entrainment (or other stressors) on the population as a whole. Also, in a population that is not limited by density-dependent interactions, the proportional loss of any life stage would be directly translated to subsequent life stages and eventual egg production.

Here again, the DEIS/DEIR applies a different standard of impact when results appear to favor the BDCP alternative. When the DEIS/DEIR asserts net benefits of reduced adult entrainment, it no longer questions whether entrainment is a meaningful stressor on the population. *See* DEIS/DEIR at 11-201.

The Draft Plan entrainment index and DEIS/DEIR fail to use known relationships between OMR flow rates and longfin smelt entrainment. Entrainment rates of longfin smelt and other pelagic fish species are known to correlate with impaired hydrodynamic patterns in the South Delta caused by the relationship between Delta export rates and Delta outflows. CDFW 2009; Rosenfield 2010. In particular, entrainment of longfin smelt and other species is significantly and negatively correlated with flow rates in the Old River and Middle River distributaries of the San Joaquin River; entrainment rates accelerate rapidly as Old and Middle River (OMR) flows become increasingly negative (flow towards the South Delta export facilities on a tidally averaged basis). Grimaldo et al. 2009. The Draft Plan fails to use OMR as an indicator of entrainment risk despite this known relationship. *See* Draft Plan at Table 5B.5-2. The Draft Plan's analysis of OMR flow rates under the BDCP indicate that they will be nearly unchanged or more negative in all year-types during April and May in both the Early Long Term, *see* Draft Plan at Figures 5B.4-15 to 4-19, and Late Long Term, *see* Draft Plan at Figures 5B.4-20 to 4-24. These are the months in which longfin smelt are most susceptible to entrainment. Rosenfield 2010. As a result, the Draft Plan fails to accurately analyze a potentially significant impact and/or the ability or failure of the BDCP to alleviate a known, periodic stressor on the longfin smelt population.

B. Chinook Salmon

1. Draft Plan Objectives for Chinook Salmon and Steelhead Populations are Inadequate

i. The Proposed Objectives are Not Consistent with the CVPIA/AFRP, ESA, and Other Laws

Unfortunately, the Draft Plan's objectives for Chinook salmon and steelhead productivity are inadequate. The Draft Plan sets thresholds for Chinook salmon and steelhead survival based on population growth rates necessary to attain Chinook salmon and steelhead abundance targets within 40-50 years after BDCP is adopted. Draft Plan Appendix 3G. There are at least two problems with setting survival rate objectives as proposed in the technical appendix. First, there is no scientific justification or rationale for survival rates that produce such anemic growth rates for Chinook salmon; Chinook salmon typically display much higher freshwater survival rates than are described in the Appendix, particularly in the first half of the BDCP permit term. Quinn 2005; Healy 1995; Bradford 1995. Thus, setting the date for attaining abundance targets 40-50 year in the future is arbitrary and inadequate.

Second, the abundance targets the Draft Plan uses to set growth rate (and thus, through-Delta survival) are not those specified by the CVPIA Anadromous Fish Restoration Program (AFRP) or the NMFS 2014 Final Recovery Plan for Central Valley salmonids (or for that matter, in the 2009 Draft Recovery Plan). For example, the BDCP Draft Plan identifies a global goal (a target to be attained by restoration efforts throughout this fish's life cycle, including upstream spawning areas, the BDCP Plan Area, and the ocean) for winter-run Chinook salmon escapement of 23,800 fish. However, this is a small fraction of the AFRP target for this species (110,000 2-yr+ fish in the ocean). AFRP 2001, Appendix B at B-1.[62] Setting survival rates based on the growth rates needed to attain an inadequate and arbitrary abundance target over an inadequate and arbitrarily long timeframe is unacceptable. Similarly, the Draft Plan's target for Sacramento River steelhead abundance is less than that specified in the AFRP. *See* AFRP 2001, Table 1. There is no explanation of the abundance target for Central Valley steelhead returning to the San Joaquin basin (1,700 per year), though this number is clearly less than that required to meet the draft recovery standards for steelhead in the San Joaquin basin. The NMFS 2014 Final Recovery Plan requires two populations in the Southern Sierra diversity group (the San Joaquin drainage basin) to be maintained at low risk of extinction and multiple "Core 2" populations maintained at

[62] Although escapement (the BDCP metric) is always lower than production (the AFRP metric) because fish die of natural causes and human fishing post-"production," the discrepancy either assumes an unreasonably high harvest rate (the California commercial fishing season is currently timed to minimize and avoid fishing-related mortality to winter-run Chinook salmon) or non-attainment of the AFRP target for winter-run Chinook salmon.

"moderate risk of extinction" or better. NMFS 2014 Final Recovery Plan at 98. The Recovery Plan defines populations at "low risk" as displaying, among other criteria, a census population abundance of 2,500 fish (or ~833 returning spawners per year). *Id.* at 97. Two such populations with 833 returning steelhead/year would be a minimum of 1,666 returning steelhead each year. The Recovery Plan defines populations at moderate risk to constitute returns of no less than 250 fish (or ~83 spawning steelhead per year). *Id.* Three such populations would be a minimum of 249 spawning steelhead. Thus to achieve recovery targets for steelhead in the San Joaquin Basin, it appears that the Delta must provide survival rates that can support the return of no less than 1,916 steelhead each year (two populations at low risk of extinction with at least 833 returning spawners per year, plus three populations at moderate risk of extinction or better, with at least 83 spawners per year) – this target is more than 12% higher than that used in the Draft Plan's technical appendix.

Finally, even with faulty abundance assumptions and unacceptably protracted period assumed for attainment of its abundance targets for the Central Valley salmonids, the Draft Plan's technical appendix reveals that its survival rate targets are likely insufficient to achieve those abundance targets. Specifically, neither spring-run or fall-run Chinook salmon from the San Joaquin basin are projected to reach the abundance targets that the Draft Plan relies on to set Delta survival targets, indicating that these through-Delta survival targets are insufficient to meet salmonid abundance targets for the San Joaquin Valley. In the case of fall-run Chinook salmon, the projected survivals are insufficient to support populations consistent with the CVPIA/AFRP and analogous state law (Cal. Fish and Game Code § 6902) for the San Joaquin River's tributaries. Draft Plan Appendix 3G at 20-21 (Table 4).

Furthermore, the Draft Plan assumes maintenance of status quo through Delta survival rates for the first 10 years of a BDCP followed by a very slow incremental improvement in survival rates for various Chinook salmon and steelhead populations. The resulting survival targets would lead to substantial declines in all Central Valley salmonid populations and steelhead, including extirpation of all San Joaquin salmonids in the first 10 years and near eradication of the endangered winter-run Chinook salmon population. Draft Plan Appendix 3G at 20-21 (Table 4).[63] This is a clearly unacceptable outcome and significant impact, and there are feasible alternatives and mitigation measures to reduce or eliminate this impact.

The Draft Plan identifies the need to conserve the life-history attribute of salmonid viability. *See, e.g.,* Draft Plan at 3.3-140 (Objective WRCS3.2); *id.* at 3.3-148 (SRCS3.2); *id.* at 3.3-156 (FRCS3.2). However, the stated objectives ("Operate water facilities to support a wide range of

[63] Also, it is not clear why the winter run population mysteriously increases from a predicted low of 565 fish in year 10 to 709 fish in year 11 of the BDCP. If this increase is an error as it seems, it will produce erroneous results that overstate the final estimated populations.

life history strategies … without favoring any one life history strategy or trait over another") is inadequately defined, so it is not possible to tell whether the objective is sufficient, whether the Draft Plan will attain the target (prior to adoption of the BDCP), or under what circumstances adaptive management actions will be triggered to attain the objective (post-implementation). As with similarly ill-defined objectives (such as those described above for longfin smelt and Delta smelt), the Draft Plan identifies export operations and associated fish entrainment as a potential stressor on salmonid life history, but the Conservation Strategy offers no guidance as to what constitutes acceptable homogeneity in entrainment risk and how to address it. As described for other species, one approach to quantifying this objective would be to identify entrainment limits on short time steps (e.g., weekly) to assure that no particular temporal component of a migrating cohort of juvenile salmon is disproportionately affected by entrainment; these weekly entrainment limits can be combined with annual and multi-year average entrainment rates in a way that allows for management flexibility and increased protection for covered fish species. Furthermore, the Draft Plan fails to identify targets and actions to limit life-history impacts due to high temperatures or low flows upstream as these impacts tend to be asymmetrical in time (i.e., affecting early or late ends of the diversity spectrum) and are largely under the control of Project operators.

ii. The Draft Plan Fails to Identify any Objective for Key Attributes of Viability that are Necessary to Achieve Conservation and Recovery of Central Valley Salmonid Species

The Draft Plan fails to establish objectives for other key attributes of viability that are necessary for recovery, such as spatial diversity. As discussed above, the Draft Plan sets survival objectives for both spring-run and fall-run Chinook salmon and Central Valley steelhead that: (a) likely lead to their extirpation of in the San Joaquin Basin during the first 10 years of the BDCP; (b) provide for no population growth and low abundance for years 10-19; and, (c) never support the abundance target identified as the global goals for the Chinook salmon populations. Draft Plan Appendix 3G at 20-21 (Table 4). If the Draft Plan established an adequate objective for spatial diversity for spring-run and fall-run Chinook salmon and steelhead then it would have focused on identifying stressors (e.g., high through-Delta mortality) and conservation measures (including but not limited to improved flow regimes) that would support conservation and recovery of these covered populations. But because it fails to set adequate objectives, the Draft Plan seems oblivious to the extirpation of existing salmon populations.

2. The Draft Plan Fails to Identify and Address the Correct Stressors on these Species

i. The Draft Plan and DEIS/DEIR Mischaracterize and Understate the Impact of Reservoir Operations on Chinook Salmon and Steelhead

The Draft Plan and DEIS/DEIR's presentation of stressors on Central Valley Chinook salmon ignores the proverbial elephant in the room – poor water quality, temperatures, and freshwater flow conditions related to CVP and SWP reservoir operations. Although the Draft Plan correctly acknowledges the historical role of dams in restricting Chinook salmon access to high elevation spawning habitats, *see* Draft Plan at 3.3-122, it ignores or downplays the impact of current dam operations on available spawning habitat, rearing, and migration habitat. Because the geographic range of Chinook salmon and steelhead spawning in the Central Valley is constrained by the presence of impassable dams (*see* Yoshiyama et al. 2001; Lindley et al. 2004), conditions below those dams have tremendous influence on the viability of these populations, including their abundance (total carrying capacity), productivity (survival rates), life history diversity (e.g. size and condition of juveniles, timing of upstream and downstream migration), and geographic range (extent of available spawning habitat). High temperatures have multiple deleterious effects on Chinook salmon, the type, severity and frequency of which vary with population spawning time and location. Quinn 2005; Myrick and Cech 2004, 2005; Richter and Kolmes 2005; NMFS 2014 Final Recovery Plan. Central Valley dams and reservoir operations exert great control on water temperature conditions in Chinook salmon spawning and rearing habitat. Nickel et al. 2004; NMFS 2009 Biological Opinion. However, the Draft Plan mentions reservoir operations only tangentially in its discussion of water temperature as a stressor on Chinook salmon. In describing the impact of temperatures, the Draft Plan credits a temperature control device (TCD) on Shasta Dam and "improved reservoir management" as "important factors contributing to the increase in adult winter-run Chinook salmon abundance in recent years." Draft Plan at 3.3-123. Yet the biological opinion indicates that upstream water temperatures have exceeded requirements in recent years, despite the TCD. *See* NMFS 2009 Biological Opinion at 263.

In addition to temperature impacts caused by operations of the Project reservoirs, flows below those dams severely constrain the abundance, productivity, spatial distribution, and life history diversity of numerous Central Valley salmonid populations. For example, following the end of the winter-run Chinook salmon incubation season releases from Shasta/Keswick are often reduced, often resulting in dewatering of fall-run Chinook salmon redds on the Sacramento River, even in recent years. SRTTG 2013; CDFW 2013. Dewatering of early spawning fall-run Chinook salmon on the Sacramento River reduces the life history diversity of this population (by eliminating the fraction that spawn, hatch, and migrate early) as well as its productivity (average survival rate) and overall abundance (carrying capacity). Redd dewatering presents similar

problem for steelhead on the American River. NMFS 2009 Biological Opinion at 279 (Table 6-18). Negative impacts resulting from variations in reservoir release have been known to impact steelhead and Chinook salmon on other Sacramento River tributaries as well. *See, e.g.,* Williams 2006 (citing Kurth 2003); DWR 2003.

The Draft Plan does appear to acknowledge the potential for water project operations on temperatures and flow conditions upstream as it sets objectives that require that the BDCP will not reduce the primary constituent elements of winter-run Chinook salmon critical habitat upstream. Draft Plan at 3.3-139 (Objective WRCS3.1). However, this target is misidentified as an objective. Objectives are statements of desired biological outcomes (e.g., a covered species' spawning extent), not drivers of those outcomes (e.g., habitat availability). The point of identifying desired outcomes separately from stressors that will be addressed to achieve those outcomes is to make transparent the Draft Plan's assessment of factors that currently impede attainment of its goals and objectives; such transparency allows reviewers to understand and evaluate the rationale for various elements of the Conservation Strategy. In any case, by setting an "objective" that is already a requirement of the status quo, the Draft Plan ignores potential feasible operational actions that would *improve* the Projects' ability to provide adequate upstream habitat for covered salmonids. *See, e.g.*, Nickel et al. 2004.

The Draft Plan is inconsistent and incomplete in its treatment of the impact of flow modification as a stressor on different runs of Chinook salmon. Flow modifications resulting from CVP and SWP operations are widely understood to affect survival (productivity), abundance (carrying capacity), spatial distribution, and life history diversity of all Central Valley Chinook salmon populations. Moyle 2002; Williams 2006; Williams 2010; NMFS 2009 Biological Opinion; NMFS 2014 Final Recovery Plan. Furthermore, several recent papers have improved our understanding of the relationship between freshwater flow rates, migratory corridor selection within the Delta, and Delta survival rates. *See* Perry et al. 2010; Michele et al. 2012. Even where the Draft Plan acknowledges the need for adequate freshwater flow rates, it largely fails to identify specific flow targets in different locations (in terms of volume, timing, duration, and frequency) that are needed to conserve and restore the different populations of Chinook salmon from the San Joaquin or Sacramento sides of the Central Valley. For example, in the same table where it sets forth the species-specific objectives for Chinook salmon, the Draft Plan lists "altered migration flows" as a stressor to Chinook salmon. Draft Plan at 3.3-134. However, its target for this stressor is only to "ensure that north Delta intake operations do not increase the incidence of upstream flows in the Sacramento River at the Georgiana Slough junction." *Id.* This target mistakes ameliorating current stressors on the population with preventing further harm from implementation of one of the Plan's own "conservation measures." In so doing, the Draft Plan ignores the fact that current flow levels are inadequate upstream, into the Delta, through the Delta, and out of the Delta into Suisun Bay. *See, e.g.*, NMFS 2009 Biological Opinion; NMFS 2014 Final Recovery Plan; SWRCB 2010 Flow Report; CDFW 2013 Letter to

the SWRCB. In addition, one of the landscape level objectives for Chinook salmon that speaks to the need for adequate transport flows for larval and juvenile fish. Draft Plan at 3.3-127 (Objective L3.3). However, this objective is not specific with regard to the magnitude, seasonal timing, or duration of flows (how much water? at what time of year? for how long?), the locations where such flows play an important role (and should be measured), or the percentage of years (frequency) in which they should occur, nor does the Draft Plan identify a time-bound for when these necessary flows will occur under the BDCP. The objective is deficient and unacceptable.

The Draft Plan and DEIS/DEIR analyze the effect of in-Delta flows on Chinook salmon and steelhead survival almost exclusively in terms of how OMR flows drive salmon entrainment. The Draft Plan and DEIS/DEIR ignore the effect of changes in freshwater flows into, through, and out of the Delta on other stressors the BDCP attempts to address and on improved survival rates of salmonids in this system. Kjelson et al. 1982; Stevens and Miller 1983; Kjelson and Brandes 1989; Brandes and McLain 2001; Newman and Rice 2002; NMFS 2009 Biological Opinion; NMFS 2010 Exhibit 7; NMFS 2014 Final Recovery Plan. For example, in the presentation and evaluation of CM14 (Aeration of the Stockton Deep Water Ship Channel to prevent violations of the dissolved oxygen standard), there is no analysis of the beneficial effect of freshwater flow rates in the lower San Joaquin River on dissolved oxygen rates, despite the fact that this effect is well-studied. Jassby and Van Nieuwenhuyse 2005.

Also, neither the Draft Plan nor the DEIS/DEIR alternatives consider provision of increased flow rates from CVP facilities on the San Joaquin River into the Delta as a means of transporting juveniles of covered fish species, attracting adults during spawning migrations, reducing negative OMR rates, alleviating dissolved oxygen problems, or increasing estuary-wide productivity. Increased flow rates also have been shown to decrease predatory efficiency on salmonids. DOI 2011 at 35 -36; USFWS Comments to SWRCB 2012; Cavallo et al. 2012. Decreased flow rates combined with increased Delta export pumping may facilitate high predator abundance in the Delta. *See* Moyle 2002, Moyle and Bennett 2008. Yet the Draft Plan and DEIS/DEIR do not consider the potential benefits of reducing predation pressure via increased flow rates into, through, and out of the Delta. Also, there is no analysis of the relationship between Delta outflow conditions and salmonid survival, distribution, and travel rates, though there is strong conceptual support for such an effect.

ii. The Draft Plan Overstates the Magnitude and/or Certainty of Stressors on Chinook Salmon Population and Incorrectly Treats these Stressors as if they have the same Impact on all Chinook Salmon Populations

In contrast to its uneven, weak, and/or missing treatment of critical flow-related stressors on Central Valley salmonid populations, the Draft Plan is overconfident about the magnitude of other stressors on Chinook salmon and steelhead. The Draft Plan frequently accepts any suggestion of a negative outcome for one salmonid population as solid evidence that (a) the factor is a stressor (as opposed to an outcome of other stressors) and (b) that the stressor effects other salmonid populations to the same degree. For example, the Draft Plan confidently states that predation is an important threat to each Chinook salmon population. *See, e.g.*, Draft Plan at 3.3-147 (spring-run); id. at 3.3-154 (fall-run and late fall-run). However, the Draft Plan only cites to a modeling study of predation on winter-run Chinook salmon to support this assertion. *Id.* at 3.3-122. Juvenile Chinook salmon and steelhead are certainly eaten in the Delta, and always have been; merely demonstrating that predation occurs, or even that predation rates are high relative to other sources of mortality is not evidence that predation is a "problem." Williams 2010 at 53. Furthermore, evidence of predation does not indicate that predation is a "stressor" per se, because any struggling fish is vulnerable to predation (whether it is undernourished, sick, suffering from toxic exposure, struggling with high temperatures, disoriented by poor flow conditions, etc.) – in other words, even high predation rates may be a only a symptom, rather than a cause, of salmon decline. Grossman et al. 2013. To support its assertion that predation rates may affect productivity of winter-run Chinook salmon, the Draft Plan relies on a modeling exercise, which showed that artificial stocking of predators could impact the recovery prospects of winter-run Chinook salmon. Lindley and Mohr 2003. The Draft Plan fails to address how stressors it identifies (lack of cover, toxins, temperatures) and those it does not (i.e., flow rates) affect predation rates and so fails to establish that controlling predation rates (by controlling predators directly) will actually alleviate impediments to salmonid recovery.

In addition, the modeling paper that the Draft Plan relies on (Lindley and Mohr 2003) to suggest that predation is a problem for winter-run Chinook salmon did not assess potential impacts of predators on other Central Valley salmonid populations and the Draft Plan provides no evidence that predation is an important outcome (much less, a stressor) on these other salmonid populations. Any population-level effect of predation is likely to differ across salmonid populations because these different fish enter the Delta at different times, from different locations, and at different sizes (i.e., they have different exposure and susceptibility to predation). For example, there are far more fall-run Chinook salmon juveniles than winter-run Chinook salmon migrants entering the Delta each year and they co-migrate with spring-run Chinook salmon juveniles, thus the proportional impact of predation on these populations is likely to differ from the impact on winter-run Chinook salmon. Juvenile late fall-run Chinook

salmon (which the Draft Plan erroneously treats as equivalent to fall-run Chinook salmon) are larger and thus less susceptible to predation than winter-run juveniles when they enter the Delta. Similarly, the Draft Plan suggests that steelhead migrants are significantly affected by predation in the Delta, *see* Draft Plan at 3.3-158, but this seems highly unlikely as steelhead spend a relatively short amount of time in the Delta, are usually several times larger (and thus less susceptible to predation) than migrating Chinook salmon fry, and are, in fact, aggressive predators in their own right.

By contrast, the Plan selectively ignores evidence of Project-related stressors to Chinook salmon and/or fails to consider how evidence of such impacts on one Chinook salmon population may indicate negative effects on other runs. For example, the Draft Plan's description of the entrainment stressor suggests that this effect is "not well understood." Draft Plan at 3.3-123. The document makes no mention of numerous detailed studies of this stressor. *See, e.g.,* Kjelson and Brandes 1989; Kimmerer 2008; Kimmerer and Nobriga 2008; NMFS 2009 Biological Opinion. The life history conceptual model for Central Valley Chinook salmon, in its coarse assessment of stressors to all salmonid populations in the Delta, rates "project diversions" and the Delta's "modified hydrograph" as equal to or more important *and* better understood than "predation by introduced fishes." Williams 2010 at 57 (Table 8). Similarly, the Final Recovery Plan for Central Valley salmonids states:

> The primary factors causing mortality of winter-run Chinook salmon in the Delta are considered to be the diversion of juveniles from the mainstem Sacramento River into the central and southern Delta where environmental conditions are poor and reverse flow conditions exist which may move them into the lower San Joaquin River and into the south Delta waterways (NMFS 1997). Survival through central Delta migratory routes is substantially lower than through northern routes. The numbers of juveniles arriving at the export pumps is lower as river flows increase, pumping decreases, and the Delta Cross Channel gates are closed (Cramer et al. 2003).

NMFS Final Recovery Plan 2014, Appendix B at 2-31.

The Final Recovery Plan indicates that spring-run Chinook salmon probably experience the same negative impact of entrainment into the Central Delta as identified for winter-run. *Id.*, Appendix B at 3-24 to 3-25. The Final Recovery Plan's stressor matrices for winter-run Chinook salmon, steelhead, and spring-run Chinook salmon (Attachments A, B, and C to Appendix B) list both entrainment at the Projects' current diversion facilities and predation in the Delta as stressors of "Very High" magnitude. It is not credible to imply, as the Draft Plan and DEIS/DEIR repeatedly do, that predation is better understood and more important as a population level stressor on Chinook salmon and/or steelhead than the entrainment stressor.

iii. The Draft Plan Provides no Rationale or Analysis Supporting the Adequacy of its Stressor Reduction Targets.

The Draft Plan does not analyze stressor reduction targets for Central Valley salmonids in a rigorous manner and, as a result, the targets are poorly defined and/or inadequate to attain desired biological outcomes (objectives) for salmonids. The point of identifying stressors that limit attainment of the Draft Plan's biological objectives is to force clear analysis of the scale of problems facing the covered species and to ensure that meaningful reductions in stressors occur within the time bounds identified by the objectives. Stressor reduction targets thus identify the degree to which threats must be reduced and the timeframe for producing the desired reduction in stress in order to serve attainment of biological objectives.

In many cases, the Draft Plan fails to identify even a rough target for reducing stressors. The stressor reduction target for "spatial structure" specifies that it must be attained by year 15, but the description of this target provides no detail regarding how to measure "spatial structure" or how much will be enough. In the end, this target sounds as though it is simply a partial explanation of the rationale for the "lack of rearing habitat" stressor reduction target. In another example of ill-defined stressor reduction targets, "illegal harvest" of steelhead and all runs of Chinook salmon is to be reduced in both the Sacramento and San Joaquin drainages "within the Plan Area" by year 15 (*see, e.g.*, Draft Plan 3.3-169 (steelhead)), but there is no indication of how much reduction in salmon or steelhead poaching the Draft Plan is expected or how much will need to occur in order to attain biological objectives for this species.[64] Above, we describe numerous inadequacies with the Draft Plan or DEIS/DEIR's description and evaluation of the illegal harvest stressor and its related conservation measures.

The Draft Plan sets objectives for improved through-Delta survival rates of juvenile San Joaquin fall-run Chinook salmon and steelhead and survival rates for spring-run Chinook salmon that are, or will be, reestablished in the San Joaquin Basin – above, we describe why those objectives are inadequate. Stressor reduction targets for San Joaquin population are related to entrainment, predation, and rearing habitat for fall-run Chinook salmon, Draft Plan at 3.3-159, spring-run Chinook salmon, *id.* at 3.3-151, and steelhead, *id.* at 3.3-168. The stressor reduction targets for predation are specific to predation rates in the export facility infrastructure and are thus redundant of the stressor reduction target related to "survival rates at south Delta export facilities" – it too calls for reduced predation within the canals and bays of the export infrastructure). The latter stressor reduction target is not SMART as there are no specifics regarding how much or when entrainment related mortality will be reduced; thus, there is no way

[64] It is also not clear how reduction in poaching of adult fish is relevant to the biological objectives set for salmonids, as there is no productivity or abundance objective for adult salmon

of telling how reduction of this stressor will contribute to improved Delta survival rates specified in the objectives for salmonids.

The "lack of rearing habitat" stressor is specific and time-bound, but the Draft Plan's description of these attributes demonstrates how little BDCP plans to reduce this stressor, particularly as compared to the needed survival improvements in the south Delta. The Draft Plan calls for restoring migrating juvenile salmonids access to at least "1000 acres of inundated floodplain habitat, primarily within the south Delta." Draft Plan at 3.3-169. This is one seventh of the floodplain acreage the Draft Plan intends to provide in the north Delta, on the Yolo Bypass, for salmonids of the Sacramento Basin, yet there is no explanation as to why migratory fishes of the San Joaquin basin require so much less floodplain habitat than Sacramento River fish. The Draft Plan calls for this new San Joaquin floodplain habitat to be inundated for a minimum of 1 week, while similar habitat on the Sacramento River is to be inundated for at least 30 days. Again, there is no explanation of why the same fish (i.e., fall-run Chinook salmon) using the same kind of habitat (inundated floodplains) would require different amounts (extent or duration) of that habitat, though the Draft Plan acknowledges that inundation periods of less than 30 days are expected to result in a lesser benefit to juvenile growth compared to inundation that extends longer than 30 days. Draft Plan at 3.4-41. Furthermore, the stressor reduction target specifies that, "On average, 50 acres of floodplain will be inundated a minimum of every other year, 500 acres will be inundated a minimum of every 5 years, and all 1000 acres will be inundated a minimum of once every 10 years." *Id.* In other words, a negligible amount of floodplain habitat will be available in only about half of years and a tiny amount will be available at a frequency of approximately once every five years. Central Valley Chinook salmon have a generation length of approximately 3 years (Moyle 2002; Williams 2006), so it is possible that two generations of migrants out of three would not experience even 500 acres of inundated habitat. Similarly, many Chinook salmon generations could migrate down the San Joaquin River without experiencing the relatively small maximum amount of floodplain habitat expected to occur in 1 year out of 10.

Though inadequate, the Draft Plan's objectives for survival through-Delta survival rates of San Joaquin salmonids are many times the current, miserably poor, survival rates. But the stressor-reduction targets the Draft Plan identifies are simply inadequate to affect such improvements, much less to attain objectives that would actually be adequate to restore San Joaquin salmonids. The floodplain habitat stressor reduction target is expected to occur by year 15 of the Plan, therefore, even if the stressor reduction target had any meaningful effect on San Joaquin survival, it would not contribute in any way to preventing extinction of all San Joaquin Valley salmonids that the Appendix 3G of the Draft Plan expects will occur within the first 10 years of the BDCP. Had the BDCP planning process followed a logical and science-based planning process, the disconnect between the timing of biological outcomes and the stressor reduction targets and conservation measures necessary to achieve desired outcomes would have been transparent; this

would have necessitated design and evaluation of actions that were appropriately scaled and timed to attain the adequate conservation and restoration objectives.

No target is identified for the "Migration Flows" stressor San Joaquin basin salmonids. This is problematic and unjustifiable given (a) the extremely impaired flows of the San Joaquin as it enters the Delta (*see, e.g.,* NMFS 2009 Biological Opinion; NMFS 2014 Final Draft Recovery Plan; SWRCB 2010 Flow Report; VAMP Panel Report 2010; NMFS March 28, 2013 Comment Letter on SWRCB 2012, Phase 1 WQCP SED), (b) the Draft Plan sets a "Migration Flow" stressor reduction target (though inadequate and ill-defined) for the Sacramento River, which has much higher spring flows (both absolute and proportional to the Basin's full-natural flow) than the San Joaquin River now and under the Draft Plan, and (c) the State Water Resources Control Board is currently contemplating water quality standards that would improve flow conditions in the lower San Joaquin. Improved flows in the lower San Joaquin are necessary to conserve and restore salmonid populations and other public trust values in that drainage and in the southern Delta. SWRCB 2010 at 119; USDOI Comments to the SWRCB 2013 at 31; NMFS 2013 Letter to the SWRCB at 1 and Enclosure 1 at 1; CDFW testimony to the SWRCB 2010b; CDFW Letter to the SWRCB 2013 at 5-6. Improved flows are also a foreseeable outcome of the State Board's update of the applicable Water Quality Control Plan, as we discuss in section I of these comments.[65]

For each Chinook salmon population and for steelhead, the Draft Plan sets a goal of reducing passage delays for adults migrating through the Delta at human-made impediments. *See, e.g.,* Draft Plan at 3.3-171 (Goal STHD2). In each case, the objective for this goal is to limit adult passage delays to less than 36 hours by year 15 of the BDCP. There is no indication of why it would not possible and desirable to remove human-made impediments to adult passage in less than 15 years or why it is not possible to restore relatively unfettered passage in less time. A key part of restoring passage for salmonids (and sturgeon and lamprey species) migrating through the Sacramento River is to modify the barriers formed by the Fremont, Lisbon, and Sacramento Weirs. Most or all of these actions are required under the 2009 NMFS biological opinion. Specifically, RPA Action I.6 and I.7 identify most of the same passage improvements described in the Draft Plan's CM2. NMFS 2009 Biological Opinion at 608-611.

The Draft Plan indicates that the passage barrier modifications will all occur within Phase 1 (years 1-5 of the BDCP) or Phase 2 (years 6-10). However, the biological opinion specifies that one half of the habitat restoration target of 17,000 to 20,000 acres of floodplain habitat must be restored by 2016. NMFS 2009 Biological Opinion at 609. There is no reason why the Draft Plan's stressor reduction objective for adult passage of salmonids, and the component projects

[65] We note that CVP facilities in the San Joaquin Basin affect the San Joaquin River inflow to the South Delta.

related to improving adult fish passage through the Yolo Bypass, should not be fully implemented in less than 15 years following adoption of BDCP. If, in fact, it is not possible to eliminate human-made barriers to fish passage in less than 15 years using the approaches described in CM2, then the Draft Plan ought to identify measures that *can produce the desired biological outcome* in less time. Again, we emphasize that the Draft Plan's own technical appendix (Appendix 3G) demonstrates that juvenile survival rates in the Delta will contribute to population declines (and perhaps extirpation for certain runs) for *all* central Valley salmonids for at least 10 years into the BDCP – the imperative to increase survival rates for salmonids (of any life stage) migrating through the Delta could not be more urgent.

3. Conservation Measures do not Adequately Address Known Stressors for this Species and/or their Impacts are Inaccurately Portrayed

i. Conservation Measures Identified in the Draft Plan are Deficient in Comparison with Similar Measures that are Already Required

In some cases, actions described by the Draft Plan are similar to those identified by the NMFS Biological Opinion RPA as necessary to prevent jeopardy to listed salmon species; however, the Draft Plan proposes a longer time period for implementation and/or a reduction in the magnitude of these actions as compared to what is specified in the RPA. For example, "CM2 Yolo Bypass Fisheries Enhancement" includes many of the same actions that are required by the 2009 NMFS biological opinion. The Draft Plan acknowledges the relationship between the RPA specified actions and those described in CM 2 (at 3.4-40), but the "fisheries enhancements" (largely floodplain restoration and removal of passage barriers) expected under the Draft Plan's CM2 are less than those specified by the RPA and BDCP implementation lags behind that required in the RPA.

Action I.6.1 of the RPA requires that an "initial performance objective" of 17,000-20,000 acres of inundated floodplain habitat (excluding acres under tidal influence) be restored in the Yolo Bypass, and it specifies that, "[i]n the event that less than one half of the total acreage identified in the plan's performance goal is implemented by 2016, then Reclamation and DWR shall re-initiate consultation." NMFS 2009 Biological Opinion at 608-609. In contrast, the Draft Plan targets restoration of only 7,000 acres of inundated floodplain habitat on Yolo Bypass, less than half of that required by the RPA. *See* Draft Plan at 3.3-159 (fall-run Chinook salmon); id. at 3.3-179 (Sacramento splittail). And it will not restore even this amount of habitat by 2016 as many of the "component projects" of CM2 are not scheduled to *begin* until the BDCP has been in effect for more than 5 years (i.e., Phases 2-4). The Draft Plan never identifies restoration of 17,000-20,000 acres of floodplain habitat on Yolo Bypass, as required by the RPA, as a stressor reduction target; thus, the BDCP's conservation measure for Yolo bypass fishery enhancements is less than what was required under the 2009 NMFS Biological Opinion as part of a suite of

actions necessary to prevent jeopardy to the listed winter-run Chinook salmon, spring-run Chinook salmon, or steelhead.[66]

ii. Some Conservation Measures Identified for Central Valley Salmonids are Speculative and the Likelihood and Magnitude of Benefits is Unspecified, Undocumented, and Likely to be very low

As with other species, the Draft Plan's expectations of benefits to many of the covered salmonids arising from restoration of tidal wetlands are speculative and overstated. The Draft Plan asserts that juvenile salmonids migrating through the freshwater and brackish water estuary will benefit from the addition of tidal rearing habitat and increased availability of food that is assumed will result from these restoration efforts. Draft Plan at 3.4-119. The assumption that Chinook salmon will rear in newly created tidal wetlands habitats is based on work from ecosystems in the Pacific Northwest where salmon rear in the estuarine environment. *See* Simenstad et al. 1982; Healy 1982.

However, recent research from the San Francisco Bay-Delta ecosystem indicates that the assumed benefits to Central Valley salmonids of tidal marsh restorations are uncertain and may not materialize. The life history conceptual model for Central Valley salmonids states, "Spring Chinook, or at least the Butte Creek population, pass quickly through the Delta, so habitat restoration there seems unlikely to do much for them. The same is probably true for late-fall Chinook, and for steelhead." Williams 2010 at 41. Also, recent, extensive research on the growth, survival, and migration rates of fall-run Chinook salmon through the San Francisco Estuary and in the nearshore ocean demonstrates that Central Valley Chinook salmon transit the brackish portion of the estuary quickly and gain little or no weight in the process; salmon smolts from the Central Valley grow more than ten times faster in the nearshore ocean than they do in the saline portion of the San Francisco Estuary. MacFarlane and Norton 2002; MacFarlane 2010. Although this may reflect the lack of suitable and highly productive estuarine rearing habitat in the current San Francisco Estuary (which has lost the vast majority of its tidal wetlands), it is also possible that low estuarine growth rates, coupled with high growth rates in the nearshore ocean has always been the case for Central Valley salmonids, as it is in many other river-estuary systems. *See* MacFarlane 2010 (providing examples). If this is the case, then restoration of complex "rearing" habitats in the Delta may serve to trap or delay small Chinook salmon migrants (exposing them to predators and potentially high Delta temperatures) more than they serve to increase growth and survival of these fish.

[66] In addition, other reviewers have emphasized the need for Yolo Bypass restoration to be completed prior to initial operations of the north Delta intakes, because of the additional impacts to migrating salmon from operation of new intakes. Mount & Saracino et al.2013. This further demonstrates the need to exceed the requirements of the 2009 biological opinion.

Second, as described above, actions to reduce illegal harvest of salmon are not sufficiently described to determine their potential to benefit adults of any of the migrating Central Valley salmonid populations. It seems very unlikely that the improved enforcement of fishing regulations would be sufficient to contribute meaningfully to restoration of all salmonid populations in both the Sacramento and San Joaquin River watersheds. Our skepticism regarding the efficacy of the Illegal Harvest Reduction conservation measure (CM17) for salmonids stems from the fact illegal harvest is not likely to be a major conservation threat to all salmonid populations of the Central Valley, not likely to be equally distributed across the Sacramento and San Joaquin basins, and not likely to be best addressed in the Delta (as specified in the stressor reduction measure). Thus, the increased enforcement identified in this conservation measures seems completely inadequate to the task of limiting illegal harvest of the number of species (two sturgeon species, five Sacramento River salmonid populations and three San Joaquin River salmonid populations) and in the geographic area covered by this action.

4. Projected Outcomes for Chinook Salmon do not Attain the Conservation Standard for these Species. In addition, the Presentation of these Results is Inaccurate, Biased, and Unacceptably Confusing.

The Draft Plan and DEIR/DEIS both demonstrate that BDCP, alone as well as in combination with climate change and other cumulative impacts, is likely to result in negative outcomes for the abundance, productivity (survival), life history diversity, and spatial distribution of several Chinook salmon and steelhead populations. The best available science demonstrates that: the three ESA-listed salmonids will experience reduced survival through the Delta, reduced abundance, and increased risk of extinction; the commercially valuable fall-run will decline substantially; and, none of the populations are likely to attain even the inadequate objectives described in the Draft Plan. Each of the species is discussed separately on the pages that follow.

C. Winter-Run Chinook Salmon

1. The Draft Plan and DEIS/DEIR Predict Severe Impairment of Winter-Run Chinook Salmon Population Viability; Significant Impacts are Overlooked or Obfuscated by Inaccurate and Irrelevant Comparisons

i. The Modeling Analysis Demonstrates that the Draft Plan will Result in Substantial Decreases in Abundance, Productivity, and Life History Diversity

The DEIS/DEIR inaccurately claims no beneficial or negative flow-related effect for winter-run Chinook salmon from Alternative 4. DEIS/DEIR at 11-55. However, this reporting ignores several large negative effects reported in the Draft Plan's effects analysis and those that are

likely to arise from large changes in flow and temperature reported in the DEIS/DEIR. The Draft Plan's Effects Analysis employs two life cycle models to evaluate the BDCP's likely effects on winter-run Chinook salmon. Draft Plan Appendix 5G. These models project that conditions in the future will be worse for winter-run Chinook salmon assuming current operations required under the Biological Opinion and other environmental standards and climate change as modeled in the BDCP (EBC2_ELT and EBC2_LLT).

Comparing outcomes of the Draft Plan to the status quo under assumed conditions in the future, the results indicate an impermissible negative impact to this endangered salmon population. In reviewing results of the OBAN modeling framework, the Draft Plan's technical appendix states: "The median of median escapement for ESO_ELT was 28% lower than the median for EBC2_ELT, and the median of median escapement for ESO_LLT was 13% lower than the median for EBC2_LLT (Table 5.G-9)." Draft Plan Appendix G at 5.G-51.[67] These results indicate that changes in CVP/SWP operations will be needed to sustain salmonids and achieve long term population abundance targets, particularly in light of climate change and other stressors.

The other model used to assess changes in winter-run Chinook salmon survival into and through the Delta (IOS) indicates that fry survival (Draft Plan at Table 5.G-20) and smolt survival (Draft Plan Table 5.G-21 to 5.G-23) will decline substantially under the Draft Plan BDCP in both the early and late-long term. This model projects a median decline in winter-run Chinook salmon escapement under the high outflow scenario of 27% relative to the EBC2_ELT (the comparison that incorporates climate change assumptions in the early long term for both scenarios); the low outflow scenario shows even more dramatic declines in winter-run Chinook salmon escapement, 66% lower escapement under the BDCP in the median case. Draft Plan at Table 5.G-25. Thus, the model provides no support (and clearly contradicts) the NEPA/CEQA finding that BDCP will not result in significant impacts to salmon migration (AQUA-42). Comparing future conditions under the BDCP Alternative 4/H3 (ESO) to modeled current conditions (without

[67] Because organisms experience conditions in particular years, not in the "mean" year, comparisons of the frequency distribution of results are more valuable than simply comparing averages. However, if a quick comparison is to be informative, median results (an indicator of the frequency distribution) are far more relevant than comparison of "mean" results; the latter are almost useless when, as the Draft Plan is at pains to emphasize, model results are not believed to reflect actual values, but are for comparative purposes only. The mathematical mean and variance of a set of values is irrelevant and likely to be misleading if the individual values are not believed to be accurate. When the purpose of analysis is to compare relative outcomes of scenarios, a variety of non-parametric statistical analyses are available (e.g., Chi-Square tests for differences in distribution, Wilxocon Ranked Signs Test, etc.). The technical appendix states: "The BDCP effects analysis uses life cycle models to provide relative comparisons among the effects of alternatives (e.g., direction and relative magnitude of anticipated population response). These results should therefore not be interpreted as predictions of changes in population abundance." Draft Plan Appendix 5G at 5.G-3. The Draft Plan inappropriately presents mean values and parametric error bounds of modeled scenarios despite this warning.

climate change) reveals that IOS predicts a decline in winter-run abundance of 53% in the early long term and 80% in the late long term. Draft Plan at Table 5.G-25 and 5.G-26.

As elsewhere, the DEIS/DEIR focus on changes in "mean" values understates the magnitude of the impacts that will be expected in years that are worse than average – impacts in "below average" years may damage the population irreparably (including, but not limited to, extinction). Understanding the conservation consequences to imperiled species requires assessment of the entire range of potential differences - the DEIS/DEIR should report both the median of differences (not the difference between the medians) and the range of differences between paired predictions arising from different scenarios. These reported declines under equivalent assumptions of climate change represent either the proportional difference between the median cases of both scenarios or the median of differences across years in the comparison (it is not clear which, though the latter would be more informative) but, in either case, it is clear that these declines do not represent the largest declines anticipated from implementation of the BDCP alternative. The technical appendix also presents these results in terms of mean declines and as the projected absolute difference in number of fish returning to spawn, despite the repeated warning in the technical appendix that these model results are for comparison purposes only.

Although both OBAN and IOS use different assumptions and analytical approaches to estimate Chinook salmon population response to different scenarios, both models project declines in winter-run Chinook salmon escapement under the BDCP, as described in the Draft Plan, when compared with current operations and infrastructure (assuming the same effect of climate change for both proposed BDCP and No Action scenarios). In both cases, the negative results were attributed to low reservoir storage and low river flow conditions arising from the BDCP. For example, the technical appendix describes the results for OBAN as follows:

> The lower escapement of winter-run Chinook under ESO compared with EBC2, even though through-Delta survival was higher under ESO, is the result of differences in modeled conditions in the Sacramento River above the Delta. In the Sacramento River spawning reaches, modeled water temperatures at Bend Bridge were higher (Figure 5.G-3) and minimum flow rate were lower (Figure 5.G-4) under the ESO compared to EBC2 scenarios, particularly during the ELT. These differences in Sacramento River conditions cause lower survival in ESO scenarios relative to EBC2 scenarios in the alevin and fry stages and are ultimately reflected in lower escapement under ESO.

Draft Plan Appendix G at 5.G-54.

The Draft Plan Technical Appendix explains its IOS modeling results as follows: "The lower BDCP scenario survival rates were the result of increased flow-related mortality in specific

model reaches in the Delta," Draft Plan Appendix 5G at 5.G-68, and "Modeled differences in egg and through Delta survival accounted for the largest differences in escapement between scenarios after the effects of climate change are considered," *Id.* at 5.G-72. Using two through-Delta survival models, different than the ones applied by the Draft Plan, NMFS projected decreased through-Delta survival for winter-run Chinook salmon juveniles under Alternative 4/H3 as compared to EBC2 in the late-long term. NMFS 2013 Evaluation of Flow Effects at 4. Projected survivals for winter-run and steelhead were also lower under HOS and LOS than under EBC2 in all years. *Id.* NMFS' estimates of through-Delta survival for spring-run Chinook salmon under H4 were lower than that projected for EBC2 in a substantial fraction of years in the late-long term. *Id.* Survival under HOS was generally substantially higher than under LOS for spring-run, steelhead, and fall-run. *Id.*

The finding that flow rates and temperature conditions would be negatively impacted during the winter-run incubation, rearing, and migration period reveals that the Draft Plan will not achieve many of its major goals for winter-run Chinook salmon and is not likely to achieve the Draft Plan's biological objectives, will cause significant environmental impacts (contrary to conclusion AQUA-42 that Alternative 4 and several other alternatives would cause less than significant impacts for migrating winter-run salmon), and may result in operations that jeopardize winter-run Chinook salmon. Goal WRCS3 calls for "No degradation of aquatic habitat conditions upstream of the water facilities." Draft Plan at 3.3-145. The related objective (WRCS3.1) states that this species' critical habitat will not be impacted. *Id.* Clearly, if mortality increases because of increased temperature and reduced flow rates upstream, then "aquatic habitat conditions upstream of the water facilities" have been degraded. These projected outcomes represent not simply a failure to meet an important restoration goal of the Draft Plan, but a likely degradation of winter-run critical habitat. *See* 50 CFR § 226.204. These findings also contradict the Draft Plan's repeated claim that BDCP will not affect how cold water pool and flows in the upper Sacramento River are managed. *See, e.g.*, Draft Plan Appendix 5G at 5.G-60; *see also* discussion in section II of these comments regarding modeling flaws. Furthermore, population declines are inconsistent with requirements of the ESA and NCCPA as they increase the risk of extinction and move the population away from recovery.

ii. The Draft Plan Improperly Ignores the Results of its own Modeling Regarding Severe Negative Impacts to Winter-Run Chinook Salmon

The Draft Plan's technical appendix uses spurious arguments and metrics in an attempt to dismiss the OBAN and IOS model results that reveal the Draft Plan will likely lead to significant impacts to viability and degraded conditions for winter-run Chinook salmon upstream and in the Delta. For example, the technical appendix points to the variance in OBAN and IOS model predictions to suggest that there may actually be no difference in model outputs between the

BDCP and baseline conditions in the future. Figures such as 5.G-21, 5.G-23, 5.G-24, and 5.G-26 imply a spurious comparison of within-scenario means relative to their total variance (error bars) when the relevant comparison between scenarios would involve analysis of the differences in outcomes within years (a paired analysis) – as stated above, any analysis that relies on mean values and calculated variances is inappropriate. Although we appreciate the recognition that variance in model predictions must be accounted for when interpreting model outputs, we note that:

- The Draft Plan and DEIS/DEIR do not present error bounds whenever doing so might discount findings that these documents suggest reflect positively on the BDCP. For example, the Draft Technical Appendix's analysis of OBAN model predictions of through-Delta survival for winter-run Chinook salmon claims improvement under BDCP operations (*see, e.g.,* Draft Plan Appendix 5G at 5G-48) and the DEIS/DEIR compares these "positive" results to negative outcomes of the IOS model to suggest that the models conflict and therefore there is uncertainty about the effect of Alternative 4 on winter-run Chinook salmon juvenile survival in the Delta (*see, e.g.,* DEIR/DEIS at 1333). However, neither document reveals that the purported improvement in through-Delta survival rates detected by OBAN are nearly undetectable. Draft Plan at Figure 5.G-13 and 5.G-14. It would be extremely surprising if the maximum survival differences in through Delta survival projected under different scenarios (~0.15%), not to mention the median differences (0.09%; *see* Draft Plan at Table 5.G-7), reflected an actual improvement (i.e., were outside the error bounds for the OBAN model's survival estimation routine). That error estimate is not presented. Thus, any "contradiction" between OBAN and IOS in their estimate of through-Delta survival has likely been overstated: IOS projects substantial declines in Chinook salmon through-Delta survival rates (productivity) and OBAN finds no improvement; both models project declines in survival upstream of the Delta. Even if the differences OBAN detects in through-Delta survival rates for different scenarios were real (in terms of the model's inherent error), it is clear that the extremely tiny alleged increases in through-Delta survival will not lead to the sizeable (though still inadequate) improvements in through-Delta survival specified in the BDCP objective (WRCS1.1) for winter-run Chinook salmon. Thus, there is no scientific evidence that the draft plan is likely to achieve the Draft Plan's biological objectives for salmon survival through the delta.
- The implied statistical comparison of upstream survival rates between scenarios is statistically inappropriate because it confounds variance *among* years surrounding the mean modeled outputs with variance in the *difference* between modeled outputs *within* years. The appropriate statistical approach is a comparison of pairs of "observations" (model outputs for different scenarios) that occur in the same year; in

other words, a statistical comparison (if one were valid) would analyze *the mean and variance of the differences*, not the difference between means relative to total variance in the modeled time series. Simply looking at the comparison of OBAN escapement estimates for EBC2_ELT and ESO_ELT (upper panel of Figure 5.G-15) suggests that the difference between modeled escapement frequently favors EBC2-ELT; OBAN's detection of abundance declines is likely to be statistically significant, whereas the statistical comparison implied by Figure 5.G-17 (which shows overlapping among-year error bounds for each scenario) are completely irrelevant and entirely misleading.

- The use of quantitative comparison of means and variance estimates is inappropriate given the technical appendix's repeated warning that its modeling outputs are for relative comparisons of between scenarios and that the results should not be compared to absolute survival or escapement targets. Comparing differences in the frequency distribution of outcomes are far more appropriate here as the frequency of high and (particularly) low abundances are of greater interest than are the mean population estimates over time – there are tests for differences between frequency distributions (e.g. Chi-square) and non-parametric analyses appropriate for relative comparisons (e.g. Wicloxon Ranked Signs test) that the technical appendix and DEIS/DEIR should have employed.

The Draft Plan also improperly interprets results of a "sensitivity analysis" to undermine the projections from its models. The comparison of "high outflow" and "low outflow" scenarios with EBC2 conditions modeled by OBAN clearly demonstrates that both of these scenarios will produce substantial declines in the median outcome across the early and late long term. Draft Plan at Table 5.G-13. All alternatives where OBAN modeling is presented (including Table 5.G-13) indicate a decline in winter-run Chinook salmon escapement compared to the NAA.

As with the OBAN model, the technical appendix presents results of a "sensitivity analysis" for the IOS model and uses those outputs to cast doubt upon the clear implications of the IOS model results described above; once again, the argument is not credible. When different assumptions are made regarding either winter-run migration paths (e.g., due to implementation of non-physical barriers, CM16) or mortality at the new North Delta diversion facility, IOS model outputs change. From this, the technical appendix derives the elementary conclusion that if different model assumptions and inputs are made, then the model will produce different outputs. But in no case do BDCP operational variants produce higher through-Delta survival than environmental baseline conditions. Draft Plan at Figure 5.G-27 and Figure 5.G-28. There is no rationale for the technical appendix's conclusion that, because the IOS model is "sensitive" to assumptions about conditions in the Delta (which it terms a "limitation"), "IOS results alone do not provide a sufficient basis for drawing conclusions about the overall effect of the BDCP on winter-run Chinook salmon." Draft Plan Appendix 5G at 5.G-78. This statement is problematic

because: (1) all models ought to be sensitive to model inputs and assumptions (that is the advantage and disadvantage of quantitative modeling exercises); (2) if the Draft Plan concludes that a model is not appropriate for evaluating future scenarios, it should not dedicate a large fraction of a lengthy technical appendix to describing and presenting model outputs; (3) the conclusion derived from review of the technical appendix's modeling efforts is not based on "IOS alone"; the IOS modeling results are consistent with OBAN modeling results in projecting very serious negative outcomes for winter-run Chinook salmon; and (4) the technical appendix presents no scenario in which BDCP operations result in higher median modeled escapements than those projected under environmental baseline conditions in the Early Late Term, and most scenarios result in lower median modeled escapements in the LLT (*see* Draft Plan at Figure 5.G-27 and Figure 5.G-28) and certainly none that demonstrate attainment of the Draft Plan's own inadequate biological objectives for this species. The Draft Plan's dismissal of the OBAN and IOS modeling results (simply because the model is sensitive to assumptions about modeling inputs) is one of many examples of the Draft Plan and DEIS/DEIR's biased presentations of the BDCP's likely effects.

The results of these modeling runs indicate that changes to flows and temperatures described in the DEIS/DEIR and the Draft Plan will not lead to improved survival of winter-run Chinook salmon in fresh water. As such, the proposed project as described in the Draft Plan and most of the DEIS/DEIR alternatives are not likely: (a) to attain the survival targets set in the BDCP objective for this species (as the ESO estimates clearly underperform the current baseline ("EBC2"); or (b) to increase abundance of winter-run Chinook salmon. Current survival rates in freshwater (through-Delta and upstream) are inadequate to attain any of these targets (and even the BDCP survival objective WRCS 1.1 is not adequate to attain the CVPIA/AFRP targets within the lifespan of the project, *see above*); thus, survival rates lower than the current level cannot be adequate or acceptable.

Whichever approach is used to estimate the significance of differences in winter-run Chinook salmon abundance among scenarios, the Draft Plan and DEIS/DEIR should have acknowledged that, under ESO assumptions, OBAN predicts near-extinction of winter-run Chinook salmon in all but a few years of the 23 year model run depicted in Figure 5.G-15. IOS estimates similarly disastrous results. Reviews of previous versions of the Draft Plan have remarked that, having chosen OBAN and IOS to model projected outcomes of different BDCP operational scenarios, the results of these models should not be "… discounted because they do not show what was "expected." Since these methods were deemed acceptable, the results need to be fully acknowledged." NMFS 2013 Progress Assessment at 12. It is clear that the NCCPA/ESA conclusions in the draft plan, and the CEQA/NEPA findings of less than significant impacts, are not supported by substantial evidence.

iii. The DEIS/DEIR Fails to Report Potentially Significant Negative Impacts to Winter-Run Chinook Salmon Arising from the Project by Improperly Attributing Negative Impacts and by Ignoring its own Analysis

The DEIS/DEIR is inconsistent and internally contradictory in its presentation of temperature and flow impacts to winter-run Chinook and other salmonids in the Sacramento River. Important impacts are overlooked, dismissed without sufficient analysis or obscured with inappropriate comparisons. Its findings of "Not Adverse" and "Less than Significant" flow-related impacts to winter-run Chinook salmon are unsubstantiated and not scientifically credible. DEIS/DEIR at 11-55 (Table 11-4-SUM1).

Temperature Impacts

High temperatures below Shasta and Keswick dams during the winter-run incubation period are a well-known impact on winter-run Chinook salmon. The NMFS 2009 biological opinion notes that "the annual change in TCP has degraded the conservation value of spawning habitat" for winter-run. NMFS 2009 Biological Opinion at 91. Thus, high temperatures in the Sacramento River downstream of Shasta-Keswick have been problematic even when direct impacts of high temperatures (egg or juvenile mortality) have been minimized through real-time management of cold water pool resources. The prior history of Keswick/Shasta operations strongly suggests that the model results overestimate benefits and underestimate the likely environmental impacts of upstream temperature impacts from CVP operations, particularly in light of real time operations to allow greater water deliveries.

As a consequence of operations under Alternative 4 of BDCP, the Bureau of Reclamation winter-run egg mortality model projects much higher mortality rates under Evaluated Starting Operations (H3, "ESO") than under the No Action Alternative (NEPA comparison) during "below normal" and "dry" year types (relative differences in mortality are 76% and 11% higher, respectively, under ESO). DEIS/DEIR at Table 11-4-17. The DEIS/DEIR seeks to minimize those differences by arguing that they "only" happen in two year-types and that the absolute difference in egg mortality is "only" about 1% of the egg population. *Id.* Both arguments are spurious. Egg mortality is generally a large problem for winter-run Chinook salmon in drier year-types because freshwater flows during those years are typically low and reservoir storages are insufficient to provide for sufficient storage of cold water. Lack of projected impact to temperatures affecting winter-run Chinook salmon productivity in wetter years is not surprising or particularly positive news, but the revelation of higher egg mortality in drier year types (representing ~40% of all years) is a major negative outcome for BDCP.

The additional loss of 1% of the total cohort at the egg stage cannot be dismissed as insignificant, especially for a critically endangered population that already suffers high egg-mortality during

drier year types. First, the impact assessment ignores sub-lethal negative effects of temperature, which are known to be large at the high end of the Chinook salmon thermal tolerance range. *See* NMFS 2009 Biological Opinion. Second, the increase in egg mortality, as noted by the DEIS/DEIR, is very large in relative terms; to accept the DEIS/DEIR's lack of concern about increased egg mortality, one would have to conclude that current egg mortality is not a problem. Yet egg mortality and other sub-lethal negative effects of high temperatures are currently considered to be a substantial problem for winter-run Chinook salmon in some year types. Moyle 2002; Williams 2006; NMFS 2009 Biological Opinion at 235. A large increase in a stressor that is already considered to be a problem is, itself, a large problem. Similarly, the SacEFT habitat model projects substantial impacts to various life stages of winter-run Chinook salmon dwelling in the upper Sacramento River, which the DEIS/DEIR seeks to minimize (suggesting, for example, that absolute losses in spawning habitat of ~9% would be "small"). DEIS/DEIR at Table 11-4-18.

In another example of its selective emphasis of results that reflect positively on the project alternatives, the DEIS/DEIR reports that, on average, degree-days decrease by up to 5% during August (a good thing in terms of Sacramento winter-run Chinook salmon egg survival and larval development). DEIS/DEIR at 11-1322. However, the results also reveal *increases* of more than 5% in degree days (in most cases, a bad thing for winter-run Chinook salmon eggs and larvae) during June (of Dry and Critical years), July (Above Normal, Below Normal, and Dry), and September (of Below Normal years). Temperatures above a certain threshold can produce negative results whenever critical values are exceeded during the winter-run incubation period; reduced temperatures in some months of a given year and even reduced "average" temperatures throughout a year are meaningless if mortality or sub-lethal negative effects occur during the incubation period. As usual, when the Draft Plan and DEIS/DEIR focus on average results across all years, they overlook important impacts that occur in particular year types (each of which occurs a significant fraction of the time).

The DEIS/DEIR's analysis that categorizes degree-day violations into color-coded "levels of concern" is scientifically unjustified. *See, e.g.,* DEIS/DEIR at Tables 11.4.14 and 11.4.15. Table 11.4.14 defines as "no effect" temperatures that exceed the known limit of winter-run Chinook salmon egg tolerance (56°F) by 1 degree for up to 9 consecutive days and by 2 degrees for up to 4 days; the DEIS/DEIR is only marginally concerned about temperatures 3 degrees higher than the limit that persist for up to 4 days. The biological significance of the 56°F temperature limit for winter-run Chinook salmon is well documented in the NMFS 2009 Biological Opinion, and this threshold has abundant support in the literature. *Id.*; Richter and Kolmes 2005. Optimum temperatures for incubation are somewhat lower than 56°F. McCullough et al. 2001; Myrick and Cech 2004. Furthermore, this method of assessing temperature impacts to winter-run Chinook salmon eggs underestimates temperature problems caused by BDCP operations because it compares scenarios based on the number of days a temperature standard is exceeded at Bend

Bridge. Bend Bridge is not the regulatory standard for temperature compliance (the actual TCP in any given year is a point generated in collaboration among federal agencies that must be approved by the SWRCB). Comparisons of relative performance between BDCP alternatives in the DEIS/DEIR and modeled baseline conditions at Bend Bridge do not necessarily reflect the actual magnitude or spatial extent of problems experienced by incubating eggs upstream. As a result of these and other issues, Tables like 11-4-15 in the DEIS/DEIR fail to provide accurate information on environmental impacts.

In the end, the DEIS/DEIR fails to make a NEPA determination regarding temperature impacts of the Alternative 4 high outflow scenario, claiming:

> "Available analytical tools show conflicting results regarding the temperature effects of relatively small changes in predicted summer and fall flows. Several models (CALSIM, SRWQM, and Reclamation Egg Mortality Model) generally show no change in upstream conditions as a result of Alternative 4. However, one model, SacEFT, shows adverse effects under some conditions. … In conclusion, Alternative 4 modeling results support a finding that effects are uncertain. Alternative 4 does not propose any changes to Shasta operating criteria, but modeled results are mixed and operations that match the CALSIM modeling are not assured. Model results will be submitted to independent peer review to confirm that adverse effects are not reasonably anticipated to occur."

DEIS/DEIR at 1322.

These claims are inaccurate, and the data demonstrates that operations will cause a significant impact under NEPA. First, the DEIS/DEIR does not present results of the Reclamation Egg Mortality Model for the high outflow scenario (H4) of Alternative 4, however, its mischaracterization of serious egg mortality outcomes for H3 suggests that similarly significant results may occur under Alternative 4 operations. Large flow reductions versus NAA are projected during September and October in some year types for Alternative 4/H3 and in October under Alternative 4/H4. DEIS/DEIR Appendix 11C at 11.C.226-227. Water temperatures are affected by reductions in flow as temperature gain during the summer and early fall generally is inversely correlated with flow volume. Thus we would expect higher egg mortality under H4 than was previously reported (and inappropriately downplayed) for H3. Second, temperatures (and thus winter-run egg mortality) were expected to increase under Alternative 4/H4 as compared to H3 between July-September (*see* DEIS/DEIR at 1324) and from August through October (*id.* at 1328). Although it is not valid to measure temperature changes in percentage terms as the DEIS/DEIR does, the temperature increase described would appear to be substantial with potentially significant implications for winter-run Chinook salmon egg viability and juvenile rearing success. Third, the statement suggests that three independent models (CALSIM,

SRWQM, and Bureau Egg Mortality) show "no change" in upstream conditions; however, these models are integrally linked, and the SRWQM (and the Reclamation Temperature Model) use CALSIM II inputs to predict temperatures in the upper Sacramento River. DEIS/DEIR Appendix 5A at 5A-A26 and Table A-2. The Draft Plan's Effects Analysis describes the Bureau of Reclamation Salmon (egg) Mortality Model as follows:

> Limited to effects of water temperature on eggs only; daily time step requires linear interpolation between monthly temperatures to compute daily temperatures; third in a sequence of models (CALSIM and Reclamation Water Temperature Model), so limitations of previous models are compounded.

Draft Plan at 5.2-19. Furthermore, the SRWQM, that develops inputs for the egg mortality model, is known to have an error rate that is high relative to the tolerances of Chinook salmon eggs for temperatures above 56°F and the model is known to underestimate temperatures and thus underestimate the impacts to winter-run Chinook salmon eggs. Quoting from the calibration and validation documentation for the model (RMA 2003), the August 2008 OCAP biological assessment reports: "Computed temperatures are generally within 3° F or less of average observed data at each of the locations plotted. Computed temperatures tend to be slightly cooler than observed." 2008 Biological Assessment Appendix H at H-9. We also note that the chain of modelling that connects CALSIM model outputs to winter-run Chinook salmon egg mortality has failed to predict the Bureau's inability to maintain adequate temperatures for winter-run Chinook salmon incubation. Temperature thresholds for migrating, incubating, and rearing winter-run Chinook salmon are already frequently exceeded, even after the annual revision of TCP to accommodate inadequate storage conditions at Shasta Lake. NMFS 2009 Biological Opinion at 234-236.

There is adequate information to reach a conclusion, and the DEIS/DEIR's claim that information regarding temperature impacts is "incomplete or unavailable" is unjustified. Therefore, it is impermissible to fail to reach a NEPA determination of significant impacts of increased temperatures on winter-run Chinook salmon based on results of both of the temperature-egg mortality analyses conducted. *See* 40 CFR § 1502.22.

The Draft Plan and DEIS/DEIR demonstrate that, relative to the NEPA No Action Alternative (which incorporates climate change), both Alternative 4 EOS (H3) and "High Outflow Scenario" (H4) will cause substantial temperature impacts to winter-run Chinook salmon upstream. The SacEFT model reveals significant effects that the DEIS/DEIR inappropriately downplays. *See* DEIS/DEIR at 11-1319 (Table 11-4-18). Similarly, two models employed by the Draft Plan's technical appendix 5G find negative temperature effects on winter-run Chinook salmon arising from BDCP operations under Alternative 4. Failing to acknowledge the consistent finding of negative outcomes related to temperature by four very different modeling frameworks is not a

credible interpretation of the results. The dramatic nature of the egg mortality impact is made even clearer when operations under the modeled Alternative are compared to modeled current conditions (i.e. prior to climate change). The DEIS/DEIR describes these severe impacts as follows:

> Egg mortality (according to the Reclamation egg mortality model) in drier water years, during which winter-run Chinook salmon would already be stressed due to reduced flows and increased temperatures, would be up to 42% greater under Alternative 4, including climate change, compared to the CEQA baseline (Table 11-4-17). Egg incubation conditions according to the SacEFT model are predicted to be 26% lower under H3, including climate change, than under the CEQA baseline. Further, the extent of spawning habitat predicted by SacEFT would be 60% lower under H3, including climate change, compared to the CEQA baseline (Table 11-4-18), which represents substantial reduction in spawning habitat and, therefore, in adult spawner and redd carrying capacity. Exceedances above NMFS temperature thresholds would be substantially greater under Alternative 4 relative to the CEQA baseline.

DEIS/DEIR at 11-1325.

Winter-run Chinook salmon are severely imperiled and already suffer from Project operations that lead to temperatures beyond this species well-documented tolerance levels. Moyle 2002; Williams 2006; Williams 2010; NMFS 2009 Biological Opinion, NMFS 2014 Final Recovery Plan. Increases in the magnitude, duration, and frequency of temperature impacts are a significant impact to this imperiled species and likely would violate numerous legal requirements including the ESA. The DEIS/DEIR's attribution of all temperature impacts to the anticipated effects of regional climate change is inaccurate, as evidenced by the scenario comparisons that incorporate climate changes. It is also misleading because it incorrectly assumes that (a) water project operations do not contribute to temperature impacts, that (b) water project operations cannot be changed to ameliorate the effect of current or future temperature impacts to winter-run Chinook salmon, and (c) that climate change and BDCP operations are not cumulative impacts.

In fact, water project infrastructure significantly contributes to temperature impacts to winter-run Chinook salmon because water warms behind the Project dams before it is released into current winter-run spawning habitat, and because reservoir releases that are, in some years, lower than natural flow levels gain temperature more quickly than if full reservoir inflows were provided in those years. Moyle 2002; Williams 2006; Williams 2010; NMFS 2009 Biological Opinion, NMFS 2014 Final Recovery Plan. Equally important, feasible mitigation measures, including infrastructure changes (TCD, cold water curtains) and reoperation of Central Valley Project reservoirs are capable of reducing or ameliorating these problems now and in the future. *See,*

e.g., Nickel et al. 2004; NMFS 2009 Biological Opinion. It is unacceptable that the DEIS/DEIR fail to consider feasible mitigation measures and alternatives to reservoir operations that would reduce or avoid temperature impacts to winter-run Chinook salmon. The claims that there are no feasible mitigation measures (AQUA-40 and AQUA-41) are not supported by substantial evidence and are not scientifically credible.

Any temperature-related impacts will, of course, depend on actual reservoir storages and flow release rates. However, BDCP modeling outputs reveal that the modeled operations will violate flow and/or storage (temperature) conditions required in the NMFS 2009 Biological Opinion. *See* section II(C), *infra*. While acknowledging that the four outcomes of the Alternative 4 outflow decision tree, "…have the potential to cause differences in upstream conditions or in-Delta flows in other seasons as well (i.e., summer and winter)," DEIS/DEIR at 11-51, the DEIS/DEIR also maintains that, "Alternative 4 does not propose any changes in Shasta Reservoir operating criteria, and CALSIM results show that Reclamation could operate Shasta in such a manner that it does not affect upstream storage or flows substantially as compared to the NAA." DEIS/DEIR at 11-1322. These two statements are irreconcilable with the BDCP's projections. *See also* MBK Engineers 2014. To meet the storage requirements and temperature conditions required under the biological opinion, reservoir release patterns will be need to change from what has been modeled in the Draft Plan and DEIS/DEIR such that more water is stored upstream in certain years – that will obviously influence flow conditions into and through the Delta in ways that have not been analyzed (it will also likely affect SWP/CVP Project deliveries in ways that have not been modeled). Thus, either the DEIS/DEIR and Draft Plan outputs and analysis are totally invalid, or the negative flow and temperature impacts to winter-run Chinook salmon described in the Draft Plan and DEIS/DEIR are likely, in which case the impacts are significant from a NEPA/CEQA point of view and impermissible from the ESA/NCCPA perspectives. Given the availability of modeling data, it is wholly inadequate to fail to provide accurate information about the likely impacts and to fail to identify whether significant impacts are likely to occur.

<u>Flow impacts on winter-run spawning and downstream migration</u>
Negative impacts to the extent of inundated spawning and incubation habitat for winter-run Chinook salmon should be anticipated as a result of flow reductions projected under the DEIS/DEIR alternatives. Winter-run spawning begins in late-April and lasts through early-August; incubation begins with the onset of spawning and lasts through October, for some fraction of the population. Moyle 2002. Reductions in flow on their spawning habitat during this period represent the potential loss of spawning habitat and/or the dewatering of eggs that have already been deposited. Both should be considered negative effects to this endangered population that suffers both from reduced productivity (low survival rates) and extremely limited spatial distribution. Compared to the No Action Alternative (NEPA), the DEIR/DEIS project substantial flow reductions upstream of Red Bluff Diversion Dam under Alternative 4 operations

for some year types in the July-October period for operational variants H3 (ESO) and H4 (HOS). These range from flows that are 5.3% lower than NAA in July of Dry years under the H4 variant to flows that are 14% lower in Dry years during August of the H3 variant. DEIS/DEIR Appendix 11C at 11.C.-225 to -227. Thus, winter-run Chinook salmon that spawn in July or early August will have less available spawning habitat. Far from mitigating for low flows in the summer period, the higher flows expected during some water year types in May for both H3 and H4 would likely exacerbate the problem of low flows that are expected later. This is because fish that spawn in May will be attracted to deposit their eggs in areas that would be unavailable under the NAA but which are not likely to remain inundated when flows decline in the later incubation period (e.g. after July), some eggs that are deposited based on spawning habitat available in May are likely to be dewatered as a result of temporally asymmetric changes in flow projected in the DEIS/DEIR. Thus, losses to winter-run spawning and incubation habitat projected under Alternative 4 should be listed as a significant impact to productivity, spatial distribution (because the drivers of these impacts (temperature and flow) reduce spawning habitat in a non-random, spatially-explicit manner and spatial extent of winter-run Chinook salmon is already severely constrained), and life history diversity.

The SacEFT model projects large decline in the number of years with desirable spawning conditions for winter-run Chinook salmon. DEIS/DEIR at 1319 (Table 11-4-18). The DEIS/DEIR's lack of concern with the very large reduction in years considered to have "good" conditions for spawning or for juvenile migration demonstrates a poor understanding of both the behavioral ecology and conservation biology of Chinook salmon as well as for the requirement to protect critical habitat for this species. It is not true, as the DEIS/DEIR contends, that these negative impacts to winter-run productivity are only of concern "if the number of spawners is limited by spawning habitat quantity." DEIS/DEIR at 11-1319. Adverse impacts to spawning habitat may violate ESA protections for winter-run Chinook salmon critical habitat, regardless of the number of Chinook salmon spawners.

Negative impacts to migrating juvenile winter-run Chinook salmon are also expected to arise from flow reductions anticipated under the DEIS/DEIR alternatives. Migration flows in the Sacramento River are a known stressor on winter-run Chinook salmon populations. NMFS 2009 Biological Opinion; NMFS 2014 Final Recovery Plan; Williams 2010. The Draft Plan acknowledges this at some points. Draft Plan at 3.3-139. Migration flow rates are also a key input into the modeling tools the Draft Plan relies on to calculate winter-run Chinook salmon juvenile migration success (IOS and OBAN). Draft Plan Appendix 5G. Under analogous climate conditions, migration flows under Evaluated Starting Operations (Alternative 4, H3) would be lower than projected under current operations by 5-18% during November. DEIS/DEIR at 11-1329. The DEIS/DEIR states that migration flows for winter-run Chinook under Alternative 4 will be greater than or equal to flows under the NAA alternative, but again, this is contradicted by the modeling reported in the DEIS/DEIR flows appendix (Appendix 11C). Flows reported for

Wilkins Slough in the "High Outflow Scenario" (H4) of Alternative 4 result in lower flows than the NAA in July (Dry years: flows up to 10.5% lower under Alternative 4 H4), August (Dry years: flows 5.4% lower) October (Below Normal years: flows 11.7% lower), and November (all year types: flows 8.5-15.6% lower). DEIS/DEIR Appendix 11C at 11C-230 to -232 (Table 6). Similar outcomes are projected at Verona, which is closer to the Delta. DEIS/DEIR Appendix 11C at 11C-233 to 11C-237 (Tables 7 and 8). Thus, flow reductions of the magnitude expected under Alternative 3 and 4 represent a significant impact Chinook salmon productivity (survival rates as specified by the Draft Plan in Objective WRCS1.1), and the asymmetrical timing of the flow reductions (unevenly distributed throughout the migration period) is a negative impact to life history diversity in this species arising from operations, contrary to the Draft Plan's objectives for winter-run (WRCS3.2).

<u>Impacts to juvenile winter-run Chinook salmon through-delta migration</u>
The DEIR/DEIS acknowledges that in-Delta flows that affect winter-run Chinook salmon migration success are expected to be reduced by 11-23%, on average, under the BDCP after the new North Delta Diversions come on-line. DEIS/DEIR at 11-1330. However, this fails to accurately assess the problem. A review of the relevant analysis in the DEIS/DEIR flow appendix reveals that:

- With very few exceptions, flows are projected to be reduced in every month from November-April in every year type, under every operational variant (H1-H4) of Alternative 4.
- The average flow reduction for any given month is exceeded (in about half of years) and the true impact on winter-run Chinook salmon populations is likely to be reflected by the maximum flow reductions more than it is by the "average" flow reduction; the maximum flow reduction is 28% in April for Above Normal water year types (and this is still only an average of like years; impacts in individual years of this type will exceed this average).
- The average flows in the "High Outflow Scenario" (H4) are between 10-24% less than projected under the No Action Alternative and, in certain year types, the outflow reductions are greater (e.g. >26% in November of Above Normal and Below Normal years).

See DEIS/DEIR Appendix 11C at 11C-284 to 285 (Table 28). Given the importance of freshwater flows in the Delta to Chinook salmon survival in the Delta, it is unimaginable that such large-scale, pervasive reductions in Sacramento River flow could be anything but a moderate to major negative impact to winter-run Chinook salmon survival and to the species' continued existence. The scientific consensus is that river flow rates have a major impact on salmon survival rates through the Delta. *See, e.g.,* Kjelson and Brandes 1989; Brandes and MacLain 2001; SWRCB 2010; Williams 2010; NMFS, Final Salmon Recovery Plan 2014 at 63, 127; NMFS 2013 Evaluation of Flow Effects. For example, Williams 2010 ranked the

"Hydrograph Modification" in the Delta as among the highest stressors in the Delta for Chinook salmon generally. The NMFS 2014 Final Recovery Plan Stressor matrix for winter-run Chinook salmon rates "changes in delta hydrology" as a "very high" stressor. NMFS 2014 Final Recovery Plan, Appendix B Attachment A. And the Recovery Plan recommends as a high priority action "Develop, implement, and enforce new Delta flow objectives that mimic historic natural flow characteristics, including increased freshwater flows (from both the Sacramento and San Joaquin rivers) into and through the Delta and more natural seasonal and interannual variability." NMFS 2014 Final Recovery Plan at 127; *see also* NMFS 2009 Biological Opinion. The DEIS/DEIR itself states: "Plan Area flows have considerable importance for downstream migrating juvenile salmonids and would be affected by the north Delta diversions, as discussed above for winter-run Chinook." DEIS/DEIR at 11-1330. And the Draft Plan states:

> For this effects analysis, it was assumed with high certainty that Plan Area flows have critical importance for migrating juvenile winter-run Chinook salmon. Agency biologist opinion during the August 2013 workshops generally thought high importance to be warranted.

Draft Plan at 5.5.3-24. NMFS' 2013 evaluation of flow effects on survival indicates that survival under the HOS and LOS are likely to substantially reduce survival (by 10% or more in some years) of migrating winter-run Chinook salmon. NMFS 2013 Evaluation of Flow Effects. So it is not scientifically credible that the substantial reductions in freshwater flow projected by the DEIS/DEIR are likely to result in only a 1% decline (a 3% relative decrease) in juvenile winter-run survival under H3 compared to the NAA. DEIS/DEIR at 1331 (referencing Table 11-4-23). The claim in the text misstates the impact revealed in the accompanying table, which indicates a decline in survival of 4-5% in "drier" years. Such a disproportionately low decline in survival resulting from such large changes in freshwater flow rates argues that the DEIS/DEIR modeling approach understates the effect. Indeed, the Draft Plan's Effects Analysis indicates that agency biologists who participated in August 2013 workshop on Draft Plan effects were of the opinion that reduced Delta flows anticipated under the Draft Plan were more likely to be a "moderate negative change," contrary to the Draft Plan's conclusions that this is impact is a "low" magnitude negative effect. Draft Plan at 5.5.3-26

The DEIS/DEIR analysis of through-Delta survival rates under the different alternatives is yet another example of its biased presentation and interpretation of results that overstates potential benefits and understates potential environmental impacts. Even if we accept that the absolute increase in loss of winter-run Chinook salmon juvenile migrants is as small as 1.4% (the value reported for dry years in Table 11-4-23), despite much larger decreases in freshwater flow rates, further declines in the survival rate of a species that has already declined to the point of being listed as endangered and which continues to decline today is a significant impact and declining winter-run Chinook survival is at odds with the Draft Plan's stated objective (WRCS1.1) of

substantially increasing Chinook salmon survival in the short and long-term. To put in context the DEIS/DEIR's interpretation of the increased losses to juvenile salmon migrating through the Delta, we look to the same document's interpretation of reductions in entrainment of winter-run Chinook salmon at the existing south Delta export facilities and reductions in survival during the incubation phase upstream.[68] The DEIS/DEIR estimate that entrainment of winter-run Chinook salmon at the existing south Delta export facilities under Alternative 4 (H3) will decline from 1.4% of the total population to 0.6%, an "improvement" amounting to less than 1% of the population, and less than the projected increase in overall through-Delta mortality described in Table 11-4-23. DEIS/DEIR at 11-1313. The DEIS/DEIR does not conclude that winter-run entrainment reductions will be "small" or "only 0.8% of the total population," but instead it avoids the apparently small absolute effect of Alternative 4 operations (which result from its significant underestimate of current entrainment rates as a proportion of the population) and presents its results in terms of the proportional reduction in entrainment between Alternative 4 and the NAA. Table 11-4-10 purports to show that entrainment under Alternative 4 will decline between 18-70% as compared to the NAA; the maximum reduction (for wet years) is less than the maximum estimated increase in winter-run Chinook salmon egg mortality (76%, Table 11-4-17), but the DEIS/DEIR dismisses the latter effect as unimportant (*see* above).

<u>Turbidity Impacts on through-Delta survival</u>

The Draft Plan and DEIS/DEIR fail to adequately acknowledge and assess the impact of reduced turbidity as a result of CM1 on Chinook salmon survival through the Delta. Predation on Chinook salmon is known to increase under low turbidity conditions. Gregory 1993; Gregory and Levings 1998. Operation of CM1 and evolution of tidal marsh sites targeted by the Draft Plan (CM4) are both expected to reduce turbidity levels throughout the Delta, particularly downstream of the north Delta diversion. As described in our assessment of impacts to Delta smelt, the Draft Plan and DEIS/DEIR both:

- underestimate the reduction of turbidity anticipated under the BDCP (particularly at the high end of the variation in this effect;
- improperly credit actions that are expected to partially ameliorate this effect to the BDCP, even though these actions are properly part of the environmental baseline, and
- incorrectly minimize the negative impact of turbidity reductions that they do report.

BDCP did not adequately model the effects of reduced turbidity on salmon survival, despite BDCP's estimate of significant reductions in downstream sediment as a result of CM1 operations. Draft Plan Appendix 5C at 5C.4-64; DSP Independent Science Review Panel Report

[68] We do not agree that the DEIS/DEIR's calculation or interpretation of winter-run entrainment rates or the proportional impact of entrainment are valid; our presentation of those claims here is solely to illustrate the inconsistent standard the DEIS/DEIR applies to weighting negative impacts as compared to impacts that are perceived as benefits of the BDCP.

2014 at 58; *see also* DSC BDCP Comments June 2014 at 10. As a result, the DEIS/DEIR and Draft Plan likely overestimate salmon survival through the Delta and underestimate the adverse impacts of BDCP on winter-run chinook salmon survival.

Impacts on Upstream Adult Migration

The Draft Plan and DEIS/DEIR fail to accurately assess impacts to upstream adult migration of winter-run Chinook salmon resulting from reduced flows below the new intakes. The DEIS/DEIR shows greater than 10% flow reductions (the DEIS/DEIR standard for impact to this variable) during March-May, during the peak months of winter-run migration. *See* DEIS/DEIR at 11-1332 (Table 11-4-24). This is a significant impact that is not accurately reported in the DEIS/DEIR. The impact would likely be reduced under the HOS of Alternative 4. *See* DEIS/DEIR Appendix 11C at 11C-288 (Table 30). In addition, by reporting the "average" reduction in the percentage of Sac River flow, the DEIS/DEIR understates the problems that will likely occur for Chinook migrants in certain months and year types. See id. (Showing that the maximum flow reductions at Rio Vista under H3 are in Below Normal years in March, and Above Normal and Wet years in April

D. Spring-Run Chinook Salmon

1. The Draft Plan and DEIS/DEIR Fail to Adequately Analyze Likely Impacts to Spring-Run Chinook Salmon, the Analysis that is Available Predicts Severe Impairment of Spring-Run Chinook Salmon Population Viability, and the Documents Understate or Ignore Significant Environmental Impacts

The Draft Plan and DEIS/DEIR fail to adequately analyze potential environmental impacts to spring-run Chinook salmon. In the absence of results from a life cycle model, [69] the documents fail to summarize/synthesize the impacts to various life stages of spring-run Chinook salmon into a single assessment of project effects to this species for each of the attributes of species' viability: abundance, spatial distribution, life history diversity, and productivity. *See* McElhany et al. 2000. Piecemeal analysis and conclusions regarding separate life stages, without a qualitative (or quantitative) framework for synthesizing the effects to attributes of viability across life stages leads to results that are unnecessarily fragmented and without proper context – simply, they fail to address the important questions: "What will happen to this population of

[69] Although the Draft Plan indicates that at least one existing life cycle model (OBAN) has been developed for spring-run, *see* Draft Plan at 5.G-10, the DEIS/DEIR and Draft Plan fail to use the OBAN model to analyze impacts. The reasons for doing so are unclear. We and other reviewers have identified significant limitations and concerns with some of the existing modeling tools. *See, e.g.*, Memorandum to J. Meral from J. Rosenfield, re: "Review of BDCP Effects Analysis Appendix G: December 22, 2011; Delta Science Program Salmonid Model Workshop 2011 at 18.

Chinook salmon under the Plan?" and "How do expected outcomes of the Plan compare with modeled baseline conditions, with and without consideration of cumulative effects such as climate change?" The DEIS/DEIR and Draft Plan should have relied on the DRERIP review process to assess impacts qualitatively (based on well-supported, peer-reviewed conceptual models) and to synthesize results, especially where quantitative models were unavailable or deemed inappropriate. *See, e.g.*, Essex Partnership 2009; TBI letter to BDCP Steering Committee August 2009. Instead, the document largely ignores these reviews and instead reaches conclusions that are not supported by the available scientific information.

i. The Draft Plan and DEIS/DEIR Fail to Report Potentially Significant Negative Impacts to Spring-Run Chinook Salmon Arising from the Project by Improperly Attributing Negative Impacts and by Ignoring its own Analysis

Both the Draft Plan Effects Analysis and DEIS/DEIR downplay or ignore significant impacts to spring-run Chinook salmon identified in their own modeling and overstate the potential benefit of BDCP Alternatives to this state and federally ESA-listed species.

<u>Impacts to Spring-Run Chinook Salmon Upstream -- Egg Mortality and Spawning Conditions</u>
As it does for winter-run Chinook salmon, the DEIS/DEIR projects increased egg mortality for spring-run Chinook salmon as a result of Alternative 4 operations. Both the SacEFT model and Bureau of Reclamation Egg Mortality model suggest very large declines in the frequency of good conditions for spring-run Chinook salmon egg incubation on the Upper Sacramento River. SacEFT projects a 35% decrease in years with "good incubation conditions" for spring-run Chinook under Alternative 4/H3 operations. The DEIS/DEIR describes increased egg mortality projected by the Bureau of Reclamation egg mortality model under BDCP Alternative 4/H3 this way:

> The Reclamation egg mortality model predicts that spring-run Chinook salmon egg mortality in the Sacramento River under H3 would be similar to mortality under NAA in dry and critical years, less in dry years, but greater in wet, above normal, and below normal (11% to 29% greater) water years (Table 11-4-30). Relative increases of 11% mortality of the spring-run population under wet and above normal water years would be negligible to the overall population, particularly because this represents a 3% to 4% increase on an absolute scale. However, the 29% relative increase in mortality in below normal years would have an effect on the spring-run population. Combining all water years, there would be no effect of H3 on egg mortality (3% absolute change).

DEIS/DEIR at 1345. As with analogous impacts to winter-run incubation success, the DEIS/DEIR again seeks to minimize the importance of this negative impact. By referring to what

it erroneously believes is a small absolute rather than obviously large relative increase in impact between operational alternatives, the DEIS/DEIR obscures the results to argue that this does not constitute a significant impact. Temperature impacts to egg viability are currently considered a significant problem for spring-run Chinook salmon. *See*, e.g., NMFS 2009 Biological Opinion at 259-260 and Figure 6-16; NMFS 2014 Final Recovery Plan, Appendix B Attachment B at B-36. Increasing that problem by 11-29% in 64% of years (the sum of wet, above normal, and below normal year-type frequencies, *see* Draft Plan at 5.2-16) exacerbates this existing problem and constitutes a significant impact.

Furthermore, the DEIS/DEIR misrepresents its own findings regarding temperature increases in the mainstem Sacramento under Alternative 4/H4 during the holding and spawning periods for spring-run Chinook salmon. The document declares that, "[a]t Bend Bridge, total degree-days under H4 would be up to 5% lower than under NAA during August and similar during other months (Table 11-4-21)." DEIS/DEIR at 11-1355. However, that same table displays increases in degree-days of greater than 5% in the Sacramento River during most years in June and July and during below normal years in September. The text is not supported by the results in this table, and the table shows significant increases in temperature impacts.

Similarly, the DEIS/DEIR summary of Table 11-4-35 focuses exclusively on perceived temperature "benefits" that it (erroneously) expects to occur under Alternative 4/H1, but it ignores that temperatures in the Feather River would be higher in most years during September under Alternative 4/H3, *see* DEIS/DEIR at Table 11-4-35.

Projected temperature increases, relative to NAA, would negatively impact spring-run Chinook salmon egg survival rates (a productivity impact) and disproportionately affect early-spawning salmon that would be exposed to the higher temperatures (a life history impact) – such losses also strongly suggest a reduction in carrying capacity of the Feather River for spring-run Chinook salmon (an impact to abundance). *See* DEIS/DEIR at Table 11-4-41.

The comparison of project alternatives to the NAA removes the effect of climate change from the estimate of temperature impacts caused by operation of the state and federal projects; for example, temperatures in the Feather River under project alternatives are much, much higher than those that are expected under current climate conditions with current operations (Existing Conditions vs. either H1 or H4; Table 11-4-40). These dramatic increases in *actual temperature* conditions experienced by spring-run Chinook salmon spawning and incubating in the Feather River are likely to: (a) extirpate this population if they were not ameliorated or mitigated, for instance by re-operating the reservoir and/or providing passage beyond current dams to cooler habitats at higher elevations, and (b) result in significant changes to reservoir operations analyzed in the DEIS/DEIR and Draft Plan, which do not make any provision to adapt to climate change.

Despite these rather large predicted increases in temperatures experienced by holding, spawning, and incubating spring-run Chinook salmon in the Sacramento River and the resulting decrease in frequency of years with suitable holding or incubation conditions, the DEIS/DEIR finds that its own analytical tools present conflicting results on temperature and egg mortality in the Sacramento River. The DEIS fails to reach a NEPA finding on this effect and instead promise that model results will be submitted to independent scientific review. By contrast, the DEIR concludes that there will be no significant impact to egg incubation success of spring-run Chinook salmon on the Feather River, but it acknowledges that operations under H4 "could affect the cold water pool and fall temperatures" in spring-run spawning habitat and so it promises to submit these modeling results to independent scientific peer review as well. Both of these conclusions are improper; existing information shows that operations in combination with climate change will cause significant adverse impacts under both CEQA and NEPA. Reservoir reoperation will be required to adapt to climate change, yet the Draft Plan and DEIS/DEIR fail to examine changes to upstream reservoir operations to avoid or mitigate these impacts.

The DEIS/DEIR concludes that, under NEPA, there will be no significant effects to spring-run Chinook salmon upstream as a result of the Draft Plan and Alternative 4 operations. This finding is contradicted by the comparisons referenced above and others. The CEQA analysis of Alternative 4 impacts to spring-run Chinook salmon upstream is starkly different from the result of the NEPA analysis:

> Collectively, the results of the Impact AQUA-59 CEQA analysis indicate that the difference between the CEQA baseline and Alternative 4 could be significant because, under the CEQA baseline, the alternative could substantially reduce the amount of suitable habitat, contrary to the NEPA conclusion set forth above. There would be small to moderate flow-related effects of Alternative 4 on spring-run Chinook salmon in the Sacramento and Feather rivers and temperature-related effects in the Feather River. Both SacEFT and SALMOD predict reduced habitat conditions for spring-run Chinook salmon in the Sacramento River. Exceedances above NMFS temperature thresholds would be higher under Alternative 4 relative to Existing Conditions. Results would be similar among model scenarios.

DEIS/DEIR at 11-1374. At a minimum, the CEQA analysis reveals that the Draft Plan cannot achieve its stated objectives of not modifying critical habitat for spring-run Chinook salmon. SRCS3.1; Draft Plan at 3.3-153 ("Implement covered activities so as to not result in a reduction in the primary constituent elements of designated critical habitat for spring-run Chinook salmon upstream of the Plan Area"). Clearly, the DEIS/DEIR analysis that the Draft Plan will fail utterly to achieve that objective or even alleviate the degrading effect of modeled changes to the regional climate.

Impacts on Spring-Run Holding, Rearing, and Juvenile Migration: Upstream

Temperature impacts to spring-run Chinook salmon juveniles rearing in the Feather River and those preparing to spawn (holding) and may be severe. Under Alternative 4/H3 operations, the DEIS/DEIR reports substantial increases in the number of years when August temperatures will be 4°F (8% increase) and 5°F (19% increase) above the relevant temperature threshold (63°F) for rearing juveniles. DEIS/DEIR at Table 11-4-43. Marine and Cech (2004) documented increased sub-lethal negative effects of on Central Valley Chinook salmon juveniles reared in temperatures above 17°C, and Richter and Kolmes (2005) reference numerous studies that found that optimal temperatures for Chinook salmon juveniles are ≤17°C. Furthermore, although the impact of water temperatures on developing embryos is not well-understood, it is believed that developing reproductive tissues exposed to high temperatures may be less viable than those that are formed under cooler temperatures. Berman 1990 (a Master's thesis cited in US EPA 1999) found that offspring of adult Chinook salmon that had been held for two weeks at temperatures between 17.5-19°C had higher pre-hatch mortality and developmental abnormality rates and lower weight than a control group held at lower temperatures. NMFS Final Recovery Plan lists high water temperatures as a stressor of "high" importance for adult spring-run Chinook salmon holding on the Feather River. NMFS 2014 Final Recovery Plan, Appendix B Attachment 2 at B-10. Thus, the anticipated increase in the number of years in which August temperatures will exceed 17°C could have large impacts on spawning success of Feather River spring-run Chinook salmon.

Migration and rearing flows would be reduced during critical months of some years under Alternative 4/H3 Operations. For example, the DEIS/DEIR projects reduced flows in the Feather River during December of Above Normal years and during January and March of Below Normal years. DEIS/DEIR at 11-1376 (Table 11-4-48). Reductions of flow in these months, with the frequency projected by the DEIS/DEIR suggests a significant impact to migration flows for spring-run Chinook salmon. The projected increase in Feather River flows during April and May under H4, *see* DEIS/DEIR at 11-1379, may benefit spring-run migration during those months, in some years; however, the improvement during two months combined with degraded conditions in earlier months of the spring-run migration period represents a large asymmetry in effects to different part of the life history spectrum represented by different migration timing; this is in stark contrast to the Draft Plan's stated objective (SRCS3.2) to, "Operate water facilities to support a wide range of life-history strategies for spring-run Chinook salmon without favoring any one life-history strategy or trait over another." Draft Plan at 3.3-153.

Rearing flows would be reduced in the high flow channel of the Feather River during June by up to 39% (DEIS/DEIR at 1369) under Alternative 4/H3. According to the DEIS/DEIR, June is the end of the spring-run rearing period and, as a result, the DEIS/DEIR does not consider this very large reduction in river flows to be biologically significant. This conclusion is erroneous as spring-run juveniles that follow a yearling life history strategy rear in the river through the

summer months; dramatic reductions in flow represent a potentially serious loss of rearing habitat for these fish. The Delta Science Program Independent Review Panel expressed similar concerns regarding the Draft Plan's unsubstantiated assertion that this change in flows would not affect rearing Feather River spring-run or steelhead. DSP Independent Review Panel Report 2014 at 50. In addition, adult spring-run Chinook salmon hold in the river throughout the summer before spawning in the fall – the loss of almost 40% of river flows expected from Alternative 4/H3 operations likely represents a serious impairment to this run-defining behavior. The DEIS/DEIR fails to acknowledge this very important impact to life history diversity of spring-run Chinook salmon; this contradicts the Draft Plan's stated objective of operating to avoid differential impacts to components of the spring-run life history distribution, *see* Draft Plan at 3.3-153 (Objective SRCS3.2), and the Draft Plan's aim to reduce stressors such as "predation, spatial structure, lack of rearing habitat, … and altered migration flows." Draft Plan at 3.3-151.

<u>Entrainment and Predation Impacts on Spring-Run Juvenile Migration: Downstream</u>
The DEIS/DEIR finds that reduced entrainment of spring-run Chinook salmon in the Delta will be a CEQA net benefit to this unique population under Alternative 4/H3 operations (Table 11-4-SUM1). This finding is not likely to be correct and lacks scientific support. As with all runs of migratory fishes, the DEIS/DEIR and Draft Plan net findings emphasize the benefits of potential reduced entrainment in the south Delta and they assume that there will be little or no entrainment or predation-related mortality at the North Delta facilities. *See, e.g.*, DEIS/DEIR at 11-1341. Regarding entrainment, the Draft Plan and DEIS/DEIR simply assume the efficacy of these screens will be perfect or nearly so under all conditions throughout the life of the north Delta diversion. There is no certainty that entrainment related mortality at the North Delta Facilities will start or remain low. In fact, the Draft Plan's Appendix 5B found that it was not possible to be certain about the level of impact these screens will have on either Chinook salmon or steelhead. Draft Plan, Appendix 5B at 5B-304. This contradicts the Draft Plan's effects analysis, which asserts that there is a moderate level of certainty that the effect will be low. Draft Plan at 5.5.4-23. The DEIS/DEIR should have considered what would happen if this assumption was incorrect, even periodically (i.e. what if damage to, imperfect maintenance, or malfunction of the screens occurs with "x" frequency and results in "y" entrainment rate for a duration of "z" weeks).

With regard to predation at the north Delta diversion, the DEIR/DEIS ignores analyses that show negative impacts, In addition to a bioenergetics model, on which it bases its findings, the Draft Plan (Appendix 5F) also applies a fixed predation model, based on observed entrainment rates at the Glenn-Colusa Irrigation District screens which are somewhat similar to those proposed for BDCP. These two models provide strikingly different predictions of predation on Chinook salmon; the bioenergetics model indicates predation rates at the NDD will be <1% for all Chinook populations, whereas the fixed predation model estimates ~12-13% loss of juvenile migrants at the NDD for each population of Chinook salmon. Both models cannot be correct and

the Draft Plan and DEIS largely ignore the result showing significant predation at the north Delta diversion. *See, e.g.,* Draft Plan, Appendix 5F at 5.F-77. In reporting only the results that are more favorable to the BDCP, the Draft Plan and DEIS/DEIR miss the opportunity to learn from the different outputs of the two models. As the Delta Independent Science Review Panel noted, the high mortality of Chinook salmon at the GCID screening facility indicates that predators may aggregate at high densities near that structure; this suggests the same risk exists for the NDD. DSP Independent Science Review Panel Report 2014 at 52. Thus, the difference in projected predation rates between the two modeling approaches applied by the Draft Plan could reveal that its inputs to the bioenergetics model, including the range of predator densities at the GCID facility or their metabolism, were unrealistically low. The bioenergetics model methodology used to calculate potential predation rates arising from the presence of the North Delta diversion would not, apparently, predict existing mortality rates at the GCID screening facility; thus, a larger range of predator densities should have been modeled. Instead, the DEIS/DEIR and Draft Plan simply assume that one model (the fixed predation model) was completely wrong (despite the fact that it's based on a relevant, recent, local observation) and the other model is completely correct. This choice was not scientifically justified.

With regard to changes in South Delta entrainment, the methodology applied is not as precise as the outputs in the DEIS/DEIR suggest accuracy to the nearest single fish, as is implied in Table 11-4-25. *See* Draft Plan, Appendix 5B (modeling appendix showing the 95% Cis, which are not displayed in the DEIS/DEIR). The Delta Science Program Independent Review Panel commented that the normalization procedure used by the Draft Plant to estimate South Delta entrainment effects across years tends to mask some of the variation and uncertainty related to different operational alternatives and the Panel found that the "variance calculations for salvage abundance and entrainment index are being calculated incorrectly." DSP Independent Science Review Panel Report at 54. We concur with these critiques and with the recommended method of calculating variance and the appropriate use of the normalized values (i.e., for qualitative purposes but not for modeling). The Delta Independent Science Board also recommended estimation of entrainment/predation impacts under different assumptions about diversion rates between north and south Delta diversion facilities that would reflect the difficulties and inherent inaccuracies associated with using monthly CalSIM outputs to reflect daily export management decisions. Delta ISB 2014 at B-40.

This brings us to the DEIS/DEIR estimate of the actual effect of reduced entrainment on spring-run Chinook salmon. With respect to the finding that effect of entrainment reduction resulting from CM1 operation under Alternative 4 will be a net benefit to spring-run Chinook salmon, the DEIS/DEIR again applies an opaque and inconsistent standard to evaluating impacts. The DEIS/DEIR states that entrainment of spring-run Chinook salmon will be reduced under Alternative 4/H3 from 5.3% on average across all years (as elsewhere, we find the "average across all years" metric to be misleading and without value) to 3.2% on average – an absolute

difference of 2.1% of the population. The NEPA conclusion states that this will be a "small" benefit, because it claims current predation losses are low; but for CEQA, it claims the entrainment reduction would be "substantial." DEIS/DEIR at 1341. By contrast, when the DEIS/DEIR found increased temperature-related mortality to spring-run incubating in the Sacramento River it concluded: "Relative increases of 11% mortality of the spring-run population under wet and above normal water years would be negligible to the overall population, particularly because this represents a 3% to 4% increase on an absolute scale." DEIS/DEIR at 1345 (emphasis added). So, when negative impacts occur, the DEIS/DEIR insists that absolute losses to the spring-run Chinook salmon of less than 5% are "negligible" or at least "not adverse" (*see also* DEIS/DEIR at 11-1341 (predation rates at the North Delta diversion), but when a perceived positive effect occurs (such as reduced south Delta entrainment) it is termed "substantial" even if it's absolute effect is 2.1%. This fluctuating, dual standard for evaluating the impact of positive versus negative effects is uninformative, misleading, and unacceptable.

Through-Delta Survival Summation

The Draft Plan applies a modification of Newman's (2003) methodology to estimate spring-run smolt survival through-Delta under different Alt 4 scenarios. EBC2_LLT outperforms both ESO and HOS in the early and late long term in this modeling (Table 5C.5.3-111, 5C.5.3-112, Table 5C.5.3-113, 5C.5.3-114 respectively), though it is not clear that any of these results is statistically significant. The Draft Plan should analyze these results using statistical techniques appropriate for paired-observations. If the results are significant, then it should conclude that EBC2 is superior to Alternative 4 variants with respect to spring-run smolt survival; if the results are not significant, then it should conclude that there is no detectable difference (using this modeling approach) between spring-run smolt through Delta survivals among alternative operations compared. In either case, the results indicate that spring-run survival through the Delta will not increase under BDCP operations, in contrast to the Draft Plan's objectives for spring-run (objective SRCS1.1), which include much higher survival rates than are currently observed. Application of the Delta Passage Model confirms that through-Delta survival of spring-run Chinook salmon juveniles is expected to decline as compared to current conditions under the LOS Alternative 4/H3. Draft Plan at 5.5.4-17 to -18. The Draft Plan estimates that survival through the Plan Area will be similar to or slightly higher than the environmental baseline under the HOS using the same methods. *Id.* The DEIS/DEIR attributes slight (but not likely meaningful) improvements in survival under H4, especially in wet years, to high river flows.

The NEPA conclusion for spring-run Chinook salmon relies on outcomes of the Delta Passage Model, and finds that:

> … through-Delta survival under Scenario H3 by juvenile spring-run Chinook salmon Alternative 4 averaged 29% across all years, ranging from about 24% in

> drier years to 38% in wetter years (Table 11-4-51). Scenario H3 survival was similar to NAA in both drier years (0.5% less survival, or 2% less in relative difference) and wetter years (2.5% reduced survival, or 6% less in relative difference) (Table 11-4-51). … Average survival under Scenario H4 (high outflow) was 30.7%, compared to … 30.3% for NAA.

DEIS/DEIR at 11-1382.[70] These results do not appear consistent with the conclusions previously drawn by NMFS, which indicate substantially lower survival of spring- run Chinook salmon under ESO LLT than under either EBC2 LLT or HOS LLT, with survival generally reduced under the HOS LLT as compared to EBC2 LLT as well. NMFS 2013, Evaluation of Flow Effects on Survival in Vicinity of Proposed North Delta Diversions. Furthermore, we note that foraging spring-run Chinook salmon should be expected to experience higher through-Delta mortality than migrant strategy fish because (a) they are smaller, (b) they spend a longer time in the Delta, (c) foraging exposes fish to additional risk of predation compared with migratory behavior. Thus, the DEIS/DEIR's reliance on DPM outputs to draw NEPA conclusions regarding spring-run Chinook salmon survival through the Delta is not supported scientifically and it probably understates mortality impacts to spring-run Chinook salmon from implementation of the BDCP. Finally, neither the DPM nor Newman (2003) methodologies would account for the substantial decline in turbidity throughout the Delta that is expected to arise from operation of the north Delta diversion and/or restoration of tidal marshes (CM4) or the decline in river stage (corresponding to reduced flow volumes) that should be expected immediately downstream of the new diversion. Both reduced turbidity and reduced river stage will translate to greater light penetration and exposure of migrating Chinook salmon to predation pressures. Existing models of Chinook salmon survival through the Delta do not account for the increased susceptibility to predation that will arise from diversion of water and sediment at the new diversion facility; therefore, existing survival models are likely to overestimate survival under BDCP conditions relative to a NAA – this would tend to make comparisons of through-Delta survival less favorable to BDCP operational alternatives.

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[70] We and other reviewers have previously emphasized that the Delta Passage Model is not an appropriate tool for evaluating cumulative changes in survival for wild, spring-run Chinook salmon because a substantial fraction of this population migrate to the Delta as fry or parr-sized fish. Williams 2006; Williams 2010. DPM is based on the relative success of migrant-strategy, hatchery-produced salmonids (such as late-fall run Chinook salmon) and thus cannot be used to understand fry and parr mortality in the Delta. *See* Draft Plan at 5.C.5.3-65. Even applying DPM to large spring-run (or fall-run) smolt is inappropriate as these fish migrate through the Delta in a different season than do late-fall run or steelhead smolt; there is no reason to expect that survival rates (and even relative survival rates) in Delta channels remain unchanged across seasons as numerous influences on predator efficiency (temperature, light penetration, SAV coverage, etc.) may all change seasonally. Memorandum to J. Meral from J. Rosenfield December 21, 2011; NMFS 2013 Progress Assessment at 8; DSP Independent Science Review Panel Report 2014 at 30.

Several things are apparent from the DEIS/DEIR summary of through-delta survival net effects. First, the DEIS/DEIR project lower survival under Alternative 4/H3 operations compared to the NAA; this contradicts the documents finding that the proposed project will have no significant effect, especially if one factors in other negative effects upstream (*see above*) that the impacts assessment inappropriately ignores. Second, restoration of floodplain habitat in the Yolo Bypass that may benefit downstream rearing and migration success is inappropriately excluded from the baseline in the Draft Plan and the DEIS/DEIR, as described above. Third, none of the survival models indicate a likelihood that survival rates will significantly increase as compared to the status quo, which would be necessary to achieve the Draft Plan's through-Delta survival objective. Thus, the document fails to provide substantial evidence that the Draft Plan is likely to achieve its objectives for spring-run Chinook salmon survival.

<u>Impacts to spring-run Chinook salmon juveniles – roll-up</u>:
The DEIS/DEIR largely estimate decreases in through Delta survival. Because the DEIS/DEIR finds that Alternative 4 operations produce only one result that is not "less than significant" for through-Delta survival (reduced entrainment), and that effect is a "benefit" to the species, one would expect to find a meaningful increase in predicted spring-run Chinook salmon through-Delta survival under Alternative 4 – but that is not the case.

Indeed, it is unlikely that spring-run Chinook salmon will benefit from operations described under Alternative 4/H3, even when combined with habitat restoration actions that were not modeled. The Delta Science Program Independent Review Panel (2014) found:

> The negative impact of reduced plan area flows should have been greater on Sacramento River species such as spring Chinook and steelhead that are dominated by migrant life histories.
>
> Migrant life histories are less likely to benefit from habitat restoration activities, which are a key focus of the BDCP conservation measures. This implies that spring Chinook and steelhead may experience less benefit from BDCP actions than other salmonid species, or they may even experience a negative net effect in response to reduced spring flows. The key question, which deserves more attention in the BDCP, is whether the migrant life history will sufficiently benefit from conservation measures to offset moderate negative impacts related to reduced spring flows. This question is key for spring Chinook and steelhead that are composed mostly of migrant life histories.

DSP Independent Science Review Panel Report 2014 at 30.

The Draft Plan also identifies an objective of improving survival of spring-run Chinook salmon juveniles emigrating from the San Joaquin basin (objective SRCS1.1). The Draft Plan suggests that several of its conservation measures will affect better survival for Chinook salmon emigrating from the San Joaquin River basin (including, CM1 operations, efforts to reduce illegal harvest, improvement of water quality conditions in the Stockton Deep Water Ship Channel, floodplain creation in the lower San Joaquin River, etc.). Yet the Draft Plan and the DEIS/DEIR wholly fail to evaluate potential effects of the BDCP on the migration success of juvenile spring-run Chinook salmon entering the Delta from the San Joaquin River. Thus, both the Draft Plan and DEIS/DEIR fail to analyze whether the BDCP will attain its stated objectives. This is a major omission and failure to provide information readers will need to evaluate BDCP benefits to spring-run Chinook salmon abundance, productivity and spatial distribution.

Impacts to upstream migration of adult spring-run

Adult spring-run Chinook salmon may begin their upstream migrations as early as late-March and as late as September, with peak migrations occurring in May and June. Yoshiyama et al. 1998; Moyle 2002. Adult salmon use olfactory cues to home to their natal rivers and streams. Healy 1991; Moyle 2002; Quinn 2005; Williams 2006. Thus, reduction of flows into and through the Delta from spawning tributaries, and the diversion of those flows, can result in confusion, delayed migration, straying, and failure to spawn. For instance, current operations of the CVP/SWP and reduced inflows from the San Joaquin River cause significant impacts on adult migration of fall-run Chinook salmon of the San Joaquin River. Marston et al. 2012. The Draft Plan describes the potential for reduced Sacramento River flows below the new North Delta Diversion to cause orientation problems for spring-run Chinook salmon adults as follows:

> … the difference in Sacramento River flow at Rio Vista in April–May was more than 20% less in wet and above-normal years and similar in other water-year types under the ESO; as described for winter- run Chinook salmon, flows in March–May were similar or greater under HOS_LLT compared to EBC2_LLT (Table 5.C.5.3-235, Mean Monthly Flows (cfs) in Sacramento River at Rio Vista for EBC2, HOS, and LOS Scenarios, and Table 5.C.5.3-236, Differences between EBC2 Scenarios and HOS and LOS Scenarios in Mean Monthly Flows (cfs) in Sacramento River at Rio Vista, in Appendix 5.C). The importance of these changes to the homing ability of spring-run Chinook is unknown. In considering the results of the DSM2 fingerprinting results and the CALSIM flow analyses, it is concluded with low certainty that there will be a low negative change to adult migration Plan Area flows under the BDCP for upstream migrating adult spring-run Chinook salmon. The low certainty in these conclusions would be informed by monitoring and targeted research under the BDCP (e.g., examining migration success of tagged adult Chinook salmon under different flow regimes), with any adverse effects being addressed by adaptive management.

Draft Plan at 5.5.4-19

However, the impacts to spring-run adult migrations from flow reductions in the lower Sacramento River will be higher than estimated in the Draft Plan, as this summary avoids impacts to flows in the peak migration month of June and misstates the predicted flow modifications it does present. According to the referenced table (Table 5.C.5.3-236), average Sacramento River flows at Rio Vista (indicative of the flows that migrating Chinook salmon might use to orient) are expected to decline on average in every month of the spring and early summer in both the High Outflow and Low Outflow Scenarios, in both the early and late long term, when equivalent climate change assumptions are applied. The proportional declines vary by scenario and year-type. In May (the beginning of peak spring-run migrations) flows under the HOS decline relative to EBC2 (factoring in climate change) by more than 10% in critical years during the ELT and by more than 9% in Wet years of the LLT; under the LOS, flow declines of greater than 10% are expected to occur in Below Normal, Above Normal, and Wet years. In June (also a peak migration month), reductions in flow exceeding 30% occur frequently (Wet and Above Normal year types of the HOS_ELT and HOS_LLT, and Wet years in the LOS_ELT). Flows in July, the shoulder of spring-run migration timing, shows even greater reductions (>30% on average across all year-types in both HOS_ELT and HOS_LLT, Critical years in LOS_ELT and LOS_LLT). DEIS/DEIR Appendix 11C at 11.C-288 to -290. The DEIS/DEIR presents expectations of flow reductions at Rio Vista under each of the Alternative 4 operational scenarios (Table 30, DEIS/DEIR Appendix 11C at 11.C-288 to -290); the results show even greater declines than those described in the Draft Plan especially when flows are compared to baseline conditions – under each operational variant, the Sacramento River's flow will be over 40% lower (up to 56% lower) in at least one year type during June. The loss of more than one-third and, in some cases, more than one-half of a River's flow is a large impact for Chinook salmon attempting to find and navigate to their natal streams. If the Draft Plan found low impact under the expectation of a 20% reduction in flow, we would expect that the magnitude and certainty of the impact would be higher when flow reductions of more than 30%, 40%, and 50% are projected. There is no credible scientific evidence that would support a finding of "low" potential impact under these conditions.

Similarly, the DEIS/DEIR analyzes flow reductions on the Feather River during the spring-run adult migration period and finds that under H3 during this period, flow reductions of up to 53% would represent changes "of moderate to large magnitude"; yet the DEIS/DEIR also concludes that the effect would "would not affect spring-run Chinook salmon in a biologically meaningful way." DEIS/DEIR at 11-1375. Once more, there appears to be no scientifically credible evidence to support a conclusion of low or "less than significant" impacts to migrating spring-run Chinook salmon adults.

Finally, with respect to efforts to control illegal harvest (poaching) of spring-run Chinook salmon, the Draft Plan overstates the importance of the stressor in the Plan Area and the likely impact of the proposed conservation measure, CM17. For adult spring-run Chinook salmon, the Draft Plan assumes with "moderate certainty" that illegal harvest is an "attribute of moderate importance for spring-run Chinook salmon adults. Draft Plan at 5.5.4-14. As described above, spring-run Chinook salmon may be the most susceptible of the salmonid species to poaching because, during the summer, *they hold in small streams, away from population centers*. *See* Moyle 2002; Williams 2006; Williams 2010. However, the "Illegal Harvest" conservation measure (CM17) is designed to increase enforcement of anti-poaching laws *within the Plan Area*. Draft Plan at 3.3-151 to -152; DEIS/DEIR at 11-233. Thus, while there could be some moderate (though uncertain and un-measureable) benefit to spring-run Chinook salmon of anti-poaching efforts upstream, where they are most vulnerable, the impact of poaching efforts "in the Plan Area" is unknown (highly uncertain) and likely quite small. Furthermore, the Draft Plan provides no evidence to support its claim that anti-poaching effort will produce measureable benefits (to say nothing of "high" effects) on the survival of spring-run juvenile salmon migrating through the Plan Area. Thus, there is no support for the Draft Plan's conclusion that its efforts to reduce illegal harvest will "...be a high positive change (i.e., decrease) in the illegal harvest attribute for spring-run Chinook salmon juvenile foragers, juvenile migrants, and adults due to CM17" or the implication that this stressor is of more than low (probably very low) importance *in the Plan Area* where the conservation measure is to occur. Furthermore, in the Plan Area, the magnitude of the stressor and the ability of warden's to reduce it is likely to decline as passage improvements described in the Draft Plan are completed. The same arguments hold for other runs of Chinook salmon and steelhead, all of which are less susceptible to poaching overall than spring-run.

Neither the Draft Plan nor the DEIS/DEIR address potential effects of the BDCP on the migration of spring-run Chinook salmon into the San Joaquin River where it enters the Delta. This is known to be a current problem affecting fall-run Chinook salmon of the San Joaquin basin. Marston et al. 2012. Thus, both the Draft Plan and DEIS/DEIR fails to analyze the potential impacts to the Draft Plan's stated objectives. Draft Plan at 3.3-53 (Objective L.2.4) and Draft Plan at 3.3-133 (objective L3.4). Objective L.2.4 is intended to "provide flows that support the movement of adult life stages of native fish species to natal spawning habitats." The DEIS/DEIR also fails to analyze potentially important effects on spring-run Chinook salmon of the San Joaquin Basin of conservation measures intended to address low dissolved oxygen in the Stockton Deepwater Ship Channel (CM14). These are major oversights given that the Draft Plan states an intention to benefit spring-run Chinook salmon in the San Joaquin Basin when spawning populations there have been reintroduced.

E. Central Valley Steelhead

1. The Draft Plan and DEIS/DEIR Fail to Adequately Analyze Impacts to Central Valley Steelhead, but the Available Analyses Demonstrate that the Draft Plan is not Likely to Achieve Plan Objectives and is Likely to Result in Significant Adverse Impacts to the Species

As with many other species, the Draft Plan fails to assess whether the BDCP will attain many of the conservation strategy's objective for steelhead. Draft Plan at 5.2-8. The failure to evaluate whether the Draft Plan is likely to achieve the through-delta survival objective is not scientifically justified. The Draft Plan's claim that it would have needed life-cycle models for steelhead that are unavailable is not accurate; because objective STHD1.1 concerns through-Delta survival only, there are existing modeling tools and analytical approaches that should have been used, albeit with caveats. Although the Draft Plan inappropriately applied DPM to interpret survival of spring, fall, and winter-run Chinook salmon (which migrate at smaller size than the fish whose movements and success were used to construct the DPM), it did not apply this model to projection of differential success rates for steelhead migrating through the Delta. Of course, caution in interpreting these results would still have been warranted for steelhead. *See, e.g.,* Memorandum to J. Meral from J. Rosenfield re: Comments on Appendix G, December 2012.

The DEIS/DEIR relies on its improper use of DPM for Chinook salmon to conclude that, "…steelhead survival would not be expected to change more than 1% under Alternative 4." DEIS/DEIR at 11-1531.[71] Late fall-run Chinook salmon migrate at similar size and in similar season to steelhead suggesting potentially similar impacts. Yet this statement neglects to mention that the DEIS/DEIR anticipates decreased through Delta survival of late fall-run Chinook salmon under H1 as compared to the NAA and in all Alternative 4 operational variants during wetter year types compared to current conditions. DEIS/DEIR at 11-1458 (Table 11-4-76).

Similarly, the DEIS/DEIR concludes that "Alternative 4 would have no effect on steelhead migration success through the Delta" for San Joaquin steelhead." DEIS/DEIR at 11-1532. Its conclusion that steelhead survival would not change seems to indicate that adverse effects of BDCP on through-Delta flows offset any benefits from reduced steelhead entrainment at the south Delta export facilities, *see* DEIS/DEIR at 11-1476 (Table 11-4-77).

In general, both the Draft Plan and DEIS/DEIR fail to use existing scientific information to evaluate the effects of CM1 on steelhead migratory survival, completely ignoring key scientific information including the 2013 NMFS Evaluation of Flow Effects on Survival in Vicinity of Proposed North Delta Diversions. *See* DEIS/DEIR at 11-1531 to -1532. In addition, Appendix

[71] The change referred to is likely to be a decrease in through-Delta survival. Draft Plan at 11-1551.

3G to the Draft Plan projects that steelhead populations will decline substantially for both Sacramento and San Joaquin basin fishes in the first 10 years of the BDCP (to extinction, in the latter case). Draft Plan, Appendix 3G at Table 4. This result is consistent with that described in NMFS testimony to the State Water Resources Control Board regarding necessary flow improvements on the lower San Joaquin River. NMFS Comments on the Phase I WQCP Update Phase 1, March 2013.

Regardless of the methodology used, these analyses (and others, like NMFS Evaluation of Flow Effects on Survival in Vicinity of Proposed North Delta Diversions 2013, which the Draft Plan and DEIS/DEIR fail to utilize in their analysis) all demonstrate the Draft Plan is unlikely to achieve the increases in steelhead survival identified in the Draft Plan's biological objective (STHD1.1). As such, the DEIS/DEIR and Draft Plan lack any scientific evidence to conclude that the Draft Plan is likely to achieve its steelhead survival objective.

Furthermore, the Draft Plan and DEIS/DEIR overstate the potential value of conservation measures to steelhead juveniles migrating through the Delta and underestimates the potential negative effects on steelhead survival through the Delta. Specifically, flow is understood to be a key driver to the success of salmonids that are primarily attempting to migrate through the Delta; salmonids that are primarily focused on foraging, by contrast, may benefit differentially from increased food and rearing habitat in the Delta. The Draft Plan assumes that 95% of steelhead juveniles in the Delta are following a migrant strategy. Draft Plan at 5.5.6-3. We concur with the Delta Science Program Independent Review Panel finding that:

> The effect of each attribute on migrant versus forager salmonids was examined in Chapter 5, but summary Figure 5.5.3-2 did not capture differences in the assumed relative abundances of these life histories among the species. Plan area flows were typically ranked as a moderate negative effect on migrant salmonids in the Sacramento River and a low negative effect on foragers. However, this attribute was ranked the same for each salmonid species regardless of the proportion migrants versus foragers assumed in the population. The negative impact of reduced plan area flows should have been greater on Sacramento River species such as spring Chinook and steelhead that are dominated by migrant life histories.
>
> Migrant life histories are less likely to benefit from habitat restoration activities, which are a key focus of the BDCP conservation measures. This implies that spring Chinook and steelhead may experience less benefit from BDCP actions than other salmonid species, or they may even experience a negative net effect in response to reduced spring flows.

DSP Independent Science Review Panel 2014 at 30; *see also* Williams 2010; NMFS 2013 Progress Assessment at 4. The findings in the Draft Plan and DEIS/DEIR regarding foodweb benefits to steelhead in the Plan Area are not scientifically supported because the vast majority of steelhead are not foraging in this location.

Similarly, the Draft Plan and DEIS/DEIR's failure to emphasize the important negative impact of flow reductions (and even status quo flows) to the 95% of steelhead that are primarily seeking to migrate through the Delta quickly is not supported by the best available science. For example, in describing the need for improved Delta inflows from the San Joaquin River to the Delta, NMFS stated:

> Flow is undisputedly a key driver for [salmon and steelhead] survival…San Joaquin River flows must be augmented significantly from current levels in order to reverse the present trend of salmonid population declines in the basin. Survival rates in the San Joaquin River were only slightly greater than one percent in 2003 and 2004 and 12 percent in 2006, which was a very high flow year… We note that these survival rates are unlikely to support a viable salmonid population.

NMFS Comments on the Phase I WQCP Update Phase 1, March 2013 (emphasis added). NMFS' comments also emphasize that habitat fixes generally cannot replace the need for increased flows in the lower San Joaquin River (but should supplement needed improvements in flows). *Id.* BDCP fails to consider any changes in upstream CVP reservoir operations in the San Joaquin Basin that could improve flow conditions.

Meanwhile, the DEIS/DEIR and Draft Plan assume, without justification, that the BDCP will provide benefits to steelhead that are unlikely to occur. For example, the Draft Plan assumes with low certainty that reduced illegal harvest of steelhead will produce a low benefit to steelhead even though the stressor itself is likely to be of low importance (and even that is a low certainty conclusion). Draft Plan at 5.5.6-9. Another way of stating this outcome is that it is unlikely to produce any measurable effect to the steelhead population. Indeed, steelhead adults migrate through the Delta during winter months when river flows are typically high and these fish are relatively difficult to detect. Williams 2010. Thus, it is very unlikely that reduction of poaching in the Plan Area (as the Conservation Strategy specifies) is likely to have much of measureable effect on steelhead populations.

Also, the Draft Plan fails to support its claims regarding the effect of predation mortality on steelhead. Draft Plan at 5.5.6-8. To the extent that their aggressive behavior and relatively large size limits predation on steelhead in the Delta (steelhead are typically ~250cm when they reach the Delta), predation mortality in the Delta is not likely to be a direct limit on steelhead populations currently, so perceived low-level benefits from measures to control predation are

unlikely to yield population-level benefits. Although steelhead that are lost, malnourished, entrained in diversion infrastructure, or otherwise stressed from poor migration conditions may be eaten by opportunistic predators, these are secondary effects; steelhead are relatively large fish when they migrate through the Delta and they are capable swimmers and are more aggressive than Chinook salmon. Moyle 2002; Quinn 2005; Williams 2006. Although predation in the Delta is probably not a major stressor for steelhead currently, ecosystem alterations anticipated under BDCP could increase steelhead exposure and susceptibility to predators in the future. For instance, the Draft Plan claims that tidal marsh restoration would provide "more shallow water habitat with less predators." Draft Plan at 5.5.6-9. However, this ignores the fact that (a) steelhead are not expected to make great use of these habitats because 95% of them are migrating quickly towards the Bay and ocean and (b) there is little evidence and no guarantee that these restored habitats will be low predation environments. Even if the promised invasive vegetation removal succeeds, predation rates may be accelerated in these environments because not all predators rely on submerged aquatic vegetation, such as avian predators or striped bass. In contrast to the statement in the Draft Plan, the DRERIP review concluded that the potential for increased predation associated with habitat restoration planned for the West Delta ROA and elsewhere was a potentially high magnitude negative impact. Essex Partnership 2009 at Appendix D. In addition, the DEIS/DEIR and Draft Plan fail to address the potential impact of reductions in turbidity increasing predation risk. *See* our discussion of impacts of reduced turbidity for Delta smelt and both sturgeon species.

For steelhead, as for most of the covered fish species, the Draft Plan largely ignores the weight of scientific evidence that improved flows are needed with respect to steelhead, in combination with other measures. *See, e.g.*, NMFS, Comments on the Draft Technical Report on the Scientific Basis for Alternative San Joaquin River Flow and Salinity Objectives (Report), February 4, 2011;[72] CDFW 2010 Flow Criteria.

2. <u>The Draft Plan and DEIS/DEIR fail to acknowledge significant negative impacts to steelhead arising from the project upstream of the Plan Area</u>

Both the Draft Plan Effects Analysis and DEIS/DEIR downplay or ignore significant upstream impacts to steelhead that result from BDCP operational alternatives, particularly regarding egg mortality and spawning conditions. The DEIS/DEIR claims that Alternative 4 will have "negligible" impacts to spawning and egg incubation habitat for steelhead, but this conclusion is not supported by the analysis. For instance, it reports a relative decline of 10% in the weighted usable area for steelhead spawning on the Sacramento River. DEIS/DEIR at 11-1478 (Table 11-

[72] These comments are available online at: http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/bay_delta_plan/water_quality_control_planning/cmmnts020811/010411dpowell.pdf and are incorporated by this reference.

4-78). Also, under Alternative 4/H4, Sacramento River flows are expected to decline substantially during the spawning and egg-incubation seasons during May in Below Normal and Wet years (9% and 18.3%, respectively); the DEIS/DEIR improperly concludes that these effects will be "small" and have no meaningful biological effect on steelhead spawning or rearing. DEIS/DEIR at 11-1507. There is no scientific basis for such conclusions; such substantial declines in flow are likely to have a significant biological effect that the DEIS/DEIR simply ignores. On Clear Creek, the DEIS/DEIR reports no change between Alternative 4/H3 and NAA but it does indicate that flow declines in Wet years relative to current conditions are expected to be as high as 38%. DEIS/DEIR at 11-1478. Similar degradation of flows and temperatures as compared to existing conditions are expected on: the Feather River, *see* DEIS/DEIR at 11-1480 to -82, -89 (Tables 11-4-80, 4-82, and 4-83; the American River, DEIS/DEIR at 11-1490 to -91 ; and the Stanislaus River, DEIS/DEIR at 1491. The net effects in the Draft Plan and conclusions in the DEIS/DEIR fail to adequately account for these increases in upstream temperatures and their likely impacts to steelhead productivity, abundance, and spatial distribution in the future. They also reveal the Draft Plan is unlikely to achieve two of its stated objectives (STHD3.1 and STHD3.2, which indicate that the Draft Plan will be implemented so as not to negatively impact critical habitat or life history diversity of steelhead, respectively). As with other salmonids, it is clear that changes in reservoir operations will be needed to adapt to climate change and other cumulative impacts.

Juvenile steelhead rearing conditions on the mainstem Sacramento River would decline substantially under Alternative 4/H3 relative to the NAA. DEIS/DEIR at Table 11-4-78 (SacEFT projects an absolute decline in frequency of years with "good" conditions of 10 percentage points and a relative decline of 22%). The DEIS/DEIR suggests that the impact would be counterbalanced by a 2% absolute (10% relative) reduction in the incidence of juvenile stranding resulting from flow fluctuations. The DEIS/DEIR concludes that more frequent degradation of steelhead juvenile rearing conditions would cause negligible effects, *see* DEIS/DEIR at 11-1498, is not supported by a scientific analysis and is contrary to the available biological evidence. For example, any countervailing effect of reduced juvenile stranding presumes that the years in which this improvement occurs are not the same years in which juveniles are expected to experience diminished quantity and quality of rearing habitat – "saving" fish from stranding is not a benefit if the fish later die in a river that is too hot or has too little flow. Even were there no overlaps between years with reduced stranding and years in which the DEIS/DEIR anticipates impacts to steelhead rearing conditions, the number of years in which the latter (negative) impact are expected outnumber the years where reduced stranding is expected. Loss of "good" rearing conditions in more than an additional 2 years out of ten (22%) under Alternative 4 operations is a bad outcome for Sacramento River steelhead.

Large reductions in flow (up to 50%) are projected during the juvenile steelhead rearing period (specifically, July through September) in the "high flow" channel of the Feather River, *see*

DEIS/DEIR at 11-1499 and on the American River (August-September) under Alternative 4/H3. As reported for spring-run Chinook salmon, the frequency of temperature exceedances on the Feather River is expected to increase during July and August of most years. Similarly large increases in temperature are reported for the American River under Alternative 4 operations and the method of reporting such exceedances on both rivers vastly underestimates the likely negative effects. Temperature exceedances on the Feather and American Rivers are reported in the DEIS/DEIR as "degree-months" or the number of months in which the *average* temperature exceeds a certain threshold, but temperature thresholds reported for salmonids and steelhead are generally daily or multi-day temperature maxima. When temperatures exceed these short-duration thresholds on a monthly basis, it means that fish are exposed to deleterious conditions for at least a large plurality of days during that month. Thus, the DEIS/DEIR's depiction of increased frequency in temperature exceedances that are greater than 5 degrees higher than the 63°F temperature threshold (Table 11-4-43, Table 11-4-85) reveal that steelhead will experience temperatures greater than 68°F (a temperature associated with negative effects to rearing steelhead; Reese and Harvey 2002) for most of those months. The table does not capture the number of months/years in which temperatures will exceed steelhead thresholds for many days (when the monthly average temperature remains below the threshold), even though severe negative impacts to rearing steelhead juveniles will occur in these months. As a result, the DEIS/DEIR dramatically understates the likely adverse temperature impacts on steelhead. We note that predicted reductions in the frequency of temperature exceedances during June under Alternative 4 versus NAA (Table 11-4-43, Table 11-4-85) do not mitigate for the high temperature impacts that are projected to occur later in the spring or summer, especially because actual temperatures are predicted to exceed critical steelhead temperature thresholds much more frequently in June relative to current conditions.

The DEIS/DEIR is inconsistent and contradictory regarding its assessment of the impact of flow reductions on steelhead migration upstream of the Plan Area. Flow reductions on major steelhead spawning rivers during the steelhead migration season represent potentially serious impacts to migration and adult survival. For example, the DEIS/DEIR appropriately finds that under Alternative 4/H3 operations on the Feather River, "The substantial reductions in flows during drier water years would have biologically meaningful effects on migration conditions during September through March." DEIS/DEIR at 11-1536. In contrast, the DEIS/DEIR concludes that under Alternative 4/H1 the significant flow reductions would have no effect "…because they occur in only one of seven months." DEIS/DEIR 11-1525. This rationalization ignores the potential survival and life history impacts to steelhead on the Feather River that can occur from unsuitable adult migration and contradicts the Draft Plan's objective to implement operations in a way that does not differentially impact particular parts of the life history range of steelhead. There is also no scientific support for the DEIS/DEIR claims that November flow reductions under Alternative 4/H3 (and other operational variants) on the Sacramento River above Red Bluff in all water year types (declines from 7.9%-16.3%, *see* DEIS/DEIR Appendix 11C (Table

4)) are "isolated" and will not have meaningful biological effect, *see* DEIS/DEIR 11-1520. The reluctance of the DEIS/DEIR to acknowledge impacts to steelhead migration resulting from reduced fall flows is not scientifically supported.

3. Conclusion

The DEIS/DEIR analysis of impacts to steelhead fails to adequately and accurately assess the overall effects of the Draft Plan to this species. The DEIS/DEIR projects no increase in through-Delta survival rate arising from Alternative 4 operational variants; in fact, it allows for and projects a decrease in through-Delta survival rates below unacceptable status-quo conditions. Projected levels of through-Delta survival are inadequate to maintain populations from either the San Joaquin Basin or Sacramento Basin, and NMFS' appendix describing through Delta survival objectives indicates that abundance will go to zero quickly at such low levels of through Delta survival. Given these outcomes, the draft documents indicate the extirpation of Central Valley steelhead in the San Joaquin Basin and substantial reductions in abundance of populations in the Sacramento Basin within the first half of the BDCP's proposed permit terms. In addition, the DEIS/DEIR reveals substantial impacts to steelhead spawning, rearing, and migration upstream of the Delta (in both the San Joaquin drainage and the Sacramento drainage). These significant adverse impacts are likely to result in the loss of one or more steelhead populations during the course of BDCP permit term, and these adverse impacts biologically outweigh and overwhelm any potential benefits from other BDCP conservation measures.

F. Green and White Sturgeon

1. The Draft Plan Fails to Define Adequate Objectives for Viability of Both Sturgeon Species

The southern distinct population segment (DPS) of green sturgeon is a federally-listed threatened species. In the Central Valley, its current spawning, egg incubation, and early rearing range falls entirely in the area downstream of Anderson, CA on the Sacramento River to and through the Plan Area. Israel and Klimley 2008; NMFS 2009 Biological Opinion at 125. White sturgeon spawning is currently believed to occur in the Sacramento River only from Colusa to the gauge at Verona, though spawning has been detected on the San Joaquin River, with rearing occurring throughout the Plan Area. Israel et al. 2009 . Both species are expected to have occurred on other larger rivers in the Central Valley, though there are no recent records from these other waterways. Both species are anadromous, meaning they spend some portion of their post-juvenile life history in marine environments. Thus, spawning, larval, and juvenile life stages of both of these covered species occur within the Plan Area or reaches of the Sacramento River where flow and water quality are significantly affected or controlled by operations of the SWP and CVP.

The Draft Plan's presentation of global goals and objectives for green sturgeon is confused, conflicting, and not specific. For instance, whereas the global goal for endangered species such as Delta smelt is to remove them from the endangered species list through restoration of their abundance and distribution, *see* Draft Plan 3.3-107, the Draft Plan identifies a global goal for green sturgeon that is to ensure that they use habitats they currently use and to maintain a stable population size and age structure. Draft Plan at 3.3-190. Clearly, this is an inadequate goal for a federally-threatened species that is at risk of extinction because of low abundance and a greatly restricted geographic range. *See, e.g.,* NMFS 2009 Biological Opinion. Fortunately, this erroneous global target is contradicted by global objectives that call for increased abundance, productivity, spatial distribution, and life history and genetic diversity, but, none of these global objectives are SMART, so they fail to set the context for what the BDCP will do to serve these larger conservation aspirations. The description of global goals and objectives for white sturgeon is identical to what is described for green sturgeon and similarly flawed

As described above, the green sturgeon productivity objective GRST1.1 is too vague to understand or to use in evaluating the adequacy of conservation measures or to assess the efficacy of the BDCP as it is implemented (i.e. for adaptive management). *See also* NMFS 2013 Progress Assessment at 15. Another objective related to green sturgeon productivity (GRST1.2; to eliminate stranding in migration corridors of the Yolo Bypass, *see* Draft Plan at 3.3-193) is actually a stressor reduction target (as it refers to a particular stress on adult survival) but it is at least close to being SMART. Unfortunately, the Draft Plan has no objectives for improved spatial distribution or life history and genetic diversity for this species – issues that are identified as important in the preceding statements of global objectives and in the existing biological opinion. NMFS 2009 Biological Opinion at 558. Again, the descriptions of white sturgeon BDCP objectives are identical to those provided for green sturgeon in the Draft Plan and they are inadequate for the same reasons.

2. <u>The Draft Plan and DEIS/DEIR Ignore Several Effects of the BDCP that are Each Likely to Cause Significant Negative Impacts on Survival of Sturgeon Juveniles in the Plan Area and Upstream. Operation of the New North Delta Diversion (CM1) Likely Will Cause Significant Impacts to Both Species that are not Reported in the DEIS/DEIR, and the Draft Plan and DEIS/DEIR Ignore the Cumulative Impacts on these Two Species.</u>

Because the Draft Plan's objectives for the sturgeon species are unacceptably vague, it is not possible to evaluate whether the Draft Plan is likely to achieve such objectives. Still, the DEIS/DEIR indicate that BDCP will cause significant environmental impacts to both sturgeon species and prevent attainment of conservation objectives. Alone and cumulatively, these impacts represent potentially devastating impacts to both sturgeon species.

Sturgeon larval and juvenile life stages are most susceptible to major stressors such as entrainment, low migration/dispersal flows, and predation. Young-of-the-year green sturgeon are present in the middle and lower Sacramento River from April-October (larvae) and from August through March (juvenile). All stages of white sturgeon are present in the lower Sacramento River, with larvae present from February-May and the smallest juveniles present from April-June. Israel *et al.* 2009. Larval and young-of-the-year juvenile sturgeon are expected to be most abundant following spawning seasons characterized by high river flows. Kolhorst 1991; Moyle 2002; Israel *et al.* 2009. The spawning cues for green sturgeon are not known, but they are believed to be analogous to those for white sturgeon, with spawning being triggered by high river flows. NMFS 2009 Biological Opinion at 127.

i. Larval and Juvenile Sturgeon Migration – Flows Downstream of North Delta Diversion

Migration and dispersal of juvenile and larval white sturgeon will likely be significantly and adversely affected by reduced flows below the north Delta diversion. The DRERIP life history conceptual model for green sturgeon indicates that the volume of flow in the middle and lower Sacramento River is a stressor that can limit transport and dispersal of larval and juvenile green sturgeon. Israel and Klimley 2008 at 32; the white sturgeon conceptual model indicates the same potential stressors for that species, Israel et al. 2009 at 36, and rates "flow operations" as the stressors with the highest possible importance and understanding for this species, *id.* at 43. Compared to EBC2 LLT, flows below the new diversion would be substantially lower under both the low and high outflow scenarios; under the LOS, flows will be reduced between 11.7%-20.4% on average, and under the HOS, flows will be reduced between 5%-18.9% on average. Draft Plan at 5.5.8-21 to 5.5.8-23 (Table 5.5.8-9). Worse, the flow reductions are greatest during above normal and wet years (up to 28% in the HOS and 28.5% in the LOS, *see id.*), the very years in which sturgeon species are likely to spawn. Anticipated average flow decline in the August-March period, when green sturgeon juveniles would be in the lower river, are dramatically lower under BDCP Alternative 4 than under the environmental baseline in the late-long term, and the reductions are greater than those identified above affecting white sturgeon juveniles. For example, flows in September under the low outflow scenario would be 49% less than under the baseline on average across all year types, and 57.4% and 70% lower in the vital above normal and wet years, respectively. *See id.* Substantially lower flows downstream of the new north Delta diversion are expected in nearly every year type of every month under Alternative 4/H3 ("evaluated starting operations"). *See also* DEIS/DEIR Appendix 11C at 11C-284 (Table 28). These significant reductions in flow are likely to result in significant adverse impacts on juvenile survival of both sturgeon species that is contrary to the Draft Plan's conservation objectives. *See* Draft Plan at 3.3-190 (GRST1.1); id. at 3.3-198 (WTST1.1).

Despite these significant reductions in flows and the prior acknowledgement of their importance, the Draft Plan disregards its own findings about the importance of river flows in the lower Sacramento River and about the large changes anticipated under Alternative 4. It identifies rearing habitat has a major stressor on both green and white sturgeon, Draft Plan at 3.3-190, 3.3-198, and it acknowledges that flow management may affect larval and juvenile rearing habitat "upstream of the Plan Area." Draft Plan at 3.3-191. The Draft Plan even concludes with "moderate" certainty that the BDCP will: "… result in a moderate negative change to migration flows for green sturgeon larvae and a low negative change for juvenile green sturgeon in the Feather River, and a low negative change for white sturgeon juveniles in the Feather River." Draft Plan at 5.5.8-19. Despite this, the Draft Plan does not regard the projected huge changes in flow downstream of the north Delta diversion as problematic. Rather, it states:

> Given that most green and white sturgeon occupying the Plan Area are likely to be from the Sacramento River region, it is concluded with moderate certainty that there would be a low negative change to Plan Area flows because of diversions at the north Delta intakes, for juvenile and adult green sturgeon; and for larval, juvenile, and adult white sturgeon … flows on the Sacramento River below the north Delta intakes, the main migratory pathway … would be lower; therefore it is felt that a low negative change is warranted.

Draft Plan at 5.5.8-24 (emphasis added). The conclusion that flow reductions represent a "low" impact change for either sturgeon species is not supported by the best available science, particularly because it impacts "most green and white sturgeon occupying the Plan Area" as they migrate through their "main migratory pathway". In fact, commenting on a previous version of the Draft Plan, the California Department of Fish and Game stated:

> River flows are important to sturgeon production in the Sacramento River system and Delta, and [proposed project] operations are predicted to result in significant occurrences of river flow reduction during the sturgeon spawning and early rearing periods. Reductions are most pronounced in the mainstem Sacramento River downstream of the Fremont Weir and the proposed northern delta intakes, but occurrences of substantial flow reductions are also predicted in more upstream river reaches.
>
> … the [proposed project] is predicted to expose green sturgeon larvae to substantial reductions in July-September Feather River flows in most years.
>
> The collective predicted negative river flow effects of the [proposed project] create the risk of a depressive effect on sturgeon production that may not be overcome by more favorable [proposed project] aspects (e.g. reduced entrainment,

> increased food production supply). This suggests the need to modify the [proposed project] to reduce the magnitude and frequency of river flow reduction occurrences, in both upstream and downstream areas.

CDFW Red Flags 2012 at 2. The Bureau of Reclamation made an analogous observation in its comments on the same earlier draft of BDCP. USBR Red Flags 2012 at 4. These problems have not been resolved in the current Draft Plan or DEIS/DEIR.

The negative effect of reduced flows is likely to extend to areas downstream of the north Delta diversion. The best available science indicates that Delta outflows likely correlate positively with sturgeon rearing success in this estuary. Israel et al. 2009 (citing Kolhorst et al. 1991); USFWS 1995;[73] AFRP 2001 Final Plan; NMFS 2010 Testimony to the SWRCB, Exhibit 9; Fish Agencies 2012 "Scenario 5 Modeling." Consistent with this scientific information, CDFW noted in 2012 that:

> The EA seems to suggest that a reduction in entrainment of juvenile sturgeon at the south Delta offsets (justifies) the effects of reduction in winter-spring outflows. While the statement that "Entrainment of juvenile sturgeon at the south Delta pumping facilities, however, is considered an important stressor for this life stage." may be true, it is not considered to be a more important stressor on sturgeon than reduced winter-spring outflow. Entrainment of juvenile white sturgeon at the south Delta pumping facilities is not a significant stressor, when compared to the loss of winter-spring outflow. Although entrainment of green sturgeon is a somewhat different matter, reducing it in exchange for reducing winter-spring outflow is still not preferred.

CDFW Red Flags 2012 at 1. As noted elsewhere in our comments (*see, e.g.,* discussion *supra* regarding longfin smelt and Delta outflows), operations under all Alternative 4 variants reduce Delta outflows, in some cases severely. Given that the best available science indicates that current levels of Delta outflow are inadequate to maintain or restore many native fish species in the Delta including sturgeon, *see* SWRCB 2010; CDFW 2010; DSP Outflows Review Panel Report 2014, the failure to increase winter-spring Delta outflows from present levels (let alone to decrease them) will perpetuate and likely exacerbate negative impacts to green and white sturgeon.

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[73] U.S. Fish and Wildlife Service, 1995. Working paper on restoration needs: habitat restoration actions to double natural production of anadromous fish in the Central Valley of California. Volume 3. May 9, 1995. Prepared for the U.S. Fish and Wildlife Service under the direction of the Anadromous Fish Restoration Program Core Group. Stockton, California.

As with other strong, well-documented relationships between flow and fish species' abundance, the Draft Plan attempts to cast doubt on the effect by pointing to a general lack of consensus regarding the mechanism underlying the effect. Yet this does not justify ignoring the best available science that clearly identifies strong relationships between freshwater flow rates and positive population-level responses among numerous aquatic species in this estuary; one does not need to understand the mechanism of an effect to be certain that a relationship exists and is likely to persist into the future. With regard to the Draft Plan's statement that: "… there is appreciable uncertainty in the mechanisms involved in Plan Area (and other) flows for migration and movement, which would be investigated during BDCP implementation monitoring and research," CDFW previously commented that:

> The assessment effects seems to turn the notion of uncertainty upside down. In general, the Plan reduces winter-spring outflow, and in some regards Sacramento River Flow. There is a strong historical association between flow conditions and sturgeon production, which the EA seems to dismiss, citing a lack of understanding of the mechanisms underlying the association.

CDFW Red Flags 2012 at 1. The best available science indicates with high certainty that green and white sturgeon spawning, larval and juvenile rearing and transport success is positively correlated with the rate of freshwater flows into, through, and out of the Delta. There is no justification for the Draft Plan or DEIS/DEIR to ignore the potential effect of reduced flows in the lower Sacramento River, Delta through-flow, and Delta outflow on these two species. Both the DEIS/DEIR and Draft Plan fail to use the best available science regarding the effects of flow reductions on green and white sturgeon. In particular, the DEIS/DEIR conclusions regarding effects on migration conditions for green sturgeon (AQUA-132),[74] including the conclusion in AQUA-130 that Alternative 4 would not cause adverse impacts on migration conditions and that there are not feasible mitigation measures to reduce impacts under other alternatives are both incorrect; the former ignores the weight of scientific evidence, and the latter ignores changes to operational rules that reduce impacts on Delta inflows, bypass flows, and outflows.

ii. Predation Risk

The DRERIP life history conceptual models for the sturgeon species both indicate that predation may be a concern to the youngest/smallest life stages, when they are in the riverine environment. Israel and Klimley 2008 at 32; Israel et al. 2009 at 36. Reduced turbidity below the north Delta intakes would exacerbate this problem as increased water clarity increases predator efficiency on sturgeon. Gadomski and Parsley 2005a,b,c. The Draft Plan inappropriately assumes that

[74] The DEIS/DEIR's conclusions regarding white sturgeon (AQUA-149 and AQUA-150) lack substantial evidence for the same reasons.

predation rates are not important to either white or green sturgeon larvae or juveniles in the Plan Area (though it is not clear why the location of these life stages in the Plan Area would reduce their susceptibility to predation); nevertheless, it assumes that the BDCP could produce a beneficial reduction in predation throughout the Plan Area. Draft Plan at 5.5.8-14. In fact, the Draft Plan and DEIS/DEIR analytical outputs indicate a substantial risk of increased predation on early life stages of both sturgeon species; this increased risk arises from both the reduced flows (*discussed above*), reduced turbidity, the interaction between the two, and the increased density of predators expected to aggregate close to the CM1 facility, *see* Draft Plan at 5.5.8-14. The US Bureau of Reclamation, commenting on an earlier version of the Draft Plan, specifically requested a more thorough evaluation of the claim that predation of green sturgeon would be a minor effect. USBR Red Flags 2012 at 5. The DEIS/DEIR and Draft Plan do not do so, as we discuss below.

iii. Reduced Turbidity and Predation Risk

Projected diversion of sediment and other suspended particles from the Sacramento River at the north Delta diversion facility are expected to increase water clarity and reduce turbidity throughout the Delta on average. DEIS/DEIR at 11-267. The effect is actually larger than the DEIS/DEIR acknowledges as operations under ESO_LLT are expected to remove well over 20% of the Sacramento River's sediment load in most months April-October. Draft Plan Appendix 5.C, Attachment 5C.D at 5C.D-24 (Figure 5.C.D-11). This is the period when this stretch of river would normally be occupied by larval and juvenile white and green sturgeon. Thus, the reduced turbidity expected under the BDCP in the primary migration corridor for white and green sturgeon juveniles will likely lead to increased predation on young-of-the-year white and green sturgeon, and this adverse impact is inappropriately dismissed in the Draft Plan (*see* Draft Plan at 5.5.8-32) and is not considered or analyzed at all in the DEIS/DEIR.

iv. Predation Risk: Combined Effects

Reduced flows and reduced turbidity below the new north Delta diversion facility (CM1) each represent separate independent threats to white and green sturgeon that the DEIS/DEIR improperly discount or ignore, and the combination of these two effects is expected to exacerbate the increased predation rates that might arise from either of the individual impacts. When river flow rates fall substantially, as they will below the new North Delta diversion, the reduction in volume concentrates predators and prey into a smaller area. In addition, the decline in river volume will also cause a drop in river depth (stage) that will allow sunlight to penetrate through more of the water column, to depths that represent prime sturgeon habitat in many places. Furthermore, diversions at the north Delta facility would be expected to reduce the Sacramento River's velocity and, therefore, its competence to transport suspended sediments that have not been diverted. Thus, diversion of water and suspended sediment by CM1 will increase water

clarity, increase light levels in near-bottom environments frequented by both sturgeon, and concentrate predators in a smaller area – it is highly likely that this will increase predation rates on both green and white sturgeon juveniles and larvae; this is likely to represent a severe impact on both species. *See, e.g.*, Gadomski and Parsley 2005 a,b,c. The proportional and absolute reduction in fresh water flows and turbidity downstream of the north Delta diversion are expected to be greatest during Wet and Above Normal type water years, the very years in which the most white and green sturgeon young-of-year would be exposed to predation risks. In addition, we note that this combined impact would apply to all species that use the Sacramento River as a primary migration corridor (e.g. all the covered salmonid species).

v. Entrainment/Impingement and Indirect Effects (Predation) at North Delta Diversions

The Draft Plan and DEIS/DEIR fail to adequately analyze the potential effect of a range of entrainment and impingement rates at the new North Delta diversion on green and white sturgeon larval-juvenile survival rates. Entrainment at existing agricultural diversions like that of the Glenn-Colusa Irrigation District is believed to be a stressor of high importance for green sturgeon feeding larvae. Israel and Klimley 2008. White sturgeon spawn downstream of the GCID diversion, so this stressor is not regarded as high currently, Israel *et al.* 2009, but the addition of a new diversion facility in the heart of this species' juvenile rearing grounds is cause for concern. Entrainment rates of juvenile green and white sturgeon at the new North Delta Diversion are unknown; however, the Draft Plan's unsubstantiated dismissal of this potential effect is unsupported by science.

The bypass flow conditions for the new screens (which are unprecedented in the length of river they will cover) were designed to protect migrating Chinook salmon juveniles and Delta smelt. These fish live in the middle and/or upper part of the water column, unlike sturgeon, which are bottom-dwellers. As indicated by green sturgeon's much greater susceptibility to entrainment in unscreened small agricultural diversions, *see* Mussen *et al.* 2014, sturgeon behavior and ability to avoid entrainment and impingement at the CM1 screens are unknown and not analogous to those of salmonid species. Furthermore, as predators are likely to aggregate near the new diversion facility, *see* Draft Plan at 5.5.8-14, the DEIS/DEIR and Draft Plan fail to adequately analyze the effects of increased predation, which is likely to be as much or higher than that affecting salmonids as described above. *See* Draft Plan, Appendix 5.F, Section 5.F.6.3.1.4). The Draft Plan and DEIS/DEIR fail to adequately analyze these impacts, and both documents need to be revised to analyze the effect of greater entrainment, impingement, and predation as a result of the operation of CM1, consistent with the scientific information provided above.

vi. Entrainment at South Delta Diversions:

The DEIS/DEIR overstates the likelihood of positive impacts from reduced entrainment of sturgeon at the south Delta export facilities. Confidence intervals on estimated entrainment at south Delta diversion suggest there are may be no differences among modeled alternatives, particularly for wet years. Draft Plan Appendix 5B at 5.B-270 (Table 5.B.6-206). Thus, reported proportional declines in sturgeon entrainment DEIR/DEIS are misleading, as they represent actual differences amounting to just a few fish and there is little confidence that these effects are real, given error bounds around the estimates. NMFS identifies entrainment as a problem for this species; thus, if there is no real change in entrainment rates under modeled alternatives, then entrainment may continue at unacceptably high rates. It is possible that entrainment at the south Delta facilities will decline in dry years at the CVP, but again the differences are not as great as the raw percentages might suggest.

vii. Temperature and Flow – Upstream Effects

Both the Draft Plan and DEIS/DEIR suggest that temperature and flow impacts to green sturgeon may occur upstream, particularly on the Feather River. We have indicated our concern with elevated temperatures and reduced flows in our discussion of potential impacts of the BDCP to salmonid populations, and there are similar concerns with regard to the potential impacts to green and white sturgeon. In particular, the DEIS/DEIR indicates that temperatures will exceed the 64°F threshold at Gridley (on the Feather River) with much greater frequency during the July-September period and that this negative effect will be most common in the Above Normal and Wet years when rearing sturgeon larvae and juveniles are expected to be most abundant. DEIS/DEIR at 11-1576. Similarly, exceedances of the temperature threshold identified for rearing green sturgeon larvae and juveniles would increase under Alternative 4/H3 on the Sacramento River at Bend Bridge in July-September. DEIS/DEIR at 11-1578 (Table 11-4-104). This table contradicts the DEIS/DEIR claim that there would be no difference in mean monthly temperatures at Bend Bridge in any month or water year type and therefore no impact to green sturgeon rearing habitat. DEIS/DEIR at 11-1588. The temperature appendix reveals that temperatures during the green sturgeon rearing period are expected to increase compared to those currently experienced. DEIS/DEIR, Appendix 11D at 11D-268 to -269 (Table 2). In other words, there will be a significant impact of elevated temperatures in the Sacramento River to rearing green sturgeon juveniles.

The DEIS/DEIR inappropriately dismisses these temperature exceedances and ignores scientific evidence indicating this is a stressor of "medium" importance and certainty to green sturgeon. *See* Israel and Klimley 2008; NMFS 2009 Biological Opinion at 712. In discussing the impacts of temperature changes driven by proposed BDCP operations, the DEIS/DEIR fails to look at

cumulative impacts and implies that perceived positive effects to green sturgeon eggs and early larvae will offset the negative effects to later life stages of the same fish; it states:

> Water temperature-related effects of H3 on green sturgeon rearing habitat in the Feather River were also evaluated by determining the total degree-months exceeding the 64°F temperature threshold at Gridley (Table 11-4-102). Combining water years, total degree-months exceeding the threshold under H3 would be 8% to 31% lower relative to NAA during May and June and 13% to 126% higher during July through September. These results indicate that there would be both beneficial and negative temperature-related effects to green sturgeon rearing in the Feather River.

DEIS/DEIR at 11-1587. Increasing survival of green sturgeon eggs (as the DEIS/DEIR asserts will occur), cannot be reported as a positive effect if, as the analysis reveals, high temperatures will impair or kill the resulting larval and juvenile life stages of these fish. Thus, the DEIS/DEIR's statement that Alternative 4 operations will not impact juvenile rearing habitat for green sturgeon is without scientific support. DEIS/DEIR at 11-1586. As a result, the DEIS/DEIR's conclusions regarding effects on rearing habitat for green sturgeon (AQUA-131) and white sturgeon (AQUA-149) lack substantial evidence and are contrary to the best available science.

viii. Conclusion

As discussed above, the Draft Plan and DEIS/DEIR fail to use the best available science and fail to adequately analyze likely impacts on green and white sturgeon. Contrary to findings and conclusions in the DEIS/DEIR, the project is likely to cause significant adverse impacts to green and white sturgeon spawning, rearing habitat, migration success, and abundance. Projected benefits associated with modeled reductions in entrainment at the existing south Delta diversion facilities are overstated. The DEIS/DEIR must be revised, and the Draft Plan and DEIS/DEIR must propose mitigation measures and operational changes to increase flows and otherwise reduce or avoid such impacts.

G. <u>Fall-Run and Late Fall-Run Chinook Salmon</u>

Fall-run Chinook salmon and late fall-run Chinook salmon merit conservation as independent and distinctive lineages. Smith et al. 1995; Moyle 2002. Thus, regardless of the population designation, it is clear that at a minimum, late fall-run warrant conservation efforts that maintain their distinctiveness from other Central Valley fall-run Chinook as an important life history variant. *See also* NMFS 2009 Biological Opinion at 181 (showing differences in life history timing between the different runs in the Central Valley). In particular, late fall-run Chinook

salmon are mostly "stream-type" Chinook salmon as opposed to fall-run Chinook salmon which are typically "ocean-type" Chinook salmon. Moyle 2002. This is a basal life-history distinction within Chinook salmon, Healy 1991, which indicates, among other differences, that late fall-run Chinook salmon juveniles tend to rear in freshwater for many months (up to one year) whereas fall-run Chinook salmon migrate to the ocean quickly, usually in less than half a year. Moyle 2002 at 255. Thus, when late fall-run Chinook salmon reach the Delta, they generally follow a "migrant" strategy (meaning they do not rear much or for long in the Delta) and fall-run Chinook salmon juveniles are much more likely to forage or rear in the Delta.

The difference in these two strategies has implications for the distribution of positive and negative effects among late fall-run and fall-run juveniles. For example, late fall-run juveniles are unlikely to benefit much from efforts to improve prey productivity in the Delta. Williams 2010. In contrast, fall-run Chinook juveniles are among the salmonids most likely to benefit from improved rearing conditions in the Delta because they actually tend to rear in downstream environments. On the other hand, fall-run Chinook salmon juveniles migrate to the Delta at smaller sizes than late fall-run juveniles and they are thus more likely to suffer from increased predation pressure and altered delta hydrodynamics that would lead to entrainment or other sources of mortality following diversion from an optimal migratory path. Clearly, the different adult migration timing of these fish exposes them to different flow rates and temperatures during their adult migration, spawning, and egg incubation phases – juveniles also migrate at different times with late fall-run arriving in the Delta in the late fall-winter while fall-run Chinook salmon juveniles enter the Delta primarily between March and June. Moyle 2002; Williams 2006.

The Draft Plan appropriately sets different through-Delta survival objectives for fall-run and late fall-run Chinook salmon. However, two other objectives regarding the maintenance of spawning and rearing conditions upstream of the new water facilities (FRCS3.1 and FRCS3.2, *see* Draft Plan at 3.3-162), treat the late fall-run and fall-run Chinook salmon life history variants cumulatively. In keeping with the genetic and eco-phenotypic differences between these two runs, the Draft Plan appropriately provides separate analyses of effects for late-fall and fall-run Chinook salmon. However, despite the separate analyses, the Draft Plan and DEIS/DEIR tend to interpret different results for the two runs as though they were the same result. More importantly, we see no indication that the Draft Plan will accomplish the objective of benefiting both life history types equally. As with most other objectives, the DEIS/DEIR does not compare projected outcomes to those described by the conservation strategy objectives.

1. The Draft Plan and DEIS/DEIR Overstate Potential Benefits Within the Plan Area and Underestimate Environmental Impacts, the Available Scientific Information Demonstrates that the Draft Plan is Unlikely to Achieve its Biological Objectives, and the Analyses Predict that the BDCP will Fail to Conserve Both Runs in the Plan Area

i. Upstream Adult Migration

The Draft Plan finds that olfactory cures for migrating adult salmon will be changed differentially for fall-run and late-fall run Chinook salmon. Specifically, the strength of olfactory cues to migrate towards the Sacramento River (i.e., the proportion of water in key Delta channels that emanates from the Sacramento River) declines under ESO operations by 10% for fall-run Chinook salmon and 50% for late-fall run Chinook salmon. Draft Plan at 5.5.5-25. Given these reductions, the Draft Plan concludes with low certainty that there will be a low magnitude negative impact for both fall-run and late-fall run adult migrants trying to orient towards the Sacramento River. The Draft Plan provides no rationale as to why both runs would experience low magnitude and low certainty negative effects given the vast difference in proportional impact to flows experienced by the two runs; it seems that the late-fall run should experience a greater impact, with greater certainty, than for fall-run given the larger projected decline (50%) in the indicator of olfactory cues for late-fall run Chinook salmon. In fact, the DEIS/DEIR implies a threshold for effect on adult salmon migration of proportional declines in flow that are 10%, but, contrary to the Draft Plan, it finds that the proportion of Sacramento River flow in the Delta will only be 10%. DEIS/DEIR at 1458. The difference between Draft Plan and DEIS/DEIR predictions of Sacramento River proportional flow reduction must be resolved in order to allow evaluation of impacts on late-fall run Chinook salmon adult migrants.

ii. Spawning, Incubation, and Rearing (Upstream)

The Draft Plan and DEIS/DEIR understate and downplay negative impacts to fall and late-fall run Chinook salmon upstream of the Delta that are related to project operations under Alternative 4. The DEIS/DEIR reports an increase in years with adequate available spawning area for fall-run Chinook salmon on the Sacramento River under Alternative 4, but also report an increased frequency of years where dewatering of redds will be a problem for Chinook salmon (particularly in November). DEIS/DEIR Appendix 11c at 11C-225. Dewatering of fall-run Chinook eggs is already a problem for Sacramento River fall-run, *e.g.* SRTTG 2013, and, it is important to note that flow levels in this spawning area that cause redd dewatering are almost completely under the control of the CVP at this time of year. The DEIS/DEIR estimate a 7% increase in years when redd dewatering will be problematic; this is a significant impact, regardless of the perceived increase in frequency of "good" availability of spawning habitats –

fish that spawn in habitats that will eventually be dewatered obviously do not benefit from any increase in spawning habitat availability.

In addition, the projected increase in available spawning habitat ignores the anticipated increase in water temperature downstream of Keswick Dam during September and October in almost every year type under Alternative 4/H3 as compared to the NAA. *See, e.g.*, DEIS/DEIR at 11D-257. Though small in relative terms, these projected increases in temperature would be expected to negatively affect available fall-run spawning habitat and egg incubation success. Temperatures are already at or near threshold for Sacramento River fall-run Chinook salmon in many years and, judging from the comparison of temperatures under existing conditions and those under Alternative 4/H3, temperatures problems will increase in the future; thus, even small (proportional) increases in temperature under H3 relative to NAA likely represent large impacts to incubating fall-run Chinook salmon eggs. In fact, the DEIS/DEIR reports increases in egg mortality of 5% or more in most years under Alternative 4/H3 relative to the NAA. The magnitude and frequency of egg mortality increases for fall-run Chinook salmon eggs is of great concern. The DEIS/DEIR reports that "Total degree-days exceeding 56°F … under H4 would be 10% higher than those under NAA during March and similar during remaining months (Table 11-4-68)." DEIS/DEIR at 11-1412. Temperature exceedances during March are likely to result in extra mortality to fall-run Chinook salmon eggs and juveniles rearing on the upper Sacramento River, an impact to run productivity; in addition, the asymmetrical impact to those fall-run Chinook salmon that incubate towards the end of this run's incubation period represents a negative impact to fall-run Chinook salmon life history diversity.

Similarly, SacEFT projects a 5% decrease in years when juvenile rearing conditions will be considered "good" for fall-run juveniles on the Sacramento River upstream under Alternative 4/H3 operations. DEIS/DEIR at 11-1393 (Table 11-4-56). The net impact of increasingly frequent occurrence of years that are "not good" for fall-run Chinook salmon redds or rearing juveniles cannot be good for fall-run Chinook salmon; but, the magnitude of the impact depends largely on how "bad" conditions become and whether bad conditions for redds overlap years with bad conditions for juveniles.

Temperatures exceeding fall-run Chinook egg tolerances are expected to increase in some year types, during either October or November, under Alternative 4/H3 on the Feather River. DEIS/DEIR at 11-1397 (Table 11-4-61). Increased temperature exceedances are also expected during September in most years under H1. DEIS/DEIR at 11-1354 (Table 11-4-41). Furthermore, comparison to current conditions indicate that temperatures on the Feather River will exceed egg incubation thresholds much more frequently in the future than under current conditions; this indicates that the BDCP will not be implemented in a way that would mitigate for expected temperature effects related to climate change. As a result, Feather River fall-run Chinook salmon spawning will be substantially impacted in a future with BDCP.

The frequency of years with "good" rearing habitat conditions for late-fall run Chinook salmon in the upper Sacramento River are projected to decline by 33% in Alternative 4/H3 as compared to the No Action Alternative. DEIS/DEIR Table 11-4-58 at 11-1394. Furthermore, the frequency of years with increased risk of juvenile stranding would increase by 9% between the two scenarios. Finally, the projected 10% increase in temperature exceedances in late-fall run Chinook salmon incubation habitat on the upper Sacramento River during March (referenced above) will likely lead to increased egg mortality for this run under Alternative 4/H4.

The DEIS/DEIR finds that "collectively" there will be no adverse impact of the BDCP to egg incubation conditions for fall-run Chinook salmon on the Sacramento River. DEIS/DEIR at 11-1415. This finding is not supported by the DEIS/DEIR analyses which reveal negative impacts to abundance, productivity, and life history diversity of fall-run Chinook salmon resulting from increased occurrence of high temperatures and red dewatering. The DEIS/DEIR concludes that Alternative 4 operations will not result in significant impacts to juvenile rearing conditions for fall or late-fall run Chinook salmon upstream on the Sacramento River; however, its rationale is confused, as it states:

> Changes in flow rates and water temperatures are generally small and infrequent under Alternative 4 relative to the NAA. Therefore, there would be no biologically meaningful effects to fall- or late fall-run Chinook salmon, <u>except for a moderate reduction in juvenile rearing habitat for late fall-run Chinook salmon</u> as predicted by SacEFT. Because this effect is isolated, it would not cause the impact to be adverse, particularly in combination with modeled flow outputs indicating that flows, which drive rearing habitat availability, would increase during the rearing period.

DEIS/DEIR at 11-1435 (emphasis added). This statement is inaccurate and the DEIS/DEIR fails to demonstrate how the reduction in surviving juveniles as a result of increased redd dewatering is somehow outweighed by improved conditions later in the year (obviously, eggs in dewatered redds will die rapidly and they will not be resurrected by subsequent flows). In addition, the DEIS/DEIR points to increased frequency of other relatively severe outcomes, such as egg incubation temperature exceedances, and large increases in the frequency of sub-optimal rearing conditions for fall-run and particularly for late-fall run Chinook salmon.

In summary, the DEIS/DEIR's projections of degraded upstream egg incubation, rearing and juvenile rearing conditions represents a significant impact to fall-run and late-fall run Chinook salmon. Impacts of Alternative 4 to late-fall run Chinook salmon are severe in the only remaining river that supports this life history; declines in the abundance and productivity of this run represent a significant loss to valuable life history diversity for the Central Valley fall-run

ESU overall. Furthermore, the DEIS/DEIR demonstrate large negative impacts to fall-run Chinook salmon incubation and juvenile rearing in the Sacramento River drainage. The available scientific information demonstrates that Alternative 4 will cause negative impacts upstream to the fall-run/late-fall run Chinook salmon ESU.

iii. North Delta Diversion Survival

The Draft Plan and DEIS/DEIR simply assume that screens on the new north Delta diversion will function perfectly and consistently throughout the life of the BDCP. The Draft Plan's Effects Analysis asserts that there is a "moderate" level of certainty that the effect will be "low." Draft Plan at 5.5.4-23. But this is contradicted by the Draft Plan's Appendix 5B, which declares that it was not possible to be certain about the level of impact these screens will have on either Chinook salmon or steelhead. Draft Plan, Appendix 5B at 5B-304. The DEIS/DEIR should have considered what would happen if the assumption of negligible entrainment was incorrect, even periodically (i.e. what if damage to, imperfect maintenance, or malfunction of the screens occurs with "x" frequency and results in "y" entrainment rate for a duration of "z" weeks?).

The DEIR/DEIS ignores analyses that show negative impacts of additional predation at the north Delta diversion facility. In addition to the bioenergetics model results presented in the DEIS/DEIR, the Draft Plan (Appendix 5F) also applies a fixed predation model, based on observed entrainment rates at the Glenn-Colusa Irrigation District diversion screens. These screens are somewhat similar to those proposed for the NDD. The two estimates of potential predation at the new facility provide strikingly different predictions of predation on Chinook salmon; the bioenergetics model indicates predation rates at the NDD will be <1% for all Chinook populations, whereas the fixed predation model estimates ~12-13% loss of juvenile migrants at the NDD for each population of Chinook salmon. Both models cannot be correct and the Draft Plan and DEIS simply ignore the result showing significant predation at the north Delta diversion. *See, e.g.*, Draft Plan Appendix 5F at 5.F-77. In reporting only the results that are more favorable to the BDCP, the Draft Plan and DEIS/DEIR miss the opportunity to learn from the different outputs of the two models and fail to inform decisionmakers and the public of the potential that these impacts may be more significant than reported in the documents. As the Delta Independent Science Review Panel noted, the high mortality of Chinook salmon at the GCID screening facility indicates that predators may aggregate near that structure, suggesting this risk exists for the NDD. DSP Independent Science Review Panel Report 2014 at 52. Thus, the difference between the two modeling approaches applied by the Draft Plan's appendix could reveal that the range of predator densities at the GCID facility or their metabolism is greater than those that were input to the bioenergetics model. The bioenergetics model methodology used to calculate potential predation rates arising from the presence of the North Delta diversion apparently would not predict existing mortality rates at the GCID screening facility; thus, a larger range of predator densities should have been modeled. Instead, the DEIS/DEIR and Draft

Plan simply assume that the high predation predicted by the fixed predation model was completely wrong (despite the fact that it's based on a relevant, recent, local observation). This assumption is not scientifically justified.

iv. Through-Delta Survival of Late Fall-Run

The effects analysis provides no compelling evidence that late-fall run Chinook salmon through-Delta survival success will improve under ESO conditions as compared to the environmental baseline (with equivalent assumptions regarding climate change). For example, the Delta Passage Model (DPM; which may actually be applicable to late-fall run Chinook salmon, though it is not appropriate for modeling other runs) finds very small differences in the early or late long-term between Alternative 4/H3 operations and current operations. Draft Plan at 5C.5.3-98 (Table 5C.5.3-49); DEIS/DEIR at 11-1458 (Table 11-4-76).

The DPM results are likely to underestimate negative effects of BDCP on through-Delta survival of late-fall run Chinook migrants because of reduced flows, decreased turbidity, and the potential for increased predator exposure. The reductions in flow and other changes below the new intakes are likely very different from the conditions that were used to generate DPM. Operation of CM1 will lead to significant reductions in flow rates downstream of the facility and will cause an increase in water clarity (due to diversion of sediment and loss of river velocity needed to support sediments that remain) and increase in the river's width-to-depth ratio (WDR; i.e., a drop in river stage). Flow rates and turbidity are strongly and positively correlated with late-fall run Chinook salmon survival through the Delta and WDR is strongly and negatively correlated with late-fall run survival. Michel 2010; Michel et al. 2012; *see* Perry et al. 2010. Thus, the changes anticipated under operation of CM1 are beyond the range used to create the relationships in the DPM model and all strongly indicate that late-fall run Chinook salmon are likely to suffer significant impacts in the lower Sacramento River. Furthermore, even the relative success of late-fall run migrants through different Delta channels is likely to change under CM1 operations as predator distribution and success rate may change as flows, turbidity, and depth in the mainstem Sacramento River drop, following operation of the new north Delta diversion.

As the Draft Plan notes, DPM does not account for "growth benefits related to floodplain and tidal wetland restoration," Draft Plan Appendix 5C at 5.C.5.3-65, but even if marsh restoration is successful, (a) late-fall run Chinook salmon juveniles generally follow a migrant strategy, *see* Michel 2010; Williams 2006; Williams 2010, and are thus not likely to use or benefit from those habitats, and (b) salmon rearing in tidal marsh habitats should be expected to experience *additional* mortality in the Delta (though potentially better post-Delta survival) because predation exposure will increase as time in the Delta increases and as foraging behavior

increases. Helfman et al. 1997.[75] Furthermore, DPM does not account for increased in-Delta mortality to migrating late-fall Chinook salmon that is likely to result from decreased turbidity under the BDCP (e.g. as a result of CM1 operation, sediment loss in restoring wetlands, CM4, etc.). Thus, DPM outputs are expected to overstate survival of late-fall run Chinook salmon through the Delta. In addition, the analysis provides no basis for concluding that the Draft Plan is likely to achieve the applicable through Delta survival objective and instead demonstrates that the Draft Plan is unlikely to achieve that biological objective for this species.

v. Through-Delta Survival of Fall-Run

It is well established that fall-run Chinook salmon experience greater survival through the Delta when river flows increase. Kjelson and Brandes 1989; Newman and Rice 2002. In-Delta flows in the Sacramento River channel are projected to decrease substantially once the new North Delta diversion (CM1) begins operations. Thus, the DEIS/DEIR and Draft Plan should anticipate that survival of fall-run Chinook salmon migrating through the Delta in the Sacramento River will decline substantially. Instead, the DEIR/DEIS and Draft Plan fail to adequately analyze survival rates of fry and parr fall-run Chinook salmon in the Delta, despite the fact that this represents most fall-run Chinook salmon migrating into the Delta.

DPM is not an appropriate tool for modeling cumulative fall-run Chinook salmon through-Delta survival rates because most fall-run Chinook salmon enter the Delta as fry or parr (foraging fish). Moyle 2002; Williams 2006. DPM is based on the relative success of migrant-strategy, hatchery-produced salmonids (such as late-fall run Chinook salmon) and thus cannot be used to understand fry and parr mortality in the Delta. Draft Plan at 5.C.5.3-65). We note that foraging fall-run Chinook salmon should be expected to experience higher through-Delta mortality than migrant strategy fish because (a) they are smaller, (b) they spend a longer time in the Delta, (c) foraging exposes fish to additional risk of predation compared with migratory behavior. Even applying DPM to large fall-run (or spring-run) smolt is subject to significant caveats as these fish migrate through the Delta in a different season than do late-fall run salmon; there is no reason to expect that survival rates (and even relative survival rates) in Delta channels remain unchanged across seasons as numerous influences on predator efficiency (temperature, light penetration, SAV coverage, etc.) may all change seasonally.

The Effects Analysis applies a modification of Newman's (2003) methodology to estimate survival of fall-run smolt survival through-Delta under different Alternative 4 scenarios. Again, smolts are expected to be a small fraction of fall-run entering the Delta. EBC2_LLT outperforms both ESO and HOS in the early long term, meaning that fall-run survival through the Delta is

[75] The Draft Plan and DEIS/DEIR ignore the likely positive relationship between increased in-Delta rearing time and total in-Delta mortality in their discussion of all salmonids.

lower under the Draft Plan than under the status quo. Draft Plan Appendix 5C at Tables 5C.5.3-115 and 5C.5.3-117. In the late long term, through Delta survival is higher under the baseline (EBC2_LLT) than under ESO. *See* Draft Plan at 5C.5.3-238 (Table 5C.5.3-116). Under HOS in the late long term, through Delta survival is similar to and may slightly exceed the baseline. Draft Plan at Table 5C.5.3-117. It is not clear that any of these results is statistically significant, and the Draft Plan should analyze these results using statistical techniques appropriate for paired model observations. Whatever the outcome, it is apparent that differences in through-Delta survival (if there are any) as estimated by this modification of the Newman (2003) methodology will be slight – not enough to claim any benefit to fall-run Chinook salmon smolt survival through the Delta and certainly not enough to achieve the Draft Plan's objectives for through Delta survival (FRCS1.1).

The DEIS/DEIR projects no overall change in through Delta survival for fall-run Chinook salmon migrating through the Delta from the San Joaquin River; decreases in through-Delta survival of ~3% in wet year survival are expected to be balanced by improvements in survival of ~1% during dry years. DEIS/DEIR at 11-1459. Setting aside the fact that the small projected changes in through-Delta survival are not equal (and would only "balance" if dry years were more frequent than wet years), the analysis demonstrates that the Draft Plan is likely unable to improve through-Delta survival rates of fall-run Chinook as specified in the biological objective for this species (objective FRCS1.1). Moreover, current rates of through-Delta survival are expected to lead to extirpation of fall-run Chinook emigrating from the San Joaquin basin in the very near future. Draft Plan Appendix 3G; NMFS Comments on the Phase I WQCP Update. We note that benefits to San Joaquin River fall-run Chinook salmon that are assumed to arise from measures in the conservation strategy (e.g. as described at 3.3.-158 through 159) cannot offset the impacts if fall-run Chinook salmon continue to suffer with status quo levels of through-Delta survival.

H. Delta Smelt

1. Draft Plan Objectives for Delta Smelt are Inadequate to Attain the NCCPA Standard for this Species

The Delta smelt geographic range for spawning, egg incubation, and early rearing fall is almost entirely contained within the Plan Area. *See, e.g.*, Moyle 2002; Bennett 2005; Nobriga and Herbold 2009; DEIS/DEIR at 11-1300. Thus, as discussed above, under the NCCPA the BDCP must provide conservation measures sufficient to achieve conservation (recovery) of this species.

The Draft Plan identifies a global goal for Delta smelt to "Remove delta smelt from the state and federal lists of endangered species through restoration of its abundance and distribution" Draft Plan at 3.3-107. The Draft Plan lists three global objectives that it believes, if attained, will lead

to attainment of the global goal (objectives define goals in SMART terms). The objectives relate to increased abundance, reduced entrainment, and increased spatial distribution of this species. However, the Draft Plan completely ignores the need to maintain or restore the historical range of life history variation of Delta smelt that is so important to its future viability. *See* Bennett 2005; Nobriga and Herbold 2009.

The Draft Plan appears to adopt the USFWS 1996 Draft Recovery Plan's global objective for spatial distribution of Delta smelt. Draft Plan at 3.3-107. This global objective is inadequate as it disregards the large portion of Delta smelt's historic range and historic spawning habitat (including the Central Delta and San Joaquin River, *see* Wang 2007). USFWS 1996 Draft Recovery Plan at 16. The USFWS correctly identifies the need to restore Delta smelt to its historic (1967-1981) distribution prior to de-listing. USFWS 1996 Draft Recovery Plan at 21. But its specific description of that range is inappropriately narrow. Also, as written, the Draft Recovery Plan's objective (and thus the BDCP's global objective) for spatial distribution allows for the species to be detected in just one sampling locality in 40% of years – for a species that is critically imperiled because of its limited geographic range, such an outcome cannot represent success of a conservation plan. The Draft Plan includes several measures that it claims will benefit Delta smelt in the south Delta, including reducing exports from the south Delta pumping facilities (CM1) and restoring shallow sub-tidal habitats in the south Delta ROA, e.g. Draft Plan at 3.3-112; thus, the Draft Plan should acknowledge its intent to restore Delta smelt to their historic range, including in the south Delta.

The BDCP-specific set of these objectives calls for (1) improving fecundity, (2) limiting entrainment, and (3) achieving target abundance. Draft Plan at 3.3-108. The first two of these objectives are related to the productivity attribute of viability while the third objective is related to the abundance viability attribute. *See* McElhany et al. 2000. The first two of these "abundance" objectives actually relate to "productivity", as they address biological rates, not threshold values of abundance or ecosystem capacity to maintain abundance levels. The first (DTSM1.1) calls for increases in Delta smelt fecundity – this is a laudable target, but the statement has none of the specificity required of SMART objectives. What does it mean to "increase" fecundity? How much? And by when must this increase occur? DTSM1.1 does not provide answers to these questions; thus, it is not useful in guiding development or evaluation of restoration actions in the Draft Plan or in guiding adaptive management of the BDCP following implementation. Without more specificity, it is not possible to know how actions described by this or other Plans will contribute towards attainment of this biological outcome.

The second of the Delta smelt targets related to productivity calls for limiting entrainment of Delta smelt. As described for longfin smelt (the parallel objectives are nearly identical), DTSM1.2 is inadequate to conserve or restore Delta smelt. First, there is no time-bound for this objective. Second, the objective is less protective of Delta smelt than protections already offered

by the USFWS 2008 Biological Opinion; for instance, because the target is constructed as a 5-year running average, extremely high rates of entrainment (i.e. up to 25%) can occur in a single year without triggering a response from BDCP's implementing agency and adaptive management process. USFWS 2008 at 387; *see* discussion *supra.* Such a result could be devastating to the population. *See* Kimmerer 2011. Also, as the Draft Plan notes, entrainment rates are highly variable due to environmental conditions in any year, and measuring entrainment as a 5-year running average obscures the impact of measures identified in the Draft Plan that are intended to reduce entrainment as these effects are conflated with "natural" variance in entrainment and entrainment-related risk.

Again, we note that the second component of the DTSM1.2 (assure that entrainment risk is evenly distributed over the adult migration and larval-juvenile life stages) is not adequately described to allow us to understand what this target will accomplish or how it will be implemented. As with the similar longfin smelt entrainment objective, this component of the "entrainment objective" could easily be made into its own "life history diversity" sub-objective or stressor reduction target and defined as a limit on entrainment on a short, within year time step (e.g. a maximum entrainment of x% in any one or two week period). Such an objective would limit disproportionate entrainment impacts on any one temporal segment of the critical life stages of this species. Combined with a single-year limit (e.g. ≤5%) and a 5-year running average (e.g. ≤3%), a within-year time step would provide protection against entrainment impacts to life history diversity, productivity, and abundance.

Furthermore, this Delta smelt "objective" is actually a stressor reduction target, as is the parallel target for longfin smelt. Although entrainment rates are an important source of Delta smelt mortality that the BDCP must reduce, they are not the only factor related to Delta smelt productivity (population growth rate potential).[76] The Draft Plan should have an objective for Delta smelt survival rates (productivity) of larval, juvenile, and sub-adult Delta smelt that complement its stated (though non-specific) objective for increased fecundity. Both of these productivity objectives should be consistent with the goal of delisting the species as quickly as possible; SMART targets for reducing particular stressors (e.g. entrainment) to levels that will allow attainment of the required survival objective should be clearly articulated as stressor reduction targets. However, substituting biological outcomes (productivity expressed as survival and/or fecundity rates) for particular strategies chosen to achieve those outcomes (e.g. reduction in entrainment) inappropriately narrows the options available to achieve desired biological

[76] This omission is partially (though inadequately) resolved in the BDCP-specific objectives for Delta smelt which identify a target for fecundity (another driver of population growth potential) and in the conservation measures for this species which seek to address other sources of mortality for this species. The scattering of components of species' productivity across the Draft Plan's conservation strategy for Delta smelt represents its general confusion about attributes of species' viability and the function of different levels of the logic chain framework for conservation planning.

conditions. In other words, even were entrainment rates reduced more than is called for in the Draft Plan target, desired productivity (population growth rates) for Delta smelt might not be achieved if other forces (water quality, predation) limited survival rates; attainment of the Draft Plan's targets ("success") while failing to produce desired levels for each attribute of species viability does not represent success.

Similarly, another objective for Delta smelt sets targets to "increase the extent of suitable habitats…" Draft Plan at 3.3-111. This objective in the Draft Plan inappropriately changes from a spatial distribution objective that defines a desired biological outcome (expressed in the parallel global objective as detecting Delta smelt in various areas throughout the Plan Area, *see* Draft Plan at 3.3-107) to creating "habitat" – the two are not the same. The current BDCP objective DTSM2.1 is actually a stressor reduction target and, as defined, is more related to providing the habitat capacity the Draft Plan believes to be necessary to support Delta smelt abundance. The term "habitat" can encompass everything from physical characteristics to biotic interactions (and the Draft Plan does describe these to a certain extent) and, in choosing so vague a term as "habitat" to supplement the very specific desired outcome (repeated detection of Delta smelt successful use of various areas), the Draft Plan immediately loses focus on what needs to happen to restore this species to a geographic range that will represent a viable Delta smelt population. For example, whereas the inadequate global objective at least specified the frequency with which Delta smelt must be detected in certain areas, the BDCP-specific objective states only "Suitable habitat for delta smelt should also be distributed geographically within the Plan Area to provide a diversity of habitat locations for delta smelt." Draft Plan at 3.3-112; this is not a SMART objective and thus obscures the Plan's intentions and limits the ability to rectify inadequate performance, because adequate performance has not been defined.

Thus, the Draft Plan has no adequate SMART target for improving and conserving the spatial extent of Delta smelt. The erosion of the Delta smelt's geographic range is a major concern for this species' conservation and restoration as they have an extremely small spawning range, that is much-reduced from historical conditions. USFWS 1996; Bennett 2005; Nobriga and Herbold 2009. Restricted geographic ranges (i.e., the area encompassed by successful spawning at the population-level) are well-correlated with extinction risk among freshwater fishes. Rosenfield 2002. The same is true for other species. *See* Macarthur and Wilson 1967; Meffe and Carrol 1994; Laurance et al. 2002. In fact, the Draft Plan identifies a "limited geographic range" as a threat to this species, *see* Draft Plan at 3.3-98, and it defines restoration of spatial distribution as global goal and objective for restoration of Delta smelt, *see* Draft Plan at 3.3-104. It also claims that the conservation measures will improve spatial distribution of juveniles and pre-spawning adults. *Id.* at 3.3-99. But neither the global objective nor BDCP-specific objective will ensure an adequate *spawning range* for this species, which is increasingly confined to the northwest corner of the Delta. The Draft Plan objective (and stressor reduction targets and conservation measures that flow from them) must provide for increased distribution of spawning among Delta smelt into

the central Delta and lower San Joaquin River. Delta smelt spawning, larval, and post-larval distribution is closely tied to Delta outflow and salinity. *See, e.g.,* Dege and Brown 2004; Bennett 2005; Nobriga and Herbold 2009. Both Delta outflow and salinity would be heavily influenced by water project operations and restoration actions under the Draft Plan. The failure to adequately define necessary spatial distribution targets for this species (which arguably experiences immediate risk from its severely constrained geographic range that is equal to or greater than the risk it experiences from its extremely low abundance), and to design measures to alleviate this risk, is a serious shortcoming of the Draft Plan's strategy to conserve and restore Delta smelt.

As noted above, the Draft Plan identifies no target to conserve and restore life history diversity among Delta smelt. Differential impacts to certain life history variants has been identified in Delta smelt and it is believed that diversity in spawning timing, growth rates, repeat spawning, and fecundity play a critical role in the Delta smelt population. Bennett 2005; Nobriga and Herbold 2009. The Draft Plan's entrainment objective for Delta smelt (DTSM1.2) actually suggests the benefit of protecting life history diversity in this species, as it states that entrainment should, "Assure that proportional entrainment risk is evenly distribution over the adult migration and larval-juvenile rearing time periods." Draft Plan at 3.3-104. This clause is not defined adequately (not SMART) to allow for evaluation of its effects or implementation through conservation actions. Also, the Draft Plan states as a "landscape objective" for Delta smelt the extremely general intent to "Maintain or increase the diversity of spawning, rearing, and migration conditions for native fish species in support of life history diversity," Draft Plan at 3.3-99, but it contradicts that intention stating that "maintaining or increasing life-history diversity is not as applicable to delta smelt [because] delta smelt do not have the range of life-history strategies…that species such as Chinook salmon have," Draft plan at 3.3-100. This statement is simply false. For instance, otolith studies have shown significant variation in life history strategies and differential survival rates depending upon the timing and location of spawning and rearing. *See, e.g.*, Hobbs et al. 2007; USFWS 2011 at 173 (draft biological opinion). As elsewhere, the Draft Plan's failure to identify objectives that represent desired outcomes for each attribute of species viability (as opposed to targets for reduction of stressors the Draft Plan *believes* will produce those desired outcomes) impedes its ability to develop specific, measureable targets that can be used to (1) evaluate the Draft Plan prior to implementation, (2) determine its progress towards these targets and adjust, as necessary, following implementation, (3) identify stressors that impede attainment of the targets, and (4) design conservation measures that provide the right level of benefit to the species. In this case, the failure to develop specific metrics for measuring the maintenance or restoration of life history diversity among the Delta smelt population is a key failing of the Draft Plan; Delta smelt are threatened by human-induced loss of critical life history diversity, *see* Bennett 2005, and this threat will be allowed to persist (and may be increased) under the Draft Plan.

Even the objectives that the Draft Plan does specify are inadequate to conserve the species in the Plan Area. The Draft Plan's biological objective for abundance (objective DTSM1.3, *see* Draft Plan at 3.3-108) is inadequate. The objective, while specific, measureable, achievable, and relevant to its associated goal, is not time-bound. There is no indication of *when* the Draft Plan intends to achieve this target. Without a specific time-bound, no trigger exists to force an evaluation of progress towards the target – without a specific trigger, adaptive management is unlikely to occur. Moreover, this objective only requires that its targets, to achieve a Recovery Index ≥ 239 for at least two years of *any* consecutive 5-year period, are achieved once; as written, the Delta smelt population can decline swiftly after attaining this target one time. Even the "floor" of the objective (limiting any two consecutive years to a mean Recovery Index of 84) can result in extinction without violating the objective; for instance, if the Delta smelt Recovery Index in one year is 169, then extinction (Recovery Index of 0) could occur the next year without causing the 2-yr average to drop below 84. The abundance objectives for Delta smelt must be rewritten to prevent extinction (e.g., establishing minimum values for any 1 year) and to require a high level of performance after attaining intermediate targets (e.g., after hitting 239 on the Recovery Index).

As currently drafted, these objectives for Delta smelt are inadequate, and the objectives in the Draft Plan should be revised consistent with these comments.

2. <u>The Draft Plan Fails to Identify and Address the Correct Stressors on this Species</u>

The Draft Plan presents a scattered and unbalanced description of stressors on the Delta smelt population, ignoring some stressors entirely and focusing myopically on others. In tables identifying the Draft Plan's objectives, stressors, and stressor reduction targets, it identifies as stressors only "food" and "habitat" (which is partially determined by the availability of "food"). As with longfin smelt, the Draft Plan does not specifically identify entrainment rates at the south Delta export facilities as a stressor, even though it sets an objective for reducing entrainment rates. Draft Plan at 3.3-108. Entrainment is a well-studied and well-documented stressor on the Delta smelt population that has population level effects. Kimmerer 2008, 2011; Kimmerer and Nobriga 2008; Mac Nally 2010; Thomson 2010; Maunder and Deriso 2011; Rose et al. 2013a,b; *see discussion above*. The failure to clearly identify this stressor is a major omission and is inconsistent with the best available science.

The Draft Plan is also inconsistent in its description of the type of habitat that Delta smelt need. There is no evidence that Delta smelt *abundance* suffers from lack of spawning habitat (i.e. that there is not sufficient habitat for Delta smelt to spawn in), but there is ample evidence that the spatial extent of Delta smelt spawning habitat is increasingly limited to an extremely small

fraction of its historic range. Nobriga and Herbold 2009. As we describe above, the Draft Plan acknowledges these facts in some places but then claims benefits from what it believes will be an increased abundance of Delta smelt spawning habitat (which is not well-described in the literature) while ignoring the need for increased spatial extent of that habitat.

The Draft Plan's description of stressors also fails to acknowledge the importance of reduced flows and an altered Delta hydrograph as important stressors that affect "habitat" for this species (including suitable salinity conditions). As a result of failing to acknowledge the importance of the flow stressor to this species, the Draft Plan is equivocal about the need for flows and assumes that it can provide adequate low salinity habitat for Delta smelt simply by constructing new habitats. The effect of outflows on the extent, availability, and quality of Delta smelt habitat in the spring, summer, and fall months is well-documented. Dege and Brown 2004; Bennett 2005; Nobriga et al. 2008; Nobriga and Herbold 2009; Kimmerer et al. 2009; Feyrer et al. 2007, 2010. In particular, several studies have related the long-term decline in flows to limited habitat extent during the fall months and to fluctuations in Delta smelt abundance indices. Feyrer et al. 2007; Feyrer et al. 2010; USFWS 2008 Biological Opinion; USFWS 2011 (draft biological opinion). The 2008 biological opinion requires implementation of a "Fall X2" action. USFWS 2008.

Thus, the Draft Plan fails to adopt the best available science, which confirms the role of freshwater flow in affecting the habitat area available to this species. As a result, the Draft Plan's description of its "decision tree" process to determine optimal outflows for covered species is inaccurate because it does not "initially use operating criteria based on the best information available," Draft Plan at 3.3-113, and this strategy for determining outflow requirements (as described in CM1 Water Facilities and Operation) is inadequate – if the Draft Plan ignores the best available science that is currently available, there is no assurance that it will utilize additional science as it becomes available in the future.

3. Conservation Measures do not Adequately Address Known Stressors for this Species and/or Their Impacts are Overstated

As elsewhere in the Draft Plan, the rationale behind different conservation measures intended to benefit Delta smelt contradicts the Draft Plan's explanation of why this species has declined. Some of the Draft Plan's conservation measures do not address the identified stressors (even conceptually) and, in some cases, will aggravate those stressors. For example conservation measures that the Draft Plan and DEIS/DEIR expect will generate large quantities of important food items for Delta smelt (e.g. CM2 and CM4) ignore the Draft Plan's favored causes of food declines (invasive clams and/or nutrient ratio limitations on prey productivity). These and other logical disconnects between the Draft Plan's description and prioritization of stressors on Delta smelt and the actions it proposes to conserve species in the Plan area are further described in our discussion of longfin smelt.

In addition, we note that the operation of a new North Delta diversion (CM1) is not consistent with ameliorating an important stressor on Delta smelt: low turbidity. Delta smelt are strongly associated with higher turbidity waters within their range and recent reductions in turbidity are among the stressors believed to affect this species' predation-related mortality and productivity overall. Feyrer et al. 2007; Feyrer et al. 2011; Herbold and Nobriga 2009. The Draft Plan acknowledges the need to raise turbidity levels within the Delta smelt range, and identifies lower turbidity as a stressor. Draft Plan at 3.3-100; Draft Plan, Appendix F, Attachment 5C.D; Draft Plan, Appendix 5.F at 5.F-ii. The Draft Plan includes turbidity as part of numerous objectives. *See* Objectives L2.2 and L2.11, Draft Plan at 3.3-103; Objective TPANC2.1, Draft Plan at 3.3-105; Objective DTSM2.1, Draft Plan at 3.3-111. And the Draft Plan designs specific conservation measures (CM 13) to address the problem locally. The Draft Plan states: "For this effects analysis, it was assumed with <u>very high certainty that water clarity is an attribute of critical importance</u> to delta smelt larvae, juveniles, and adults." Draft Plan at 5.5.1-30 (emphasis added). The Draft Plan also identifies low turbidity as a stressor on longfin smelt, Draft Plan at 3.3-114, Sacramento splittail, Draft Plan at 3.3-174, green sturgeon, Draft Plan at 3.3-183, white sturgeon, Draft Plan at 3.3-196, and water quality in the Delta generally, Draft Plan at 3.2-6. In addition, the Draft Plan should have identified low turbidity conditions as a stressor on Delta smelt as decreased turbidity is associated with higher predation-related mortality for many native species. *See* Gregory 1993; Gregory and Levings 1998.

When CM1 operations begin, water and the turbidity it carries will be removed from the lower Sacramento River and the north Delta – the very areas the Draft Plan targets for Delta smelt "restoration." The U.S. Fish and Wildlife Service previously expressed concern with the effect of CM1 operations on turbidity on Delta smelt and longfin smelt as follows:

> The effects analysis acknowledges that a portion of the Sacramento River sediment supply will be diverted at the North Delta intakes, and that that diversion might be detrimental to native fishes, estimating the average effect to be minus 8-9% of sediment. It is hard to draw definitive conclusions about the ultimate effect of this change, but an average loss of 8-9% of the sediment supply that would ordinarily pass into the Delta and Suisun Bay likely implies higher average water clarity throughout the year. Besides potentially negative effects on delta smelt and longfin smelt and their habitat, which benefit from turbid water, clearer water would encourage growth of exotic aquatic plants and related effects in many areas of the North and West Delta.
>
> …
>
> [Diversion of turbidity at a north Delta intake] …remains an important issue, because we are concerned that an average loss of 8-9% of sediment will have greater negative effects on delta smelt and longfin smelt and their habitats

> downstream of the diversions than are acknowledged in the effects analysis and net effects, and will likely encourage the growth of exotic aquatic plants in the lower Sacramento River and in off-channel tidal marsh areas.

USFWS 2013 Progress Assessment at 16; *see id.* at 8. Both USFWS and CDFW raised similar concerns in earlier analyses. USFWS Red Flags 2012; CDFW Red Flags 2012. The Delta Independent Science Board also raised similar concerns. Delta ISB 2014 at B-24. Unfortunately, as discussed below, the DEIS/DEIR improperly understate the negative effects of BDCP on delta smelt, including the negative effects of CM1 operations on turbidity levels throughout the Delta and those impacts to Delta smelt and other species.

4. Projected Outcomes for Delta Smelt are Inaccurate, and/or do not Attain the Conservation Standard for this Species. In addition, Presentation of these Results is Incoherent, Biased, and Unacceptably Confusing

The Draft Plan and DEIR/DEIS both demonstrate that BDCP is likely to result in substantial negative impacts to Delta smelt and is unlikely to achieve the biological objectives for the species. This is clear even though both documents fail to synthesize the expected outcomes of BDCP conservation measures and operations to Delta smelt. There are numerous life cycle models and statistical models that the documents can and should have used and/or modified by the Draft Plan effects analysis and the DEIS/DEIR to assess the impacts to Delta smelt of the Draft Plan and operational alternatives. Statistical approaches to understanding cumulative effects of changes in multiple environmental variables have been developed and demonstrated, for example by Thomson et al. 2010, Mac Nally et al. 2010. Life cycle models described by Rose et al. (2013a,b) should also have been applied to understand the combined effects of changes to environmental conditions that would result from BDCP. Failure to provide such analyses represents an unacceptable omission from the DEIS/DEIR. Numerous peer reviews have also expressed concern that the Draft Plan and DEIS/DEIR inappropriately excluded some of these life cycle models. DSP Independent Science Review Panel Report 2014 at 14, 21, 31-32 (expressing concern that some models were inappropriately dismissed, and stating on pages 31-32 that, "Appendix 5G excluded delta smelt life cycle models in the Effects Analysis without adequate justification."); Delta ISB 2014 at B-43, B-45.

i. Entrainment Rates for Adult and Larval-Juvenile Delta Smelt are Likely to Exceed Targets set by Draft Plan Objectives and Claims of Modest CM1 Benefits are Likely Overstated

The Draft Plan's claim of reduced entrainment resulting from the BDCP is confused, internally inconsistent, and unsubstantiated. The Effects Analysis and DEIS/DEIR confuse the issue by discussing separately the results of its analyses of larval-juvenile and adult Delta smelt; the

outcome that matters is the proportional entrainment to the Delta smelt population as a whole (i.e. the Draft Plan's objective and overall impacts to productivity must be assessed by the additive effect of entrainment to the two life history stages). The Draft Plan claims relative reductions of ~20% in both adult and larval entrainment under BDCP, but these results translate to an average reduction in entrainment of only 1.5% or 2% respectively. The DEIS/DEIR analysis reveals only tiny differences in entrainment rates between Alternative 3 operations and the NAA. Draft Plan at Figures 11-3-1, 11-3-2 (which is actually the same figure as the previous, though labeled differently)). The DEIS/DEIR identify similarly small differences in entrainment among Alternative 4 operational variants H1, H3, and H4. Draft Plan at Figures 11-4-1 and 11-4-2. Although, in most years, absolute entrainment rates for each of the Alternative 4 variants, are projected to be well above the 5% target of identified in the conservation strategy, all of the *differences* between BDCP operations and NAA are less than 5% in absolute terms. These "differences" in modeled outcomes are unlikely to represent any change at all in actual entrainment rates within year-type comparisons; however, if it can be shown that the projected differences are significant within the error of the modeling technique, then it must also be concluded that Alternative 4/H3 has higher entrainment rates than NAA in most years and that all Alternative 4 variants have higher entrainment rates than NAA in Critically Dry years. DEIS/DEIR at Figure 11-4-1.

The Draft Plan's entrainment appendix (5B) provides estimates of entrainment impacts for the population as a whole (both age classes considered together) and demonstrates that all Alternative 4 operational variants would have total entrainment rates that are much higher than the 5% annual total average entrainment called for by objective DTSM1.2 (Figure 5.B.6-22 at 5.B-215).[77] This strongly implies that the BDCP will fail to meet its own entrainment objective for Delta smelt and that it will violate the existing incidental take limit of 5% of the adult population in any year. USFWS 2008 Biological Opinion at 387. Nonetheless, the Draft Plan concludes that BDCP will produce a "moderate" positive change for adult Delta smelt and a "low" positive change for larval and juvenile Delta smelt and (at 5.5.1-28) – the Draft Plan does not explain the difference in the two ratings given that projected reductions in entrainment of adult and larval-juvenile Delta smelt are both less than 5% in absolute terms and the difference between the two outcomes is less than 0.5%. In contrast to the findings in the Draft Plan, agency biologists who participated in August 2013 workshops "suggested that <u>zero</u> or low positive change [for larval-juvenile entrainment] would be warranted on the basis of the high-outflow scenario" and "<u>low</u> to moderate change" would be warranted for adult Delta smelt. Draft Plan at 5.5.1-28 (emphasis added). The Draft Plan does not explain why it chose the high end of agency biologist position in each case, but we note that the sum of a "low" and a "moderate" change is qualitatively different than the sum of a "zero" and "low" change – the Draft Plan's optimism biases the overall projected result.

[77] Only Wet water year types have average entrainment rates close to 5%.

The claim of "high certainty" about the projected benefits of reductions in Delta smelt entrainment, Draft Plan at 5.5.1-28, is unwarranted and unsupported by science and by the Draft Plan's own statements. The small differences in projected entrainment rates among variants of the Alternative 4 do not suggest a significant difference (i.e. greater than the intrinsic error rate of the entrainment modeling method).[78] In fact, the Draft Plan contradicts its own statements of certainty in the same paragraph where those statements are offered, as it acknowledges that "modeling of entrainment of larval-juvenile delta smelt—and indeed other species—has uncertainty because of real-time management decisions that could occur and alter export rates from those modeled here … Such decisions cannot be modeled accurately; accordingly, the results of the entrainment analyses should be viewed with some caution" and "the extent of positive change under the BDCP in light of existing and future real-time management cannot be predicted with very high certainty." Draft Plan at 5.5.1-28. Thus, the Draft Plan overrates the certainty of its supposed entrainment benefits to Delta smelt entrainment.

The BDCP can attain lower entrainment rates than those projected under Alternative 4 operations. The entrainment rates under Alternative 4 operations are, at best, only slightly better (if at all) from those under baseline operations, but, there appear to be substantial changes in entrainment across year-types, with wetter years showing lower (though still high) entrainment rates. This demonstrates that human management activities in the Delta can have meaningful impacts on Delta smelt entrainment. Differences in Delta conditions among year-types are largely a result of human management decisions, although there are certainly exceptions (such as wet years that follow wet years, when flood control releases occur, or after several drier conditions in a row, when management options regarding Delta flow conditions are severely limited). Differences in year-type conditions in the Delta that are under the control of human export and reservoir release decisions appear to produce measureable differences in Delta smelt entrainment. As the documents acknowledge, "[h]igher outflows under HOS_LLT could result in lower proportional entrainment loss of larval-juvenile delta smelt than under EBC2_LLT." Draft Plan at 5.5.1-28. In contrast to these smaller changes, the data presented in the Draft Plan and DEIS/DEIR demonstrate that Alternative 7 and Alternative 8 operations project substantial declines in both juvenile and adult Delta smelt entrainment. DEIS/DEIR at Figures 11-7-1, 11-7-2 and 11-8-1, 11-8-2. Thus, it is possible for operational decisions to produce larger reductions in Delta smelt entrainment that appear capable, with some refinement, of satisfying the BDCP Delta smelt entrainment objective (DTSM1.2) and of producing a substantial benefit to the species relative to the NAA.

[78] As discussed in section 2 of these comments, modeled results are unlikely to occur.

ii. The DEIS/DEIR and Draft Plan Understate and Improperly Downplay Negative Impacts to Delta turbidity Caused by BDCP, and this will Cause Significant Impacts to the Species

The concerns with impacts to turbidity found in previous versions of the Draft Plan (*see above*) were not addressed in the current Draft Plan and DEIS/DEIR; the DEIS/DEIR acknowledges the potential for an 8 or 9% decline in turbidity on average (under ESO_LLT or HOS_LLT scenarios, respectively as compared to NAA). DEIS/DEIR at 11-267. The effect is actually larger than the DEIS/DEIR acknowledges as operations under ESO_LLT are expected to remove well over 20% of the Sacramento River's sediment load in most months April-October. Draft Plan at Figure 5C.D-11. Both sets of results are for "average" conditions, meaning the actual loss of turbidity is likely to be greater in some years (probably in wet years, when the north Delta diversions would divert a greater amount of flow). Finally, the DEIS/DEIR and Draft Plan's estimate of average effects on turbidity levels throughout the Delta incorporates anticipated additions of suspended sediment from floodplain inundation on the Yolo Bypass, but the increased acreages and frequency of floodplain inundation anticipated by the Draft Plan were improperly excluded from the baseline as restoration of even greater acreages are required under NMFS 2009 Biological Opinion.[79] Thus, the Draft Plan and DEIR/DEIS improperly report lower levels of turbidity impact under BDCP than would occur under an accurate accounting of baseline conditions.

Even given their underreporting of anticipated declines in turbidity under the BDCP, the Draft Plan and DEIS/DEIR downplay the effect of reduced turbidity as a result of CM1 operations. The DEIS/DEIR does not adequately explain or analyze its interpretation of projected reduced turbidity throughout the Delta, despite the DEIS/DEIR's claim that, for its physical modeling, "A 'difference' was defined as a >5% difference between the pair of model scenarios in at least one water year type in at least 1 month." DEIS/DEIR at 11-202. The Draft Plan declares with "very high certainty" that reduced turbidity is a stressor of "critical importance," found a large proportional negative change in the stressor under BDCP operations, and then concluded that the impacts of such a change are "low" or nonexistent with "low" certainty. Draft Plan at 5.5.1-31. This conclusion is unwarranted and not supported by the scientific information that is available. The average loss of turbidity of 8-9% (and, more likely, over 20% in some months) is a significant impact. Thus, in addition to concerns about the impact of reduced flows below the north Delta diversion and its effects on through-Delta flows and Delta outflow (addressed elsewhere), it is clear that CM1 aggravates rather than alleviates important stressors like low turbidity that affect most, if not all, of the covered species. The magnitude of CM1 operations reduction of turbidity suggests that it will have a significant negative impact on productivity (for

[79] This is another example of how the improper baselines lead to flawed analysis of potential impacts. *See* discussion *supra* regarding improper baselines for analysis.

instance through increased predation and decreased foraging success) of Delta smelt, longfin smelt, Chinook salmon, and Sacramento splittail. We note that low river flows below the north Delta diversion may cause additional reductions in turbidity (slower river velocities can result in deposition of additional sediments, beyond those that are diverted directly at CM1) and that there are synergistic interactions between reduced river velocities, stage, and turbidity that would lead to increased predation of Delta smelt and other small fishes in the riverine environment below the north Delta diversion. In addition, the loss of turbidity may further reduce the geographic range and carrying capacity of the Delta for endemic species like Delta smelt, *see* Nobriga and Herbold 2009 at 14, and Sacramento splittail.

5. The Draft Plan and DEIS/DEIR Fail to use the Best Available Science Regarding the Impacts of Tidal Marsh Habitat Restoration, Dramatically Overstating the Likely Benefits to Delta Smelt and Understating Likely Negative Impacts to the Species Under the Draft Plan and some Alternatives

There is no indication that Delta smelt populations are limited by the availability of shallow sub-tidal or inter-tidal habitats, except as access is limited by unsuitable salinity or temperature conditions. *See, e.g.*, Nobriga and Herbold 2009. For example, the Draft Plan acknowledges that spawning habitat is not believed to be limiting to the population. Draft Plan, Appendix 5F at 5.F-63. So, it is not clear why the Draft Plan concludes with "moderate certainty" that there would be an "very high positive change in the intertidal habitat attribute for occupancy by delta smelt eggs and larvae as a result of restoration actions under CM4 Tidal Natural Communities Restoration" and that there would be a "moderate" positive change in egg and larval habitat from addition of subtidal habitat. Draft Plan at 5.5.1-9. These statements obviously overstate the potential for any benefit to Delta smelt spawning habitat (if, indeed, such habitat is limited by the existence of shallow water, and not by the existence of appropriate salinity and flow conditions in existing shallow water habitats). In particular, they assume that all restored wetland acreages, and both inter-tidal and sub-tidal habitats, will benefit Delta smelt eggs and larvae when, in fact, inter-tidal habitats are unlikely to provide any direct benefit to either larvae or eggs. Bennett 2005; Nobriga and Herbold 2009. Shallow sub-tidal habitats may be locations of egg deposition (though this is unknown; Nobriga and Herbold 2009) but, upon hatching, larval Delta smelt are believed to migrate quickly away from nearshore habitats towards the Delta's low salinity zone. Dege and Brown 2004; Nobriga and Herbold 2009 at 5, 9. It is thus highly unlikely that larval Delta smelt experience benefits substantial benefit from shallow sub-tidal habitats of the type targeted for restoration by the BDCP.[80]

[80] Again, we emphasize, as we have many times before, that we are not opposed to restoring tidal and sub-tidal wetlands in the Plan Area as a potential measure that may benefit numerous species and ecosystem processes in the Delta and northern San Francisco Estuary. However, the Draft Plan's heavy

Numerous reviewers have reached similar conclusions. In their 2013 comments on a previous version of the Draft Plan, the USFWS recommended that future versions: "…either (1) show through modeling what subset of "tidal habitat restoration" will have sandy beaches with a turbid, active overlying water column, or (2) avoid the speculation that habitat restoration will create spawning habitat and the speculation that spawning habitat is limiting delta smelt recruitment"; analogous recommendations were made for longfin smelt. USFWS 2013 Progress Assessment at 9.Although some studies have found benefit of "shallow" environments for Delta smelt, these almost always refer to the shallow pelagic environments like those in Suisun Bay (Bennett 2005; Hobbs et al. 2006; Nobriga and Herbold 2009), not, as the Draft Plan assumes, those immediately adjacent (within one to several dozen meters) of historic or restored wetlands. Furthermore, the Draft Plan overstates the acreages of "restored" wetlands that are likely to benefit Delta smelt (if those benefits even occur); the USFWS stated in 2013 that:

> Because delta and longfin smelts are generally pelagic fish, they are not expected to extensively rear in many restored tidal habitats except under very specific circumstances where there is somewhat deep (> 1, but < 4 meters), cool, and very turbid open water (examples: Liberty Island, Suisun Bay, Sherman Lake). These conditions cannot be created everywhere. Current scientific understanding suggests that some regions of the Plan Area are unlikely to be good places for delta and longfin smelt – especially if the only practical option is to flood subsided Delta islands; existing examples include the interiors of Franks Tract and Mildred Island.

USFWS, 2013 Progress Assessment at 14-15. Even if Delta smelt receive little (or short-lived) direct benefit (related only to spawning and egg incubation) from some fraction of the shallow sub-tidal, nearshore habitats targeted for restoration under the BDCP, the Draft Plan's claims of increased suitable habitat during fall (non-spawning) months (Fall X2 habitat) are overstated and inaccurate. Draft Plan, Table 5.5.1-6; DEIS/DEIR, Table 11-4-3. As the DEIS/DEIR states, with regard to its projections for fall habitat for Delta smelt:

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reliance on these measures to address all manner of problems for all covered fish species lack scientific support and fails to adequately consider well-known risks of such restoration projects. We, and others, have recommended before that these marsh restoration actions should be implemented as targeted research projects so that uncertainties regarding their potential beneficial and negative impacts can be reduced and so that agencies responsible for BDCP implementation can learn whether there are design or implementation strategies that maximize benefits and minimize risks of these restorations. If the Draft Plan's expectations of benefits from the proposed tidal marsh restoration actions are demonstrated, then an effective adaptive management program can adjust the overall strategy accordingly. *See also* National Research Council 2010; USFWS 2013 Progress Assessment at 8; Mount and Saracino et al. 2013 at 109.

> The benefits of restored habitat for this species will depend on the success of restoration in creating physical habitat for smelt and in fostering ecological conditions that favor good feeding conditions and production of food upon which smelt can feed. The magnitude of restored habitat benefits is uncertain.

DEIS/DEIR at 11-1298; *see* discussion *infra*. Furthermore, the Draft Plan's assumption that Delta smelt may benefit from spawning in shallow sub-tidal habitats fails to consider that such habitats may also be occupied by invasive predators, such as inland silverside, Nobriga and Herbold 2009, and that restoration of these habitats may support predators as well, Grimaldo et al. 2012. Indeed, the potential for restored areas to be colonized organisms that compete with Delta smelt for food or prey on different life stages of Delta smelt were chief concerns of the earlier expert review of a prior draft of the BDCP. Essex Partnership 2009 (2009 DRERIP reviews). However, these scientific concerns are not addressed at all with regard to habitat restoration in the DEIS/DEIR and are only mentioned in passing in the Draft Plan.

The Draft Plan argues that, "The certainty level reflects some uncertainty regarding selection of habitat types by delta smelt." Draft Plan at 5.5.1-10. This is an understatement as, even though spawning microhabitat utilization of Delta smelt are unknown, Bennett 2005, they are not believed to include inter-tidal habitats, *see* Nobriga and Herbold 2009. As the Draft Plan admits, agency biologists polled at an August 2013 workshop concluded that, "… the function of the restored intertidal habitat for delta smelt may have less to do with direct occupation as opposed to other functions." Draft Plan at 5.5.1-10. Additional uncertainty must be attributed to any benefit to Delta smelt because, as the Draft Plan notes, "Use of restored areas by delta smelt will depend on the habitat characteristics within these areas (e.g., the extent of tidal excursion and velocity, temperature, and turbidity)," factors that have not been described or modeled for the BDCP's wetland and sub-tidal restoration areas.

Equally important, as described at length above, there is little to no scientific support for the notion that the Draft Plan's habitat restoration conservation measures (e.g. CM2, CM4) will export substantial amounts of Delta smelt food items to the pelagic habitats these fish inhabit. Numerous agencies and independent expert reports have found unlikely or, at best, highly uncertain the Draft Plan's proposed linkage between tidal marsh restorations and meaningful benefits to the Delta smelt prey base (i.e. the kind of food Delta smelt consume in the areas and at the times where food is believed to limit their populations), including:

- Brown 2003;
- National Research Council 2010;
- USFWS Red Flags 2012;
- USFWS Progress Assessment 2013;
- DSC 2013 BDCP Comments;

- DSP Independent Science Review Panel Report 2014;
- Delta ISB 2014;
- Mount and Saracino et al. 2013;
- Herbold et al.2014; and
- BDCP's own review process involving outside scientific experts (DRERIP Reviews, Essex Partnership 2009)

Each of these reports is described in detail elsewhere in this comment letter.

Thus, there is no scientific support for the Draft Plan's conclusions that tidal and sub-tidal habitat restoration will produce: "…a moderate positive change … on zooplankton abundance for juvenile delta smelt". As noted above, and elsewhere, the Draft Plan's reference to literature it believes supports its alleged benefits to the Delta smelt food web are inaccurate and biased. For instance, the Mount and Saracino et al. 2013 review of the Draft Plan's alleged benefits to the Delta smelt food web finds that the methodology applies in the Draft Plan habitat restoration appendix (5E) is flawed in that it:

> …uses "prodQacres" to index the expected productivity of phytoplankton in the restored areas. However, this index is conceptually flawed in two ways. First, it uses an estimate of growth rate rather than production of phytoplankton, which is the product of growth rate and biomass. Second, it assumes implicitly that all phytoplankton growth is available as food for the zooplankton consumed by the smelt species, but analyses published on the San Francisco Estuary and elsewhere show that most of the production is consumed by benthos and by microzooplankton such as ciliates (e.g., Lopez et al. 2006, Lucas and Thompson 2012, Kimmerer and Thompson submitted).

Mount and Saracino et al. 2013 at 71.

The "low certainty" attributed to this outcome is not solely due to the potential for restored sites to be colonized by invasive clams, as the Draft Plan suggests. There is simply not much evidence that restored habitats will generate a regular supply of food (on any time step) to the surrounding environment and even less evidence or indication that any measureable quantity of exported food will be transported far downstream to the areas where pelagic species (like Delta smelt and longfin smelt) rear. Mount and Saracino et al. 2013 at 78. Even the reference the Draft Plan cites regarding export of food from existing shallow sub-tidal habitats makes the point that these habitats are (at best) periodically sinks for primary productivity, Lehman et al. 2010, not a surprising result as tidal marsh areas are characterized by accretion of materials. Invasion of restored sites by invasive clams could actually change the effect of habitat restoration to a

negative effect as habitats created under CM4 would then become a sink for primary productivity generated elsewhere in the Delta. Essex Partnership 2009 (DRERIP Reviews 2009). The independent peer review panel report from Mount and Saracino et al. 2013 concluded:

> Thus, marshes may act either as net sources or sinks for plankton in the adjacent waters, depending on the availability of habitat for small fish and the degree of colonization by benthic grazers such as clams. The exact details of the exchange processes depend on the physical configuration of the marsh including permanence of inundation (Brucet et al. 2005), residence time of the water (Lucas and Thompson 2012), and the biological composition, i.e., the kinds and abundance of producers and consumers within the marsh including transient organisms (Kneib 1997).

Mount and Saracino et al. 2013 at 71; *see also* Lucas and Thompson 2012. Indeed, an accurate reporting of uncertainty regarding the food web effect of CM4 for Delta smelt would be that there is "low" certainty of any positive effect at all, "moderate certainty" of no effect (especially for ROA's that are not immediately adjacent to Delta smelt and longfin smelt habitat), and, a "moderate-high" certainty of negative effects to Delta smelt if the restored habitats become colonized by invasive clams or invasive Delta smelt predators. BDCP's DRERIP reviews made exactly these points in their ratings of most tidal marsh ROA's. Essex Partnership 2009 at 9 and appendices.

In addition, any benefits from shallow water habitat restoration could not arise until the habitat restoration occurred, and potentially many years after active restoration ceased. In most cases, the planned restoration will not occur for several decades, meaning there cannot possibly be a food benefit to the covered species for many of these species' generations. In addition, the Draft Plan's assertion of benefits to Delta smelt from habitat restoration incorrectly assumes that no habitat restoration occurs under the environmental baseline. In fact, as we have discussed elsewhere, restoration of 8,000 acres of tidal marsh and shallow sub-tidal habitat is already called for in the USFWS 2008 Biological Opinion, and under the NMFS 2009 Biological Opinion a much larger expanse of floodplain habitat is targeted for restoration, at an earlier date, than what is expected under the Draft Plan. Thus the DEIR/DEIS improperly credits to the BDCP all of its expected benefits to Delta smelt from tidal marsh restoration and Yolo Bypass floodplain restoration because of the flawed baseline used for comparison.

In summary, the Draft Plan and DEIS/DEIR claims that operations under the proposed project will benefit Delta smelt by reducing entrainment are not supported scientifically. In fact, operations of the new north Delta diversion are likely to have a negative effect on Delta smelt as a result of the diversion of turbidity that both the Draft Plan and DEIS/DEIR report will occur there (though both underestimate the overall reduction in turbidity and its likely effects). If

restored habitats are not utilized by Delta smelt to the degree expected or if habitat restorations are delayed, any scenario of BDCP operations that does not include provision of fall outflows will result in a marked decrease in fall habitat for Delta smelt. DEIS/DEIR at 11-1298. The best available science demonstrates that the Fall X2 action is necessary to meet minimum protections for delta smelt. The Draft Plan and DEIS/DEIR overstate the value of habitat restoration measures in both their estimate of the direct utility of these habitats to Delta smelt and in their claims that these habitats will export significant amounts of food to environments where Delta smelt are common. Benefits to the species rely completely on habitat restoration measures, which are unlikely to produce intended benefits and which cannot produce those benefits until they are actually restored, decades from now. Furthermore, the Draft Plan and DEIS/DEIR inappropriately ignore or downplay the risk that restored habitats will be colonized by species that compete with Delta smelt for food or prey directly on Delta smelt eggs, larvae, juveniles, or adults or that restoring marsh habitats will become sinks for turbidity or Delta smelt prey items. The risks posed by shallow water habitat restorations to Delta smelt have not been adequately evaluated.

6. The Draft Plan and DEIS/DEIR Fail to use the Best Available Science to Analyze Environmental Effects on the Effects of Fall X2, and the Documents Understate the Likely Negative Impacts to the Species

Finally, the DEIS/DEIR and Draft Plan fail adequately analyze the effect of fall Delta outflows on delta smelt abundance and productivity. First, the documents fail to discuss the results of scientific studies on the higher fall outflow provided in 2011, when delta smelt abundance increased by a factor of approximately 10, consistent with the predicted outcomes in the adaptive management plan for Fall X2. The California Department of Fish and Game in 2011 stated that, "Delta smelt abundance in 2011 is greater than it has been since 2001 but remains a small fraction of historical abundance, state biologists say. The improvement is likely due in large part to higher than usual Delta outflow which resulted in more and better habitat." California Department of Fish and Wildlife, press release, Endangered Delta Smelt Population Improves, December 22, 2011, available online at: http://cdfgnews.wordpress.com/2011/12/22/endangered-delta-smelt-population-improves-2/.

Increased Delta outflow in the fall of 2011 appeared to result in higher growth rates, reduced effects of invasive clams on productivity and prey abundance, and increased food production. *See, e.g.*, Brown et al. 2012; Thompson et al. 2012; Teh 2012; Baxter and Slater 2012. The DEIS/DEIR and Draft Plan likewise make no reference to the MAST report or other Fall X2 studies conducted in 2011 and recent years. *See* Baxter et al. 2013. The documents need to be revised to incorporate this existing scientific information.

Second, the documents fail to use existing statistical methods to quantify and analyze the effects of fall outflow on delta smelt abundance. Kimmerer, as part of an independent peer review of BDCP, developed an alternative model that analyzed the effects of fall outflow on subsequent summer abundance as measured by the townet survey. Mount and Saracino et al. 2013 at 64-66, 68. That peer review concludes that the model "was appropriate for the data," and found that "the predicted ratio of townet index for LOS:NAA was about the same as that for HOS:NAA about half the time, and the other half of the time it was much lower, with large confidence intervals related to the uncertainty in the prediction from the model." *Id.* at 65. The peer review concludes that "projections under LOS showed about half the time a marked reduction in predicted summer abundance index compared to NAA." *Id.* at 68.[81] The Draft Plan and DEIS/DEIR need to be revised to use this existing model to asses effects of fall outflow on delta smelt.

V. THE BDCP FAILS TO ADEQUATELY ANALYZE IMPACTS TO NATURAL COMMUNITIES, TERRESTRIAL SPECIES AND WILDLIFE REFUGE AND THE CONSERVATION STRATEGIES BENEFITTING TERRESTRIAL SPECIES SUFFER FROM MULTIPLE FLAWS.

A. The Conservation Strategies in Chapter 3 for Protection and Restoration of Natural Communities are Uncertain and are Based on Unsupported Assumptions

The Plan assumes that restoration of various natural communities and habitat types will provide sufficient benefits for covered natural communities, plants and wildlife. However, as the Delta ISB pointed out in detail in their assessment of the BDCP, Chapter 3 suffers from a lack of underlying reasoning and evidence to support the conclusion that conservation acreage or restoration goals will provide the contemplated benefits to covered species. *See* Delta ISB 2014. In particular, the Delta ISB commented that the BDCP relies on an assumption that restoration will adequately address the impacts from the project. However, that conclusion is premised on the assumption that restoration would occur in a time-frame relevant to address the impacts. Such a conclusion is flawed as restoration of most habitat types may take years or decades to achieve the level of what had been functioning habitat before it was destroyed or degraded by BDCP activities. *Id.* at B-51. In addition, the BDCP is also based on the assumption that restoration will always be effective and would provide habitat equal or better than the habitat lost. However, such a conclusion is fraught with uncertainties, none of which were acknowledged or addressed in the Plan. *Id.* at B-52. Finally, the extensive use of habitat suitability models, which rely on assumptions about where habitat may or may not be located, results in uncertainty about the location of species and the value of habitat. *Id.* at 50. The Delta

[81] However, as noted above, this review also identified significant modeling flaws with outflow in the fall months that may affect these results.

ISB recommended that the BDCP incorporate extensive monitoring in order to ensure that the extensive uncertainties are addressed. *Id.*

B. The Conservation Strategy relying on Cultivated Lands is confusing and lacks clarity

The BDCP proposes to conserve 48,625 acres of cultivated land for the benefit of wildlife. Draft Plan at 3.4-76 to -88. However, the acreage numbers of cultivated lands do not appear consistent. For example, of the 48,625 acres of cultivated land, the BDCP requires 43,325 acres of cultivated lands for Swainson hawk, leaving 5300 acres for crops that are not of moderate or high value for hawks. However, this acreage breakdown does not fit with the cultivated lands requirement for Sandhill crane, which requires 7300 acres of cultivated land for foraging, of which 5840 must be of high quality (i.e., rice or corn). Since moderate or high value crops for Swainson hawk cannot be rice or corn, the remaining 5300 acres of cropland not needed for Swainson's hawk does not match with the 5840 acres of high value crop needed for cranes. In addition, the Plan fails to provide any details regarding the management of cultivated lands after harvest. For many species, how cultivated lands are managed after harvest is critical for those species. For example, Sandhill crane require specific timing and flooding of fields after harvest. In addition, tillage practices can leave fields either providing food for wildlife or providing no value to wildlife. The final Plan must include specific details about treatment of after-harvest lands.

C. The Plan fails to assess the direct and indirect impacts to wildlife refuges.

As discussed *supra* in section I(h), the DEIR/DEIS failed to include level 4 water supply as part of the baseline conditions, which is a significant oversight by the state and federal agencies as level 4 water supply for wildlife refuges is required under the CVPIA. The Central Valley Joint Venture (CVJV) partners specifically requested that the BDCP assess impacts to refuge water supply and "adopt a goal to contribute to the attainment of the acreage, water, and bird population goals set forth by the CVJV Implementation Plan." Central Valley Joint Venture Letter to BDCP (May 24, 2013). Similarly, it is not clear that the Draft Plan included Level 4 water deliveries. *See supra*, section I(d). As a result, the DEIR/DEIS fails to adequately assess the direct and indirect impacts from BDCP operations on state and federal wildlife refuges. The BDCP must take into account the effects of water operations on the timing and quantity of water deliveries to refuges across water years. Those impacts must be assessed and fully mitigated consistent with the requirements of the CVPIA.

D. The BDCP must improve the analysis and conservation strategies for specific covered terrestrial species.

1. Tricolored Blackbird

Tricolored blackbird population numbers have crashed in the last few years, resulting in DFW proposing to emergency list the blackbird under CESA. *See* Fish and Game Commission Agenda Item 11, "Possible Adoption of Emergency Regulations to add the Tricolored Blackbird (Agelaius tricolor) to the list of Endangered Species (pursuant to Section 2076.5, Fish and Game Code)," available online at http://www.fgc.gov/meetings/2014/aug/080614agd.pdf (incorporated by reference). Given the dire condition of Tricolored blackbirds and the likely imminent listing under CESA, the BDCP must include a robust conservation strategy for this species. Unfortunately, the Plan provides a mere 50 acres and no restoration within the Plan area. This does not meet the NCCP's conservation standard.

2. Sandhill Crane

The BDCP will have a significant impact on Sandhill crane due to the decision to site the tunnel alignment and other associated structures in crane habitat. As noted above, there are substantial concerns about the temporal mismatch between habitat lost and conservation lands protected or restored. This concern applies to the conservation strategy for cranes. Further, there are serious concerns that the siting of powerlines through and near crane habitat will result in a serious impact to cranes. It is appears that the scientific information associated with powerline impact analysis and the minimization of those impacts is outdated. The analysis of the risk to birds from powerlines did not include a 2012 report from the Avian Powerline Interaction Committee (APLIC), "Reducing Avian Collisions with Powerlines: The State of the Art in 2012," Edison Electric Institute and APLIC. Washington, DC, available online at: http://www.aplic.org/uploads/files/11218/Reducing_Avian_Collisions_2012watermarkLR.pdf (incorporated by reference).

3. Giant Garter Snake

The conservation strategy for Giant garter snake appears to be little more than 1:1 mitigation for habitat acres lost, which falls well short of the NCCP conservation standard. Conservation Measure 1 as well as impacts from the conversion of land in the Yolo Bypass will result in the loss of 6,538 acres of Giant garter snake habitat in key areas for garter snake. Draft Plan at 3.3-30 to -31. There is no explanation how a 1:1 mitigation ratio for a critically endangered species with only 13 populations left in California meets the NCCP requirement that the plan "provide for the conservation" of the species in the Plan Area. The conservation strategy for Giant garter snake must be revised to include substantially more habitat for snakes within the Plan Area.

4. California Red-Legged Frog and California Tiger Salamander

The conservation strategy for California red-legged frog and California tiger salamander includes a directive to protect stock ponds on conserved grasslands. Draft Plan at 3.3-31. While such a conservation requirement is important, additional detail should be required, including a requirement that funding shall be directed towards stock pond improvement and maintenance in perpetuity as part of the management of the grasslands. Stock ponds are frequently in need of repair and require on-going management (e.g., cleaning and tulle control) in order to remain of value to these listed species.

5. Valley Elderberry Longhorn Beetle

The conservation objectives for Valley elderberry longhorn beetle (VELB) lacks any specific conservation acreage number. Draft Plan at 3.3-32. It is impossible to tell how much acreage is required in this plan to address VELB impacts and to provide for the conservation of VELB in the plan area. The conservation objective must be revised to be quantifiable.

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To: Rader, Cliff[Rader.Cliff@epa.gov]
From: Gorke, Roger
Sent: Tue 7/22/2014 2:40:32 PM
Subject: FW: BDCP Comments from USACE Signed - Will hand carry over a copy as well
BDCP Comment Responses Cover Letter_Signed.pdf
USACE combined comments_BDCP Public Draft_EIR_EIS_New Comments Only_No Names.pdf

Roger Gorke
Senior Policy Advisor
Office of Water
U.S. Environmental Protection Agency
PH: 202-564-0470
FAX: 202-564-0500
gorke.roger@epa.gov

-----Original Message-----
From: Hagler, Tom
Sent: Friday, July 18, 2014 1:54 PM
To: Gorke, Roger
Subject: FW: BDCP Comments from USACE Signed - Will hand carry over a copy as well

Try these.

From: Foresman, Erin
Sent: Thursday, July 17, 2014 11:22 AM
To: Hagler, Tom; Vendlinski, Tim; Skophammer, Stephanie; Cabrera-Stagno, Valentina
Cc: Jones, Paul; Scianni, Melissa; Brush, Jason
Subject: FW: BDCP Comments from USACE Signed - Will hand carry over a copy as well

-----Original Message-----
From: Nepstad, Michael G SPK [mailto:Michael.G.Nepstad@usace.army.mil]
Sent: Thursday, July 17, 2014 11:20 AM
To: ryan.wulff@noaa.gov; michael_hoover@fws.gov; astine@usbr.gov; larry_rabin@fws.gov; Foresman, Erin; tolson@usbr.gov; pidlof@usbr.gov; lori_rinek@fws.gov; kaylee.allen@sol.doi.gov; Skophammer, Stephanie; mkshouse@usgs.gov; luana.kiger@ca.usda.gov; jkeay@usgs.gov; Vendlinski, Tim; rfujii@usgs.gov; Clark, Susan S SPK; michael_chotkowski@fws.gov; Deanna Harwood - NOAA Federal; mknecht@usbr.gov; mbanonis@usbr.gov; Hagler, Tom; Michael Tucker - NOAA Federal; Dadey, Kathleen A SPK
Subject: FW: BDCP Comments from USACE Signed - Will hand carry over a copy as well

As requested by NMFS, here's our cover letter and comments on BDCP public draft EIS

BLUF (army lingo for bottom line up front):

We have determined that without substantive changes, we will not be able to adopt the EIS/EIR, and would require additional NEPA documentation for any Corps permits on the actions to implement the BDCP, including potentially requiring an EIS for the proposed new intakes, tunnels and operations (Conservation Measure 1).

We were unable to comment on Conservation Measures 2 through 22 due to the lack of detail in the

document.

We have no opinion on the suitability of the EIS/EIR for decisions made by other agencies.

Our inability to adopt the EIS/EIR does not affect the BDCP's approval as an HCP.

We remain hopeful that at least some of our comments can be incorporated into the Final EIS/EIR (for which there currently is no schedule), and we continue to work with DWR and others.

Let me know if you have any questions

Thanks,

Michael G. Nepstad
Deputy Chief, Regulatory Division
US Army Corps of Engineers, Sacramento District
1325 J Street, Room 1350
Sacramento, California 95814-2922
(916) 557-7262
michael.g.nepstad@usace.army.mil

* We want your feedback! Take the survey:
http://per2.nwp.usace.army.mil/survey.html

* Need information on the Regulatory Program? Visit our website:
http://www.spk.usace.army.mil/organizations/cespk-co/regulatory/index.html

* Facebook: www.facebook.com/sacramentodistrict

* YouTube: www.youtube.com/sacramentodistrict

* Twitter: www.twitter.com/USACESacramento

-----Original Message-----
From: Nepstad, Michael G SPK
Sent: Thursday, July 17, 2014 8:19 AM
To: 'Ryan Wulff - NOAA Federal'
Cc: Clark, Susan S SPK
Subject: BDCP Comments from USACE Signed - Will hand carry over a copy as well

Michael G. Nepstad
Deputy Chief, Regulatory Division
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DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
1325 J STREET
SACRAMENTO CA 95814-2922

REPLY TO
ATTENTION OF

July 16, 2014

Regulatory Division SPK-2008-00861

Ryan Wulff
National Marine Fisheries Service
650 Capital Mall, Suite 5-100
Sacramento, California 95814

Dear Mr. Wulff:

This letter is in response to the Draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR) dated December 2013 for the Bay Delta Conservation Plan (BDCP). The Corps has regulatory jurisdiction over portions of the BDCP under Section 404 of the Clean Water Act, 33 U.S. Code 1344 (CWA 404), and Sections 10 and 14 of the Rivers and Harbors Act of 1899, 33 U.S. Code 403 and 33 U.S. Code 408 (RHA 10 and 14).

Enclosed is a table of our specific comments on the Draft EIS/EIR. Due to the time allowed and the size and organization of the EIS/EIR, the Corps reviewed only the "project level" portions of the document. The programmatic treatment of Conservation Measures 2 through 22 made it unclear whether or not those conceptual plans would complement or conflict with Corps actions within the Central Valley and Bay-Delta. Please note that many of our comments are similar to those submitted on the administrative Draft EIS/EIR.

I have determined the EIS/EIR is not sufficient at this time in meeting the Corps' needs under the National Environmental Policy Act (NEPA) and 404(b)(1) Guidelines, in particular with regard to the incomplete description of the proposed actions, alternatives analysis, impacts to navigation, impacts to federal flood control and navigation projects, and impacts to waters of the United States and navigable waters, as well as the avoidance and minimization of, and compensatory mitigation for, impacts to waters of the United States. Without incorporation of the changes recommended in our comments on the administrative and public drafts, the Corps will not be able to adopt the EIS/EIR for any of our permit decisions on the proposed actions to implement the BDCP. The Corps has no opinion as to the suitability of the EIS/EIR for decisions by other agencies.

I am also concerned about the inadequate treatment of two proposed navigation projects: the Sacramento River Deep Water Ship Channel Deepening and the San Francisco Bay to Stockton Deepening. The EIS/EIR concludes there is no need to

consider either project under NEPA regarding items such as existing conditions or cumulative impacts. I strongly disagree with that conclusion. These ship channels are significant hydrologic and economic features of the Delta, and intersect with the BDCP in numerous ways.

I request all of our comments on the administrative and public drafts are incorporated into the Final EIS/EIR. I also request a formal letter response from the National Marine Fisheries Service to our comments.

I look forward to continuing to work with you and others on the BDCP. Please refer to identification number SPK-2008-00861 in any correspondence concerning this project. If you have any questions, including clarification of the enclosed comments, please contact Mr. Michael Nepstad of my staff by email at *Michael.G.Nepstad@usace.army.mil* or by telephone at 916-557-7262.

Sincerely,

FARRELL.MICHAEL.JORDAN.1099678557

Digitally signed by FARRELL.MICHAEL.JORDAN.1099678557
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=FARRELL.MICHAEL.JORDAN.1099678557
Date: 2014.07.16 16:43:04 -07'00'

Michael J. Farrell
Colonel, U.S. Army
District Commander

Enclosure

				U.S. Army Corps of Engineers (Corps) Review of Public Draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR) for the Bay Delta Conservation Plan (BDCP)
#	**Chapter**	**Page #**	**Line #**	**Comment**
1	Note			The Corps has regulatory jurisdiction over portions of the BDCP under Section 404 of the Clean Water Act, 33 U.S. Code 1344 (section 404), and Sections 10 and 14 of the Rivers and Harbors Act of 1899, 33 U.S. Code 403 and 33 U.S. Code 408 (sections 10 and 14). All usage of the term "section 10" below refers to Section 10 of the Rivers and Harbors Act of 1899, and not to Section 10 of the Endangered Species Act.
2	Note			We note that very few of the 429 comments we made on the administrative draft EIS/EIR have been adequately addressed in the public draft EIS/EIR or anywhere else. We consider all those prior comments to remain applicable, and we have tried not to repeat them in our below comments on the public draft EIS/EIR.
3	Overall			The Corps only reviewed in detail the Chapters that we have comments as listed below. Our review was further constrained by limitations of staff time and by the size and organization of the EIS/EIR.
4	Overall			The EIS/EIR does not contain the information and analysis needed for our permit decisions, including, but not limited to, a complete project description, analysis of impacts to navigation, analysis of impacts to Federal projects, delineation of wetlands, an acceptable alternatives analysis, and a mitigation plan.
5	Overall			For purposes of National Environmental Policy Act (NEPA) compliance for our permit decisions, Conservation Measure 1 (CM1), the proposed new water intakes, operations, and conveyance facilities, is not fully described in the EIS/EIR, and its description and analysis is not to the level of detail necessary for our processes. The incomplete information and analysis would prevent us from making any decision based on the EIS/EIR as it is currently written, including making a recommendation on which alternative may contain the Least Environmentally Damaging Practicable Alternative (LEDPA). As a result, we would likely require an additional EIS process as part of our permitting review for CM1.
6	Overall			The Corps had hoped that the BDCP process would develop an EIS/EIR document which could serve as a "master analysis" that would be helpful to all others doing work in the Delta, so that each project doesn't need to repeat similar modeling and analysis. Unfortunately, the data and analysis in the EIS/EIR is already several years out of date, and various data sets are incomplete or have been truncated. This reduces the likelihood that we could incorporate or borrow analysis from the EIS/EIR in support of other future Corps permit and project decisions.

7	Overall			The Corps does have major concerns regarding all the components of the BDCP which may alter or be adjacent to Federal projects. However, because Conservation Measures 2 through 22 are only described in very general programmatic terms, we were only able to give detailed comments on CM1. We ask to continue to be included in the planning and development of the remaining Conservation Measures so that we can work together to develop designs which may be able to obtain permits.
8	Overall			The Corps has no opinion on the usability of the EIS/EIR by other agencies for their decisions. All of our comments are in regards to our permitting processes, including compliance with NEPA for our permitting decisions.
9	Overall			Typically our regulatory program considers impacts which last for 5, 10, or more years as permanent impacts, not as temporary impacts as is described throughout the document.
10	Overall			Throughout document, use "section 14" in place of "section 408" for all reference to Section 14 of the Rivers and Harbors Act of 1899, 33 U.S. Code 408.
11	Overall			We are concerned about the inadequate treatment of two proposed navigation projects: The Sacramento River Deep Water Ship Channel deepening and the San Francisco Bay to Stockton deepening project. The EIS/EIR concludes that there is no need to consider either project under NEPA regarding items such as existing conditions or cumulative impacts. We strongly disagree with that conclusion. These ship channels are significant hydrologic and economic features of the Delta, and intersect with the BDCP in numerous ways, including overlapping project mitigation and BDCP restoration areas, overlapping dredged material disposal and BDCP restoration areas, cumulative changes to salinity in the Delta, and the potential for beneficial reuse of dredged material. The proposed navigation projects must be included in the cumulative impacts analysis of the EIS/EIR, and the ongoing need for maintenance dredging and to maintain and operate dredged material disposal sites must also be included in the existing conditions of the EIS/EIR.
12	1	1-14	8-18	Design information for CM1 is available but not at the project level for those potential impacts to federal projects, surface water hydrological regimes, navigation, mitigation projects impacting Federal projects, and other related impact topics required for a project level NEPA required for section 14 decisions. The impacts analysis needed for the section 14 must be included if this is project-level NEPA document for CM1.
13	1	1-14	1-39	The EIR/EIS presents the levels of analysis, project level and program level, for CM1 (project level), and the CM2-CM22 (all analyzed at the program level). Mitigations for CM1 are included in several of the other CMs; therefore, they are directly related to feasibility of implementation of CM1 (connected actions), and impacts should be assessed at the project level (CM2-CM10). Any portion of CMs 2-22 which are mitigation for impacts of CM1 also need to be described and analyzed at the project level of detail.

14	1	1-14 to 1-15	42-43; 1-7	In the HCP, some of the water contractors are called "authorized entities" What is the difference in both role and responsibilities for "BDCP proponents" versus "authorized entities"?
15	1	1-20	31 to 39	Delete "For example, USACE is expected to use the BDCP EIR/EIS as part of its permit issuance responsibilities regarding compliance with Section 404 of the Clean Water Act, which would result in a separate Record of Decision in consideration of related permit actions; Section 404 compliance requires that USACE select the Least Environmentally Damaging Practicable Alternative for implementation under 40 C.F.R Part 230 (the "Guidelines"), and to assure compliance with the USACE/EPA joint "Mitigation Rule" (33 C.F.R. Parts 325 and 332, and 40 C.F.R. Part 230) USACE may rely on this EIS/EIR in whole or part in satisfying its NEPA obligations with respect to individual permit actions. In fulfilling its obligation with respect to those permits, USACE may determine that additional NEPA analysis is required."
16	1	1-21	Table 1-2	Under USACE permit, decision, approval, or other action: Executive Order 11988 was left out of this list and does need to be considered and addressed with all section 10/404 and 14 actions
17	1	1-24		Should include a subsection on tribal review (government to government) and other stakeholder outreach/coordination/consultation
18	1	1-30	9	Insert "would" require a separate ROD
19	3	Overall		The document needs a clear explanation of a reasonable range of alternatives and a comparison of such, including a concise description of the environmental consequences of each.
20	3	Overall		When CM1 moves into Corps permitting review, we would need a full project level review and analysis of all the impacts of CM1, including all proposed mitigation. The EIS/EIR does not contain a project level review nor does it analyze the impacts of the mitigation proposed for CM1, including setback levees mentioned at 6-59 and waters of the U.S. mitigation mentioned at 12-147. Permanent and temporary loss of terrestrial habitat and natural communities (specifically wetlands) resulting from CM1 construction and operations, including associated mitigation, are not clearly described or analyzed at the level necessary to select a preferred alternative. Much of the mitigation for impacts to terrestrial habits resulting from CM1 construction operations is based on theoretical footprints and aerial imagery. There is too much uncertainty to conclude that adverse effects to natural communities would be mitigated entirely.
21	3	General		This chapter was very difficult to follow. Additional figures are needed to better communicate all of the potential measures, especially as they pertain to CM1. Also, include other figures to locate other CMs. These would be extremely helpful in identifying the wide array of potential 14 approvals which may be required for the full implementation of the BDCP.
22	3	General		New conveyance was not a part of the preferred alternative for CalFed. Does this EIS/EIR describe why the reasons for rejecting new conveyance in CalFed are no longer valid? The CalFed EIS/EIR and

				ROD are presently being cited in support of major projects consistent with the CalFed preferred alternative, including raising Shasta Dam (Shasta Lake Water Resources Investigation), constructing Sites Reservoir (NODOS) and constructing a dam at Temperance Flats in Millerton Reservoir (Upper San Joaquin River Basin Storage Investigation).
23	3	General		Unable to determine which conservation measure included improvements to the existing fish salvage facilities.
24	3	3-34	11-15	Some questions on the new operational rules for the north delta intake diversions. 1) How do these operations relate to the operations of the existing State Water Project diversion at Clifton Court Forebay? Neither description states how the two diversions would operate together; i.e., when the south is operating at high level, does the north have to operate at low level or vice versa or can both be on at full capacity as long as stated parameters are met? 2) There doesn't seem to be a discussion in document of how the diversion of water at the new intakes plus the old intakes would affect water levels, direction of flow, velocity, scour and accretion, both at the area of diversions north and south as well as throughout the delta. On 6-59 the document discusses water level change from the physical constriction of the river by the new structures, but nowhere was the operational effects to water levels. This isn't asking about OMR reverse flow criteria or position of X2.
25	3	3-92	23-24	Example of lack of specificity which affects our ability to compare alternatives as well as different intake locations: "Foundation type, dimensions, and construction methods would be revised further when additional site-specific subsurface geotechnical data becomes available."
26	3	3-92	34-37	Example of lack of specificity which affects our ability to compare alternatives as well as different intake locations: "The length of the bank protection required on either side of the intake would vary by intake location but would range from approximately 100 to 2,200 feet for the pipeline/tunnel, modified pipeline/tunnel, and east alignments, and from 500 to 1,800 feet for the west alignment."
27	3	Section 3.1; 3-92	37-38	The intakes and associated bank protection would permanently change existing substrates and local hydraulic conditions in the immediate vicinity of the intakes. How would the hydraulic conditions change? Has this been modeled?
28	3	Section 3.1; 3-92	37-42	Here the EIS/EIR states the Sacramento River would remain navigable during construction of the intakes, but it does not state the maximum width of boats that would be able to navigate up the Sacramento River. Please describe current navigation concerns and current boating/shipping activities in the river segments proposed for intake construction. The Horn Blower is about 60' wide and the San Francisco Belle is a 2200 passenger boat, 97' wide. Here it states that river channel width at several intake sites varies from a minimum width of 400 feet, and the protrusion of cofferdams into the river is estimated at 60 feet. The river does not appear to be that wide at proposed intake sites for Alternative

				4. Where exactly is the river a minimum of 400' wide from Courtland to Clarksburg? A diagram would help.
29	3	3-92	39-41	Extension from the bank into the Sacramento River is not the only factor in determining impacts to navigation. The depth of the River is also important; if the facility is located in the deepest side of the River its impacts to navigation would be disproportionate to its extension from the shore. In addition, intakes could also affect navigation by altering the water depth, velocity, direction of flow, and patterns of erosion and accretion, both by the physical structure of the intakes as well as the diversion of water by the intake. This is also another example of lack of specificity which affects USACE ability to compare alternatives as well as different intake locations.
30	3	3-95	4-35	Example of lack of specificity which affects our ability to compare alternatives: This section described that for a 30 mile pipeline, a maximum of 80 acres of additional surface disturbance might be needed for grout injection, but that this won't be known until site specific subsurface conditions are known.
31	3	Section 3.1; 3-181	20-22	All operations of new intake and conveyance facilities included as either covered activities, or federal actions associated with the BDCP (or an alternative), and the effects of those activities/actions are not thoroughly addressed in the BDCP EIS at the level of detail required for Corps permitting.
32	3	Section 3.2; 3-12	28-35	Through formulation of CM1 alternatives, agencies should have considered and analyzed impacts to waters of the US and wetlands that would occur from implementation of CM1, particularly with type and location of conveyance, and number and location of intakes. This would provide assist in determining the LEDPA (least environmentally damaging practicable alt) required by the Corps under section 404(b)(1).
33	3A	3A-15	39-45	We comply with NEPA (Pub. L. 91-190, 42 U.S.C. 4321-4347), 40 CFR 1500-1508, 33 CFR Part 230, 33 CFR Part 325 Appendix B. DOI NEPA regulations do not apply to Corps NEPA analysis associated with permit decisions.
34	3A	3A-59	16-22	The "Early Look" preliminary effects analysis did not consider periodic and contiguous drought years with decreased precipitation and snow pack, and related changes in water exports during drought periods.
35	3A	3A-7	35-36	Further information, clarification (and associates citations) is needed regarding seismic risk.
36	3B	3B	3B-4	Conduct surveys in project area to identify cultural resources that may be affected.
37	3B	3B-22	6-7	Loss of emergent vegetation and associated post-project restoration may require section 404 permits
38	3B	3B-36		Construction of dredge material disposal sites may require section 404 permits
39	3C	General		We need detailed hydraulics and designs to verify that assumptions are correct or within ranges.
40	3C	3C-3	Table 3C-1	Example of lack of specificity which affects USACE ability to compare alternatives as well as different intake locations: "Each intake would range from 40 to 60 ft wide and 700 to 2,300 ft long."

41	3C	3C-4	Table 3C-1	Example of lack of specificity which affects USACE ability to compare alternatives as well as different intake locations: "The length of the temporary cofferdam at each intake site would vary depending on the alignment and intake but would range from 740 ft to 2,500 ft for the pipeline/tunnel alignment and modified pipeline/tunnel alignment, and 890 ft to 2,440 ft for the west alignment."
42	3C	3C-4-5	Table 3C-1	Example of lack of specificity which affects USACE ability to compare alternatives as well as different intake locations: "The in-water area temporarily isolated inside the temporary cofferdam would vary by intake location, but would range from 0.2 to 5 acres."
43	3C	3C-5	Table 3C-1	Example of lack of specificity which affects USACE ability to compare alternatives as well as different intake locations: "permanent cofferdams would range in length from 1,220 to 3,360 linear ft."
44	3C	3C-5	Table 3C-1	Example of lack of specificity which affects USACE ability to compare alternatives as well as different intake locations: "Affects area enclosed by cofferdam, approximately 0.2-1.9 acres."
45	3C	3C-6	Table 3C-1	Table states "15,876 cy of spoil (including slurry bulking) removed." Respectfully express skepticism at the level of exactness here when the document gives all other dimensions in very broad ranges.
46	3C	3C-7	Table 3C-1	Example of lack of specificity which affects USACE ability to compare alternatives as well as different intake locations: "Screen dimensions would vary depending on location, ranging from 10 to 22 ft high and from 915 to 1,935 ft long."
47	3D			Unclear why the "River Islands" project is not included. This long planned development may alter the viability of restoration opportunity areas in the south Delta.
48	3D			Which CalFed projects are included and which are not and why
49	3D			Unclear why the U.S. Bureau of Reclamation's "Title XVI Recycled Water Program" project is not included. This long-standing program reduces water demands.
50	3D	3D-23	6-13	Unclear about some assumptions in the No Action Alternative regarding the Central Valley Flood Control Plan. Please clarify.
51	3D	3D-30		What assumptions were made for the "Fish Screen and Passage Program" in the cumulative analysis? Which barriers are anticipated to be removed and when and how? Which intakes are anticipated to be screened and when and how? Would these fish screen projects result in changes to the timing and amounts of water diverted at those facilities?
52	3D	3D-47		Unclear why "South Delta Temporary Barriers Projects" is not included in the cumulative analysis.
53	3D	3D-52		Unclear why "North Bay Aqueduct Alternative Intake Project" is not included in the cumulative analysis. This project proposes another intake structure/water diversion in the Sacramento River near the CM1 intake locations, and the cumulative impacts of both projects should be analyzed. Also, this project contains alternatives which include sharing BDCP facilities.
54	3D	3D-52		Unclear why "Dutch Slough Tidal Marsh Restoration Project" is not included in the cumulative analysis. This is a very long-standing effort anticipated by many to be ready for implementation prior

				to authorization of the BDCP.
55	3D	3D-75		Unclear why "Sacramento River Water Reliability Study" is not included in the cumulative analysis. This project proposes another intake structure/water diversion in the Sacramento River near the CM1 intake locations, and the cumulative impacts of both projects should be analyzed.
56	3D	3D-83		Unclear why "Delta Wetlands Project" is not included in the cumulative analysis. This is a very long-standing effort which is much further along than the "NODOS" project, which is included in the cumulative analysis.
57	3D	3D-87		Unclear why "Lower San Joaquin Feasibility Study" is not included in the cumulative analysis.
58	3D	3D-88		Unclear why "Delta Islands and Levees Feasibility Study" is not included in the cumulative analysis.
59	3D	3D-88-89		The EIS/EIR appears to exclude from their analysis the current efforts underway to make navigational improvements to the Stockton Deep Water Ship Channel and the Sacramento Deep Water Ship Channel as well as the ongoing need to maintain and operate dredged material disposal sites for routine USACE and Port maintenance dredging programs. USACE is concerned that by excluding these navigational improvement projects: 1) the navigational improvement projects may not be able to obtain regulatory approval as they would be "inconsistent" with the BDCP; 2) the BDCP's planned reoperations of the CVP and SWP may need to be remodeled/modified if one or more navigational improvement projects is constructed as the EIS/EIR isn't considering the cumulative impacts to salinity intrusion and sensitive species impacts; 3) the habitat planned in the vicinity of the Sacramento Deep Water Ship Channel may not perform as expected because the BDCP did not take into account navigational improvements to that channel, 4) the habitat planned in the BDCP may be in conflict with both ongoing O&M upland dredged material placement sites, and 5) the BDCP would not be able to benefit from beneficial use of dredged material.
60	3D	3D-90		Unclear why "Shasta Lake Water Resources Investigation" is not included in the cumulative analysis. This is a part of the same effort as the "NODOS" project, which is included in the cumulative analysis.
61	3D	3D-90		Unclear why "Delta-Mendota Canal Recirculation Feasibility Study" is not included in the cumulative analysis.
62	3D	3D-92		Unclear why "Upper San Joaquin River Basin Storage Investigation" is not included in the cumulative analysis. This is a part of the same effort as the "NODOS" project, which is included in the cumulative analysis.
63	3D	3D-97		What assumptions were made for the "Anadromous Fish Screen Program" in the cumulative analysis? Which intakes are anticipated to be screened and when and how? Would these fish screen projects result in changes to the timing and amounts of water diverted at those facilities?
64	3D	3D-98		Unclear why "San Luis Reservoir Low Point Improvement" is not included in the cumulative analysis.

65	3D	3D-109		Unclear why "Yolo County Habitat/Natural Community Conservation Plan" is not included in the cumulative analysis.
66	3F	General		Uncertain if the screening and selection of intake locations is consistent with 404(b)(1).
67	3F	General		Unclear if intake locations examined are the same as those under consideration for the proposed North Bay Aqueduct project, and if the opportunity to reduce impacts by having both projects share intakes was considered.
68	3F	Figures	Figure 3F-1	Where is the cross section drawings referred to on this figure?
69	4	4-2	25-29	The EIR/EIS does not analyze the effects of CM1 on all required resource impact topics at a project-level; In order to implement CM1, additional NEPA analysis would be required.
70	6	General		We still have many unanswered questions on how CM1 would alter water levels. Do these numbers include the raise in water surface elevations from the physical constriction of the Sacramento River as described in 6-59? Do these numbers include the effects of the full operations of the CVP and SWP including the Delta Cross Channel Gates and the export pumps at Banks and Jones Pumping Plants? What are the numbers for the other alternatives? Are these numbers the same through all seasons and water year types? Would the expected increases in water levels in some parts of the Delta have any impacts, e.g., threatening levees, enabling scour and erosion to occur higher on, impacting outfall pipes, docks or other structures, reduce the navigability of the channels by reducing the clearance under bridges? Would the expected decreases in water levels in other parts of the Delta have any impacts, e.g., requiring more dredging in marinas and by docks; requiring water intakes to be lowered, reducing the navigability of the channels by reducing the depths of the channels? What about changes in water velocity and direction of flow? Would shallower waters mean slower flow with higher levels of sedimentation and accumulation of aquatic vegetation such as water hyacinth? Would deeper waters mean higher velocities with greater erosion and scour and higher maintenance requirements for riprap/revetment on levees and structures?
71	6	General		Refer to page 176-177 of the "Effects of the CVP upon the southern Delta water supply, Sacramento San Joaquin River Delta, California" (we'll send you a copy if you don't have it available) for a summary of a discussion of impact of export pumps on water levels. This type of discussion, although dated, is a good example of the type of analysis/discussion which is missing from the BDCP EIS/EIR and which is needed for USACE permit decisions. Also needed would be discussion of how water levels would change with the implementation of CM1 with and without continued operations of the existing SWP/CVP diversions.
72	6	6-23	24	If this section is intended to list all surface water-related laws that may apply to BDCP CM implementation, then the Rivers and Harbors Act Section 10 and 14 should be listed.

73	6	6-30	1-3	You quoted 230.10(d) here; however, 230.10 (a) through (c) contain relevant information that should be cited here, for example, CFR 230.10(a) "Except as provided under section 404(b) (2), no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences."
74	6	6-45	31-43	Please give page numbers, not just chapters. We are unable to find the effects associated with erosion, accretion and sedimentation anywhere in the EIS/EIR.
75	6	6-45	31-43	Refer to page 151-153 of the "Effects of the CVP upon the southern Delta water supply, Sacramento San Joaquin River Delta, California" (we'll send you a copy if you don't have it available) for a discussion of changes in bottom elevations in the South Delta. This type of discussion, although dated, is a good example of the type of analysis/discussion which is missing from the EIS/EIR and which is needed for our permit decisions. Also needed would be discussion of how patterns of aggradation and degradation would change with the implementation of CM1 with and without continued operations of the existing SWP/CVP diversions.
76	8	8-114	12-29	This discussion of section 404 of the Clean Water Act both garbled and largely wrong. Recommend deleting all descriptions of USACE regulations in the entire EIS/EIR document except for Chapter 32.
77	11	Overall		The impacts are not well described. The proposal of adaptive management needs clarification.
78	11	10	26-30	Habitat quality as a mitigating factor especially with regard to migration
79	11	11	4-5	Are these impacts fully described elsewhere in the document? If so this should be referenced.
80	11	11, 12	19-24, 1-7	This is an extremely general statement. Maintenance activities and the associated impacts and mitigation need to be fully described and analyzed. If this is description and analysis is contained elsewhere in the document it should be referenced.
81	11	14	19-25	This is confusing. Is the reduced entrainment due to improved screening?
82	11	15-16	25-39 1-2	Clarification needed on the impacts to endangered salmon and the mitigation for those impacts.
83	11	16	3-4	The Benefits need clarification.
84	11	16	5-35	This alternative seems to negatively affect all anadromous species. Where are the benefits?
85	11	17	Table 11-1A-SUM2	Adverse affects to migration would reduce spawning potential; if the alternative adversely affects migration it would follow that the alternative would adversely affect spawning.
86	11	17	10-11	This statement is in conflict with the information provided.
87	11A	11A-60,	23-26	Are these CALFED projects currently being funded?

		11A-61	16-45	
88	11A	77	Table 2A.4-1	Table does not match table on page 37 from NMFS biological opinion for the Corps operation and maintenance of Daguerre Point Dam on the Yuba River (dated 12 May 2014). The NMFS BO shows the species are present for longer time periods than is in the BDCP EIS/EIR.
89	11A	130	Table 2A.6-1	Table does not match table on page 80 from NMFS biological opinion for the Corps operation and maintenance of Daguerre Point Dam on the Yuba River (dated 12 May 2014). The NMFS BO shows the species are present for longer time periods than is in the BDCP EIS/EIR.
90	12	General		There seem to be a lot of assumptions in the effects analysis and biological outcomes, particularly the discussion that all conservation measures would be entirely successful. There is a lack of quantitative analysis to determine that the project would achieve biological objectives.
91	12	General		Increased diversion of Sacramento River flows in the north Delta, and reduced diversions from south Delta channels (associated with Operational Scenario H) could result in the reduction in acreage of wetland habitats. Operational Scenario H is not articulated in the document to the degree that an accurate effects analysis can be made. The water export and flows released into the delta to protect fish and delta ecosystem associated with Scenario H is dependent upon future data collection and adaptive management in the projects near term. With so much uncertainty with export amounts and effects of climate change and drought, flow levels in the upstream rivers may likely change to the degree that water levels in adjacent managed wetlands would be altered. Similarly, increased diversions of Sacramento River flows in the north Delta may likely result in a permanent reduction in the managed wetland community downstream of these diversions.
92	12	General		CM1 is treated at a project level of analysis whereas CM2 -22 are described and analyzed at a programmatic level. Additional information is needed to effectively evaluate the CMs and their ability to mitigate adverse impacts on terrestrial habitats from proposed activities and operations associated with CM1.
93	12	12-10	Table 12-ES-3	Temporary and permanent effects to wetlands and other waters should be identified separately, that is each impact identified in a separate column.
94	12	12-115	32-39	Delete discussion on Corps permitting for CM1.
95	12	12-116	1-14	Delete discussion on Corps permitting for CM1.
96	12	12-118	6-8	Depending on proposed project activity, Letter of Permission, Standard or General Permit from the Corps is required prior to any work begun within navigable waters and other waters of the U.S.
97	12	12-147	12.3.2.4	The methods used in the EIS/EIR to assess wetlands and other waters of the United States has identified less wetland acreage than have been Corps ground truthed and verified at several CM1 locations in the Delta. The under reporting of wetlands and other waters potentially affected by CM1

				alternatives means that USACE cannot rely upon the information to make even preliminary determinations of which CM1 alternative may contain the LEDPA.
98	12	12-164	21-37	It appears that the EIS/EIR proposes to mitigate the impacts to waters of the US from implementation of Conservation Measure 1 by the habitat creation included as part of Conservation Measure 4. A final mitigation plan is required prior to our permitting decisions. This means that if CM4 is proposed as mitigation for CM1, than CM4 will have to be developed to a sufficient level of detail to be evaluated as acceptable mitigation for CM1. CM4 is not sufficiently described in the EIS/EIR to be evaluated as appropriate mitigation for CM1. In addition, the proposed time of 10 years or so between the impacts to waters and the mitigation would result in a mitigation ratio considerably greater that 1:1 due to temporal losses in the functions and services of those waters. Lastly, the plan for mitigation described is not compliant with USACE 2008 Compensatory Mitigation Rule.
99	12	12-165	13-20	The creation of approximately 3,400 acres of high-value tidal perennial aquatic natural community as part of CM4 is possible, but without the project level analysis for CM4, the feasibility and actual implementation of this measure is uncertain; therefore, adverse effect associated with construction activities may be unavoidable.
100	12	12-167	37-40	Why wouldn't increased diversions of Sacramento River flows in the north Delta result in a permanent reduction in tidal perennial aquatic community downstream of these diversions?
101	12	12-179	1-10	We don't believe that the EIS/EIR should assert that mitigation for impacts of CM1 will be accomplished by the undefined and uncertain conservation measures 2-22. All mitigation for CM1 should be part of CM1.
102	12	12-187	22-38	During the near-term timeframe (the first 10 years of BDCP implementation), Alternative 1A would affect the valley/foothill riparian natural community through CM1 construction losses (58 acres 23 permanent and 28 acres temporary). The natural community would be lost primarily along the eastern bank of the Sacramento River at intake sites, along pipeline routes connecting these intakes to the forebay (for CM1). The construction losses of this natural community would likely result in an adverse effect; the mitigation plan for losses, CM7 and CM3, are not clearly articulated or analyzed to insure impacts would be offset by avoidance and minimization measures and protection/restoration actions associated with CM7 and CM3. Restoration of 800 acres and protection (including enhancement) of 750 acres of 35 valley/foothill riparian natural community during the first 10 years of Alternative 1A implementation would not likely minimize this near and long-term loss of valley oak. Mitigation for the loss of this species would require decades, therefore; CM1 would likely have a permanent long term adverse effect to the valley riparian community.
103	12	12-188	20-26	Alternative 1A would affect the valley/foothill riparian natural community through CM1 construction losses (58 acres). The construction losses of this special-status natural community represent an

				adverse effect. Feasibility of implementing CM7 and CM3 must be further investigated before it is certain that these measures would offset adverse effects and minimize this loss.
104	12	12-2015 12-2016	39-44 1-5	Restoration, enhancement and protection of valley foothill/riparian habitat over the NT and LLT would not likely mitigate for adverse effects to valley oak which take decades to fully mature and cannot be replaced in-kind within a 10 to50 year period. CM1 would have a permanent adverse impact on riparian habitats.
105	12	12-2078	28-42	CM1 conveyance facilities and operations would result in the permanent and temporary combined loss of approximately 33 acres of vernal pool crustacean habitat. In addition, conveyance facility construction could result in the indirect conversion of 10 acres of modeled vernal pool crustacean habitat in the vicinity of Clifton Court Forebay. Alternative 4 would impact 14 acres of critical habitat for vernal pool fairy shrimp. Mitigation measures (AMM12) may not be adequate to ensure there would be no adverse effects or habitat loss. In essence, AMM12 states that project design would minimize indirect effects on modeled habitat, avoid effects on core recovery areas, minimize ground-disturbing activities or alterations to hydrology to ensure there is no suitable habitat within these areas. Conveyance facilities may impact over 33 acres of vernal pool habitat due to mitigation timeframe and success rate for creation of vernal pool. Restoration and enhancement would not likely suffice for mitigation for loss.
106	12	12-2083	1-25	These mitigation ratios may not coincide with the Corps policies and requirements for compensatory mitigation. Preservation and restoration (versus creation) may not compensate for temporary or permanent loss of vernal pools. Considering temporal loss (5-10 years) of wetland function associated with temporary adverse impacts may require a higher mitigation ratio than anticipated.
107	12D	12D-1	16-38	The analysis presented in the appendix supplementing the impact assessment of Chapter 12 states it assesses whether the portion of conservation measures implemented in the 10-year near-term period would offset impacts of conveyance facilities, thereby, rendering feasible at a planning level. However, the assessment considers if suitable conditions are present within specified conservation zones to implement the appropriate conservation measures within the near-term. This level of analysis is not at the project-level, as it does not consider socio-economic aspects of feasibility (e.g., funding, availability of properties, willing sellers of real property), and does not consider engineering feasibility of implementing the CMs. Conveyance facilities operations effects were not considered in this section either. The feasibility of offsetting the impacts of CM1 construction and operation of the water conveyance facilities (CM1) is analyzed in the EIR/EIS at a project level supposedly, while implementation of the remaining conservation measures is analyzed at a program level. It doesn't seem plausible to avoid significant adverse effects by relying upon on mitigation measures that are not fully fleshed out/not yet known to be feasible.

108	12D	12D-23	39-43	This section addresses mitigation for vernal pool or alkali seasonal wetland at a ratio of 1:1 (if replacement occurs before the impact occurs), or at 1.5:1 if replacement occurs concurrently with the impact. There is no discussion regarding compensation for adverse effect on wetlands ecosystem function, and of the success/failure rate for compensatory mitigation.
109	12D	12D-28	Table 12D-9	Mitigation ratios used for compensatory mitigation for impacts to wetlands/waters of the US impacts must be approved by Corps. A ratio of 1:1 for vernal pools is not a standard ratio in the section 404 program.
110	18	General		The document is overwritten and obscures the process rather than explaining it to the public.
111	18	General		The federal process is downplayed and is virtually absent from the document.
112	18	General		The Impacts/MM are split too finely. They could easily be stated in 4 instead of 8: Archaeological sites, Built environment, TCPs, and Unanticipated Finds/Effects.
113	18	General		The BDCP is constrained by state law from waiting until after the formal evaluation of cultural resources prior to determination of eligibility within this document. It is my understanding that determinations of eligibility cannot be rescinded on a state level once made. If the determination of eligibility/significance cannot be reversed, unnecessary funds may be expended to mitigate for resources that do not meet the National Register of Historic Places or California Register of Historic Resources criteria. There should be some discussion concerning this limitation within the document that explains why sites that have not been evaluated are being considered eligible.
114	18	General		The References Cited section is incomplete and should be updated.
115	18	General		Not all previously recorded sites were captured in the record search.
116	18	General		There appears to be confusion in the document concerning the ability to access a property and the presence of sites and/or the determination of a site's eligibility. Recommend clarifying process.
117	19	General		The Delta King appears to be the largest vessel which recently navigated past the locations of the proposed intakes for CM1. Could such a vessel continue to navigate past the proposed CM1 intakes on the Sacramento River, both during and after construction, including operating of the new intakes with and without continued operations of the existing SWP/CVP diversions?
118	19	General		Navigational discussions are incomplete. No mention of in-delta navigation or what impacts CM1 would have on navigation, with or without continued operations of the existing SWP/CVP diversions. Refer to the USACE publications "Waterborne Commerce of the United States" at http://www.navigationdatacenter.us/wcsc/wcsc.htm. In 2011, 25,000 tons of sand and gravel (6-9 ft vessel draft) were shipped on Middle River, CA; 24,000 tons of sand and gravel (6-9 ft vessel draft) were shipped on Mokelumne River, CA; 12,000 tons of sand and gravel (10-12 ft draft) were shipped on Old River, CA. In 2010, 59,000 tons of sand and gravel (10-12 ft draft) were shipped on Old River, CA. In 2009, 18,000 tons of sand and gravel (6-9 ft draft) were shipped on Old River, CA. In 2007,

				140,000 tons of sand and gravel (10-12 ft vessel draft) were shipped on Middle River, CA. Need discussion of how water depths, velocity, direction of flow, and patterns of aggradation and degradation would change with the implementation of CM1 with and without continued operations of the existing SWP/CVP diversions and its impacts to shipping on Middle River, Mokelumne River and Old River.
119	19	19-184	23-40	Extension from the bank into the Sacramento River is not the only factor in determining impacts to navigation. The depth of the River is also important; if the facility is located in the deepest side of the River its impacts to navigation would be disproportionate to its extension from the shore. In addition, intakes could also affect navigation by altering the water depth, velocity, direction of flow, and patterns of erosion and accretion, both by the physical structure of the intakes as well as the diversion of water by the intake. Also another example of lack of specificity which affects USACE ability to compare alternatives as well as different intake locations.
120	30	General		For Section 14 review, Chapter 30 should contain a write-up/discussion of Executive Order 11988.
121	32	General		Executive Order 11988 was left out of this list and does need to be considered and addressed

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From: Hagler, Tom
Sent: Thur 5/29/2014 6:33:35 PM
Subject: FW: Request for additional Extension on Comment Period for NOAA DEIS, EPA #20130365
NOAA_DEIS_Bay_Delta_Conservation_Plan_Comment_Extension_EIS_20130365.pdf

Looks like the public extension to July 28th is a done deal.

Not sure that changes anything for tomorrow's meeting.

From: Ryan Wulff - NOAA Federal [mailto:ryan.wulff@noaa.gov]
Sent: Thursday, May 29, 2014 11:27 AM
To: Foresman, Erin; Skophammer, Stephanie; Vendlinski, Tim; Hagler, Tom
Subject: Fwd: Request for additional Extension on Comment Period for NOAA DEIS, EPA #20130365

FYI

Sent from my iPhone

Begin forwarded message:

From: Steve Kokkinakis - NOAA Federal <steve.kokkinakis@noaa.gov>
Date: May 29, 2014 at 11:13:30 AM PDT
To: Dawn Roberts <Roberts.Dawn@epamail.epa.gov>
Cc: Steve Kokkinakis - NOAA Federal <Steve.Kokkinakis@noaa.gov>, Shelby Mendez - NOAA Federal <Shelby.L.Mendez@noaa.gov>, Ryan Wulff - NOAA Federal <Ryan.Wulff@noaa.gov>
Subject: Request for additional Extension on Comment Period for NOAA DEIS, EPA #20130365

Dear Dawn,

Please find attached a letter from our NOAA NEPA Coordinator requesting an addtional 45 day extension on the Bay Delta Conservation Plan DEIS, which was originally filed under EPA #20130365 (current deadline extended goes until 6/13/2014, for new extension until July 28, 2014). I appreciate your assistance in getting this extension notice published in EPA's next EIS notice publication on June 6, 2014

Please confirm your receipt of this email, and thanks for your help!

Best,

Steve

Steve Kokkinakis

Senior Advisor on NEPA Coordination and Compliance

Office of Program Planning and Integration

National Oceanic & Atmospheric Administration

US Department of Commerce

1315 East-West Highway
Silver Spring, MD 20910
Phone: 240-533-9021
Fax: (301) 713-0585

Website: www.nepa.noaa.gov

Please consider the environment before printing this e-mail

On Wed, Feb 12, 2014 at 12:56 PM, Steve Kokkinakis - NOAA Federal <steve.kokkinakis@noaa.gov> wrote:

Dear Dawn,

Please find attached a letter from our NOAA NEPA Coordinator requesting a

60 day extension on the Bay Delta Conservation Plan DEIS, which was originally filed under EPA #20130365 (current deadline 4/14/2014, extended to 6/13/2014). I appreciate your assistance in getting this extension notice published in EPA next EIS notices publication on February 21, 2014.

Thanks,

Steve

Steve Kokkinakis

Senior Advisor on NEPA Coordination and Compliance

Office of Program Planning and Integration

National Oceanic & Atmospheric Administration

US Department of Commerce

1315 East-West Highway
Silver Spring, MD 20910
Phone: 240-533-9021
Fax: (301) 713-0585

Website: www.nepa.noaa.gov

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UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
PROGRAM PLANNING AND INTEGRATION
Silver Spring, Maryland 20910

MAY 29 2014

Ms. Susan Bromm
US Environmental Protection Agency
Office of Federal Activities
EIS Filing Section
Ariel Rios Building (South Oval Lobby), Mail Code 2252-A
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Dear Ms. Bromm:

We are requesting a 45 day extension to the current 180 day comment period on the Bay Delta Conservation Plan Draft Environmental Impact Statement (EIS #20130365). This request is based on multiple requests from the public to extend the comment period and to correspond with the public comment period on the draft Implementing Agreement for the proposed action. Therefore, we would like to extend the comment period from June 13, 2014 through July 28, 2014. Please include this extension to the comment period in the next available posting of the EPA weekly notices.

This is the second extension of the public comment period for this Draft EIS. The comment period began on December 13, 2013 and was scheduled to end on April 14, 2014. On February 21, 2014 we extended the public comment period through June 13, 2014.

Sincerely,

Patricia A. Montanio
NOAA NEPA Coordinator

Printed on Recycled Paper

To: Rader, Cliff[Rader.Cliff@epa.gov]
From: Gorke, Roger
Sent: Wed 5/28/2014 1:21:06 PM
Subject: release
Draft_CommentExtensionLegalNotice_5-19-14.docx

Roger Gorke

Senior Policy Advisor

Office of Water

U.S. Environmental Protection Agency

PH: 202-564-0470

FAX: 202-564-0500

gorke.roger@epa.gov

BDCP
BAY DELTA CONSERVATION PLAN

Draft Bay Delta Conservation Plan (BDCP) Implementing Agreement Released; Public Review/Comment Period Extended for Draft BDCP and Draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS)

The U.S. Department of the Interior and the California Natural Resources Agency today released the "Draft Implementing Agreement for the Bay Delta Conservation Plan (IA)" for a 60-day public review and comment period. The Draft IA can be found online at: www.baydeltaconservationplan.com.

SAMPLE

Lead state and federal agencies have also extended the public comment period for the Draft BDCP by an additional 45 days to allow the public more time to review and comment.

Comments on the Draft BDCP and Draft IA must be received electronically or postmarked on or before July 28, 2014.

In addition, lead state and federal agencies have extended the public comment period for the Draft EIR/EIS by an additional 17 days, for a 197-day review. The comment period began on December 13, 2013 and will conclude on June 30, 2014.

The Draft BDCP and Draft EIR/EIS are being made available to the public in accordance with the California Natural Community Conservation Planning Act (NCCPA), Section 10 of the federal Endangered Species Act (ESA), the California Environmental Quality Act (CEQA,) and the National Environmental Policy Act (NEPA).

Written comments on all documents may be submitted via:

- Mail or hand delivery to Ryan Wulff, National Marine Fisheries Service, 650 Capitol Mall, Suite 5–100, Sacramento, CA 95814
- Email to BDCP.comments@noaa.gov

No final decisions have been made regarding going forward with the BDCP or in selecting an alternative; those decisions will only occur after completion of the CEQA and NEPA processes.

Copies of the Draft BDCP and Draft EIR/EIS:
Hard copy Draft documents are available at the Department of Water Resources, 3500 Industrial Blvd., Room 117, West Sacramento, CA 95691 and at the National Marine Fisheries Service, 650 Capitol Mall, Suite 5-100, Sacramento, CA 95814, electronically on the project website at www.BayDeltaConservationPlan.com and electronically at libraries throughout the state. Visit www.BayDeltaConservationPlan.com to find a location near you. Copies of the documents referenced in the Draft EIR/EIS will be available at the DWR Office at 3500 Industrial Blvd., Room 117, West Sacramento, CA 95691. If you would like to request a DVD copy of the documents please email a request to BDCP.comments@noaa.gov.

Executive Summary

Under the auspices of the Delta Science Program, the seven-member Independent Scientific Review Panel (Panel) reviewed the adequacy of the Effects Analysis component of the Bay Delta Conservation Plan (BDCP or Plan). This report represents the third phase of the Effects Analysis review; the Phase 1 (completed in November 2011) and Phase 2 reviews (completed June 2012) were partial reviews of the Effects Analysis and were completed as the Conceptual Foundation and Analytical Approach were still under development. These documents are available online at: http://deltacouncil.ca.gov/science-program/independent-review-draft-bay-delta-conservation-plan-effects-analysis. The present, Phase 3 review covers the first complete public draft of the BDCP Chapter 5 Effects Analysis and its associated technical appendices, made available in December 2013.

Four broad themes emerged from the Panel's review of the BDCP Effects Analysis. Firstly, the long, highly detailed document was difficult to review and comprehend. The vastness of the Effects Analysis report and appendices are both its strength and weakness. Although highly improved from the documents that the Panel reviewed during Phase 2, Chapter 5 continues to be fragmented in its presentation and sometimes inconsistent with the technical appendices. While the sheer scope of the analysis is impressive, the inefficient organization and incomplete cross-referencing among sections within the Effects Analysis (e.g., the 8 supporting appendices, totaling ~4500 pages) as well as with the larger BDCP planning documents make interpretation of anticipated net effects of BDCP implementation difficult at best. The 745-page Chapter 5: Effects Analysis does not represent a stand-alone document and it relies extensively on the associated appendices and other chapters for the presentation of scientific information, with insufficient guidance for the reader. As concluded from the Phase 2 report, the Panel universally believes that by itself, Chapter 5: Effects Analysis inadequately conveys the fully integrated assessment that is needed to draw conclusions about the Plan, in part because of incomplete information on factors affecting the covered species.

The second theme in the Panel's review is an apparent disconnect between the assessments of the levels of scientific uncertainty presented in Chapter 5 versus what is characterized in the technical appendices. In many cases, the Panel felt that there was appropriate characterization of high uncertainty within the technical appendices but Chapter 5 did not sufficiently acknowledge or articulate this reality, especially when using professional judgment to reach overall net effects of the BDCP on key species. In particular, the Panel observed that the critical uncertainties associated with presumed beneficial effects of tidal wetland restoration were not recognized in the Chapter 5 summary. Given the magnitude of the BDCP, the inherent natural and anthropogenic complexity in the Bay-Delta ecosystem, and the long time horizon for BDCP implementation and rehabilitated community development, most of the potential BDCP effects carry a relatively high level of uncertainty. For these reasons, the Effects Analysis must provide clear guidance for conceptual models, monitoring, metrics that assess underlying ecosystem processes, explicit thresholds and triggers, alternative hypotheses, special studies to address critical information gaps, and structured decision making in the form of a rigorously institutionalized adaptive

management process.

The third major theme of this review is the lack of an integrated or quantitative assessment of net effects, echoing a similar review comment in the Phase 2 review. The Panel acknowledges that considerable effort has been made in documenting the complex information used to determine net effects. However, in the case of covered species, effects could not be quantified and only two of the sixteen existing life cycle models were deemed to be relevant to BDCP. For these and other reasons, a systematic approach to synopsize the overall net effect on each species was not used. Instead, professional judgment was used instead of a ranking approach to quantify a synthesis of cumulative effects and associated certainty in the projected outcome. Finally, in one paragraph, Chapter 5 accurately portrayed the anticipated BDCP effects: "*These expectations represent a working hypothesis of the relationship between actions, stressors, and biological performance*". However, this statement was not emphasized throughout the document.

The fourth major theme reflected on the need to address the extensive uncertainties associated with the assumptions and predictions of the beneficial effects of the BDCP conservation measures. While the Phase 2 Effects Analysis accurately reflected the detailed process and implementation structure to apply an adaptive management approach to resolve uncertainties, the Panel was concerned that it defaulted to rather "passive learning" instead of a rigorous, institutionalized adaptive management process that resolved effects on covered species and their requisite ecosystems through an active, experimental approach.

Together with background obtained during Phase 1 and 2 of the BDCP Effects Analysis review, the Panel provides the following synopsis of the Panel's responses to their General Charge Questions; further responses to specific issues and the adequacy of supporting documents are provided in the body of the report.

1. How well does the Effects Analysis meet its expected goals?

The Phase 3 review-version of the Effects Analysis is a much improved and impressive compilation of background material and scientific and technical knowledge about the Bay-Delta that provides a plausible basis for the conservation measures. The Panel concluded that much of the available data and arguments for the rationale behind the Effects Analysis assumptions and conclusions are contained within the BDCP documents. However, we suggest that the Effects Analysis (Chapter 5) itself is still poorly substantiated and leaves too much to appendices and other BDCP chapters without explicit cross-references. The lack of accessibility to information within the chapter or clear reference to supporting detail inhibits rather than elucidates comprehension of the findings and thus conveys an unsatisfying "trust us" message.

Our conclusion of the Effects Analysis is that many of the critical assumptions in modeling effects and justifications behind the supposed benefits of the conservation measures are highly uncertain. Much of the conservation measures center around restoration activities and management actions to improve current conditions. Our impression, therefore, is that the foundation of the BDCP is weak in many respects and the default burden to ensure covered species benefit, if not recovery, depends on adaptive management. The adequacy of the BDCP therefore rests not in the intent and development of the conservation measures, but in the rigor and application of

adaptive management to ensure that the critical uncertainties are addressed and strategically incorporated into a progressively refined Plan.

2. How complete is the Effects Analysis; how clearly are the methods described?

Chapter 5 provides a comprehensive overview of the spatial and temporal scope of the analysis, definitions of project baselines that differ depending on regulatory authority, recognition of climate change information, identification of a variety of models used to evaluate effects, treatment of viable salmon population criteria, and the approach to determining net effects on fish and wildlife. As might be expected, with the size of the Effects Analysis task, the quality of the assessments ranged in scientific rigor based on the amount of available data and best available science. Some aspects of the assessment, such as water quality and flow, were quantitatively assessed using sophisticated mathematical models. Some aspects of the Chinook salmon assessments were also based on empirical data and process-based models. However, for many of the other fish species and their potential stressors, conceptual models supported by the scientific literature were the only recourse.

3. Is the Effects Analysis reasonable and scientifically defensible? How clearly are the net effects results conveyed in the text, figures and tables?

The approach to net effect conclusions needs to be reconsidered and revamped. The Effects Analysis assessment of net effects, particularly for covered fish, tries to incorporate information on potentially beneficial or detrimental effects covering 12 different stressors, 32 attributes, and multiple life stages using best available information and science. Only a perfect life-cycle model with perfect information on all the effects and their interactions could possibly weight the results correctly and draw unambiguous conclusions. A serious limiting factor of the current consolidation of Net Effects is a near complete absence of any weighting of the biological importance to particularly sensitive life history stages of the many attributes under consideration. As a result, whether and how any critical life stages or attributes are being adversely affected by the BDCP is generally unclear. The net effects conclusions for a fish species needs to therefore take into account the relative importance of the various life history stages, make them explicit, and interpret Plan effects within that context on a species-by-species basis. Similarly, the simple summation of the number of acres of suitable habitat that are removed or restored for each species by the conservation measures does not consider landscape-level effects such as connectivity and patch size, nor does it take into account variation in habitat quality.

The net effects analysis tends to overreach conclusions of positive benefits for covered fish species, given the inability to quantify the over-all net effects and the realization of high uncertainty. In particular, it does not adequately defend conclusions regarding the net effects of habitat restoration. Restoration of tidal wetlands (and other communities) is highly uncertain and at least an extremely long process. The Effects Analysis does not adequately justify the critical assumption of the benefit of tidal wetland restoration as a food web subsidy for covered pelagic fish given the uncertainties of tidal wetland restoration itself. A critical issue is the implicit expectation that restoration activities will result in increases in abundance of lower trophic levels, but it is uncertain whether the resulting increased production will result in food web pathways supporting covered species. The presentation of phytoplankton-based and tidal wetland macrophyte

detritus-based food webs as alternative ecosystem processes, rather than as an integrated system, also significantly complicates the interpretation of the potential benefit of BDCP restoration. For foraging salmonids, the Effects Analysis did not evaluate the reduced extent to which salmonids would have access to rehabilitated habitat when the north Delta intakes are operating and flows are reduced.

Only one configuration of Restoration Opportunity Areas (ROAs) were modeled by the hydrodynamic models and the locations of these assumed Restoration Opportunity Areas are not available. Some details of the hydrodynamic modeling, especially where 1D and 2D models did not agree or situations where counter-intuitive results were reported, could not be evaluated due to the limited information provided.

4. How well is uncertainty addressed? How could communication of uncertainty be improved?

A broad consensus exists among the Panel that Chapter 5 does not adequately acknowledge the extensive uncertainty associated with the BDCP's assumptions and predictions. In its current form, at the level of detail conveyed, in the models used, and in the verbal assessments and conclusions, the level of uncertainty is often downplayed. Within appendices sometimes more explicit discussion of uncertainties can be found, but there is a disconnect between the summary pages with the conclusions drawn in Chapter 5. In situations in which an array of outcomes may be possible, only the more beneficial outcomes are used in conclusions about the BDCP. Communication of uncertainty would be improved by consideration of a range of potential outcome values in models.

5. How well does the Effects Analysis describe how conflicting model results and analyses in the technical appendices are interpreted?

The Panel found models describing salmonid Delta passage and habitat suitability for terrestrial species to be appropriate and any conflicting results adequately explained. Because hydrodynamic models are sensitive to how the open water regions are represented and how they are connected to the adjacent channels, and because the panel was not provided the bathymetric configuration of the ROAs or the order in which the ROAs were established, it is not feasible for the Panel to evaluate the sensitivity of the models to the placement of the Restoration Opportunity Areas.

Overall, the Panel found the Chapter 5 text describing the two life cycle models (IOS and OBAN), which provide alternative views of BDCP effects compared with other analyses, to be complicated and somewhat confusing. It was not clear whether or not the models were appropriately applied to evaluate a portion of the BDCP attributes.

The Effects Analysis modeling of salmon sensitivity to water temperature during egg incubation in the Sacramento River is not clear, given that the BDCP has no effect on upstream conditions according to some sections of Chapter 5. The Chapter 5 evaluation needs clarification, including a clear description of how the BDCP might affect flow and temperature in this area.

6. How well does the Effects Analysis link to the adaptive management plan and associated monitoring programs?

While both the need for and operative structure of adaptive management is identified considerably more in the Phase 3 review version of the Effects Analysis, it remains

characterized as a silver bullet but without clear articulation about how key assumptions will be vetted or uncertainties resolved to the point that the BDCP goals and objectives are more assured. The concept of adaptive management is appropriately described and allocated a prominent role in the implementation structure. However, the commonly acknowledged process of adaptive management is easily misunderstood and misapplied, often resulting in a loss of rigor and commitment in application. Because of the extensive uncertainties surrounding the assumptions and predictions of the BDCP, the Panel strongly emphasizes institutionalizing an exceedingly rigorous adaptive management process. This is critical in order to avoid the high risk associated with ecological surprises that will be difficult or impossible to reverse once they have occurred. BDCP must make a commitment to the fundamental process, and specifically the required monitoring and independent science review, not just the concept of adaptive management.

American Rivers
Rivers Connect Us

The Nature Conservancy
Protecting nature. Preserving life.™
nature.org

September 19, 2013

Re: Independent Panel Review of the Bay Delta Conservation Plan

Dear Interested Stakeholder:

The attached report was prepared by an independent panel of experts convened by Dr. Jeff Mount for American Rivers and The Nature Conservancy to assist in our deliberations regarding the Bay Delta Conservation Plan. Dr. Mount assembled a balanced, interdisciplinary, and objective group of experts with long experience in the San Francisco Bay-Delta estuary to conduct this review of the March 2013 BDCP Administrative Draft and associated documents released during the Spring of 2013. This report will now join a growing library of independent reviews of efforts to resolve the Delta crisis.

The opinions, analyses, and recommendations provided in the report are solely those of the authors. Our organizations will use the information in the report along with our own analysis of BDCP to develop a proposal for increasing the probability that BDCP will substantially improve environmental conditions in the Delta. This report does not represent the position of American Rivers or the Nature Conservancy.

American Rivers and The Nature Conservancy have been active participants in the BDCP planning process for the last seven years. Our organizations have not taken a formal position in support of the proposed project described in the administrative draft of the BDCP, but we are fully committed to continue our work in good faith to develop a conservation plan for the Delta ecosystem that advances the co-equal goals of ecosystem restoration and water supply reliability. The status quo condition in the Delta is unacceptable, and without action, will result in the inexorable decline of the Delta ecosystem and the species it supports.

Please direct questions regarding the report to Leo Winternitz or John Cain at lwinternitz@TNC.ORG and jcain@americanrivers.org. Thank you for your consideration.

Sincerely:

Leo Winternitz

Leo Winternitz
Senior Advisor - Water Program
The Nature Conservancy

John Cain
Conservation Director
American Rivers

PANEL REVIEW OF DRAFT BASIN PLAN CONSERVATION PLAN:

PREPARED FOR THE NATURE CONSERVANCY AND CALIFORNIA RIVERS

Jeffrey M. Mount (Chair)
William Fleenor
Brian Gray
Bruce Herbold
Wim Kimmerer

Financial support provided by S.D. Bechtel, Jr. Foundation

Technical support provided by NewFields, Inc.

September 2013

Saracino & Mount, LLC

Anthony M. Saracino anthony@saracinoandmount.com 916-952-8573 Jeffrey F. Mount, PhD jeff@saracinoandmount.com 530-400-1942

Preface꿯□ η

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Executive Summary

Two non-governmental organizations, The Nature Conservancy (TNC) (AR), are evaluating their options for engagement with the (BDCP). If approved, the Plan would become a Habitat federal Endangered Species Act and a Natural Communities under California law. The purpose of the Plan is to diversion facilities in the Sacramento-San Joaquin Delta while also protecting terrestrial species that may be adversely affected by the in the State Water Project (SWP) and Central Valley Proje also includes habitat restoration and a conservation strategy assist recovery of species that are listed for protection under th Species Act.

With financial support from the S.D. Bechtel, Jr. Foundation, convened an independent panel of local experts, with the NewFields, evaluate portions of the Plan. The panel, working jointly series of technical and legal questions about the Plan. these questions, along with recommendations on how to improve BDC

To simplify analysis, this review focuses on conditions for Early Long Term (ELT), a decade after a permit would These are described in the BDCP Effects Analysis and accompanying Environmental Impact Statement/Environmental Impact Report. We con performance of three different scenarios: a No Action Alternati North Delta diversion facility is proposed, as part of the where facilities are operated in a manner that prioritizes fall outflo a Low Outflow Scenario, which allows spring and fall outflows. The emphasizes Delta and Sacramento River conditions during the ELT, attention to San Joaquin River conditions and fishes.

Although multiple data sources were used in this analysis, CALSIM simulations conducted by BDCP consultants, the conclusions drawn from these simulations. Flow simulations uncertainties that can lead to significant error: (1) uncertainty and future conditions, (2) model uncertainties (particularly 1 2-, and 3-dimensional models), and (3) behavioral/regulatory uncertainty models cannot capture the scope of human behavior in op various conditions. These uncertainties, which are BDCP documents makes all of our conclusions contingent upon the operational as

Do Operations Shift Delta Exports from Dry to Wet

The BDCP calls for increasing exports in wet years, taking advantage of the increased operational flexibility provided by

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constrained뀀□ηby뀀□ηupstream뀀□ηconsumptive뀀□ηuses,뀀□ηregulations뀀□ηthat뀀□ηcover
and뀀□ηflow뀀□ηand뀀□ηwater뀀□ηquality뀀□ηstandards.뀀□η뀀□η뀀□ηThis뀀□ηgreatly뀀□η
associated뀀□ηwith뀀□ηoperation뀀□ηof뀀□ηthese뀀□ηfacilities,뀀□ηare뀀□ηmodele
is뀀□ηan뀀□ηincrease뀀□ηin뀀□ηexports뀀□ηin뀀□ηwet뀀□ηyears.뀀□η뀀□ηIn뀀□ηmost뀀□η
over뀀□ηNAA뀀□ηconditions.뀀□η뀀□ηHowever,뀀□ηsignificant뀀□ηimprovements뀀□ηin뀀□η
River뀀□η(OMR)뀀□ηconditions뀀□ηoccurring뀀□ηin뀀□ηyears.뀀□η뀀□ηWe뀀□ηwere뀀□ηunable뀀□ηt
or뀀□ηoperational뀀□ηrequirements뀀□ηthat뀀□ηwould뀀□ηlead뀀□ηto뀀□ηthis.뀀□η

Are뀀□ηImpacts뀀□ηof뀀□ηthe뀀□ηNorth뀀□ηDelta뀀□ηFacility뀀□ηFully뀀□ηAssessed뀀□
뀀□η

The뀀□ηPlan뀀□ηidentifies뀀□ηand뀀□ηdiscusses뀀□ηthe뀀□ηeffects뀀□ηof뀀□ηthe뀀□ηfacility뀀□ηon뀀□ηBa
on뀀□ηour뀀□ηreview뀀□ηof뀀□ηthe뀀□ηEffects뀀□ηAnalysis,뀀□ηthe뀀□ηPlan뀀□ηappears뀀□
significant뀀□ηeffects뀀□ηand뀀□ηuses뀀□ηstandard뀀□ηmodels뀀□ηto뀀□ηassess뀀□ηthem.뀀
run뀀□ηand뀀□ηrun-spring Chinook뀀□ηsalmon뀀□ηwill뀀□ηbe뀀□ηhatching,뀀□ηin뀀□ηthe뀀□ηab
mitigation,뀀□ηto뀀□ηsignificant뀀□ηlosses.뀀□ηThe뀀□ηPlan뀀□ηidentifies뀀□ηmultiple뀀□ηmi
pulse뀀□ηflow뀀□ηmanagement,뀀□ηpredator뀀□ηcontrol,뀀□ηenhancement,뀀□ηhabitat뀀□ηrestoration,뀀□ηn
real-time뀀□ηoperations뀀□ηand뀀□ηdevelopment뀀□ηof뀀□ηalternative뀀□ηmigration뀀□ηpathways뀀□η(Yol
With뀀□ηthe뀀□ηexception뀀□ηof뀀□ηbenefits뀀□ηfrom뀀□ηdiverting뀀□ηjuveniles뀀□ηonto뀀
mitigation뀀□ηapproaches뀀□ηhave뀀□ηhigh뀀□ηuncertainties.뀀□η뀀□ηDone뀀□ηwell뀀□ηand
appear뀀□ηto뀀□ηreduce뀀□ηthe뀀□ηlosses뀀□ηassociated뀀□ηwith뀀□ηoperation뀀□ηof뀀□ηthe뀀□ηNorth뀀
appears뀀□ηmost뀀□ηprotective뀀□ηof뀀□ηconditions뀀□ηupstream뀀□ηof뀀□ηthe뀀□ηDelta뀀
facility.뀀□η뀀□ηHowever,뀀□ηmitigation뀀□ηactions뀀□ηare뀀□ηunlikely뀀□ηto뀀□ηcontribute
these뀀□ηspecies.뀀□η뀀□ηAdditionally,뀀□ηsuccessful뀀□ηmitigation뀀□ηis뀀□ηlikely뀀□ηto뀀
adaptive뀀□ηmanagement뀀□ηand뀀□ηpeer뀀□ηoperations뀀□ηprogram.뀀□η뀀□ηThe뀀□ηPlan뀀□ηprovi

Are뀀□ηDelta뀀□ηConditions뀀□ηSignificantly뀀□ηImproved뀀□ηfor뀀□ηSmelt?뀀□η
뀀□η

We뀀□ηevaluated뀀□ηthese뀀□ηresults뀀□ηin뀀□ηthe뀀□ηPlan뀀□ηand뀀□ηconducted뀀□ηour뀀
how뀀□ηchanges뀀□ηin뀀□ηconditions뀀□ηwould뀀□ηaffect뀀□ηdelta뀀□ηand뀀□ηlongfin뀀□η
concerned뀀□ηthat뀀□ηanomalously뀀□ηpositive뀀□η(or뀀□ηless뀀□ηnegative)뀀□ηOMR뀀□ηfl
that뀀□ηare뀀□ηmodeled뀀□ηduring뀀□ηsome뀀□ηdrier뀀□ηyears뀀□ηwould뀀□ηnot뀀□ηactually뀀□ηo
However,뀀□ηif뀀□ηthese뀀□ηchanges뀀□ηwere뀀□ηto뀀□ηoccur뀀□ηwe뀀□ηfind뀀□ηmodest
Delta뀀□ηconditions뀀□ηfor뀀□ηsmelt,뀀□ηparticularly뀀□ηdelta뀀□ηsmelt.뀀□η뀀□η뀀□ηImpr
HOS뀀□ηand뀀□ηresult뀀□ηin뀀□ηsubstantial뀀□ηdecreases뀀□ηin뀀□ηentrainment,뀀□ηleading
in뀀□ηlong뀀□ηsurvival뀀□ηpercentages뀀□ηfor뀀□ηdelta뀀□ηsmelt.뀀□η뀀□ηHowever,뀀□ηin
outflow뀀□ηunder뀀□ηHOS뀀□ηlead뀀□ηto뀀□ηsmall뀀□ηincreases뀀□ηin뀀□ηlongfin뀀□ηsmel
improvements뀀□ηin뀀□ηdelta뀀□ηsmelt뀀□ηrecruitment.뀀□η뀀□η
뀀□η

Will뀀□ηPelagic뀀□ηFishes뀀□ηBenefit뀀□ηfrom뀀□ηFloodplain뀀□ηand뀀□ηTidal뀀□ηMar
뀀□η

The뀀□ηPlan뀀□ηproperly뀀□ηidentifies뀀□ηfood뀀□ηlimitation뀀□ηas뀀□ηa뀀□ηsignificant뀀□
the뀀□ηDelta.뀀□η뀀□ηThe뀀□ηPlan뀀□ηisolates뀀□ηissues뀀□ηto뀀□ηmodeling뀀□ηphysical뀀□ηhabita
subsidize뀀□ηpelagic뀀□ηfood뀀□ηwebs.뀀□ηBased뀀□ηon뀀□ηsimple뀀□ηmodeling뀀□ηand뀀□

we꿯□ηfind꿯□ηthat꿯□ηrestored꿯□ηfloodplains꿯□ηand꿯□ηtidal꿯□ηmarshes꿯□ηare꿯□ηu
contribution꿯□ηto꿯□ηsmelt꿯□ηrearing꿯□ηhabitat꿯□ηTidal꿯□ηmarshes꿯□ηcan꿯□ηbe꿯□ηsi
food,꿯□ηwith꿯□ηmost꿯□ηappearing꿯□ηto꿯□ηbe꿯□ηsinks꿯□ηfor꿯□ηzooplankton.꿯□η꿯
optimistic꿯□ηabout꿯□ηthe꿯□ηbenefits꿯□ηof꿯□ηtidal꿯□ηmarsh꿯□ηand꿯□ηfloodplain꿯□
likely꿯□ηto꿯□ηbe꿯□ηbenefiting꿯□ηfishes꿯□ηwhich꿯□ηhave꿯□ηdirect꿯□ηaccess꿯□ηto꿯□ηproductivity,꿯□ηs
In꿯□ηaddition,꿯□ηalthough꿯□ηbenefits꿯□ηfor꿯□ηlisted꿯□ηpelagic꿯□ηfishes꿯□ηare꿯□η
restoration꿯□ηfor꿯□ηmany꿯□ηaquatic꿯□ηand꿯□ηterrestrial꿯□ηspecies꿯□ηcovered꿯□ηb

Does꿯□ηthe꿯□ηPlan꿯□ηan꿯□ηEffective꿯□ηGovernance꿯□ηStructure?꿯□η꿯□η

We꿯□ηreviewed꿯□ηthe꿯□ηproposed꿯□ηBDCP꿯□ηgovernance꿯□ηstructure꿯□ηto꿯□ηeval
in꿯□ηmeeting꿯□ηthe꿯□ηPlan's꿯□ηgoals꿯□ηand꿯□ηobjectives.꿯□η꿯□ηImplementation꿯□
an꿯□ηAuthorized꿯□ηEntity꿯□ηcomprising꿯□ηthe꿯□ηCalifornia꿯□ηDepartment꿯□ηof꿯□ηW
Resources꿯□η(DWR),꿯□ηthe꿯□ηBureau꿯□ηof꿯□ηReclamation꿯□η(USBR),꿯□ηand꿯□ηthe꿯□ηs
contractors꿯□ηif꿯□ηthey꿯□ηare꿯□ηissued꿯□ηincidental꿯□ηtake꿯□ηpermits꿯□ηpursuant
Oversight꿯□ηGroup꿯□η(POG),꿯□ηconsisting꿯□ηof꿯□ηthe꿯□ηU.S.꿯□ηFish꿯□ηand꿯□ηWildlife꿯□ηService꿯□
Marine꿯□ηFisheries꿯□ηService꿯□η(NMFS),꿯□ηand꿯□ηthe꿯□ηCalifornia꿯□ηDepartment꿯□
(CDFW),꿯□ηwould꿯□ηmonitor꿯□ηimplementation꿯□ηof꿯□ηthe꿯□ηPlan꿯□ηand꿯□ηcomp
objectives꿯□ηand꿯□ηconservation꿯□ηmeasures.꿯□η꿯□ηThe꿯□ηdraft꿯□ηBDCP꿯□ηincludes꿯□ηa꿯□
surprises"꿯□ηguarantee,꿯□ηas꿯□ηwell꿯□ηas꿯□ηother꿯□ηregulatory꿯□ηassurances.꿯□η꿯
examined꿯□ηin꿯□ηdetail,꿯□ηthe꿯□ηdraft꿯□ηBDCP꿯□ηblurs꿯□ηthe꿯□ηlines꿯□ηbetwee
and꿯□ηgrants꿯□ηthe꿯□ηpermittees꿯□ηauthority.꿯□ηAdditionally,꿯□ηthe꿯□ηregulatory꿯
assurances꿯□ηin꿯□ηthe꿯□ηPlan,꿯□ηsuch꿯□ηas꿯□ηthe꿯□ηpolicies꿯□ηprohibiting꿯□ηundue꿯□ηfinancial꿯
responsibilities꿯□ηon꿯□ηthe꿯□ηstate꿯□ηand꿯□ηfederal꿯□ηgovernments꿯□ηif꿯□ηcertai
become꿯□ηnecessary꿯□ηduring꿯□ηthe꿯□ηterm꿯□ηof꿯□ηthe꿯□ηPlan.꿯□η꿯□ηGiven꿯□ηthe꿯□ηcomplexity꿯□ηof꿯□η
predicted꿯□ηchanges꿯□ηin꿯□ηhydrology,꿯□ηchanges꿯□ηin꿯□ηthe꿯□ηDelta꿯□ηnot꿯□ηincl
and꿯□ηsignificant꿯□ηscientific꿯□ηuncertainties,꿯□ηPlan꿯□ηmodifications꿯□ηare꿯□ηlikely
future.꿯□η꿯□η

Is꿯□ηthere꿯□ηa꿯□ηRobust꿯□ηScience꿯□ηand꿯□ηAdaptive꿯□ηManagement꿯□ηPlan꿯□η꿯□η

The꿯□ηPlan꿯□ηis꿯□ηcommitted꿯□ηto꿯□ηadaptive꿯□ηmanagement꿯□ηin꿯□ηorder꿯□ηt
Most꿯□ηof꿯□ηthe꿯□ηunresolved꿯□ηissues꿯□ηin꿯□ηthe꿯□ηPlan꿯□ηare꿯□ηto꿯□ηbe꿯
adaptive꿯□ηmanagement꿯□η"decision꿯□ηtree"꿯□ηapproach꿯□ηis꿯□ηproposed꿯□ηto꿯□ηre
starting꿯□ηoperations.꿯□ηWe꿯□ηfound꿯□ηthat꿯□ηthe꿯□ηgovernance꿯□ηstructure,꿯□ηw
exercise꿯□ηveto꿯□ηauthority꿯□ηover꿯□ηchanges꿯□ηto꿯□ηthe꿯□ηbiological꿯□ηobjective
measures,꿯□ηis꿯□ηlikely꿯□ηto꿯□ηdiscourage꿯□ηfor꿯□ηadaptive꿯□ηmanagement.꿯□η꿯□ηIn꿯
proposed꿯□ηconsensus꿯□ηAdaptive꿯□ηManagement꿯□ηTeam꿯□ηmade꿯□ηup꿯□ηof꿯□η
scientific꿯□ηcommunity꿯□ηmembers꿯□ηcreates꿯□ηconflicting꿯□ηrelationships꿯□ηbetween
and꿯□ηproviders꿯□ηof꿯□ηkey꿯□ηinformation.꿯□ηInformation꿯□ηavailable꿯□ηabout꿯□ηthe
program꿯□ηsuggests꿯□ηthat꿯□ηBDCP꿯□ηproposes꿯□ηto꿯□ηdevelop꿯□ηa꿯□ηwholly꿯□
integrated,꿯□ηbut꿯□ηshould꿯□ηbe,꿯□ηwith꿯□ηexisting꿯□ηprograms.꿯□η꿯□ηFinally,꿯□
process꿯□ηindicates꿯□ηthat꿯□ηunlikely꿯□ηto꿯□ηachieve꿯□ηthe꿯□ηgoal꿯□ηof꿯□ηsignif
uncertainties꿯□ηbefore꿯□ηthe꿯□ηNorth꿯□ηDelta꿯□ηfacility꿯□ηis꿯□ηconstructed꿯□ηand

Recommendations

Based on answers to these six questions, the Panel formu
recommendations for improving the BDCP.

- All parties need to recognize the model uncertainties in decision-making. It is unlikely that actual operations will operations.

- Given the high uncertainty over [illegible] efforts should [illegible] facility is completed. [illegible] completion of the Fremont Weir modifications on the Y scale, significant experimentation [illegible] predator control and non-physical barriers.

- The improvements [illegible] survival percentages for delta smelt changes in OMR need to be more rigorously evaluated, uncertainties over operations. [illegible] these findings, operational rules should be developed that insure that improved [illegible] OMR and outflow conditions occur.

- The limited benefit derived from changes in outflow look at options for significant increases in outflow, water outside the direct control of BDCP.

- Although we find that marsh and floodplain restoration benefits for pelagic fishes [illegible] resolved experimental restoration projects. These projects need to implemented rapidly to resolve this issue.

- Substantial revision of BDCP's governance structure is needed full regulatory authority to the POG, while limiting their implementation.

- To address high uncertainties about project performance and instead of [illegible] permit, there should be renewable "no s issued every ten years based on conditions at the

- An adaptive management program needs to be developed authority to [illegible] adaptive management experiments and effectively outcomes to revise and improve future actions..

- A well [illegible] science program needs to be developed that existing Delta science programs. [illegible] current efforts to update the Delta Science Program.

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Chapter꿹□η1:꿹□ηThe꿹□ηBay꿹□ηDelta꿹 Plan꿹□ηand꿹□ηCharge꿹꿹□η꿹□ηthe꿹□

Introduction꿹□η

The꿹□ηBay꿹□ηDelta꿹□ηConservation꿹□ηPlan꿹□η(BDCP)꿹□ηis꿹□ηbeing꿹□ηdevelope species꿹□ηact꿹□ηpermit꿹□ηrequirements꿹□ηfor꿹□ηoperations꿹□ηof꿹□ηthe꿹□ηFede (CVP)꿹□ηand꿹□ηthe꿹□ηState꿹□ηWater꿹□ηProject꿹□η(SWP)꿹□ηwill꿹□ηmeet꿹□ηSa The꿹□ηPlan꿹□ηincludes꿹□ηproposals꿹□ηfor꿹□ηnew꿹□ηpoints꿹□ηof꿹□ηdiversion꿹□ηin꿹□η operations꿹□ηcriteria,꿹□ηextensive꿹□ηfloodplain꿹□ηand꿹□ηtidal꿹□ηmarsh꿹□ηrestora governance,꿹□ηoversight꿹□ηand꿹□ηadaptive꿹□ηmanagement꿹□ηprograms.꿹□η꿹□ηTh seeking꿹□ηHabitat꿹□ηConservation꿹□η(HCP)/Natural꿹□ηCommunities꿹□ηConservation꿹□ηP (NCCP)꿹□ηpermits꿹□ηthat꿹□ηwill꿹□ηguide꿹□ηwater꿹□ηexports꿹□ηand꿹□ηhabitat꿹

The꿹□ηBay꿹□ηDelta꿹□ηConservation꿹□ηPlan꿹□ηis꿹□ηthe꿹□ηmost꿹□ηcomplex꿹□η ever꿹□ηattempted.꿹□η꿹□ηDevelopment꿹□ηof꿹□ηthe꿹□ηplan꿹□ηprincipally꿹□ηby꿹□ηs federal꿹□ηwater꿹□ηcontractors꿹□ηand꿹□ηbeneficiaries꿹□ηof꿹□ηthe꿹□ηplan꿹□ηbegan꿹□η 2013,꿹□ηselect꿹□ηchapters꿹□ηof꿹□ηthe꿹□ηAdministrative꿹□ηDraft꿹□ηof꿹□ηBDCP꿹 public꿹□ηreview꿹□ηAn꿹□ηAdministrative꿹□ηDraft꿹□ηof꿹□ηthe꿹□ηplan꿹□ηwas꿹□ηrel May꿹□ηof꿹꿹꿹꿹꿹□η꿹□η꿹□η꿹□η

At꿹□ηthe꿹□ηrequest꿹□ηof꿹□ηThe꿹□ηNature꿹□ηConservancy꿹□ηwas꿹□ηfunded꿹□ηand꿹 non-governmental꿹□ηorganizations꿹□ηengaged꿹□ηin꿹□ηthe꿹□ηBDCP꿹□ηindependent꿹□ηprocess panel꿹□ηof꿹□ηfive꿹□ηexperts꿹□η(Text꿹□ηBox꿹□η31-1)꿹□ηwas꿹□ηtechnically꿹□ηreview꿹 BDCP꿹□ηdocuments.꿹□ηThe꿹□ηpanel꿹□ηwas꿹□ηasked꿹□ηto꿹□ηanswer꿹□ηa꿹□ηsu to꿹□ηhelp꿹□ηinform꿹□ηdecisionmaking꿹□ηby꿹□ηAmerican꿹□ηRivers꿹□ηand꿹□ηThe The꿹□ηpanel꿹□ηwas꿹□ηassembled꿹□ηand꿹□ηmanaged꿹□ηunder꿹□ηcontract꿹□η&꿹□η from꿹□ηthe꿹□ηS.D.꿹□ηBechtel,꿹□ηJr.꿹□ηFoundation꿹□ηWater꿹□ηProgram.꿹□η꿹□η support꿹□ηfor꿹□ηthe꿹□ηpanel,꿹□ηincluding꿹□ηdata꿹□ηretrieval,꿹□ηanalysis꿹□ηand report꿹□ηsummarizes꿹□ηthe꿹□ηconclusions꿹□ηof꿹□ηthe꿹□ηwork꿹□ηof꿹□ηthis꿹□η

Guiding꿹□ηQuestions꿹□η

Two꿹□ηplanning꿹□ηmeetings꿹□ηwere꿹□ηheld꿹□ηbetween꿹□ηSaracino꿹□η&꿹□ηMou American꿹□ηRivers꿹□ηand꿹□ηThe꿹□ηNature꿹□ηConservancy.꿹□η꿹□ηAn꿹□ηinitial꿹 questions꿹□ηwere꿹□ηdeveloped꿹□ηthat꿹□ηwere꿹□ηgermane꿹□ηto꿹□ηdecisions꿹□η

꿹□η꿹□η꿹□η꿹□η꿹꿹꿹꿹꿹

needed 뀀 □ η to 뀀 □ η make 뀀 □ η a 뀀 □ η comprehensive 뀀 □ η effort 뀀 □ η with 뀀 □ η BDCP. 뀀 □ η 뀀 □ η These 뀀 □ η questions
distilled 뀀 □ η into 뀀 □ η the 뀀 □ η following 뀀 □ η six: 뀀 □ η

- *Q.1 뀀 □ η Do 뀀 □ η operations 뀀 □ η of 뀀 □ η the 뀀 □ η dual 뀀 □ η facilities 뀀 □ η meet 뀀 □ η the 뀀 □ η broad advantage 뀀 □ η of 뀀 □ η wet 뀀 □ η and 뀀 □ η above 뀀 □ η average 뀀 □ η years 뀀 □ η for 뀀 □ η exports on 뀀 □ η below-average 뀀 □ η years? 뀀 □ η What 뀀 □ η substantive 뀀 □ η changes 뀀 □ η operations 뀀 □ η (and 뀀 □ η responses, 뀀 □ η see 뀀 □ η below) 뀀 □ η are 뀀 □ η there 뀀 □ η both 뀀 □ η interannually? 뀀 □ η*
- *Q.2 뀀 □ η Based 뀀 □ η on 뀀 □ η operations 뀀 □ η criteria, 뀀 □ η does 뀀 □ η the 뀀 □ η Plan 뀀 □ η properly 뀀 □ η impacts 뀀 □ η likely 뀀 □ η to 뀀 □ η occur 뀀 □ η in 뀀 □ η the 뀀 □ η Delta by 뀀 □ η passing 뀀 □ η flows 뀀 □ η through 뀀 □ η the 뀀 □ η new 뀀 □ η North 뀀 □ η Delta 뀀 □ η diversion 뀀 □ η facilities? 뀀 □ η If 뀀 □ η there 뀀 □ η will 뀀 □ η be 뀀 □ η listed 뀀 □ η species 뀀 □ η by 뀀 □ η the 뀀 □ η facilities, 뀀 □ η does 뀀 □ η the 뀀 □ η Plan 뀀 □ η prescribe measures? 뀀 □ η*
- *Q.3 뀀 □ η Are 뀀 □ η changes 뀀 □ η in 뀀 □ η operations 뀀 □ η and 뀀 □ η points 뀀 □ η of 뀀 □ η diversion sufficient 뀀 □ η to 뀀 □ η significantly 뀀 □ η improve 뀀 □ η conditions 뀀 □ η for 뀀 □ η covered 뀀 □ η species? 뀀 □ η focus 뀀 □ η is 뀀 □ η on 뀀 □ η species, 뀀 □ η listed 뀀 □ η spe including 뀀 □ η delta 뀀 □ η and 뀀 □ η longfin 뀀 □ η sm steelhead, 뀀 □ η winter 뀀 □ η and 뀀 □ η spring 뀀 □ η Chinook 뀀 □ η and 뀀 □ η green 뀀 □ η sturgeon. 뀀 □ η*
- *Q.4 뀀 □ η Are 뀀 □ η covered 뀀 □ η pelagic fish 뀀 □ η like 뀀 □ η longfin 뀀 □ η smelt 뀀 □ η and 뀀 □ η smelt 뀀 □ η likely 뀀 □ η to 뀀 □ η benefit 뀀 □ η from 뀀 □ η restoration 뀀 □ η of 뀀 □ η floodplain 뀀 □ η and 뀀 □ η tidal 뀀 □ η marsh 뀀 □ η habitat 뀀 □ η at 뀀 □ η the 뀀 □ η proposed 뀀 □ η by 뀀 □ η the 뀀 □ η Plan? 뀀 □ η Given current 뀀 □ η state 뀀 □ η of 뀀 □ η knowledge, 뀀 □ η a assuming 뀀 □ η that 뀀 □ η all 뀀 □ η Plan 뀀 □ η commitments 뀀 □ η are 뀀 □ η met, 뀀 □ η are 뀀 □ η th efforts 뀀 □ η likely 뀀 □ η to 뀀 □ η result 뀀 □ η in 뀀 □ η X2 뀀 □ η and 뀀 □ η spring 뀀 □ η outflow 뀀 □ η standa
- *Q.5 뀀 □ η Does 뀀 □ η the 뀀 □ η Plan 뀀 □ η prov achievable, 뀀 □ η clear 뀀 □ η and 뀀 □ η measureable 뀀 □ η goals 뀀 □ η objectives, 뀀 □ η so as 뀀 □ η well 뀀 □ η as 뀀 □ η governance 뀀 □ η that 뀀 □ η transparent 뀀 □ η and 뀀 □ η resilient 뀀 □ η to 뀀 □ η political 뀀 □ η and 뀀 □ η special 뀀 □ η interest 뀀 □ η*
- *Q.6 뀀 □ η Is 뀀 □ η there 뀀 □ η a 뀀 □ η robust 뀀 □ η science 뀀 □ η and 뀀 □ η adaptive 뀀 □ η managemen described, 뀀 □ η is 뀀 □ η the 뀀 □ η proposed 뀀 □ η "decision 뀀 □ η tree" 뀀 □ η likely 뀀 □ η to 뀀 □ η resc regarding 뀀 □ η Fall 뀀 □ η X2 뀀 □ η and 뀀 □ η Spring 뀀 □ η Outflow 뀀 □ η prior 뀀 □ η to 뀀 □ η initial*

Text 뀀 □ η Box 뀀 □ η 1.1: 뀀 □ η Members 뀀 □ η of 뀀

Jeffrey 뀀 □ η Mount η (Lead), 뀀 □ η geomorphologist, 뀀 □ η Professor 뀀 □ η Emeritus 뀀 □ η UC 뀀 □ η Davis, 뀀 □ η former 뀀 □ η Director 뀀 □ η of 뀀 □ η the 뀀 □ η Delta 뀀 □ η Independent 뀀 □ η Science 뀀 □ η Board, 뀀 □ η and 뀀 □ η Partner, 뀀 □ η Saracino 뀀 □ η & 뀀 □ η Mount 뀀 □ η LLC

William 뀀 □ η Fleenor, 뀀 □ η Ph.D. 뀀 □ η hydrologist 뀀 □ η and 뀀 □ η water 뀀 □ η quality 뀀 □ η specialist, 뀀 □ η Research 뀀 □ η Scientist, 뀀 □ η UC 뀀 □ η Davis 뀀 □ η Center 뀀 □ η for 뀀 □ η Watershed 뀀 □ η Sciences 뀀 □ η

Brian 뀀 □ η Gray, 뀀 □ η Professor, 뀀 □ η environmental 뀀 □ η law, 뀀 □ η UC 뀀 □ η Hastings 뀀 □ η

Bruce 뀀 □ η Herbold, 뀀 □ η Ph.D. 뀀 □ η retired 뀀 □ η US 뀀 □ η Environmental 뀀 □ η Protection 뀀 □ η Agency, 뀀 □ η former 뀀 □ η Coordinator 뀀 □ η for 뀀 □ η the 뀀 □ η Interagency 뀀 □ η Ecological 뀀 □ η Program

Wim 뀀 □ η Kimmerer, 뀀 □ η Ph.D. 뀀 □ η Professional 뀀 □ η ecologist, 뀀 □ η Researcher, 뀀 □ η San 뀀 □ η Francisco 뀀 □ η State 뀀 □ η University, 뀀 □ η Tiburon 뀀 □ η Center 뀀 □ η

- *Q.7 뀀 □ η Are 뀀 □ η there 뀀 □ η other 뀀 □ η ecological 뀀 □ η stressors 뀀 □ η that 뀀 □ η affect 뀀 □ η the 뀀 □ η species 뀀 □ η and 뀀 □ η habitats 뀀 □ η in 뀀 □ η the 뀀 □ η Delta 뀀 □ η that 뀀 □ η are 뀀 □ η not 뀀 □ η addressed 뀀 □ η in 뀀 □ η the 뀀 □ η Plan? 뀀 □ η If 뀀 □ η so, 뀀 □ η what 뀀 □ η are 뀀 □ η the 뀀 □ η stressors 뀀 □ η and 뀀 □ η how 뀀 □ η are 뀀 □ η they 뀀 □ η affecting 뀀 □ η the 뀀 □ η Plan's 뀀 □ η ability 뀀 □ η to 뀀 □ η achieve 뀀 □ η its 뀀 □ η goals 뀀 □ η and 뀀 □ η objectives? 뀀 □ η*

Using 뀀 □ η these 뀀 □ η questions 뀀 □ η as 뀀 □ η guide, 뀀 □ η the 뀀 □ η panel 뀀 □ η reviewed 뀀 □ η selected
The 뀀 □ η focus 뀀 □ η of 뀀 □ η the 뀀 □ η review 뀀 □ η was 뀀 □ η on 뀀 □ η the 뀀 □ η biological 뀀 □ η goals 뀀 □
listed 뀀 □ η threatened 뀀 □ η or 뀀 □ η endangered 뀀 □ η (BDCP 뀀 □ η Chapters 뀀 □ η 1, 뀀 □ η 2), 뀀 □ η the 뀀 □
measures 뀀 □ η proposed 뀀 □ η to 뀀 □ η meet 뀀 □ η the 뀀 □ η biological 뀀 □ η objectives 뀀 □ η (BDCP 뀀 □
appendixes, 뀀 □ η see 뀀 □ η Text 뀀 □ η Box 뀀 □ η 1.2), 뀀 □ η and 뀀 □ η the 뀀 □ η analysis 뀀 □ η of 뀀 □ η the
fish 뀀 □ η species 뀀 □ η and 뀀 □ η communities 뀀 □ η in 뀀 □ η BDCP 뀀 □ η Chapter 뀀 □ η 5 뀀 □ η and 뀀 □ η appendixes). 뀀 □ η The 뀀 □ η
examined 뀀 □ η governance, 뀀 □ η adaptive 뀀 □ η management 뀀 □ η and 뀀 □ η science 뀀 □ η programs

Plan,뀀□ηincluding뀀□ηthe뀀□η“decision뀀□ηtree”뀀□ηintended뀀□ηto뀀□ηresolve뀀□ηtech
about뀀□ηinitial뀀□ηoperations뀀□η(BDCP뀀□η[illegible]

In뀀□ηaddition뀀□ηto뀀□ηreviewing뀀□ηBDCP뀀□ηdocuments뀀□ηand뀀□ηliterature,뀀□ηth
meetings뀀□ηwith뀀□ηthe뀀□ηconsultants뀀□ηwho뀀□ηprepared뀀□ηthe뀀□ηPlan뀀□ηfor뀀
consultants뀀□ηanswered뀀□ηquestions뀀□ηabout뀀□ηanalyses뀀□ηcontained뀀□ηwithin뀀□
provided뀀□ηdirected뀀□ηpanel뀀□ηmembers뀀□ηto뀀□ηpertinent뀀□ηsources뀀□ηof뀀□ηmo

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species.뀀□η

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habitat뀀□ηfor뀀□ηsalmon뀀□ηas뀀□ηwell뀀□ηas뀀□ηimprove뀀□ηDelta뀀□ηfood뀀

Conservation뀀□ηMeasure뀀□η4:뀀□ηTidal뀀□ηNatural뀀□ηCommunities뀀□ηRestoration.뀀
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an뀀□ηadditional뀀□η10,000뀀□ηacres뀀□ηof뀀□ηtransitional뀀□ηhabitat.뀀□η뀀□ηT
rearing뀀□ηhabitat뀀□ηfor뀀□ηseveral뀀□ηlisted뀀□ηspecies뀀□ηand뀀□ηimprove뀀
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creating뀀□ηmudflat,뀀□ηriparian뀀□ηand뀀□ηwetland뀀□ηhabitat뀀□ηthrough뀀□ηl

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Basis뀀□ηof뀀□ηComparison

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below)꿯□ηto꿯□ηmitigate꿯□ηfor꿯□ηimpacts꿯□ηof꿯□ηthe꿯□ηproject꿯□ηand꿯□ηto꿯
species꿯□ηand꿯□ηtheir꿯□ηbiologic꿯□ηcommunitie

One꿯□ηof꿯□ηthe꿯□ηmany꿯□ηcontroversies꿯□ηsurrounding꿯□ηthe꿯□ηPlan꿯□ηis꿯□
environmental꿯□ηbaseline꿯□ηfor꿯□ηcomparison꿯□ηof꿯□ηalternatives꿯□ηand꿯□ηanaly
the꿯□ηproject꿯□ηon꿯□ηlisted꿯□ηspecies.꿯□η꿯□ηThe꿯□ηrequirements꿯□ηof꿯□ηthe
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requirements꿯□ηfor꿯□ηhigh꿯□ηDelta꿯□ηoutflows꿯□ηto꿯□ηsupport꿯□ηlongfin꿯□ηsm
outflows꿯□ηto꿯□ηachieve꿯□ηFall꿯□ηX2꿯□η(low꿯□ηsalinity꿯□ηzone)꿯□ηprovisions꿯
For꿯□ηthis꿯□ηreason꿯□ηwo꿯□ηthe꿯□ηexisting꿯□ηBiological꿯□ηConditions꿯□η(EBC)꿯□ηconside
the꿯□ηPlan꿯□η(Table꿯□η1.1):꿯□ηEBC1꿯□ηincludes꿯□ηhigh꿯□ηspring꿯□ηoutflow꿯□
includes꿯□ηboth꿯□ηhigh꿯□ηspring꿯□ηoutflow꿯□ηand꿯□ηthe꿯□ηnew꿯□ηFall꿯□ηX2

A꿯□ηcentral꿯□ηrequirement꿯□ηof꿯□ηthe꿯□ηPlan꿯□ηis꿯□ηits꿯□ηcomplexity,꿯□ηof꿯
analyze꿯□ηconditions꿯□ηover꿯□ηthe꿯□η50꿯□ηof꿯□ηthe꿯□ηproject.꿯□η꿯□ηThe꿯□ηPlan
conditions꿯□ηinto꿯□ηtwo꿯□ηclasses:꿯□ηEarly꿯□ηLong꿯□ηTerm꿯□η(ELT),꿯□ηwhich
operating꿯□ηconditions꿯□ηof꿯□ηthe꿯□ηproject꿯□ηonce꿯□ηa꿯□ηnew꿯□ηdiversion꿯
constructed꿯□η(approximately꿯□η2025),꿯□ηand꿯□ηLate꿯□ηLong꿯□ηTerm꿯□η(LLT)꿯
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EBC1꿯□ηand꿯□ηEBC2꿯□ηare꿯□ηconsidered꿯□ηfor꿯□ηboth꿯□ηELT꿯□ηand꿯□ηLLT.
(ESO)꿯□ηof꿯□ηthe꿯□ηpreferred꿯□ηproject꿯□ηand꿯□ηalternatives꿯□ηare꿯□ηpresent
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bookends꿯□ηto꿯□ηproject꿯□ηoperations꿯□ηthat꿯□ηdictate꿯□ηfuture꿯□ηwater꿯□ηex
Outflow꿯□ηScenario꿯□η(HOS),꿯□ηwhich꿯□ηis꿯□ηsimilar꿯□ηto꿯□ηthe꿯□ηoutflow꿯□
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considered꿯□ηin꿯□ηthe꿯□ηELT꿯□ηand꿯□ηLLT,꿯□ηwith꿯□ηthe꿯□ηlatter꿯□ηincludi
restoration.꿯□η꿯□ηThe꿯□ηPlan꿯□ηproposes꿯□ηa꿯□η“decision꿯□ηtree꿯□ηprocess”꿯
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operations,꿯□ηpresumably꿯□ηwithin꿯□ηthe꿯□ηbounds꿯□ηof꿯□ηthe꿯□ηHOS꿯□ηand
9).꿯□η

For the purposes of this review, we simplified our con
restoration scenarios to three, [illegible] Using simulation data provided
consultants we examined the HOS and LOS scenarios for
project alternative, NAA ELT, that commonly appears throughou
documentation, particularly in the EIR/EIS. [illegible] NAA [illegible] protocols
maintain X2 standards [illegible] flow standards re
the State Water Resources Control Board [illegible] the remainder

Table 1.1. Definitions of existing baseline conditions and simulated in BDCP.

Conditions		Description
Existing Biological Conditions	EBC1	Current operations based on BiOps, management of outflows to the USFWS 2008 BiOp.
	EBC2	Current operations based on BiOps, management of outflows to meet provisions from 2008 BiOp.
Projected Future Conditions without BDCP	EBC2_ELT	EBC2 projected into year 15 (2 climate change expected at that
	EBC2_LLT	EBC2 projected into year 50 (2 climate change expected at that
Projected Future Conditions with BDCP	ESO_ELT	Evaluated starting operations in yea intake facility operational and resto implemented
	ESO_LLT	Evaluated starting operations in yea intake facility operational and resto implemented.
	HOS_ELT	High-outflow operations during spring 15 assuming new intake facility restoration not fully implemented.
	HOS_LLT	High-outflow operations during spring 50 assuming new intake facility restoration fully implemented.
	LOS_ELT	Low-outflow operations during spring 15 assuming new intake facility restoration not fully implemented.
	LOS_LLT	Low-outflow operations during spring 50 assuming new intake facility restoration fully implemented.

It should be noted that the Parameters [illegible] beyond the question of whether restoration of marsh is

Although꿯□ηit꿯□ηis꿯□ηnecessary꿯□ηand꿯□ηuseful꿯□ηto꿯□ηconsider꿯□ηhow꿯□ηth
the꿯□ηlong,꿯□ηespecially꿯□ηunder꿯□ηclimate꿯□ηchange꿯□ηthat꿯□ηexceptionally꿯□ηhigh
uncertainties꿯□ηmade꿯□ηit꿯□ηdifficult꿯□ηto꿯□ηoffer꿯□ηprecise꿯□ηanswers꿯□ηwith
These꿯□ηuncertainties꿯□ηare꿯□ηassociated꿯□ηwith꿯□ηour꿯□ηunderstanding꿯□ηof꿯
models꿯□ηused꿯□ηto꿯□ηsimulate꿯□ηfuture꿯□ηconditions,꿯□ηsuch꿯□ηas꿯□ηwithdrawals꿯□ηhigh
invasions,꿯□ηfloods,꿯□ηdroughts,꿯□ηearthquakes,꿯□ηpolicy꿯□ηchanges,꿯□ηlawsuits,꿯□
likely꿯□ηto꿯□ηoccur.꿯□η

A꿯□ηNote꿯□ηAbout꿯□ηHydrologic꿯□ηModeling꿯□ηTools꿯□ηand

The꿯□ηbasis꿯□ηfor꿯□ηthe꿯□ηBDCP꿯□ηanalysis꿯□ηis꿯□ηhydrologic꿯□ηsimulation꿯□
flow,꿯□ηwater꿯□ηelevations,꿯□ηtemperature꿯□ηand꿯□ηsalinity꿯□ηat꿯□ηvarious꿯□η
Delta꿯□ηand꿯□ηits꿯□ηupstream꿯□ηareas.꿯□η꿯□ηMuch꿯□ηof꿯□ηthe꿯□ηEffects꿯□η
of꿯□ηthe꿯□ηexport꿯□ηprojections꿯□ηare꿯□ηbased꿯□ηon꿯□ηoutputs꿯□ηfrom꿯□ηthese꿯
is꿯□ηone꿯□ηof꿯□ηthe꿯□ηmost꿯□ηcomplex꿯□ηmodeling꿯□ηefforts꿯□ηof꿯□ηits꿯□η
complex꿯□ηever꿯□ηattempted꿯□ηin꿯□ηthe꿯□ηDelta.꿯□η꿯□ηThis꿯□ηis꿯□ηa꿯□ηhe

There꿯□ηare꿯□ηthreats꿯□ηgeneral꿯□ηof꿯□ηuncertainty꿯□ηin꿯□ηthe꿯□ηhydrologic꿯□ηm

*Model꿯□ηuncertainties*꿯□η꿯□ηThis꿯□ηincludes꿯□ηhow꿯□ηthe꿯□ηmodel꿯□ηsimulates꿯□
hydrologic꿯□ηresults꿯□ηof꿯□ηoperations,꿯□ηincluding꿯□ηsalinity,꿯□ηtemperatures꿯□
quality꿯□ηparameters.꿯□η꿯□ηMany꿯□ηcurrently꿯□ηmodeling꿯□ηtools꿯□ηare꿯□ηless꿯□ηthan꿯
simulate꿯□ηsuch꿯□ηterms꿯□ηrecord꿯□ηwith꿯□ηdramatic꿯□ηchanges꿯□ηin꿯□ηconditions
level꿯□ηrise꿯□ηand꿯□ηinadequate꿯□ηdata꿯□ηfor꿯□ηland.꿯□ηThe꿯□ηprincipal꿯□ηissues꿯□
summarized꿯□ηin꿯□ηTexas꿯□ηBox꿯□η1.3.꿯□η

*Future꿯□ηconditions꿯□ηuncertainties*꿯□η꿯□ηThere꿯□ηis꿯□ηextensive꿯□ηeffort꿯□ηin꿯□ηBDCP
conditions꿯□ηin꿯□ηthe꿯□ηDelta,꿯□ηincluding꿯□ηsea꿯□ηlevel꿯□ηrise꿯□ηand꿯□ηcha
runoff.꿯□η꿯□ηThis꿯□ηis꿯□ηthe꿯□ηmost꿯□ηcomprehensive꿯□ηapproach꿯□ηto꿯□ηd
in꿯□ηAppendix꿯□ηPlanning꿯□ηand꿯□ηhighlight꿯□ηhighlevels꿯□ηof꿯□ηuncertain

*Regulatory꿯□ηand꿯□ηbehavioral꿯□ηuncertainty*꿯□η꿯□ηBDCP꿯□ηmodels꿯□ηassume꿯□ηthat꿯□ηflow
quality꿯□ηstandards꿯□ηwill꿯□ηremain꿯□ηstatic꿯□ηduring꿯□ηthe꿯□ηlife꿯□ηof꿯□ηt
models꿯□ηassume꿯□ηuniform꿯□ηbehavior꿯□ηof꿯□ηsignificant꿯□ηoperations
and꿯□ηadaptations.꿯□η꿯□ηAll꿯□ηof꿯□ηthese꿯□ηare꿯□ηhighly꿯□ηunlikely꿯□ηto꿯□

The꿯□ηhydrologic꿯□ηmodel꿯□ηresults꿯□ηof꿯□ηBDCP꿯□ηare꿯□ηpresented꿯□ηas꿯□
Given꿯□ηthe꿯□ηcompounding꿯□ηuncertainties,꿯□ηBDCP꿯□ηmodelers꿯□ηshou
scenarios꿯□ηrather꿯□ηthan꿯□ηspecific꿯□ηoutcomes.꿯□η꿯□ηThis꿯□ηissue꿯□ηis꿯□η
debates꿯□ηover꿯□ηBDCP.꿯□ηAs꿯□ηdiscussed꿯□ηlater꿯□ηin꿯□ηthis꿯□ηreport,꿯□ηt
significantly꿯□ηimpact꿯□ηour꿯□ηconfidence꿯□ηin꿯□ηsome꿯□ηof꿯□ηresults,
of꿯□ηthe꿯□ηresponse꿯□ηof꿯□ηpelagic꿯□ηfishes꿯□ηto꿯□ηchanges꿯□ηin꿯□ηSouth꿯

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Text꿹□ηBox꿹□η1.3:꿹□ηHydrologic꿹□ηModel꿹□ηUncertainty.꿹□η꿹□η

To꿹□ηadapt꿹□ηexisting꿹□ηtools꿹□ηto꿹□ηmodel꿹□ηfuture꿹□ηconditions꿹□ηunder꿹
developed꿹□ηdispersion꿹□ηcoefficients꿹□ηwithin꿹□ηTNM꿹□ηmodel꿹□η
developed꿹□ηby꿹□ηMichael꿹□ηMacWilliams꿹□ηfor꿹□ηsea꿹□ηlevel꿹□ηrise.꿹□η꿹□η
followed꿹□ηwith꿹□ηsimilar꿹□ηmodel꿹□ηdeveloped꿹□ηby꿹□ηResearch꿹□ηManagemen
Associates꿹□ηto꿹□ηestimate꿹□ηthe꿹□ηadditional꿹□ηdispersion꿹□ηfor꿹□ηthe꿹□ηpr
areas.꿹□η꿹□ηParameters꿹□ηdeveloped꿹□ηmodel꿹□ηfor꿹□ηthe꿹□ηNorth꿹□ηwere꿹□ηthen꿹□η
incorporated꿹□ηinto꿹□ηthe꿹□ηDSM2꿹□ηplanning꿹□ηmodel꿹□ηde
simulate꿹□ηa꿹□ηpart꿹□ηof꿹□ηthe꿹□ηbroad꿹□ηplan꿹□ηincorporating꿹□ηsea꿹□ηlevel꿹□ηrise꿹□ηa
restored꿹□ηacreage.꿹□η꿹□ηyear꿹□ηthe꿹□ηtimeframe꿹□ηfor꿹□ηthe꿹□ηDSM2꿹□ηmodel,꿹□ηwh
at꿹□ηtime꿹□ηsteps꿹□ηas꿹□ηshort꿹□ηas꿹□η15꿹□ηminutes꿹□ηdensitional꿹□ηprovided꿹
system-wide꿹□ηwater꿹□ηoperations꿹□ηoptimization꿹□ηmodel.꿹□ηCALSIM꿹□ηoutput꿹
monthly꿹□ηtime꿹□ηsteps꿹□ηand꿹□ηhad꿹□ηto꿹□ηbe꿹□ηdisaggregated꿹□ηto꿹□ηp
for꿹□ηDSM2.꿹□η꿹□ηAll꿹□ηthe꿹□ηresults,꿹□ηincluding꿹□ηthe꿹□ηDSM2꿹□ηresults
network꿹□ηsalinity꿹□ηresults,꿹□ηwere꿹□ηthen꿹□ηused꿹□ηto꿹□ηtrai
model꿹□ηwas꿹□ηthen꿹□ηused꿹□ηto꿹□ηyear꿹□ηperiod꿹□ηrecorded꿹□ηthe꿹□ηhistorical꿹□ηthe꿹□
for꿹□ηthe꿹□ηEffects꿹□ηAnalysis.꿹□ηAll꿹□ηof꿹□ηthese꿹□ηmodels,꿹□ηclimate꿹□ηchanges,꿹□
and꿹□ηdirectional꿹□ηmodels,꿹□ηcreate꿹□ηerror꿹□ηor꿹□ηmodel꿹□ηbias.꿹□ηTo꿹□η
assessment꿹□ηof꿹□ηthese꿹□ηmodel꿹□ηbiases꿹□ηand꿹□ηbetween꿹□ηthe

Organization꿹□ηof꿹□ηthe꿹□ηReport꿹□ηR

This꿹□ηreport꿹□ηis꿹□ηorganized꿹□ηinto꿹□ηnine꿹□ηchapters꿹□ηfollowed꿹□ηby꿹□
guiding꿹□ηquestions.꿹□η꿹□ηChapter꿹□η2

- *Chapter 꿹□η2, 꿹□ηOverview 꿹□ηof 꿹□ηthe 꿹□ηAllowable 꿹□ηLoading 꿹□ηSpecifically 꿹□η꿹□η*
  requested꿹□ηby꿹□ηTNC꿹□ηand꿹□ηAR,꿹□ηevaluate꿹□ηkeyne꿹□ηpitfalls꿹□ηthese꿹□η
  HCP/NCCP꿹□ηlaws꿹□ηthat꿹□ηset꿹□ηstandards꿹□ηfor꿹□ηrecovery꿹□ηof꿹□ηp
  fishes.꿹□η꿹□η꿹□η
- *Chapter 꿹□η3, 꿹□ηSupply 꿹□ηOperations. 꿹□ηThis꿹□η*꿹□ηchapter꿹□ηexamines꿹□ηhow꿹□ηBDCP꿹□
  performs꿹□ηin꿹□ηmeeting꿹□ηthe꿹□ηgoal꿹□ηof꿹□ηincreasing꿹□ηwater꿹□ηsu
  includes꿹□ηassessment꿹□ηof꿹□ηchanges꿹□ηin꿹□ηexport꿹□ηvolumes,꿹□ηboth꿹
  within꿹□ηdifferent꿹□ηyear꿹□ηtypes.꿹□η꿹□η꿹□η
- *Chapter 꿹□η4, 꿹□ηEnvironmental 꿹□ηFlow 꿹□ηPerformance: 꿹□ηThe꿹□ηpresent꿹□ηand 꿹□η*
  facilities꿹□ηand꿹□ηtheir꿹□ηoperation꿹□ηare꿹□ηsupposed꿹□ηto꿹□ηimprove꿹□
  impacted꿹□ηby꿹□ηthe꿹□ηand꿹□ηCVP.꿹□η꿹□η꿹□ηThis꿹□ηchapter꿹□ηdescribes꿹□ηflo
  project꿹□ηdams,꿹□ηflows꿹□ηpast꿹□ηand꿹□ηthrough꿹□ηthe꿹□ηnew꿹□ηNorth
  overall꿹□ηinflow꿹□ηregime꿹□ηof꿹□ηthe꿹□ηestuary.꿹□η꿹□η꿹□η
- *Chapter 꿹□η5, 꿹□ηEffects 꿹□ηon 꿹□ηHydrologic 꿹□ηChanges. 꿹□η*꿹□ηin꿹□ηflow꿹□ηconditio
  outlined꿹□ηin꿹□ηthe꿹□ηprevious꿹□ηchapter꿹□ηtranslate꿹□ηto꿹□ηchanges꿹□
  for꿹□ηlisted꿹□ηfish꿹□ηspecies.꿹□η꿹□η꿹□ηThis꿹□ηchapter꿹□ηevaluates꿹□ηthe꿹□
  smelt꿹□ηand꿹□ηlongfin꿹□ηsmelt꿹□ηp꿹□ηthese꿹□ηchanges

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- *Chapter 뀀□η6, 뀀□ηEstimated 뀀□ηEffects 뀀□ηof 뀀□η[illegible] 뀀□ηFlow 뀀□ηon 뀀□ηSmelt.* the뀀□ηmagnitude뀀□ηof뀀□ηchanges뀀□ηin뀀□ηoutflow뀀□ηand뀀□ηthe뀀□ηlikely뀀 longfin뀀□ηsmelt뀀□η
- *Chapter 뀀□η7, 뀀□ηLikely 뀀□ηResponse 뀀□ηof 뀀□ηListed 뀀□ηFish 뀀□ηto 뀀□ηHabitat* fundamental뀀□ηhypothesis뀀□ηof뀀□ηBDCP뀀□ηis뀀□ηthat뀀□ηrestoration뀀□ηof뀀□ particularly뀀□ηtidal뀀□ηmarsh,뀀□ηwill뀀□ηimprove뀀□ηfood뀀□ηweb뀀□ηcondition aiding뀀□ηtheir뀀□ηrecovery.뀀□η뀀□ηThis뀀□ηchapter뀀□η evaluates뀀□ηthis뀀□ηhy
- *Chapter 뀀□η8, 뀀□ηGovernance 뀀□ηand 뀀□ηTerms* [illegible] 50 unit뀀□ηfor뀀□ηthe뀀□ηpr coupled뀀□ηwith뀀□ηgovernance뀀□ηand [illegible] chapter.뀀□η뀀
- *Chapter 뀀□η9, 뀀□ηScience 뀀□ηand 뀀□ηAdaptive* [illegible] makes뀀□ηextensive뀀□η mention뀀□ηof뀀□ηthe뀀□ηuse뀀□ηof뀀□ηadaptive뀀□ηmanagement뀀□ηsupported뀀 address뀀□ηmajor뀀□ηuncertainties.뀀□η뀀□ηThe뀀□ηPlan's뀀□ηobjectives뀀□ηin뀀□ reviewed.뀀□η뀀□η
- *Chapter 뀀□η10* ηSummary뀀□ηand뀀□ηConclusions.뀀□η뀀□ηThis뀀□ηchapter뀀□ηprov answers뀀□ηto뀀□ηthe뀀□ηsix뀀□ηquestions뀀□ηpresented뀀□ηto뀀□ηthe뀀□ηpanel The뀀□ηNature뀀□ηConservancy.뀀□η뀀□ηIn뀀□ηaddition,뀀□ηwhere뀀□ηappropriate are뀀□ηoffered뀀□ηfor뀀□ηways뀀□η [illegible] per

Conclusion뀀□η

This뀀□ηreport뀀□ηis,뀀□ηby뀀□ηdesign,뀀□ηnarrowly뀀□ηfocused뀀□ηon뀀□ηa뀀□ηlimite The뀀□ηNature뀀□ηConservancy뀀□ηand뀀□ηAmerican뀀□ηRivers.뀀□η뀀□ηIt뀀□ηis뀀□ηno review뀀□ηof뀀□ηBDCP,뀀□ηnor뀀□ηis뀀□ηit뀀□ηdirected뀀□η [illegible] specifically뀀□ηsteered뀀□ηaway뀀□ηfrom뀀□ηendorsing뀀□ηor뀀□ηrejecting뀀□ηBDCP,뀀□ recommendation뀀□ηon뀀□ηthe뀀□ηcritical뀀□ηquestion뀀□ηof뀀□ηwhether뀀□ηAmerican뀀 Nature뀀□ηConservancy뀀□ηshould뀀□ηsupport뀀□ηBDCP,뀀□ηsupport뀀□ηit뀀□ηwith뀀□η reject/oppose뀀□ηit.뀀□η뀀□ηRather,뀀□ηthe뀀□ηobservations,뀀□ηanalyses뀀□ηand뀀□ηre solely뀀□ηintended뀀□ηto뀀□ηinform뀀□η this뀀□ηdecision.뀀□η

뀀□η

Chapter꿹□η2:꿹□ηAn꿹□ηOverview꿹□ηof Governing꿹□ηthe꿹□ηBDCP

Introduction꿹□η

This꿹□ηchapter꿹□ηprovides꿹□ηa꿹□ηbrief꿹□ηoverview꿹□ηof꿹□ηthe꿹□ηlaw꿹□ηthat꿹□ηgove
implementation꿹□ηof꿹□ηthe꿹□ηConservation꿹□ηPlan꿹□ηalso꿹□ηaddresses꿹□ηan꿹
question꿹□ηthat꿹□ηhas꿹□ηarisen꿹□ηduring꿹□ηthe꿹□ηCalifornia꿹□ηDepartment꿹□ηof꿹□ηFish꿹□ηand꿹□ηWildlife꿹□η(CDFW)꿹□ηapprove꿹□ηthe꿹□ηBDCP
conservation꿹□ηplan꿹□ηif꿹□ηthe꿹□ηBDCP꿹□ηdoes꿹□ηnot꿹□ηprovide꿹□ηfor꿹□ηful
and꿹□ηthreatened꿹□ηspecies꿹□ηcovered꿹□ηby꿹□ηthe꿹□ηPlan?

Habitat꿹□ηConservation꿹□ηPlanning꿹□ηand꿹□ηNatural꿹□ηCommu Conservation꿹□ηPlanning꿹□ηUnder꿹□ηFederal꿹□ηand꿹□ηCalifornia

The꿹□ηBDCP꿹□ηis꿹□ηa꿹□ηHabitat꿹□ηConservation꿹□ηPlan꿹□η(HCP)꿹□ηauthorized
federal꿹□ηEndangered꿹□ηSpecies꿹□ηAct꿹□η(ESA),꿹□η16꿹□ηU.S.C.꿹□η§꿹□η1539(a),꿹□η
Conservation꿹□ηPlan꿹□η(NCCP)꿹□ηauthorized꿹□ηby꿹□ηthe꿹□ηCalifornia꿹□ηNatural꿹
Conservation꿹□ηPlanning꿹□η(NCCPA),꿹□ηCalifornia꿹□ηFish꿹□ηand꿹□ηGame꿹□ηCode꿹□η§
Section꿹□η10(a)꿹□ηof꿹□ηthe꿹□ηESA꿹□ηallows꿹□ηthe꿹□ηU.S.꿹□ηFish꿹□ηand꿹□ηWildlife꿹□η
and꿹□ηthe꿹□ηNational꿹□ηMarine꿹□ηFisheries꿹□ηService꿹□η(NMFS)꿹□ηto꿹□ηissue
the꿹□ηtaking꿹□ηof꿹□ηendangered꿹□ηor꿹□ηthreatened꿹□ηspecies꿹□η"if꿹□ηsuch꿹□
not꿹□ηthe꿹□ηpurpose꿹□ηof,꿹□ηof꿹□ηthe꿹□ηactivity꿹□ηproposed꿹□ηactivity꿹□ηis꿹□ηgoverned꿹□ηby꿹□ηsection꿹□η10(a)(1)(B)꿹□ηof꿹□ηthe꿹□η
Similarly,꿹□ηunder꿹□ηNCCPA꿹□ηthe꿹□ηCalifornia꿹□ηDepartment꿹□ηof꿹□ηFish꿹□ηand꿹□ηWil
may꿹□ηauthorize꿹□ηby꿹□ηpermit꿹□ηthe꿹□ηtaking꿹□ηof꿹□ηspecies꿹□ηcovered꿹□ηspeci
and꿹□ηmanagement꿹□ηis꿹□ηprovided꿹□ηfor꿹□ηin꿹□ηa꿹□ηnatural꿹□ηcommunity꿹
approved꿹□ηby꿹□ηthe꿹□ηdepartment꿹□ηCalifornia꿹□ηFish꿹□η&꿹□ηGame꿹□ηCode꿹□η§꿹□η
꿹□η

If꿹□ηapproved꿹□ηby꿹□ηthe꿹□ηthree꿹□ηfish꿹□ηand꿹□ηwildlife꿹□ηagencies,꿹□ηthe
document꿹□ηthat꿹□ηdefines꿹□ηthe꿹□ηterms꿹□ηand꿹□ηconditions꿹□ηunder꿹□ηwhi
Reclamation꿹□η(USBR)꿹□ηand꿹□ηthe꿹□ηCalifornia꿹□ηDepartment꿹□ηof꿹□ηWater꿹□
construct꿹□ηand꿹□ηoperate꿹□ηthe꿹□ηproposed꿹□ηnew꿹□ηwater꿹□ηdiversion꿹□ηa
described꿹□ηin꿹□ηdraft꿹□ηthe꿹□ηBDCP꿹□ηalso꿹□ηprovides꿹□η"

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1 꿹□η꿹□η꿹□η

conservation strategy for the San Joaquin River Delta (Delta) to restore and protect ecosystem health, water supply, and stable regulatory "framework" (BDCP 1-1).[1]

The BDCP will "provide assurances" that protect the permittees financial cost of changes to the BDCP or other regulatory the species or [illegible] authorized by federal and state law, regulatory assurances provided that, if changed circumstances arise that unforeseen or not provided for in the BDCP, will [illegible] not require the permittees to [illegible] additional land, water, resources or financial beyond the set level set forth in the BDCP. Of the plan Nor will the federal [illegible] impose [illegible] restrictions on proje operations without compensating the permittees for the lost costs.[5]

Both state and federal agencies to authorize the fish and wildlife agencies to sus incidental take permits for compliance with the terms and conditions BDCP [illegible] where implementation of the Plan will place the jeopardy of [illegible].[6]

We consider the regulatory assurances, [illegible] and [illegible] of aspec BDCP governance in [illegible] Chapter

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[3] In addition, the BDCP will be the basis for a biological assessment that USB NMFS prior to consultation under section 7 of the Endangered Species Act. to inform the federal fish [illegible] wildlife agencies' [illegible] facilities and changes in co CVP/SWP operations proposed in the draft Plan. The agencies then will to jeopardize the continued existence of any endangered [illegible] or threatened destruction or adverse modification of [the species' critical habitat]." 16 U.S determine that [illegible] BDCP will jeopardize a listed species or adversely affect critical opinion that they issue to the Bureau will include "reasonable and prudent alte consequences, as well as incidental take authorization [illegible] CVP operations.

[4] The regulatory assurances [illegible] apply to [illegible] that are issued incidental take permits including DWR and the CVP and SWP contractors if the contractors become assurance will not apply, however, to the Bureau of Reclamation. BDCP 29

[5] The USFWS and NMFS adopted the federal "no surprises" policy by rulemal requirements of these rules may be found at 50 C.F.R. § 17.22(b)(5) & respectively. The "no surprises" [illegible] the NCCPA itself. California § 2820(f).

[6] The federal suspension and revocation rules are set forth in the Endangere 1539(a)(2)(C), and in the ESA regulations, 50 C.F.R. § 17.22(b)(8) the [illegible] California Fish & Game [illegible] § 2820(b)(3).

Conservation꿹□ηand꿹□ηRecovery꿹□ηRequirements꿹□ηUnder꿹□ηFe State꿹□ηLaw

The꿹□ηfederal꿹□ηEndangered꿹□ηSpecies꿹□ηAct꿹□ηCalifornia꿹□ηNatural꿹□ηCommuni Conservation꿹□ηPlanning꿹□ηAct꿹□ηtheir꿹□ηrespective꿹□ηconservation꿹□ηand꿹□η standards.꿹□η꿹□ηThese꿹□ηprovisions꿹□ηmean꿹□ηwildlife꿹□ηagencies꿹□ηmay꿹 approve꿹□ηthe꿹□ηBDCP꿹□ηunless꿹□ηthey꿹□ηdetermine꿹□ηthat꿹□ηthe꿹□ηincidenta permit꿹□ηand꿹□ηHCP꿹□η"will꿹□ηnot꿹□ηappreciably꿹□ηreduce꿹□ηthe꿹□ηlikelihood recovery꿹□ηof꿹□ηthe꿹□ηspecies꿹□ηin꿹□ηthe꿹□ηwild."꿹□η꿹□η16꿹□ηU.S.C.꿹□η§꿹 꿹□η

In꿹□ηcontrast,꿹□ηthe꿹□ηNCCPA꿹□ηstates꿹□ηthat꿹□ηDepartment꿹□ηapproval꿹□ηis꿹□ηthe꿹□η BDCP꿹□ηonly꿹□ηinterim꿹□ηplan꿹□ηPl 꿹□η

> provides꿹□ηfor꿹□ηthe꿹□ηprotection꿹□ηof꿹□ηhabitat,꿹□ηnatural꿹□ηcommuniti diversity꿹□ηon꿹□ηa꿹□ηlandscape꿹□ηor꿹□ηecosystem꿹□ηlevel꿹□ηthrough꿹□η term꿹□ηmanagement꿹□ηof꿹□ηhabitat꿹□ηreserves꿹□ηor꿹□ηother꿹□ηmeasures equivalent꿹□ηconservation꿹□ηof꿹□ηcovered꿹□ηspecies꿹□ηappropriate꿹□ηfor꿹□ηland,꿹□η marine꿹□ηhabitats꿹□ηwithin꿹□ηthe꿹□ηplan꿹□ηarea.
> 꿹□η

California꿹□ηFish꿹□η&꿹□ηGame꿹□η2820(a)(3)꿹□ηCode꿹□η(emphasis꿹□ηadded)꿹□ηThe꿹□ηAct꿹□ηdefines꿹 "conservation"꿹□ηas꿹□η"the꿹□ηmethods꿹□ηand꿹□ηprocedures꿹□ηwithin꿹□ηthe꿹□ηplan꿹□η necessary꿹□η*to꿹□ηbring꿹□ηany꿹□ηcovered꿹□ηspecies꿹□ηto꿹□ηthe꿹□ηpoint꿹□ηat꿹□ηw pursuant꿹□ηto꿹□η[the꿹□ηCalifornia꿹□ηEndangered꿹□ηSpecies꿹□ηAct꿹□η2820(a)(3)꿹□ηthe꿹□ηnot꿹* (emphasis꿹□ηadded)꿹□η

In꿹□ηother꿹□ηwords,꿹□ηthe꿹□ηfederal꿹□ηEndangered꿹□ηSpecies꿹□ηAct꿹□ηrequire conservation꿹□ηplans꿹□ηensure꿹□ηthat꿹□ηthe꿹□ηpermitted꿹□ηactivities꿹□ηdo꿹□η listed꿹□ηspecies꿹□ηor꿹□ηto꿹□ηtheir꿹□ηcritical꿹□ηhabitats.꿹□η꿹□ηThe꿹□ηCaliforn Conservation꿹□ηPlanning꿹□ηAct,꿹□ηby꿹□ηcomparison,꿹□ηregards꿹□ηproposed꿹□ηpr BDCP꿹□ηas꿹□ηopportunities꿹□ηfor꿹□ηmore꿹□ηcoordinated꿹□ηand꿹□ηcohesive꿹□η condition꿹□ηof꿹□ηcovered꿹□ηspecies꿹□ηand꿹□ηtheir꿹□ηhabitat,꿹□ηrather꿹□ηthan authorize꿹□ηthe꿹□ηperiodic꿹□ηactivities꿹□ηwhile꿹□η*maintaining꿹□ηsufficient꿹□η* 꿹□η

The꿹□ηdraft꿹□ηBDCP꿹□ηdescribes꿹□ηgoals꿹□ηand꿹□ηobjectives꿹□ηin꿹□ηtwo꿹□ηways: 꿹□η꿹□η At꿹□ηthe꿹□η"landscape꿹□ηlevel,"꿹□ηgoals꿹□ηrelate꿹□ηto꿹□ηcoordinated꿹□ηecological꿹□η processes꿹□ηand꿹□ηconditions꿹□ηthat꿹□ηsustain꿹□ηcommunities꿹□ηand꿹□ηnatural native꿹□ηspecies.꿹□ηBDCP꿹□η5.3.3꿹□η꿹□ηAt꿹□ηthe꿹□η"species꿹□ηlevel,"꿹□ηgoals꿹□η refer꿹□η*progress꿹□ηtowards꿹□η*the꿹□ηlandscape꿹□ηlevel꿹□ηgoal꿹□ηof꿹□ηreestablished꿹□ηand natural꿹□ηcommunities꿹□ηand꿹□ηactive꿹□ηspecies.꿹□η꿹□η꿹□η

Thus,꿹□ηthe꿹□ηprimary꿹□ηbiological꿹□ηmeasures꿹□ηfor꿹□ηSmelt꿹□ηand꿹□ηLongfin꿹□ηSmelt꿹□ηar "increased꿹□ηend꿹□ηof꿹□ηyear꿹□ηfecundity꿹□ηand꿹□ηimproved꿹□ηsurvival꿹□ηof smelt꿹□ηto꿹□ηsupport꿹□ηincreased꿹□ηabundance꿹□ηand꿹□ηviability꿹□ηBDCP꿹□η5.3.3 13꿹□η&꿹□η5.3.3.1꿹□ηSimilarly,꿹□ηthe꿹□ηprincipal꿹□ηgoal꿹□ηfor꿹□ηSacramento꿹□ηWinter Chinook꿹□ηSalmon꿹□ηis꿹□η"improved꿹□ηsurvival꿹□η(to꿹□ηcontribute꿹□ηto꿹□ηinc immigrating꿹□ηand꿹□ηemigrating꿹□η꿹□η.꿹□η.꿹□η,꿹□ηBDCP꿹□η5.3.3꿹□ηthroughout꿹□ηthe꿹

for species of salmon have greatly increased. "[A]bunda
(BDCP 173 to 183).

The draft BDCP explains that the process of developing
goals did not assume that the BDCP was solely responsible for recov
these species, and so the designated biological goals and
necessarily match the recovery goals, but instead represented
to contribute to achieve the BDCP's emphasis added).
decision has become a focal point of debate over the
mandates of the NCCPA.

In July 2013, the Director of DFW, the environmental organizations
challenged the BDCP's proposed biological goals that do not
full recovery of the species, arguing that this "contribution
violates California law:

> Under the plain text of the NCCPA, conservation mea
> is required to measures that are sufficient to achieve r
> the plan area.

*The Natural Community Conservation Planning Act is the Fou
Bay Delta Conservation Plan.* Director of the Califo
Department of and Wildlife, from the Defenders of Wildlife,
Defense Council, and the Bay Institute, July 10, 2013, a
2805(c)).

As described in detail in the chapters that follow, the
operations and other conservation measures set forth in th
meet the conservation standard proposed — the recovery 10th
of the species—though they are likely to contribute to spe
letter thus raises a legal question that will have to be res
Director of DFW consultation with the Department's and the
Attorney General before the Department decides whether to approve

The question is not in doubt, as the Legislature
purposes of the NCCPA is some other. For
example, section 2801(i) declares that "community
conservation planning is a tool to protect species and habitat
that are necessary to maintain the continued viability of
communities impacted by human changes to the landscape.
Game Code 2801(i) (emphasis added). Section 2801(g) states
"[n]atural community conservation planning is a mechanism tha
early planning framework for proposed projects to
minimize, and compensate for impacts (emphasis
added).

A careful and integrated reading of the text of the statute, however, should lead to a conclusion that the approve the BDCP concludes that the project would adverse effects of the projects authorized by the Plan those effects would promote the recovery of those we do not believe that the Legislature intended Depa approving the BDCP unless it concluded that the project existing sources of the species' decline and from other protect listed species achieve full recovery of the species. conclusion for reasons.

First, the interpretation proposed in the July 10th letter rely entirely on the section of the Act that the Legislature actually intended to CDFW to determine that an NCCP would be likely to be adopted or listed species, have included this requirement Section 2820, which governs the Department's approv NCCPs.

Section 2820(a) contains ten separate findings that are DFW's approval and section 2820(b) contains nine terms that must be implementation agreements that accompany NCCPs these mandatory findings and terms includes the requirement provided in not believe that the Legislature intended the requirement to these terms the NCCP and implementation plan specifies pro recovery—by implication from the definitions section of the Act.

Second, there are two provisions in section 2820 that conservation measures to the effects of the proposed authoriz 2820(a) states that the CDFW may approve an NCCP that the

> contains *specific conservation measures that meet the biological covered species and that the best available* scientific information regarding the status of *the covered species and permitted activities on* (emphasis added).

Section 2820(b) stipulates that implementation agreements must

> to ensure *implementation of mitigation conservation measures on a plan basis is roughly proportional in time and nature to the impact or covered species* provisions identify the *conservation measures that will be carried out in proportion to the adverse impacts on covered species* 2820(b)(9) emphasis added).]

This pairing of conservation measures with "recovery" impacts of permitted activities," together with the "proportionality" limitation

conservation measures suggests that the Legislature intended to authorize as a means of contributing to other state and federal efforts not significantly in excess of the burdens that the project will impose on the[7] species.

Third, there is nothing in the text of the NCCPA or legislative history that the Legislature intended the state program to be an unfunded financial responsibility for species recovery. Indeed, the statute requires Conservation measures required to achieve full recovery may scope of individual NCCPs. Indeed, a requirement of full recovery particularly problematic for plans such as the BDCP that (some of which, partly inhabit the program area), multiple and diverse land and water management and regulatory agencies independent obligations to contribute to species conservation and not believe that the Legislature have assigned such a Herculean the Department, or imposed such a potentially large financial taxpayers, without saying so explicitly in the text of the

Finally, an interpretation of the statute that would make determination that all NCCPs provide for full recovery of listed would likely have the unintended and pernicious consequence Department from approving The BDCP was an NCCP that of the necessary species recovery effort extends beyond the project and hence beyond the capabilities of the project conservation measures that would be included in the individual be taken to approve an NCCP in situations where the listed species covered by the plan state would have to be a significantly exceed the project mitigation costs that may be proponents.[8]

Again, these factors are especially pronounced such as the Delta ecosystem where there are multiple species and whose

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[7] The July 10th letter acknowledges that the NCCPA contains this "rough proportionality" requirement. Nothing in the text of the NCCPA requires that "the concept of 'rough proportionality' be applied to every NCCP." Rather, it is a plan's conservation measures." Letter to Director Bonham at 7. The text of the NCCPA uses "rough proportionality" in four of the five statutory references expressly apply this "rough proportionality" requirements. *See* California Fish & Game Code §§ 2805(g)(3)(C), 2820(b)(1)(B), § 282

[8] The July 10th letter recognizes that the entities that receive incidental take be required to bear all of the costs of recovery of the various listed plan's conservation strategy, individual developers are only responsible for paying for 'conservation' increment above mitigation is the responsibility of the state." Thus, if the costs of recovery exceed fully mitigating the impacts assigned to the state must make up the difference: "The BDCP cannot limit its conservation impacts from the covered activities and avoid providing conservation measures sufficient species." *Id.* at 8.

within the 꿹 □η project, 꿹 □η multiple 꿹 □η layers 꿹 □η of 꿹 □η which 꿹 □η are 꿹 □η not 꿹 □η plan 꿹 □η participants), 꿹 □η overlapping 꿹 □η timeline 꿹 □η of 꿹 □η habitat 꿹 □η requirements, 꿹 □η and 꿹 □η tremendous 꿹 □η uncertainty 꿹 □η both 꿹 □η about 꿹 □η the 꿹 □η needs 꿹 □η of 꿹 □η the 꿹 □η species success 꿹 □η of 꿹 □η recovery 꿹 □η strategies. 꿹 □η Interpretation 꿹 □η of 꿹 □η the 꿹 □η NCCP 꿹 □η Act 꿹 □η set 꿹 □η forth 꿹 □η July 꿹 □η the 꿹 □η 10th letter 꿹 □η therefore 꿹 □η poses 꿹 □η a 꿹 □η significant 꿹 □η risk 꿹 □η of 꿹 □η deterring 꿹 □η otherwise 꿹 □η applications 꿹 □η of 꿹 □η natural 꿹 □η resources 꿹 □η conservation 꿹 □η planning. 꿹 □η

Conclusion 꿹 □η

We 꿹 □η conclude 꿹 □η that 꿹 □η the 꿹 □η establishment 꿹 □η of 꿹 □η biological conservation 꿹 □η measures 꿹 □η that 꿹 □η are 꿹 □η based 꿹 □η on 꿹 □η the 꿹 □η potential 꿹 □η to 꿹 □η contribute 꿹 □η to 꿹 □η recovery" 꿹 □η of 꿹 □η the 꿹 □η covered 꿹 □η species 꿹 □η in 꿹 □η the 꿹 □η natural 꿹 □η communities 꿹 □η the 꿹 □η Conservation 꿹 □η Planning 꿹 □η Area 꿹 □η the 꿹 □η CDFW 꿹 □η may 꿹 □η approve 꿹 □η the 꿹 □η it 꿹 □η determines 꿹 □η that 꿹 □η the 꿹 □η survival 꿹 □η of 꿹 □η the 꿹 □η listed 꿹 □η mitigate 꿹 □η the 꿹 □η effects 꿹 □η of 꿹 □η the 꿹 □η project 꿹 □η on 꿹 □η the 꿹 □η and 꿹 □η their 꿹 □η habitat and 꿹 □η further 꿹 □η more 꿹 □η generally 꿹 □η natural 꿹 □η efforts 꿹 □η to 꿹 □η recover 꿹 □η and 꿹 □η to 꿹 □η restore 꿹 □η the 꿹 □η favorable 꿹 □η conditions 꿹 □η of 꿹 □η their 꿹 □η habitat.

Chapter 3: Water Supply Operations

Introduction

The construction of a new North Delta diversion facility, operation of the North and South Delta facilities constitute prominent conservation measure (CM#1) of the BDCP. conservation measure, the facilities are principally an effort to reliability of exports from the Delta. Their operations, conservation measures, are intended to mitigate for impacts avoid jeopardy and/or to contribute recovery of covered species

A basic premise of BDCP is that the construction of facility will simultaneously improve water supply reliability ecosystem impacts. This proposed flexibility associated with two points of diversion located in different portions benefit of this flexibility is the capacity to take advanta for exports, allowing for reduction during periods when im the ecosystem may be largest. This goals is consistent with in the 2009 Delta Reform Act.

This chapter examines the water supply operations proposed evaluate (1) if important changes in supply reliability associated project and (2) how these changes apportion exports in description is foundational for the assessment of ecological consequences of BDCP in subsequent chapters.

Proposed Facilities and Operations

There are lengthy descriptions of the design and operation water export facilities in the Administrative Drafts of the reader is referred to those documents for more information. The centerpiece of the 9000 cfs capacity diversion in the North Delta that and CVP export facilities in the South Delta through tw

Regulatory Constraints

The operational criteria for the facilities are both complex an constrained (Appendix A). As outlined below, *significant* constraints *the operational flexibility of the facilities* different regulatory constraint but are not limited to:

- SWRCB water rights 64 decisions includes standards for m monthly Delta outflow, salinity objectives at multiple Del of X2 (the position of the 2 ppt salinity near

export/import꿯□ηratio꿯□η꿯□ηenclosures꿯□ηof꿯□ηthe꿯□ηDelta꿯□ηCross꿯□ηCha
placement꿯□ηof꿯□ηa꿯□ηbarrier꿯□ηat꿯□ηthe꿯□ηhead꿯□ηof꿯□ηOld꿯□ηRiver,
San꿯□ηJoaquin꿯□ηRiver꿯□ηbelow꿯□ηVernalis.꿯□ηThese꿯□ηstandards꿯□ηvary꿯
months꿯□ηof꿯□ηthe꿯□ηyear꿯□ηand꿯□ηwater꿯□ηyear꿯□ηtype.꿯□η

- Remanded꿯□η2008꿯□ηBiOp꿯□ηUSFWS꿯□ηOpinion꿯□η(BiOp):꿯□ηprescribes꿯□ηrestrictio
for꿯□ηmagnitude꿯□ηand꿯□ηtiming꿯□ηof꿯□ηreverse꿯□ηflows꿯□ηin꿯□ηOld꿯□
the꿯□ηSouth꿯□ηDelta,꿯□ηto꿯□ηprotect꿯□ηdelta꿯□ηsmelt.꿯□ηThese꿯□ηvary꿯
year,꿯□ηwater꿯□ηtemperature,꿯□ηflows꿯□ηon꿯□ηthe꿯□ηSan꿯□ηJoaquin꿯□ηR
smelt.꿯□ηThis꿯□ηBiOp꿯□ηalso꿯□ηcalls꿯□ηfor꿯□ηhigher꿯□ηspring꿯□ηand꿯□
1641꿯□ηstandards.꿯□η꿯□ηThese꿯□ηoutflow꿯□ηstandards꿯□ηvary꿯□ηon꿯□ηw
- Remanded꿯□η2009꿯□ηNMFS꿯□ηBiOp:꿯□ηhas꿯□ηdifferent꿯□ηrestrictions꿯□ηor
the꿯□ηUSFWS꿯□ηBiOp꿯□ηin꿯□ηRe꿯□ηreverse꿯□ηOMR꿯□ηflows꿯□ηare꿯□ηschedu
outmigrating꿯□ηsalmonids.꿯□η꿯□ηThese꿯□ηvary꿯□ηdepending꿯□ηon꿯□ηtempe
This꿯□ηBiOp꿯□ηincreased꿯□ηSan꿯□ηJoaquin꿯□ηRiver꿯□ηflows꿯□ηand꿯□ηset
River꿯□ηflow꿯□ηratios꿯□ηthat꿯□ηare꿯□ηmore꿯□ηrestrictive꿯□ηthan꿯□ηD

There꿯□ηare꿯□ηother꿯□ηregulatory꿯□ηconstraints꿯□ηbeyond꿯□ηthe꿯□ηtwo꿯□ηremanded꿯
BiOps;꿯□ηhowever,꿯□ηcompliance꿯□ηwith꿯□ηthese꿯□ηregulations꿯□ηappears꿯□ηto꿯
supply꿯□ηexport꿯□ηmodeling.꿯□η꿯□ηAdditional꿯□ηconstraints꿯□ηare꿯□ηbased꿯□η
rules꿯□ηfor꿯□ηboth꿯□ηthe꿯□ηDelta꿯□ηand꿯□ηfacilities.꿯□η꿯□ηThe꿯□ηmost꿯□ηsignifica

- Maintenance꿯□ηof꿯□ηminimum꿯□ηflows꿯□ηdownstream꿯□ηof꿯□ηthe꿯□ηNorth
(called꿯□η“Bypass꿯□ηFlows”)
- Restrictions꿯□ηaimed꿯□ηto꿯□ηreduce꿯□ηreverse꿯□ηflows꿯□ηat꿯□ηthe꿯□ηco
Sacramento꿯□ηRiver꿯□ηand꿯□ηgreater꿯□ηSlo
- A꿯□ηtiered,꿯□ηlevel꿯□ηpumping꿯□ηregime꿯□ηfor꿯□ηDecember꿯□ηthrough꿯□ηJu
to꿯□ηprotect꿯□ηthe꿯□ηinitial꿯□ηwinter꿯□ηflood꿯□ηpulse꿯□ηand꿯□ηspring꿯
salmon꿯□ηoutmigration꿯□η
- Flows꿯□ηwith꿯□ηsufficient꿯□ηvelocity꿯□ηto꿯□ηreduce꿯□ηimpingement꿯□ηof꿯
diversion꿯□ηscreens꿯□η
- Increased꿯□ηrestrictions꿯□ηfor꿯□ηreverse꿯□ηOld꿯□ηand꿯□ηMiddle꿯□ηRiver꿯
associated꿯□ηwith꿯□ηSouth꿯□ηDelta꿯□ηexports.꿯□η

Infrastructure꿯□ηand꿯□ηInflow꿯□ηConstraints

Infrastructure꿯□ηdesign꿯□ηand꿯□ηcapacity꿯□ηforms꿯□ηanother꿯□ηarray꿯□ηof꿯□η
purposes꿯□ηof꿯□ηBaseline꿯□ηDCP꿯□ηmodeling,꿯□ηsouth꿯□ηof꿯□ηDelta꿯□ηstorage꿯□ηwas꿯
within꿯□ηSan꿯□ηLuis꿯□ηReservoir.꿯□η꿯□η꿯□ηOperations꿯□ηduring꿯□ηwet꿯□ηan
often꿯□ηconstrained꿯□ηby꿯□ηavailable꿯□ηspace꿯□ηto꿯□ηstore꿯□ηwater꿯□ηin꿯□η
potential꿯□ηstorage,꿯□ηparticularly꿯□ηgroundwater꿯□ηstorage,꿯□ηwould꿯□ηhave꿯□ηcreated꿯
considerably꿯□ηmore꿯□ηflexibility꿯□ηin꿯□ηexports,꿯□ηparticularly꿯□ηduring꿯□ηwet

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[1] 꿯□η꿯□η꿯□η

The size of the North Delta facility is also a const
sustained high flow on the same [illegible] River [illegible] proy
has shifted from an initial facility size of 15,000 cfs
The export, economic and environmental performance of the
compared to 14 alternatives in [illegible] chapter [illegible] EIS/EIR [illegible] These of
alternatives vary facility size, location and operations in the
is presented in the EIS/EIR that describes the rationale
alternatives and selecting the preferred project

Exports are also constrained by the timing and volume
strong seasonal and interannual variation. One of the
by BDCP is its location at the bottom of the syste
Upstream water management consumptive use dominate inflows to
over most years (Figure 3.1). These abstractions, wh
water that would naturally flow to the Delta, are beyo
the greatest operational [illegible] Under BDCP, exports
roughly equivalent to upstream consumptive use.

In addition, there are important restrictions on reservoir
exports. The USACE has congressionally authorized rule
Winter and Spring operations to maintain flood reserves.
are BiOps that dictate flow and temperature requirements
needs of covered salmon, steelhead and sturgeon below the
standards, particularly in drier years and under a warming
amount and timing of inflows to the Delta. Oroville
restrictions on flows, becomes the most important for supp
result, particularly during drought conditions (see below).

Consequences of Constraints

The above discussion is intended to highlight a conundrum
much outside of the BDCP community of experts and i
export operations and [illegible] support *highly* complex
These regulatory, operational and infrastructure constraints limit
BDCP to adaptively manage operations [illegible] co
objectives. For this reason, management actions associated with the
diversion facility is not fully realized.

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[2] It is beyond the scope of this review to examine facility size in detai
EIR/EIS conclude that the 9000 cfs facility provides the optimal balance of
capacity of the 15,000 cfs facility is rarely used in the operations that
increase (<250 taf) exports [illegible] The EIS/EIR did examine smaller facilities with
3000 cfs. However, the operating criteria used to evaluate these two al
the preferred alternative, making the comparison moot.

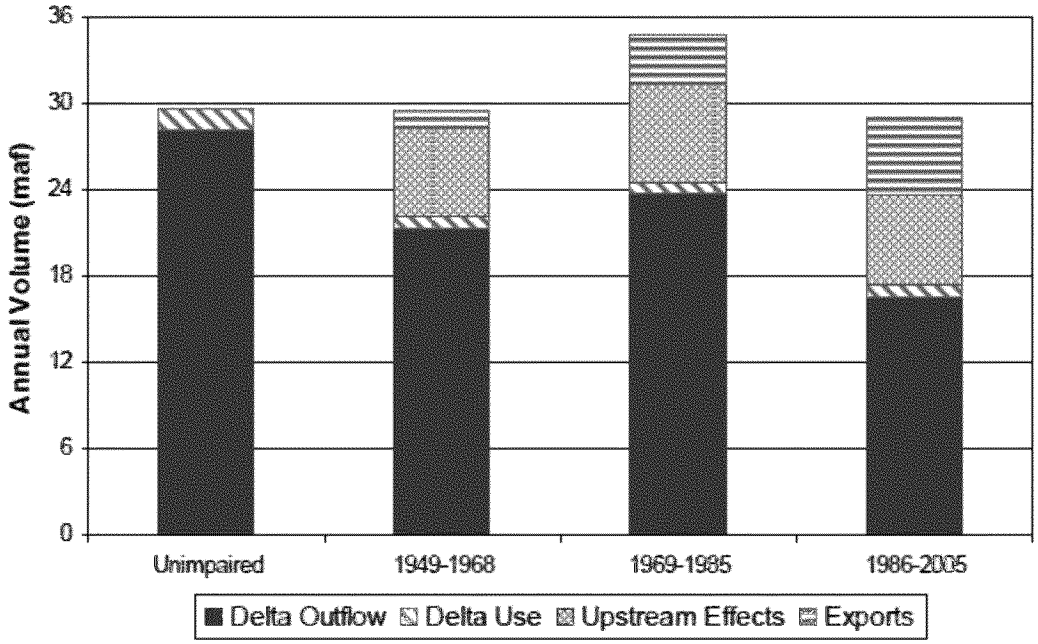

Figure 3.1 Proportion of Exports to Delta Water Use Roughly 18% of the unimpaired flow of the Delta in the 1986-2005 period, upstream consumptive use approximately 24%. From Fleenor et al.

This also highlights how flow management in BDCP was models. As described in Appendix 5C of the Plan, the requirements 16 of D1641, the remanded BiOps, reservoir and diversion constraints, and south of Delta storage. The objective maximize Delta exports within constraints. Although this seems highlights how CM1 is not a conservation measure, per bottom-up assessment of ecosystem flow needs, as is typical environmental flows, the modeling sought to regulatory requirements and flow constraints sought by fish agencies. This illustrates made by Lund et al. (2010) and Moyle et al. (2010) of the Delta is likely to be evaluated in the context of water quality standards.

Export Reliability

A goal of the BDCP project and the current Delta water derived from the Delta. For simplicity, model simulations provided by BDCP, we assume have evaluated how well BDCP improving export reliability. The most commonly discussed

[3] actuality, the most reliable system would provide a given amount of water deviation from that amount. Instead, BDCP attempts to produce the most given regulatory and operational constraints, provide supply systems, whereby the greatest volume is made available, even under the event of catastrophic saline terms resilient and reliable are used interchangeably. BDCP and other docum

average꿯□ηannual꿯□ηexports꿯□ηsummarized꿯□ηin꿯□ηFigure꿯□η3.2,꿯□ηand꿯□ηcompares꿯
alternative,꿯□ηNAA꿯□ηwith꿯□ηthe꿯□ηhigher꿯□ηHOS꿯□ηand꿯□ηlower꿯□ηLOS꿯□ηscenario,
(defined꿯□ηin꿯□ηChapter꿯□η1).꿯□ηThis꿯□ηmodeling꿯□ηsuggests꿯□ηthat꿯□ηthe꿯□
roughly꿯□ηequal꿯□ηaverage꿯□ηexports,꿯□ηwith꿯□ηthe꿯□ηLOS꿯□ηproviding꿯□ηapp
However,꿯□ηthese꿯□ηfigures꿯□ηare꿯□ηany꿯□ηyear꿯□ηaverages꿯□ηand꿯□ηoffer꿯
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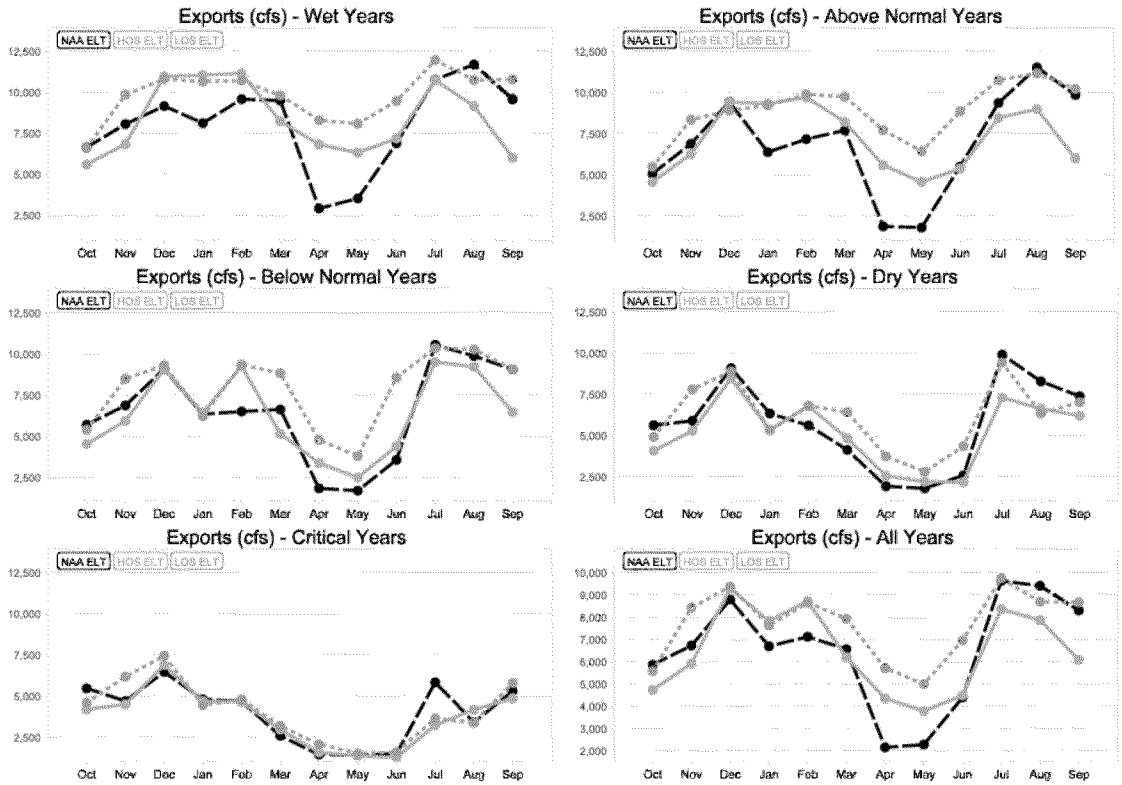

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Figure꿯□η3.2:꿯□ηMonthly꿯□ηaveraged꿯□ηexports꿯□ηfor꿯□ηNAA,꿯□ηLOS꿯□ηand꿯□ηHOS Based꿯□ηon꿯□ηBDCP꿯□ηCALSIM꿯□ηdata.꿯□η

꿯□η

Exceedance꿯□ηcurves꿯□η(Figure꿯□η3.3)꿯□ηgive꿯□ηa꿯□ηbetter꿯□ηindication꿯□ηof꿯
provides꿯□ηthe꿯□ηprobability꿯□ηthat꿯□ηa꿯□ηgiven꿯□ηexport꿯□ηvolume꿯□ηwill꿯□
any꿯□ηgiven꿯□ηyear.꿯□η꿯□ηFor꿯□ηexample,꿯□ηfor꿯□ηthe꿯□η50%꿯□ηexceedance
of꿯□ηevery꿯□ηtwo꿯□ηyears),꿯□ηthe꿯□ηNAA꿯□ηperforms꿯□ηslightly꿯□ηbetter꿯□η
than꿯□ηthe꿯□ηLOS.꿯□η꿯□ηOverall,꿯□ηthe꿯□ηLOS꿯□ηperforms꿯□ηsignificantly꿯□η
ten꿯□ηyears꿯□ηand꿯□ηbetter꿯□ηthan꿯□ηthe꿯□ηHOS꿯□ηin꿯□ηeight꿯□ηout꿯□ηof
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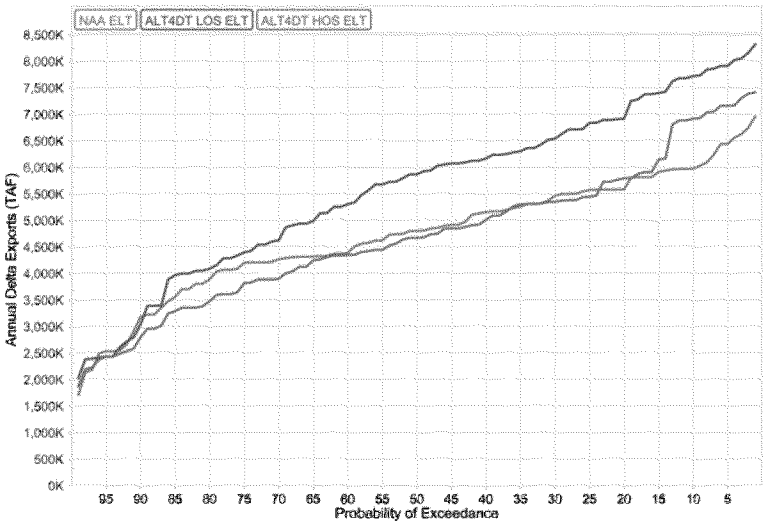

Figure 3.2. Exceedance probabilities for LOS, NAA, and HOS exports under ELT conditions. Note that LOS produces higher exports for all that it is the most reliable/resilient of the scenarios.

Water supply reliability curves for SWP and CVP customers Chapter 3 of the Draft EIS/EIR. These curves indicate and farm users would realize considerable increases in over under the LOS, compared to the NAA and HOS, particu wet years. A-of-Delta Point users of CVP water would likely see reliability over the long term, principally due to climate

Export Timing

A goal of BDCP and the Delta Plan is to shift pressure on drier years to be the average exports of NAA for all types is presented in Figure 3.2. Based provided, there appears to be a significant increase in and wet years as compared to HOS. The intermediate This increase is accomplished through increased use of the during winter and spring periods when OMR restrictions South Delta operations.

Below average, dry and critical performance of BDCP is mixe For LOS, overall exports during the drier years are hig exports are roughly the same as NAA. Exports, on HOS tend to be higher during the early spring, and the summer. This minimal change in exports during to wet years, from the constraints on North Delta facil illustrated below, during dry periods facilities in North Delta very li creating pressure on South Delta facilities.

In 뀀 □ ηsum, 뀀 □ ηalthough 뀀 □ ηthere 뀀 □ ηare 뀀 □ ηmany 뀀 □ ηregulatory 뀀 □ ηand 뀀 □ ηinfrastruct
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exports 뀀 □ ηdepending 뀀 □ ηon 뀀 □ ηwhich 뀀 □ ηexport 뀀 □ ηscenario 뀀 □ ηis 뀀 □ ηevaluated, 뀀 □ ηe
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year-to-year 뀀 □ ηvariability 뀀 □ ηin 뀀 □ ηexports 뀀 □ η(although 뀀 □ ηsee 뀀 □ ηconcerns 뀀 □ ηover 뀀
described 뀀 □ ηin 뀀 □ ηChapter 뀀 □ η1). 뀀 □ ηThis 뀀 □ ηissue 뀀 □ ηis 뀀 □ ηparticularly 뀀 □ ηacute 뀀 □
when 뀀 □ ηcarryover 뀀 □ ηstorage 뀀 □ ηis 뀀 □ ηgreatly 뀀 □ ηreduced 뀀 □ ηand 뀀 □ ηdemand 뀀 □ η
significantly. 뀀 □ η 뀀 □ ηTo 뀀 □ ηbetter 뀀 □ ηillustrate 뀀 □ ηhow 뀀 □ ηthis 뀀 □ ηsystem 뀀 □ ηmight 뀀 □
series 뀀 □ ηof 뀀 □ ηmodel 뀀 □ ηoutputs 뀀 □ ηduring 뀀 □ ηdrought 뀀 □ ηperiods. 뀀 □ η

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[4] 뀀 □ η
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decision 뀀 □ ηto 뀀 □ ηonly 뀀 □ ηcompare 뀀 □ ηproposed 뀀 □ ηoperations 뀀 □ ηwith 뀀 □ ηthose 뀀 □ ηmade 뀀 □ ηunder 뀀 □ ηBiOps 뀀 □ ηwas 뀀 □ ηthe 뀀 □ ηmaking 뀀 □ ηdifferences 뀀 □ ηbetw
historic 뀀 □ ηexport 뀀 □ ηoperations 뀀 □ ηand 뀀 □ ηthose 뀀 □ ηproposed 뀀 □ ηunder 뀀 □ ηBDCP.

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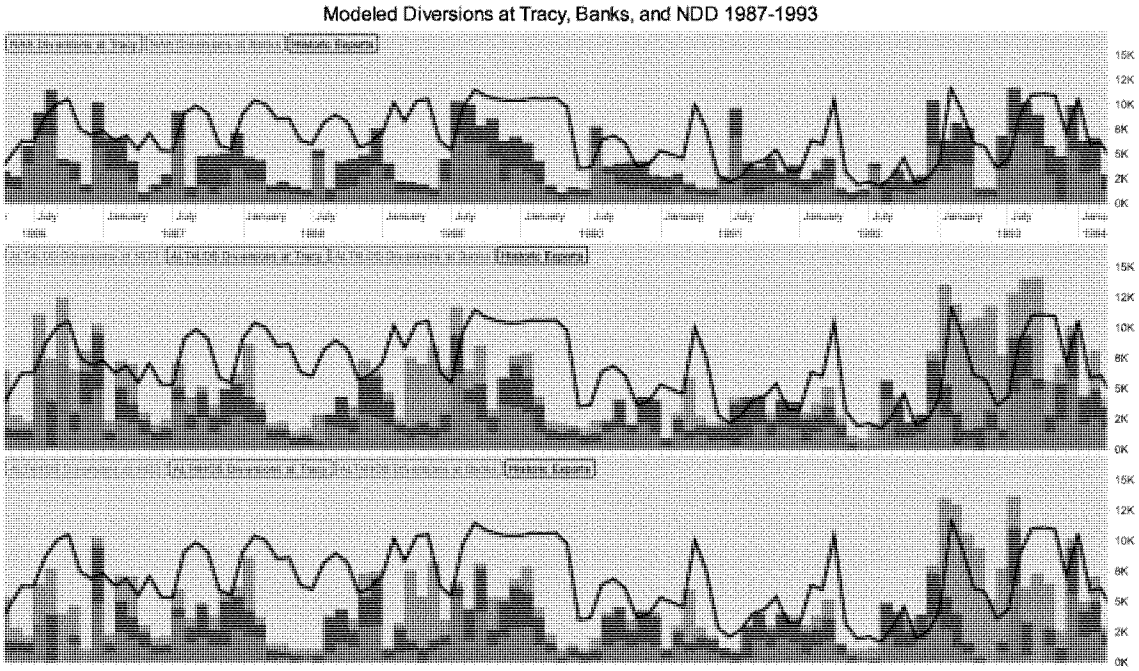

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Figure꿹□η3.4:꿹□ηExports꿹□ηfor꿹□ηNAA,꿹□ηLOS꿹□ηand꿹□ηHOS꿹□ηunder꿹□ηELT꿹□ηco
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historic꿹□ηconditions꿹□ηreflect꿹□ηhuman꿹□ηbehavior;꿹□ηsignificant꿹□ηchanges꿹□ηconditions꿹□ηare
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꿹□η

Role꿹□ηof꿹□ηReservoirs꿹□ηin꿹□ηDrought꿹□ηManagement

Reservoir꿹□ηstorage꿹□ηand꿹□ηoperations꿹□ηplay꿹□ηa꿹□ηcritical꿹□ηrole꿹□ηin꿹□η
California꿹□ηand꿹□ηgreatly꿹□ηinfluence꿹□ηthe꿹□ηtiming꿹□ηand꿹□ηmagnitude꿹□ηo
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single뀕□ηsimulation뀕□ηrecord뀕□ηdoes뀕□ηnot뀕□ηgive뀕□ηguidance뀕□ηon뀕□ηhow뀕□
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(reservoir뀕□ηand뀕□ηtemperature)뀕□ηconditions뀕□ηat뀕□ηthe뀕□ηstart,뀕□ηdifferent뀕□ηprecipit
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above뀕□ηobservations뀕□ηmore뀕□ηthoroughly뀕□ηand뀕□ηmore뀕□ηof뀕□ηcases,뀕□ηshould뀕
be뀕□ηsimulated뀕□ηand뀕□ηanalyzed뀕□ηmost뀕□ηclimate뀕□ηmodels뀕□ηprescribe뀕□
in뀕□ηfrequency뀕□ηand뀕□ηduration뀕□ηof뀕□ηdrought,뀕□ηthis뀕□ηanecdotal뀕□ηassess
that뀕□ηis뀕□ηlikely뀕□ηto뀕□ηoccur뀕□ηduring뀕□ηthe뀕□ηlife뀕□ηof뀕□ηthe뀕□ηprojec
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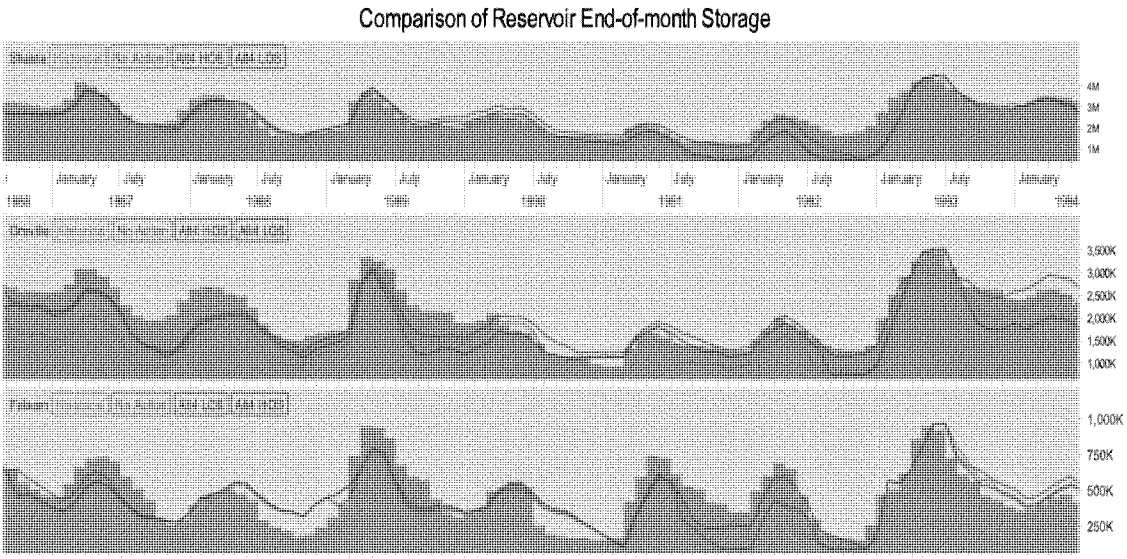

Figure 3.5: End of month storage for HOS, LOS and NAA simulated for the 1987 drought. (yellow shaded bars) plotted for comparison. During the latter stages of the occur on all three reservoirs. Note that ELT conditions take changes in climate and sea level rise by 2025 and can historical conditions.

Conclusions

The project described in the Draft BDCP and EIR/EIS seeks to improve water supply reliability for water exported from improving conditions for covered species. An underlying p that adding a second point of diversion, at the North Del conjunction with existing South Delta facilities will allow fo operations that better support environmental goals and objectiv approach appears reasonable and should provide significant flex however, regulatory and infrastructure constraints, coupled with consumptive uses of water, severely limits flexibility in ope constrained operations limit the effectiveness of BDCP in ir reliability.

One of the objectives of BDCP that is in line with increase exports during wet periods and decrease them du impacts on the ecosystem are greatest. In comparison the new facility appears to achieve the former to a mo significantly reduce pressure on the Delta during drier peri

The proposed system is particularly vulnerable to extended years). The NAA shows a much more favorable conditions in upstream re 3-4 years of drought. This decreases water supply rel

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Chapter 4: Environmental Flow Performance: Upstream and Inflo

Introduction

The focus of the BDCP is principally on the legal I Marsh, where export operations have the most direct impa discussed in Chapter 3, upstream management, including reserv consumptive uses of water, and flood management, play a c timing and volume. In this chapter, we examine how (water operations) and #2 (Yolo Bypass fisheries) meet co impact listed aquatic species

The focus of this chapter is on the environmental perf changes in the Sacramento watershed, including the Sacramento American Rivers, and inflows to the Delta through the r Sacramento River. Although inflow from the San Joaquin River is determinant of conditions in the South Delta, BDCP does changes in flows. For this reason, our analysis is focus watershed.

Performance, as reflected in how well actions proposed by BDC the goals and objectives of the plan. Although there ar Plan for the Sacramento system and covered species, there performance concerns: changes reservoir release timing and magnitude impact on anadromous fishes; modifications to Fremont Weir floodplain habitat for outmigrating and rearing juvenile Chinook North Delta diversion operations.

Impaired Flow in an Impaired System

One of the objectives of BDCP is to contribute to improve to produce a flow regime with attributes that better su covered aquatic and riparian species. This objective is prod national and international literature that has demonstrated how natural flow regimes in highly regulated systems improves species (see recent summary by Arthington, 2012). This iss forefront of controversial efforts by the SWRCB to develop addresses flows (Fleenor et al., 2010).

A flow regime that mimics natural seasonal variation is scientific community in the Delta better reflects fundamental (Hanak et al., 2013). Restoring appropriate ecosystem and

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involves establishing flow timing, magnitude, duration, frequency change that drive key ecosystem attributes natural, species turn, (Figure 4.1).

Although restoring elements of the natural flow regime is should be made clear that in the Delta and its trib natural (Bay Institute, 1998; Wheelock et al., 2012) physical chan are profound shifts in biological conditions, including a Del by native plants and animals (Lund et al., 2008; Baxter reason, restoring a more naturally variable flow regime watershed, while necessary for improving conditions for covere to lead, by itself, to their recovery (Mount et al., 2

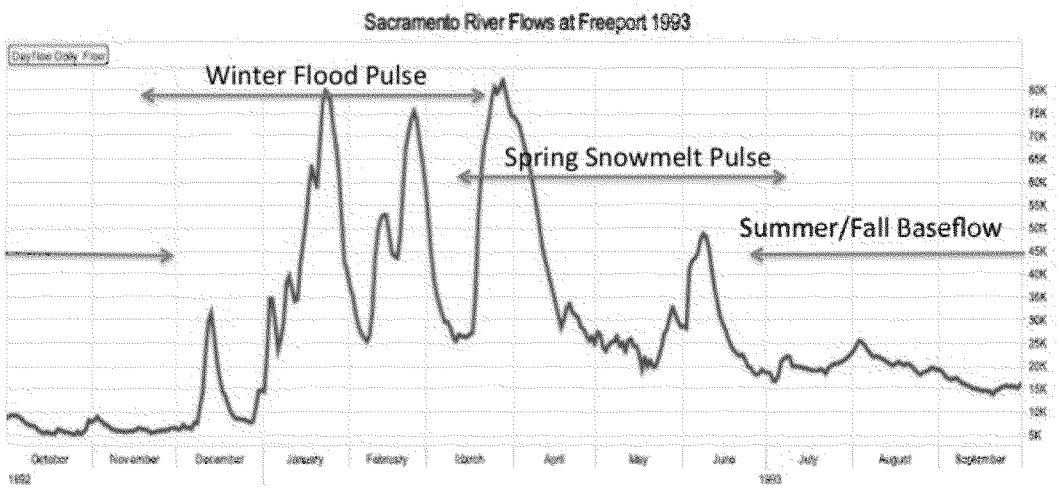

Figure 4.1: Unimpaired Sacramento River flow at Freeport based on DAYFLOW data (DWR). This illustrates the range of natural flow. Reproduction or migration of aquatic and riparian sp magnitude, frequency, duration and flow variability winter and spring flood pulses, are necessary for geomorphic various life history stages. Flow regulation and land reclam altered flow regime (see text) for discussion).

In this chapter we sought to evaluate BDCP's potential impact upstream and into the Delta. Note: Inasmuch as the natural flow in the Central Valley given the significant Instead, we *assumed* DWR 2007) as a proxy for a mo distributed flow regime. Unimpaired flow is the volume of wate a given point if no upstream impoundments or diversions

[1] We focus here principally on the rivers that feed into the Delta rather changes in outflow that occurs in response to changes in operations is

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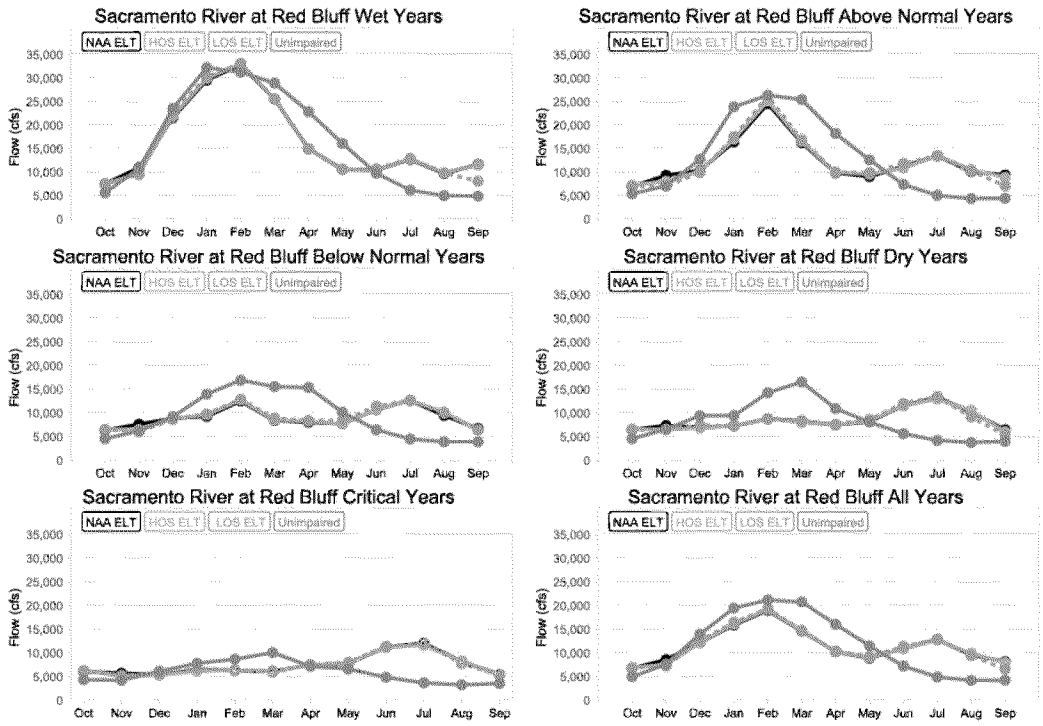

Figure 4.2A: Sacramento River at Red Bluff.

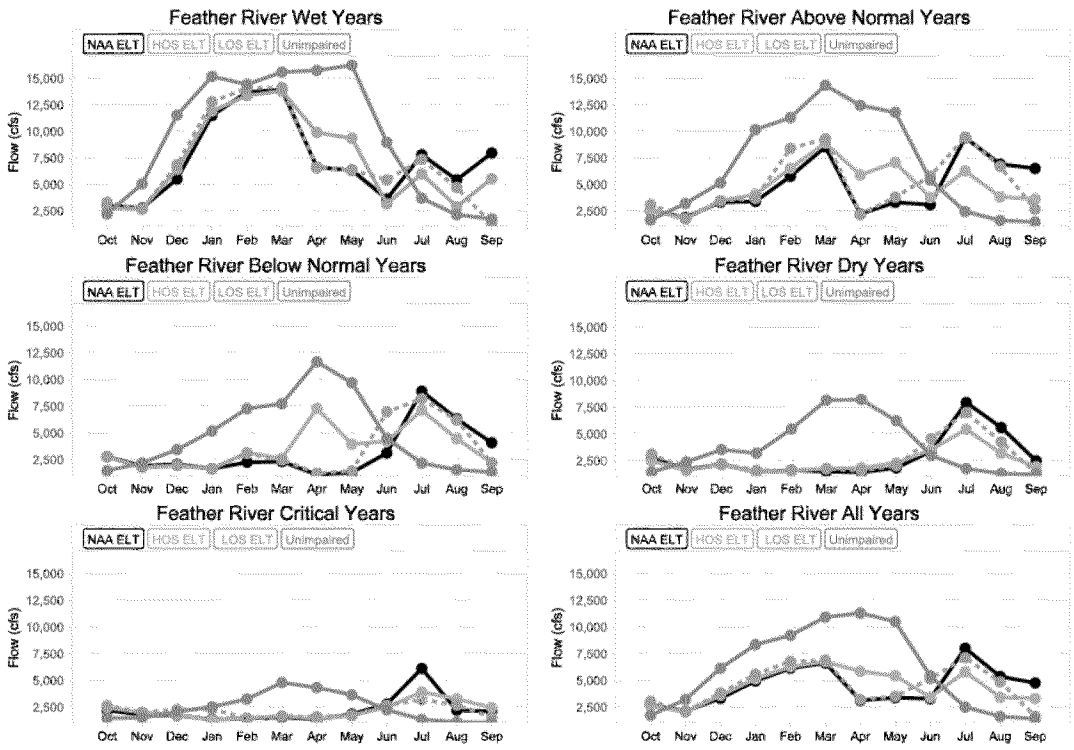

Figure 4.2B: Feather River.

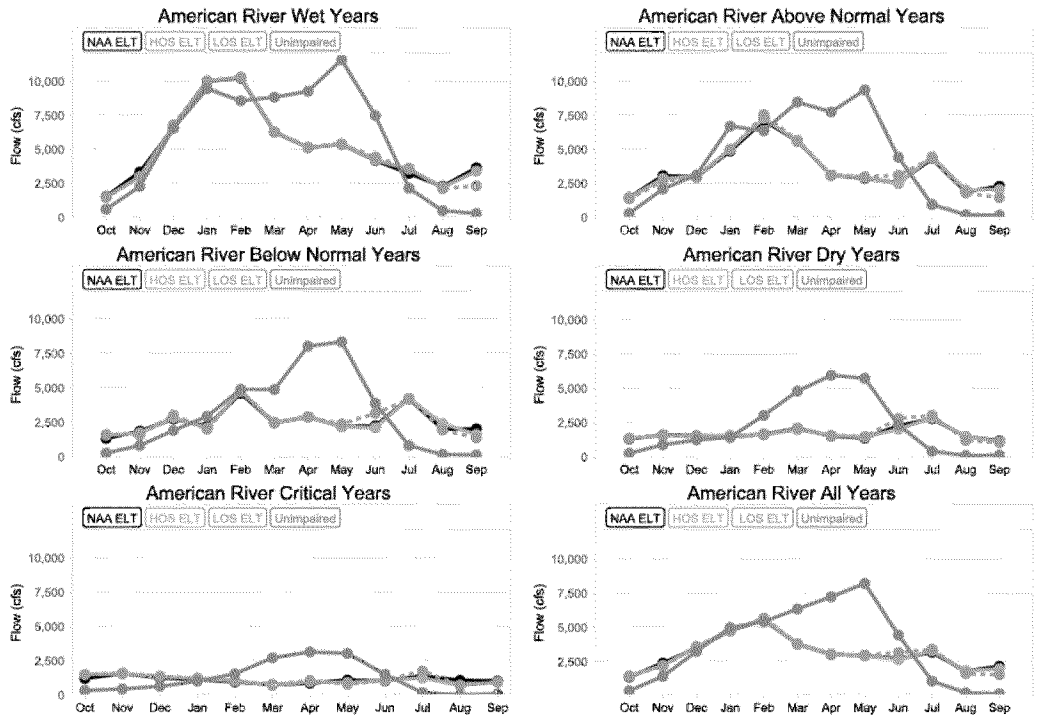

Figure 4.2C: American River.

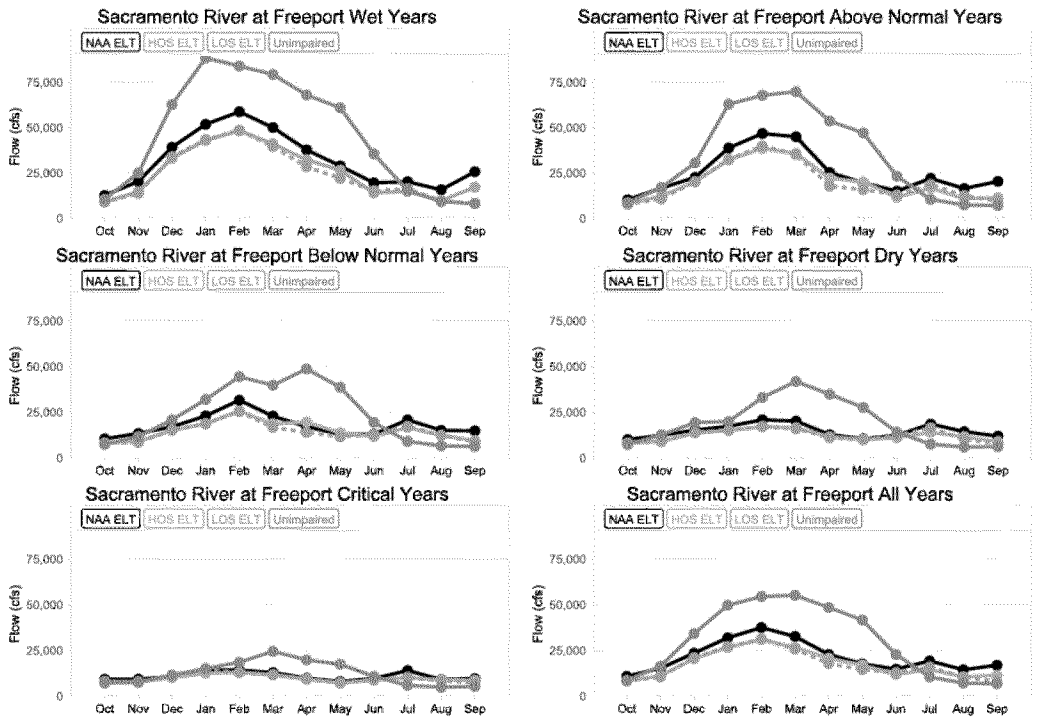

Figure 4.2D: Flow averages sorted by water year types for HOS, LOS, NAA and unimpaired flow. Unimpaired conditions and HOS, LOS and NAA are ELT conditions. from BDCP CALSIM simulations.

As noted in Chapter 3, the constraints on reservoir operations and temperature and downstream flow requirements, based mostly on
For this reason, the differences between scenarios are not
comparison of the simulated flow data allows for several
conclusions about the impact of BDCP on key attributes
regimes:

Winter Flood Pulse With the exception of the American River,
is significantly reduced over conditions in the Sacramento Vall
magnitude of this reduction reflects the size and operations
impoundments relative to the total runoff of the watershed
impairment of winter flood pulses in the Feather pulse
virtually eliminated in most years. There are no
LOS, HOS and NAA operations for winter flood pulses.
marginally higher under NAA at Freeport, flows reflects
down the Yolo Bypass.

Spring Snowmelt Pulse The rise and gradual recession of flow
to low baseflow conditions in the late summer, the mo
Sacramento Valley flow regime logical significance of As shown in
Figures 4.2A the spring snowmelt pulse is highly impaired
and flow diversions. With the exception of the Feather
substantive differences between HOS, LOS and NAA snowmelt impacts
pulse in the Sacramento Valley. On the Feather, HOS
improve spring outflow in the Delta, lead to significant
conditions in all but dry and critical year types.

Summer/Fall Baseflow There and magnitude of reservoir releases
the summer/fall flow regime of the basins (figure 4.2) are
meet the complex array of temperature and flow requirem
dams, irrigation demands upstream flows to meet Delta export demanc
and outflows to meet water quality and habitat standards.
flow regimes are highly altered with flows three to fiv
unimpaired flows. With the exception of the American River,
summer/fall baseflow conditions. Under HOS and LOS sim
flows on the Feather are reduced, creating marginal improv

Main Rivers Summary The plan area for BDCP is, by
same applies to its conservation measures. The project Pla
clear that operations of the CVP and SWP reservoirs
licenses, and not BDCP. In addition, they note limited
operation due to water pool management, particularly on Shasta
Reservoirs. In this way, the reservoirs are in effect
(Chapter 3), rather than an asset for management.

Yet operations of these reservoirs cumulative impacts on
habitat downstream. As shown above, these operations co

impairment of flows of the Sacramento River and its n
challenge when trying to meet the biologically objectives of
dams block access to holding, spawning and rearing habita
effects on water temperature Chinook salmon populations (Williams,
2009). These dams also support mitigation hatcheries wh
contributing to harm of native salmon (Moyle et al., 20

It is unclear to us how to disentangle the relationship
BDCP—a project designed to meet CVP and SWP water
associated biological goals and objectives of SWP and CV
reservoirs. It seems logical to include these reservoirs
along with the new facilities, under a single HCP/NCCP.
Feather River flows not withstanding its separation from
in effect, to maintain the status quo for the highly
system.

Yolo Bypass Flows

One of the more prominent conservation measures (CM#2)
modification of the Fremont Weir more to promote frequency of
and early spring inundation of established Yolo Bypass rearing
body of evidence, involving monitoring data, field experimentati
extent, life cycle models indicate that benefits of foraging
juvenile salmon (see BDPC documentation for a full summa
use of high value habitat by juveniles, who, under optima
conditions and low predation pressures realize growth rates high rates,
survivorship through the Delta. Fish that either forage on
use it as a migration corridor fewer effects predators impacted
proposed North Delta diversion facilities. Fish likely the
to enter the interior of the Delta where predation pres
juveniles that use the Bypass leave the Delta later in
likelihood of arriving at the ocean during higher upwelling
availability.

Currently flow onto the Yolo Bypass from the Sacramento
the Verona gauge exceeds 55,000 cfs. Modifications to
allow 1,000 cfs to flow onto the floodplain when flow
Flow through the Weir would climb to 6000 cfs when
cfs. Above 55,000 cfs flow into the Bypass would
addition to allowing flood flows, the weir would be m
attraction water to a fish ladder to improve upstream passa
steelhead and sturgeon (passage issues not evaluated here).

The average annual flow of the Yolo Bypass is approxi
HOS and LOS, this amount would increase depending on
volume on the Bypass occurs when the Sacramento overto

Sacramento꿹□ηWeir꿹□η(Figure꿹□η4.3).꿹□η꿹□ηHowever,꿹□ηthe꿹□ηtiming,꿹□ηfreque
floodplain꿹□ηinundation꿹□ηelements꿹□ηof꿹□ηthe꿹□ηnatural꿹□ηflow꿹□ηregime
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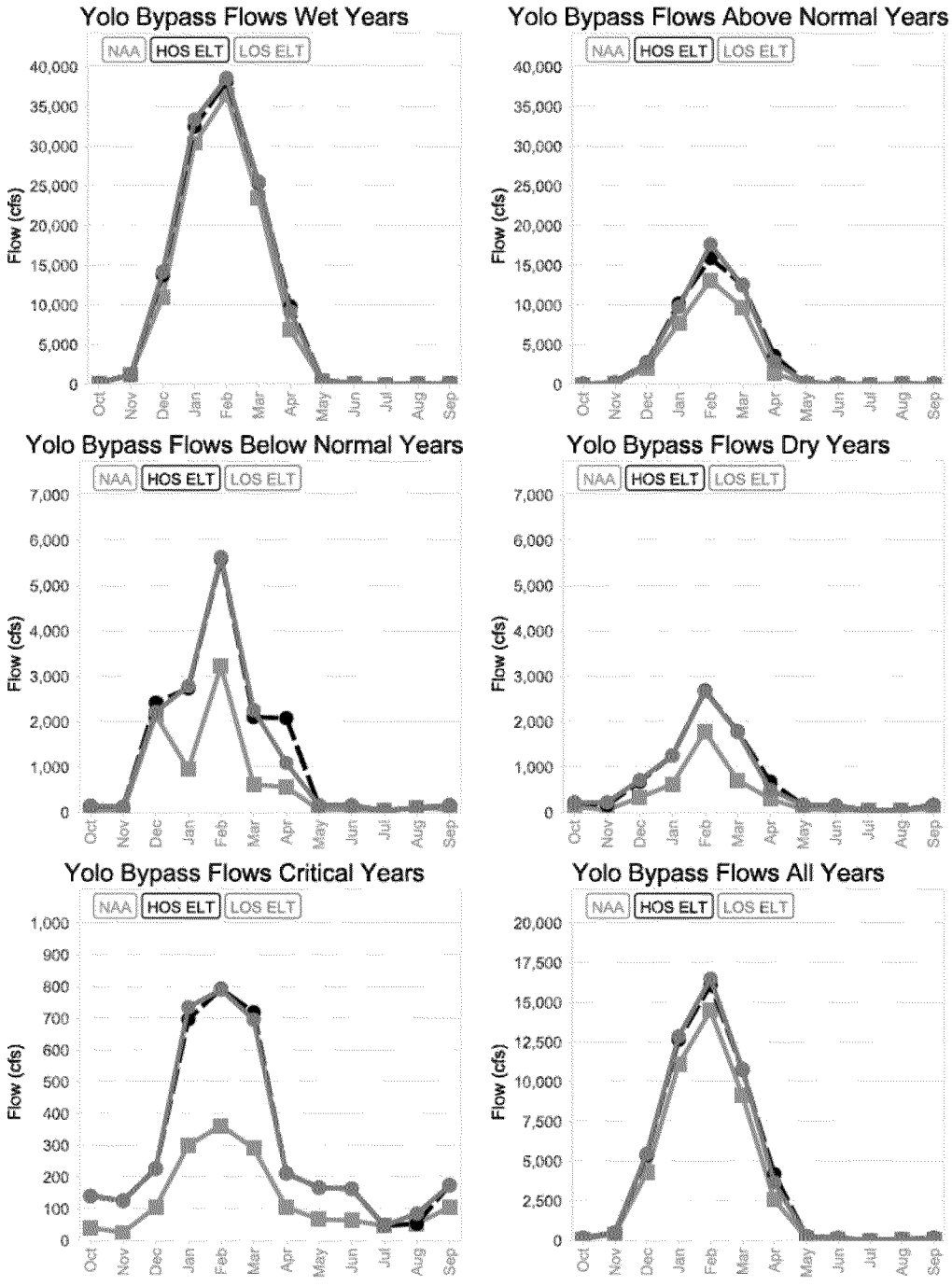

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Figure꿹□η4.3:꿹□ηAverage꿹□ηmonthly꿹□ηflows꿹□ηfor꿹□ηthe꿹□ηYolo꿹□ηBypass꿹□η
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*Flood 뀡□ηFrequency*꿲□ηThe꿲□η꿲□ηfrequency꿲□ηinundation꿲□ηof꿲□ηthe꿲□ηBypass꿲□ηincreases
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flooding꿲□ηon꿲□ηthe꿲□ηYolo꿲□ηBypass.꿲□η꿲□ηUnder꿲□ηBDCP꿲□ηthis꿲□ηincreas
probability꿲□η(BDCP꿲□ηstatistics)꿲□η꿲□ηchange꿲□ηoccurs꿲□ηin꿲□ηdrier꿲□ηyears꿲□η
꿲□η
*Flood 뀡□ηDuration*꿲□ηMultiple꿲□ηstudies꿲□ηhave꿲□ηshown꿲□ηthat꿲□ηflood꿲□ηduration
nutrient꿲□ηcycling꿲□ηand꿲□ηprimary꿲□ηproduction,꿲□ηis꿲□ηessential꿲□ηfor꿲□ηsu
salmonid꿲□ηforaging꿲□η(Sommer꿲□ηet꿲□ηal.,꿲□η2002;꿲□η2001;꿲□η2007)꿲□η꿲□ηModifications꿲
Fremont꿲□ηWeir꿲□ηincrease꿲□ηflood꿲□ηdurations꿲□ηwith꿲□ηhigh꿲□ηhabitat꿲□ηbe
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Second,뀀□ŋaccording뀀□ŋto뀀□ŋBDCP뀀□ŋmodels,뀀□ŋjuveniles뀀□ŋspring뀀□ŋthe뀀□ŋDelta,뀀 presumably뀀□ŋthe뀀□ŋYolo뀀□ŋBypass,뀀□ŋas뀀□ŋyearling뀀□ŋsmolts.뀀□ŋ뀀□ŋIn뀀□ŋth BDCP뀀□ŋconsultants뀀□ŋto뀀□ŋnot뀀□ŋtake뀀□ŋfull뀀□ŋadvantage뀀□ŋof뀀□ŋthe뀀□ŋhig of뀀□ŋthe뀀□ŋBypass,뀀□ŋbut뀀□ŋuse뀀□ŋit뀀□ŋprincipally뀀□ŋas뀀□ŋa뀀□ŋmigration뀀□ estimate뀀□ŋthat뀀□ŋ90%뀀□ŋof뀀□ŋspawning뀀□ŋin뀀□ŋthe뀀□ŋYolo뀀□ŋBypass뀀□ŋare뀀□ŋ than뀀□ŋforaging뀀□ŋfish.뀀□ŋ뀀□ŋThe뀀□ŋBDCP뀀□ŋconsultants뀀□ŋrecently뀀□ŋnote뀀□ŋ the뀀□ŋsplit뀀□ŋbetween뀀□ŋmigrants뀀□ŋand뀀□ŋforaging뀀□ŋcharacteristics뀀□ŋin뀀□ŋ be뀀□ŋindicative뀀□ŋof뀀□ŋproportions뀀□ŋof뀀□ŋwild뀀□ŋfish.뀀□ŋ뀀□ŋOur뀀□ŋconsulta biologists뀀□ŋsuggests뀀□ŋthat뀀□ŋthe뀀□ŋdistinction뀀□ŋbetween뀀□ŋforagers뀀□ŋand뀀□ and뀀□ŋlikely뀀□ŋdoes뀀□ŋnot뀀□ŋreflect뀀□ŋactual뀀□ŋbehavior뀀□ŋof뀀□ŋjuveniles뀀□ there뀀□ŋis뀀□ŋemerging뀀□ŋevidence뀀□ŋthat뀀□ŋa뀀□ŋhigh뀀□ŋpercentage뀀□ŋof뀀□ŋ out뀀□ŋas뀀□ŋfry뀀□ŋand뀀□ŋmigrate뀀□ŋ*during* 뀀□ŋ*late* 뀀□ŋ*winter* 뀀□ŋ*early* 뀀□ŋ*spring* 뀀□ŋ(뀀□ŋ 뀀□ŋ

The뀀□ŋBDCP뀀□ŋconsultants뀀□ŋused뀀□ŋseveral뀀□ŋapproaches뀀□ŋto뀀□ŋmodel뀀□ŋth Bypass뀀□ŋon뀀□ŋsurvivorship.뀀□ŋ뀀□ŋThey뀀□ŋacknowledge뀀□ŋthat뀀□ŋcurrent뀀□ŋm well-suited뀀□ŋto뀀□ŋthis뀀□ŋkind뀀□ŋof뀀□ŋanalysis.뀀□ŋ뀀□ŋThey뀀□ŋdeveloped뀀□ŋa floodplain뀀□ŋmgae뀀□ŋbut뀀□ŋtold뀀□ŋthe뀀□ŋpanel뀀□ŋthat뀀□ŋthey뀀□ŋfelt뀀□ŋit뀀□ŋd benefits뀀□ŋof뀀□ŋthe뀀□ŋBypass,뀀□ŋand뀀□ŋthat뀀□ŋtheir뀀□ŋestimates뀀□ŋof뀀□ŋsurv low.뀀□ŋ뀀□ŋDespite뀀□ŋthese뀀□ŋlimitations뀀□ŋthe뀀□ŋBDCP뀀□ŋmodels뀀□ŋalong뀀□ŋ literature뀀□ŋsuggest뀀□ŋmigrant뀀□ŋjuveniles뀀□ŋas뀀□ŋ*well* 뀀□ŋ*as* 뀀□ŋ*with* 뀀□ŋ*that* 뀀□ŋ access뀀□ŋthe뀀□ŋBypass뀀□ŋare뀀□ŋlikely뀀□ŋto뀀□ŋhave뀀□ŋsignificantly뀀□ŋhigher뀀□ Island뀀□ŋand뀀□ŋpresumably뀀□ŋhigher뀀□ŋ[2]뀀□ŋescapement

뀀□ŋ

Yolo뀀□ŋBypass뀀□ŋSummary

CM#2뀀□ŋhas뀀□ŋhigh뀀□ŋpotential뀀□ŋ*covered* 뀀□ŋ*species* 뀀□ŋ*ranges* 뀀□ŋ*benefit* 뀀□ŋf and뀀□ŋspring뀀□ŋChinook뀀□ŋis뀀□ŋmuted뀀□ŋdue뀀□ŋto뀀□ŋ*flow* 뀀□ŋ*migration* 뀀□ŋ*training* 뀀□ structural뀀□ŋdifficulty뀀□ŋin뀀□ŋdiverting뀀□ŋFeather뀀□ŋRiver뀀□ŋ*made* 뀀□ŋ*Butte* 뀀□ŋCr onto뀀□ŋthe뀀□ŋBypass.뀀□ŋ뀀□ŋYet뀀□ŋ*even* 뀀□ŋ*with* 뀀□ŋ*likely* 뀀□ŋ*concerns* 뀀□ŋ*improv* in뀀□ŋsurvivorship뀀□ŋassociated뀀□ŋwith뀀□ŋan뀀□ŋalternative뀀□ŋmigration뀀□ŋcorrido foraging뀀□ŋhabitat.뀀□ŋ뀀□ŋThere뀀□ŋis뀀□ŋan뀀□ŋadaptive뀀□ŋmanagement뀀□ŋprogra the뀀□ŋYolo뀀□ŋBypass뀀□ŋthat뀀□ŋwill뀀□ŋbe뀀□ŋ*incorporated* 뀀□ŋ*into* 뀀□ŋ*BDCP* objectives뀀□ŋby뀀□ŋconducting뀀□ŋexperiments뀀□ŋand뀀□ŋmodeling뀀□ŋthat뀀□ŋtest뀀□ access뀀□ŋof뀀□ŋlisted뀀□ŋsalmon뀀□ŋonto뀀□ŋthe뀀□ŋBypass.뀀□ŋ뀀□ŋThis뀀□ŋcan뀀□ŋ Fremont뀀□ŋWeir뀀□ŋor뀀□ŋpulse뀀□ŋflow뀀□ŋ*releases* 뀀□ŋ*diversion* 뀀□ŋ*improve* 뀀□ŋ*fish* modification뀀□ŋof뀀□ŋFremont뀀□ŋWeir,뀀□ŋthis뀀□ŋprogram뀀□ŋmay뀀□ŋalso뀀□ŋwant for뀀□ŋusing뀀□ŋthe뀀□ŋSacramento뀀□ŋWeir뀀□ŋto뀀□ŋdivert뀀□ŋFeather뀀□ŋRiver뀀□ŋ Regardless,뀀□ŋas뀀□ŋoutlined뀀□ŋbelow,뀀□ŋa뀀□ŋmore뀀□ŋaggressive뀀□ŋapproach뀀□ŋ alternative뀀□ŋ*migration* 뀀□ŋcorridor뀀□ŋ*fall* 뀀□ŋ*winter* 뀀□ŋ*spring* 뀀□ŋChinook뀀□ŋis뀀□ŋlikely뀀□ŋto뀀 necessary뀀□ŋto뀀□ŋmitigate뀀□ŋthe뀀□ŋeffects뀀□ŋof뀀□ŋ*the* 뀀□ŋnew뀀□ŋNorth뀀□ŋDel

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[2] 뀀□ŋ*The* 뀀□ŋfocus뀀□ŋof뀀□ŋthis뀀□ŋ*discussion* 뀀□ŋ*is* 뀀□ŋ*on* 뀀□ŋ*Chinook* 뀀□ŋ*spring* 뀀□ŋThere뀀□ŋis뀀□ŋvery뀀□ŋsignificant뀀□ŋbenefit뀀 covered뀀□ŋspecies,뀀□ŋparticularly뀀□ŋChinook뀀□ŋand뀀□ŋSacramento뀀□ŋsplittail뀀□ŋthat뀀□ŋcan뀀□ŋtake뀀□ŋadvantage flooding뀀□ŋmore뀀□ŋ*heavily* 뀀□ŋ.

North꿺□ηDelta꿺□ηFacility꿺□ηImpacts꿺□ηand꿺□ηMitigation

The꿺□ηnew꿺□ηpoint꿺□ηof꿺□ηdiversion꿺□ηalong꿺□ηthe꿺□ηSacramento꿺□ηRiver꿺□
covered꿺□ηfish꿺□ηthat꿺□ηeither꿺□ηuse꿺□ηthe꿺□ηmain꿺□ηchannel꿺□ηof꿺□ηthe꿺
rearing,꿺□ηor꿺□ηare꿺□ηindirectly꿺□ηaffected꿺□ηby꿺□ηdownstream꿺□ηchanges꿺□ηi
timing.꿺□η꿺□ηThese꿺□ηimpacts꿺□ηare꿺□ηsome꿺□ηof꿺□ηthe꿺□ηmost꿺□ηdifficult꿺
about꿺□ηdesigning꿺□ηoperation꿺□ηof꿺□ηthe꿺□ηfacilities꿺□η(no꿺□ηcomparable꿺□ηfacili
models)꿺□ηand꿺□ηthe꿺□ηrelationship꿺□ηbetween꿺□ηdownstream꿺□ηactions,꿺□ηsuch
restoration,꿺□ηand꿺□ηflows.꿺□η꿺□ηThis꿺□ηsection꿺□ηassesses꿺□ηBDCP's꿺□ηevalua
(adjacent꿺□ηto꿺□ηthe꿺□ηfacility)꿺□ηand꿺□η(downstream꿺□ηfrom꿺□ηthe꿺□ηfacility)꿺□ηeffect

Near꿺□ηField꿺꿺□ηEffects

The꿺□ηpreferred꿺□ηproject꿺□ηinvolves꿺□ηthe꿺□ηconstruction꿺□ηof꿺□ηthree꿺□ηscr
left꿺□ηbank꿺□ηof꿺□ηthe꿺□ηSacramento꿺□ηRiver꿺□ηin꿺□ηthe꿺□ηvicinity꿺□ηof꿺□
will꿺□ηbase꿺□ηcap꿺□ηwithdrawing꿺□ηup꿺□ηto꿺□η3000꿺□ηcfs.꿺□η꿺□ηIn꿺□ηour꿺
have꿺□ηproperly꿺□ηidentified꿺□ηthe꿺□ηtwo꿺□ηmain꿺□ηsources꿺□ηof꿺□ηnear꿺□η
out-migrating꿺□ηsalmonids:꿺□ηlosses꿺□ηdue꿺□ηto꿺□ηimpingement꿺□ηon꿺□ηthe꿺□η
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꿺□η

To꿺□ηmitigate꿺□ηfor꿺□ηimpingement꿺□ηpotential,꿺□ηthe꿺□ηconsultants꿺□ηpropose
management꿺□ηof꿺□ηpumping꿺□ηregimes꿺□ηrelative꿺□ηto꿺□ηchannel꿺□ηflow꿺□ηi
approach꿺□ηand꿺□ηsweeping꿺□ηvelocities꿺□ηthat꿺□ηreduce꿺□ηcontact꿺□ηwith꿺□η
real-time꿺□ηmanagement꿺□ηwould꿺□ηbe꿺□ηinformed꿺□ηby꿺□ηupstream꿺□ηmonitor
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program꿺□ηcoupled꿺□ηwith꿺□ηmanagement꿺□ηcould꿺□ηreduce꿺□ηimpacts.꿺□η꿺□η
this꿺□ηwriting,꿺□ηthe꿺□ηspecifics꿺□ηof꿺□ηthis꿺□ηprogram꿺□ηare꿺□ηnot꿺□ηprov
in꿺□ηChapter꿺□η8,꿺□η9꿺□ηthis꿺□ηreport)꿺□ηand꿺□ηwe꿺□ηare꿺□ηunable꿺□ηto꿺□η
꿺□η

A꿺□ηgreater꿺□ηnear꿺□ηfield꿺□ηeffect꿺□ηof꿺□ηthe꿺□ηfacility꿺□ηis꿺□ηthe꿺□ηhig
predators꿺□ηnear꿺□ηthe꿺□ηfacility,꿺□ηwith꿺□ηresulting꿺□ηlosses꿺□ηof꿺□ηmigrant
predation.꿺□η꿺□ηPredators꿺□ηtake꿺□ηadvantage꿺□ηof꿺□ηconcentrated꿺□ηprey꿺□η
physical꿺□ηstructures꿺□ηthroughout꿺□ηthe꿺□ηDelta꿺□η꿺□η(Vogel,꿺□η2008)꿺□ηanc
same꿺□ηat꿺□ηthe꿺□ηNorth꿺□ηDelta꿺□ηintake꿺□ηfacilities.꿺□η꿺□ηThe꿺□ηBDCP꿺
modeling꿺□ηapproaches꿺□ηestimate꿺□ηpotential꿺□ηpredation꿺□ηlosses,꿺□ηincluding꿺□
with꿺□ηestimates꿺□ηof꿺□ηlosses꿺□ηat꿺□ηknown꿺□ηstructures꿺□ηsuch꿺□ηas꿺□ηc
Colusa꿺□ηIrrigation꿺□ηDistrict.꿺□η꿺□ηEstimated꿺□ηpredation꿺□ηlosses꿺□ηfor꿺□ηju
Chinook꿺□ηthat꿺□ηpass꿺□ηvary꿺□ηfrom꿺□ηhigh꿺□ηlow꿺□ηas꿺□η1%꿺□ηto꿺□ηas꿺□η
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would꿺□ηfail꿺□ηto꿺□ηmeet꿺□ηbiological꿺□ηobjectives꿺□ηassumes꿺□ηBDCP꿺□ηacknowledges꿺□ηhigh꿺□ηlevels
uncertainty꿺□ηabout꿺□ηpredation꿺□ηeffects꿺□ηat꿺□ηthe꿺□ηfacility.꿺□η꿺□ηThe꿺□η
with꿺□ηhigh꿺□ηuncertainty꿺□ηin꿺□ηBDCP,꿺□ηis꿺□ηto꿺□ηdefer꿺□ηthis꿺□ηto꿺□η
project,꿺□ηincluding꿺□ηunspecified꿺□ηprograms꿺□ηand꿺□ηreal꿺□ηtime꿺□ηmanage

of꿯□ηflows.꿯□η꿯□ηBased꿯□ηon꿯□ηour꿯□ηexperience꿯□ηin꿯□ηthe꿯□ηDelta,꿯□ηw
unresolved꿯□ηmanagement꿯꿯ηissue.꿯□η꿯□η

Far꿯□ηField꿯꿯ηEffects

The꿯□ηNorth꿯□ηDelta꿯□ηfacility꿯□ηis꿯□ηexpected꿯□ηto꿯□ηprovide꿯□ηan꿯□ηaver
exports꿯□ηfrom꿯□ηthe꿯□ηDelta.꿯□η꿯□ηAs꿯□ηoutlined꿯□ηin꿯□ηChapter꿯□η3,꿯□η
constrained꿯□ηby꿯□ηflow꿯□ηand꿯□ηwater꿯□ηquality꿯□ηregulations,꿯□ηupstream꿯□
operations꿯□ηand꿯□ηhydrology.꿯□η꿯□ηThe꿯□ηsimulated꿯□ηoperations꿯□ηof꿯□ηthe
summarized꿯□ηin꿯□ηFigure꿯□η4.4,꿯□ηincluding꿯□ηa꿯□ηmeasure꿯□ηof꿯□ηthe꿯□η
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survivorship for smolts leaving the Sacramento River (Newman, 2010).

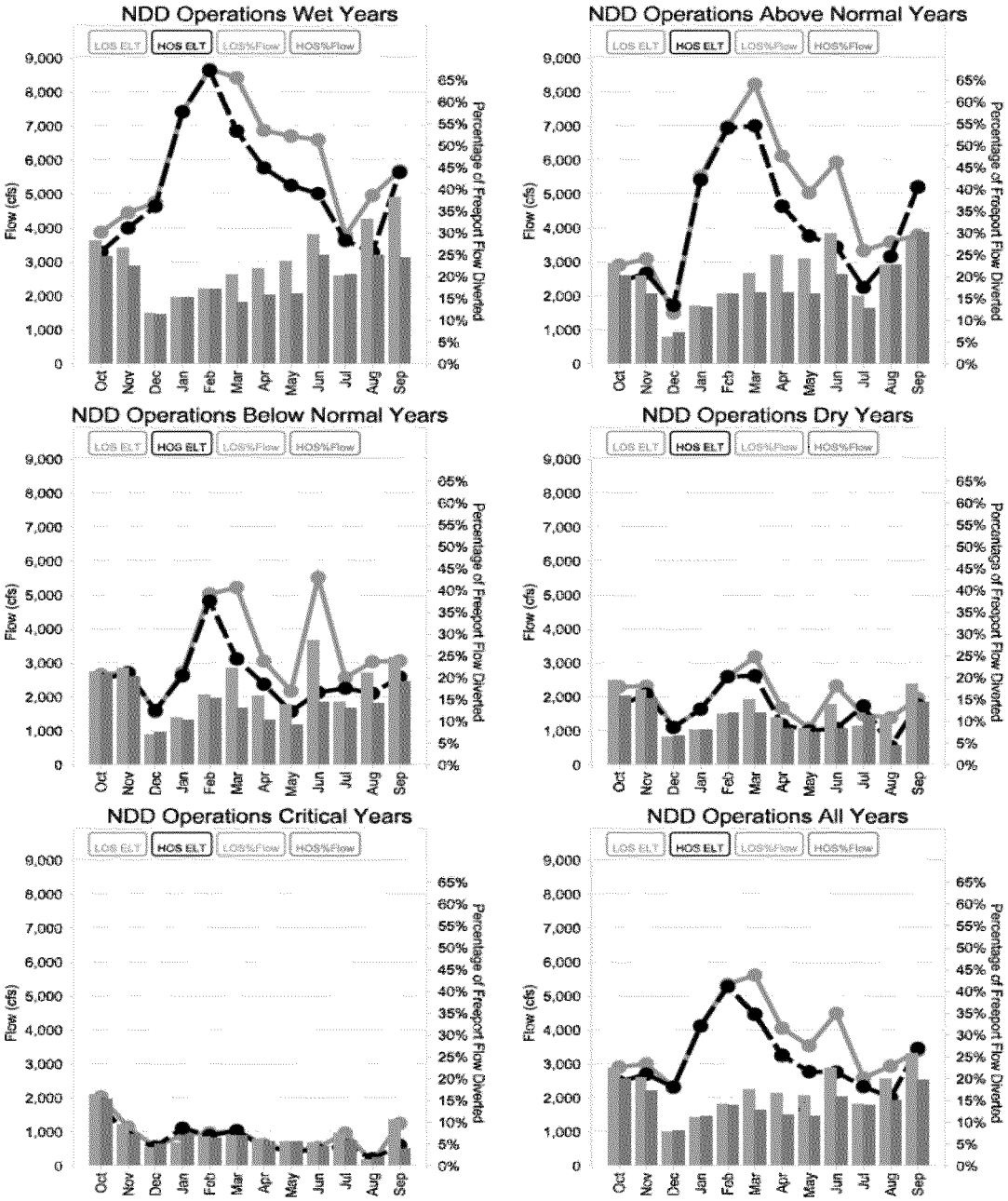

Figure 14. Average monthly export flows for the Delta diversion facility under LOS and HOS for all different years, and the percentage of bypass flow exported.

BDCP proposes to mitigate the increase in flows and effects through six strategies:

- Tiered pumping regimes to reduce withdrawals during the flood pulse (described in Chapter 3)

- Real-time 뀕 □ η operational 뀕 □ η changes 뀕 □ η that 뀕 □ η reduce 뀕 □ η export 뀕 □ η pumping 뀕 □ indicates 뀕 □ η that 뀕 □ η large 뀕 □ η numbers 뀕 □ η of 뀕 □ η migrants 뀕 □ η have 뀕 □ η entered 뀕 the 뀕 □ η facility η
- Flow 뀕 □ η management 뀕 □ η that 뀕 □ η reduces 뀕 □ η tidal 뀕 □ η reversals 뀕 □ η at 뀕 □ η Georgia decreasing 뀕 □ η the 뀕 □ η likelihood 뀕 □ η of 뀕 □ η smolts 뀕 □ η diverting 뀕 □ η into 뀕 □ η the 뀕 □
- Non-physical 뀕 □ η barriers 뀕 □ η at 뀕 □ η Georgiana 뀕 □ η Slough 뀕 □ η
- Reductions 뀕 □ η in 뀕 □ η entrainment 뀕 □ η at 뀕 □ η the 뀕 □ η South 뀕 □ η Delta 뀕 □ η facility 뀕 □ pumping 뀕 □ η
- Increased 뀕 □ η diversion 뀕 □ η of 뀕 □ η foragers 뀕 □ η and 뀕 □ η migrants 뀕 □ η onto 뀕 □ η the 뀕 □
- Improved 뀕 □ η channel 뀕 □ η margin, 뀕 □ η floodplain 뀕 □ η and 뀕 □ η tidal 뀕 □ η marsh 뀕 □ η hab foraging 뀕 □ η juveniles η

The 뀕 □ η benefits 뀕 □ η of 뀕 □ η the 뀕 □ η last 뀕 □ η table 뀕 □ η of 뀕 □ η restoration 뀕 □ η strategies 뀕 □ η captured 뀕 □ η in the 뀕 □ η survivorship 뀕 □ η modeling 뀕 □ η that 뀕 □ η was 뀕 □ η completed 뀕 □ η by 뀕 □ η BDCP 뀕 □ η co for 뀕 □ η a 뀕 □ η discussion). 뀕 □ η 뀕 □ η In 뀕 □ η addition, 뀕 □ η the 뀕 □ η model 뀕 □ η operations 뀕 □ η not 뀕 □ η adjustments 뀕 □ η since 뀕 □ η the 뀕 □ η scope 뀕 □ η and 뀕 □ η terms 뀕 □ η of 뀕 □ η these 뀕 □ η operations determined. 뀕 □ η 뀕 □ η The 뀕 □ η remaining 뀕 □ η restoration 뀕 □ η strategies 뀕 □ η are 뀕 □ η incorporated 뀕 □ η into 뀕 □ η models 뀕 □ η smolt 뀕 □ η survivorship. 뀕 □ η Closely 뀕 □ η examined, 뀕 □ η BDCP 뀕 □ η model 뀕 □ η results 뀕 □ η indic measures, 뀕 □ η in 뀕 □ η combination, 뀕 □ η roughly 뀕 □ η offset 뀕 □ η the 뀕 □ η losses 뀕 □ η created 뀕 □ and 뀕 □ η increases 뀕 □ η in 뀕 □ η bypass 뀕 □ η reach, 뀕 □ η the 뀕 □ η meeting 뀕 □ η the 뀕 □ η standard 뀕 □ η of 뀕 □ There 뀕 □ η is 뀕 □ η no 뀕 □ η indication 뀕 □ η that 뀕 □ η these 뀕 □ η actions 뀕 □ η would 뀕 □ η result 뀕 □ η conditions 뀕 □ η for 뀕 □ η listed 뀕 □ η salmon. 뀕 □ η 뀕 □ η This 뀕 □ η includes 뀕 □ η the 뀕 □ η Yolo 뀕 □ η By significant 뀕 □ η benefits 뀕 □ η for 뀕 □ η other 뀕 □ η covered 뀕 □ η spe

North 뀕 □ η Delta 뀕 □ η Facility 뀕 □ η Summary

We 뀕 □ η have 뀕 □ η not 뀕 □ η had 뀕 □ η sufficient 뀕 □ η time 뀕 □ η or 뀕 □ η resources 뀕 □ η to 뀕 □ η condu models 뀕 □ η used 뀕 □ η to 뀕 □ η assess 뀕 □ η survivorship 뀕 □ η in 뀕 □ η the 뀕 □ η bypass 뀕 □ η reach 뀕 □ mitigation 뀕 □ η efforts. 뀕 □ η Overall, 뀕 □ η most 뀕 □ η of 뀕 □ η the 뀕 □ η and 뀕 □ η models 뀕 □ η used 뀕 □ η for impact standard 뀕 □ η Delta 뀕 □ η models. 뀕 □ η Model 뀕 □ η results 뀕 □ η seem 뀕 □ η reasonable 뀕 □ η and 뀕 □ boundaries 뀕 □ η of 뀕 □ η current 뀕 □ η understanding. 뀕 □ η 뀕 □ η This 뀕 □ η suggests 뀕 □ η that 뀕 □ η th first-order 뀕 □ η approximation 뀕 □ η useful 뀕 □ η enough 뀕 □ η as 뀕 □ η a 뀕 □ η basis 뀕 □ η for 뀕 □ η further management 뀕 □ η experiments. η 뀕 □ η 뀕 □ η

뀕 □ η

We 뀕 □ η view 뀕 □ η the 뀕 □ η efforts 뀕 □ η to 뀕 □ η model 뀕 □ η the 뀕 □ η effectiveness 뀕 □ η of 뀕 □ η pred physical 뀕 □ η barriers 뀕 □ η as 뀕 □ η having 뀕 □ η high 뀕 □ η uncertainty. 뀕 □ η 뀕 □ η In 뀕 □ η addition, 뀕 insufficient 뀕 □ η detail 뀕 □ η to 뀕 □ η manage 뀕 □ η management 뀕 □ η to 뀕 □ η make 뀕 □ η a 뀕 □ η success. 뀕 □ η 뀕 □ η flow 뀕 □ η modeling 뀕 □ η that 뀕 □ η was 뀕 □ η done 뀕 □ η on 뀕 □ η the 뀕 □ η bypass 뀕 □ η reach 뀕 □ η mak marsh 뀕 □ η restoration 뀕 □ η in 뀕 □ η the 뀕 □ η Cache 뀕 □ η Slough 뀕 □ η area. 뀕 □ η 뀕 □ η This 뀕 □ η rest role 뀕 □ η in 뀕 □ η tidal 뀕 □ η energy 뀕 □ η and 뀕 □ η efforts 뀕 □ η to 뀕 □ η manage 뀕 □ η Cache 뀕 □ η Slough 뀕 □ η flow 뀕 □ η We sa are 뀕 □ η uncertain 뀕 □ η about 뀕 □ η both 뀕 □ η the 뀕 □ η impact 뀕 □ η of 뀕 □ η this 뀕 □ η tidal 뀕 □ η mars correctly, 뀕 □ η whether 뀕 □ η the 뀕 □ η assumed 뀕 □ η restoration 뀕 □ η would 뀕 □ η be 뀕 □ η completed same 뀕 □ η issue 뀕 □ η applies 뀕 □ η to 뀕 □ η the 뀕 □ η Yolo 뀕 □ η Bypass. 뀕 □ η 뀕 □ η Schedule 뀕 □ η cor the 뀕 □ η Yolo 뀕 □ η Bypass 뀕 □ η project 뀕 □ η would 뀕 □ η not 뀕 □ η be 뀕 □ η complete 뀕 □ η until 뀕 □ η a This 뀕 □ η lag 뀕 □ η in 뀕 □ η completion 뀕 □ η hampers 뀕 □ η efforts 뀕 □ η to 뀕 □ η mitigate 뀕 □ η for 뀕 □ η given 뀕 □ η the 뀕 □ η large 뀕 □ η uncertainties, 뀕 □ η it 뀕 □ η seems 뀕 □ η prudent 뀕 □ η to 뀕 □ η have 뀕 □ and 뀕 □ η tested 뀕 □ η prior 뀕 □ η to 뀕 □ η initiating 뀕 □ η operation 뀕 □ η of 뀕 □ η the 뀕 □ η diversion 뀕 □

Conclusion뀀□η

To뀀□ηmeet뀀□ηits뀀□ηbiological뀀□ηgoals뀀□ηand뀀□ηobjectives,뀀□ηBDCP뀀□ηhas뀀□ηc
measures.뀀□η뀀□ηTwo뀀□ηof뀀□ηCM#1,뀀□ηWater뀀□ηOperations,뀀□ηand뀀□ηCM#2,뀀□ηY
Bypass—are뀀□ηintended뀀□ηto뀀□ηcreate뀀□ηsignificant뀀□ηimprovement뀀□ηin뀀□ηcondition
fishes뀀□ηby뀀□ηcreating뀀□ηmore뀀□ηnatural뀀□ηflow뀀□ηconditions,뀀□ηimproving뀀□η
case뀀□ηof뀀□ηthe뀀□ηYolo뀀□ηBypass,뀀□ηimproving뀀□ηfloodplain뀀□ηspawning뀀□ηan
focused뀀□ηour뀀□ηassessment뀀□ηon뀀□ηCM#1뀀□ηand뀀□ηCM#2뀀□ηperformed뀀□ηfor뀀□ηwinte
run뀀□ηChinook뀀□ηin뀀□ηthis뀀□ηregard.뀀□η뀀□η
뀀□η
In뀀□ηgeneral,뀀□ηwe뀀□ηfound뀀□ηthat뀀□ηCM#1뀀□ηdoes뀀□ηnot뀀□ηsignificantly뀀□η
flow뀀□ηregime뀀□ηupstream뀀□ηof뀀□ηthe뀀□ηYolo뀀□ηBypass뀀□ηand뀀□ηFreeport,뀀□
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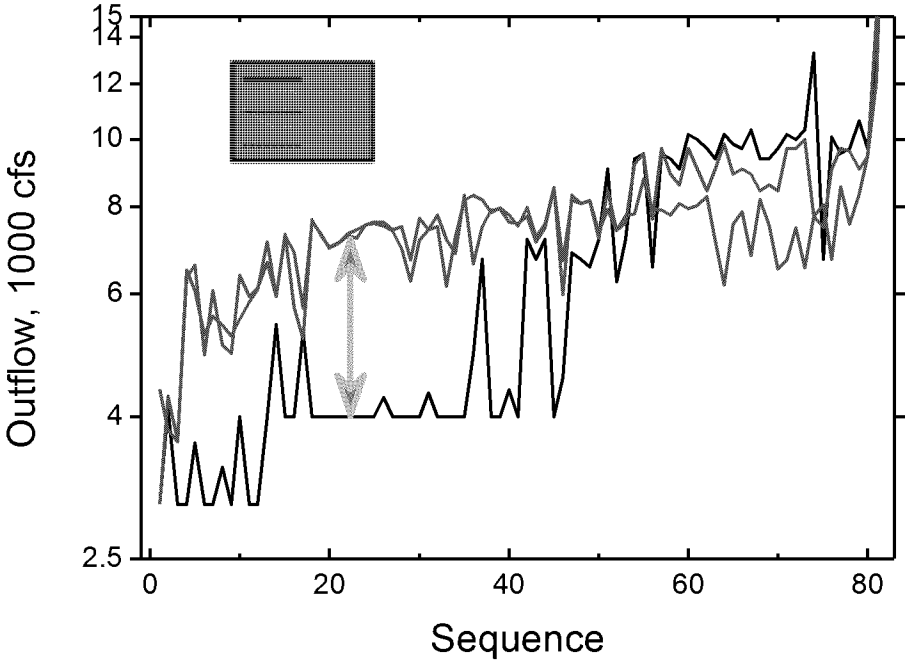
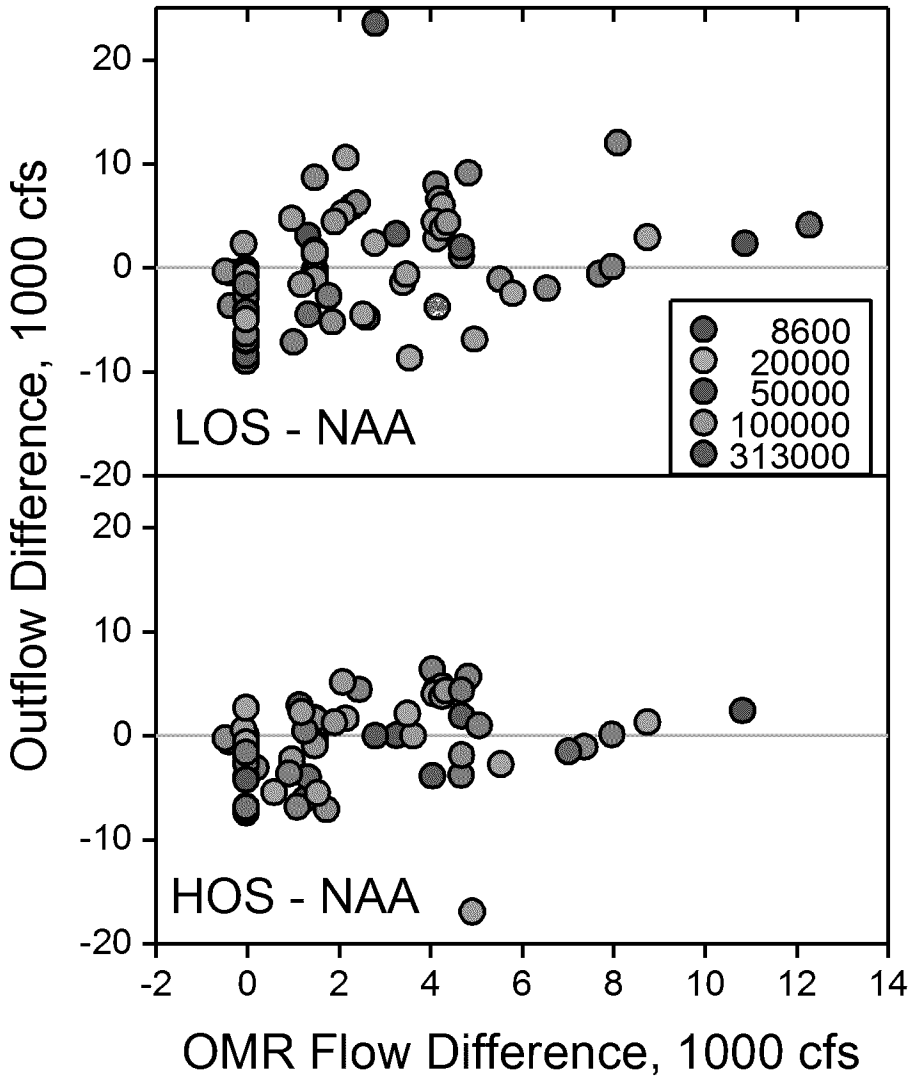


Figure 5.1. Net Delta outflow in October under the three determined by CALSIM under NAA; i.e., sequence 1 is the lo The gray arrow points out the region of interest where ou much as double that under NAA. Outflow is plotted on a differences among scenarios especially at low flows, and because function of the log of outflow. The highest two outflows ha on the lower values.

As a result of this anomaly, the modeled scenarios (LOS export flows in Januaries following wet years, which substanti many Januaries at the dry end of the historic range). unrealistic for several reasons. First, the actual values do requirements [illegible] cfs, depending on previous year type; quite variable and achieve zeroes, rarely there is no clear regula flows.

Second, the reduction in export flows was sometimes accompli outflow rather than reduced reservoir releases or increased ex (Figure 5.2). This, many January outflows during drier years than were corresponding flows of the NAA alternative.



Figure꿺□ŋ5.2.꿺□ŋ꿺□ŋJanuary꿺□ŋflow꿺□ŋconditions꿺□ŋcompared꿺□ŋbetween꿺□ŋthe꿺□ŋtwo HOS,꿺□ŋbottom꿺□ŋpanel꿺□ŋdifferences꿺□ŋfrom꿺□ŋthe꿺□ŋflows꿺□ŋunder꿺□ŋNAA.꿺□ŋ꿺□ŋThe NAA꿺□ŋinflow.꿺□ŋ꿺□ŋUnder꿺□ŋthe꿺□ŋLOS꿺□ŋthere꿺□ŋwere꿺□ŋmany꿺□ŋJanuaries꿺□ŋwh and꿺□ŋOMR꿺□ŋflow꿺□ŋwere꿺□ŋincreased꿺□ŋby꿺□ŋabout꿺□ŋthe꿺□ŋsame꿺□ŋamount꿺□ŋ

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is therefore a poor measure, but entrainment are effects no other Estimates of entrainment as a proportion of total population Chapter 5 of an analysis has not been developed for any Therefore, to broaden the analysis to include species OMR. This measure has been used in models by models and measured in the field; Rivers mouths total exports. Because San Joaquin inflows are less conditions, OMR flows are usually negative, the primary #1's goal to "reduce the incidence of reverse flow". the degree to which flows are negative by the alternatives.

Incidence of reverse flow

Because 'incidence' measures frequency, the "Incidence of reverse flow" frequency with which is changed from a negative (northward) under the proposed alternative model output is available we examine frequency on a monthly basis distribution across months the change in net OMR effects on species entrainment season of seasonality

The results below are consistent with greater frequency positive net flows in Delta channels by shifting exports to This is true more for than LOS operations.

LOS effects. The reduce incidence of negative OMR flows by 5 out of the 984 months, model predicts a months had northward OMR flows in 60 months positive flows under LOS for zero OMR under LOS is with negative flows in NA. August, but frequently in January March. here were months with OMR flows were positive under NAA but negative under Alt LOS (and

The shift to positive net OMR flows is a large (about 6000 occurred almost solely under reverse flow during December through The occasions when NAA produced only in April and the change in OMR flows between NAA and LOS we

HOS effects. HOS had a more substantial effect on flows LOS (Table 3). instances of positive OMR flows NAA under negative under the HOS, and the differences as well with LOS, the changed OMR statistics months save August most noticeable difference between HOS and the other two alternatives was when HOS was northward about a third of the time LOS northward only a few times. The low frequency of October may be related to the anomalies in outflow ident the otherwise high frequency of positive OMR flows in fal are not called for by regulations and no fishes of concern entrainment at that time.

Table 1. Frequency by month of northward (including a few under NAA vs. LOS, and NAA vs. HOS) and southwards flows, and total when the direction of flow differed between NAA and the April there were 47 years when NAA flow was northward, and 35 years when both flows were southwards, 82 years.

Month	NAA North		NAA South		All LOS North	NAA North		NAA South		All HOS North
	LOS North	*LOS South*	*LOS North*	LOS South		HOS North	*HOS South*	*HOS North*	HOS South	
Oct	0	*0*	*1*	81	**1**	0	*0*	*8*	74	**8**
Nov	0	*0*	*2*	80	**2**	0	*0*	*25*	57	**25**
Dec	3	*0*	*1*	78	**4**	3	*0*	*0*	79	**3**
Jan	4	*0*	*11*	67	**15**	4	*0*	*12*	66	**16**
Feb	8	*0*	*18*	56	**26**	8	*0*	*19*	55	**27**
Mar	6	*0*	*25*	51	**31**	6	*0*	*36*	40	**42**
Apr	42	*5*	*0*	35	**42**	44	*3*	*5*	30	**49**
May	25	*16*	*0*	41	**25**	31	*10*	*6*	35	**37**
Jun	1	*0*	*9*	72	**10**	1	*0*	*9*	72	**10**
Jul	0	*0*	*1*	81	**1**	0	*0*	*1*	81	**1**
Aug	0	*0*	*0*	82	**0**	0	*0*	*0*	82	**0**
Sep	0	*0*	*3*	79	**3**	0	*0*	*38*	44	**38**
All months	89	*21*	*71*	803	**160**	97	*13*	*159*	715	**256**

Magnitude of negative OMR flows

Entrainment rates are a function of season of occurrence in delta, and flow condition during export rates (or OMR conditi
The months of vulnerability for each species were taken from the BDCP documents. For adult longfin and delta smelt the season of through March. For juvenile delta smelt March through June

The effects of overall flow conditions, i.e. were grouped by grouping the months of all 82 months in the NAA; e.g., for which data were considered vulnerable during March, there were 82 months in each of the four OMR river inflow and outflow operational scenarios. We examined under four levels of month using outflow in the mo wetness. Historically drier conditions than unde

In Figure 3 comparisons of the LOS and HOS outflow (under the NAA scenario to ensure comparisons of

Under the HOS and LOS offers alternatives [illegible] OMR the seasons of the sensitivity for adult delta smelt (Delta smelt).

Three patterns can be seen:

1. In the of sensitivity adult (December–March), HOS and LOS both show about 4,000-5,000 cfs increase toward positive OMR under all quartiles of outflow but all OMR negative except strongly the quartile of exports in December and January can be north Delta diversion can improve OMR (but see "Concerns" above). For juvenile smelt, in the OMR increase now unclear is LOS smelt and consistent. In all cases the level of OMR flow is – March.
2. The HOS and LOS alternatives except during the drie when OMR flow is slightly less negative under HOS
3. Under wetter conditions all alternatives produce median OM targeted as protective Biological Opinion positive 500 cfs but see Modeled Impacts on Delta smelt under NDD conditions allows the HOS and LOS to avoid the extreme occur under because of the high south Delta exports rate

Thus, in summary, model results suggest that reverse flows more positive under both LOS and OMR. These changes seen both in the frequency and in the distribution of vulnerability and the four quartiles of NAA outflow. In diversion does not fully replace south Delta exports so that OMR remains negative in most months of during the period of vulnerability of young delta smelt December–March because all alternatives by Biological much higher baseline OMR flow.

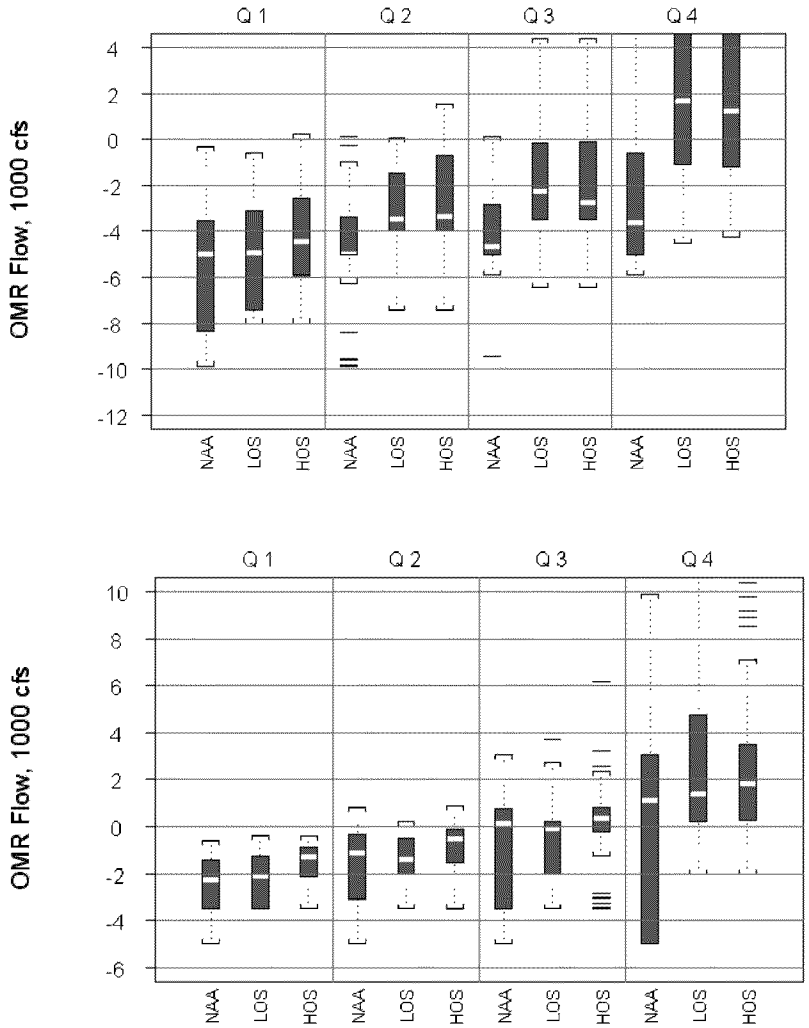

Figure 5.3. Values of OMR under the three alternatives for outflow under the Alternative. Boxes show first and third quartiles, median as a white bar. The whiskers encompass points within range, and the short lines are outliers. Top, expected flows when vulnerable (March). Bottom, period when juvenile delta smelt (June).

Indirect Effects

Net or average flow on the lower San Joaquin River at parameterized as QWEST. This flow can be negative (i.e., an indicator of flow conditions unfavorable to adverse Negative or path migration through the Delta, the proximity migrations or making them susceptible to adverse conditions in the Delta. No have been made difficult biological difficult to define and because the lower San Joaquin River are compared to the flows, regulatory agencies, particularly the CDFW

NMFS, have long been expressed regarding the values QWEST project operations present in the implementation of the effective migration.

The "west flow pattern in the Delta as a result of San Joaquin River" justification CM#1 is apparently QWEST is calculated Dayflow program balance (http://www.water.ca.gov/dayflow/) as:

QSJR QCSMR QMOKE + QMISC-QEXPORTS QMISDV (QCDEC)

i.e., the sum of inflows Sacramento and the Sacramento via the Delta Channel and Sacramento Delta exports, miscellaneous diversions in Delta, the fraction of the difference between precipitation and consumptive use operations, CALSIM Delta consumptive use (QCDEC) precipitation (QPRECIP) Delta miscellaneous diversions (QMISDV) are unavailable tables variables stored

QWEST = QSJR QCSMR QXGEO-QEXPORTS.

QXGEO increases Sacramento River flows as a result of Delta gates operations. Specifically, QXGEO changes as 13.3% of Sacramento River flow and 29.3% with both gates open (Dayflow documentation cited flow into the Delta will decrease by the amount diverted the flows controlled under BDCP, QWEST decreases by 100% and 13.3% or 29.3% of north Delta diversion flows depen

There are many species that migrate through the Delta (Table 5.2). At least one of these species months present August. Conditions in the Delta are migratory species that spawn in the San Joaquin River because the population must travel the central Delta. The fraction of the unknown to the central Delta during migration To cover these points affected by flows in the San Joaquin River migrating salmonid juveniles (February April) and upmigrating San Joaquin salmon (September

Juvenile salmon

The occasional high springtime flows HOS (to benefit longfin coincide with the smolt emigration season, February conditions two quartiles) there is very little difference between NAA occasional occurrence low requirements in HOS produce some LOS and HOS scenarios, but mostly in the second quartile likely to be triggered than in the driest quartile. All under the scenarios as more water is diverted from the for high south Delta several thousand cfs differences months are occurring against baseline flows in the realm the changes in flows in drier conditions are very small diversion operations at low flows do not affect broad indi

Table 5.2. Species of fish considered by the BDCP and their life history stages and the seasonal changes in activity due to conditions due to operations from various sources)

Species and Life History Stage	Timing
Sacramento and San Joaquin steelhead	February-April
Winter-run Chinook salmon juveniles	November-April
Spring-run Chinook salmon juveniles	March-May
Green sturgeon	November-December
Delta smelt adults	December-March
Delta smelt juveniles	April-June
Longfin smelt adults	December-February
Longfin juveniles	February-March
Upmigrating San Joaquin steelhead	September-April
Upmigrating spring-run Chinook salmon	March-August
Upmigrating winter-run Chinook salmon	January-May
Upmigrating fall-run salmon Chinook salmon	September-November

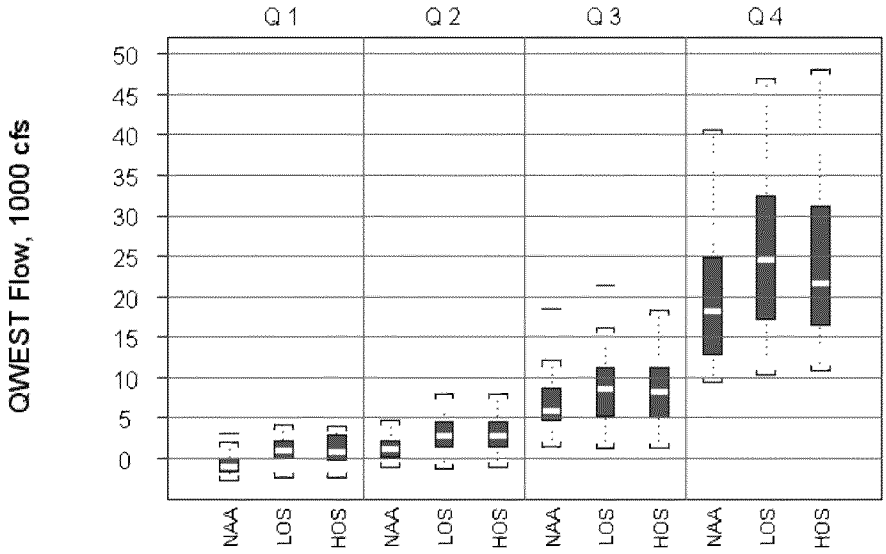

Figure 5.4. April-February QWEST flows for NAA and 3 alternative scenarios, depicted by quartiles of monthly outflows for each scenario in Quarter 4, 98,000 cfs were cut off to allow better resolution of the low

Adult San Joaquin Salmon

Upmigrating salmon adults in San Joaquin River pass through the southern lower San Joaquin River in September and fall there is a difference among the alternatives that is not dwarfed by other flood releases in other years (Figure 5.5). However, all alternatives increase in QWEST compared to values for NAA because

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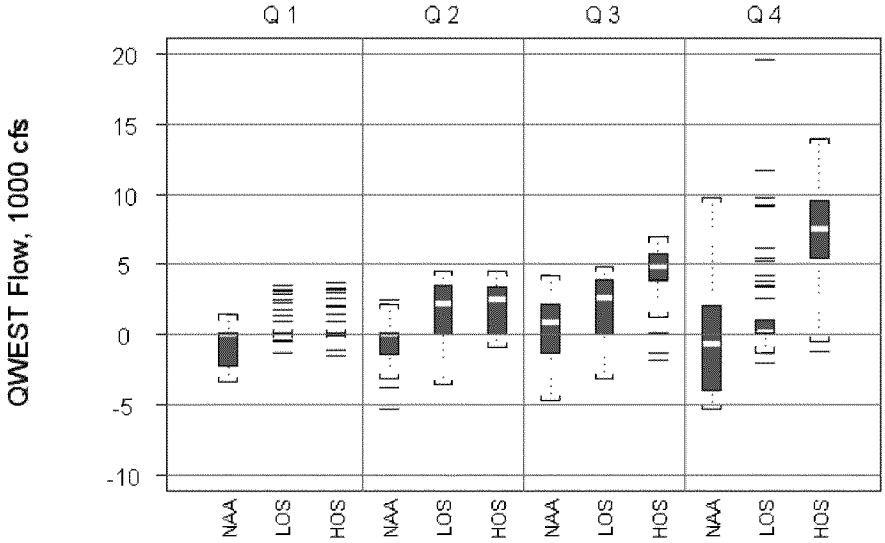

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Conclusion꿺□η

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Chapter 6 Estimated Effects of BDCP on Delta Smelt

Introduction

This chapter takes the model projections for three scenarios (HOS, and LOS) and uses various simple statistical models to these flows on delta and longfin smelt. The principal flow

- Winter and spring flows in Old and Middle Rivers, juvenile delta smelt, respectively
- Fall outflow, which may influence extent of habitat and recruitment of delta smelt
- Spring outflow, which may be related with subsequent abunda young-of-the-year longfin smelt

We did not consider export effects on longfin smelt, for statistical model and therefore no method to estimate losses beyond the scope of this

In making the calculations presented here we were constraine output for the various flows by the month presented year. The apply here *we do not believe that the system needed to obtain patterns of flow like those this is a particularly* true October, when wild swings in flows from one year to would be very unlikely in the real s

Direct Losses of Delta S

Flows in Old and Middle River are related to salvage south Delta fish facilities. Annual salvage in turn is of entrainment losses, particularly young (small) fish, because of attributed to export pumping, including predation in the water and inefficient capture of delta smelt by the facilities.

Here we present estimates of the fraction of the delta smelt during the adult stage and the larval to the of which is (Kimmerer 2008). The calculations were based Kimmerer (2008) as amended for smelt by Kimmerer (2011). procedure was to determine a relationship for each of the survival and flow variables that were available from CALSIM. Middle River flow (OMR), for flows in., inflow less north flow, NDD) and export flow in the south Delta for lar

We modeled the entire period of 2003 CALSIM for analysis and and the historical (2003) period (1995 comparison. We calculated losses

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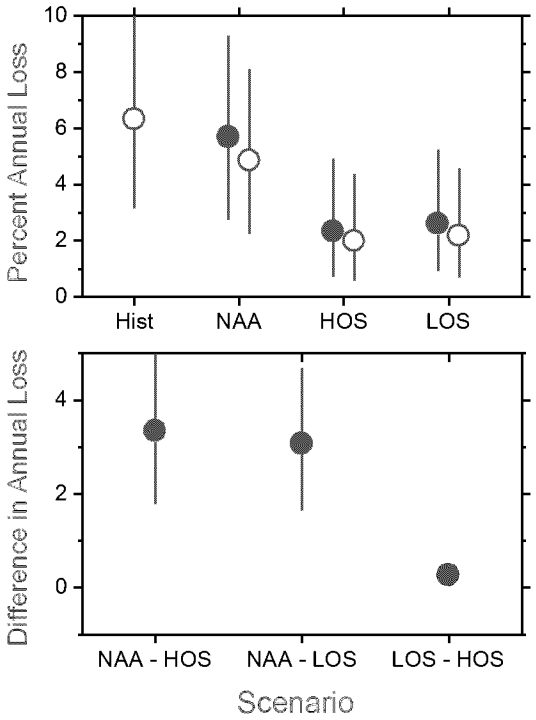
Appendix 6 Both the BDCP scenarios for both time periods, and using Dayflow variables and OMR flows from USGS monitoring

The principal assumptions were:

- The relationship used to calculate survival or recruitment a corresponding population parameters; that is, the confidence predictions were assumed to include the true values of with 95% probability. These analyses (Kimmerer 2008, 2011 been repeated by any analysts, although Miller (2011) This is rather worrisome, because both the BiOP and studies rely on the analyses (Maunder and Deriso 2011, 2013a, b).
- Changes due to BDCP actions were cumulative such tha examined in isolation from the others, and its effect others.
- The only changes considered were to the entrainment effect Long-term changes in sea level, tidal prism, temperature, configuration of the Delta were neglected, despite their exposure of the smelt population. Exceptions to this influences of these factors on fish were modeled by CALSIM
- The flow series produced by CALSIM accurately reflected th various changes (but note concerns expressed above and
- The broad spatial distributions of delta smelt will not those existing when the above analyses were made. fraction of the population in the north Delta is hig when the analyses were made (Miller 2011, Kimmerer 2011).

Losses of adult delta smelt were calculated as a linear percent loss under each of the three scenarios was simila time periods (Figure 6.1). The proportion of adults lost to entr slightly lower for the NAA than for the historical period, flows presumably because some operating rules were not in period. Flow scenarios (HOS and LOS) both had that were ~ half of those under the NAA, or a n

Losses of larval + juvenile smelt were modeled as a function and inflow Delta diversions from the Delta facility. The patte smelt were somewhat similar to those for adults but with scenarios. The NAA had substantially lower losses than t historical period (Figure 6.2). Flows projected for both the lower losses than for the NAA, with losses under the



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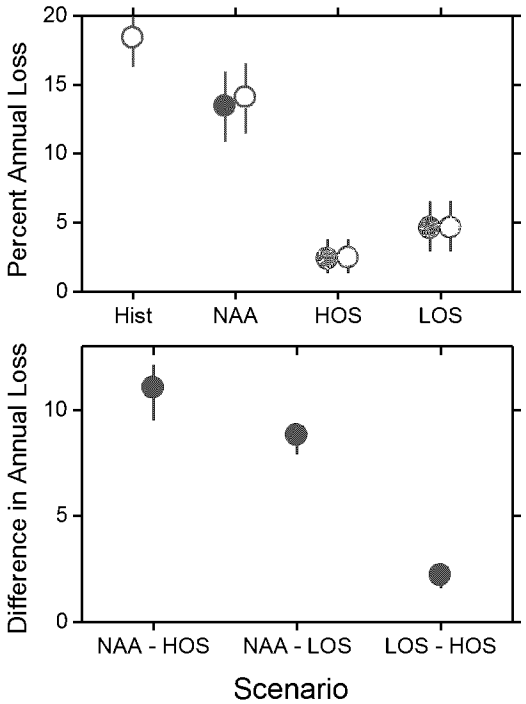

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Table 6.1. Percent losses remaining for each of three BDC after 20 years of losses at the rates estimated and shown with 95% confidence intervals.

	Adults	Juveniles	Combined
NAA	31 ± [illegible]	6 ± [illegible]	2 ± [illegible]
HOS	62 ± [illegible]	62 ± [illegible]	38 ± [illegible]
LOS	59 ± [illegible]	39 ± [illegible]	23 ± [illegible]

Outflow Effects

Two time periods are considered for effects of changed outflow in spring for longfin smelt. These effects are typically cast in terms of calculated X2 values based on determined by CALSIM, using the model of Jassby et al. (1995), as has been done for all previous abundance indices or habitat of fish (e.g., Feyrer et al. 2007, 2011). Since also produces X2 but it is for the previous month and previously, particularly since it is [illegible] additional tidal prism due to marsh restoration. Since we term (ELT), we elected for now to neglect these considerations reflected the anticipated outflows in the same way as in

Fall X2 Effects on Delta Smelt

The USFWS Biological Opinion for Delta smelt proposes to use December period as a management tool. The principal basis for of fall habitat indices (Feyrer et al. 2007, 2011) and Summer Townet index the previous fall Midwater Trawl index

$$TNS_{y+1} \sim a + bMWT_y + cX2_y + \varepsilon_y \quad (6.1)$$

where TNS is the summer townet [illegible] MWT [illegible] is fall Fye error, a, b, and c are fitted parameters, and the time account for the changes in the foodweb resulting from the *Potamocorbula amurensis* (Chapter 7 food web modeling) of Delta smelt).

This model assumes that the main effect of fall X2 or of survival and growth and therefore population reproduction resulting in effects on [illegible] summer. The equation 6.1 is some illogical in modeling TNS as an additive function of MWT influenced by the data point from 1998, the wettest fall analysis. Removing that point [illegible] although it rem strong. Nevertheless, we fitted an alternative model:

$$\log(TNS_{y+1}) \sim a + b\log(MWT_y) + cX2_y + \varepsilon_y \quad (6.2)$$

which is more in keeping with the form of the other model was fitted to [illegible] using a robust regression

some꿯□η-dispersion꿯□ηin꿯□ηthe꿯□ηresiduals꿯□ηfrom꿯□ηthe꿯□ηMcNaughton꿯□ηand꿯□ηRipley꿯□η2003).꿯□
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operated, and therefore suggest these results be considered as conditional operational rules.

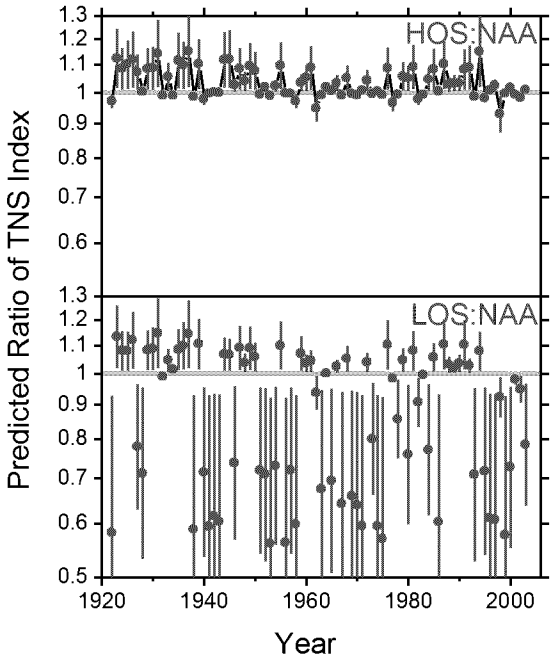


Figure 6.4. **Ratios of predicted TNS index by year from from NAA.**

Spring Outflow/X2 Effects on Longfin

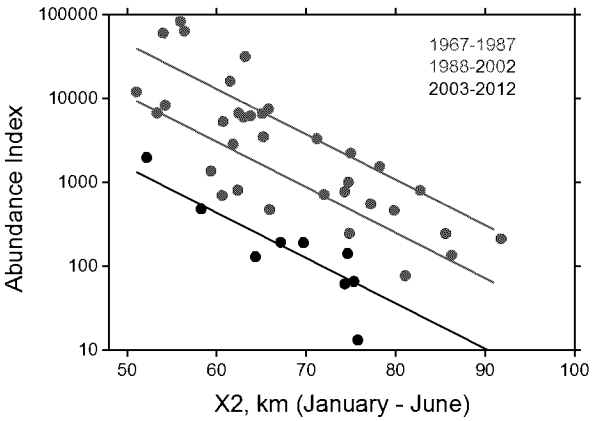
Longfin smelt has the strongest relationship of abundance index al. 1995). The index for a given level of X2 has changed. We updated the latest published (Kimmerer 2009) by adding two step changes in the index to reflect the of the *Potamocorbula amurensis* and the decline (Thomson et al. 2010). The statistical model used was

$$\log_{10}(LFS_y) = a_y + bX2_y + \varepsilon_y \quad (6.3)$$

Where LFS is the annual index of longfin smelt abundance survey, y is year, X2 is monthly value averaged over May, March and ε is a parameter that takes one of values by year, b, is the slope of the X2 relationship.

The resulting relationship (shows both the two changes in abundance index. Diagnostic statistics shown that Since we were interested in the difference between the NAA, the only parameter that could be km⁻¹, essentially identical to the averaging over May

gave [illegible] a [illegible] -0.049 [illegible] slope [illegible] of [illegible] 0.05 [illegible] and [illegible] km [illegible] the [illegible] fit [illegible] was [illegible] slightly [illegible] inferior [illegible] t
June [illegible] model [illegible]



[illegible]

Figure [illegible] 6.5. [illegible] Abundance [illegible] index [illegible] vs. [illegible] X2 [illegible] averaged [illegible] over [illegible] January [illegible] changes [illegible] between [illegible] 1987 [illegible] and [illegible] 1988 [illegible] and [illegible] between [illegible] 2002 [illegible] and [illegible] 2003. indicate [illegible] the [illegible] time [illegible] period.

The [illegible] months [illegible] selected [illegible] in [illegible] the [illegible] original [illegible] analysis [illegible] were [illegible] based [illegible] c
(unknown) [illegible] X2 [illegible] mechanism [illegible] operated [illegible] during [illegible] early [illegible] life [illegible] history [illegible] of [illegible]
experts [illegible] linked [illegible] to [illegible] this [illegible] period. [illegible] Autocorrelation [illegible] in [illegible] the [illegible] X2 [illegible]
statistical [illegible] analysis [illegible] provides [illegible] little [illegible] guidance [illegible] for [illegible] improving [illegible] the [illegible] s
understanding [illegible] of [illegible] the [illegible] mechanism(s) [illegible] underlying [illegible] the [illegible] relationship [illegible] wo
period [illegible] to [illegible] be [illegible] narrowed [illegible] and [illegible] focused, [illegible] but [illegible] for [illegible] now [illegible] there [illegible]
period [illegible] for [illegible] averaging [illegible] X2.

The [illegible] predictions [illegible] from [illegible] the [illegible] [illegible] were [illegible] the [illegible] X2 [illegible] values [illegible]
the [illegible] CALSIM [illegible] projections [illegible] of [illegible] -year [illegible] low [illegible] period [illegible] the [illegible] 2 [illegible] did [illegible] not [illegible] att
prediction [illegible] error [illegible] because [illegible] it [illegible] is [illegible] small [illegible] compared [illegible] to [illegible] variability [illegible]
January-June [illegible] value [illegible] for [illegible] the [illegible] scenarios [illegible] resulted [illegible] in [illegible] scant [illegible] diffe
predicted [illegible] abundance [illegible] (The [illegible] mean [illegible] log [illegible] indices [illegible] for [illegible] HOS
was [illegible] 1.00 [illegible] (mean [illegible] 0 [illegible] of [illegible] 0.91 [illegible] and [illegible] 1.27. [illegible] Co
values [illegible] for [illegible] LOS:NAA [illegible] 0.92 [illegible] (mean [illegible] 0.92) [illegible] and [illegible] percentiles [illegible] of [illegible]

Thus, [illegible] changes [illegible] in [illegible] outflow [illegible] resulting [illegible] from [illegible] the [illegible] CALSIM [illegible] projection
small, [illegible] particularly [illegible] on [illegible] the [illegible] scale [illegible] of [illegible] the [illegible] high [illegible] variability [illegible] with
increase [illegible] in [illegible] the [illegible] median [illegible] but [illegible] did [illegible] not [illegible] change [illegible] from [illegible] NAA, [illegible] indic
years [illegible] had [illegible] higher, [illegible] and [illegible] half [illegible] lower, [illegible] values [illegible] under [illegible] HOS [illegible] than
were [illegible] ~8% [illegible] lower [illegible] than [illegible] those [illegible] under [illegible] NAA.

Although [illegible] it [illegible] would [illegible] be [illegible] desirable [illegible] to [illegible] link [illegible] dynamics [illegible] models, [illegible] to
no [illegible] such [illegible] is [illegible] available, [illegible] furthermore, [illegible] previous [illegible] analyses [illegible] have [illegible] shown [illegible] t
longfin [illegible] smelt [illegible] is [illegible] highly [illegible] predictable [illegible] from [illegible] X2 [illegible] and, [illegible] more [illegible] rece
above. [illegible] This [illegible] does [illegible] not [illegible] mean [illegible] that [illegible] stock [illegible] unimportant; [illegible] an [illegible] alte
analysis [illegible] models [illegible] a [illegible] recruitment [illegible] index, [illegible] the [illegible] log [illegible] of [illegible] the [illegible] ratio

earlier,꿯□ηas꿯□ηa꿯□ηfunction꿯□ηof꿯□ηX2꿯꿯η꿯꿯η꿯꿯η

(Chapter 8) Nevertheless, at present we lack the capability more thorough analysis, but believe it should be done.

Longfin smelt, by contrast, are not as much affected by BDCP changes in outflow are rather minor, and the flows needed longfin smelt are [illegible] be practically achieved

Chapter 꿯: 꿯 꿯 꿯Likely 꿯 꿯Response 꿯 꿯of 꿯 꿯 to 꿯 꿯Physical 꿯 꿯Habitat 꿯꿯 꿯Restoration

Introduction 꿯 꿯

This 꿯 꿯Chapter 꿯 꿯focuses 꿯 꿯on 꿯 꿯the 꿯 꿯proposed 꿯 꿯restoration 꿯 꿯of 꿯 꿯physical 꿯
Suisun 꿯 꿯Marsh. 꿯 꿯 꿯 꿯Because 꿯 꿯of 꿯 꿯time 꿯 꿯constraints 꿯 꿯we 꿯 꿯 꿯 꿯

- The뀀□ηsubpopulation뀀□ηof뀀□ηdelta뀀□ηsmelt뀀□ηthat뀀□ηinhabit뀀□ηthe뀀□ηCache summer뀀□ηmay뀀□ηbenefit뀀□ηfrom뀀□ηadditional뀀□ηphysical뀀□ηhabitat뀀□ηin뀀□ηt true뀀□ηin뀀□ηSuisun뀀□ηMarsh뀀□ηcurrent뀀□ηuse뀀□ηby뀀□ηsmelts뀀□ηis뀀□ηlow
- The뀀□ηhigh뀀□ηlevel뀀□ηof뀀□ηuncertainty뀀□ηabout뀀□ηoutcomes뀀□ηpoints뀀□ηto large-scale뀀□ηexperimental뀀□ηrestoration뀀□ηprojects뀀□ηto뀀□ηdetermine뀀□ηwheth restoration뀀□ηwill뀀□ηaid뀀□ηthe뀀□ηproduction뀀□ηgoals뀀□ηand,뀀□ηif뀀□ηso,뀀□ηhow뀀□ηt optimally.뀀□η

Marsh뀀□ηRestoration뀀□η

Review뀀□ηof뀀□ηconceptual뀀□ηbasis

The뀀□ηBDCP뀀□ηanticipates뀀□ηmany뀀□ηbenefits뀀□ηto뀀□ηdelta뀀□ηsmelt뀀□ηthroughout뀀□ηlongfin뀀□ηs documentation뀀□ηis뀀□ηunclear뀀□ηregarding뀀□ηthe뀀□ηmagnitude뀀□ηof뀀□ηexpected뀀□ηbenefits,뀀□ηthe뀀□ηBDCP뀀□η optimistic뀀□ηthat뀀□ηthey뀀□ηwill뀀□ηcontribute뀀□ηsubstantially뀀□ηto뀀□ηrecovery뀀□ηof on뀀□ηtwo뀀□ηpotential뀀□ηbenefits뀀□ηto뀀□ηthe뀀□ηsmelts뀀□ηfrom뀀□ηthe뀀□ηrestorati restored뀀□ηhabitats뀀□ηare뀀□ηexpected뀀□ηto뀀□ηprovide뀀□ηfood뀀□ηand뀀□ηenhance뀀□ηthe available뀀□ηto뀀□ηthe뀀□ηsmelts.뀀□η뀀□ηSecond,뀀□ηthe뀀□ηrestored뀀□ηhabitats뀀□ηare physical뀀□ηspace,뀀□ηresulting뀀□ηin뀀□ηan뀀□ηincrease뀀□ηin뀀□ηsmelt뀀□ηabundance.뀀□ benefits뀀□ηis뀀□ηwell뀀□ηdocumented뀀□ηin뀀□ηand뀀□ηthe뀀□ηliterature뀀□ηcited뀀□ηs been뀀□ηselected뀀□ηto뀀□ηsupport뀀□ηthe뀀□ηclaims뀀□ηmade.뀀□η뀀□ηThe뀀□ηBDCP뀀□η factual뀀□ηerrors뀀□ηand뀀□ηmisinterpretations뀀□ηthat뀀□ηcast뀀□ηdoubt뀀□ηupon뀀□ηthe however뀀□ηqualitative뀀□ηnature뀀□ηof뀀□ηconducted뀀□ηa뀀□ηreasonably뀀□ηthorough뀀□ηana specific뀀□ηclaims,뀀□ηwithin뀀□ηthe뀀□ηconstraints뀀□ηof뀀□ηtime뀀□ηavailable.

The뀀□ηfirst뀀□ηoutcome뀀□ηrequires뀀□ηtwo뀀□ηconditions:뀀□η1)뀀□ηthat뀀□ηthe뀀□ηsm food-limited,뀀□ηmeaning뀀□ηthat뀀□ηan뀀□ηincrease뀀□ηin뀀□ηfood뀀□ηfor뀀□ηorganisms뀀□ηwould뀀 higher뀀□ηabundance뀀□ηof뀀□ηsmelt;뀀□ηand뀀□η2)뀀□ηthat뀀□ηthe뀀□ηrestored뀀□ηmars enough뀀□ηfood뀀□ηorganisms뀀□ηto뀀□ηmake뀀□ηa뀀□ηdifference뀀□ηto뀀□ηthe뀀□ηpopul

BDCP뀀□ηAppendix뀀□η5E뀀□ηuses뀀□η"productivity"뀀□ηindex뀀□ηexpected뀀□ηproductivity뀀□ηof뀀□ηphytopla in뀀□ηthe뀀□ηrestored뀀□ηareas.뀀□η뀀□ηHowever,뀀□ηthis뀀□ηindex뀀□ηis뀀□ηconceptually an뀀□ηestimate뀀□ηof뀀□ηgrowth뀀□ηrate뀀□ηrather뀀□ηthan뀀□ηproduction뀀□ηof뀀□ηphyt of뀀□ηgrowth뀀□ηrate뀀□ηand뀀□ηbiomass.뀀□ηassumes뀀□ηimplicitly뀀□ηthat뀀□ηall뀀□ηphytop available뀀□ηas뀀□ηfood뀀□ηfor뀀□ηthe뀀□ηzooplankton뀀□ηconsumed뀀□ηby뀀□ηthe뀀□ηsn published뀀□ηon뀀□ηthe뀀□ηSan뀀□ηFrancisco뀀□ηEstuary뀀□ηand뀀□ηelsewhere뀀□ηshow뀀 consumed뀀□ηby뀀□ηmicrozooplankton뀀□ηsuch뀀□ηas,뀀□η(e.g.,뀀□ηLopez뀀□ηet뀀□ηal.뀀□η20 Lucas뀀□ηand뀀□ηThompson뀀□η2012;뀀□ηKimmerer뀀□ηand뀀□ηThompson뀀□ηsubmitted).

The뀀□ηsmelt뀀□ηspecies뀀□ηare뀀□ηexpected뀀□ηto뀀□ηoccupy뀀□ηsome뀀□ηof뀀□ηthe뀀□η benefits뀀□ηin뀀□ηthe뀀□ηform뀀□ηof뀀□ηincreased뀀□ηopportunities뀀□ηfish뀀□ηto뀀□ηfind뀀□ηs such뀀□ηas뀀□ηspawning뀀□ηsubstrate,뀀□ηfood뀀□ηpatches,뀀□ηor뀀□ηshelter뀀□ηfrom뀀□η to뀀□ηdiversify뀀□ηthe뀀□ηlocations뀀□ηin뀀□ηwhich뀀□ηthe뀀□ηsmelt뀀□ηspecies뀀□ηoccur resilience뀀□ηof뀀□ηpulses뀀□ηto뀀□ηlocal뀀□ηperturbations뀀□ηsuch뀀□ηas뀀□ηpesticide뀀□ηuse뀀□ηor뀀□η toxic뀀□ηspills.뀀□η뀀□η

Analysis of comments

For effects of production exposure assessed the evidence for food the smelt populations, and for the kind of information that restoration managers would export to waters where the smelt species occur. current patterns of occurrence to determine the likely effect on the smelt species.

We do not address indirect impacts of restoration, with other proposed projects. Restoration of extensive areas tidal prism in the restored area. This will affect tida and the way to Carquinez Strait, and therefore affect salinity movement of sediments. The effects on salinity have been presented in BDCP documents, but we did not review this Engineers have a project, now on hold, to widen the Channel, which is currently an important part of the habit non-BDCP projects should be taken into account when conside

Are smelt spawning limited?

What is the evidence for and against food limitation in limitation we mean a situation in which an increase in would result in a higher abundance of smelt. All those fish have depressed growth or reproductive rates, only that Substantial food limitation would require the following to be

1. The density of food organisms is too low to support fish.
2. Therefore some fish are in poorer condition or grow satiation.
3. Either or both of the following:
   a. Survival over a life stage depends on condition a
   b. Reproductive rate of adult growth rate during development through its effect on maturity or total eggs per
4. Higher reproduction leads to a larger population size. This condition must be true as a straightforward consequenc dynamics.

Food limitation could occur at one or more life stages, the estuary. During spawning and early life delta smelt ar the late larval stage (spawning during March–December), part of population is in the zone (LSZ, 5–15 psu) part is in the Liberty Island complex in the North Delta (Sommer et al. in freshwater but move earlier in Rose Marsh and Seawater Kimmerer et al. 2009). We refer to fish between me their spawning migration as juveniles (i.e., including all fish

trawl꿯□ηsurveys꿯□ηsmelt꿯□ηspecies꿯□ηbecause꿯□ηplankton꿯□ηin꿯□ηtheir꿯□ηhabitat,꿯□η
of꿯□ηprey꿯□ηrelated꿯□ηto꿯□ηthat꿯□ηof꿯□ηthe꿯□ηfish.꿯□η

Food꿯□ηlimitation꿯□ηis꿯□ηsurprisingly꿯□ηdifficult꿯□ηto꿯□ηdemonstrate꿯□ηin꿯□ηa꿯□
populations꿯□ηmust꿯□ηbe꿯□ηfood꿯□ηlimited꿯□ηbut꿯□ηwe꿯□ηfound꿯□ηlittle꿯□ηevidence꿯□ηof
fish꿯□ηcan꿯□ηbe꿯□ηdifficult꿯□ηto꿯□ηdetect.꿯□η꿯□ηThe꿯□ηprey꿯□ηand꿯□ηthe꿯□η
variable,꿯□ηsee꿯□ηthe꿯□ηdegree꿯□ηof꿯□ηfood꿯□ηspecialization꿯□ηand꿯□ηpatchy꿯□η꿯□ηGreat꿯□ηdifferen
individuals꿯□ηin꿯□ηfeeding꿯□ηsuccess꿯□ηresulting꿯□ηin꿯□ηdifferences꿯□ηin꿯□ηsurvival꿯□ηin꿯□ηsuch꿯□ηgrow꿯□ηthat
survivors꿯□ηare꿯□ηthose꿯□ηwhich꿯□ηfed.꿯□η꿯□ηFeeding꿯□ηsuccess꿯□ηalso꿯□ηinterac
influences꿯□ηsuch꿯□ηas꿯□ηpredation꿯□ηrisk꿯□ηand꿯□ηphysiological꿯□ηstress.

The꿯□ηanalysis꿯□ηof꿯□ηfood꿯□ηlimitation꿯□ηrelies꿯□ηon꿯□ηindirect꿯□ηevidence꿯□ηDetails꿯□ηof꿯□η
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rate꿯□ηin꿯□ηrelation꿯□ηto꿯□ηfood꿯□ηconcentration.꿯□η꿯□ηA꿯□ηfew꿯□ηother꿯□ηst
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꿯□η

Export꿯□ηof꿯□ηfood꿯□ηfrom꿯□ηrestored꿯□ηshallow꿯□ηareas

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in꿯□ηthese꿯□ηareas꿯□ηwill꿯□ηbe꿯□ηexported꿯□ηas꿯□ηa꿯□ηsubsidy꿯□ηto꿯□ηopen꿯
The꿯□ηimplicit꿯□ηconceptual꿯□ηmodel꿯□ηwith꿯□ηrestored꿯□ηshallow꿯□ηareas꿯□ηthat꿯□ηproduce꿯□ηshallow꿯□ηexcess꿯□η
phytoplankton꿯□ηand꿯□ηzooplankton꿯□ηthat꿯□ηwill꿯□ηthen꿯□ηbe꿯□ηexported꿯□ηby꿯
A꿯□ηsubsidy꿯□ηof꿯□ηphytoplankton꿯□ηcould꿯□ηstimulate꿯□ηzooplankton꿯□ηproduction
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reproduction꿯□ηrather꿯□ηthan꿯□ηfood꿯□ηquantity꿯□η(Ivey꿯□ηSolger꿯□ηet꿯□ηal.꿯□η2002,꿯□ηKimmerer꿯□η2005).꿯□η꿯□η However,꿯□ηgrazing꿯□ηby꿯□ηclam
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- A subsidy of zooplankton from Suisun Marsh to Grizzly under current conditions is unlikely to be much larger extent of restoration.

Do shallow areas export phytoplankton or zooplankton?

Marshes can be major producers of organic matter because surface exposed to sunlight, shallow waters leading to light of the water column, and the continual supply of nutrient land (Figure 1). This appears to be true restored marshes (How Simenstad 2011). However, the balance, so production in respiration by organisms within the marsh must be either matter or organisms to adjacent estuarine waters.

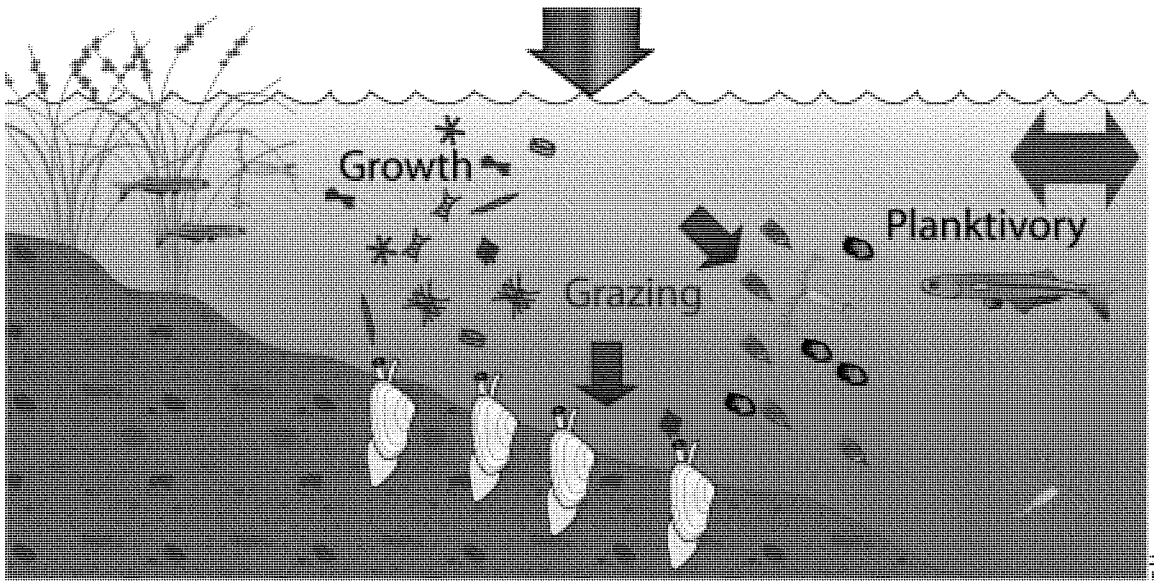

Figure 7.1. Conceptual model of the production of food for marsh channel. Because the water is shallow (and may be light penetration is good and growth of phytoplankton and ber Losses of phytoplankton occur through benthic grazing, mainly by microzooplankton but also by larger zooplankton such as copepo fish. Benthic grazers filter a certain volume of water ever the more intensive the grazing, the more planktivorous as Mississippi silversides seek shelter in the shallowest and ve consumption of zooplankton is also more focused and more se shallow water. Tidal exchange of water (higher) channel transports nutrients, organic matter, and plankton between marsh direction of transport for zooplankton may be in or out of outcomes of the various and production consumption processes.

꿮□ η

Export꿮□ηof꿮□ηorganic꿮□ηmatter꿮□ηfrom꿮□ηmarshes꿮□ηto꿮□ηadjacent꿮□ηestuarine꿮
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production꿮□ηactually꿮□ηavailable꿮□ηfor꿮□ηconsumption꿮□ηby꿮□ηmesozooplankton,꿮□η
considerably꿮□ηlower꿮□ηthan꿮□ηwould꿮□ηbe꿮□ηexpected꿮□ηfrom꿮□ηprimary꿮□ηproduction.

For꿮□ηzooplankton꿮□ηthe꿮□ηmagnitude꿮□ηand꿮□ηdirection꿮□ηof꿮□ηtidal꿮□ηflux꿮□ηc
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2002, 꿯 □ η Feyrer 꿯 □ η et 꿯 □ η al. 꿯 □ η 2003) 꿯 □ η and 꿯 □ η medusae 꿯 □ η and 꿯 □ η some 꿯 □ η zooplan
al. 꿯 □ η 2003). 꿯 □ η and 꿯 □ η some 꿯 □ η detailed 꿯 □ η studies 꿯 □ η of 꿯 □ η exchange 꿯 □ η processes 꿯 □ η hav
(Culberson 꿯 □ η et 꿯 □ η al. 2004). 꿯 □ η Zooplankton 꿯 □ η abundance 꿯 □ η is 꿯 □ η highest 꿯 □ η in 꿯 □ η small 꿯 □ η sloug
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foodwebs 꿯 □ η and 꿯 □ η those 꿯 □ η supporting 꿯 □ η pelagic 꿯 □ η foodwebs 꿯 □ η (Grimaldo 꿯 □ η et 꿯 □ η al. 꿯 □ η 2009).

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large 꿯 □ η seasonal 꿯 □ η shifts 꿯 □ η in 꿯 □ η the 꿯 □ η magnitude 꿯 □ η and 꿯 □ η In 꿯 □ η particular, 꿯 □
chlorophyll 꿯 □ η flux 꿯 □ η was 꿯 □ η lowest 꿯 □ η in 꿯 □ η spring 꿯 □ η and 꿯 □ η out 꿯 □ η of 꿯 □ η the 꿯 □ η fall, 꿯 □ η based 꿯
measurements, 꿯 □ η and 꿯 □ η into 꿯 □ η the 꿯 □ η seasons 꿯 □ η but 꿯 □ η more 꿯 □ η so 꿯 □ η in 꿯 □ η spri
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potential 꿯 □ η links 꿯 □ η open 꿯 □ η waters. 꿯 □ η 꿯 □ η The 꿯 □ η South 꿯 □ η Bay 꿯 □ η Salt 꿯 □ η Ponds, 꿯 □ η
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open 꿯 □ η water. 꿯 □ η 꿯 □ η We 꿯 □ η assume 꿯 □ η smelt 꿯 □ η habitat 꿯 □ η is 꿯 □ η 꿯 □ η 꿯 □ η

Phytoplankton input to the LSZ could amount to 16%/day, production in the LSZ. However, smelt species do not conversion of phytoplankton to zooplankton depends on such factors grazing. The direct subsidy of zooplankton would be unrealistically ideal conditions. Although this is not the would effectively eliminate the subsidy to open water.

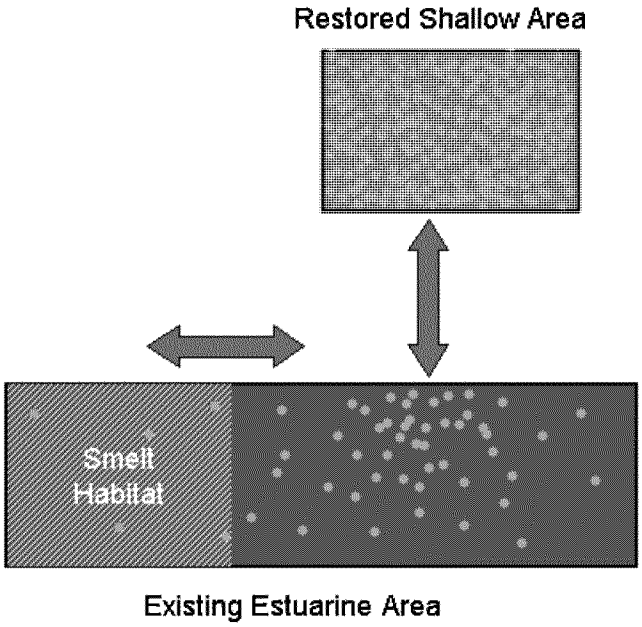

Figure 1. Schematic diagram of a subsidy of zooplankton (yellow tidal marsh or other shallow area to an existing estuarine dispersion (double arrows) between the restored and existing are existing area from the outlet of the restored area to other smelt habitat. Advection may alter the flow of zooplankton, is on a creek that produces a net flow into the existin

Zooplankton export from Suisun Marsh

One of the proposed restoration areas is in the northern estimated the subsidy of copepods to the LSZ from this and using a tidal model to estimate copepod If the copepods behaved as passive particles, this subsidy would am population in this LSZ. unlikely to produce a noticeable incre biomass, as potential population growth rate is the order of 10%/d. particles that migrate to the bottom tidally zooplankton nea

do [illegible] (Kimmerer [illegible] et al. 2002). [illegible] trapped within the [illegible]
marsh. Behavioral responses to tidal entrapment within the marsh,
from the mouth of the marsh [illegible] operations [illegible]
control gate on Montezuma Slough reduce or even eliminate th

The real world

Several features of actual restoration site would alter the subsid
the analyses above. First, the enlarged restoration area w
therefore the exchange rate. The proposed restoration for
the [illegible] area, 12 with a corresponding increase in tidal
the exchange will be mediated by tides, this could substan
Whether this would increase or decrease the [illegible] would
growth rate achieved in the marsh [illegible] change
residence time would require a 3D model with very accur
region. It is impossible to tell [illegible] information
connections would result in a greater subsidy from Suisun
offset by zooplankton behavior or by consumption within the
could be done using a hydrodynamic [illegible] tracking
assumptions about zooplankton behavior.

The BDCP documents acknowledge that grazing by clams
settle on [illegible] subtidal areas may remove all or most
production and [illegible] zooplankton. Grazing by clams and zoo
microzooplankton) removed all of the phytoplankton production in
time from late spring through [illegible] Kimmerer [illegible] Thompson
submitted.). Whether [illegible] newly restored areas is cri
whether the area can export any phytoplankton [illegible] and
clams are not abundant in Suisun Marsh except for the
Sloughs, where they [illegible] fraction of the phytoplankton and
zooplankton that would otherwise enter Grizzly Bay.

Zooplankton organisms are not passive, and undergo tidal mig
(Kimmerer et al. 1998, 2002). It does also very seem likely that
which would greatly lengthen the residence time for copepods
particularly in the far northern area of Suisun Marsh.
shown that zooplankton organisms [illegible] planktivorous
within a marsh, resulting in a net flux of zooplankton
above).

Finally, some of the proposed restoration sites are far fro
delta and longfin smelt [illegible] from these sites to where the
order of weeks to months in the dry season or when
operating (Kimmerer and Nobriga 2008). A plankton populati
biomass in a [illegible] total food supply and predation.
zooplankton from a restored area should be assumed to s

All of these considerations are based on rather crude mod
processes. [illegible] appropriate given the level of specificity of t

Nevertheless,꿯□ηthis꿯□ηanalysis꿯□ηraises꿯□ηsignificant꿯□ηquestions꿯□ηabout꿯□ηthe꿯□
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should꿯□ηbe꿯□ηundertaken.꿯□η

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habitat꿯□ηis꿯□ηopen꿯□ηwaters꿯□ηof꿯□ηthe꿯□ηestuary,꿯□ηeither꿯□ηin꿯□ηfreshwater
stages꿯□ηin꿯□ηspring꿯□ηto꿯□ηearly꿯□ηsummer,꿯□η꿯□ηThe
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channels꿯□ηof꿯□ηSuisun꿯□ηMarsh꿯□ηto꿯□ηwould꿯□ηallow꿯□η
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(Kimmerer꿯□η2004).꿯□η꿯□ηThose꿯□ηtrends꿯□ηmay꿯□ηbe꿯□ηdifficult꿯□ηto꿯□ηrever
smelts.꿯□η꿯□ηHowever꿯□ηproportion꿯□ηof꿯□ηthe꿯□ηdelta꿯□ηsmelt꿯□
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2002).꿯□η꿯□ηDelta꿯□ηsmelt꿯□ηin꿯□ηSuisun꿯□ηMarsh꿯□ηformerly
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data,꿯□ηbut꿯□ηif꿯□ηsmelt꿯□ηavoid꿯□ηthe꿯□ηwarmer꿯□ηwater꿯□ηin꿯□ηsummer꿯□
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November-April꿯□ηwith꿯□ηno꿯□ηobvious꿯□ηdifferences꿯□ηamong꿯□ηthe꿯□ηvarious꿯□

The꿯□η20mm꿯□ηsurvey꿯□ηsummer꿯□ηin꿯□ηMontezuma꿯□ηSlough꿯□ηin꿯
Marsh꿯□ηand꿯□ηin꿯□ηcentral꿯□ηSuisun꿯□ηBay꿯□ηincluding꿯□ηone꿯□ηstation꿯□ηin
western꿯□ηentrance꿯□ηto꿯□ηthe꿯□ηmarsh.꿯□η꿯□ηA꿯□ηgraphical꿯□ηcomparison꿯□η
locations꿯□ηdid꿯□ηnot꿯□ηreveal꿯□ηconsistent꿯□ηeither꿯□ηspecies.꿯□η꿯□ηA꿯□ηsimil
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and꿯□ηlongfin꿯□ηsmelt꿯□ηare꿯□ηroughly꿯□ηas꿯□ηabundant꿯□ηin꿯□ηthe꿯□ηlarger꿯
open꿯□ηwater꿯□ηof꿯□ηthe꿯□ηestuary.

The key question for this aspect of restoration habitat would result in larger populations of smelt delta smelt is related habitat availability based on salinity and turbidity (Feyrer et al. 2008). However, the extent to which the LSZ may be related to the abundance of either smelt species (Kimmerer et al. because the LSZ is a complex physical and biological process and the fish can move around freely. In contrast, shallow may offer enough physical structure to provide habitat value under conditions. In that case, having more habitat area could Note that a relatively weak relationship between the quantity of habitat and the need not rely on dependent relationship between habitat and the reproduction of individual fish, which seems unlikely for delta levels.

Thus, we are cautiously optimistic that restoration of habitat subsequent population expansion of delta smelt including Cache Sacramento Ship Channel (Moyle et al. 2008, Sommer and Mejia 2013). unlikely to benefit from this. We cannot determine whether from similar restoration in the Suisun Marsh or the western sites are too remote from the current range of population of Delta smelt about their colonization by other smelt species.

Floodplain

The BDCP proposes to alter the Fremont Weir at the that the Bypass would flood at lower stages of the Sacramento only the likely effects on the smelt species.

Review of conceptual basis

Although the smelt species do not use floodplain as habitat plankton on the floodplain may provide a subsidy to smelt slightly from that of the potential subsidy from marshes floodplain is through flow system so that increased biomass of plankton transported by the Fremont Weir rather than by tidal exchange. time on a floodplain with flow conditions, from hours to days conditions to effectively infinite in ponds remaining after the

Analysis of components

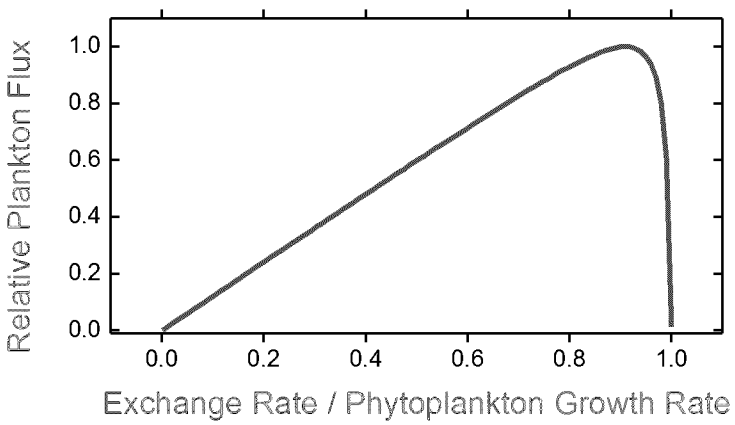
Apart from its suitability as habitat species, there is also Yolo Bypass support foodwebs within the estuary. The mechanism for phytoplankton and zooplankton production because of depth and better light penetration than in river channels, because water is more shallow. Whether this translates to zooplankton is uncertain; zooplankton was similar to that in during 2000 (Sommer et al. 2004). Plankton biomass on a floodplain may increase as residence time

increases 뀀□ηand 뀀□ηfish 뀀□ηswitch 뀀□ηto 뀀□ηlarger 뀀□ηprey 뀀□η(Grozholz 뀀□ηand 뀀□ηGa
observed 뀀□ηon 뀀□ηthe 뀀□ηYolo 뀀□ηBypass 뀀□ηin 뀀□ηmost 뀀□ηyears 뀀□η(Sommer 뀀□ηet 뀀

At 뀀□ηvery 뀀□ηhigh 뀀□ηflows 뀀□ηresidence 뀀□ηtime 뀀□ηon 뀀□ηthe 뀀□ηBypass 뀀□ηis 뀀□ηbu
of 뀀□ηbiomass, 뀀□ηwhile 뀀□ηat 뀀□ηlower 뀀□ηflows 뀀□ηsuch 뀀□ηa 뀀□ηbuildup 뀀□ηmay 뀀□η
low 뀀□η(Schemel 뀀□ηet 뀀□ηal. 뀀□η2006). 뀀□ηThus, 뀀□ηthe 뀀□ηtidal 뀀□ηexchange 뀀□η(i.e., 뀀□η
there 뀀□ηis 뀀□ηan 뀀□ηintermediate 뀀□ηrange 뀀□ηof 뀀□ηflow 뀀□ηthat 뀀□ηmaximizes 뀀□ηexp

A 뀀□ηsubsidy 뀀□ηfrom 뀀□ηthe 뀀□ηYolo 뀀□ηBypass 뀀□ηmay 뀀□ηbe 뀀□ηmore 뀀□ηor 뀀□ηless
the 뀀□ηCache 뀀□ηSlough 뀀□ηcomplex 뀀□ηat 뀀□ηthe 뀀□ηsouthern 뀀□ηend 뀀□ηof 뀀□ηthe 뀀□η
the 뀀□ηfish 뀀□ηhabitat 뀀□ηused 뀀□ηby 뀀□ηboth 뀀□ηspring 뀀□ηchinook 뀀□ηand 뀀□η

In 뀀□ηappendix 뀀□ηB, 뀀□ηexamine 뀀□ηevidence 뀀□ηfor 뀀□ηsubsidy 뀀□ηof 뀀□ηzooplankton 뀀□ηto 뀀□ηthe 뀀□η
the 뀀□ηestuary 뀀□ηunder 뀀□ηthe 뀀□ηcurrent 뀀□ηregime 뀀□ηusing 뀀□ηmorphometric 뀀□ηand 뀀□ηdata 뀀□ηto 뀀□ηnot 뀀□η
actually 뀀□ηcalculate 뀀□ηthe 뀀□ηmagnitude 뀀□ηof 뀀□ηsubsidy, 뀀□ηwould 뀀□ηinterve
alter 뀀□ηconditions. 뀀□η 뀀□ηIn 뀀□ηparticular, 뀀□ηthe 뀀□ηBypass 뀀□ηcould 뀀□ηbe 뀀□ηflooded
case, 뀀□ηand 뀀□ηthe 뀀□ηhigher 뀀□ηtemperature 뀀□ηwould 뀀□ηprovide 뀀□η
plankton 뀀□ηproduction 뀀□ηthan 뀀□ηnow. 뀀□ηFurthermore, 뀀□ηBypass 뀀□ηflow 뀀□ηwould 뀀□η
greater 뀀□ηproportion 뀀□ηof 뀀□ηtotal 뀀□ηinflow 뀀□ηto 뀀□ηthe 뀀□ηDelta 뀀□ηlater 뀀□ηin 뀀□
the 뀀□ηplankton 뀀□ηcoming 뀀□ηoff 뀀□ηthe 뀀□ηBypass.



뀀□η

Figure 뀀□η7.3. 뀀□η 뀀□ηRelative 뀀□ηmagnitude 뀀□ηof 뀀□ηphytoplankton 뀀□ηtidal 뀀□ηmarsh 뀀□ηas 뀀
exchange 뀀□ηrate, 뀀□ηscaled 뀀□ηto 뀀□ηthe 뀀□ηgrowth 뀀□ηrate 뀀□ηof 뀀□ηthe 뀀□ηphytoplankton.
balance 뀀□ηamong 뀀□ηimport 뀀□ηof 뀀□ηnutrients 뀀□ηto 뀀□ηthe 뀀□ηmarsh, 뀀□ηuptake 뀀□ηof 뀀□
phytoplankton, 뀀□ηand 뀀□ηexport 뀀□ηof 뀀□ηphytoplankton. 뀀□ηAll 뀀□ηnutrient 뀀□ηuptake 뀀□ηis 뀀□ηby 뀀□ηp
is 뀀□ηno 뀀□ηconsumption, 뀀□ηand 뀀□ηthe 뀀□ηphytoplankton 뀀□ηconcentration 뀀□ηin 뀀□ηthe 뀀□η

뀀□η

뀀□η

Our꿿□ηanalysis꿿□ηshows꿿□ηno꿿□ηevidence꿿□ηthat꿿□ηthe꿿□ηopen꿿□ηwaters꿿□ηof꿿
subsidy꿿□ηof꿿□ηphytoplankton꿿□ηand꿿□ηzooplankton꿿□ηabundance꿿□ηis꿿□ηinver
related꿿□ηto꿿□ηYolo꿿□ηBypass꿿□ηflow,꿿□ηeither꿿□ηbetween꿿□ηthe꿿□ηmouth꿿□ηof
winter꿿□ηand꿿□ηzooplankton꿿□ηabundance꿿□ηin꿿□ηthe꿿□ηfollowing꿿□ηsummer

Conclusions꿿□η

There꿿□ηare꿿□ηmany꿿□ηpressures꿿□ηon꿿□ηphysical꿿□ηhabitat꿿□ηin꿿□ηthe꿿□ηDelta꿿□ηand꿿
host꿿□ηof꿿□ηspecies꿿□ηthat꿿□ηare꿿□ηlikely꿿□ηto꿿□ηbenefit.꿿□η꿿□ηAmong꿿□ηthe
marsh꿿□ηand꿿□ηfloodplain꿿□ηduring꿿□ηresidence,꿿□ηsalutatory꿿□ηdownstream꿿□ηmov
migration.꿿□η꿿□ηHowever,꿿□ηunclear꿿□ηwhether꿿□ηconditions꿿□ηin꿿□ηthe꿿□ηDelta꿿
the꿿□ηpopulation꿿□ηdynamics꿿□ηof꿿□ηsalmon,꿿□ηand꿿□ηtherefore꿿□ηwe꿿□ηhave꿿□
species,꿿□ηfor꿿□ηwhich꿿□ηthe꿿□ηDelta꿿□ηis꿿□ηa꿿□ηkey꿿□ηpart꿿□ηof꿿□ηhome꿿□

The꿿□ηBDCP꿿□ηprovides꿿□ηvery꿿□ηlittle꿿□ηinformation꿿□ηabout꿿□ηthe꿿□ηpotential꿿□ηbenefits꿿□ηto꿿□ηdelta꿿□ηa
physical꿿□ηhabitat꿿□ηrestoration.꿿□η꿿□η꿿□ηLongfin꿿□ηsmelt꿿□ηdo꿿□ηnot꿿□ηappear
great꿿□ηextent.꿿□η꿿□ηDelta꿿□ηsmelt꿿□ηare꿿□ηalso꿿□ηconsidered꿿□ηpelagic꿿□ηbut꿿
Cache꿿□ηSlough꿿□ηcomplex,꿿□ηand꿿□ηgreater꿿□ηsalmon꿿□ηdelta꿿□ηin꿿□ηwhich꿿□ηsugges
some꿿□ηpotential꿿□ηbenefit꿿□ηto꿿□ηsalmon꿿□ηfrom꿿□ηexpanded꿿□ηhabitat꿿□ηin꿿□ηthe꿿□ηmarsh꿿□ηand꿿□ηthat꿿□ηmagnitud
of꿿□ηthis꿿□ηbenefit꿿□ηis꿿□ηimpossible꿿□ηto꿿□ηpredict,꿿□ηbecause꿿□ηthe꿿□ηdegr
restoration꿿□ηmight꿿□ηcause꿿□ηan꿿□ηincrease,꿿□ηor꿿□ηreverse꿿□ηthe꿿□ηdecline,꿿□
Under꿿□ηthese꿿□ηconditions꿿□ηit꿿□ηis꿿□ηpremature꿿□ηto꿿□ηassert꿿□ηthat꿿□ηthe꿿
an꿿□ηeffect,꿿□ηuntil꿿□ηstudies꿿□ηincluding꿿□ηsome꿿□ηpilot꿿□ηprojects꿿□ηhave꿿□ηbeen꿿□ηcarried꿿□ηout꿿□η
projects꿿□ηcan꿿□ηshow꿿□ηwhether꿿□ηan꿿□ηeffect꿿□ηis꿿□ηto꿿□ηbe꿿□ηexpected.

The꿿□ηidea꿿□ηthat꿿□ηrestored꿿□ηmarsh꿿□ηand꿿□ηfloodplain꿿□ηwill꿿□ηexport꿿□ηs
zooplankton꿿□ηto꿿□ηthe꿿□ηopen꿿□ηwaters꿿□ηof꿿□ηsl
waters꿿□ηsuggests꿿□ηshallow꿿□ηareas꿿□ηare꿿□ηmore꿿□ηlikely꿿□ηto꿿□ηbe꿿□ηsinks
were꿿□ηsources,꿿□ηsimple꿿□ηmass꿿□ηbalance꿿□ηconsiderations꿿□ηindicate꿿□ηthat꿿□ηthe꿿□ηresulting
produce꿿□ηat꿿□ηmost꿿□ηa꿿□ηsmall꿿□ηenhancement꿿□ηof꿿□ηzooplankton꿿
should꿿□ηbe꿿□ηdropped꿿□ηfrom꿿□ηdiscussions꿿□ηof꿿□ηBDCP,꿿□ηalthough꿿□ηexperi
ahead꿿□ηto꿿□ηdetermine꿿□ηunder꿿□ηwhat꿿□ηconditions꿿□ηmarsh꿿□ηhabitats꿿□ηcou
food꿿□ηfor꿿□ηdelta꿿□ηand꿿□ηlongfin꿿□ηsmelt꿿□ηin꿿□ηthe꿿□ηopen꿿□ηwaters.

Chapter 8: Regulatory Oversight Assurances

Introduction

The previous chapters have demonstrated the relatively high associated with proposed conservation actions in BDCP. These likely result in the need to change Plan goals and the prescribed conservation measures to address them.

This chapter addresses the question whether the draft Bay includes governance policies that have the "resilient to political special interest influence. We divide our analysis into two regulatory oversight of plan implementation and adaptive mana evaluation of the regulatory assurances comprised in the guarantee.

Regulatory Oversight

Introduction

The draft BDCP vests primary responsibility for implementing Manager, who shall "ensure that the BDCP is properly duration of the Plan" (BDCP 7). The Program Manager's authority includes protection and restoration, production of habitat ecological stre management of conservation, coordination of CVP and SWP, and development of the new facilities authorized by the Plan (B

The Program Manager's implementation of the BDCP is subject to Authorized Entity Group, which will be comprised of the Department of Water Resources as operator of the SWP, U.S. Bureau of Reclamation as operator of the CVP, and one representative the CVP and SWP contractors if the contractors are iss (BDCP 8). The BDCP also covers certain diversions of water CVP or SWP operations and the operations may incidental take permits under the terms and conditions of these water projects would become Authorized Entities, but of the Authorized Entity Group (BDCP 7

[1] The Program Manager also will have responsibility, power and authority to implement the Program Manager in all aspects of implementation of the BDCP, including Adaptive Management Team as described in Chapter 9 of this report.

[2] A question has arisen whether the Program Manager's legal authority to grant incidental take to the CVP and SWP contractors under the federal Endangered Species Act Community Conservation Planning Act (NCCPA) and the Appendix G

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The [illegible] Authorized [illegible] Entity [illegible] Group's [illegible] authority [illegible] over [illegible] the [illegible] BDCP [illegible] also [illegible] is [illegible] multifaceted. [illegible] The [illegible] draft [illegible] BDCP [illegible] states: [illegible]

> The [illegible] Authorized [illegible] Entity [illegible] Group [illegible] oversight [illegible] and [illegible] direction [illegible] to [illegible] Program [illegible] Manager [illegible] on [illegible] matters [illegible] concerning [illegible] the [illegible] implementation [illegible] provide [illegible] input [illegible] [illegible] [illegible] general [illegible] policy [illegible] and [illegible] program- [illegible] relate [illegible] monitor [illegible] and [illegible] assess [illegible] the [illegible] effectiveness [illegible] of [illegible] the [illegible] Implementati [illegible] implementing [illegible] the [illegible] Plan, [illegible] and [illegible] foster [illegible] and [illegible] maintain [illegible] collabora [illegible] constructive [illegible] relationships [illegible] [illegible] fish [illegible] [illegible] wildl [illegible] agencies, [illegible] other [illegible] public [illegible] agencies, [illegible] stakeholders [illegible] and [illegible] other [illegible] in [illegible] and [illegible] local [illegible] government [illegible] [illegible] implementation [illegible] of [illegible] the [illegible] BDCP [illegible] ([illegible] to [illegible] [illegible]

This [illegible] oversight [illegible] structure [illegible] means [illegible] that [illegible] the [illegible] Authorized [illegible] Entity [illegible] significant [illegible] [illegible] [illegible] over [illegible] both [illegible] the [illegible] coordinated [illegible] operation [illegible] of [illegible] the [illegible] implementation [illegible] of [illegible] the [illegible] BDCP [illegible] itself. [illegible] Indeed, [illegible] the [illegible] draft [illegible] P [illegible] Manager [illegible] "will [illegible] report [illegible] to [illegible] the [illegible] Authorized [illegible] Entity [illegible] Group, [illegible] and [illegible] group's [illegible] direction [illegible] [illegible]

The [illegible] draft [illegible] Plan [illegible] vests [illegible] regulatory [illegible] responsibility [illegible] within [illegible] the [illegible] BI [illegible] Oversight [illegible] Group," [illegible] which [illegible] is [illegible] composed [illegible] of [illegible] the [illegible] Regional [illegible] Direc [illegible] Wildlife [illegible] Service, [illegible] the [illegible] Regional [illegible] Administrator [illegible] of [illegible] the [illegible] National [illegible] [illegible] and [illegible] the [illegible] Director [illegible] of [illegible] the [illegible] California [illegible] Department [illegible] [illegible] [illegible]

Group—rather than the regulatory authority over changes to conservation measures, biological objectives, and adaptive management as well as over BDCP amendments to the

Regulatory vs. Programmatic Responsibilities: Implementation

The draft Plan grants the Permit Oversight Group a si the conservation goals and adaptive management strategies of

> The Permit Oversight Group involved in certain decisions the implementation of water operations and other conser actions proposed through the adaptive management program to changed circumstances, approaches to research (BDCP 17)

It then provides Permit Oversight Group the following roles, among others, in implementation matters

- *Approve, jointly with the Authorized Entity,* conservation measures or biological objectives proposed by the Adaptive Management Team.
- *Decide, jointly with the Authorized Entity,* adaptive management matters for which concurrence has not been Adaptive Management Team.
- Provide input into the science Manager of the Science Manager.
- *Provide input and advice on the* consistency of specified sections Annual Work Plan and Budget with the BDCP and decisions.
- *Provide input and advice on the* consistency of the Annual Operations Plan with the BDCP.
- Provide input and accept Annual Reports.
- *Provide input and advice on* amendments (BDCP 1-12 emphasis added).

These definitions are poorly drafted, and they assign progr fish and wildlife agencies that may undermine their regulat therefore recommend that the draft BDCP be revised in

First, where is the part the negotiations want to grant the Group authority to determine whether certain actions or de with the BDCP, the Plan should define its responsibilities than does the current draft provide a "input and concur"; "provide

[4] The draft Plan also contains a "flowchart" which states "the Permit Oversight Group play a role in "decision-making regarding real-time operations, water quality, consistent with *Facilities and Operations Plan.*" limitations set out in the BDCP Plans and DP the details of this role as still under negotiation, we do not address it Permit Oversight Group should be clearly defined and limited regulatory

and꿯□ηaccept";꿯□ηand꿯□η"provide꿯□ηinput꿯□ηand꿯□ηapprove."꿯□η꿯□ηThus,꿯□ηt
revised꿯□ηto꿯□η꿯□ηstate:

> The꿯□ηPermit꿯□ηOversight꿯□ηGroup꿯□ηshall꿯□ηhave꿯□ηexclusive꿯□ηauthorit
> whether꿯□ηthe꿯□ηAnnual꿯□ηWork꿯□η꿯□η꿯□η

identifies [illegible] three [illegible] types [illegible] of [illegible] administrative [illegible] modifications, [illegible] minor [illegible] modifications, [illegible] and [illegible] amendments [illegible] the [illegible] latter [illegible] two [illegible] concern [illegible] us [illegible]

The [illegible] draft [illegible] Plan [illegible] defines [illegible] "minor [illegible] modifications" [illegible] as [illegible] including [illegible] between [illegible] Restoration [illegible] Opportunity [illegible] Areas [illegible] or [illegible] conservation [illegible] of [illegible] conservation [illegible] measures [illegible] or [illegible] the [illegible] monitoring [illegible] and [illegible] adaptive [illegible] management [illegible] program [illegible] covered [illegible] species" [illegible] 46). [illegible] "formal [illegible] amendments" [illegible] as [illegible] including, [illegible] limited [illegible] to:

- Changes [illegible] boundary [illegible] BDCP [illegible]
- Additions [illegible] of [illegible] species [illegible] to [illegible] the [illegible] covered [illegible] species [illegible] list.
- Increases [illegible] the [illegible] allowable [illegible] take [illegible] limits [illegible] of [illegible] new [illegible] covered [illegible] to [illegible] the [illegible]
- Substantial [illegible] changes [illegible] in [illegible] implementation [illegible] schedules [illegible] that [illegible] will [illegible] adverse [illegible] effects [illegible] on [illegible] the [illegible] covered [illegible] species.
- Changes [illegible] in [illegible] water [illegible] operations [illegible] beyond [illegible] described [illegible] unc *Facilities* [illegible] *and* [illegible] 476 [illegible]

The [illegible] "minor [illegible] modifications" [illegible] and [illegible] "formal [illegible] amendments" [illegible] thus [illegible] include [illegible] all BDCP [illegible] implementation [illegible] that [illegible] will [illegible] be [illegible] vital [illegible] to [illegible] the [illegible] success [illegible] draft [illegible] Plan [illegible] expressly [illegible] provides [illegible] that [illegible] the [illegible] Authorized [illegible] Entities [illegible] changes.[5] [illegible] minor [illegible] modifications, [illegible] the [illegible] draft [illegible] BDCP [illegible] any [illegible] Authorized [illegible] Entity [illegible] disagrees [illegible] with [illegible] the [illegible] proposed [illegible] minor [illegible] modification [illegible] or [illegible] revision [illegible] minor [illegible] modification [illegible] or [illegible] revision [illegible] will [illegible] not [illegible] into [illegible] the [illegible] BDCP" [illegible] (BD 46).[6] [illegible] The [illegible] draft [illegible] Plan [illegible] formal [illegible] amendments [illegible] subject [illegible] to [illegible] review [illegible] and [illegible] approval [illegible] by [illegible] the [illegible] Authorized [illegible] Entities."[7] [illegible]

The [illegible] BDCP [illegible] is [illegible] fundamentally [illegible] a [illegible] set [illegible] of [illegible] terms [illegible] and [illegible] conditio regulatory [illegible] agencies [illegible] U.S. [illegible] Fish [illegible] Wildlife [illegible] National [illegible] Marine [illegible] Fisheries [illegible] Service, [illegible] and [illegible] the [illegible] California [illegible] Department [illegible] authorizes [illegible] and the [illegible] construction [illegible] and [illegible] operation [illegible] of [illegible] physical [illegible] improvements [illegible] to [illegible] facilitate [illegible] more [illegible] reliable [illegible] (and, [illegible] one [illegible] may [illegible] sustainable) [illegible] more [illegible] environm

[illegible]

[5] [illegible] Please [illegible] note [illegible] that [illegible] the [illegible] draft [illegible] BDCP [illegible] states [illegible] that [illegible] the [illegible] Authorized [illegible] Entity [illegible] group this [illegible] veto [illegible] power. [illegible] This [illegible] may [illegible] be [illegible] a [illegible] typographical [illegible] error, [illegible] as [illegible] the [illegible] Authorized [illegible] decisionmaking [illegible] authority [illegible] (except [illegible] through [illegible] Authorized [illegible] Entity [illegible] Group) [illegible] any [illegible] other [illegible] place [illegible] in [illegible] the the [illegible] BDCP [illegible] negotiators [illegible] in [illegible] fact [illegible] intend [illegible] to [illegible] vest [illegible] veto [illegible] authority [illegible] in [illegible] the [illegible] Authorize problematic [illegible] as [illegible] the [illegible] Authorized [illegible] Entities [illegible] potentially [illegible] the [illegible] power [illegible] the [illegible] enterprise [illegible] the [illegible] Authorized [illegible] Entity [illegible] Group [illegible] BDCP [illegible] 7 [illegible]

[6] By [illegible] contrast, [illegible] if [illegible] any [illegible] of [illegible] the [illegible] fish [illegible] and [illegible] wildlife [illegible] regulatory [illegible] agencies [illegible] disagrees [illegible] rights [illegible] are [illegible] limited [illegible] to [illegible] insisting [illegible] that [illegible] the [illegible] proposed [illegible] amendments [illegible] be [illegible] [illegible] BDCP [illegible]

[7] At [illegible] least [illegible] in [illegible] the [illegible] case [illegible] of [illegible] formal [illegible] amendments [illegible] the [illegible] draft [illegible] Plan [illegible] recognizes [illegible] regulators [illegible] and [illegible] the [illegible] regulated, [illegible] acknowledging [illegible] that [illegible] such [illegible] amendments [illegible] require [illegible] the [illegible] authorizations/ [illegible] permits, [illegible] in [illegible] accordance [illegible] with [illegible] applicable [illegible] laws [illegible] and [illegible] regulations [illegible] BDCP [illegible] 476 [illegible] It [illegible] also [illegible] states, [illegible] however, [illegible] that [illegible] the [illegible] "fish [illegible] and [illegible] wildlife [illegible] agencies [illegible] proposed [illegible] amendments [illegible] within [illegible] BDCP [illegible] 6 [illegible]

exports꿯□ηof꿯□ηwater꿯□ηby꿯□ηthe꿯□ηCVP꿯□ηand꿯□ηSWP.꿯□η꿯□ηAlthough꿯□η
is꿯□ηto꿯□ηfacilitate꿯□ηthis꿯□ηwater꿯□ηdevelopment,꿯□ηthe꿯□ηregulatory꿯□ηagen
responsibility꿯□ηis꿯□ηto꿯□ηensure꿯□ηthat꿯□ηthe꿯□ηproject꿯□ηdoes꿯□ηnot꿯□ηje
existence꿯□ηof꿯□ηthe꿯□ηspecies꿯□ηthat꿯□ηare꿯□ηlisted꿯□ηfor꿯□ηprotection꿯□ηu
Endangered꿯□ηSpecies꿯□ηActs.꿯□η꿯□η

To꿯□ηaccomplish꿯□ηthis꿯□ηessential꿯□ηobligation,꿯□ηthe꿯□ηfish꿯□ηand꿯□ηwildlife
insist꿯□ηon꿯□ηan꿯□ηinitial꿯□ηset꿯□ηof꿯□ηbiological꿯□ηvalues,꿯□ηobjectives,꿯□ηconservation
conditions꿯□ηon꿯□ηcoordinated꿯□ηproject꿯□ηoperations꿯□ηthat꿯□ηare꿯□ηfulfill꿯□
must꿯□ηhave꿯□ηthe꿯□ηmeans꿯□ηof꿯□ηensuring꿯□ηthat꿯□ηthe꿯□ηimplementation
to꿯□ηachieve꿯□ηthat꿯□ηgoal꿯□ηthroughout꿯□ηits꿯□ηfifty꿯□ηyear꿯□ηterm.

We꿯□ηdo꿯□ηnot꿯□ηbelieve꿯□ηthat꿯□ηsatisfies꿯□ηthis꿯□ηsecond꿯□ηrequiremen
veto꿯□ηauthority꿯□ηover꿯□ηnecessary꿯□ηchanges꿯□ηin꿯□ηthe꿯□ηbiological꿯□ηobj
measures,꿯□ηadaptive꿯□ηmanagement꿯□ηstrategies,꿯□ηand꿯□ηthe꿯□ηterms꿯□ηand
BDCP꿯□ηitself,꿯□ηnot꿯□ηindependent꿯□ηregulatory꿯□ηbodies꿯□ηthe꿯□ηregulated꿯□ηentities꿯□
comprise꿯□ηthe꿯□ηAuthorized꿯□ηEntity꿯□ηGroup.꿯□η꿯□ηWe꿯□ηtherefore꿯□ηrecon
draft꿯□ηPlan꿯□ηto꿯□ηrequire꿯□ηthat꿯□ηall꿯□η"minor꿯□ηmodifications"꿯□ηand꿯□
BDCP꿯□ηbe꿯□ηsubject꿯□ηto꿯□ηreview꿯□ηand꿯□ηoversight꿯□ηby꿯□ηthe꿯□ηPer

As꿯□ηexplained꿯□ηabove,꿯□ηwe꿯□ηalso꿯□ηrecommend꿯□ηthat꿯□ηthe꿯□ηdraft꿯□η
the꿯□ηPermit꿯□ηOversight꿯□ηGroup꿯□ηitself꿯□ηto꿯□ηinitiate꿯□ηand꿯□ηmake꿯□η
objectives,꿯□ηconservation꿯□ηmeasures,꿯□ηand꿯□ηother꿯□ηadaptive꿯□ηmanagement꿯
the꿯□ηfish꿯□ηand꿯□ηwildlife꿯□ηagencies꿯□ηconclude꿯□ηare꿯□ηneeded꿯□ηto꿯□η
recovery꿯□ηof꿯□ηthe꿯□ηspecies꿯□ηlisted꿯□ηunder꿯□ηthe꿯□ηfederal꿯□ηand꿯□ηst
This꿯□ηunilateral꿯□ηauthority꿯□ηmust꿯□ηextend꿯□ηto꿯□ηall꿯□ηof꿯□ηthe꿯□ηiden
and꿯□ηto꿯□ηat꿯□ηleast꿯□ηone꿯□ηof꿯□ηthe꿯□ηvital꿯□ηfunctions꿯□ηmanagement
implementation꿯□ηschedules꿯□ηthat꿯□ηwill꿯□ηhave꿯□ηsignificant꿯□ηadverse꿯□ηeffects꿯□η
species"꿯□η(BDCP꿯□η꿯□η

The꿯□ηother꿯□ηlisted꿯□η"formal꿯□ηamendment꿯□ηprocedure"꿯□ηof꿯□ηthe꿯□ηgeographic
boundaries꿯□ηof꿯□ηthe꿯□ηPlan꿯□ηand꿯□ηthe꿯□ηaddition꿯□ηof꿯□ηare꿯□ηnew꿯□ηspecie
different,꿯□ηas꿯□ηthey꿯□ηinclude꿯□ηpossible꿯□ηchanges꿯□ηto꿯□ηthe꿯□ηscope꿯□
rather꿯□ηthan꿯□ηadaptive꿯□ηchanges꿯□ηto꿯□ηthe꿯□ηimplementation꿯□ηof꿯□ηthe꿯□ηmanagement
the꿯□ηexisting꿯□ηBDCP꿯□ηPlan꿯□ηtherefore꿯□ηproperly꿯□ηassessed꿯□η
꿯□η꿯□η꿯□η

"will involve the same process that was required for the
BDCP"- i.e., approval of both the Authorized Entity and the
Group (BDCP 47).[9]

Regulatory Assurances and the "No Surprises" Policy

Introduction

The draft Plan proposes to create two types of "regulatory
seeks to eliminate the uncertainties associated with consultation
the federal Endangered Species Act for coordinated CVP an
stipulating that biological opinions shall be consistent with the
conditions of the BDCP. Second, it offers "no surprises
deviations between the biological opinions and the BDCP a
the BDCP itself. [illegible] difficult scientific, legal,
political burdens on the state and federal governments' po
incidental take permits and to rescind the BDCP.

In our judgment, these regulatory assurances compel the
preceding section because they severely constrain the fish
ability to respond to inadequacies in the biological objectiv
measures, and other adaptive management strategies from the vet
authority that the Plan vests in the Authorized Entity Grou

Section 7 Consultation and the BDCP

According to the draft Plan, once the facilities authorized
constructed, the Plan will largely displace the existing secti
requirements applicable to coordinated CVP and SWP operations
the BDCP and the companion biological assessment, it is
NMFS will issue a new joint biological opinion (BiOp)
existing at that time. [illegible] addressed by the BD
(BDCP 2). The draft Plan then requires that the new
any subsequent biological opinions issued during the 50
consistent with the terms and conditions of the BDCP
BDCP itself:

> The BDCP is intended to meet the requirements of
> for regulatory coverage for a range of activities identifie

[9] The draft Plan also provides that, [illegible] public review and con
CEQA and NEPA compliance, [illegible] Section 7 consultation," and it requires the fi
agencies to use "reasonable efforts" to amendments with [illegible] days" is
probably insufficient time, however, to allow for section 7 consultation, internal
proposed formal amendments on listed species [illegible] public review, and the
completion of a [illegible]

It is also worth noting that even this limited "bilateral" approval process
BDCP may not be consistent with [illegible] NMFS Authorized Entity take permits
issued subject to the condition that the National Marine Fisheries Service reserves
provisions permit for just cause at any time during its term." 50 C.F

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Unless꿯otherwise꿯required꿯by꿯law꿯or꿯consultations꿯in꿯any꿯
related꿯to꿯a꿯covered꿯activity꿯or꿯associated꿯federal꿯action
USFWS꿯and꿯NMFS꿯will꿯each꿯ensure꿯that꿯the꿯resulting꿯
the꿯integrated꿯BiOp꿯for꿯the꿯BDCP꿯(BDCP꿯6

We꿯do꿯not꿯necessarily꿯believe꿯that꿯this꿯is꿯an꿯important꿯go
BDCP꿯is꿯to꿯provide꿯the꿯Authorized꿯Entities꿯measure꿯
of꿯regulatory꿯and꿯operational꿯certainty꿯that꿯will꿯enable꿯the
new꿯facilities꿯and꿯to꿯make꿯water꿯management꿯respective꿯serv
areas꿯in꿯reliance꿯on꿯water꿯deliveries꿯from꿯the꿯CVP꿯and
future꿯section꿯7꿯consultations꿯conform꿯to꿯the꿯terms꿯of꿯
enhanced.꿯꿯꿯We꿯also꿯note꿯the꿯enforceable꿯provisions꿯of꿯the꿯which
expressly꿯reserves꿯the꿯authority꿯of꿯USFWS꿯and꿯NMFS꿯to꿯
that꿯depart꿯from꿯the꿯terms꿯of꿯the꿯BDCP꿯if꿯necessary꿯
law.꿯꿯꿯This꿯law,꿯of꿯course,꿯includes꿯ESA꿯section꿯7(a)(2)꿯requires꿯of
all꿯consulting꿯agencies꿯to꿯ensure꿯that꿯their꿯actions꿯are꿯
continued꿯existence꿯of꿯any꿯endangered꿯species꿯or꿯threatened꿯
destruction꿯or꿯adverse꿯modification꿯of꿯U.S.꿯critical꿯habitat꿯(2).꿯꿯꿯꿯

We꿯do꿯believe,꿯however,꿯that꿯the꿯proposal꿯to꿯substitute꿯
consultation꿯as꿯the꿯principal꿯means꿯of꿯applying꿯the꿯federal
to꿯the꿯CVP,꿯SWP,꿯and꿯other꿯Authorized꿯Entities꿯reinforces
from꿯the꿯preceding꿯statement꿯the꿯Permit꿯Oversight꿯Group꿯must꿯
independent꿯regulatory꿯prerogatives꿯that꿯the꿯fish꿯and꿯wildlife
possess꿯and꿯must꿯have꿯authority꿯to꿯approve꿯or꿯to꿯den
biological꿯objectives,꿯conservation꿯measures,꿯and꿯other꿯terms꿯ar
BDCP꿯as꿯required꿯to꿯protect꿯and꿯recover꿯the꿯species꿯c
support꿯for꿯the꿯biological꿯opinion/BDCP꿯consistency꿯directive꿯sh
this꿯caveat꿯꿯꿯

"No꿯Surprises"꿯꿯꿯

The꿯draft꿯Plan꿯contains꿯two꿯"no꿯surprises"꿯guarantees.꿯꿯꿯꿯
in꿯coordinated꿯CVP꿯and꿯SWP꿯operations꿯or꿯water꿯supply꿯
required꿯by꿯future꿯biological꿯opinions꿯that꿯do꿯not꿯conform
is꿯a꿯more꿯general꿯"no꿯surprises"꿯commitment꿯that꿯protects
from꿯certain꿯changes꿯to꿯the꿯BDCP꿯itself

According꿯to꿯the꿯draft꿯Plan,꿯"Incorporated꿯꿯꿯꿯

6-31 [illegible] draft Plan [illegible] responses have been designed to be practical and roughly proportional to the impacts of covered species and natural communities, effectively [illegible] such events" (BDCP 3-106). The BDCP budget will include funds to implementing some [illegible] planned responses reasonably foreseeable" changed circumstances (BDCP 6-[illegible]).

The draft Plan also recognizes that "unforeseen circumstances" to the biological objectives, conservation measures, [illegible] or the terms and conditions of the BDCP itself. [illegible] It as changes in circumstances that affect a species or geogra HCP that could not reasonably have been anticipated by the development of the conservation plan, and that result adverse change in the status [illegible] & 50 C.F.R. § 222.102). The Draft Plan contains a similar definition circumstances" under state law [illegible] or more habitat, natural community, or the geographic area covered that could not reasonably have been anticipated [illegible] the and that result in a substantial adverse change in the species" (BDCP 6-[illegible]).

The draft Plan then sets forth the following regulatory state law:

> Under SAE regulations, if unforeseen circumstances arise during the BDCP, USFWS and/or NMFS may not require the additional land or financial compensation, or additional use of land, water, or other natural resources beyond the plan, the levels authorized Entities covered (BDCP 6-

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[11] The Implementation Office is charged with identifying the onset of a changed Permit Oversight Group to fashion a response, and for implementing and mo (BDCP 3-106).

[12] This funding process is characterized in the draft BDCP as "[illegible] generally that, to "allow for the ability to respond to changed circumstances Implementation Office should maintain a reserve fund for [illegible]" (BDCP 8-61). The plan explains that this is because "the [illegible] attached to tidal marsh and [illegible] remedial measures increases as of the conservation strategy are implemented." [illegible]

The draft BDCP only includes levee failure and wildfire damage to preserved circumstances for which responses are expected to result [illegible] additional implemen "changed circumstances related to climate change, flooding, failure of water operatio invasive species, new species listings, and toxic or hazardous spills," explaining are accounted for in the BDCP funding, will be paid by the state and fede surprises" guarantees, or would be the responsibility [illegible] a third party. BDC

> In the event of unforeseen circumstances, CDFW will land, water, or financial compensation or additional restr land, water or other natural resources without the conse participants for a period not to exceed the time specified in Agreement (BDCP 43).[13]

As noted above, for federal agencies that are subject to (including consultation coordinated CVP/SWP operations), the draft contains an additional "no surprises" pledge if new biologic operational or water supply restrictions that differ from th

> Furthermore, USFWS and NMFS will provide land, water, other natural resources, or financial compensation or add on the use of land, water, or other natural reso implementation of covered activities beyond the measures under the BDCP, the Implementing Agreement, permits, and incidental and the integrated HCP (BDCP 6

The purpose of these regulatory assurances is to exempt from any of the costs of complying with Species Federal Acts except as defined in (and funded pursuant to) the surprises" guarantees therefore may place the financial burden changes to the BDCP and project operations exclusively on taxpayers.

Although both federal Endangered Species Act regulations and Natural Community Conservation Planning Act authorize "no su we believe, given the uncertainties outlined in the previous significant risk that the costs of compensating the projects future "unforeseen" hydrologic, engineering, and operational changes excessive. More importantly, we are concerned that the governments' assumption of liability may deter the fish and wild making changes to future biological opinions or to the believe are necessary to protect and recover listed species. focusing on the "reasonably foreseeable" changed circumstance of climate illustrates our concerns.

The draft Plan defines climate change as sea level, watershed hydrology, precipitation, temperature (air or water), that are not effect assumed for the effects analy adversely affect conservation strategy implementation or covered considered a changed circumstance (BDCP 6). Often provides that

[13] The draft Plan notes that, under California law, the Department may approve a suitable substitute conservation strategy in lieu of the BDCP if it determines that the plan is not being implemented in a manner which CDFW determines that the plan is not being implemented in a manner consistent with the terms of the Implementation Agreement (BDCP 6). Fish & Game Code §

"occurrence 뀕 □ η of 뀕 □ η this 뀕 □ η changed 뀕 □ η circumstances 뀕 □ η will 뀕 □ η jointly 뀕 □ η by 뀕 □ η the
Implementation 뀕 □ η Guide 뀕 □ η fish 뀕 □ η and 뀕 □ η wildlife 뀕 □ η agencies 뀕 □ η (BDCP 뀕 □ η 6

According 뀕 □ η to 뀕 □ η the 뀕 □ η draft 뀕 □ η Plan, 뀕 □ η however, 뀕 □ η alterations 뀕 □ η in 뀕 □ η the 뀕 □
listed 뀕 □ η species 뀕 □ η caused 뀕 □ η by 뀕 □ η climate 뀕 □ η change 뀕 □ η will 뀕 □ η not 뀕 □ η trigger 뀕 □
regulatory 뀕 □ η responses 뀕 □ η beyond 뀕 □ η those 뀕 □ η set 뀕 □ η forth 뀕 □ η in 뀕 □ η the 뀕 □ η BDCP. 뀕
already 뀕 □ η anticipates 뀕 □ η the 뀕 □ η effects 뀕 □ η of 뀕 □ η climate 뀕 □ η change, 뀕 □ η no 뀕 □ η additio
required 뀕 □ η to 뀕 □ η remediate 뀕 □ η climate 뀕 □ η change 뀕 □ η effects 뀕 □ η on 뀕 □ η covered 뀕 □ η sp
communities 뀕 □ η in 뀕 □ η the 뀕 □ η system" 뀕 □ η (BDCP 뀕 □ η 6) Rather, 뀕 □ η the 뀕 □ η Adaptive 뀕 □ η
Management 뀕 □ η Team 뀕 □ η will 뀕 □ η monitor 뀕 □ η these 뀕 □ η changes 뀕 □ η and 뀕 □ η the 뀕 □ η Imp
"continually 뀕 □ η adjust 뀕 □ η conservation 뀕 □ η measures 뀕 □ η to 뀕 □ η the 뀕 □ η changing 뀕 □ η cond
Area 뀕 □ η as 뀕 □ η part 뀕 □ η of 뀕 □ η adaptive 뀕 □ η management 뀕 □ η program. 뀕 □ η (BDCP 뀕 □ η 6) 뀕 □ η

The 뀕 □ η draft 뀕 □ η Plan 뀕 □ η also 뀕 □ η states 뀕 □ η that 뀕 □ η will 뀕 □ η responses 뀕 □ η to 뀕 □ η climate
of 뀕 □ η the 뀕 □ η adaptive 뀕 □ η management 뀕 □ η and 뀕 □ η measures 뀕 □ η beyond 뀕 □ η those 뀕 □ η
contemplated 뀕 □ η by 뀕 □ η the 뀕 □ η adaptive 뀕 □ η management 뀕 □ η and 뀕 □ η monitoring 뀕 □ η prog
to 뀕 □ η be 뀕 □ η necessary 뀕 □ η because 뀕 □ η the 뀕 □ η conservation 뀕 □ η strategy 뀕 □ η was 뀕 □ η des
reasonable 뀕 □ η worst-□case 뀕 □ η scenario 뀕 □ η of 뀕 □ η climate 뀕 □ η change. 뀕 □ η *Conservation* 뀕 □ η
measures 뀕 □ η *in* 뀕 □ η *response* 뀕 □ η *to* 뀕 □ η *climate* 뀕 □ η *change* 뀕 □ η *beyond* 뀕 □ η *that* 뀕 □ η *consider*
Conservation 뀕 □ η Strategy 뀕 □ η *through* 뀕 □ η *the* 뀕 □ η *adaptive* 뀕 □ η *management* 뀕 □ η *and* 뀕 □ η *mo*
program 뀕 □ η *is* 뀕 □ η *considered* 뀕 □ η *an* 뀕 □ η *unforeseen* 뀕 □ η (BDCP 뀕 □ η 6) 뀕 □ η (emphasis 뀕 □ η added).

There 뀕 □ η are 뀕 □ η two 뀕 □ η issues 뀕 □ η with 뀕 □ η this 뀕 □ η changed 뀕 □ η circumstances 뀕 □ η strategy:

First, 뀕 □ η although 뀕 □ η the 뀕 □ η "biological 뀕 □ η goals 뀕 □ η and 뀕 □ η objectives 뀕 □ η [of 뀕 □ η the 뀕
established 뀕 □ η at 뀕 □ η the 뀕 □ η landscape 뀕 □ η level 뀕 □ η to 뀕 □ η take 뀕 □ η climate 뀕 □ η change 뀕
conservation 뀕 □ η strategy 뀕 □ η implementation," 뀕 □ η and 뀕 □ η consequently 뀕 □ η "□ η strategy, 뀕 □ η monitoring 뀕 □ η
and 뀕 □ η research 뀕 □ η program, 뀕 □ η and 뀕 □ η adaptive 뀕 □ η management 뀕 □ η and 뀕 □ η monitori
include 뀕 □ η responses 뀕 □ η to 뀕 □ η anticipate 뀕 □ η climate 뀕 □ η change 뀕 □ η and 뀕 □ η effects 뀕 □ η at 뀕 □ η th
community, 뀕 □ η and 뀕 □ η species 뀕 □ η scale, 뀕 □ η (BDCP 뀕 □ η 6) 뀕 □ η Plan 뀕 □ η fails 뀕 □ η to 뀕 □ η accurately 뀕 □ η an
that 뀕 □ η the 뀕 □ η biological 뀕 □ η objectives, 뀕 □ η conservation 뀕 □ η measures, 뀕 □ η and 뀕 □ η other
management 뀕 □ η strategies 뀕 □ η are 뀕 □ η likely 뀕 □ η to 뀕 □ η be 뀕 □ η modified 뀕 □ η over 뀕 □ η time
the 뀕 □ η changed 뀕 □ η conditions 뀕 □ η brought 뀕 □ η about 뀕 □ η by 뀕 □ η climate 뀕 □ η change. 뀕 □ η
previously, 뀕 □ η such 뀕 □ η modifications 뀕 □ η are 뀕 □ η subject 뀕 □ η to 뀕 □ η approval 뀕 □ η by 뀕 □ η
(BDCP 뀕 □ η 6) 뀕 □ η The 뀕 □ η fish 뀕 □ η and 뀕 □ η wildlife 뀕 □ η agencies 뀕 □ η consequently 뀕 □ η
authority 뀕 □ η to 뀕 □ η determine 뀕 □ η the 뀕 □ η appropriate 뀕 □ η policy 뀕 □ η and 뀕 □ η management
climate 뀕 □ η change, 뀕 □ η even 뀕 □ η when 뀕 □ η of 뀕 □ η the 뀕 □ η defined 뀕 □ η responses 뀕 □ η set 뀕 □ η
Chapter 뀕 □ η 3 뀕 □ η of 뀕 □ η the 뀕 □ η BDCP.

Second, 뀕 □ η changes 뀕 □ η in 뀕 □ η conservation 뀕 □ η measures 뀕 □ η that 뀕 □ η differ 뀕 □ η from 뀕 □ η
are 뀕 □ η "unforeseen 뀕 □ η circumstances," 뀕 □ η which 뀕 □ η trigger 뀕 □ η the 뀕 □ η "no 뀕 □ η surprises
while 뀕 □ η the 뀕 □ η draft 뀕 □ η Plan 뀕 □ η anticipates 뀕 □ η an 뀕 □ η broad 뀕 □ η array 뀕 □ η of 뀕 □ η ecological 뀕 □ η changes 뀕
caused 뀕 □ η by 뀕 □ η climate 뀕 □ η change, 뀕 □ η and 뀕 □ η lays 뀕 □ η out 뀕 □ η a 뀕 □ η detailed 뀕 □ η set
is 뀕 □ η folly 뀕 □ η to 뀕 □ η believe 뀕 □ η that 뀕 □ η the 뀕 □ η BDCP 뀕 □ η scientists 뀕 □ η and 뀕 □ η negotia

[14] 뀕 □ η Reiterate 뀕 □ η here 뀕 □ η the 뀕 □ η problems 뀕 □ η that 뀕 □ η we 뀕 □ η identified 뀕 □ η in 뀕 □ η the 뀕 □ η preceding 뀕 □ η section: 뀕 □ η
agencies' 뀕 □ η regulatory 뀕 □ η and 뀕 □ η programmatic 뀕 □ η roles 뀕 □ η and 뀕 □ η the 뀕 □ η granting 뀕 □ η of 뀕 □ η an 뀕 □ η effective 뀕 □ η
through 뀕 □ η the 뀕 □ η Implementation 뀕 □ η Office.

all 뀕 □ η of 뀕 □ η the 뀕 □ η [illegible] 뀕 □ η [illegible] 뀕 □ η [illegible]

even꿯□ηthough꿯□ηthe꿯□ηfish꿯□ηand꿯□ηwildlife꿯□ηagencies꿯□ηdetermined꿯□ηthat꿯□ηthis꿯
protect꿯□ηone꿯□ηor꿯□ηmore꿯□ηlisted꿯□ηspecies꿯□ηfrom꿯□ηextinction꿯□η(while꿯
releases꿯□ηand꿯□ηexports꿯□ηat꿯□ηthe꿯□ηlevels꿯□ηand꿯□ηtiming꿯□ηauthorized꿯□

Alternatively,꿯□ηif꿯□ηfunding꿯□ηwere꿯□ηto꿯□ηconstruct꿯□ηthe꿯□ηnew꿯□ηstora
and꿯□ηthe꿯□ηfish꿯□ηand꿯□ηwildlife꿯□ηagencies꿯□ηmade꿯□ηjeopardy꿯□ηfindings꿯
opinions꿯□ηthat꿯□ηaltered꿯□ηreservoir꿯□ηrelease꿯□ηrequirements꿯□ηin꿯□ηa꿯□ηm
water꿯□ηsupply꿯□ηor꿯□ηexport꿯□ηcapacity,꿯□ηthe꿯□ηgovernments꿯□ηwould꿯□ηhave
compensate꿯□ηthe꿯□ηAuthorized꿯□ηEntities꿯□ηfor꿯□ηthe꿯□ηvalue꿯□ηof꿯□ηthe꿯□
replacement꿯□ηsupplies.[15]꿯□η

For꿯□ηthese꿯□ηreasons,꿯□ηwe꿯□ηdo꿯□ηnot꿯□ηbelieve꿯□ηthat꿯□ηguarantees꿯□η
wise꿯□ηor꿯□ηprudent꿯□ηinvestment꿯□ηthat꿯□ηAuthorized꿯□ηEntities꿯□ηseek꿯
their꿯□ηcapital꿯□ηinvestment꿯□ηand꿯□ηobtain꿯□ηmaximum꿯□ηsecurity꿯□ηof꿯□ηth
capabilities,꿯□ηand꿯□ηthat꿯□ηa꿯□ηrelatively꿯□ηfixed꿯□ηset꿯□ηof꿯□ηbiological꿯□η
measures,꿯□ηand꿯□ηoperational꿯□ηconstraints꿯□ηachieve꿯□ηthese꿯□ηgoals꿯□η(BDCP꿯
a꿯□η50-year꿯□ηcommitment꿯□ηwith꿯□ηan꿯□ηecosystem꿯□ηas꿯□ηcomplex,꿯□ηvari
scientifically꿯□ηinscrutable꿯□ηas꿯□ηthe꿯□ηDelta.꿯□η꿯□ηAs꿯□ηour꿯□ηcolleague꿯□
the꿯□ηDelta꿯□ηEcosystem꿯□ηRestoration꿯□ηPlans꿯□ηin꿯□ηadvance꿯□ηis꿯□ηunlikely꿯□ηto
adequate꿯□ηresponsiveness꿯□ηand꿯□ηflexibility꿯□ηto꿯□ηmost꿯□ηevent
scientifically꿯□ηbased꿯□ηmanagement꿯□ηwill꿯□ηsurprise꿯□ηand꿯□ηmake꿯□ηmistakes”꿯
(From꿯□ηMoyle꿯□ηet꿯□ηal.,꿯□η2012).

The꿯□ηparties꿯□ηto꿯□ηthe꿯□ηBDCP꿯□ηnegotiations꿯□ηtherefore꿯□ηshould꿯□ηcons
surprises”꿯□ηguarantees꿯□ηgoverning꿯□ηconstruction꿯□ηof꿯□ηthe꿯□ηBDCP꿯□ηproje
series꿯□ηof꿯□ηoperational꿯□η“no꿯□ηsurprises”꿯□ηcommitments꿯□ηthat꿯□ηwould꿯□

[15] During꿯□ηthe꿯□ηJuly꿯□η23,꿯□η2013,꿯□ηmeeting꿯□ηwith꿯□ηDWR꿯□ηDirector꿯□ηMark꿯□ηCowin꿯□ηand꿯□η
Director꿯□ηCowin꿯□ηstated꿯□ηthat꿯□ηit꿯□ηwas꿯□ηnot꿯□ηthe꿯□ηparties’꿯□ηintent꿯□ηto꿯□ηapply꿯□ηthe꿯□
outside꿯□ηthe꿯□ηplan꿯□ηarea꿯□ηthat꿯□ηmay꿯□ηaffect꿯□ηsequoia꿯□ηnotes꿯□ηwarning꿯□ηor꿯□ηother꿯□ηchang
conditions꿯□ηon꿯□ηlisted꿯□ηspecies.꿯□η꿯□ηAlthough꿯□ηwe꿯□ηwere꿯□ηpleased꿯□ηto꿯□ηlearn꿯□ηthis,꿯□ηw
text꿯□ηfor꿯□ηtwo꿯□ηreasons:꿯□ηFirst,꿯□ηthe꿯□ηdraft꿯□ηPlan꿯□ηdoes꿯□ηnot꿯□ηstate꿯□ηthat꿯□ηthe꿯□ηinfr
to꿯□ηensure꿯□ηthe꿯□ηsurvival꿯□ηof꿯□ηspecies꿯□ηcovered꿯□ηby꿯□ηthe꿯□ηBDCP꿯□ηare꿯□ηexempt꿯□ηfrom꿯
located꿯□ηoutside꿯□ηthe꿯□ηplan꿯□ηarea.꿯□η꿯□ηRather,꿯□ηthe꿯□ηdraft꿯□ηlinks꿯□ηCVP꿯□ηand꿯□ηSWP꿯□ηfa
upstream꿯□ηof꿯□ηthe꿯□ηplan꿯□ηthe꿯□ηconservation꿯□ηmeasures꿯□ηthat꿯□ηmay꿯□ηbe꿯□ηrequired꿯□ηto꿯□ηp
their꿯□ηdownstream꿯□ηhabitat.[16] 꿯□η꿯□ηBDCP꿯□ηwithout꿯□ηan꿯□ηexplicit꿯□ηlimitation꿯□ηon꿯□ηthe꿯□η“no꿯□ηsurpr
“unforeseen”꿯□ηconservation꿯□ηmeasures꿯□ηundertaken꿯□ηwithin꿯□ηthe꿯□ηplan꿯□ηarea꿯□ηthat꿯□ηthere꿯□ηis꿯□ηan
risk꿯□ηthat꿯□ηthe꿯□ηAuthorized꿯□ηEntities꿯□ηcould꿯□ηraise꿯□ηa꿯□ηplausible꿯□ηclaim꿯□ηthat꿯□ηthe꿯□η“no
liability꿯□ηfor꿯□ηnew꿯□ηfacilities꿯□ηand꿯□ηoperational꿯□ηchanges꿯□ηupstream꿯□ηof꿯□ηprotected꿯□ηcovered꿯□ηarea꿯
species꿯□ηwithin꿯□ηthe꿯□ηplan꿯□ηarea.

Second,꿯□ηthe꿯□ηdraft꿯□ηPlan꿯□ηexpressly꿯□ηextends꿯□ηthe꿯□η“no꿯□ηsurprises”꿯□ηassurance꿯□ηfor꿯□ηfut
new꿯□ηfacilities꿯□ηand꿯□ηother꿯□ηchanges꿯□ηin꿯□ηCVP꿯□ηoperations꿯□ηthat꿯□ηare꿯□ηoutside꿯□ηthe꿯□η
covered꿯□ηactivities.꿯□η꿯□ηThe꿯□ηdraft꿯□ηPlan꿯□ηstipulates꿯□ηthat꿯□η“USFWS꿯□ηand꿯□ηNMFS꿯□ηwill꿯□
BiOp꿯□ηissued꿯□ηin꿯□ηconnection꿯□ηwith꿯□ηprojects꿯□ηthat꿯□ηare꿯□ηindependent꿯□ηof꿯□ηthe꿯□ηcovered
actions꿯□ηdo꿯□ηnot꿯□ηresult꿯□ηin꿯□ηany꿯□ηadditional꿯□ηobligation,꿯□ηcost,꿯□ηor꿯□ηexpense꿯□ηto꿯□ηthe꿯□ηA
44).꿯□η

If꿯□ηthe꿯□ηparties꿯□ηto꿯□ηthe꿯□ηBDCP꿯□ηnegotiations꿯□ηdo꿯□ηnot꿯□ηintend꿯□ηfor꿯□ηthe꿯□η“no꿯□ηsurp
and꿯□ηproject꿯□ηoperational꿯□ηchanges꿯□ηto꿯□ηthe꿯□ηplan꿯□ηarea꿯□ηthey꿯□ηplan꿯□ηshould꿯□ηrevise꿯□ηthe꿯□ηdraft꿯□ηPlan꿯□η
and꿯□ηclearly.꿯□η꿯□ηWe꿯□ηalso꿯□ηrecommend꿯□ηthat꿯□ηthe꿯□ηsentence꿯□ηquoted꿯□ηabove,꿯□ηwhich꿯□
all꿯□ηcosts꿯□ηassociated꿯□ηwith꿯□ηsection꿯□η7꿯□ηconsultations꿯□ηas꿯□ηto꿯□ηprojects꿯□ηthat꿯□ηBDCP꿯□ηcovered꿯□η
activities꿯□ηbe꿯□ηdeleted.

ten years based on information on the appropriateness of the
objectives, the success or failure of the conservation measu
recovery, overall ecosystem health, climate change, invasive spe
effects of authorized operations, other stressors, and regulatory

We have chosen ten years for the recommended length
assurances because a ten-year period is likely to include a variet
of water years. It may be difficult for lengthy to enable BDCP
regulators to evaluate how well the biological objectives an
perform across a spectrum of hydrologic conditions. At
short enough to minimize the risk and conditions of th
become antiquated and ineffective in light of the inevitable
changes to the ecosystem. Indeed, "no surprises" renewal
guarantees could create a construct where participants lose the BDCP
monitor progress and achievement of the biological objectives
measures and to make adaptive management changes as re
recover the covered species[16] and their habitat.

Revocation of Incidental Take Permits and the BDCP

Many of our concerns about the rigidities of the draft
of the regulatory assurances would be lessened if there
revoking the incidental take permits and [illegible]

As described in the draft Plan, the "Permit Revocation
allows the federal fish and wildlife agencies to "revoke
granted under the No Surprises rule and revoke the S
specified instances, including where continuation of a permitted
jeopardize the continued existence of a species covered by
the permitted activity on the species has not been rem
(BDCP 48-16). quoted Dec. 20, 2012). The draft Plan states,

[16] Where is nothing in federal or state law that requires that the term
coextensive with the term of the HCP/NCCP. Indeed, the California Natural
Act requires that the duration of all regulatory assurances be based on
scientific understanding of the covered species and their habitat. California Fis
that the CDFW's determination of the level of assurances and the time limits spec
agreement for assurances may be based on localized conditions and shall co

(A) The level of knowledge of the status of the covered species a

(B) The adequacy of analysis of the impact of take on covered sp

(C) The use of the best available science to make assessments about
of mitigation strategies, and the appropriateness of monitoring

(D) The appropriateness of the size and duration of the plan with

*

(H) The size and duration of the plan.

however, the USFWS or NMFS will begin the revocation pro
determined that the continuation of a covered activity will
likelihood of jeopardy and recovery of one or more covered
remedy [other than revocation] can be found [49 Cal. Reg.
implemented"

Similarly, under the California Natural Communities Conservation
Department of Fish and Game [will] state [incidental take perm
necessary to avoid jeopardizing the continued existence of
49: citing California Fish & Game Code § 2820(c)[17] fish
wildlife agencies also may [authorized permittees] fail to
their obligations under the BDCP, but only following the
set forth [implementing agreement] the Implementation Office
and Authorized Entities with a [reasonable opportunity
responsive action" [Id. § 6
Before the fish and wildlife agencies may revoke the in
follow a variety of procedures and substantive standards. [
determining, in concert with [the Implementing changes can be
made to the conservation strategy [to remedy the situation
additional voluntary implementation actions that the Authorized
undertake to remedy [the situation.

More importantly, [the draft Plan also requires the federal fish
to determine whether they or some other agencies can
survival of the listed species, rather than imposing such
the Authorized Entities:

> The USFWS or NMFS will determine whether the fis
> other state and federal agencies can undertake actions
> situation. [The] determination must be based on a thorou
> available practices concerning population status and the ef
> multiple federal and non-federal actions affecting [that the fish
> *wildlife agencies have available a wide array of autho*
> *can be used to provide additional protection for the*
> *and federal agencies* [emphasis added).

The draft Plan thus makes it difficult for the fish
incidental take permits if the biological objectives, conservation
adaptive management changes do not achieve their primary
recovering the listed species. [Procedural and substantive

[17] Section 2820(c) actually addresses [a] more [limited provision] for [suspension or
or revocation if a plan participant fails to "maintain the proportionality betw
measures specified in the implementation agreement and does not either cure
enter into [an agreement] with the department within 45 days to expeditiously cure
Game Code § 2820(c). The more general revocation [standard] [set forth

reason꿯□ηto꿯□ηdoubt꿯□ηthis꿯□ηlast꿯□ηline꿯□ηof꿯□ηdefense꿯□ηagainst꿯□ηextinc
lead꿯□ηus꿯□ηto꿯□ηthe꿯□ηconclusion꿯□ηthat꿯□ηpermit꿯□ηrevocation꿯□ηis꿯□ηnot
of꿯□ηensuring꿯□ηthe꿯□ηsurvival꿯□ηof꿯□ηthe꿯□ηspecies꿯□ηif꿯□ηthe꿯□ηBDCP꿯□

First,꿯□ηneither꿯□ηthe꿯□ηfederal꿯□ηfish꿯□ηand꿯□ηwildlife꿯□ηagencies꿯□ηnor꿯□η
Fish꿯□ηand꿯□ηWildlife꿯□ηhave꿯□ηever꿯□ηrevoked꿯□ηan꿯□ηincidental꿯□ηtake꿯□η
one꿯□ηcase꿯□ηin꿯□ηwhich꿯□ηa꿯□ηfederal꿯□ηincidental꿯□ηtake꿯□ηpermit꿯□ηhas
for꿯□ηthe꿯□ηpermittee's꿯□ηviolation꿯□ηof꿯□ηthe꿯□ηterms꿯□ηand꿯□ηconditions꿯□
plan,꿯□ηrather꿯□ηthan꿯□ηbecause꿯□ηof꿯□ηchanges꿯□ηin꿯□ηecological꿯□ηconditior
failure꿯□ηto꿯□ηagree꿯□ηto꿯□ηamendments꿯□ηto꿯□ηthe꿯□ηbiological꿯□ηobjectives
measures[18].꿯□ηRevocation꿯□ηof꿯□ηthe꿯□ηincidental꿯□ηtake꿯□ηpermits꿯□ηcovered꿯
therefore꿯□ηwould꿯□ηbe꿯□ηin꿯□ηand꿯□ηnot꿯□ηarbitrary꿯□ηand꿯□ηcapricious.

Second,꿯□ηa꿯□ηdecision꿯□ηto꿯□ηrevoke꿯□ηthe꿯□ηincidental꿯□ηtake꿯□ηpermits꿯□
scientific꿯□ηdetermination꿯□ηthat꿯□ηas꿯□ηthe꿯□ηBDCP꿯□ηtoday꿯□ηand꿯□ηimplemented꿯□
future꿯□ηdate꿯□ηduring꿯□ηthe꿯□ηtestimony꿯□ηnot꿯□ηadequate꿯□ηto꿯□ηensure꿯□ηthe꿯□
and꿯□ηrecovery꿯□ηof꿯□ηthe꿯□ηlisted꿯□ηspecies.꿯□η꿯□ηAlthough꿯□ηthe꿯□ηBDCP
revoke꿯□ηthe꿯□ηstate꿯□ηincidental꿯□ηtake꿯□ηpermit꿯□ηto꿯□ηthe꿯□ηDirector꿯□η
of꿯□ηFish꿯□ηand꿯□ηWildlife꿯□ηthe꿯□ηBDCP꿯□ηstipulates꿯□ηshall꿯□ηto꿯□ηany꿯□ηrevoke꿯□ηone꿯□η
both꿯□ηfederal꿯□ηpermits꿯□ηmust꿯□ηbe꿯□ηin꿯□ηwriting꿯□ηand꿯□ηmust꿯□ηbe꿯
Interior꿯□ηor꿯□ηthe꿯□ηSecretary꿯□ηof꿯□ηCom꿯□ηcase꿯□ηmay꿯□η꿯□ηthe꿯□η(BDC
our꿯□ηjudgment,꿯□ηthis꿯□ηposes꿯□ηan꿯□ηundue꿯□ηrisk꿯□ηthat꿯□ηthe꿯□ηrevoca
on꿯□ηscientific꿯□ηand꿯□ηtechnical꿯□ηconsiderations.꿯□η꿯□ηIndeed,꿯□ηthere꿯□ηwould꿯□ηseem꿯□
purpose꿯□ηfor꿯□ηelevating꿯□ηthe꿯□ηrevocation꿯□ηauthority꿯□ηfrom꿯□ηthe꿯□ηfisl
the꿯□ηtwo꿯□ηCabinet꿯□ηSecretaries.

For꿯□ηthese꿯□ηreasons,꿯□ηwe꿯□ηdo꿯□ηnot꿯□ηbelieve꿯□ηthat꿯□ηthe꿯□ηrevoke꿯□η
the꿯□ηincidental꿯□ηtake꿯□ηpermits꿯□ηcompensates꿯□ηfor꿯□ηthe꿯□ηdeficiencies꿯□
described꿯□ηabove.

Conclusion꿯□η

We꿯□ηconclude꿯□ηthat꿯□ηgovernance꿯□ηstructure꿯□ηset꿯□ηforth꿯□ηin꿯□ηthe꿯□
"transparent꿯□ηbasis꿯□ηment꿯□ηto꿯□ηpolitical꿯□ηand꿯□ηspecial꿯□ηinterest꿯□ηinfluence
undermines꿯□ηthe꿯□ηauthority꿯□ηof꿯□ηthe꿯□ηfederal꿯□ηand꿯□ηstate꿯□ηfish꿯□η
assigning꿯□ηthem꿯□ηprogram꿯□ηresponsibilities꿯□ηand꿯□ηby꿯□ηgranting꿯□ηthe꿯□
veto꿯□ηpower꿯□ηover꿯□ηchanges꿯□ηbiological꿯□ηobjectives,꿯□ηconservation꿯□ηmeasur
adaptive꿯□ηmanagement꿯□ηstrategies꿯□ηthat꿯□ηmay꿯□ηbe꿯□ηneeded꿯□ηto꿯□ηens
achieves꿯□ηits꿯□ηstated꿯□ηgoals.꿯□η꿯□ηTo꿯□ηaddress꿯□ηthis꿯□ηdeficiency,꿯□ηw
be꿯□ηrevised꿯□ηto꿯□ηremove꿯□ηthe꿯□ηDepartment꿯□ηof꿯□ηoversight꿯□ηdecisionmaking꿯□η
to꿯□ηclarify꿯□ηthe꿯□ηregulatory꿯□ηauthority꿯□ηof꿯□ηthe꿯□ηfish꿯□ηand꿯□ηwildl
BDCP꿯□ηand꿯□ηin꿯□ηtheir꿯□ηindependent꿯□ηroles꿯□ηas꿯□ηprincipal꿯□ηregulator

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꿯□η꿯□η꿯□η

state꿲□ηEndangered꿲□ηSpecies꿲□ηActs꿲□ηand꿲□ηthe꿲□ηCommunity꿲□ηConservation꿲□η
Planning꿲□ηAct.η

We꿲□ηalso꿲□ηbelieve꿲□ηthat꿲□ηthe꿲□ηregulatory꿲□ηassurances꿲□ηcontained꿲□ηin
jeopardize꿲□ηthe꿲□ηability꿲□ηof꿲□ηthe꿲□ηfish꿲□ηand꿲□ηwildlife꿲□ηagencies꿲□η
conditions꿲□ηthat꿲□ηmay꿲□ηrequire꿲□ηfuture꿲□ηgical꿲□ηrevisions꿲□ηto꿲□ηobjectives꿲□ηand꿲□ηbiolo
conservation꿲□ηmeasures꿲□ηof꿲□ηthe꿲□ηBDCP.꿲□η꿲□η꿲□ηThey꿲□ηwould꿲□ηsurprise꿲□η
state꿲□ηand꿲□ηfederal꿲□ηgovernments꿲□ηwould꿲□ηassume꿲□ηthe꿲□ηfinancial꿲□η
infrastructure꿲□ηand꿲□ηregulatory꿲□ηchanges꿲□ηin꿲□ηCVP/SWP꿲□ηoperations꿲□ηn
the꿲□ηfish꿲□ηchanged꿲□ηcircumstances꿲□ηnot꿲□ηprovided꿲□ηfor꿲□ηespecially꿲□ηthe꿲□ηE
troubling.꿲□η꿲□ηTo꿲□ηaddress꿲□ηthis꿲□ηproblem,꿲□ηwe꿲□ηwere꿲□ηcommended꿲□ηthat꿲□η
surprises”꿲□ηguarantees꿲□ηbe꿲□ηconverted꿲□ηinto꿲□ηa꿲□ηseries꿲□ηof꿲□ηrenewa
to꿲□ηcover꿲□ηconstruction꿲□ηprojects꿲□ηauthorized꿲□ηby꿲□ηthe꿲□ηBDCP꿲□ηanc
cover꿲□ηproject꿲□ηoperations꿲□ηfor꿲□ηyears꿲□ηsequential꿲□ηten

Finally,꿲□ηalthough꿲□ηthe꿲□ηfish꿲□ηand꿲□ηwildlife꿲□ηagencies꿲□ηretain꿲□ηthe꿲□η
incidental꿲□ηtake꿲□ηpermits꿲□ηthus꿲□ηto꿲□ηrescind꿲□ηnecessary꿲□ηBDCP꿲□ηto꿲□ηavoid꿲□η
jeopardizing꿲□ηany꿲□ηlisted꿲□ηspecies,꿲□ηthe꿲□ηdraft꿲□ηPlan꿲□ηmakes꿲□ηit꿲□η
the꿲□ηfederal꿲□ηagencies꿲□ηto꿲□ηtake꿲□ηaction꿲□ηagainst꿲□ηother꿲□ηstressors꿲
determine꿲□ηthat꿲□ηit꿲□ηis꿲□ηnecessary꿲□ηto꿲□ηrevoke꿲□ηor꿲□ηalter꿲□ηthe꿲□ηterms꿲□ηof꿲□ηthe꿲□η
revocation꿲□ηdecision꿲□ηfrom꿲□ηthe꿲□ηfederal꿲□ηagencies꿲□ηthemselves꿲□ηand꿲□η
Cabinet-level꿲□ηSecretaries꿲□ηin꿲□ηwhose꿲□ηDepartment꿲□ηthe꿲□ηfish꿲□ηand꿲□η
located.꿲□η꿲□ηWe꿲□ηbelieve꿲□ηthat꿲□ηthese꿲□ηheightened꿲□ηrequirements꿲□ηand
reduce꿲□ηthe꿲□ηlikelihood꿲□ηthat꿲□ηpermit꿲□ηrevocation꿲□ηwould꿲□ηserve꿲□ηa
the꿲□ηevent꿲□ηthat꿲□ηthe꿲□ηBDCP꿲□ηfails꿲□ηto꿲□ηachieve꿲□ηits꿲□ηoverriding
survival꿲□ηand꿲□ηcontributing꿲□ηto꿲□ηthe꿲□ηrecovery꿲□ηof꿲□ηthe꿲□ηspecies.꿲□η
permit꿲□ηrevocation꿲□ηstrengthen꿲□ηour꿲□ηconclusions꿲□ηthat꿲□ηthe꿲□ηgovernan
described꿲□ηthroughout꿲□ηthis꿲□ηchapter꿲□ηbe꿲□ηrepaired꿲□ηso꿲□ηthat꿲□ηthe
retain꿲□ηthe꿲□ηauthority꿲□ηto꿲□ηinsist꿲□ηon꿲□ηchanges꿲□ηto꿲□ηthe꿲□ηbiologi
conservation꿲□ηmeasures꿲□ηof꿲□ηthe꿲□ηBDCP꿲□ηas꿲□ηrequired꿲□ηto꿲□ηachieve꿲□η
recovery.꿲□η

꿲□η

CHAPTER 9: SCIENCE AND ADAPTIVE MANAGEMENT

Introduction

From the outset BDCP makes it basic and that adaptive management principles of adaptive management. The plan recognizes the measures that are designed the plan goals and objectives uncertainty and that measures used to implement them will adjustment and refinement. Indeed, given the unprecedented will most certainly fail without investments in a program of monitoring linked to a robust adaptive management program change course.

At the time of this review, the science and adaptive BDCP was, by the project sponsors, work in progress of the key elements yet to be determined. We br information with the understanding that these elements are possibly considerably, before the public draft is released

Adaptive Management Program

The plan documents recognize that BDCP is compelled to standards for adaptive management of the program (summarize BDCP). This includes requirements of the USFWS and NMFS adaptive management (65 FR 35257; 50 CFR 402.14) requirements for monitoring and adaptive management programs (Fish & Game (8), and the requirements of the Endangered Species Act for management of all ecosystem management programs in the Code § 8302(f)).

The BDCP documents the adaptive management cycle involving: *plan*, where management problems are recognized leading action to test management actions, plans are implemented, acco by monitoring *evaluation*, where monitoring information is evaluated effectiveness, and information learned initiates anew the planni cycle. As described in BDCP, the adaptive management closely aligned to the approach codified in the Delta P Plan.

Governance and Implementation of Adaptive Management

BDCP envisions that its adaptive management program by its Implementation Office. The office will be run by hired by the Authorized Entity Group (AEG). The AEG Reclamation, and the state and federal water contractors.

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selects꿹 꿹 꿹

Second, the AMT is made up of [illegible] as the main [illegible] scientific [illegible] regulator providers such as IEP and DSP. This places the [illegible] being decisionmakers, creating clear conflicts of interest. [illegible] discussed below, this eliminates one of [illegible] these [illegible] important support of adaptive management: scientific independence.

Adaptive Capacity

The AMT, with approval from the POG, AEG or higher [illegible] will oversee implementation of the adaptive management program through [illegible] Manager. A central issue likely to arise [illegible] the adaptive flexibility available. All such programs have [illegible] wanting to provide [illegible] how much water will be [illegible] Delta—and [illegible] flexibility in amount and timing of exports [illegible] implement adaptive management programs. The current BDCP [illegible] little to no guidance on adaptive capacity. This is [illegible] adjustments are made [illegible] more importantly, how [illegible] time operations (an element of adaptive management) are [illegible] sought to defer this decision, both within the document [illegible] process (discussed below). [illegible]

Science Program

Science should underpin the discussions and information needed [illegible] implement adaptive management decisions. The extensive [illegible] management cites a [illegible] science and monitoring [illegible] program as essential for management. The BDCP documents [illegible] provide extensive information about science to support adaptive [illegible] other than a solid commitment to build and support a [illegible] in the EIR/EIS, a significant funding [illegible] science program would be run by the Science Manager [illegible] Program Manager and the AEG. The role of the [illegible] an array of activities, guide synthesis and analysis, and [illegible] numerous public and private institutions working on the [illegible] are few specifics. [illegible]

BDCP's current efforts on science have come in for [illegible] entities, including the National Research Council (2012), [illegible] the [illegible] Science Board (Memo to Delta Stewardship Council dated [illegible] Public Policy Institute of California (Hanak et al., 2013, [illegible] the project proponents recognize that the BDCP [illegible] science [illegible] progress and likely to change before the public draft [illegible] However, several significant issues will need to be resolved [illegible]

- *Integration*: the National Research Council in its review [illegible] highly critical of [illegible] scientific efforts in the [illegible] NRC and others have pointed out that coordination [illegible] integration. BDCP [illegible] opportunity to reorganize [illegible] science in the Delta to make [illegible] integrated [illegible]

addressing the major issues of the day. As stru
stand-alone science program that seeks to coordinate wit
such as IEP and DSP, rather than to integrate th
successful.

- *Independence*: As noted above, the AMT blurs the dis
makers, regulated entities, and the providers of science
In addition, the BDCP science program is, in effect,
entities and lacks independence. This creates the potential for
selection of what science gets funded and what is
to the public. Given that most major disputes i
differences of opinion in court about the best availal
demonstrating scientific integrity and transparency should be
priority.

- *Oversight*: As currently structured, there is no independent
BDCP science program. There is a review mechanism to
scientific or technical products and plans. In addition, there
coordinating with the existing DSP and the Delta Inc
But oversight, which is essential for creating public
available science is being made, is currently absent
from the plan.

- *Funding*: Science is expensive, and for a program this
likely to be expensive. There are no discussions regardin
BDCP plan documents. However, in draft the BDCP administra
are substantial commitments to funding a science progra
categories of funding (monitoring, research, etc.), but litt
how it would be distributed, organized and administered
commitment is significant and necessary.

To be effective, during revision of the plan documents,
the considerable weaknesses in science governance, integration
programs, independence and transparency, oversight is
a parallel process underway, led by the DSC, to develo
science in the Delta. This "One Delta, One Science" of
BDCP. It seems to us that an integrated science effor
the Delta Science Plan, if not led by the DSP.
involvement with this planning process.

Decision Trees

Earlier chapters of this review note that most controversia
with high scientific uncertainty, are proposed to be resolve
management *(i.e., adaptive)*. One of the most important decision
operations of the dual export facilities approximately ten y
HCP/NCCP permit. The operations are to be based on

how꿲□ηto꿲□ηmeet꿲꿲ηthe꿲□ηgoals꿲□ηof꿲□ηecosystem꿲□ηbenefit꿲□ηand꿲□ηwater꿲□ηs
of꿲□ηmeet꿲□ηthe꿲□ηHCP/NCCP꿲□ηconservation꿲꿲□ηstandards.

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second,꿲□ηembedded꿲□ηwithin꿲□ηthe꿲□ηagency꿲□ηred꿲□ηflag꿲□ηcomments꿲□ηan
that꿲□ηthese꿲□ηsteps꿲□ηare꿲□ηinsufficient꿲□ηand꿲□ηthat꿲□ηlower꿲□ηexports꿲□
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affects꿲□ηthe꿲□ηeconomic꿲□ηviability꿲□ηof꿲□ηwater꿲꿲ηsupplied꿲□ηfrom꿲□ηthe꿲

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contentious꿯□ηpublic꿯□ηengagement꿯□ηeffort꿯□ηwill꿯□ηbe꿯□ηneeded.꿯□η꿯
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Conclusion꿯□η

The꿯□ηdraft꿯□ηdocumentation꿯□ηprovided꿯□ηby꿯□ηBDCP꿯□ηmakes꿯□ηa꿯□ηstrong
principles꿯□ηof꿯□ηadaptive꿯□ηmanagement꿯□ηsupported꿯□ηby꿯□ηa꿯□ηrobust꿯□η
the꿯□ηcomplexity꿯□ηof꿯□ηBDCP꿯□ηand꿯□ηthe꿯□ηgreat꿯□ηscientific꿯□ηuncertainti
the꿯□ηcentral꿯□ηelements꿯□ηof꿯□ηBDCP,꿯□ηthis꿯□ηis꿯□ηabsolutely꿯□ηnecessary꿯
described,꿯□ηthe꿯□ηBDCP꿯□ηadaptive꿯□ηmanagement꿯□ηprogram꿯□ηeither꿯□ηlacks

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We꿯□ηrecommend꿯□ηthat꿯□ηBDCP꿯□ηseek꿯□ηsubstantive꿯□ηengagement꿯□η(beyon with꿯□ηthe꿯□ηongoing꿯□ηefforts꿯□ηby꿯□ηthe꿯□ηDelta꿯□ηDelta꿯□ηSciences꿯□ηand꿯□ηstakeholders꿯□ηto꿯□ηdevelo Delta꿯□ηScience꿯□ηPlan.꿯□η꿯□ηThe꿯□ηgoal꿯□ηshould꿯□ηbe꿯□ηto꿯□ηintegrate꿯□ η management꿯□ηinto꿯□ηthe꿯□ηbroader꿯□ηscience꿯□ηinfrastructure꿯□ηof꿯□ηthe꿯□η construct꿯□ηa꿯□ηnew꿯□ηscience꿯□ηorganization.꿯□ηBDCP꿯□ηneeds꿯□ηto꿯□η revisit꿯□ηhow꿯□ηadaptive꿯□ηmanagement꿯□ηdecisions꿯□ηare꿯□ηmade,꿯□ηreallocati decisionmaking꿯□ηauthorities.꿯□η

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Chapter 10: Summary and Recommendations

Introduction

We present a narrow review of aspects of BDCP that are federally listed fishes. We identify both strengths and [illegible] conservation measures in its effort to balance water supply [illegible] ecosystem goals [illegible] Due to time and resource limits [illegible] incomplete. We did not examine all issues associated [illegible] example, we did not evaluate habitat restoration on the [illegible] we evaluate conservation [illegible] covered fishes, giving limited [illegible] Sacramento splittail, San Joaquin steelhead, sturgeon and lamp[illegible] focused on the conservation measures [illegible] winter Chinook salmon, delta smelt, [illegible] are the most controversial and have greatest impacts on water sup[illegible] focused on a limited subset of the alternatives listed in [illegible] Early Long Term conditions [illegible] Outflow Scenario (LOS) and High Outflow Scenario (HOS)

We summarize our findings on the six guiding questions [illegible] several recommendations sought by the NGOs after we beg[illegible] intended to help [illegible] and American Rivers in [illegible] engagement efforts with BDCP. Where appropriate, we describe approaches that might be taken for BDCP to more effe[illegible] many issues we have no [illegible] recommendations.

Question 1: Operations

Do operations of the dual facilities meet the broader goa[illegible] and above average years for exports while reducing pressure [illegible] and critically dry years? What substantive changes [illegible] operati[illegible] below) are there both seasonally and interannually?

We analyzed the CALSIM data on export operations under [illegible] ELT conditions. We note that the modeling of flows [illegible] compounding uncertainties: uncertainty under system and future conditions, model uncertainties associated with CALSIM, DSM2 [illegible] behavioral/regulatory uncertainty, where the model cannot fully [illegible] operational flexibility. For this reason, model outputs shou[illegible]

[1] [illegible] ELT [illegible] Alternative using the [illegible] 2008, [illegible] 2009 [illegible] outflow, 2025 climate [illegible] sea level conditions. [illegible] with low fall and spring outflow, 2025 [illegible] conditions. [illegible] Alternative with high spring and [illegible] standards, [illegible] level conditions. [illegible]

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approximations 뀀 □ η useful 뀀 □ η for 뀀 □ η comparing 뀀 □ η different 뀀 □ η scenarios 뀀 □ η rather 뀀 □ η
of 뀀 □ η future 뀀 □ η conditions. 뀀 □ η 뀀 □ η This 뀀 □ η issue 뀀 □ η influences 뀀 □ η all 뀀 □ η of 뀀 □ η our 뀀

Based 뀀 □ η on 뀀 □ η our 뀀 □ η review 뀀 □ η we 뀀 □ η conclude: 뀀 □ η

- The 뀀 □ η array 뀀 □ η of 뀀 □ η existing 뀀 □ η and 뀀 □ η projected 뀀 □ η flow 뀀 □ η requirements 뀀 □ η regulations 뀀 □ η operations 뀀 □ η in 뀀 □ η BDCP. 뀀 □ η 뀀 □ η The 뀀 □ η assumed 뀀 □ η operational 뀀 □ η flexibility North 뀀 □ η Delta 뀀 □ η facility 뀀 □ η is 뀀 □ η limited. 뀀 □ η

- HOS 뀀 □ η and 뀀 □ η LOS 뀀 □ η operations 뀀 □ η promote 뀀 □ η greater 뀀 □ η export 뀀 □ η during increased 뀀 □ η use 뀀 □ η of 뀀 □ η North 뀀 □ η Delta 뀀 □ η diversions 뀀 □ η during 뀀 □ η During dry 뀀 □ η and 뀀 □ η critical 뀀 □ η years, 뀀 □ η there 뀀 □ η is 뀀 □ η average 뀀 □ η exports 뀀 □ η much 뀀 □ η difference compared 뀀 □ η to 뀀 □ η NAA. 뀀 □ η 뀀 □ η For 뀀 □ η this 뀀 □ η reason, 뀀 □ η BDCP 뀀 □ η generally objective 뀀 □ η of 뀀 □ η reducing 뀀 □ η pressure 뀀 □ η on 뀀 □ η the 뀀 □ η Delta 뀀 □ η during 뀀 □ η d

- In 뀀 □ η some 뀀 □ η dry 뀀 □ η periods 뀀 □ η OMR 뀀 □ η flows 뀀 □ η and 뀀 □ η North 뀀 diversions 뀀 □ η lead 뀀 □ η to 뀀 □ η significant 뀀 □ η increases 뀀 □ η in 뀀 □ η outflow 뀀 □ η and 뀀 □ These 뀀 □ η unexpected 뀀 □ η results 뀀 □ η are 뀀 □ η the 뀀 □ η consequence 뀀 □ η of 뀀 □ η stricter for 뀀 □ η HOS 뀀 □ η and 뀀 □ η LOS 뀀 □ η and 뀀 □ η operations 뀀 □ η during 뀀 □ η the 뀀 fall 뀀 □ η and 뀀 □ η early 뀀 □ η winter. 뀀 □ η 뀀 □ η We 뀀 □ η are 뀀 □ η unsure 뀀 □ η if 뀀 □ η the 뀀 this 뀀 □ η way 뀀 □ η under 뀀 □ η these 뀀 □ η conditions.

- We 뀀 □ η evaluated 뀀 □ η how 뀀 □ η NAA, 뀀 □ η HOS 뀀 □ η and 뀀 □ η LOS 뀀 □ η performed 뀀 □ η du Of 뀀 □ η the 뀀 □ η three 뀀 □ η scenarios, 뀀 □ η HOS 뀀 □ η appears 뀀 □ η to 뀀 □ η supply 뀀 □ η most 뀀 ecosystems 뀀 □ η by 뀀 □ η reducing 뀀 □ η the 뀀 □ η frequency 뀀 □ η and 뀀 □ η duration 뀀 □ η of 뀀 on 뀀 □ η Sacramento 뀀 □ η Valley 뀀 □ η reservoirs 뀀 □ η and 뀀 □ η assuring 뀀 □ η higher 뀀 □ η spri

Recommendations: 뀀 □ η caution 뀀 □ η must 뀀 □ η be 뀀 □ η used 뀀 □ η in 뀀 □ η interpreting 뀀 □ η CA for 뀀 □ η both 뀀 □ η expo 뀀 □ η environmental 뀀 □ η performance 뀀 □ η of 뀀 □ η BDCP 뀀 □ η due 뀀 uncertainties. 뀀 □ η 뀀 □ η However, 뀀 □ η modeling 뀀 □ η results 뀀 □ η suggest 뀀 □ η that 뀀 □ η overa are 뀀 □ η improved 뀀 □ η over 뀀 □ η NAA. 뀀 □ η 뀀 □ η

Question 뀀 □ η 2: 뀀 □ η Impacts 뀀 □ η of 뀀 □ η North 뀀 □ η Delta 뀀 □ η Facility

Based 뀀 □ η on 뀀 □ η operations 뀀 □ η criteria, 뀀 □ η how 뀀 □ η does 뀀 □ η the 뀀 □ η Plan 뀀 □ η propose 뀀 □ η to 뀀 □ η identify 뀀 □ η the 뀀 □ η impacts 뀀 □ η lik to 뀀 □ η occur 뀀 □ η adjacent 뀀 □ η to 뀀 □ η and 뀀 □ η in 뀀 □ η the 뀀 □ η bypass 뀀 □ η reach 뀀 □ η downstrea diversion 뀀 □ η facilities? 뀀 □ η If 뀀 □ η there 뀀 □ η will 뀀 □ η be 뀀 □ η direct 뀀 □ η and 뀀 □ η indirect 뀀 □ η h facilities, 뀀 □ η does 뀀 □ η the 뀀 □ η Plan 뀀 □ η propose 뀀 □ η to 뀀 □ η mitigate 뀀 □ η the 뀀 □ η impacts? 뀀 □ η

We 뀀 □ η reviewed 뀀 □ η the 뀀 □ η Conservation 뀀 □ η Measures 뀀 □ η and 뀀 □ η Effects 뀀 □ η Analysis 뀀 supporting 뀀 □ η appendices 뀀 □ η to 뀀 □ η evaluate 뀀 □ η conditions 뀀 □ η upstream 뀀 □ η of 뀀 □ η the 뀀 as 뀀 □ η well 뀀 □ η as 뀀 □ η the 뀀 □ η effects 뀀 □ η of 뀀 □ η the 뀀 □ η facility 뀀 □ η on 뀀 □ η water. 뀀 □ η Our 뀀 □ and 뀀 □ η spring 뀀 □ η Chinook 뀀 □ η salmon, 뀀 □ η rather 뀀 □ η than 뀀 □ η all 뀀 □ η covered 뀀 □ η species. review 뀀 □ η we 뀀 □ η conclude: 뀀 □ η

- The 뀀 □ η BDCP 뀀 □ η consultants 뀀 □ η have 뀀 □ η appropriately 뀀 □ η identified 뀀 □ η the 뀀 □ η r listed 뀀 □ η salmon 뀀 □ η likely 뀀 □ η to 뀀 □ η be 뀀 □ η associated 뀀 □ η with 뀀 □ η the 뀀 □ η operat facility. 뀀 □ η 뀀 □ η 뀀 □ η The 뀀 □ η effects 뀀 □ η research 뀀 □ η as 뀀 □ η impingement 뀀 □ η on 뀀

screens 뀀 □ η and 뀀 □ η high 뀀 □ η predation 뀀 □ η losses 뀀 □ η at 뀀 □ η the 뀀 □ η facility, 뀀 □ η as 뀀
reduced 뀀 □ η survivorship 뀀 □ η of 뀀 □ η juvenile 뀀 □ η salmon 뀀 □ η due 뀀 □ η to 뀀 □ η higher 뀀
redirection 뀀 □ η the 뀀 □ η interior 뀀 □ η Delta. 뀀 □ η 뀀 □ η Using 뀀 □ η multiple 뀀 □ η modeling 뀀
have 뀀 □ η created 뀀 □ η reasonable 뀀 □ η estimates 뀀 □ η of 뀀 □ η losses 뀀 □ η due 뀀 □ η to 뀀 □ η c

∞ Mitigation 뀀 □ η for 뀀 □ η take 뀀 □ η associated 뀀 □ η with 뀀 □ η the 뀀 □ η new 뀀 □ η facility 뀀 □ η i
diversion 뀀 □ η flows 뀀 □ η during 뀀 □ η juvenile 뀀 □ η salmon 뀀 □ η in 뀀 □ η the 뀀 □ η river, 뀀 □ η predator 뀀 □ η cont
physical 뀀 □ η barriers, 뀀 □ η and 뀀 □ η operations 뀀 □ η to 뀀 □ η protect 뀀 □ η outmigrants, 뀀 □ η and 뀀
modification 뀀 □ η of 뀀 □ η the 뀀 □ η Fremont 뀀 □ η Weir 뀀 □ η to 뀀 □ η divert 뀀 □ η fish 뀀 □ η onto
the 뀀 □ η possible 뀀 □ η exception 뀀 □ η of 뀀 □ η benefits 뀀 □ η from 뀀 □ η Fremont 뀀 □ η Weir 뀀 □
uncertainties 뀀 □ η over 뀀 □ η mitigation 뀀 □ η actions 뀀 □ η are 뀀 □ η all 뀀 □ η high. 뀀 □ η 뀀 □ η

∞ We 뀀 □ η see 뀀 □ η high 뀀 □ η potential 뀀 □ η value 뀀 □ η in 뀀 □ η the 뀀 □ η Yolo 뀀 □ η Bypass 뀀 □ η
North 뀀 □ η Delta 뀀 □ η diversions 뀀 □ η on 뀀 □ η juvenile 뀀 □ η salmon, 뀀 □ η particularly 뀀 □ η ir
Therefore, 뀀 □ η existing 뀀 □ η adaptive 뀀 □ η management 뀀 □ η the 뀀 □ η program 뀀 □ η Bypass 뀀 □ η must 뀀 □ η
supported, 뀀 □ η with 뀀 □ η accelerated 뀀 □ η pilot 뀀 □ η studies, 뀀 □ η monitoring 뀀 □ η and 뀀 □ η
modeling, 뀀 □ η to 뀀 □ η ensure 뀀 □ η success 뀀 □ η of 뀀 □ η any 뀀 □ η modifications 뀀 □ η of 뀀 □ η

∞ Mitigation 뀀 □ η is 뀀 □ η hampered 뀀 □ η by 뀀 □ η the 뀀 □ η lack 뀀 □ η of 뀀 □ η a 뀀 □ η viable 뀀 □ η a
real-time 뀀 □ η management 뀀 □ η plan 뀀 □ η current 뀀 □ η BDCP 뀀 □ η for 뀀 □ η the 뀀 □ η North
Still, 뀀 □ η even 뀀 □ η with 뀀 □ η these 뀀 □ η uncertainties, 뀀 □ η if 뀀 □ η managed 뀀 □ η well, 뀀 □ η
functioning 뀀 □ η as 뀀 □ η described 뀀 □ η in 뀀 □ η the 뀀 □ η plan, 뀀 □ η the 뀀 □ η actions 뀀 □ η app
associated 뀀 □ η with 뀀 □ η the 뀀 □ η North 뀀 □ η Delta 뀀 □ η facilities. 뀀 □ η

∞ These 뀀 □ η mitigation 뀀 □ η efforts 뀀 □ η alone 뀀 □ η are 뀀 □ η unlikely 뀀 □ η to 뀀 □ η lead 뀀 □ η t
salmon 뀀 □ η populations, 뀀 □ η and 뀀 □ η extinction 뀀 □ η risk 뀀 □ η remains 뀀 □ η high 뀀 □ η for
run 뀀 □ η Chinook 뀀 □ η salmon, 뀀 □ η particularly 뀀 □ η during 뀀 □ η extended 뀀 □ η drought 뀀 □
when 뀀 □ η reservoirs 뀀 □ η are 뀀 □ η even 뀀 □ η below 뀀 □ η these 뀀 □ η zone 뀀 □ η flow management 뀀 □ η is 뀀 □ η not 뀀 □ η w
scope 뀀 □ η of 뀀 □ η BDCP. 뀀 □ η 뀀 □ η

Recommendations: 뀀 □ η given 뀀 □ η the 뀀 □ η uncertainties 뀀 □ η over 뀀 □ η mitigation 뀀 □ η for 뀀 □ η th
facility, 뀀 □ η we 뀀 □ η recommend 뀀 □ η that 뀀 □ η all 뀀 □ η mitigation 뀀 □ η actions 뀀 □ η be 뀀 □ η evalua
to 뀀 □ η initiating 뀀 □ η operations 뀀 □ η at 뀀 □ η the 뀀 □ η facility. 뀀 □ η 뀀 □ η Of 뀀 □ η highest 뀀 □ η priority 뀀 □
complete 뀀 □ η adaptive 뀀 □ η management 뀀 □ η activities 뀀 □ η in 뀀 □ η progress 뀀 □ η on 뀀 □ η the 뀀 □
Additionally, 뀀 □ η we 뀀 □ η recommend 뀀 □ η establishing 뀀 □ η an 뀀 □ η adaptive 뀀 □ η management 뀀
management 뀀 □ η program 뀀 □ η with 뀀 □ η the 뀀 □ η significance 뀀 □ η of 뀀 □ η experimental 뀀 □ η in 뀀 □ η flow 뀀
management, 뀀 □ η predator 뀀 □ η control, 뀀 □ η and 뀀 □ η barrier 뀀 □ η implementation 뀀 □ η
initiating 뀀 □ η facility 뀀 □ η operation. 뀀 □ η 뀀 □ η These 뀀 □ η should 뀀 □ η be 뀀 □ η conditions 뀀 □ η of
permit. 뀀 □ η 뀀 □ η

Question 뀀 □ η Delta 뀀 □ η In η Conditions 뀀 □ η

Are 뀀 □ η changes 뀀 □ η in 뀀 □ η operation 뀀 □ η points 뀀 □ η of 뀀 □ η diversion 뀀 □ η prescribed 뀀 □ η in 뀀 □ η the
significantly 뀀 □ η improve 뀀 □ η Delta 뀀 □ η conditions 뀀 □ η for 뀀 □ η covered 뀀 □ η species? 뀀 □ η The 뀀 □ η focus
species, 뀀 □ η including 뀀 □ η delta 뀀 □ η and 뀀 □ η longfin 뀀 □ η smelt, 뀀 □ η steelhead, 뀀 □ η winter 뀀 □ η a
and 뀀 □ η green 뀀 □ η sturgeon.

We꿯□ηfocused꿯□ηour꿯□ηanalysis꿯□ηon꿯□ηin꿯□ηthat꿯□ηmay꿯□ηaffect꿯□ηdelta꿯□ηs
longfin꿯□ηsmelt.꿯□η꿯□ηWe꿯□ηreviewed꿯□ηthe꿯□ηeffects꿯□ηanalysis꿯□ηand꿯□ηsu
conducted꿯□ηour꿯□ηown꿯□ηmodeling꿯□ηbased꿯□ηon꿯□ηCALSIM꿯□ηoutput.꿯□η꿯□
conclude:꿯□η

- The꿯□ηCALSIM꿯□ηwe꿯□ηused꿯□ηshowed꿯□ηconditions꿯□ηthat꿯□ηappeared based꿯□ηon꿯□ηour꿯□ηunderstanding꿯□ηof꿯□ηhow꿯□ηthe꿯□ηsystem꿯□ηwou Although꿯□ηwe꿯□ηhave꿯□ηbeen꿯□ηassured꿯□ηthat꿯□ηthese꿯□ηconditions꿯□ consequences꿯□ηof꿯□ηmodel꿯□ηdesign꿯□ηand꿯□ηoperations꿯□ηwe꿯□ηmeet꿯□ remain꿯□ηunconvinced꿯□ηthat꿯□ηthey꿯□ηreflect꿯□ηactual꿯□ηfuture꿯□ηopera hydrologic꿯□ηconditions꿯□ηsimulated.꿯□η꿯□ηWe꿯□η**the꿯□ηconclusions꿯□ηbelow꿯□ηare꿯□ηcontingent꿯□ηupon꿯□ηthe꿯□ηactual꿯□ηoperations꿯□ηof꿯□ηresembling꿯□ηthose꿯□ηin꿯□ηthe꿯□ηmodel꿯□ηout**also꿯□ηcontingent꿯□ηon꿯□ biological꿯□ηmodels꿯□ηaccurately꿯□ηreflecting꿯□ηresponses꿯□ηof꿯□ηthe꿯□ηs conditions.꿯□η

- Roughly꿯□ηhalf꿯□ηof꿯□ηthe꿯□ηexport꿯□ηfrom꿯□ηthe꿯□ηDelta꿯□ηwill꿯□ηg facility.꿯□η꿯□ηIn꿯□ηaddition,꿯□ηOMR꿯□ηflow꿯□ηregulation꿯□ηprotective꿯□ηmore under꿯□ηHOS꿯□ηand꿯□ηLOS꿯□ηscenarios꿯□ηthan꿯□ηNAA.꿯□ηThus꿯□ηthe꿯 flows꿯□ηrose꿯□ηfrom꿯□η11%꿯□ηunder꿯□ηNAA꿯□ηto꿯□η16%꿯□ηunder꿯□η HOS꿯□ηand꿯□ηLOS꿯□ηare꿯□ηconsistently꿯□ηmore꿯□ηprotective꿯□ηof꿯□ηsm these꿯□ηmodeling꿯□ηassumptions꿯□η

- OMR꿯□ηflow꿯□ηregulation꿯□ηunder꿯□ηHOS꿯□ηand꿯□ηLOS꿯□ηfor꿯□ηOctobe governed꿯□ηby꿯□ηprevious꿯□ηwater꿯□ηyear꿯□ηtype.꿯□η꿯□ηThis꿯□ηleads꿯 (positive)꿯□ηOMR꿯□ηflows꿯□ηand꿯□ηcorresponding꿯□ηoutflow꿯□ηduring꿯□η creating꿯□ηapparent꿯□ηbenefits꿯□ηfor꿯□ηdelta꿯□ηsmelt꿯□ηuncertain꿯□ηif꿯□η manifest꿯□ηin꿯□ηreal꿯□ηoperations.꿯□η

- Entrainment꿯□ηresults꿯□ηin꿯□ηfractional꿯□ηpopulation꿯□ηlosses꿯□ηof꿯□ηde calculated꿯□ηfrom꿯□ηmodeled꿯□ηflow꿯□ηconditions.꿯□ηBased꿯□ηon꿯□ηthese estimate꿯□ηthat꿯□ηHOS꿯□ηand꿯□ηLOS꿯□ηpopulation꿯□ηlosses꿯□ηby꿯□ηhalf꿯 compared꿯□ηto꿯□ηNAA.꿯□η꿯□ηIf꿯□ηactual꿯□ηoperations꿯□ηwere꿯□ηsimilar they꿯□ηwould꿯□ηlead꿯□ηto꿯□ηsignificant꿯□ηdecreases꿯□ηin꿯□ηentrainment.

- Estimates꿯□ηof꿯□ηrelative꿯□ηdifferences꿯□ηin꿯□ηlong꿯□ηpercentages꿯□η(not꿯□η predictions)꿯□ηshowed꿯□η10꿯□ηincrease꿯□ηfor꿯□ηHOS꿯□ηincrease꿯□ηfor꿯□ηLOS꿯 over꿯□ηNAA,꿯□ηalbeit꿯□ηwith꿯□ηlarge꿯□ηuncertainty.꿯□η꿯□ηA꿯□ηdifferenc the꿯□ηlast꿯□η20꿯□ηyears꿯□ηwould꿯□ηhave꿯□ηreversed꿯□ηthe꿯□ηdecline꿯

- Increases꿯□ηin꿯□ηspring꿯□ηoutflow꿯□ηare꿯□ηthe꿯□ηprojected꿯□ηmodels꿯□ηto꿯□ηproduce very꿯□ηsmall꿯□ηincrease꿯□ηin꿯□ηlongfin꿯□ηsmelt꿯□ηabundance꿯□ηindex꿯□ to꿯□ηNAA,꿯□ηand꿯□ηa꿯□ηcomparable꿯□ηdecrease꿯□ηunder꿯□ηLOS.

- Increases꿯□ηin꿯□ηfall꿯□ηoutflow꿯□ηunder꿯□ηHOS꿯□ηare꿯□ηprojected꿯□ηto increase꿯□ηin꿯□ηrecruitment꿯□ηwhich꿯□ηsummer,꿯□ηfollow꿯□ηand꿯□ηunder꿯□ηLOS꿯□ηa

decrease,뀀□ηbut뀀□ηbecause뀀□ηof뀀□ηhigh뀀□ηvariability뀀□ηin뀀□ηthe뀀□ηdata
predictions,뀀□ηthese뀀□ηvalues뀀□ηare뀀□ηvery뀀□ηuncertain.

Recommendations:뀀□ηwe뀀□ηremain뀀□ηuncertain뀀□ηabout뀀□ηsignificant뀀□ηreduction뀀
population뀀□ηlosses뀀□ηof뀀□ηdelta뀀□ηsmelt뀀□ηunder뀀□ηthe뀀□ηnew뀀□ηHOS뀀□ηa
recommend뀀□ηinvestment뀀□ηin뀀□ηresolving뀀□ηthese뀀□ηuncertainties뀀□ηbefore뀀□η
finalized.뀀□η뀀□ηIf뀀□ηthese뀀□ηrelationships,뀀□ηthen뀀□ηoperational뀀□ηrules뀀□ηneed
refined뀀□ηto뀀□ηprotect뀀□ηthe뀀□ηbenefits뀀□ηof뀀□ηthese뀀□ηimprovements뀀□ηover
conditions.뀀□η뀀□η

Question뀀□η4:뀀□ηBenefits뀀□ηof뀀□ηHabitat뀀□ηRestoration

*Are뀀□ηcovered뀀□η뀀□η뀀□ηlike뀀□ηlongfin뀀□η뀀□η뀀□η

in꿿□ηdesigning꿿□ηfuture꿿□ηefforts.꿿□ηdesigned꿿□ηBDCP꿿□ηand꿿□ηshould꿿□ηdescribe꿿□ηa꿿□ηspecific꿿□
resolve꿿□ηthis꿿□ηissue.꿿□ηUntil꿿□ηthis꿿□ηuncertainty꿿□ηis꿿□ηresolved꿿□ηflow꿿□
the꿿□ηprincipal꿿□ηtool꿿□ηto꿿□ηmitigate꿿□ηproject꿿□ηimpacts.꿿□η

Question꿿□η5:꿿□ηGovernance

Does꿿□ηthe꿿□ηPlan꿿□ηprovide꿿□ηachievable,꿿□ηclear꿿□ηand꿿□ηobjectives,꿿□ηwa
as꿿□ηgovernance꿿□ηthat꿿□ηis꿿□ηtransparent꿿□ηand꿿□ηresilient꿿□ηto꿿□ηpolitical꿿
influence?꿿□η

We꿿□ηanalyzed꿿□ηthe꿿□ηproposed꿿□ηgovernance꿿□ηstructure꿿□ηof꿿□ηBDCP,꿿□ηi
responsibilities꿿□ηand꿿□ηauthorities꿿□ηof꿿□ηnew꿿□ηentities꿿□ηincluding꿿□ηthe꿿□ηEnvironmental꿿□ηCommitment꿿□ηGroup꿿□ηthe
(AEG),꿿□ηthe꿿□ηPermit꿿□ηOversight꿿□ηGroup꿿□η(POG),꿿□ηthe꿿□ηAdaptive꿿□ηMa
Implementation꿿□ηOffice,꿿□ηProgram꿿□ηManager꿿□ηand꿿□ηProgram꿿□ηScientist.꿿□
review꿿□ηwe꿿□ηconclude꿿□ηthe꿿□ηfollowing:

- The꿿□ηgovernance꿿□ηplan,꿿□ηas꿿□ηstructured,꿿□ηblurs꿿□ηsome꿿□ηlines꿿□ηbetween꿿□ηpre
  implementation꿿□ηand꿿□ηregulation.꿿□η꿿□ηIt꿿□ηgrants꿿□ηAEG꿿□ηfinal꿿□η
  over꿿□ηactions꿿□ηthat꿿□ηshould꿿□ηbe꿿□ηsolely꿿□ηwithin꿿□ηthe꿿□ηauthori
  agencies.꿿□η꿿□ηIt꿿□ηalso꿿□ηinvolves꿿□ηthe꿿□ηpermitting꿿□ηagencies꿿□ηto
  implementation꿿□ηprojects꿿□η

- As꿿□ηwritten,꿿□ηthe꿿□ηplan꿿□ηgrants꿿□ηthe꿿□ηAEG꿿□ηveto꿿□ηauthority꿿
  the꿿□ηprogram,꿿□ηincluding꿿□ηany꿿□ηchanges꿿□ηin꿿□ηbiological꿿□ηgoals꿿□
  conservation꿿□ηmeasures.꿿□η꿿□η

- The꿿□ηAEG꿿□ηhas꿿□ηthe꿿□ηpower꿿□ηto꿿□ηveto꿿□ηany꿿□ηminor꿿□ηmod
  amendment꿿□ηto꿿□ηthe꿿□ηPlan꿿□ηthat꿿□ηmay꿿□ηbe꿿□ηnecessary꿿□ηto꿿□

- The꿿□ηregulatory꿿□ηassurances꿿□ηset꿿□ηforth꿿□ηin꿿□ηthe꿿□ηdraft꿿□ηPlan
  fish꿿□ηagencies'꿿□ηability꿿□ηto꿿□ηrespond꿿□ηto꿿□ηinadequacies꿿□ηin꿿□ηb

- Given꿿□ηthe꿿□ηhigh꿿□ηuncertainties꿿□ηin꿿□ηBDCP,꿿□ηit꿿□ηis꿿□ηvery꿿□ηlikely
  unforeseen꿿□ηcircumstances꿿□ηwill꿿□ηrequire꿿□ηsignificant꿿□ηchanges꿿□ηin꿿
  and꿿□ηobjectives꿿□ηand꿿□ηconservation꿿□ηactions꿿□ηover꿿□ηthe꿿□ηcourse꿿□ηof꿿□ηthe꿿□η
  guarantee,꿿□ηthe꿿□ηfish꿿□ηagencies꿿□ηassume꿿□ηfinancial꿿□ηresponsibility꿿
  significant꿿□ηchanges.꿿□ηThis꿿□ηliability꿿□ηcould꿿□ηdeter꿿□ηneeded꿿□ηregu
  BDCP꿿□ηand꿿□ηCVP/SWP꿿꿿□ηoperations.꿿□η

- The꿿□ηprocedural꿿□ηhurdles꿿□ηnecessary꿿□ηto꿿□ηrevoke꿿□ηthe꿿□ηincidenta
  BDCP꿿□ηare꿿□ηso꿿□ηgreat꿿□ηthat꿿□ηrevocation꿿□ηis꿿□ηunlikely꿿□ηto꿿□
  the꿿□ηpermit.꿿□η꿿□ηIndeed,꿿□ηpermit꿿□ηrevocation꿿□ηand꿿□ηtermination꿿
  unprecedented꿿□ηunder꿿□ηboth꿿□ηstate꿿꿿□ηand꿿□ηfederal꿿□ηlaw.꿿□η꿿□η

Recommendations:꿿□ηThe꿿□ηPOG꿿□ηshould꿿□ηbe꿿□ηgranted꿿□ηexclusive꿿□ηregula
determine꿿□ηwhether꿿□ηbudgets꿿□ηand꿿□ηsustainable꿿□ηplans꿿□ηare꿿□ηsufficient꿿□ηto꿿□ηpermit꿿□ηand꿿
approve꿿□ηrevisions꿿□ηto꿿□ηthe꿿□ηbiological꿿□ηgoals꿿□ηand꿿□ηobjectives꿿□ηor꿿
It꿿□ηshould꿿□ηhave꿿□ηthe꿿□ηauthority꿿□ηto꿿□ηinitiate꿿□ηchanges꿿□ηneeded꿿□
covered꿿□ηspecies.꿿□η꿿□ηThe꿿□ηPOG's꿿□ηfunctions꿿□ηshould꿿□ηbe꿿□ηregulatory꿿□ηbeyond꿿□ηsight꿿□η

rather뀀□ηthan뀀□ηdirect뀀□ηinvolvement뀀□ηin뀀□ηimplementation.뀀□ηThere뀀□ηshould
guarantee뀀□ηfor뀀□ηconstruction뀀□ηof뀀□ηthe뀀□ηproject.뀀□η뀀□ηUpon뀀□ηcompletion
should뀀□ηbe뀀□ηrenewable뀀□η"no뀀□ηsurprises"뀀□ηguarantees뀀□ηrenewals뀀□ηen뀀□ηy
should뀀□ηbe뀀□ηbased뀀□ηon뀀□ηconditions뀀□ηat뀀□ηthe뀀□ηtime뀀□ηof뀀□ηrenewal뀀
biological뀀□ηgoals뀀□ηand뀀□ηobjectives.뀀□η뀀□ηThis뀀□ηapproach뀀□ηcreates뀀□ηan뀀
adapt뀀□ηto뀀□ηchanges뀀□ηin뀀□ηconditions뀀□ηto뀀□ηsustain뀀□ηcovered뀀□ηspecies,뀀
fulfilling뀀□ηobligations뀀□ηon뀀□ηconservation뀀□ηmeasures.뀀□η

Question뀀□η6:뀀□ηScience뀀□ηand뀀□ηAdaptive뀀□ηManagement

Is뀀□ηthere뀀□ηa뀀□ηrobust뀀□ηscience뀀□ηand뀀□ηadaptive뀀□ηmanagement뀀□ηplan뀀□η
the뀀□ηproposed뀀□η"decision뀀□ηtree"뀀□ηlikely뀀□ηto뀀□ηresolve뀀□ηspecific뀀□ηissues뀀□η
Outflow뀀□ηprior뀀□ηto뀀□ηinitial뀀□ηoperations?뀀□η뀀□η뀀□η

We뀀□ηreviewed뀀□ηthe뀀□ηscience뀀□ηand뀀□ηadaptive뀀□ηmanagement뀀□ηplans뀀□ηi
EIS/EIR뀀□ηdocuments.뀀□η뀀□ηMost뀀□ηissues뀀□ηwith뀀□ηhigh뀀□ηuncertainty뀀□ηor뀀
are뀀□ηrelegated뀀□ηto뀀□ηresolution뀀□ηthrough뀀□ηmanagement뀀□ηplan뀀□ηadaptive뀀□ηBased뀀□ηon뀀□η
documentation,뀀□ηwe뀀□ηconclude:뀀□η

- Given뀀□ηthe뀀□ηmajor뀀□ηuncertainties뀀□ηfacing뀀□ηBDCP뀀□ηand뀀□ηrobust,뀀□η
  nimble뀀□ηadaptive뀀□ηmanagement뀀□ηplan뀀□ηwill뀀□ηbe뀀□ηnecessary.뀀□η뀀□η
  adheres뀀□ηto뀀□ηand뀀□ηstrongly뀀□ηpromotes뀀□ηthe뀀□ηmanagement뀀□ηof뀀□ηa
  and뀀□ηscience.뀀□η

- The뀀□ηrequirement뀀□ηof뀀□ηunanimous뀀□ηconsent뀀□ηfor뀀□ηall뀀□ηdecisions뀀
  veto뀀□ηpower뀀□ηof뀀□ηany뀀□ηmember뀀□ηof뀀□ηthe뀀□ηAEG뀀□ηand뀀□ηPOG
  management.뀀□η

- There뀀□ηis뀀□ηa뀀□ηblurring뀀□ηof뀀□ηthe뀀□ηresponsibilities뀀□ηbetween뀀□ηr
  responsible뀀□ηfor뀀□ηimplementation뀀□ηof뀀□ηadaptive뀀□ηmanagement뀀□ηthat
  potential뀀□ηto뀀□ηcreate뀀□ηconflicts.뀀□η뀀□ηThere뀀□ηis뀀□ηa뀀□ηconflicting뀀
  decisionmaking뀀□ηand뀀□ηthe뀀□ηscientific뀀□ηorganizations뀀□ηproviding뀀□ηsup
  decisonmaking.뀀□η

- The뀀□ηplan뀀□ηrecognizes뀀□ηthe뀀□ηimportance뀀□ηof뀀□ηadaptive뀀□ηcapacity,뀀□ηmeaning뀀□ηf
  in뀀□ηoperations뀀□ηand뀀□ηactions뀀□ηthat뀀□ηallow뀀□ηfor뀀□ηlearning.뀀□η뀀□η
  capacity뀀□ηin뀀□ηa뀀□ηmeaningful뀀□ηway.뀀□η

- There뀀□ηis뀀□ηalmost뀀□ηno뀀□ηdescription뀀□ηof뀀□ηa뀀□ηscience뀀□ηprogram
  evidence뀀□ηformation뀀□ηwith뀀□ηexisting뀀□ηprograms,뀀□ηtransparency,뀀□ηinde
  from뀀□ηbias뀀□ηand뀀□ηinfluence,뀀□ηand뀀□ηstructured뀀□ηoversight.뀀□η뀀□ηT
  for뀀□ηsuccess.뀀□η뀀□η

- The뀀□ηdecision뀀□ηtree뀀□ηprocess뀀□ηto뀀□ηestablish뀀□ηinitial뀀□ηoperating뀀
  appropriate.뀀□η뀀□ηDone뀀□ηsolve,뀀□ηmany뀀□ηcriteria뀀□ηissues.뀀□ηHowever,뀀□ηit뀀□ηis뀀
  resolve뀀□ηthe뀀□ηcentral뀀□ηissue뀀□ηover뀀□ηstarting뀀□ηconditions.뀀□ηin뀀□η

- Although뀀□ηdifficult뀀□ηdecisions뀀□ηare뀀□ηrelegated뀀□ηto뀀□ηa뀀□ηfuture뀀□η program,뀀□ηactually뀀□ηimplementing뀀□ηsuch뀀□η[illegible] difficult뀀□ηand뀀□ηwill뀀□ηrequire뀀□ηcareful뀀□ηdesign.뀀□ηBDCP뀀□ηdoes뀀□η sufficient뀀□ηto뀀□ηdetermine뀀□ηwhether뀀□ηit뀀□ηwill뀀□ηbe뀀□ηeffective.뀀□η it뀀□η[illegible]

Recommendations:뀀□ηmany뀀□ηof뀀□ηthe뀀□ηrecommendations뀀□η[illegible]nges뀀□ηin previously뀀□ηwill뀀□ηgo뀀□ηa뀀□ηlong뀀□ηway뀀□ηtoward뀀□ηimproving뀀□ηthe뀀□ηac including뀀□ηthe뀀□ηseparation뀀□ηof뀀□ηregulators뀀□ηfrom뀀□ηimplementation뀀□ηeffo plan뀀□ηstill뀀□ηneeds뀀□ηa뀀□ηcomplete뀀□ηdescription뀀□ηof뀀□ηhow뀀□ηits뀀□ηadap would뀀□η[illegible]뀀□η뀀□ηThe뀀□ηAMT,뀀□ηin뀀□ηwhatever뀀□ηform뀀□ηit뀀□ηtakes,뀀□ηs program,뀀□ηwithout뀀□ηscientists뀀□ηresponsible뀀□ηfor뀀□ηdecisionmaking.뀀□η뀀□ηTh should뀀□ηbe뀀□ηintegrated뀀□ηwith뀀□ηexisting뀀□ηDelta뀀□ηscience뀀□ηprograms,뀀□η new뀀□ηparallel뀀□η[illegible]뀀□η뀀□ηThe뀀□ηbest뀀□ηopportunity뀀□ηfor뀀□ηintegration뀀□ηis뀀□η establish뀀□ηa뀀□ηDelta뀀□ηScience뀀□ηPlan뀀□ηthrough뀀□ηthe뀀□ηDelta뀀□ηScience뀀□η Stewardship뀀□ηCouncil.뀀□ηGiven뀀□ηthat뀀□ηthe뀀□ηdecision뀀□ηtree뀀□ηis뀀□ηunlikel uncertainties뀀□ηin뀀□ηtime,뀀□η[illegible]뀀□η뀀□ηover뀀□ηhow뀀□ηthe뀀□ηproject뀀□η operated뀀□ηrather뀀□ηthan뀀□ηmodeled,뀀□ηwe뀀□ηrecommend뀀□ηthat뀀□ηdefault뀀□η conditions뀀□ηbe뀀□ηnegotiated뀀□ηthat뀀□ηapproximates뀀□ηthe뀀□ηHOS뀀□ηscenario,뀀□η identifying뀀□ηand뀀□ηoperationalizing뀀□ηattributes뀀□η[illegible]뀀□η뀀□η뀀□η

Appendices꿹□η

Appendix꿹A:꿹η□ηOperational꿹□ηrules꿹□ηfor꿹□ηthe꿹□ηNorth꿹□ηDe

Appendix꿹B:꿹η□ηpaired꿹□ηFlows꿹□ηinto꿹□ηan꿹꿹η□ηpaired꿹□ηEstuar

Appendix꿹□ηEffects꿹□η꿹η꿹η꿹□ηof꿹□ηchange꿹□ηflow꿹꿹η□ηconditions꿹□η
entrainment꿹□ηlosses꿹□ηof꿹꿹η□ηDelta꿹□η

Appendix꿹□ηD:꿹□η꿹□ηEvidence꿹□ηfa꿹꿹η□ηpsod꿹꿹꿹η□ηspatiea꿹□η

Appendix꿹□ηE:꿹□η꿹□ηModel꿹□ηof꿹□ηplankton꿹□η꿹ηsubsidy꿹□ηf

Appendix꿹□ηF:꿹□ηEffects꿹□ηof꿹□ηFlood꿹ηplain꿹□ηInundation

Appendix꿹□ηG:꿹□ηCan꿹□ηincidental꿹□ηtake꿹□ηpermits꿹□ηbe꿹
contractors?꿹□η

꿹□η

꿹□η

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Table 3.4.1 1. Water Operations Flow Criteria

Parameter	Criteria
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]

[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]

Table 3.4.1 1. Continued

Parameter	Criteria
	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]

Table 3.4.1-2. Flow Criteria for North Delta Diversion Bypass Flows from December through June

Level I			Level II			Level III		
December–April			December–April			December–April		
Sacramento River Flow			Sacramento River Flow			Sacramento River Flow		
Is Over	Is Not Over	Bypass Flow	Is Over	Is Not Over	Bypass Flow	Is Over	Is Not Over	Bypass Flow
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

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Table 3.4.1-2. Continued

May			May			May		
Sacramento River Flow			Sacramento River Flow			Sacramento River Flow		
Is Over	Is Not Over	Bypass Flow	Is Over	Is Not Over	Bypass Flow	Is Over	Is Not Over	Bypass Flow
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
June			**June**			**June**		
Sacramento River Flow			Sacramento River Flow			Sacramento River Flow		
Is Over	Is Not Over	Bypass Flow	Is Over	Is Not Over	Bypass Flow	Is Over	Is Not Over	Bypass Flow
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

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Appendix 꿹B: 꿹 □ ηImpaired 꿹 □ ηflows 꿹 □ ηinto 꿹 □ ηSacramento 꿹 □ ηimpaired 꿹 □ ηe
꿹□η

The꿹□ηSacramento꿹□ηRiver꿹□ηwatershed꿹□ηis꿹□ηthe꿹□ηmain꿹□ηsource꿹□ηof꿹□
integral꿹□ηto꿹□ηcurrent꿹□ηoperations꿹□ηof꿹□ηthe꿹□ηSWP꿹□ηand꿹□ηCVP.꿹□η꿹
Delta꿹□ηfacility꿹□ηwill꿹□ηnot꿹□ηchange꿹□ηthe꿹□ηreliance꿹□ηon꿹□ηthe꿹□ηSacra
However, 꿹□η꿹□ηconjunction꿹□ηwith꿹□ηlimited꿹□ηchanges꿹□ηin꿹□ηreservoir꿹□ηopera
modifications꿹□ηto꿹□ηthe꿹□ηYolo꿹□ηBypass,꿹□ηit꿹□ηwill꿹□ηalter꿹□ηthe꿹□ηtimi

One꿹□ηof꿹□ηthe꿹□ηgoals꿹□ηof꿹□ηBDCP꿹□ηand꿹□ηthe꿹□ηDelta꿹□ηPlan꿹□ηis꿹□
As꿹□ηnoted꿹□ηin,꿹□η꿹□ηchapter꿹□ηis꿹□ηlittle꿹□ηnatural꿹□ηabout꿹□ηthe꿹□ηlandscape,
fully꿹□ηintegrated꿹□ηinto꿹□ηthe꿹□ηecosystem.꿹□η꿹□ηStill,꿹□ηreturning꿹□ηmore꿹
changes꿹□ηwill꿹□ηhelp꿹□ηin꿹□ηmanaging꿹□ηspecies꿹□ηwhose꿹□ηlife꿹□ηhistory꿹

The꿹□ηprojected꿹□ηchanges꿹□ηin꿹□ηunder꿹□ηBDCP꿹□ηare꿹□ηpresented꿹□ηin꿹□ηI
monthly꿹□ηaverages꿹□ηare꿹□ηcompared꿹□ηto꿹□ηestimated꿹□ηunimpaired꿹□ηoutflow꿹□ηfrom꿹□ηthe꿹□η
Delta,꿹□ηan꿹□ηimperfect꿹□ηmeasure꿹□ηof꿹□ηoutflow꿹□ηunder꿹□ηunregulated꿹□η
used꿹□ηfor꿹□ηcomparison꿹□ηof꿹□ηBDCP꿹□ηscenarios.꿹□η꿹□η꿹□ηprojected꿹□ηalternatives,꿹
alternatives,꿹□ηdo꿹□ηlittle꿹□ηto꿹□ηalter꿹□ηthe꿹□ηsignificant꿹□ηchanges꿹□η꿹□η꿹□η

This꿮□ηbroad꿮□ηsimilarity꿮□ηin꿮□ηimpairment꿮□ηhighlights꿮□ηhow꿮□ηuniform꿮□
Delta꿮□ηhas꿮□ηbecome:꿮□ηan꿮□ηissue꿮□[illegible]
contributing꿮□ηto꿮□ηthe꿮□ηregime꿮□ηchange꿮□ηin[illegible]
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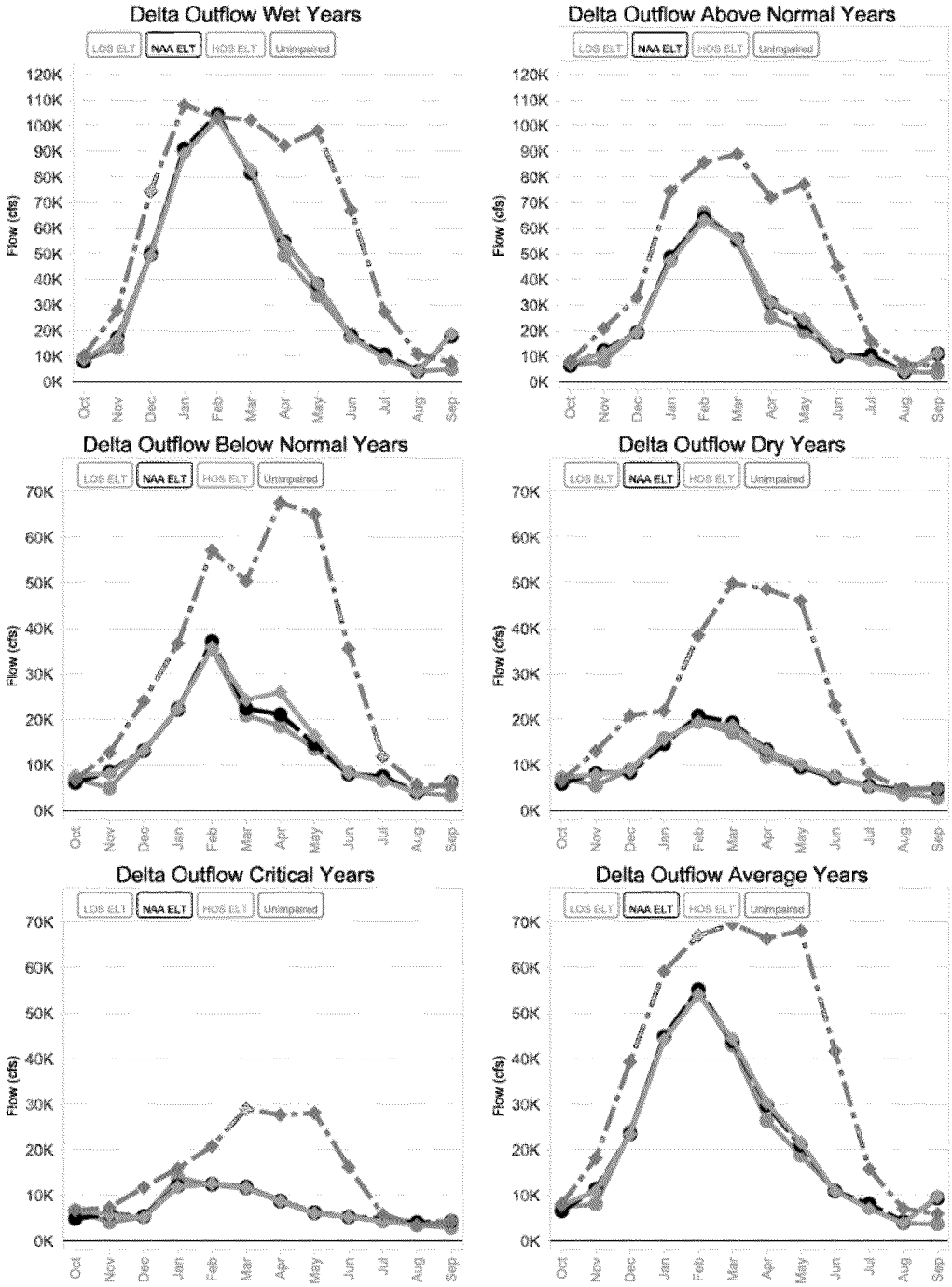

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Figure꿮□η3.1:꿮□ηDelta꿮□ηoutflow꿮□ηunder꿮□ηHOS,꿮□ηLOS,꿮□ηand꿮□ηNAA꿮□ηELT꿮□η
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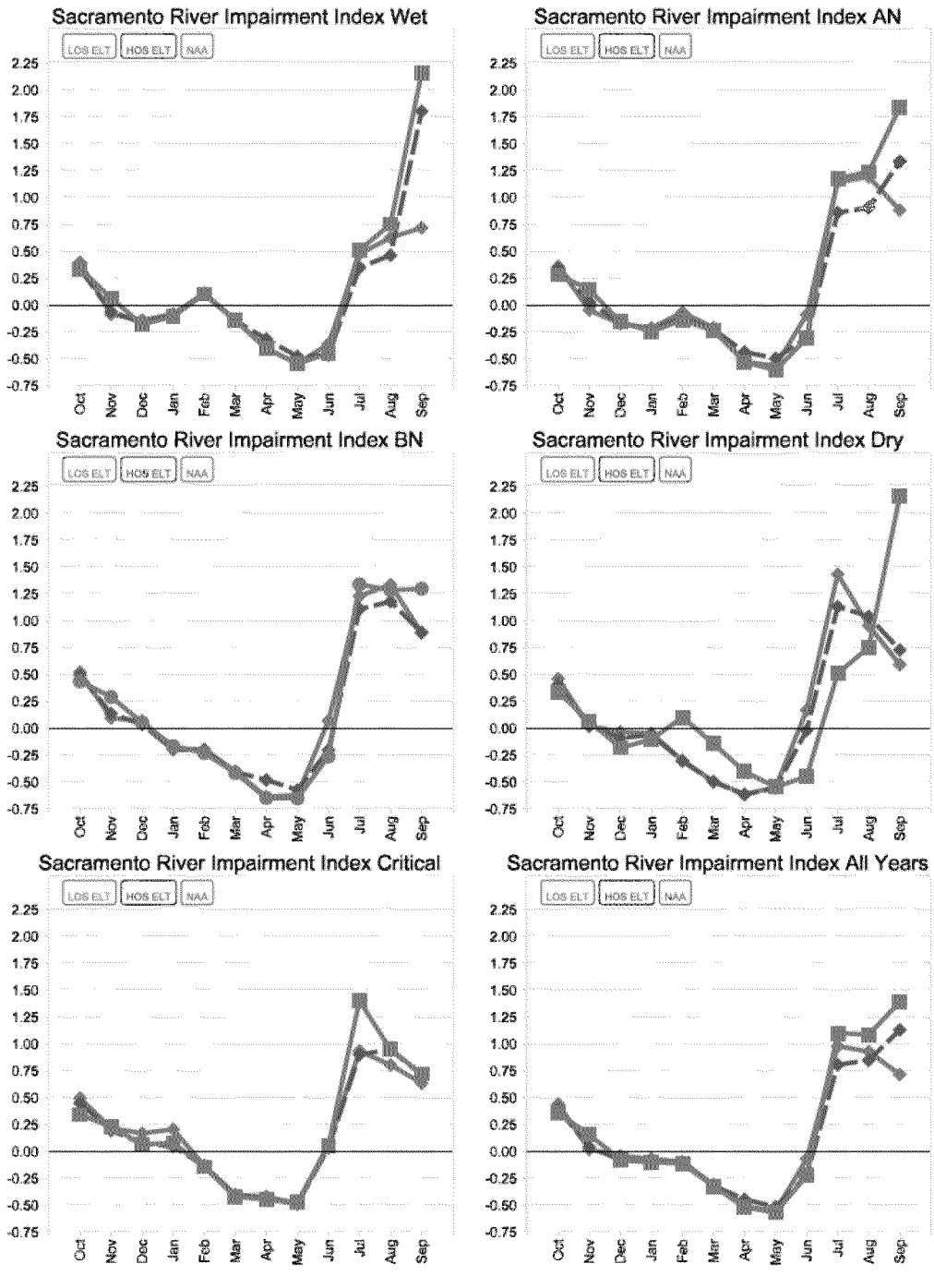


Figure 3.2: Sacramento River impairment LOS and HOS ELT and NAA

A second approach can be used to characterize total impairment types. In this, we have plotted unimpaired vs. impairment each year type, and fitted a line through the data points. The line from 1 (impaired = unimpaired) illustrates the overall trend while the slope is a measure of variation in relative impairment. The Figures 3-3 5.

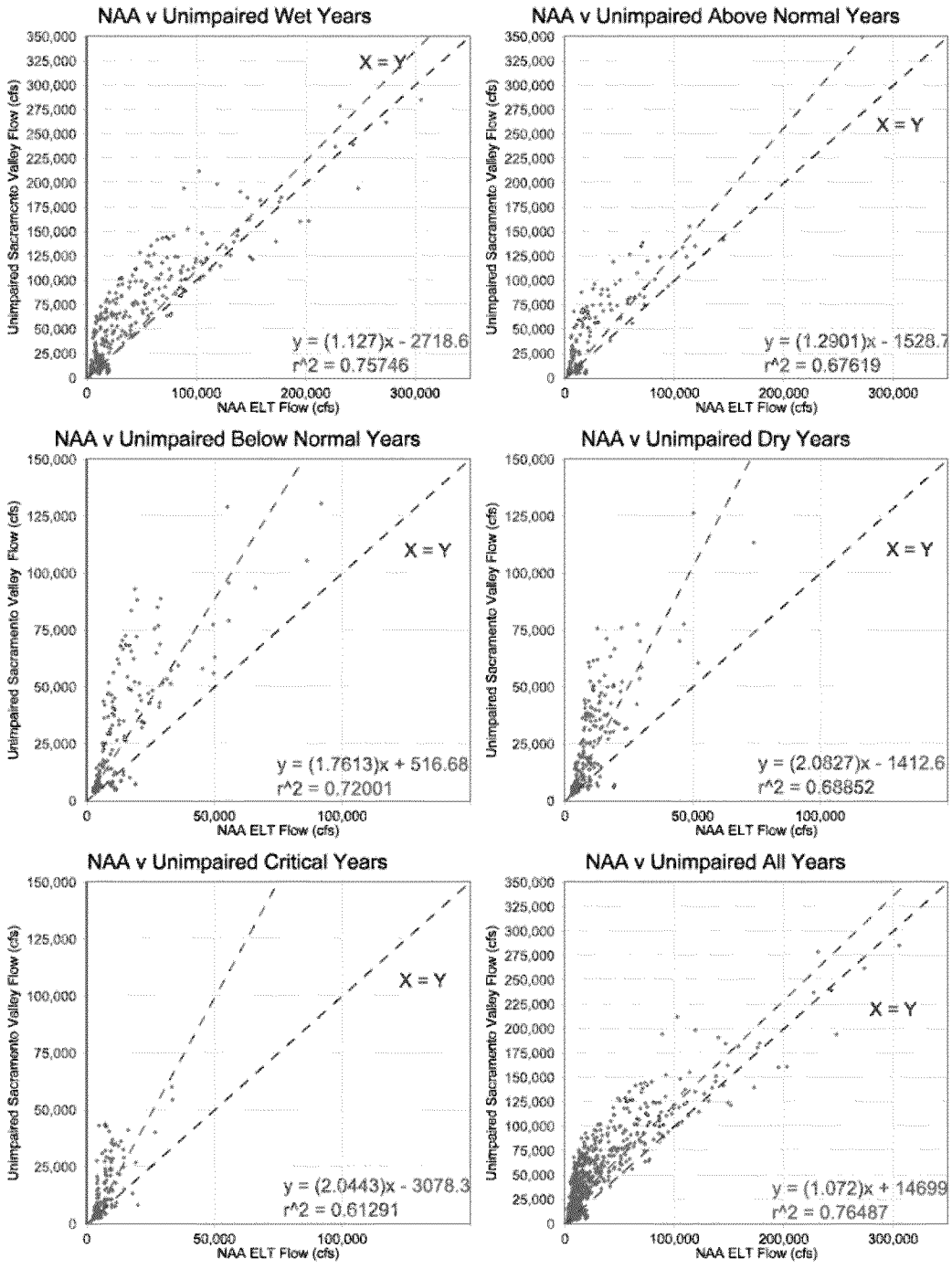
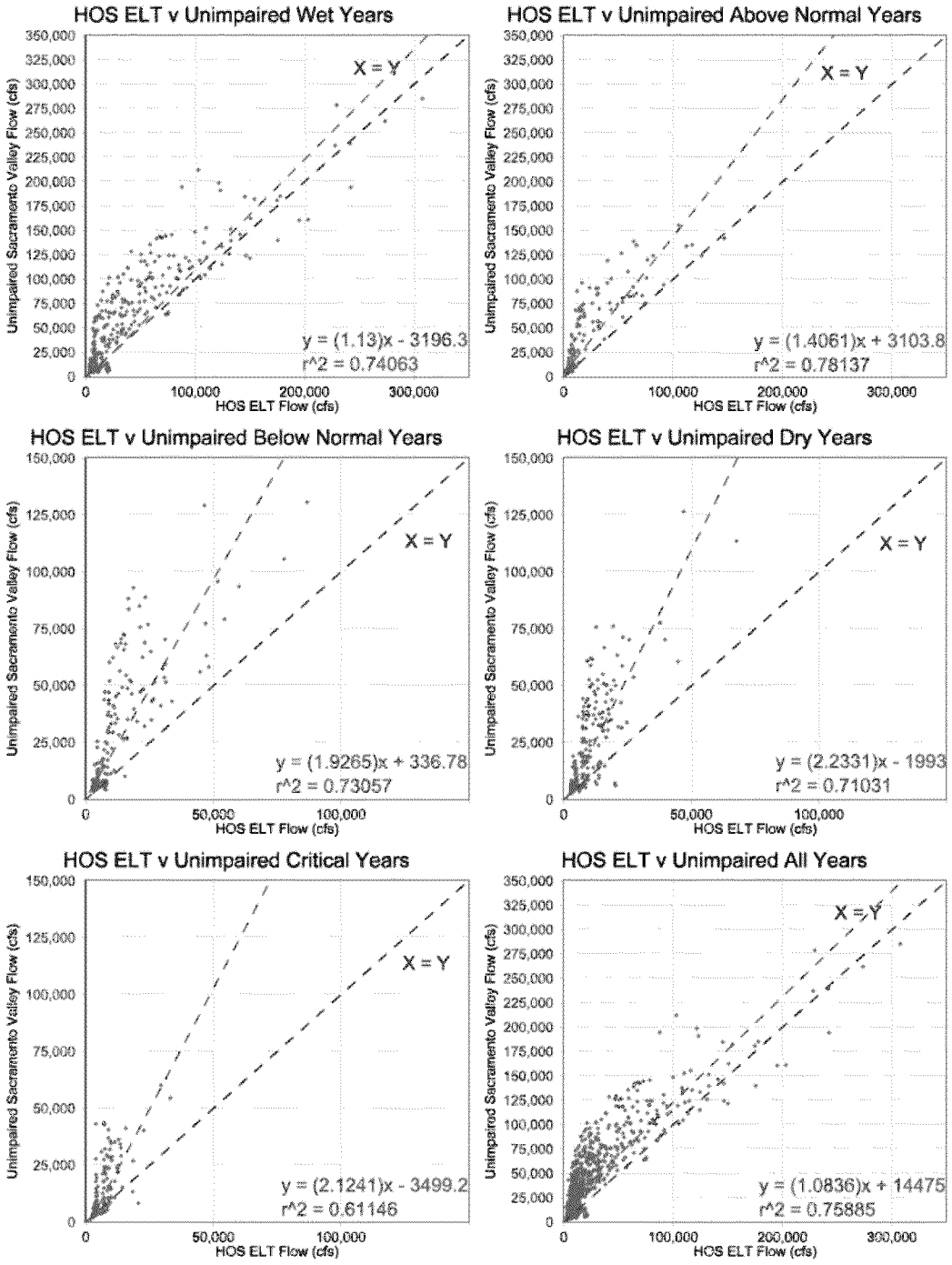


Figure 3.3. Scatterplot of NAA flows versus estimated unimpaired flows for ELT conditions. Higher slope and lower r² of impairment.



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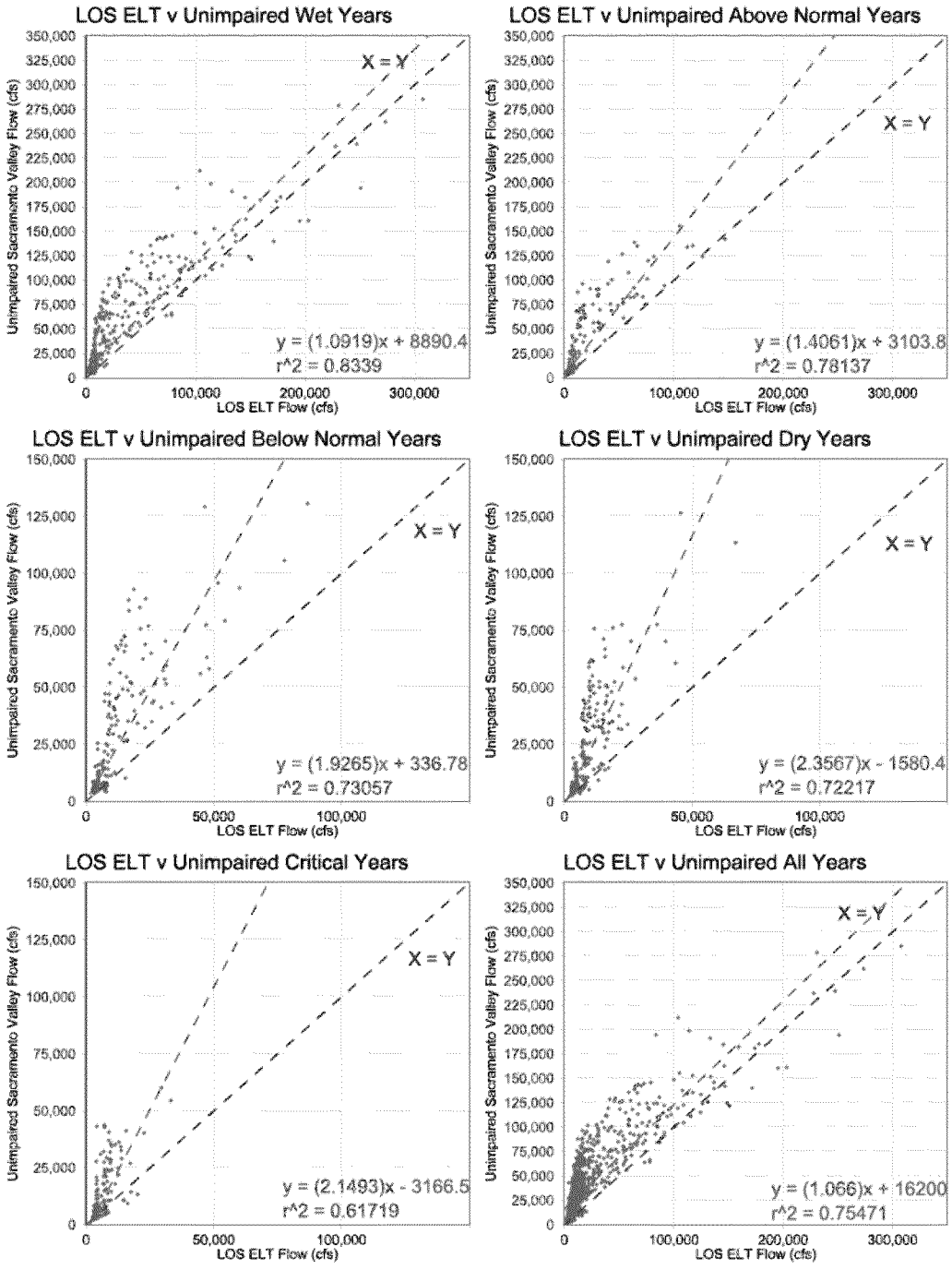
Figure꿹□η3.4:꿹□ηScatterplot꿹□ηof꿹□ηHOS꿹□ηalternative꿹□ηDelta꿹□ηoutflows꿹□ηvs.꿹□η flows꿹□ηfor꿹□ηELT꿹□ηconditions꿹□ηand꿹□ηHydrologic꿹□ηa꿹□ηrelative꿹□ηmeasure꿹□ηof꿹 impairment.꿹□η꿹□η



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**Figure꿹□η3.5.꿹□ηScatterplot꿹□ηof꿹□ηHOS꿹□ηalternative꿹□ηDelta꿹□ηoutflows꿹□ηvs.꿹□η flows꿹□ηfor꿹□ηELT꿹□ηconditions.꿹□η꿹□η꿹□η

years꿿□ηwhen꿿□ηthe꿿□ηcapacity꿿□ηfor꿿□ηwater꿿□ηalteration꿿□ηis꿿□ηgreatest.꿿□
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Conclusion꿿□η

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Appendix 1: Infer the change of flow conditions entrainment losses of adult delta smelt

This Appendix describes the methods and results of the analysis Delta smelt their potential effects on The general procedure was determine a relationship between survival or recruitment during delta smelt, and calculate the expected response based on CALSIM and using historical data. CALSIM 2003 results were three BDCP NAA scenarios CALSIM historical CALSIM data were used for in export flow, and outflows 2003, during 1955 and Middle River 1980 to 2003.

The calculations were based on results of Kimmerer (2008) delta smelt by Kimmerer (2011). Miller (2011) pointed that analysis. Young delta smelt may be more abunda previously elicited, which would mean that the proportional lo Kimmerer (2008) were too high (Miller 2011); however, th considered amenable to quantitative analysis with the available 2011). Nevertheless, the entrainment losses and reductions herein may actually be somewhat overestimated.

The principal assumptions analysis are stated here. Analyses of export losses we used a resampling approach to account underlying statistical relationships between flow and entrainment error distributions from these models were sampled 1000 times estimates. The same 1000 samples were used for each allowed us to include variability due to model uncertainty, comparisons among scenarios. The calculation was repeated provide the variability due to the hydrological conditions m scenario. Confidence limits estimated as quantiles of the resulti simulated values for each parameter.

Losses of adult delta smelt

Losses as a proportion of the population of adult delta from salvage density, catches in the Spring Trawl Survey, and flows in the south Delta (Kimmerer 2008, 2011). total southward flow in Old and Middle Rivers:

$$Q_{sd} = mean_{Dec-Mar} \begin{cases} 0, Q_{OM} \geq 0 \\ -Q_{OM}, Q_{OM} < 0 \end{cases} \quad (1)$$

where Q_{SD} is the mean flow in the South Delta during December monthly mean flow in Old and Middle Rivers.

Estimated annual proportional losses are obtained by linear regression for each year during which data were available (wate

$$P_L \sim \max(0, a + bQ_{SD}) \quad (2)$$

where a=-0.003 and b=0.0032 (regression coefficients) calculated using a regression model with 3 years of data. uncertainty in the calculated parameters and standard deviation (Kimmerer 2011).

Because we focused on mortality we focused on converting these values to survival, calculating geometric means, and proportions lost:

$$\overline{P_L} = 1 - \frac{1}{N}\prod_{N}(1 - P_{Li}) \quad (3)$$

where the overbar indicates a mean, N is the total proportional loss each year. period was somewhat arbitrary roughly the timescale for the decline in abundance of differences between pairs of the three scenarios we calcula of differences for each pair.

There was little difference in the full time series analysis and the reduced time series (1980-2003). The Action Alternative (AA) had a slightly lower percent historical period. The flow scenarios (LOW HOS and LOS) had values that were slightly below AA, at about 3%/year.

Losses of juvenile delta smelt

Losses as a proportion of the population of juvenile de from the spatial distribution of fish in the 20mm surve supplemented by particle tracking results (Kimmerer and Nobriga 2008). We related these estimates to total inflow to noting that these results may vary depending on the p from the aquatic Delta. As with adults, CALSIM output March and May for each year and scenario.

Annual proportional loss was calculated from a regression particle-tracking data and applied to estimated losses of yo

$$P_L \sim \max(0, a + bQ_{In} + cQ_{Ex} + dQ_{In}Q_{Ex}) \quad (4)$$

where a= b=0.36 ±0.17, c=0.90 ±0.02, d=0.22 (regression coefficients (Kimmerer 2008).

P_L values were accumulated and plotted as above (see Figures annual means for NAA were somewhat lower than the histor reflecting overall lower export flows than in the historical alternative scenarios resulted in substantial decreases in loss 14%/year for HOS, 3%/year, and a 2%/year higher loss than the HOS.

Appendix꿹A:꿹Evidence꿹□ η꿹□ η꿹□ η

6. (2)꿯□ηGlycogen꿯□ηwas꿯□ηdepleted꿯□ηin꿯□η30%꿯□ηof꿯□ηfish꿯□ηin꿯□ηsu
1999꿯□η(Fig.꿯□η28C꿯□ηin꿯□ηBennett꿯□η2005)꿯□ηwhich꿯□ηcould꿯□ηbe꿯□
poor꿯□ηnutritio꿯□η꿯□ηbecause꿯□ηof꿯□ηa꿯□ηfood꿯□ηshortage꿯□ηor꿯□ηbecau
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7. (2)꿯□ηMean꿯□ηlengths꿯□ηdeclined꿯□ηin꿯□ηeither꿯□η1989꿯□η(Bay꿯□ηStudy
Fig.꿯□η29꿯□ηin꿯□η꿯□ηBennett꿯□η2005)꿯□ηyear꿯□ηis꿯□ηwhen꿯□ηthe꿯□ηc
Pseudodiaptomus 꿯□η*forbesi*꿯□ηback꿯□ηfrom꿯□ηthe꿯□η꿯□ηin꿯□ηsummer
presumably꿯□ηbecause꿯□ηof꿯□ηthe꿯□ηcombined꿯□ηeffects꿯□ηof꿯□ηclams꿯□
other꿯□ηcope꿯□η꿯□ηBennett꿯□η(2005,꿯□ηFigure꿯□η30)꿯□ηalso꿯□ηshowed꿯□ηpositi
relationships꿯□ηbetween꿯□ηmean꿯□ηlengths꿯□ηand꿯□ηcopepod꿯□ηdensity꿯□η
(Bennett꿯□ηFig꿯□η30).
8. (3a)꿯□η꿯□ηCopepod꿯□ηbiomass꿯□ηis꿯□ηcorrelated꿯□ηwith꿯□ηan꿯□ηindex꿯□ηo
to꿯□ηfall꿯□η(Kimmerer꿯□η2008).
9. (3a)꿯□ηAbundance꿯□ηdata꿯□ηshow꿯□ηevidence꿯□ηfor꿯□ηdensity꿯□ηdepende
summer꿯□ηand꿯□ηfall꿯□ηwhen꿯□ηthe꿯□η꿯□η꿯□η

16. A꿯□ηgeneralpoint꿯□ηmodel꿯□η(Thomson꿯□ηet꿯□ηal.꿯□η2010)꿯□ηshowed꿯□ηno꿯
abundance꿯□ηof꿯□ηvarious꿯□ηzooplankton꿯□ηand꿯□ηabundance꿯□ηindices꿯□
species.꿯□η
17. Sampling꿯□ηfor꿯□ηzooplankton꿯□ηis꿯□ηat꿯□ηtoo꿯□ηcoarse꿯□ηa꿯□ηscale꿯□
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Appendix 2: Model of plankton subsidy from marsh

Here we assume that the restored areas will actually p
phytoplankton or zooplankton over adjacent waters, and ask
of food availability to would result. This is based
and some calculations using data from IEP monitoring, as
calculations are unpublished except where a citation is give
are available on request.

The total zooplankton biomass available to the open
production in restored shallow subtidal areas depends on t
the restored areas, the resulting gradient in biomass, the
between the restored areas and open waters, and the net p
the zooplankton in the open waters. The benefit of
smelt species depends on the proximity of the restored
centers of the smelt (Fig. 7.2).

A simple model of this subsidy is:

$$F = B_R V_R X \qquad (1)$$

where F is the subsidy as a daily proportion of plankto
receiving water, B_R is biomass per unit volume, V_R is
and volume in the restored area, X is exchange rate as a
volume of the restored area and units cancel

It is clear from Equation 1 that the subsidy is ma
large, the zooplankton biomass in the restored area must
water, and exchange rate is high. However, there is
B_R, volume and exchange rate X. First, water depth
1) Phytoplankton growth rate slows as water gets shallower, hence light penetratio
high; 2) For a given area of restoration, volume is
3) any bivalve grazing consumes phytoplankton and zooplankto
proportion to depth. Second, as the exchange rate X
growth rate within the restored area decreases as organism
exchange. If there is no exchange there is no sub
there is also no subsidy because the zooplankton are
to their internal growth processes (see Figure 3). The
efficiency of conversion of phytoplankton to zooplankton in
system was maximized when the tidal exchange rate X was
population growth rate of primary consumers.

It is beyond our scope to model explicitly the growth
consequent biomass levels. However, it is possible to
phytoplankton and zooplankton biomass with data from using
During strong blooms nutrients are converted to phytoplankton
conversion is incomplete because some is lost to other

detritus, bacteria, and zooplankton. Thus, the total amount nitrogen (DIN, comprising nitrate, nitrite, and ammonium) can total phytoplankton biomass.

We used data from the IEP water quality and zooplankt from 1975–2012. Data used were from May through October of winter flows, and to focus on the dry season w constrained by food supply. Data were taken from the to a salinity of about 0.5 the range of salinity where abundant in their first summer, and averaged by year

Chlorophyll was converted to phytoplankton C using a carb 50, under the assumption of high light availability conditions, we used data for which phytoplankton biomass exceeded these data, we determined the linear model of phy carbon vs. dissolved inorganic nitrogen (DIN), under the as represented the maximum conversion DIN to phytoplankton biomass. corresponded to about 90 mg C/m of the sum of phytop DIN converted to C using a molar ratio of 6.6:1). limit for phytoplankton C in a marshlands calculations co was estimated to be about 2.5% of actual phytoplankton this proportion would apply to the maximum phytoplankton Using the same data the median phytoplankton and water during 2011–2014 were 73 respectively mgC/m

The optimum exchange rate was calculated separately for zooplankton. For calculation we assume a mean depth (2500 ac) in the area. From Lopez et al. (2006) th phytoplankton in a shallow area can be modeled as

$$\mu_P = 0.91 + \quad (2)$$

where H is water depth. At a water depth we use although a single data from 2007 LSZ gave a 2006 growth rate that was about 25% lower. We assume that area is negligible, but cannot neglect grazing by microzoop modeled either as:

$$g = \max(0.3, 0.9 \quad (3)$$

based on experimental results from the Zooplankton work et al. 2011), for

$$g = 0.6 \quad (4)$$

from a review of microzooplankton grazing estimates, using (Calbet and Landry 2004). These so The latter value is probably more generally representative conditions and for this analysis gives a higher net phy

Using 𝜂 an 𝜂 exchange 𝜂 coefficient 𝜂 X 𝜂 [illegible] 𝜂 [illegible] 𝜂 [illegible]

introduced. Over 9000 parasites were released. Tows were made run at approximate
same number per unit volume throughout the marsh. r
as the rate of decline of the log of total particles

For neutrally buoyant (i.e., passive) particles, the time required for the marsh
about 28 days, and particles continuously were flushed out of the marsh
Particles that either sank or migrated tidally (down on
had a more complex pattern but generally particles
marsh did not leave the marsh during the 45

Taking the passive case first and using available bathymetr
the marsh and Suisun Bay, Equation 1 can be reduced

F

Based on the existing data cited above for Suisun Mars
additional 2%/d of copepods to Suisun Bay if the cope
particles. This is unlikely to produce a noticeable increase in cop
their population growth rates are on the order of 10%
tendency to remain near the bottom (which can be co
shallow, tidal waters) relative to or even eliminate the n
the marsh to the open waters.

Appendix 꿵 꿵 꿵

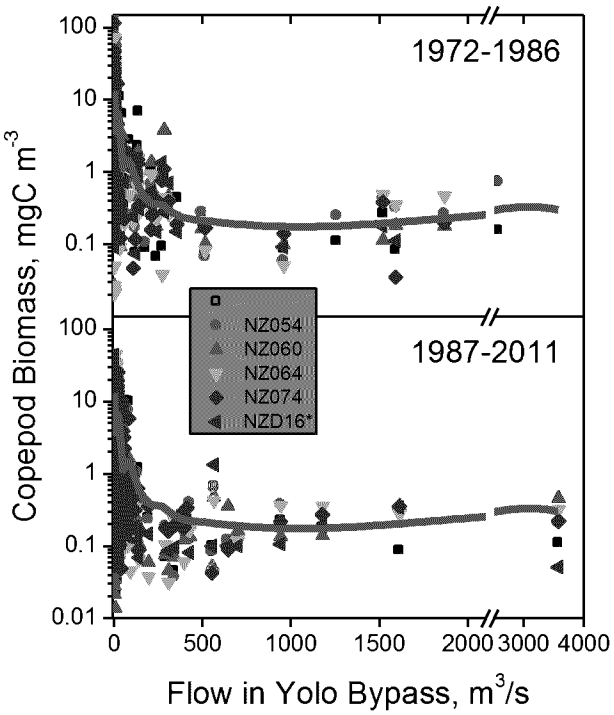

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Figure 1.1. 꿹□η꿹□η**Copepod**꿹□η**biomass**꿹□η**as**꿹□η**a**꿹□η**function**꿹□η**of**꿹□η**flow**꿹□η**in**꿹□η**tl**
periods.꿹□η꿹□η**Symbol**꿹□η**shapes**꿹□η**and**꿹□η**colors**꿹□η**show**꿹□η**the**꿹□η**sampling**꿹□η**stat**
zooplankton꿹□η**monitoring**꿹□η**survey.**꿹□η꿹□η**Green**꿹□η**line**꿹□η**is**꿹□η**from**꿹□η**a**꿹□η**gener**
a꿹□η**loess**꿹□η**(locally**꿹□η**weighted)**꿹□η**smoothing**꿹□η**function**꿹□η**applied**꿹□η**to**꿹□η**the**꿹□η**entire**꿹□η
shown꿹□η**in**꿹□η**the**꿹□η**lower**꿹□η**graph**꿹□η**for**꿹□η**comparison.**

Appendix 꿹: 꿹 Can 꿹 incidental 꿹 take permits to 꿹 water 꿹 contractors? 꿹

꿹

Do 꿹 the 꿹 federal 꿹 Endangered 꿹 Species 꿹 Act 꿹 and 꿹 the 꿹 California 꿹 Conservation 꿹 Planning 꿹 Act 꿹 allow 꿹 the 꿹 U.S. 꿹 Fish 꿹 and 꿹 Wildlife 꿹 Marine 꿹 Fisheries 꿹 Service, 꿹 and 꿹 the 꿹 California 꿹 Department 꿹 of 꿹 incidental 꿹 take 꿹 permits 꿹 to 꿹 water 꿹 project 꿹 and 꿹 State 꿹 Water 꿹 Pr contractors? 꿹

꿹

This 꿹 question 꿹 is 꿹 significant, 꿹 because 꿹 the 꿹 draft 꿹 BDCP 꿹 provide Entity 꿹 Group 꿹 shall 꿹 be 꿹 comprised 꿹 of 꿹 the 꿹 Director 꿹 of 꿹 the Water 꿹 Resources 꿹 as 꿹 operator 꿹 of 꿹 the 꿹 SWP, 꿹 the 꿹 Regional 꿹 Reclamation 꿹 as 꿹 operator 꿹 of 꿹 the 꿹 CVP, 꿹 and 꿹 one 꿹 representative SWP 꿹 contractors 꿹 if 꿹 the 꿹 contractors 꿹 are 꿹 issued 꿹 permits 꿹 if 꿹 we 꿹 correctly 꿹 understand 꿹 the 꿹 premise 꿹 of 꿹 this 꿹 question, 꿹 it 꿹 operators 꿹 of 꿹 the 꿹 two 꿹 projects 꿹 Bureau 꿹 of 꿹 Reclamation 꿹 and 꿹 the Department 꿹 of 꿹 Water 꿹 Resources 꿹 are 꿹 responsible 꿹 to 꿹 hold 꿹 the 꿹 incidental 꿹 would 꿹 govern 꿹 construction 꿹 and 꿹 operation 꿹 of 꿹 the 꿹 facilities 꿹

꿹

Although 꿹 there 꿹 is 꿹 no 꿹 definitive 꿹 answer 꿹 to 꿹 this 꿹 question, 꿹 and 꿹 SWP 꿹 contractors 꿹 may 꿹 receive 꿹 incidental 꿹 take 꿹 permits. 꿹 on 꿹 two 꿹 factors: 꿹 (1) 꿹 There 꿹 is 꿹 nothing 꿹 in 꿹 either 꿹 the 꿹 feder the 꿹 California 꿹 Natural 꿹 Community 꿹 Conservation 꿹 Planning 꿹 Act 꿹 tha and 꿹 wildlife 꿹 agencies 꿹 from 꿹 issuing 꿹 incidental 꿹 take 꿹 permits 꿹 t and 꿹 SWP 꿹 contractors 꿹 who 꿹 receive 꿹 water 꿹 service 꿹 from 꿹 (and 꿹 beneficiaries 꿹 of) 꿹 the 꿹 permitted 꿹 project 꿹 operators. 꿹 (2) 꿹 The allows 꿹 for 꿹 the 꿹 grant 꿹 of 꿹 incidental 꿹 take 꿹 permits 꿹 to 꿹 perso owners 꿹 and 꿹 direct 꿹 operators 꿹 the 꿹 projects 꿹 governed 꿹 by 꿹 an 꿹 HCP There 꿹 is 꿹 precedent 꿹 for 꿹 the 꿹 inclusion 꿹 of 꿹 both 꿹 government landowners 꿹 and 꿹 resource 꿹 users 꿹 within 꿹 a 꿹 single 꿹 HCP/NCCP. 꿹 reasons 꿹 both 꿹 for 꿹 the 꿹 CVP 꿹 speaks 꿹 to 꿹 the 꿹 CVP 꿹 contractors 꿹 to 꿹 an incidental 꿹 take 꿹 permit 꿹 and 꿹 for 꿹 the 꿹 fish 꿹 and 꿹 wildlife 꿹 age contractors 꿹 within 꿹 the 꿹 management 꿹 structure 꿹 of 꿹 the 꿹 BDCP. 꿹 the 꿹 courts 꿹 would 꿹 defer 꿹 to 꿹 the 꿹 agencies' 꿹 take 꿹 decisions 꿹 permits 꿹 to the 꿹 contractors. 꿹

꿹

The 꿹 incidental 꿹 take 꿹 permitting 꿹 and 꿹 HCP 꿹 provisions 꿹 of 꿹 sectio authorize 꿹 the 꿹 taking 꿹 of 꿹 individual 꿹 members 꿹 of 꿹 a 꿹 listed 꿹 be 꿹 prohibited 꿹 by 꿹 section 꿹 9(a)(1)(B). 꿹 See 꿹 16 꿹 U.S.C. 꿹 § 꿹 1538(a)(1)(B). 꿹 The 꿹 prohibition 꿹 of 꿹 section 꿹 9 꿹 applies 꿹 to 꿹 "any 꿹 person 꿹 subject 꿹 United 꿹 States." 꿹 *Id.* 꿹 § 꿹 1538(a)(1). 꿹 The 꿹 statute 꿹 defines 꿹 "person" 꿹 as

> an 뀕 □ η individual, 뀕 □ η corporation, 뀕 □ η partnership, 뀕 □ η trust, any η association, 뀕 □ η o
> private 뀕 □ η entity; 뀕 □ η or 뀕 □ η any 뀕 □ η officer, 뀕 □ η employee, 뀕 □ η agent, 뀕 □ η departmer
> instrumentality 뀕 □ η of 뀕 □ η the 뀕 □ η Federal 뀕 □ η Government, 뀕 □ η of 뀕 □ η any 뀕 □ η State, 뀕
> political 뀕 □ η subdivision 뀕 □ η of 뀕 □ η a 뀕 □ η State, 뀕 □ η or 뀕 □ η of 뀕 □ η any 뀕 □ η foreign 뀕 □
> municipality, 뀕 □ η or 뀕 □ η political 뀕 □ η subdivision 뀕 □ η of 뀕 □ η a 뀕 □ η State; 뀕 □ η or 뀕 □ η any 뀕 □ η other 뀕
> the 뀕 □ η jurisdiction 뀕 □ η of 뀕 □ η the 뀕 □ η United 뀕 □ η States. [Government Code § 53260(b)(5).]

This 뀕 □ η definition 뀕 □ η expressly 뀕 □ η includes 뀕 □ η the 뀕 □ η CVP 뀕 □ η and 뀕 □ η SWP 뀕 □ η contrac
comprised 뀕 □ η primarily 뀕 □ η of 뀕 □ η instrumentalities 뀕 □ η of 뀕 □ η the 뀕 □ η State 뀕 □ η CVP and η
includes 뀕 □ η some 뀕 □ η individuals). 뀕 □ η 뀕 □ η The 뀕 □ η statute 뀕 □ η thus 뀕 □ η extends 뀕 □ η eligib
conditional) 뀕 □ η exemption 뀕 □ η from 뀕 □ η the 뀕 □ η take 뀕 □ η prohibition 뀕 □ η of 뀕 □ η section 뀕 □
contractors, 뀕 □ η and 뀕 □ η it 뀕 □ η contains 뀕 □ η no 뀕 □ η exclusion 뀕 □ η from 뀕 □ η this η □ η eligibilit
the 뀕 □ η contractors 뀕 □ η do 뀕 □ η not 뀕 □ η themselves 뀕 □ η own η or 뀕 □ η operate 뀕 □ η the 뀕 □ η

The 뀕 □ η California 뀕 □ η Natural 뀕 □ η Community 뀕 □ η Conservation 뀕 □ η Planning 뀕 □ η Act 뀕 □ η ac
question 뀕 □ η even 뀕 □ η more 뀕 □ η directly. 뀕 □ η 뀕 □ η In 뀕 □ η its 뀕 □ η articulation 뀕 □ η of 뀕 □ η the
Legislature 뀕 □ η stated:

> Natural 뀕 □ η community 뀕 □ η conservation 뀕 □ η planning 뀕 □ η is 뀕 □ η a 뀕 □ η cooperative 뀕 □ η pro
> involves 뀕 □ η local, 뀕 □ η state, 뀕 □ η and 뀕 □ η federal 뀕 □ η agencies 뀕 □ η and 뀕 □ η the 뀕 □ η pu
> landowners 뀕 □ η within 뀕 □ η the 뀕 □ η planning η process. 뀕 □ η should 뀕 □ η encourage 뀕 □ η the 뀕 □
> participation 뀕 □ η and 뀕 □ η support 뀕 □ η of 뀕 □ η landowners η the η conservation 뀕 □ η
> stewardship 뀕 □ η of 뀕 □ η natural 뀕 □ η resources 뀕 □ η in 뀕 □ η the 뀕 □ η plan 뀕 □ η area 뀕 □ η du
> using 뀕 □ η appropriate 뀕 □ η measures, 뀕 □ η including η Fish 뀕 □ η & 뀕 □ η Game 뀕 □
> Code 뀕 □ η § 뀕 □ η 2801(j).]

The 뀕 □ η Act 뀕 □ η also 뀕 □ η Any η person η or 뀕 □ η any η federal η agency η
independently, 뀕 □ η or 뀕 □ η in 뀕 □ η cooperation 뀕 □ η with 뀕 □ η other 뀕 □ η persons, 뀕 □ η may 뀕 □ η
community 뀕 □ η conservation 뀕 □ η planning. η 뀕 □ η

Indeed, 뀕 □ η the 뀕 □ η fish 뀕 □ η and 뀕 □ η wildlife 뀕 □ η agencies 뀕 □ η approved 뀕 □ η this 뀕 □ η type 뀕
multijurisdictional, 뀕 □ η cooperative 뀕 □ η approach 뀕 □ η in 뀕 □ η the 뀕 □ η Orange 뀕 □ η County 뀕 □ η
protection 뀕 □ η of 뀕 □ η the 뀕 □ η coastal 뀕 □ η gnatcatcher, 뀕 □ η other 뀕 □ η target 뀕 □ η species, 뀕 □ η
cooperating 뀕 □ η and η individually η 뀕 □ η permitted 뀕 □ η entities 뀕 □ η include 뀕 □ η the 뀕 □ η County 뀕 □ η of
cities 뀕 □ η of 뀕 □ η Anaheim, 뀕 □ η Costa 뀕 □ η Mesa, 뀕 □ η Newport 뀕 □ η Beach, 뀕 □ η Irvine, 뀕 □ η Lagu
San 뀕 □ η Juan 뀕 □ η Capistrano, 뀕 □ η as 뀕 □ η well 뀕 □ η as 뀕 □ η other 뀕 □ η participating 뀕 □ η public 뀕
and 뀕 □ η water 뀕 □ η users, 뀕 □ η such η as η Southern η California η Edison, 뀕 □ η the 뀕 □ η Metropolitan 뀕 □ η Wat
Irvine 뀕 □ η Ranch 뀕 □ η Water 뀕 □ η District, 뀕 □ η the 뀕 □ η Irvine 뀕 □ η Company, 뀕 □ η UC 뀕 □ η Irvine,
Department 뀕 □ η of 뀕 □ η Parks 뀕 □ η and 뀕 □ η Recreation, 뀕 □ η and 뀕 □ η transportation η 뀕 □ η corrido
OF ORANGE, η FINAL η NATURAL η COMMUNITY η CONSERVATION η PLAN 뀕 □ η HABITAT η CONSERVATION 뀕 □ η
PLAN, η CENTRAL 뀕 □ η COASTAL η SUBREGION η (1996), η document 뀕 □ η available 뀕 □ η at 뀕 □ η
http://www.naturereserveoc.org/documents.htm. η Although η this η 뀕 □ η situation 뀕 □ η does 뀕 □ η not 뀕
precisely 뀕 □ η mirror η the 뀕 □ η relationship 뀕 □ η between 뀕 □ η the 뀕 □ η CVP 뀕 □ η and 뀕 □ η SWP 뀕 □
does 뀕 □ η serve 뀕 □ η as 뀕 □ η precedent 뀕 □ η for 뀕 □ η creation 뀕 □ η of 뀕 □ η an 뀕 □ η HCP/NCCP 뀕 □ η
resource 뀕 □ η management 뀕 □ η agencies 뀕 □ η and 뀕 □ η public/private 뀕 □ η land 뀕 □ η and 뀕 □ η res
incidental 뀕 □ η take 뀕 □ η permit η holders.

Finally,뀀□ηit뀀□ηmakes뀀□ηsense뀀□ηfor뀀□ηthe뀀□ηCVP뀀□ηand뀀□ηSWP뀀□ηcontracto
the뀀□ηincidental뀀□ηtake뀀□ηpermits뀀□ηgoverning뀀□ηoperation뀀□ηof뀀□ηthe뀀□ηfacil
BDCP,뀀□ηas뀀□ηit뀀□ηis뀀□ηtheir뀀□ηuses뀀□ηof뀀□ηproject뀀□ηwater뀀□ηthat뀀□ηwou
and뀀□ηstate뀀□ηtake뀀□ηprohibitions.뀀□η뀀□ηThe뀀□ηcontractors뀀□ηthus뀀□ηwould뀀
security뀀□ηprovided뀀□ηby뀀□ηthe뀀□ηincidental뀀□ηtake뀀□ηpermits뀀□ηand뀀□ηfrom
decisions뀀□ηthat뀀□ηwould뀀□ηshape뀀□ηimplementation뀀□ηand뀀□ηcompliance뀀□ηwit
conditions뀀□ηlimiting뀀□ηthat뀀□ηCVP/SWP뀀□ηoperations뀀□ηset뀀□ηforth뀀□ηin뀀□ηthe
Concomitantly,뀀□ηit뀀□ηis뀀□ηin뀀□ηthe뀀□ηfish뀀□ηand뀀□ηwildlife뀀□ηagencies'뀀□ηir
participate뀀□ηas뀀□ηpermittees뀀□ηso뀀□ηthat뀀□ηdisputes뀀□ηbetween뀀□ηthe뀀□ηcon
DWR뀀□ηas뀀□ηproject뀀□ηoperators뀀□ηmay뀀□ηbe뀀□ηresolved뀀□ηin뀀□ηthe뀀□ηforum뀀□ηof뀀□ηthe뀀□ηAu
Entity뀀□ηGroup,뀀□ηrather뀀□ηthan뀀□ηoutside뀀□ηthe뀀□ηpurview뀀□ηand뀀□ηprocedu
these뀀□ηcircumstances,뀀□ηwe뀀□ηbelieve뀀□ηthat뀀□ηit뀀□ηis뀀□ηlikely뀀□ηthat뀀□ηth
fish뀀□ηand뀀□ηwildlife뀀□ηagencies'뀀□ηreasonable뀀□ηinterpretation뀀□ηof뀀□ηthe뀀□ηstatutes뀀□ηas뀀□ηauth
the뀀□ηgrant뀀□ηof뀀□ηincidental뀀□ηtake뀀□ηpermits뀀□ηto뀀□ηCVP뀀□ηand뀀□

U.S.A. 뀀□ηv. 뀀□ηNatural 뀀□ηResources 뀀□ηDefense 뀀□ηCouncil 뀀□ηv. 뀀□ηHodel 뀀□η(1984) 뀀□ηFindings 뀀□η
Ass'n. 뀀□ηv. 뀀□ηSouth 뀀□ηCoast 뀀□ηAir 뀀□ηQuality 뀀□ηMgmt. 뀀□ηDist.

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zooplankton꿯□ηgrazing꿯□ηand꿯□ηnet꿯□ηtransport꿯□ηzone꿯□ηin꿯□ηthe꿯□ηlower꿯□ηSan
Francisco꿯□ηEstuary꿯□ηSubmitted,꿯□ηEstuaries꿯□ηand꿯□ηCoasts.

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Migration꿯□ηof꿯□ηDelta꿯□ηSmelt꿯□ηin꿯□ηthe꿯□ηUpper꿯□ηSan꿯□ηFrancisco꿯
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Executive Summary

Under the auspices of the Delta Science Program, the seven-member Independent Scientific Review Panel (Panel) reviewed the adequacy of the Effects Analysis component of the Bay Delta Conservation Plan (BDCP or Plan). This report represents the third phase of the Effects Analysis review; the Phase 1 (completed in November 2011) and Phase 2 reviews (completed June 2012) were partial reviews of the Effects Analysis and were completed as the Conceptual Foundation and Analytical Approach were still under development. These documents are available online at: http://deltacouncil.ca.gov/science-program/independent-review-draft-bay-delta-conservation-plan-effects-analysis. The present, Phase 3 review covers the first complete public draft of the BDCP Chapter 5 Effects Analysis and its associated technical appendices, made available in December 2013.

Four broad themes emerged from the Panel's review of the BDCP Effects Analysis. Firstly, the long, highly detailed document was difficult to review and comprehend. The vastness of the Effects Analysis report and appendices are both its strength and weakness. Although highly improved from the documents that the Panel reviewed during Phase 2, Chapter 5 continues to be fragmented in its presentation and sometimes inconsistent with the technical appendices. While the sheer scope of the analysis is impressive, the inefficient organization and incomplete cross-referencing among sections within the Effects Analysis (e.g., the 8 supporting appendices, totaling ~4500 pages) as well as with the larger BDCP planning documents make interpretation of anticipated net effects of BDCP implementation difficult at best. The 745-page Chapter 5: Effects Analysis does not represent a stand-alone document and it relies extensively on the associated appendices and other chapters for the presentation of scientific information, with insufficient guidance for the reader. As concluded from the Phase 2 report, the Panel universally believes that by itself, Chapter 5: Effects Analysis inadequately conveys the fully integrated assessment that is needed to draw conclusions about the Plan, in part because of incomplete information on factors affecting the covered species.

The second theme in the Panel's review is an apparent disconnect between the assessments of the levels of scientific uncertainty presented in Chapter 5 versus what is characterized in the technical appendices. In many cases, the Panel felt that there was appropriate characterization of high uncertainty within the technical appendices but Chapter 5 did not sufficiently acknowledge or articulate this reality, especially when using professional judgment to reach overall net effects of the BDCP on key species. In particular, the Panel observed that the critical uncertainties associated with presumed beneficial effects of tidal wetland restoration were not recognized in the Chapter 5 summary. Given the magnitude of the BDCP, the inherent natural and anthropogenic complexity in the Bay-Delta ecosystem, and the long time horizon for BDCP implementation and rehabilitated community development, most of the potential BDCP effects carry a relatively high level of uncertainty. For these reasons, the Effects Analysis must provide clear guidance for conceptual models, monitoring, metrics that assess underlying ecosystem processes, explicit thresholds and triggers, alternative hypotheses, special studies to address critical information gaps, and structured decision making in the form of a rigorously institutionalized adaptive

management process.

The third major theme of this review is the lack of an integrated or quantitative assessment of net effects, echoing a similar review comment in the Phase 2 review. The Panel acknowledges that considerable effort has been made in documenting the complex information used to determine net effects. However, in the case of covered species, effects could not be quantified and only two of the sixteen existing life cycle models were deemed to be relevant to BDCP. For these and other reasons, a systematic approach to synopsize the overall net effect on each species was not used. Instead, professional judgment was used instead of a ranking approach to quantify a synthesis of cumulative effects and associated certainty in the projected outcome. Finally, in one paragraph, Chapter 5 accurately portrayed the anticipated BDCP effects: "*These expectations represent a working hypothesis of the relationship between actions, stressors, and biological performance*". However, this statement was not emphasized throughout the document.

The fourth major theme reflected on the need to address the extensive uncertainties associated with the assumptions and predictions of the beneficial effects of the BDCP conservation measures. While the Phase 2 Effects Analysis accurately reflected the detailed process and implementation structure to apply an adaptive management approach to resolve uncertainties, the Panel was concerned that it defaulted to rather "passive learning" instead of a rigorous, institutionalized adaptive management process that resolved effects on covered species and their requisite ecosystems through an active, experimental approach.

Together with background obtained during Phase 1 and 2 of the BDCP Effects Analysis review, the Panel provides the following synopsis of the Panel's responses to their General Charge Questions; further responses to specific issues and the adequacy of supporting documents are provided in the body of the report.

1. How well does the Effects Analysis meet its expected goals?

The Phase 3 review-version of the Effects Analysis is a much improved and impressive compilation of background material and scientific and technical knowledge about the Bay-Delta that provides a plausible basis for the conservation measures. The Panel concluded that much of the available data and arguments for the rationale behind the Effects Analysis assumptions and conclusions are contained within the BDCP documents. However, we suggest that the Effects Analysis (Chapter 5) itself is still poorly substantiated and leaves too much to appendices and other BDCP chapters without explicit cross-references. The lack of accessibility to information within the chapter or clear reference to supporting detail inhibits rather than elucidates comprehension of the findings and thus conveys an unsatisfying "trust us" message.

Our conclusion of the Effects Analysis is that many of the critical assumptions in modeling effects and justifications behind the supposed benefits of the conservation measures are highly uncertain. Much of the conservation measures center around restoration activities and management actions to improve current conditions. Our impression, therefore, is that the foundation of the BDCP is weak in many respects and the default burden to ensure covered species benefit, if not recovery, depends on adaptive management. The adequacy of the BDCP therefore rests not in the intent and development of the conservation measures, but in the rigor and application of

adaptive management to ensure that the critical uncertainties are addressed and strategically incorporated into a progressively refined Plan.

2. How complete is the Effects Analysis; how clearly are the methods described?

Chapter 5 provides a comprehensive overview of the spatial and temporal scope of the analysis, definitions of project baselines that differ depending on regulatory authority, recognition of climate change information, identification of a variety of models used to evaluate effects, treatment of viable salmon population criteria, and the approach to determining net effects on fish and wildlife. As might be expected, with the size of the Effects Analysis task, the quality of the assessments ranged in scientific rigor based on the amount of available data and best available science. Some aspects of the assessment, such as water quality and flow, were quantitatively assessed using sophisticated mathematical models. Some aspects of the Chinook salmon assessments were also based on empirical data and process-based models. However, for many of the other fish species and their potential stressors, conceptual models supported by the scientific literature were the only recourse.

3. Is the Effects Analysis reasonable and scientifically defensible? How clearly are the net effects results conveyed in the text, figures and tables?

The approach to net effect conclusions needs to be reconsidered and revamped. The Effects Analysis assessment of net effects, particularly for covered fish, tries to incorporate information on potentially beneficial or detrimental effects covering 12 different stressors, 32 attributes, and multiple life stages using best available information and science. Only a perfect life-cycle model with perfect information on all the effects and their interactions could possibly weight the results correctly and draw unambiguous conclusions. A serious limiting factor of the current consolidation of Net Effects is a near complete absence of any weighting of the biological importance to particularly sensitive life history stages of the many attributes under consideration. As a result, whether and how any critical life stages or attributes are being adversely affected by the BDCP is generally unclear. The net effects conclusions for a fish species needs to therefore take into account the relative importance of the various life history stages, make them explicit, and interpret Plan effects within that context on a species-by-species basis. Similarly, the simple summation of the number of acres of suitable habitat that are removed or restored for each species by the conservation measures does not consider landscape-level effects such as connectivity and patch size, nor does it take into account variation in habitat quality.

The net effects analysis tends to overreach conclusions of positive benefits for covered fish species, given the inability to quantify the over-all net effects and the realization of high uncertainty. In particular, it does not adequately defend conclusions regarding the net effects of habitat restoration. Restoration of tidal wetlands (and other communities) is highly uncertain and at least an extremely long process. The Effects Analysis does not adequately justify the critical assumption of the benefit of tidal wetland restoration as a food web subsidy for covered pelagic fish given the uncertainties of tidal wetland restoration itself. A critical issue is the implicit expectation that restoration activities will result in increases in abundance of lower trophic levels, but it is uncertain whether the resulting increased production will result in food web pathways supporting covered species. The presentation of phytoplankton-based and tidal wetland macrophyte

detritus-based food webs as alternative ecosystem processes, rather than as an integrated system, also significantly complicates the interpretation of the potential benefit of BDCP restoration. For foraging salmonids, the Effects Analysis did not evaluate the reduced extent to which salmonids would have access to rehabilitated habitat when the north Delta intakes are operating and flows are reduced.

Only one configuration of Restoration Opportunity Areas (ROAs) were modeled by the hydrodynamic models and the locations of these assumed Restoration Opportunity Areas are not available. Some details of the hydrodynamic modeling, especially where 1D and 2D models did not agree or situations where counter-intuitive results were reported, could not be evaluated due to the limited information provided.

4. How well is uncertainty addressed? How could communication of uncertainty be improved?

A broad consensus exists among the Panel that Chapter 5 does not adequately acknowledge the extensive uncertainty associated with the BDCP's assumptions and predictions. In its current form, at the level of detail conveyed, in the models used, and in the verbal assessments and conclusions, the level of uncertainty is often downplayed. Within appendices sometimes more explicit discussion of uncertainties can be found, but there is a disconnect between the summary pages with the conclusions drawn in Chapter 5. In situations in which an array of outcomes may be possible, only the more beneficial outcomes are used in conclusions about the BDCP. Communication of uncertainty would be improved by consideration of a range of potential outcome values in models.

5. How well does the Effects Analysis describe how conflicting model results and analyses in the technical appendices are interpreted?

The Panel found models describing salmonid Delta passage and habitat suitability for terrestrial species to be appropriate and any conflicting results adequately explained. Because hydrodynamic models are sensitive to how the open water regions are represented and how they are connected to the adjacent channels, and because the panel was not provided the bathymetric configuration of the ROAs or the order in which the ROAs were established, it is not feasible for the Panel to evaluate the sensitivity of the models to the placement of the Restoration Opportunity Areas.

Overall, the Panel found the Chapter 5 text describing the two life cycle models (IOS and OBAN), which provide alternative views of BDCP effects compared with other analyses, to be complicated and somewhat confusing. It was not clear whether or not the models were appropriately applied to evaluate a portion of the BDCP attributes.

The Effects Analysis modeling of salmon sensitivity to water temperature during egg incubation in the Sacramento River is not clear, given that the BDCP has no effect on upstream conditions according to some sections of Chapter 5. The Chapter 5 evaluation needs clarification, including a clear description of how the BDCP might affect flow and temperature in this area.

6. How well does the Effects Analysis link to the adaptive management plan and associated monitoring programs?

While both the need for and operative structure of adaptive management is identified considerably more in the Phase 3 review version of the Effects Analysis, it remains

characterized as a silver bullet but without clear articulation about how key assumptions will be vetted or uncertainties resolved to the point that the BDCP goals and objectives are more assured. The concept of adaptive management is appropriately described and allocated a prominent role in the implementation structure. However, the commonly acknowledged process of adaptive management is easily misunderstood and misapplied, often resulting in a loss of rigor and commitment in application. Because of the extensive uncertainties surrounding the assumptions and predictions of the BDCP, the Panel strongly emphasizes institutionalizing an exceedingly rigorous adaptive management process. This is critical in order to avoid the high risk associated with ecological surprises that will be difficult or impossible to reverse once they have occurred. BDCP must make a commitment to the fundamental process, and specifically the required monitoring and independent science review, not just the concept of adaptive management.

To: Rader, Cliff[Rader.Cliff@epa.gov]
From: Alston, Wanda
Sent: Wed 3/19/2014 11:21:54 AM
Subject: FW: Final Region IX Fact Sheets for the FY2015 HEC, HAC, SAC, and SEPW Budget and Appropriations Hearings
San Francisco Bay - Sacramento- Sacramento-San Joaquin Delta (Bay Delta) - Fat Sheet.docx

Good morning!

Please don't forget to give me your response to this request from John. I would like to give him something this afternoon. Thank you!

From: Warren, JohnM
Sent: Tuesday, March 18, 2014 9:36 AM
To: Alston, Wanda
Cc: Strickland, Francine
Subject: FW: Final Region IX Fact Sheets for the FY2015 HEC, HAC, SAC, and SEPW Budget and Appropriations Hearings
Importance: High

Wanda,

I wanted to run this fact sheet by your office since NEPA is mentioned in the response. Region 9 submitted this fact sheet to OCFO for the Congressional hearings.

Please let me know if you have any edits.

Thanks.

From: Warren, John
Sent: Tuesday, March 18, 2014 8:54 AM
To: Warren, JohnM
Subject: FW: Final Region IX Fact Sheets for the FY2015 HEC, HAC, SAC, and SEPW Budget and Appropriations Hearings
Importance: High

From: Maier, Brent
Sent: Monday, March 17, 2014 1:55 PM
To: Salgado, Omayra; Priftis, Sue; Fontaine, Tim; Warren, John
Cc: Ryerson.Teddy; Keener, Bill; Zito, Kelly; Gaudario, Abigail; Blizzard, James; Kaiser, Sven-Erik; Lewis, Josh; Levine, Carolyn; Moody, Christina; Thomas, Janie; Keener, Bill; Zito, Kelly; Yogi, David; Glosson, Niloufar; Harris-Bishop, Rusty; Stollman, Scott; Hood, Timonie; Johnson, AudreyL; Ripley, Laura; John, Steven
Subject: Final Region IX Fact Sheets for the FY2015 HEC, HAC, SAC, and SEPW Budget and Appropriations Hearings
Importance: High

All –

Please find attached the Region IX fact sheet submittals for the FY2015 House Energy and Commerce (HEC), House Appropriations Committee (HAC), Senate Appropriations Committee (SAC), and Senate Environment and Public Works Committee (SEPW) budget and appropriations hearings. I am sending them to the listed SBOs for OAR, OECA, OSWER, and OW. If they should have been sent to any additional SBOs, please forward on to them. Thank you.

The Region IX Members for each of these committees are listed below.

House Energy and Commerce Full Committee & Subcommittee on Energy and Power

Rep. Henry A. Waxman (D-CA-33) - Ranking Member

Rep. Anna G. Eshoo (D-CA-18)

Rep. Lois Capps (D-CA-24)

Rep. Doris O. Matsui (D-CA)

Rep. Gerald "Jerry" McNerney (D-CA-9)

House Appropriations Committee - Subcommittee on Interior, Environment, and Related Agencies

Rep. Kenneth S. "Ken" Calvert (R-CA-42) - Chairman

Rep. David G. Valadao (R-CA-21)

Senate Appropriations Committee - Subcommittee on Interior, Environment, and Related Agencies

Sen. Dianne Feinstein (D-CA)

Sen. Thomas S. "Tom" Udall (D-NM) – (Note: For Navajo Nation Issues Only)

Senate Environment and Public Works Committee (SEPW)

Sen. Barbara Boxer (D-CA) – Chairwoman

Sen. Tom Udall (D-NM)

Region IX fact sheets for the FY2015 budget and appropriations hearings before the

House Energy and Commerce Committee (HEC), House Appropriations Committee (HAC), and Senate Appropriations Committee (SAC)

Superfund – (OSWER)

Uranium Mines on Navajo Lands

Sen. Tom Udall (D-NM) – (Note: For Navajo Nation Issues Only)

Air – (OAR)

Navajo Generating Station (NGS) - Proposed Federal Implementation Plan (FIP)

Sen. Tom Udall (D-NM) – (Note: For Navajo Nation Issues Only)

Controlling Emissions from Ships and Locomotives

Sen. Barbara Boxer (D-CA)

Sen. Dianne Feinstein (D-CA)

Enforcement – (OECA)

Enforcement in Environmental Justice Communities

Sen. Barbara Boxer (D-CA)

Sen. Dianne Feinstein (D-CA)

Water – (OW)

Lake Tahoe

Sen. Dianne Feinstein (D-CA)

Sen. Barbara Boxer (D-CA)

Fracking and Offshore Oil Production

Rep. Lois Capps (D-CA-24)

Sen. Dianne Feinstein (D-CA)

Sen. Barbara Boxer (D-CA)

Drinking Water Challenges in the Central Valley

Rep. Doris Matsui (D-CA-6)

Rep. Jerry McNerney (D-CA-9)

Rep. David Valadao (R-CA-21)

Rep. Ken Calvert (R-CA-42)

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San Francisco Bay/Sacramento-San-Joaquin Delta (Bay Delta)

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Sen. Barbara Boxer (D-CA)

California's Drought Emergency of 2014

Rep. Doris Matsui (D-CA-6)

Rep. Jerry McNerney (D-CA-9)

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Rep. Ken Calvert (R-CA-42)

Sen. Dianne Feinstein (D-CA)

Sen. Barbara Boxer (D-CA)

Please let us know if you have any questions or need any additional information.

Regards,

Brent Maier

Congressional Liaison

U.S. Environmental Protection Agency, Region IX

75 Hawthorne St. (OPA-3)

San Francisco, CA 94105

Ph: 415.947.4256

To: Rader, Cliff[Rader.Cliff@epa.gov]; Hessert, Aimee[Hessert.Aimee@epa.gov]
From: Alston, Wanda
Sent: Tue 3/18/2014 1:38:27 PM
Subject: FW: Final Region IX Fact Sheets for the FY2015 HEC, HAC, SAC, and SEPW Budget and Appropriations Hearings
San Francisco Bay - Sacramento- Sacramento-San Joaquin Delta (Bay Delta) - Fat Sheet.docx

Hi Cliff,

Would you please look at the attachment and let me know if you have any edits to submit to John. If possible, please let me know sometime today if you have any edits. Thank you!

From: Warren, JohnM
Sent: Tuesday, March 18, 2014 9:36 AM
To: Alston, Wanda
Cc: Strickland, Francine
Subject: FW: Final Region IX Fact Sheets for the FY2015 HEC, HAC, SAC, and SEPW Budget and Appropriations Hearings
Importance: High

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From: Maier, Brent
Sent: Monday, March 17, 2014 1:55 PM
To: Salgado, Omayra; Priftis, Sue; Fontaine, Tim; Warren, John
Cc: Ryerson.Teddy; Keener, Bill; Zito, Kelly; Gaudario, Abigail; Blizzard, James; Kaiser, Sven-Erik; Lewis, Josh; Levine, Carolyn; Moody, Christina; Thomas, Janie; Keener, Bill; Zito, Kelly; Yogi, David; Glosson, Niloufar; Harris-Bishop, Rusty; Stollman, Scott; Hood, Timonie; Johnson, AudreyL; Ripley, Laura; John, Steven
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Importance: High

All –

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Sen. Dianne Feinstein (D-CA)

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Please let us know if you have any questions or need any additional information.

Regards,

Brent Maier

Congressional Liaison

U.S. Environmental Protection Agency, Region IX

75 Hawthorne St. (OPA-3)

San Francisco, CA 94105

Ph: 415.947.4256

From: Nagle, Kathleen
Location: 866-299-3188 code: 617-918-1067
Importance: Normal
Subject: FW: Monthly CEH Call
Start Date/Time: Thur 2/27/2014 6:30:00 PM
End Date/Time: Thur 2/27/2014 7:30:00 PM
NEPA Overview Briefing - CEH Conf Call.pptx

See below for updated agenda and power point for call today.

-----Original Appointment-----
From: Abrams, Dan
Sent: Monday, September 09, 2013 10:33 AM
To: Abrams, Dan; Roemele, Julie; Rader, Cliff; Nagle, Kathleen; Maddaloni, Mark; Ward, Prentiss; Garfinkel, Wayne; Suero, Maryann; Master, Edward; Selzer, Paula; Sanders, LaTonya; Wood, MelanieL; hayes, jacquelyn; Young, Margo; Reed, Khesha; Mosby, Jackie; Brown, Margot; Coopwood, Theodore; Grantham, Nancy; ONeill, Maureen; Stewart, Kathleen; Dobrahner, Jaslyn; Schuller, Jennifer
Cc: Hing, Jessica; Rosenberg, Lorna; Murphy, Stacy; Fenton, Kathleen; Frye, Christopher; Campopiano, Jorine; Conley, Alanna
Subject: FW: Monthly CEH Call
When: Thursday, February 27, 2014 1:30 PM-2:30 PM (UTC-05:00) Eastern Time (US & Canada).
Where: 866-299-3188 code: 617-918-1067

-----Original Appointment-----
From: Abrams, Dan
Sent: Monday, September 09, 2013 10:33 AM
To: Abrams, Dan; Grantham, Nancy; Nagle, Kathleen; ONeill, Maureen; Ward, Prentiss; Garfinkel, Wayne; Suero, Maryann; Selzer, Paula; Sanders, LaTonya; Stewart, Kathleen; Young, Margo; Wood, MelanieL; hayes, jacquelyn; Dobrahner, Jaslyn; Schuller, Jennifer; Master, Edward; Maddaloni, Mark
Cc: Hing, Jessica; Rosenberg, Lorna; Murphy, Stacy; Fenton, Kathleen; Frye, Christopher; Campopiano, Jorine; Conley, Alanna
Subject: Monthly CEH Call
When: Thursday, February 27, 2014 1:30 PM-2:30 PM (UTC-05:00) Eastern Time (US & Canada).
Where: 866-299-3188 code: 617-918-1067

Agenda

Roll Call	
NEPA Briefing and Discussion (30 minutes) (powerpoint attached	Cliff Rader
Lead/Asthma Budget request	Khesha
Expanded accesses to Youth Curriculum and Role of the Regions	Ted
Regional Updates if time permits	All

To: Rader, Cliff[Rader.Cliff@epa.gov]; Spraul, Greg[Spraul.Greg@epa.gov]
Cc: Carney, Kimberley[Carney.Kimberley@epa.gov]
From: Miles, Erin
Sent: Wed 2/26/2014 5:39:05 PM
Subject: RE: URGENT - Congressional Response
denham response.docx

A few stylistic edits (redline). Otherwise, looks good.

From: Rader, Cliff
Sent: Wednesday, February 26, 2014 12:22 PM
To: Spraul, Greg; Miles, Erin
Cc: Carney, Kimberley
Subject: URGENT - Congressional Response

Greg and Erin –

We are two days overdue on this response to AL-14-000-4733 (Denham).

Can you take a quick look?

Thanks.

Cliff

To: Rader, Cliff[Rader.Cliff@epa.gov]
From: Carney, Kimberley
Sent: Wed 2/26/2014 1:34:42 PM
Subject: FW: CMS Inactivity Notification - Sent Item(s)

Cliff,
Are you on top of the Congressional I forwarded to you (#4733) on 2/11 and reminded you on 2/19? It was due two days ago (2/24)

-----Original Message-----
From: cmsadmin@epa.gov [mailto:cmsadmin@epa.gov]
Sent: Tuesday, February 25, 2014 11:10 PM
To: Carney, Kimberley
Subject: CMS Inactivity Notification - Sent Item(s)

Kimberley Carney:

The following item(s) sent by you have not been acted upon for more than 5 days. Please contact the responsible CMS user(s) for proper action or reassign the control.

Control Number: AX-14-000-4793
Control Subject: DRF - Daily Reading File - Application for Presidential Permit by TransCanada Keystone Pipeline, L.P. to Construct, Connect, Operate and Maintain Pipeline Facilities on the Border of the United States and Canada
From: Bass, John R.
Task Name: New Assignment
Sent By: Kimberley Carney
Sent To: OECA-OFA-NCD
Date Sent: Feb 11 2014
Days Inactive: 13

Control Number: AL-14-000-4733
Control Subject: REQUEST THAT THE PUBLIC COMMENT PERIOD FOR THE BAY-DELTA CONSERVATION PLAN AND THE ENVIRONMENTAL IMPACT REPORT BE EXTENDED BEYOND THE CURRENT 120-DAY COMMENT PERIOD
From: Denham, Jeff
Task Name: New Assignment
Sent By: Kimberley Carney
Sent To: OECA-OFA-NCD
Date Sent: Feb 11 2014
Days Inactive: 13

Note: This Email was automatically generated. Please do not attempt to respond to it. You can access this control at https://cms.epa.gov/cms. Questions or comments concerning CMS should be directed to CMS Support at 202-564-4985 or CMS Information@epa.gov.

Bay Delta Conservation Plan EIS/EIR Alternatives Overview

The alternatives generated for the Bay Delta Conservation Plan EIS are a result of combinations of Conveyance Methods, Operational Scenarios, and Conservation Components. The conveyance facilities are designed to carry water from the North Delta to the State Water Project and Central Valley Plan pumping stations in the South Delta. These facilities provide water to Northern California Agriculture. Alternative 4 has been

General Description of Conveyance Methods (view detailed maps and schematics below):

Of the 15 Alternatives, eight feature Pipeline to Tunnel alignments, where pipelines from the intake facilities carry water from the Sacramento River to the tunnels:

- Seven (Altenatives 1A, 2A, 3, 4, 5, 7, and 8) of these are Dual Conveyance, meaning existing facilities would continue operation along with new construction. The Dual Conveyance water delivery system would consist of the new north Delta diversion facilities and the existing export facilities in the south Delta. The existing south Delta diversion would only operate on its own when the north Delta diversion is nonoperational during infrequent periods for maintenance or repair. The CEQA preferred alternative, Alternative 4, is a modified version of this setup where the tunnels are located closer to the Sacramento River, reducing the length of the pipelines from the intake facilities.
- One (Alternative 6A) of these is Isolated Conveyance, meaning the existing facilities would cease operation. The Isolated Conveyance water delivery system would consist only of the new north Delta diversion facilities. The SWP/CVP south Delta diversion points would no longer be operated.

Three feature the East Alignment, which diverts a portion of the Sacramento River's flow by intake pipelines to a canal, which carries water to the existing pumping stations. Two are Dual Conveyance (Alternatives 1B and 2B) and one (Alternative 6B) is Isolated Conveyance, as described above.

Three feature West Alignment, which diverts a portion of the Sacramento River's flow by intake pipelines to a canal, which carries the water to a tunnel underneath a length of the delta and then carries the water to another canal, which carries water to the existing pumping stations. Two are Dual Conveyance (Alternatives 1C and 2C) and one (Alternative 6C) is Isolated Conveyance, as described above.

One (Alternative 9) Features a Through Delta/Separate Corridors Alignment which diverts a portion of the Sacramento River's flow through existing waterways by use of operable barriers.

Operational Element Scenarios:

The conveyance methods are then further divided into alternatives by a number of rules that guide the operation of those facilities. These methods include maximum capacities, volume allowances for inflow and outflow, salinity allowances, storage allowances, etc. The individual rules have been grouped into operational scenarios specified as Scenarios A-H. Alternatives 1A, 1B, 1C, and 3 use Operational Scenario

A. Alternatives 2A, 2B, and 2C use Operational Scenario B; Alternative 5 uses Operational Scenario C; Alternatives 6A, 6B, and 6C use Operational Scenario D; Alternative 7 uses Operational Scenario E; Alternative 8 uses Operational Scenario F; Alternative 9 uses Operational Scenario G; and Alternative 4 (the CEQA preferred alternative) uses Operational Scenario H. For an idea of these specific operational rules, see Table 3-6, excerpted below.

Conservation Components:

Conservation components for most alternatives would be identical, with the exception of Alternatives 5, 7, and 9:

- 5 features 25,000 acres of tidal habitat restoration rather than 65,000. All other conservation measures are identical to Alternatives 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 6A, 6B, 6C, and 8.
- 7 features 40 rather than 20 linear miles of channel margin habitat to be enhanced, and 20,000 rather than 10,000 acres of seasonally inundated floodplain to be restored to further improve fish and wildlife habitat, particularly along the San Joaquin River. All other conservation measures are identical to Alternatives 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 6A, 6B, 6C, and 8.
- 9 would feature similar conservation measures to the other alternatives, but restoration and enhancement locations would likely be different because of this alternative's configuration.

List of Alternatives Featured in EIS:

- No action alternative
- Alternative 1A – Dual Conveyance with Pipeline/Tunnel and Intakes 1-5 (15,000 cfs; Operational Scenario A)
- Alternative 1B – Dual Conveyance with East Alignment and Intakes 1-5 (15,000 cfs; Operational Scenario A)
- Alternative 1C—Dual Conveyance with West Alignment and Intakes W1–W5 (15,000 cfs; Operational Scenario A)
- Alternative 2A—Dual Conveyance with Pipeline/Tunnel and Five Intakes (15,000 cfs; Operational Scenario B)
- Alternative 2B—Dual Conveyance with East Alignment and Five Intakes (15,000 cfs; Operational Scenario B)
- Alternative 2C—Dual Conveyance with West Alignment and Intakes W1–W5 (15,000 cfs; Operational Scenario B)
- Alternative 3—Dual Conveyance with Pipeline/Tunnel and Intakes 1 and 2 (6,000 cfs; Operational Scenario A)
- Alternative 4—Dual Conveyance with Modified Pipeline/Tunnel and Intakes 2, 3, and 5 (9,000 cfs; Operational Scenario H; CEQA Preferred Alternative)

- Alternative 5—Dual Conveyance with Pipeline/Tunnel and Intake 1 (3,000 cfs; Operational Scenario C)
- Alternative 6A—Isolated Conveyance with Pipeline/Tunnel and Intakes 1–5 (15,000 cfs; Operational Scenario D)
- Alternative 6B—Isolated Conveyance with East Alignment and Intakes 1–5 (15,000 cfs; Operational Scenario D)
- Alternative 6C—Isolated Conveyance with West Alignment and Intakes W1–W5 (15,000 cfs; Operational Scenario D)
- Alternative 7—Dual Conveyance with Pipeline/Tunnel, Intakes 2, 3, and 5, and Enhanced Aquatic Conservation (9,000 cfs; Operational Scenario E)
- Alternative 8—Dual Conveyance with Pipeline/Tunnel, Intakes 2, 3, and 5, and Increased Delta Outflow (9,000 cfs; Operational Scenario F)
- Alternative 9—Through Delta/Separate Corridors (15,000 cfs; Operational Scenario G)

1 **Table 3-1. Action Alternatives Evaluated in the BDCP EIR/EIS**

EIR/EIS Alternative Number	Conveyance	Conveyance Alignment	Intakes Selected for Analysis	North Delta Diversion Capacity (cfs)	Operations[e]	Conservation Components	Measures to Reduce Other Stressors	Associated NMFS and USFWS Action
1A	Dual[a]	Pipeline/ Tunnel	1, 2, 3, 4, 5	15,000	Scenario A	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species
1B	Dual[a]	East	1, 2, 3, 4, 5	15,000	Scenario A	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species
1C	Dual[a]	West	West side intakes 1, 2, 3, 4, 5[g]	15,000	Scenario A	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species
2A	Dual[a]	Pipeline/ Tunnel	1, 2, 3, 4, 5 (or 1,2, 3, 6, 7)[b]	15,000	Scenario B	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species
2B	Dual[a]	East	1, 2, 3, 4, 5 (or 1, 2, 3, 6, 7)[b]	15,000	Scenario B	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species
2C	Dual[a]	West	West side intakes 1, 2, 3, 4, 5[g]	15,000	Scenario B	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species
3	Dual[a]	Pipeline/ Tunnel	1, 2[i]	6,000	Scenario A	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species

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EIR/EIS Alternative Number	Conveyance	Conveyance Alignment	Intakes Selected for Analysis	North Delta Diversion Capacity (cfs)	Operations[e]	Conservation Components	Measures to Reduce Other Stressors	Associated NMFS and USFWS Action
4 (CEQA Preferred Alternative)	Dual[a]	Modified Pipeline/ Tunnel	2, 3, 5	9,000	Scenario H	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species
5	Dual[a]	Pipeline/ Tunnel	1	3,000	Scenario C	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f]); tidal habitat restoration limited to 25,000 acres	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species
6A	Isolated[c]	Pipeline/ Tunnel	1, 2, 3, 4, 5	15,000	Scenario D	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species
6B	Isolated[c]	East	1, 2, 3, 4, 5	15,000	Scenario D	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species
6C	Isolated[c]	West	West side intakes 1, 2, 3, 4, 5[g]	15,000	Scenario D	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species
7	Dual[a]	Pipeline/ Tunnel	2, 3, 5 [i]	9,000	Scenario E	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f]); additional 20 linear miles of channel margin habitat enhancement and 10,000 acres of seasonally inundated floodplain	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species

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EIR/EIS Alternative Number	Conveyance	Conveyance Alignment	Intakes Selected for Analysis	North Delta Diversion Capacity (cfs)	Operations[e]	Conservation Components	Measures to Reduce Other Stressors	Associated NMFS and USFWS Action
8	Dual[a]	Pipeline/ Tunnel	2, 3, 5 [i]	9,000	Scenario F	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species
9	Through Delta[d]	Through Delta/ Separate Corridors[d]	Screened intakes at Delta Cross Channel and Georgiana Slough	15,000[d]	Scenario G	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f]); changes in the south Delta[h]	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species

[a] The *Dual Conveyance* water delivery system would consist of the new north Delta diversion facilities and the existing SWP/CVP export facilities in the south Delta. The north Delta diversion would be the primary diversion point using specific operating criteria and would be operated in conjunction with the existing south Delta diversion. The existing south Delta diversion would only operate on its own when the north Delta diversion is nonoperational during infrequent periods for maintenance or repair.

[b] Under Alternatives 2A, 2B, and 2C a total of five intakes would be constructed and operated. Intake locations 1–5 or 1, 2, 3, 6, and 7 are analyzed for these alternatives.

[c] The *Isolated Conveyance* water delivery system would consist only of the new north Delta diversion facilities. The SWP/CVP south Delta diversion points would no longer be operated. For the SWP this means the gated intake on Old River, Clifton Court Forebay, and the Skinner Fish Facility would no longer be operated. For the CVP this means the diversion point on Old River and the Tracy Fish Collection Facility would no longer be operated.

[d] The *Through Delta/Separate Corridors* water delivery system would convey water from the Sacramento River through the Delta using existing Delta channels for diversion by the SWP and CVP pumping plants. While the north Delta diversion capacity associated with this alternative is up to 15,000 cfs, it differs from the other action alternatives in that this capacity would be provided by flows through existing channels.

[e] See Table 3-6 for a summary of the individual rules that comprise the operational scenarios and a comparison by scenario and alternative. An overview of operational scenarios is provided in Section 3.4.1.2, *Operational Components*, while a more detailed description appears in Section 3.6.4.2, *North Delta and South Delta Water Conveyance Operational Criteria*.

[f] The BDCP Steering Committee Handout of 3/25/10 is available at: <http://baydeltaconservationplan.com/Library/ArchivedDocuments/SteeringCommittee/SteeringCommitteeAgendasAndHandouts.aspx>.

[g] The west side intakes would be located on the west bank of the Sacramento River.

[h] Under this alternative, lands acquired for restoration or enhancement in the south Delta would not be located alongside corridors designated for water supply.

[i] The intake locations listed represent those locations selected for the analysis of each BDCP alternative. Based on the results of an October 2011 workshop on the Phased Construction of North Delta Intake Facilities (see Appendix 3F, *Intake Location Analysis*), different combinations of intakes could be constructed under these alternatives. Once an alternative is selected as part of the final BDCP, a decision regarding intake locations would be made.

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1 **Table 3-6. Comparison of Operational Rules under BDCP Operational Scenarios and Alternatives**

Operational Scenario Alternative	Applicable Months	No Action	Scenario A Alt 1	Scenario B Alt 2	Scenario A Alt 3	Scenario H Alt 4	Scenario C Alt 5	Scenario D Alt 6	Scenario E Alt 7	Scenario F Alt 8	Scenario G Alt 9
Delta Operational Rules Controlling Maximum Allowable CVP and SWP South Delta Exports											
Physical/Permitted Limit for CVP (4,600 cfs)	Jan–Dec	X	X	X	X	X	X	X	X	X	X
Physical Limit for SWP (10,300 cfs)	Jan–Dec	X	X	X	X	X	X	X	X	X	X
Permitted Limit for SWP (6,680 cfs plus 1/3 of San Joaquin River Dec 15–March 15)	Jan–Dec	X	O	O	O	O	X	O	O	O	X
Export/Inflow Ratio (65% Jul–Jan; 35% Feb–Jun)	Jan–Dec	X	X[a]	X[a]	X[a]	X[a]	X[a]	O	X[a]	X[a]	X
SJR Inflow/Export Ratio	Apr–May	X	O	O[b]	O	O[b]	X	O	X[c]	X[c]	O[d]
Reverse Old and Middle River Flows	Dec–Jun	X	X	X[e]	X	X[e]	X	O	X[f]	X[f]	X
Available San Luis Reservoir Storage	Jan–Dec	X	X	X	X	X	X	X	X	X	X
SWP Article 21 Delivery (when San Luis Reservoir is Full)	Jan–Dec	X	X	X	X	X	X	X	X	X	X
Seasonal CVP and SWP Delivery Pattern	Jan–Dec	X	X	X	X	X	X	X	X	X	X
Delta Operational Rules Controlling Minimum Required Delta Outflow											
Minimum Monthly Specified Outflow	Jan–Dec	X	X	X	X	X	X	X	X	X[g]	X
Maximum Salinity (EC) for Delta Diversions	Jan–Dec	X	X	X	X	X	X	X	X	X	X
Maximum Spring X2 Location	Feb–Jun	X	X	X	X	X[h]	X	X	X	X	X
Maximum Fall X2 Location	Sep–Oct	X	O	X	O	X[h]	X	X	X	X	X

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Operational Scenario Alternative	Applicable Months	No Action	Scenario A Alt 1	Scenario B Alt 2	Scenario A Alt 3	Scenario H Alt 4	Scenario C Alt 5	Scenario D Alt 6	Scenario E Alt 7	Scenario F Alt 8	Scenario G Alt 9
New Operational Rules Controlling Maximum North Delta Intake Diversions											
Maximum Capacity of North Delta Intakes (cfs)	N/A	None	15,000	15,000	6,000	9,000	3,000	15,000	9,000	9,000	None
Bypass Flows (% of Sacramento River at Freeport)	Jan–Dec	O	X	X	X	X	X	X	X	X	O

Note:

"X" indicates that a BDCP alternative incorporates an operational rule.

"O" indicates that a BDCP alternative does not incorporate that operational rule.

[a] In computing the E/I ratio for these scenarios, the Sacramento River inflow is considered to be downstream of the north Delta intakes, with the exception of Scenarios H2 and H4, for which Sacramento River inflow was assumed to be upstream of the proposed north Delta intakes.

[b] Under these scenarios, a different strategy was applied to achieve similar objectives as the SJR I/E ratio.

[c] SJR I/E ratio is applicable December through June and therefore would apply for five months longer than under the No Action Alternative.

[d] SJR I/E ratio is applicable when the San Joaquin River flow at Vernalis is greater than 10,000 cfs.

[e] More restrictive/protective than Scenario A.

[f] More restrictive/protective than Scenario B.

[g] More restrictive/protective than in the No Action Alternative; the Delta outflow requirement is expressed as a percent of unimpaired flow.

[h] For Alternative 4, additional spring outflow will be determined based on the results of the decision tree process. Maximum Fall X2 Location will also be determined by the decision tree process under Alternative 4.

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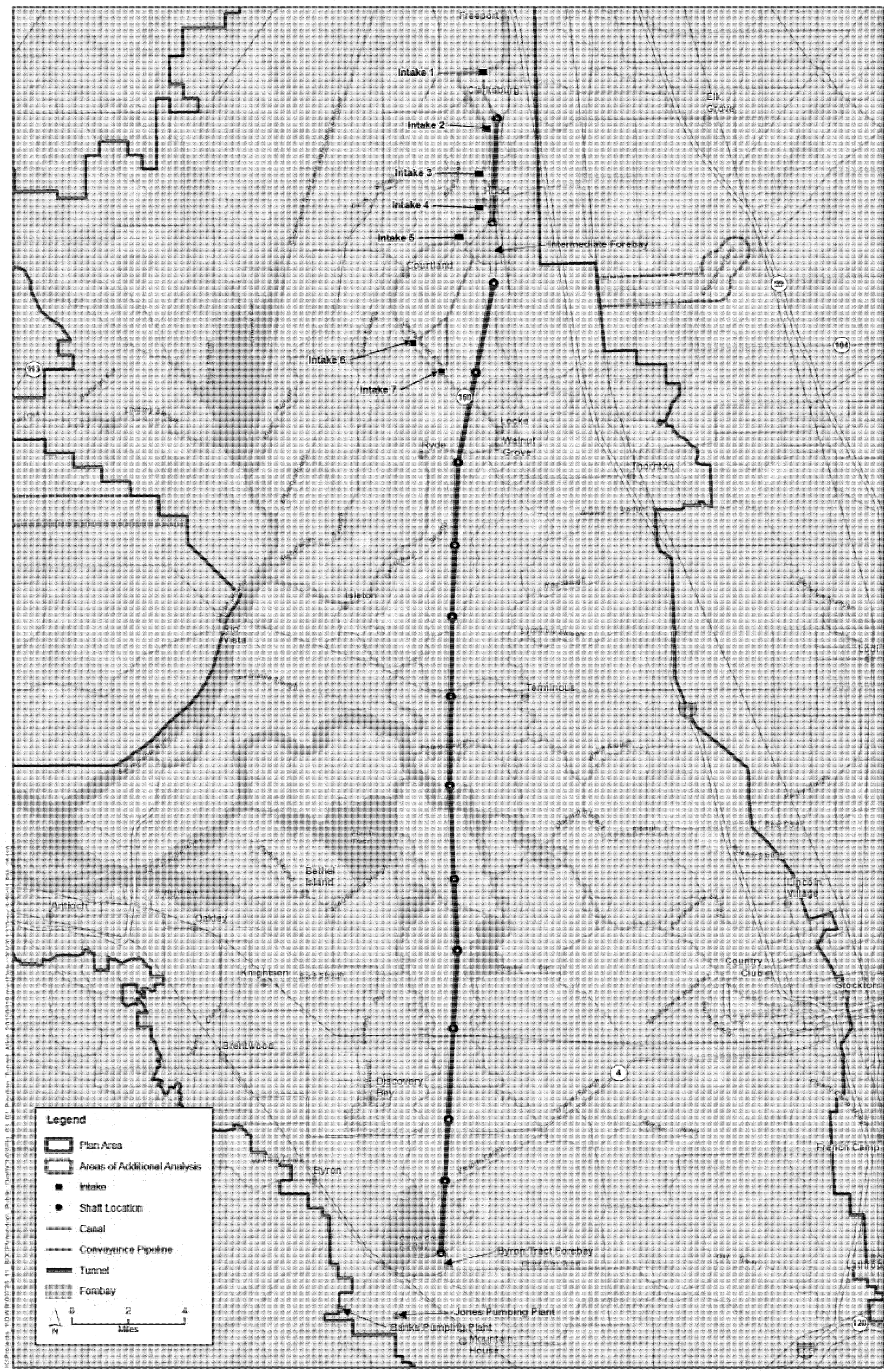


Sources: Plan Area, ICF 2012; Option Features (Rev 10b), DHCCP DWR 2012

Figure 3-2
Pipeline/Tunnel Alignment Overview (Alternatives 1A, 2A, 3, 5, 6A, 7, and 8)

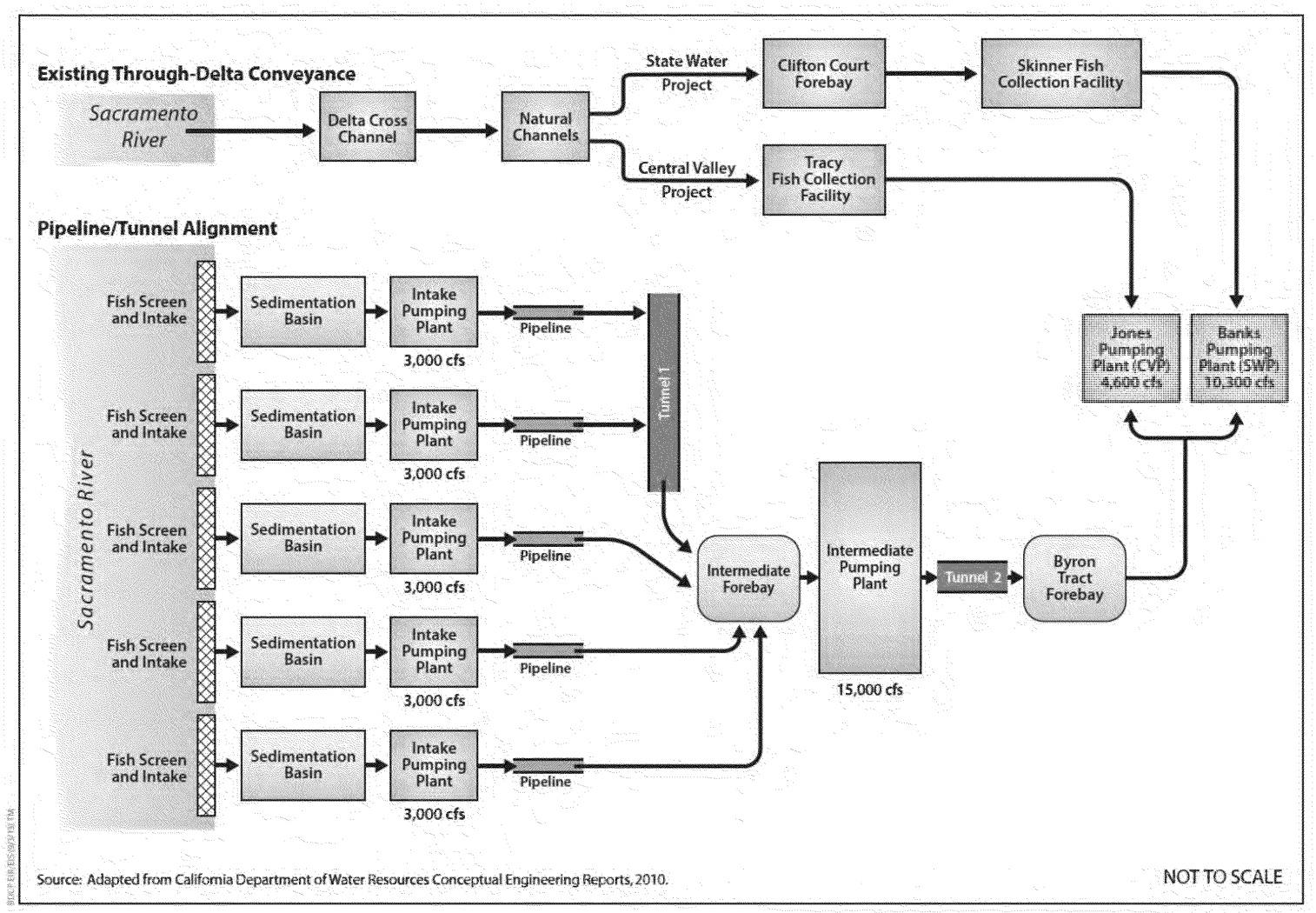
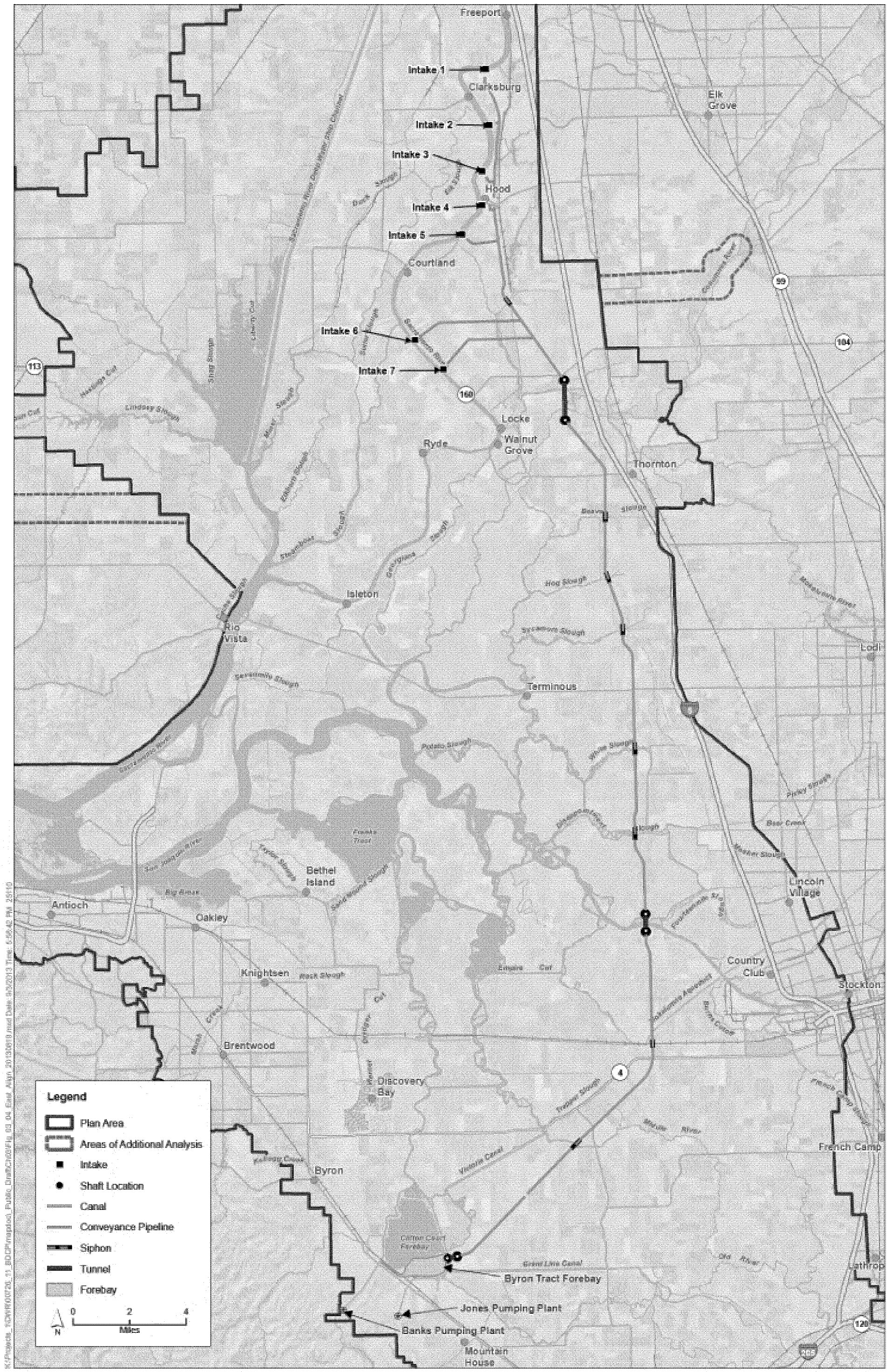


Figure 3-3
Alternatives 1A and 2A Conveyance Schematic



Sources: Plan Area, ICF 2012; Option Features (Rev 10b), DHCCP DWR 2012

Figure 3-4
East Alignment Overview (Alternatives 1B, 2B, and 6B)

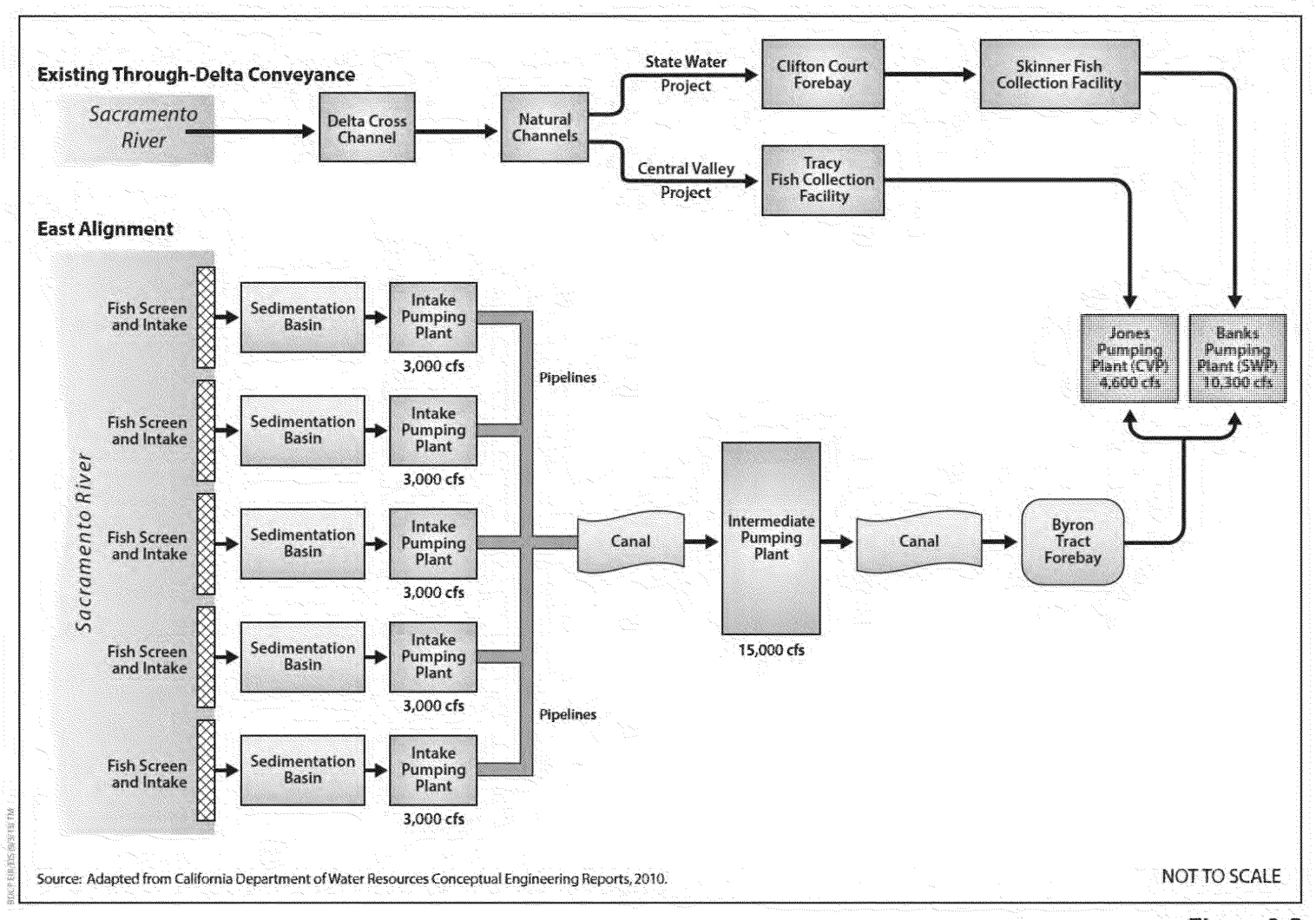
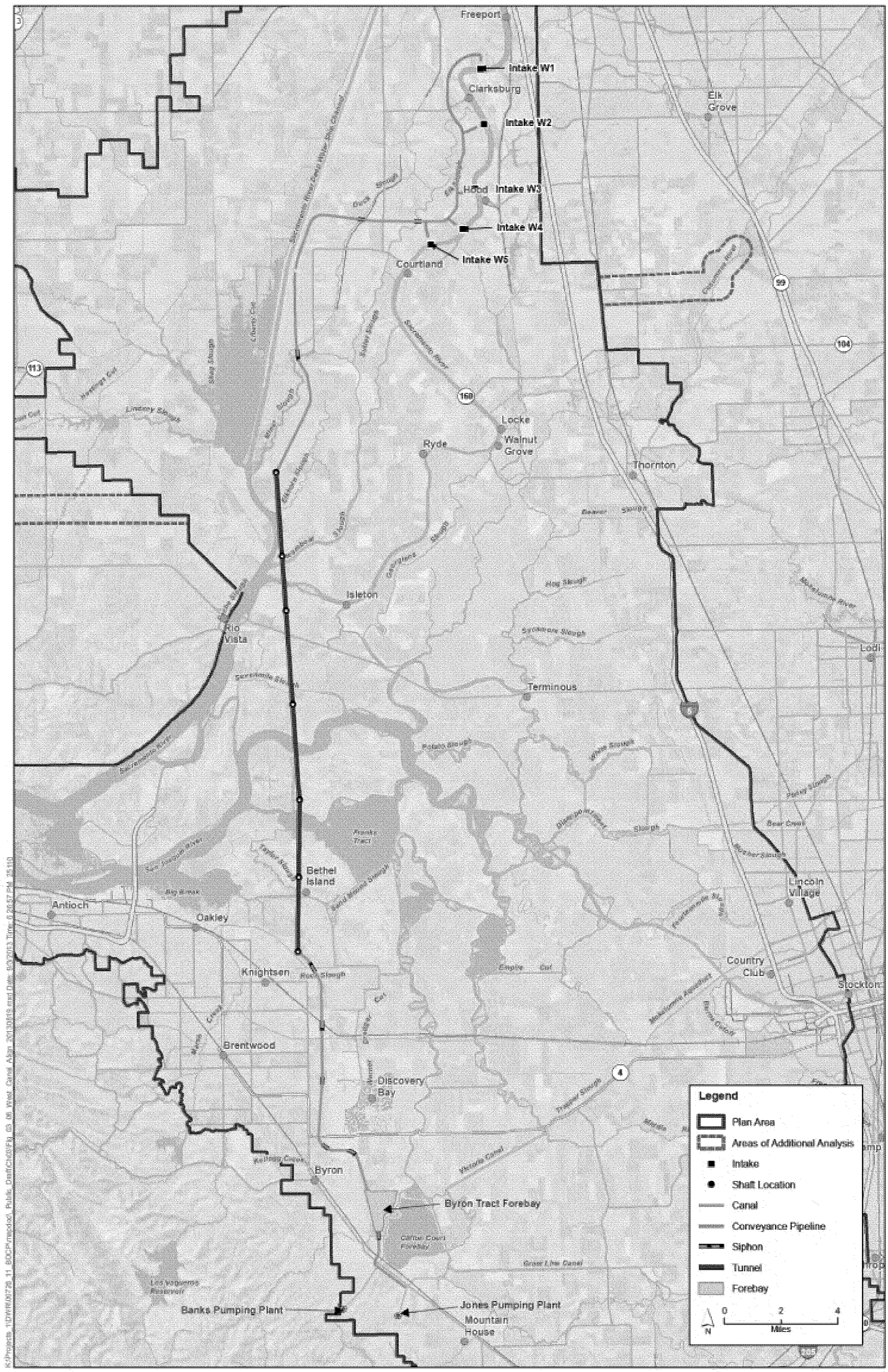
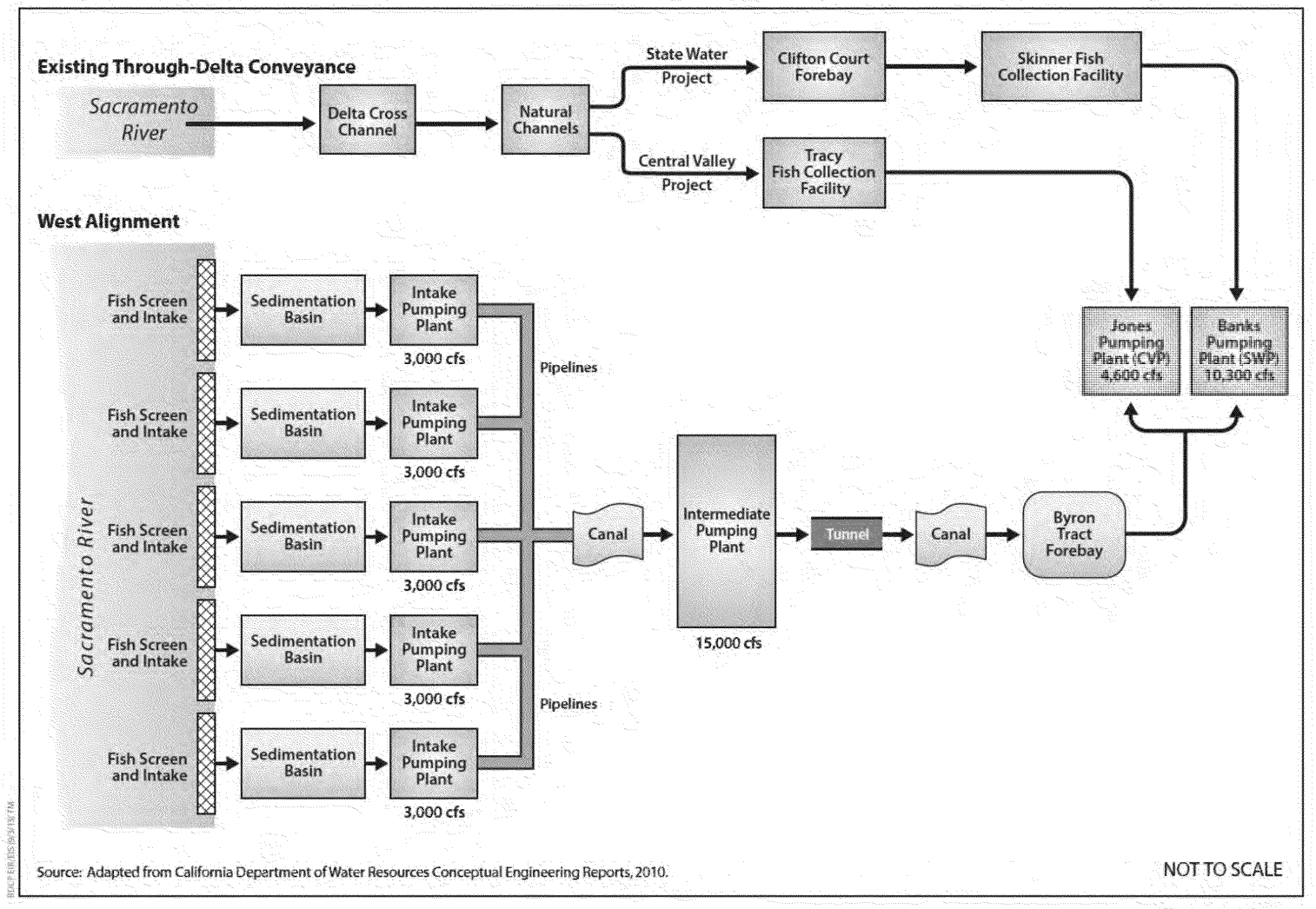


Figure 3-5
Alternatives 1B and 2B Conveyance Schematic



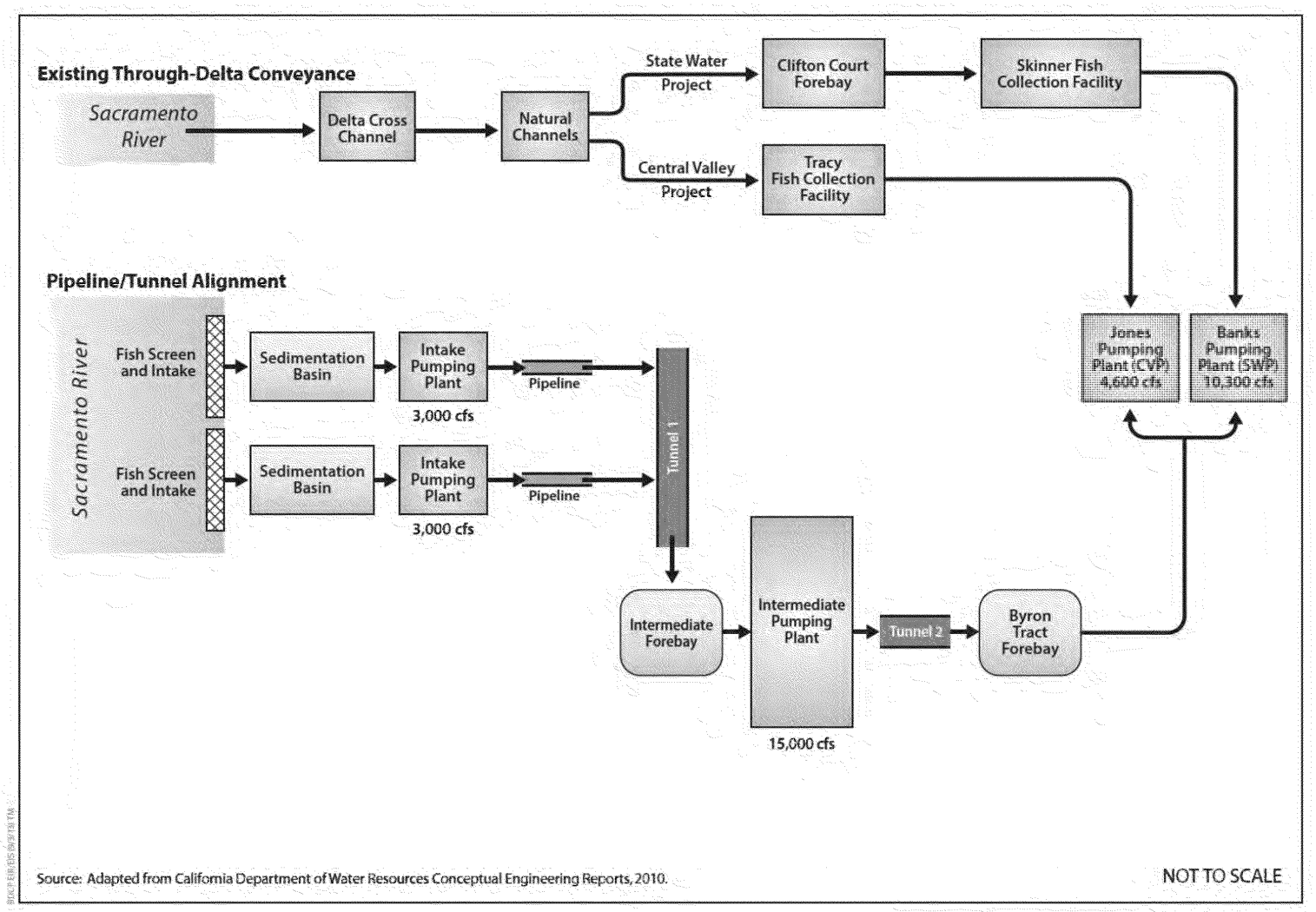
Sources: Plan Area, ICF 2012; Area of Additional Analysis, ICF 2012; Option Feature (Rev 10b), DHCCP DWR 2012

Figure 3-6
West Alignment Overview (Alternatives 1C, 2C, and 6C)



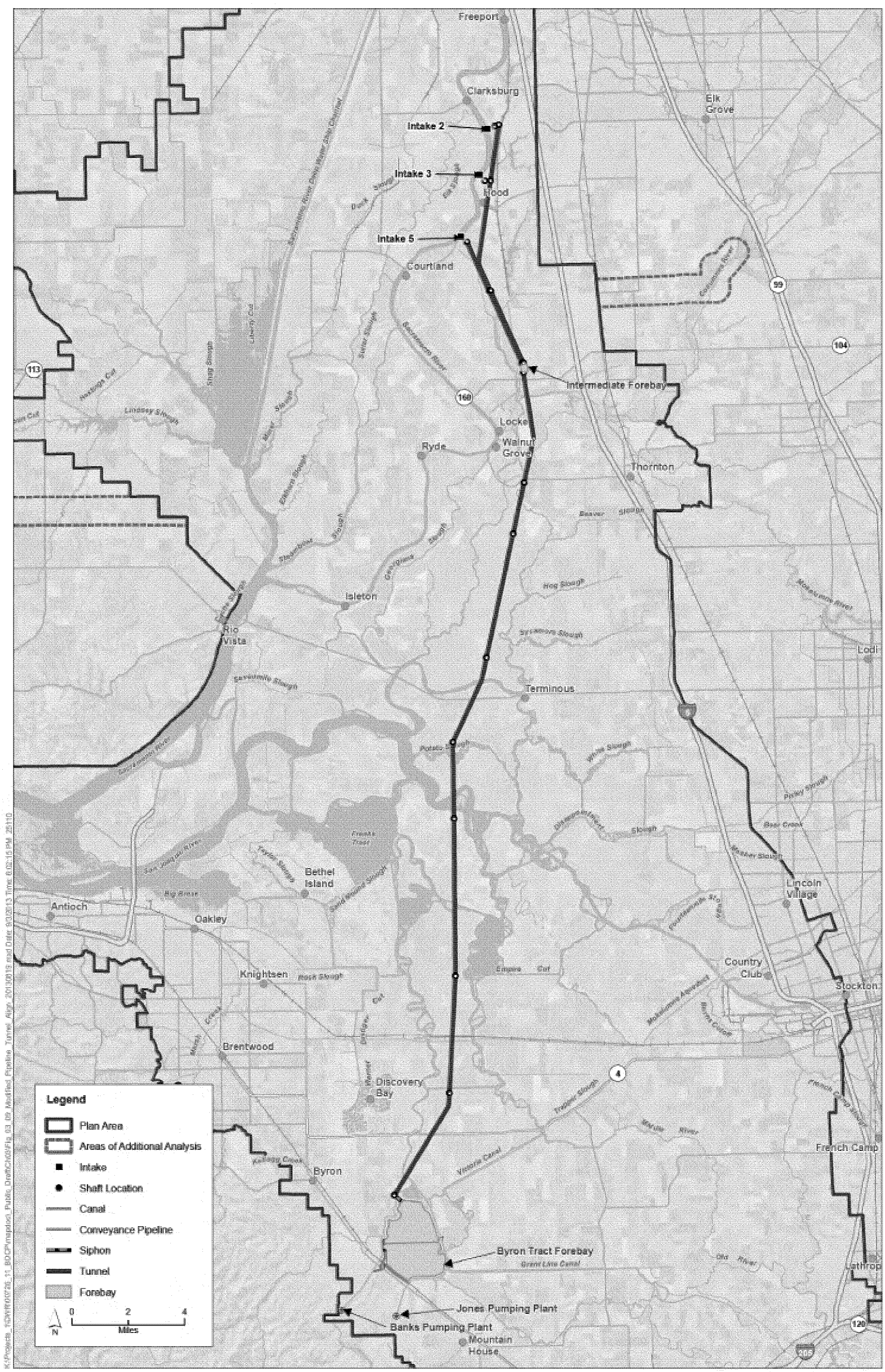
Source: Adapted from California Department of Water Resources Conceptual Engineering Reports, 2010.

Figure 3-7
Alternatives 1C and 2C Conveyance Schematic



Source: Adapted from California Department of Water Resources Conceptual Engineering Reports, 2010.

Figure 3-8
Alternative 3 Conveyance Schematic



Sources: Plan Area, ICF 2012; Option Features (Rev 2b), DHCCP DWR 2013

Figure 3-9
Modified Pipeline/Tunnel Alignment Overview (Alternative 4)

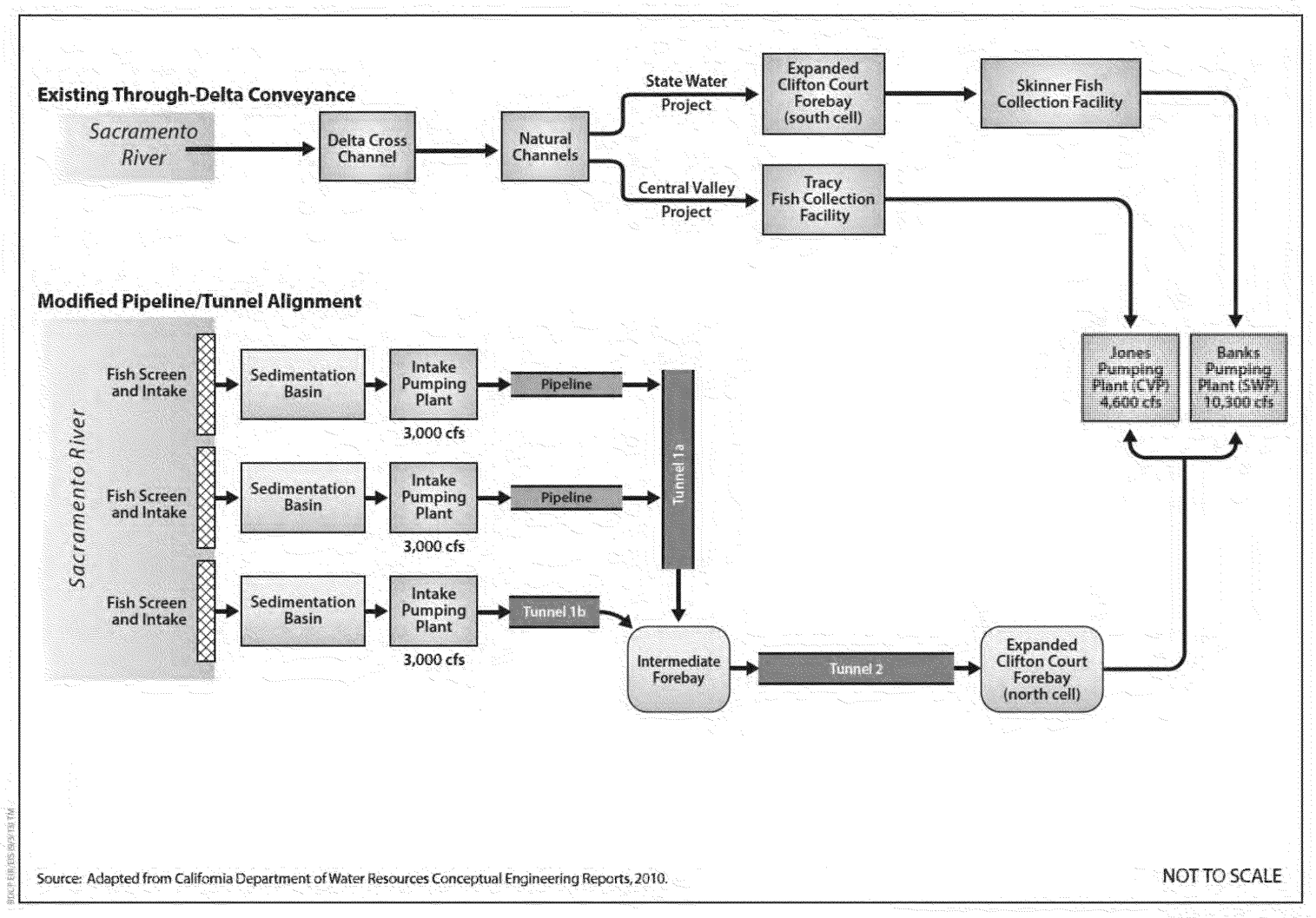
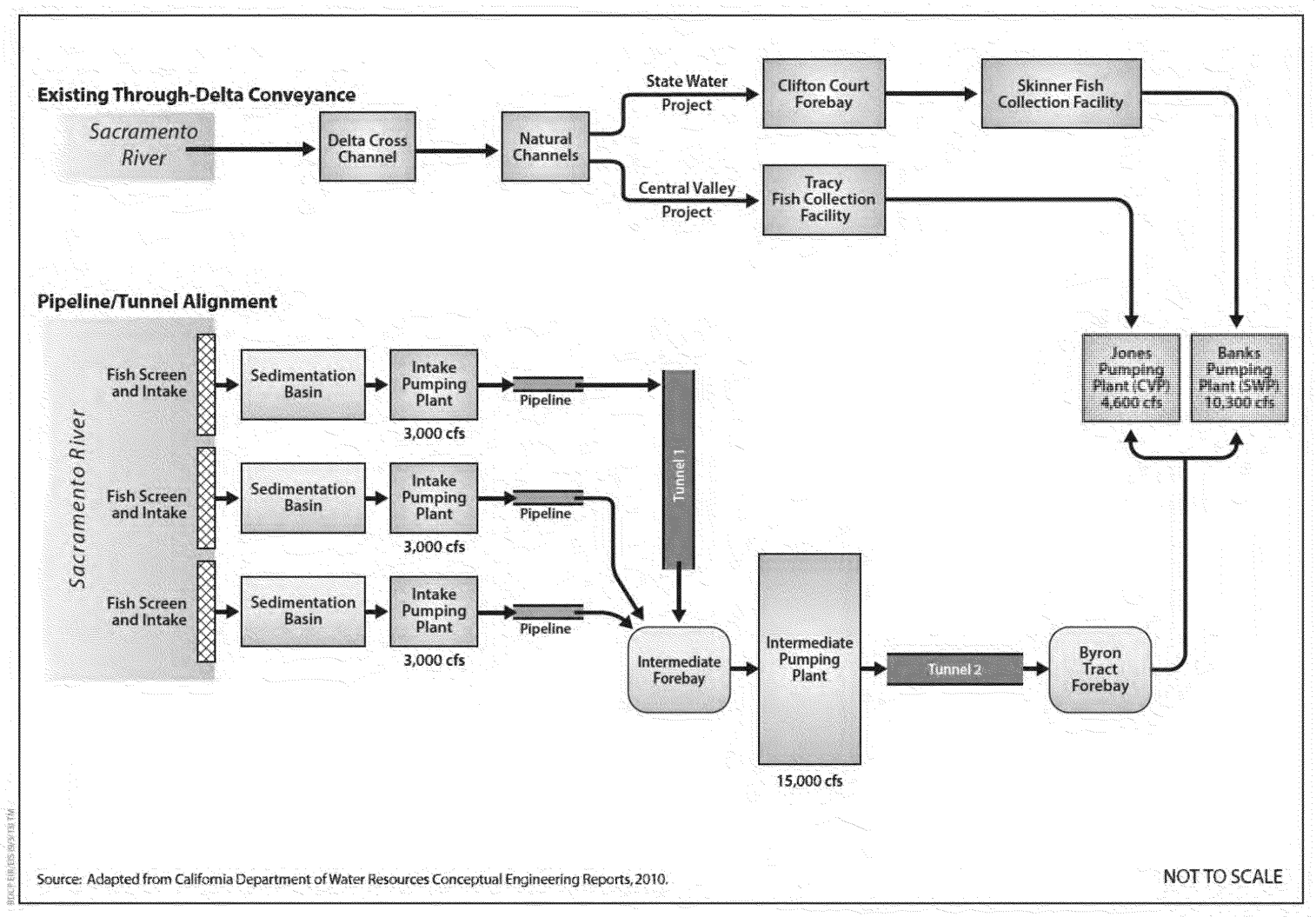


Figure 3-10
Alternative 4 Conveyance Schematic



Source: Adapted from California Department of Water Resources Conceptual Engineering Reports, 2010.

Figure 3-11
Alternatives 7 and 8 Conveyance Schematic

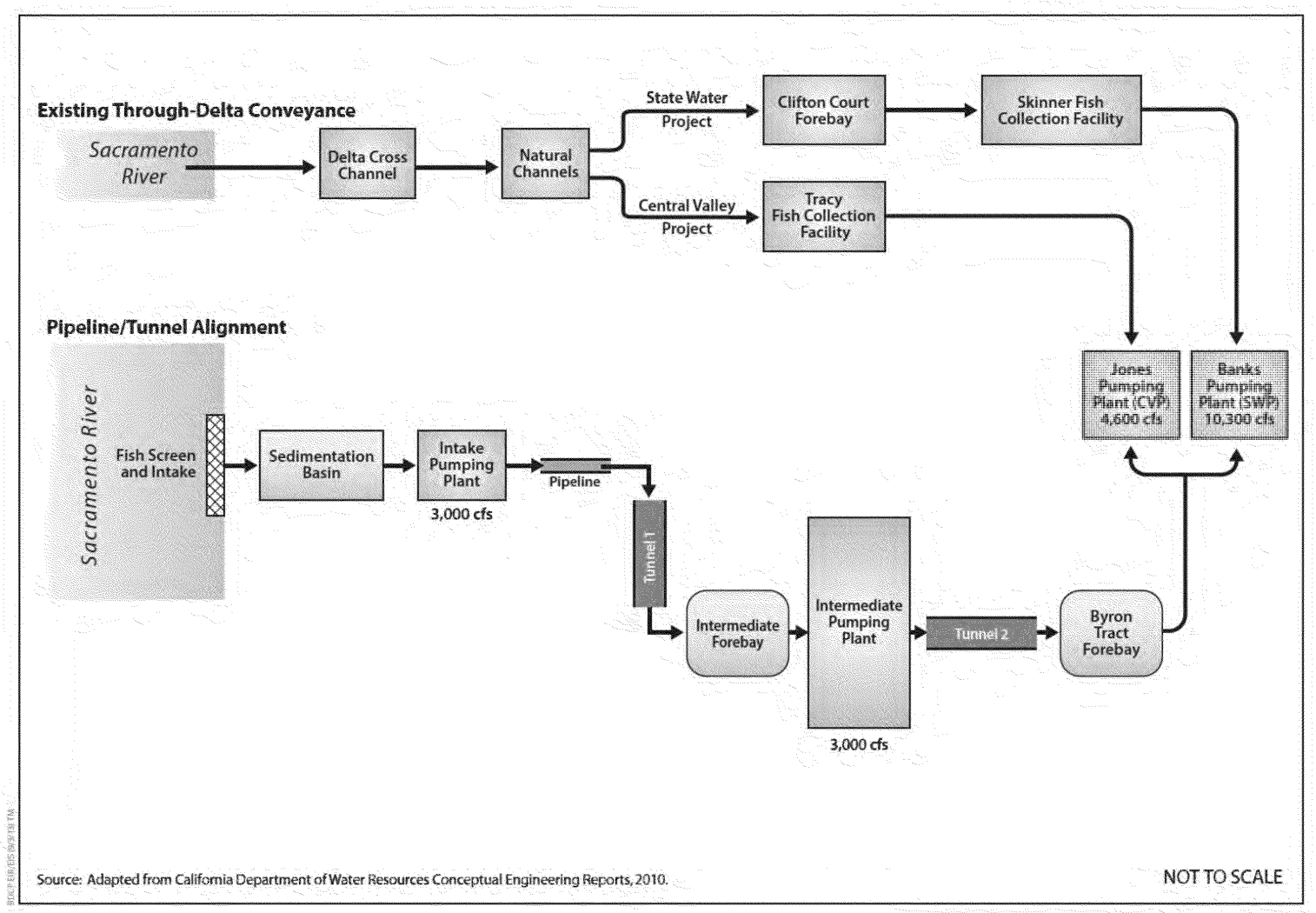


Figure 3-12
Alternative 5 Conveyance Schematic

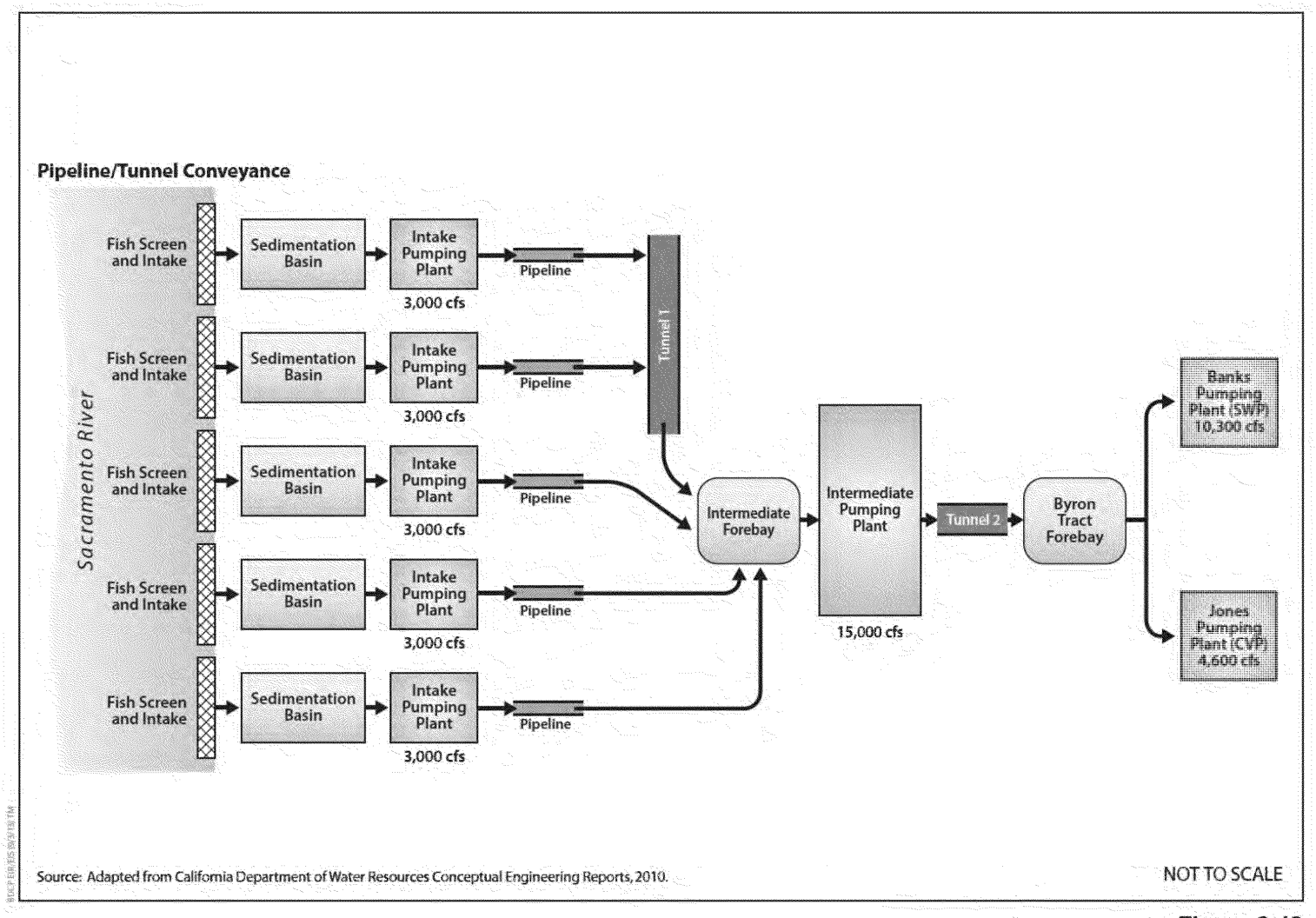


Figure 3-13
Alternative 6A Conveyance Schematic

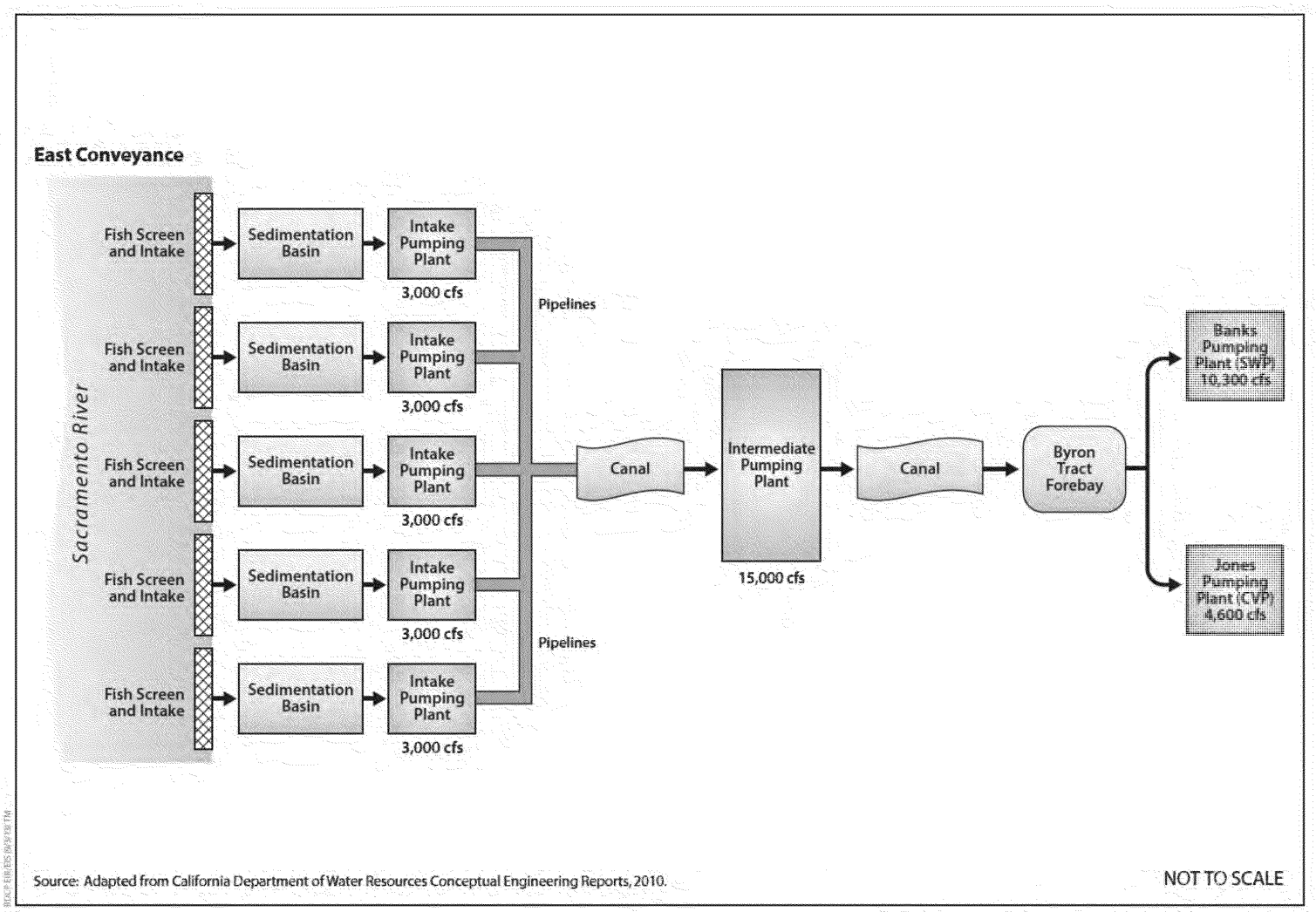


Figure 3-14
Alternative 6B Conveyance Schematic

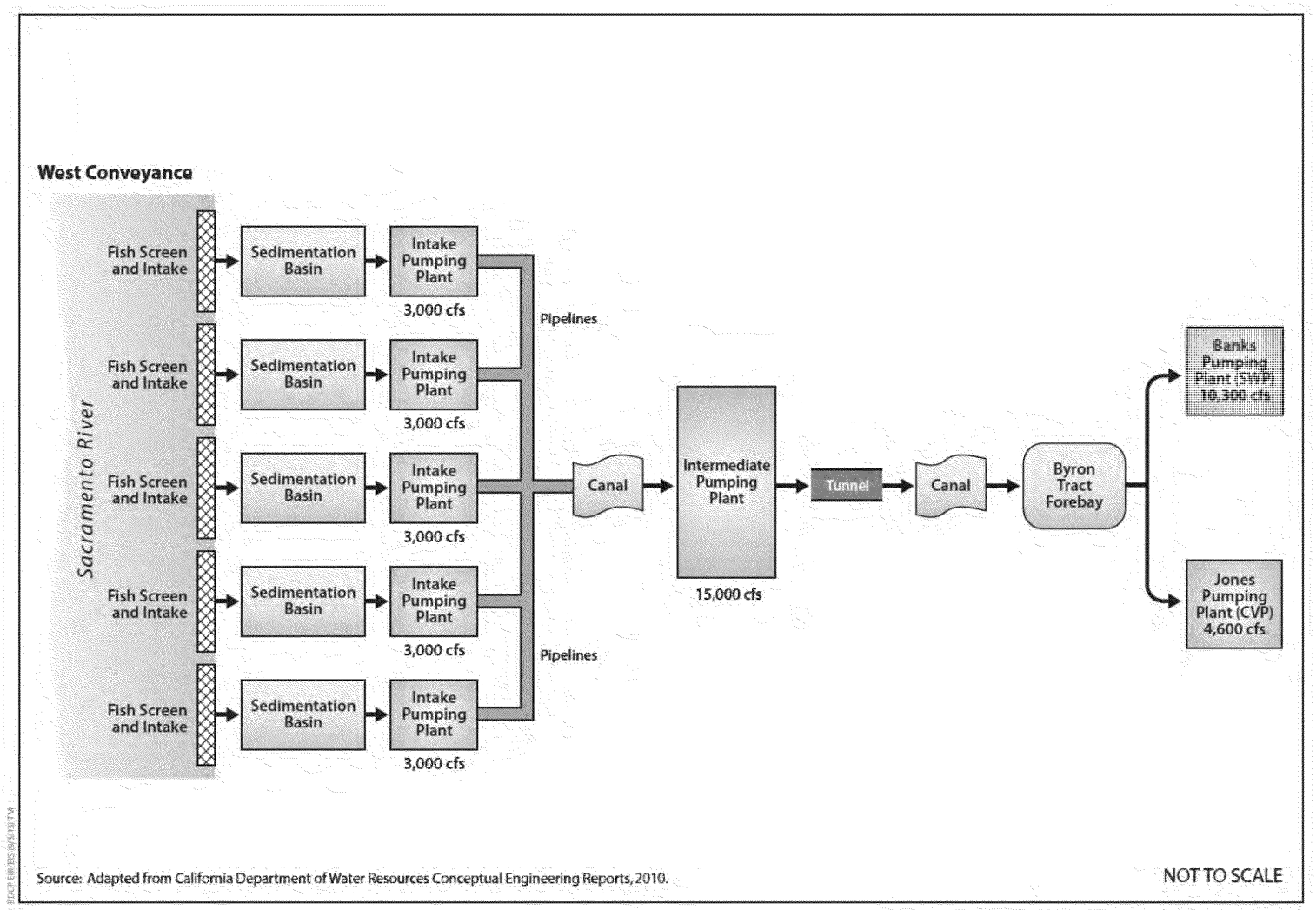
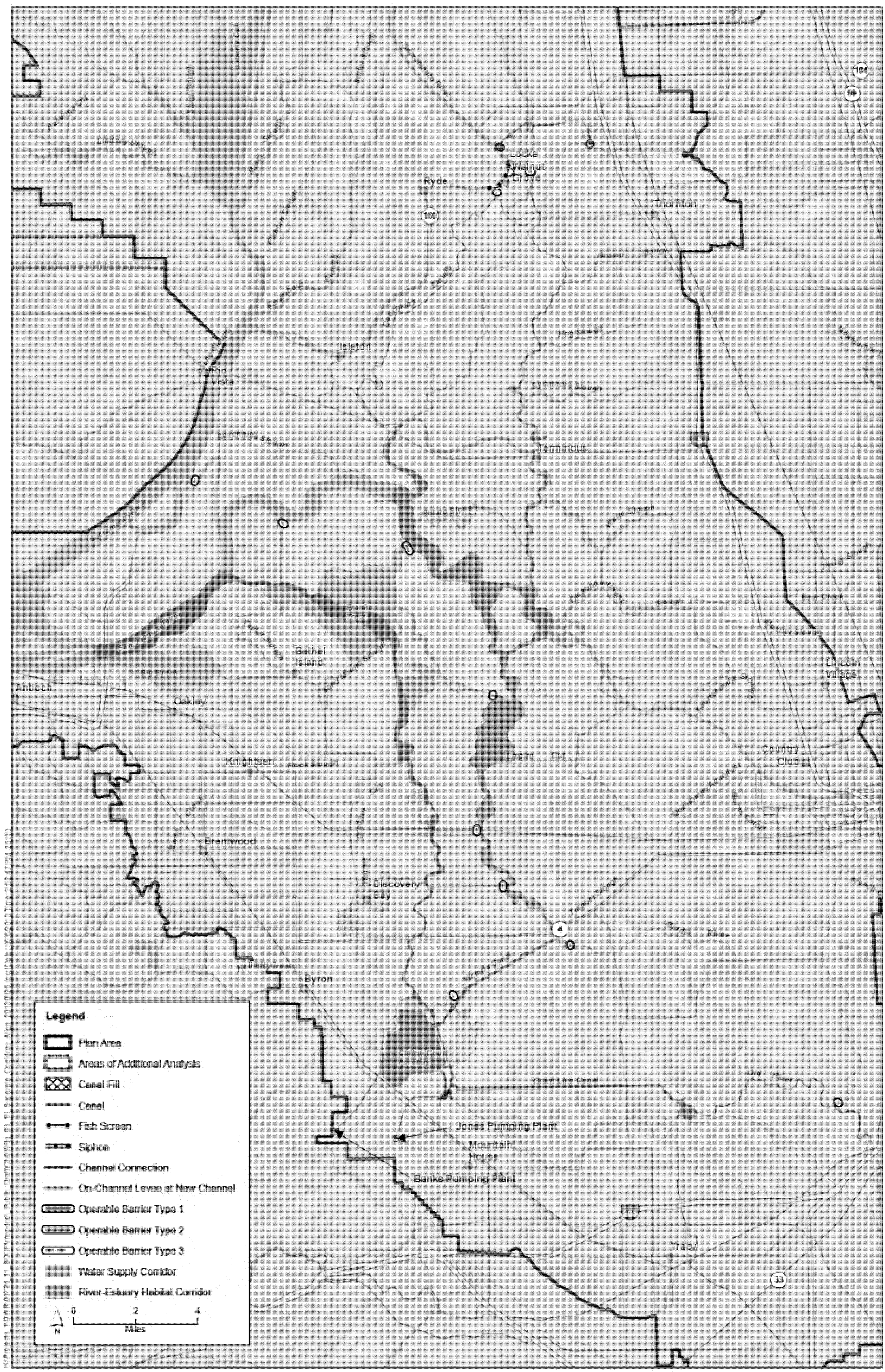


Figure 3-15
Alternative 6C Conveyance Schematic


Legend
Plan Area
Areas of Additional Analysis
Canal Fill
Canal
Fish Screen
Siphon
Channel Connection
On-Channel Levee at New Channel
Operable Barrier Type 1
Operable Barrier Type 2
Operable Barrier Type 3
Water Supply Corridor
River-Estuary Habitat Corridor
0
2
4
Miles
N
Locke
Walnut Grove
Ryde
Thornton
Isleton
Rio Vista
Terminous
Bethel Island
Antioch
Oakley
Knightsen
Brentwood
Discovery Bay
Byron
Lincoln Village
Country Club
Jones Pumping Plant
Mountain House
Banks Pumping Plant
Tracy
Grant Line Canal
Old River
Middle River
Mokelumne River
Sacramento River
Sacramento Slough
Steamboat Slough
Cache Slough
Rock Slough
Big Break
Kellogg Creek
Marsh Creek
Dutch Slough
Bradford Island
Hog Island
Sherman Island
Jersey Island
Venice Island
Twitchell Island
Bacon Island
Tyler Island
Roberts Island
Union Island
Woodward Island
Lindsey Slough
Prospect Slough
Ryer Island
Grizzly Slough
Lookout Slough
Cache Slough
Rio Vista
Montezuma Slough
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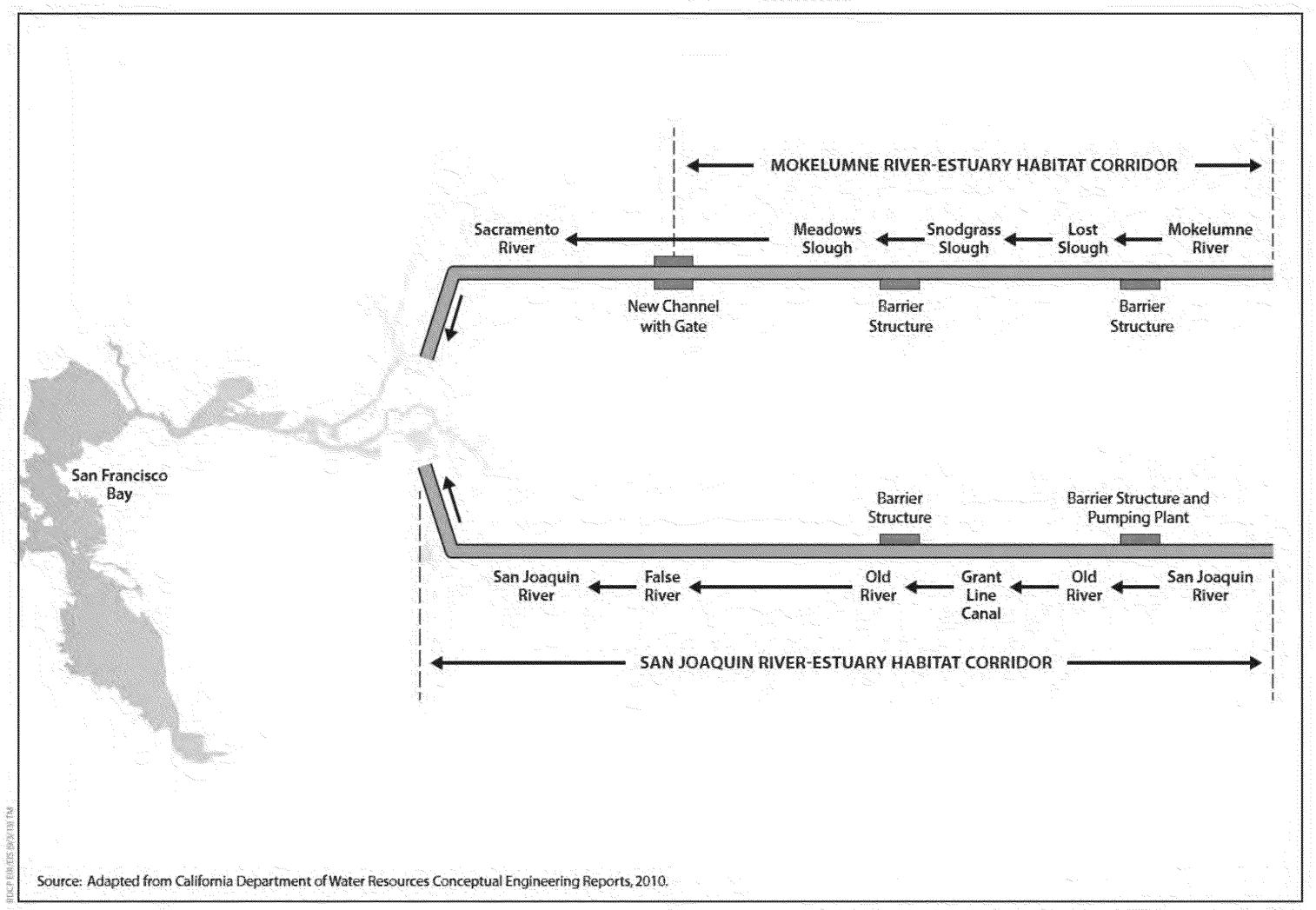
Suisun Bay
Carquinez Strait
Sacramento
Stockton
Lodi
Manteca
Ripon
Mossdale
Vernalis
Tracy



Source: Adapted from California Department of Water Resources Conceptual Engineering Reports, 2010.

Figure 3-17
Alternative 9 Fish Movement Corridor Schematic

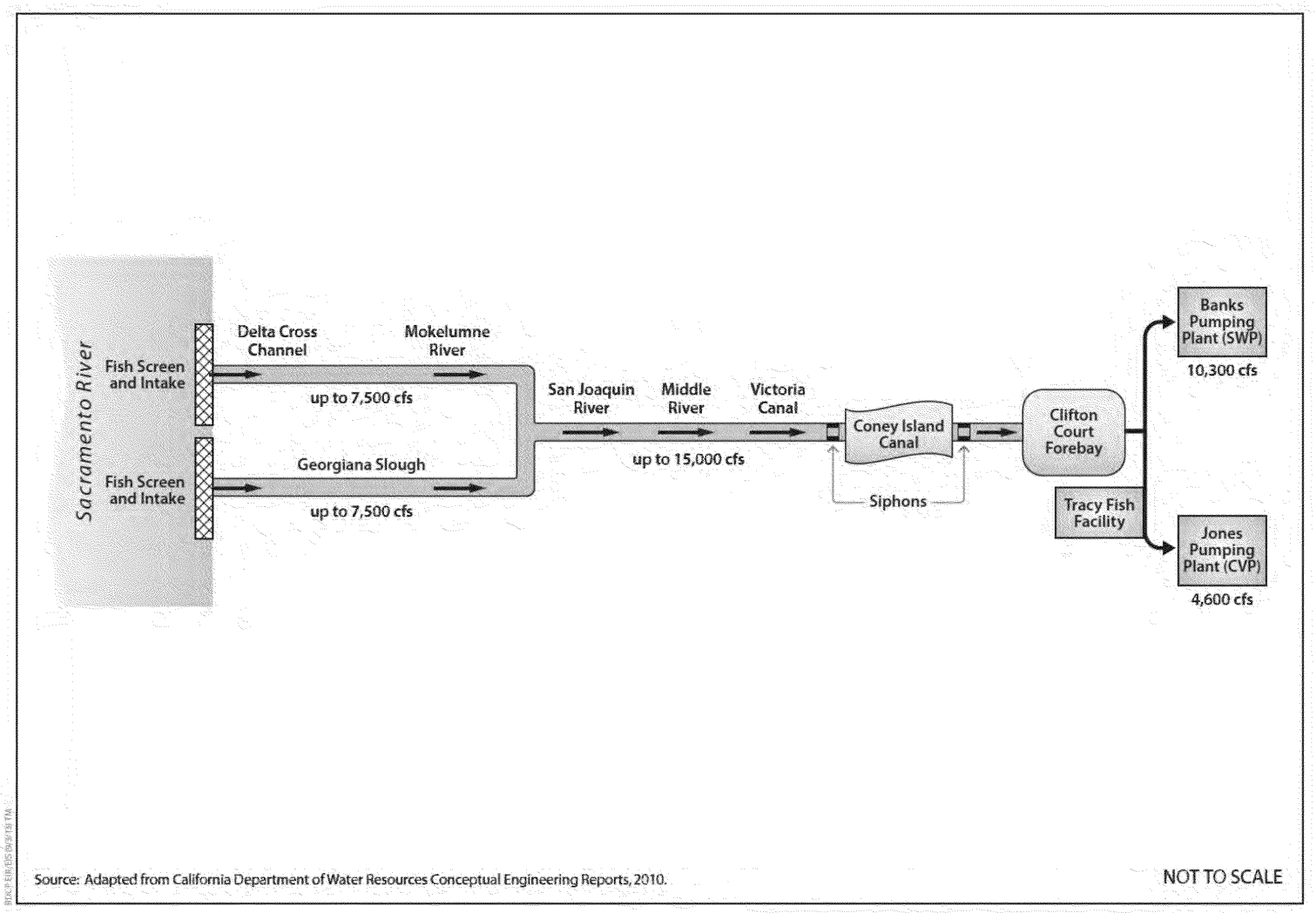
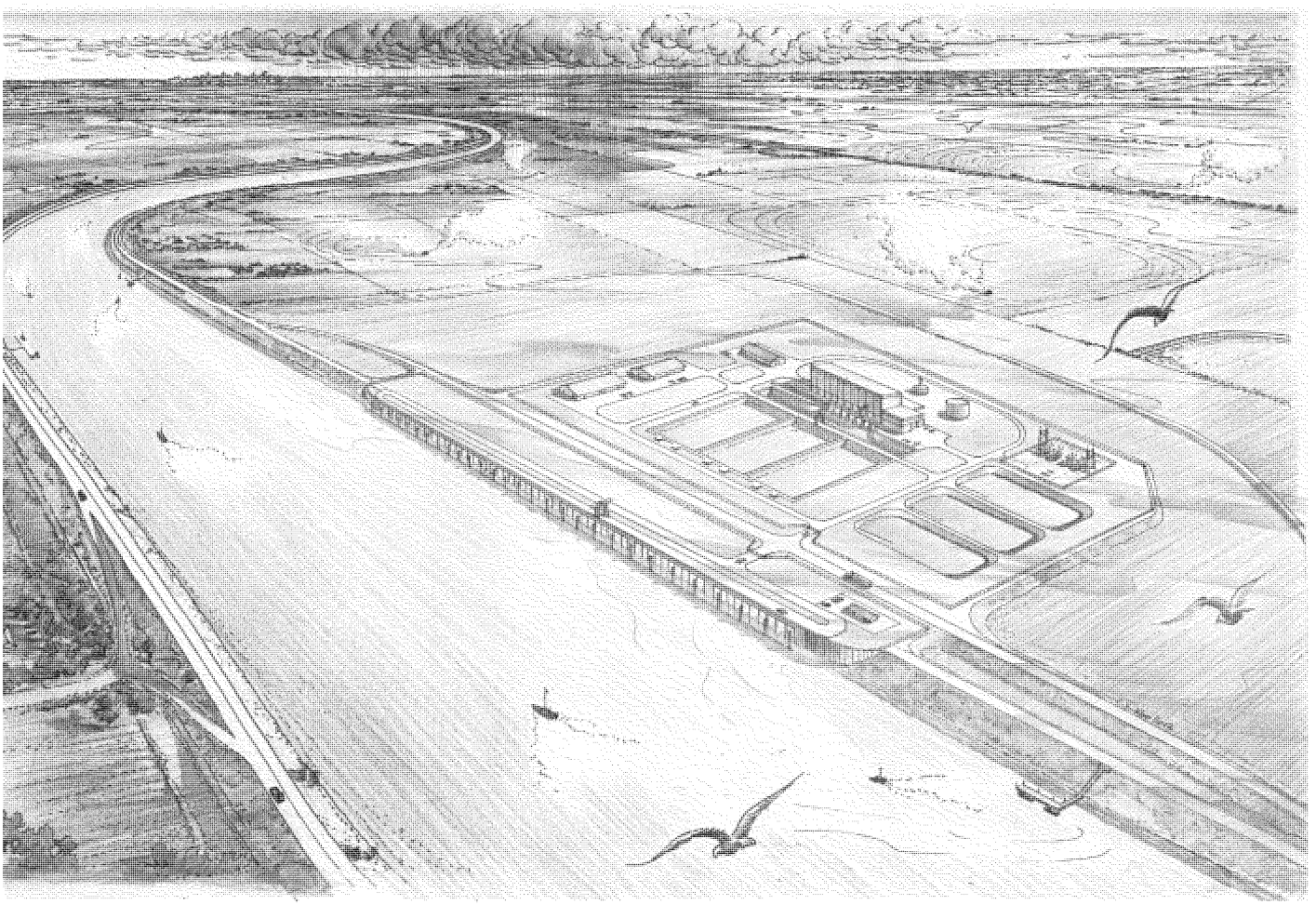


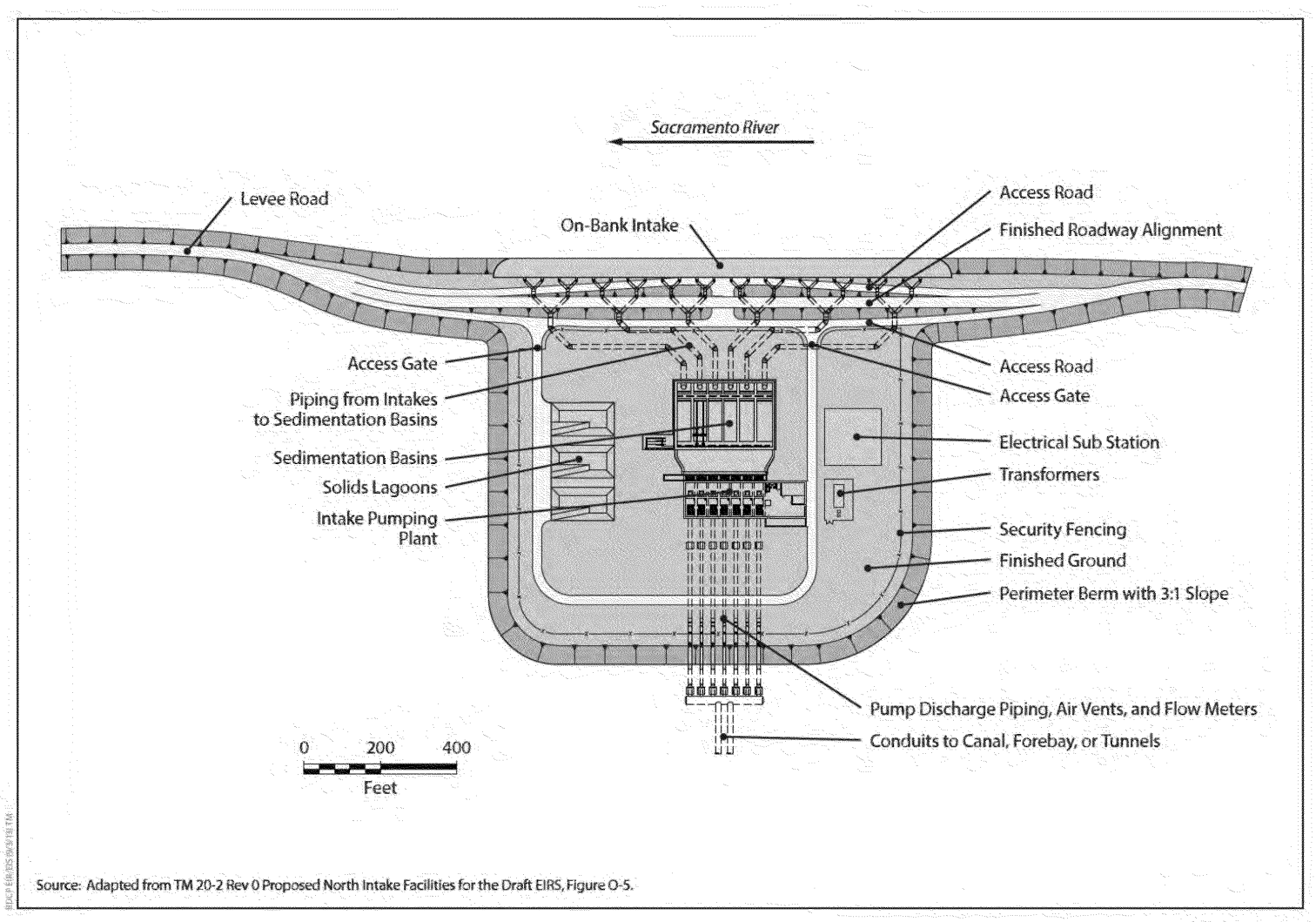
Figure 3-18
Alternative 9 Water Supply Corridor Schematic



Source: Conceptual Engineering Report, Modified Pipeline/Tunnel Option.

BOP BR-RS/9/3/13 TM

Figure 3-19
Conceptual Rendering of On-Bank Intake Facility



Source: Adapted from TM 20-2 Rev 0 Proposed North Intake Facilities for the Draft EIRS, Figure O-5.

Figure 3-20
Conceptual Intake and Pumping Plant Site

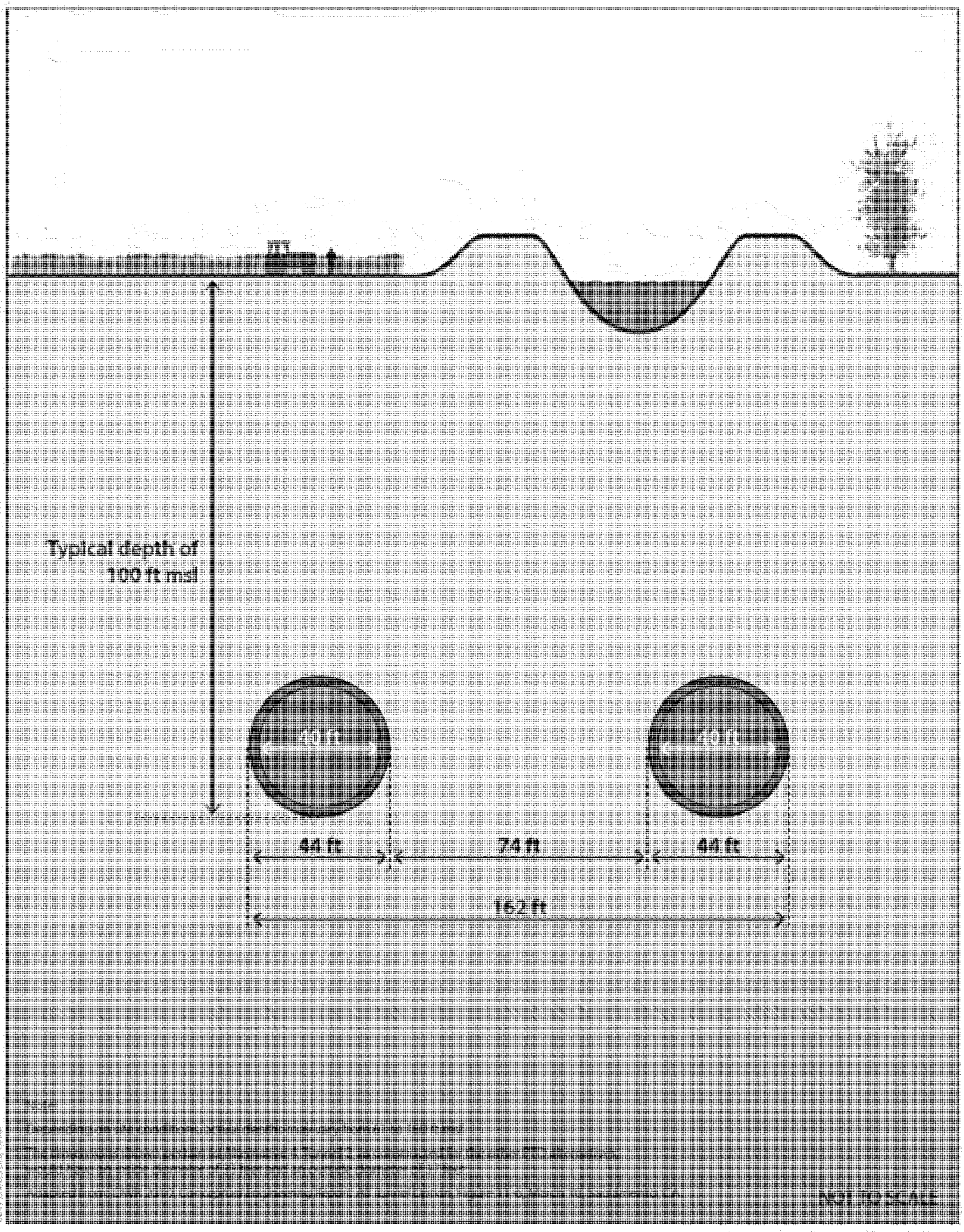
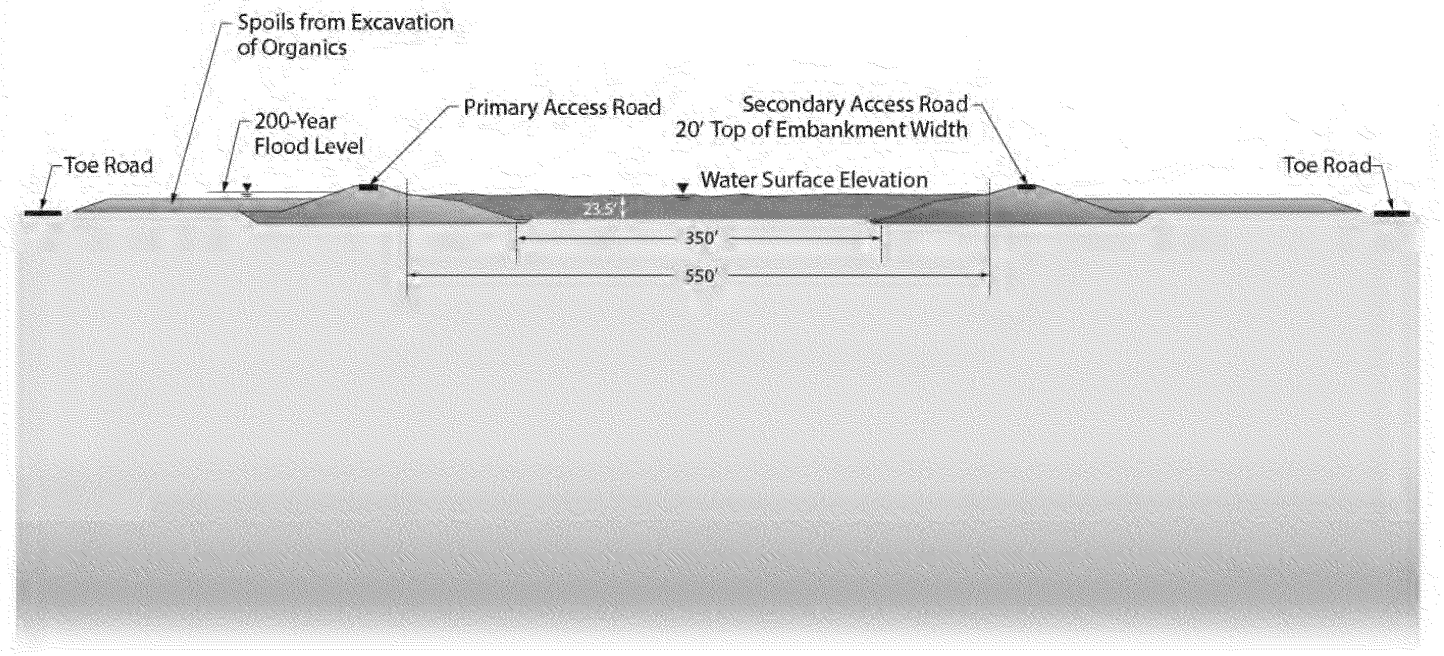


Figure 3-21
Tunnel 2 Configuration



Adapted from: Department of Water Resources 2009. Conceptual Engineering Report—Isolated Conveyance Facility East Option, Figure 9-1. November 18. Sacramento, CA.

Figure 3-22
Canal–Typical Cross Section

Source: CER - Isolated Conveyance Facility East Option Nov 2009, Figure 10-1.

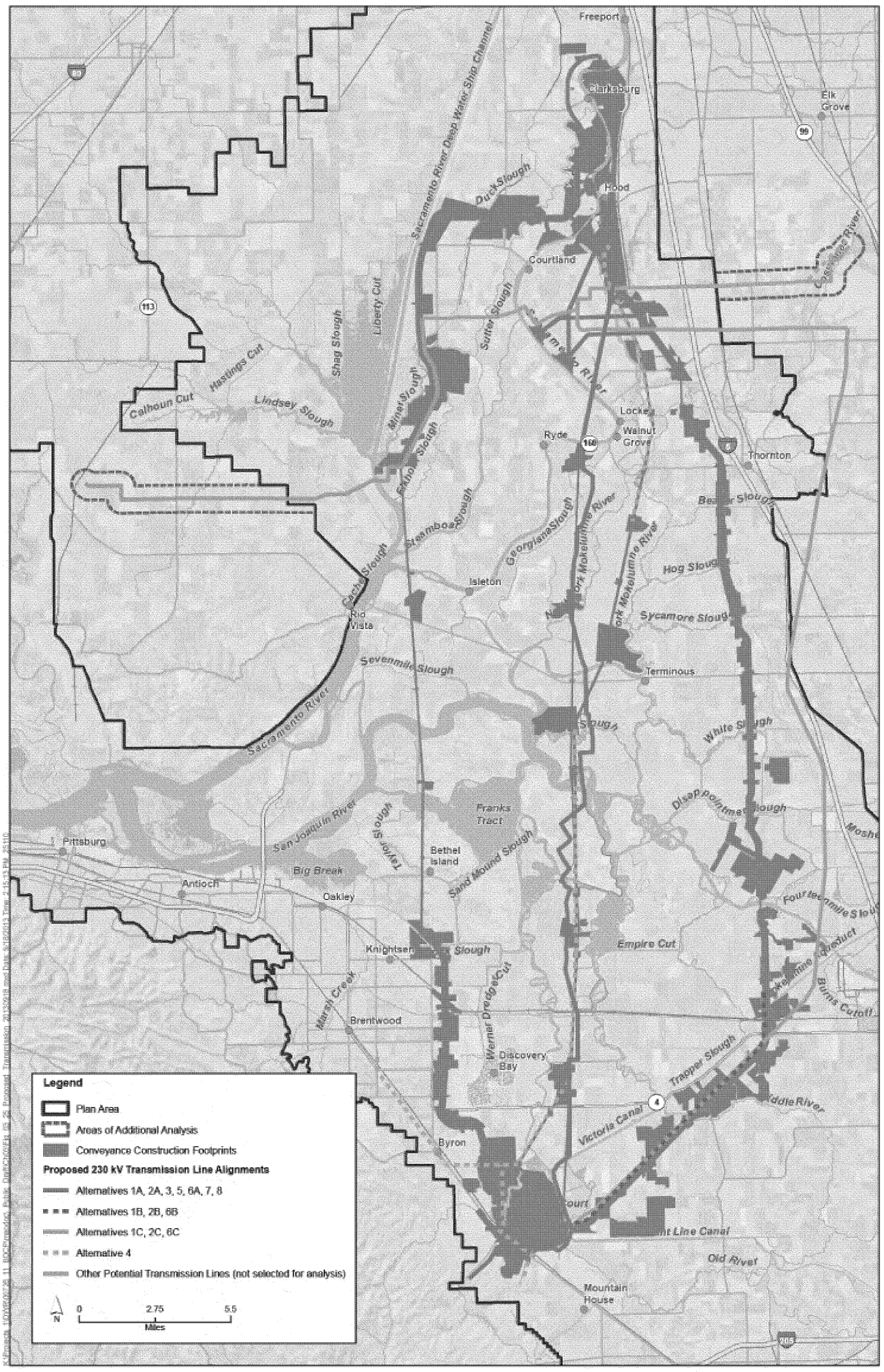
BDCP:BR:RS:9/3/13:TM

Figure 3-23
Conceptual Rendering of Culvert Siphon

Source: CER - Isolated Conveyance Facility East Option Nov 2009, Figure 9-2.

BDOPBR-RS09/31/13 TM

Figure 3-24
Conceptual Rendering of Canal Segment



Sources: Plan Area, ICF 2012; Area of Additional Analysis, ICF 2012; Constructability & Utility Linear Features (Rev 10b), DHCCP DWR 2012; Constructability & Utility Linear Features (Rev 2b), DHCCP DWR 2013; Constructability & Utility Linear Features (Rev 3b), DHCCP DWR 2013

Figure 3-25
Proposed Locations of Electrical Transmission Lines

1 **Table 3-1. Action Alternatives Evaluated in the BDCP EIR/EIS**

EIR/EIS Alternative Number	Conveyance	Conveyance Alignment	Intakes Selected for Analysis	North Delta Diversion Capacity (cfs)	Operations[e]	Conservation Components	Measures to Reduce Other Stressors	Associated NMFS and USFWS Action
1A	Dual[a]	Pipeline/ Tunnel	1, 2, 3, 4, 5	15,000	Scenario A	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species
1B	Dual[a]	East	1, 2, 3, 4, 5	15,000	Scenario A	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species
1C	Dual[a]	West	West side intakes 1, 2, 3, 4, 5[g]	15,000	Scenario A	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species
2A	Dual[a]	Pipeline/ Tunnel	1, 2, 3, 4, 5 (or 1,2, 3, 6, 7)[b]	15,000	Scenario B	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species
2B	Dual[a]	East	1, 2, 3, 4, 5 (or 1, 2, 3, 6, 7)[b]	15,000	Scenario B	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species
2C	Dual[a]	West	West side intakes 1, 2, 3, 4, 5[g]	15,000	Scenario B	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species
3	Dual[a]	Pipeline/ Tunnel	1, 2[i]	6,000	Scenario A	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species

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EIR/EIS Alternative Number	Conveyance	Conveyance Alignment	Intakes Selected for Analysis	North Delta Diversion Capacity (cfs)	Operations[e]	Conservation Components	Measures to Reduce Other Stressors	Associated NMFS and USFWS Action
4 (CEQA Preferred Alternative)	Dual[a]	Modified Pipeline/ Tunnel	2, 3, 5	9,000	Scenario H	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species
5	Dual[a]	Pipeline/ Tunnel	1	3,000	Scenario C	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f]); tidal habitat restoration limited to 25,000 acres	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species
6A	Isolated[c]	Pipeline/ Tunnel	1, 2, 3, 4, 5	15,000	Scenario D	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species
6B	Isolated[c]	East	1, 2, 3, 4, 5	15,000	Scenario D	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species
6C	Isolated[c]	West	West side intakes 1, 2, 3, 4, 5[g]	15,000	Scenario D	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species
7	Dual[a]	Pipeline/ Tunnel	2, 3, 5 [i]	9,000	Scenario E	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f]); additional 20 linear miles of channel margin habitat enhancement and 10,000 acres of seasonally inundated floodplain	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species

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EIR/EIS Alternative Number	Conveyance	Conveyance Alignment	Intakes Selected for Analysis	North Delta Diversion Capacity (cfs)	Operations[e]	Conservation Components	Measures to Reduce Other Stressors	Associated NMFS and USFWS Action
8	Dual[a]	Pipeline/ Tunnel	2, 3, 5 [i]	9,000	Scenario F	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species
9	Through Delta[d]	Through Delta/ Separate Corridors[d]	Screened intakes at Delta Cross Channel and Georgiana Slough	15,000[d]	Scenario G	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f]); changes in the south Delta[h]	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species

[a] The *Dual Conveyance* water delivery system would consist of the new north Delta diversion facilities and the existing SWP/CVP export facilities in the south Delta. The north Delta diversion would be the primary diversion point using specific operating criteria and would be operated in conjunction with the existing south Delta diversion. The existing south Delta diversion would only operate on its own when the north Delta diversion is nonoperational during infrequent periods for maintenance or repair.

[b] Under Alternatives 2A, 2B, and 2C a total of five intakes would be constructed and operated. Intake locations 1–5 or 1, 2, 3, 6, and 7 are analyzed for these alternatives.

[c] The *Isolated Conveyance* water delivery system would consist only of the new north Delta diversion facilities. The SWP/CVP south Delta diversion points would no longer be operated. For the SWP this means the gated intake on Old River, Clifton Court Forebay, and the Skinner Fish Facility would no longer be operated. For the CVP this means the diversion point on Old River and the Tracy Fish Collection Facility would no longer be operated.

[d] The *Through Delta/Separate Corridors* water delivery system would convey water from the Sacramento River through the Delta using existing Delta channels for diversion by the SWP and CVP pumping plants. While the north Delta diversion capacity associated with this alternative is up to 15,000 cfs, it differs from the other action alternatives in that this capacity would be provided by flows through existing channels.

[e] See Table 3-6 for a summary of the individual rules that comprise the operational scenarios and a comparison by scenario and alternative. An overview of operational scenarios is provided in Section 3.4.1.2, *Operational Components*, while a more detailed description appears in Section 3.6.4.2, *North Delta and South Delta Water Conveyance Operational Criteria*.

[f] The BDCP Steering Committee Handout of 3/25/10 is available at: <http://baydeltaconservationplan.com/Library/ArchivedDocuments/SteeringCommittee/SteeringCommitteeAgendasAndHandouts.aspx>.

[g] The west side intakes would be located on the west bank of the Sacramento River.

[h] Under this alternative, lands acquired for restoration or enhancement in the south Delta would not be located alongside corridors designated for water supply.

[i] The intake locations listed represent those locations selected for the analysis of each BDCP alternative. Based on the results of an October 2011 workshop on the Phased Construction of North Delta Intake Facilities (see Appendix 3F, *Intake Location Analysis*), different combinations of intakes could be constructed under these alternatives. Once an alternative is selected as part of the final BDCP, a decision regarding intake locations would be made.

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Table 3-5. Water Conveyance Facilities Components of Each Alternative

Component	Alternative															
	No Action	1A	1B	1C	2A	2B	2C	3	4	5	6A	6B	6C	7	8	9
New north Delta fish-screened intakes		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
New intake pumping plants		X	X	X	X	X	X	X	X	X	X	X	X	X	X	
New diversion pumping plants																X
New intermediate pumping plant		X	X	X	X	X	X	X		X	X	X	X	X	X	
Use of existing SWP and CVP south Delta intake facilities	X	X	X	X	X	X	X	X	X	X				X	X	X
Operations of North Bay Aqueduct Alternative Intake Project	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Byron Tract Forebay[a]		X	X	X	X	X	X	X		X	X	X	X	X	X	
Expanded Clifton Court Forebay[b]									X							
Intermediate forebay		X			X			X	X	X	X			X	X	
Primary Conveyance Facility																
Pipelines/tunnels		X		X	X		X	X	X	X	X		X	X	X	
Canals			X	X		X	X					X	X			
Channels	X															X
New operable barrier(s)					X	X	X		X							X
Fish movement and habitat corridor around Clifton Court Forebay																X

[a] *Byron Tract Forebay* currently refers to proposed forebays both north and south of Clifton Court Forebay.

[b] *Expanded Clifton Court Forebay* refers to modifications to Clifton Court Forebay and expansion on Byron Tract 2.

- Intakes
  - New on-bank intake facilities would be constructed on the Sacramento River between Clarksburg and Walnut Grove. Alternatives 1A through 8 would entail between one and five 3,000 cfs-diversion-capacity facilities in 12 possible locations—7 locations on the east bank of the river (for pipeline/tunnel, modified pipeline/tunnel, and east alignment alternatives) and 5 locations on the west bank (for west alignment alternatives). Any single action alternative would include the construction of between one and five intakes. These intakes would rise approximately 55 feet from river bottom to top of structure with a length of approximately 700–2,300 feet, depending on location; fish screen heights would vary with location. Construction of the on-bank intakes would require the installation of cofferdams. Each intake site would require a temporary cofferdam to create a dewatered construction area encompassing the entire intake site. A portion of the cofferdam would remain in place as an integral part of the intake structure within the existing water side levee. Under Alternative 9, two 2,800-foot-long intakes, each with a capacity of 7,500 cfs, would be placed at the entrances to the Delta Cross Channel and Georgiana Slough (described in more detail in Section 3.5.16.1). At the Delta Cross Channel location, there would potentially be a new replacement intake control structure with gates. At the Georgiana Slough location, a new gated intake control structure with a flood flow capacity of 20,600 cfs would be constructed. Construction of Alternative 9 intakes would also require the installation of temporary

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Table 3-6. Comparison of Operational Rules under BDCP Operational Scenarios and Alternatives

Operational Scenario Alternative	Applicable Months	No Action	Scenario A Alt 1	Scenario B Alt 2	Scenario A Alt 3	Scenario H Alt 4	Scenario C Alt 5	Scenario D Alt 6	Scenario E Alt 7	Scenario F Alt 8	Scenario G Alt 9
Delta Operational Rules Controlling Maximum Allowable CVP and SWP South Delta Exports											
Physical/Permitted Limit for CVP (4,600 cfs)	Jan–Dec	X	X	X	X	X	X	X	X	X	X
Physical Limit for SWP (10,300 cfs)	Jan–Dec	X	X	X	X	X	X	X	X	X	X
Permitted Limit for SWP (6,680 cfs plus 1/3 of San Joaquin River Dec 15–March 15)	Jan–Dec	X	O	O	O	O	X	O	O	O	X
Export/Inflow Ratio (65% Jul–Jan; 35% Feb–Jun)	Jan–Dec	X	X[a]	X[a]	X[a]	X[a]	X[a]	O	X[a]	X[a]	X
SJR Inflow/Export Ratio	Apr–May	X	O	O[b]	O	O[b]	X	O	X[c]	X[c]	O[d]
Reverse Old and Middle River Flows	Dec–Jun	X	X	X[e]	X	X[e]	X	O	X[f]	X[f]	X
Available San Luis Reservoir Storage	Jan–Dec	X	X	X	X	X	X	X	X	X	X
SWP Article 21 Delivery (when San Luis Reservoir is Full)	Jan–Dec	X	X	X	X	X	X	X	X	X	X
Seasonal CVP and SWP Delivery Pattern	Jan–Dec	X	X	X	X	X	X	X	X	X	X
Delta Operational Rules Controlling Minimum Required Delta Outflow											
Minimum Monthly Specified Outflow	Jan–Dec	X	X	X	X	X	X	X	X	X[g]	X
Maximum Salinity (EC) for Delta Diversions	Jan–Dec	X	X	X	X	X	X	X	X	X	X
Maximum Spring X2 Location	Feb–Jun	X	X	X	X	X[h]	X	X	X	X	X
Maximum Fall X2 Location	Sep–Oct	X	O	X	O	X[h]	X	X	X	X	X

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Operational Scenario Alternative	Applicable Months	No Action	Scenario A Alt 1	Scenario B Alt 2	Scenario A Alt 3	Scenario H Alt 4	Scenario C Alt 5	Scenario D Alt 6	Scenario E Alt 7	Scenario F Alt 8	Scenario G Alt 9
New Operational Rules Controlling Maximum North Delta Intake Diversions											
Maximum Capacity of North Delta Intakes (cfs)	N/A	None	15,000	15,000	6,000	9,000	3,000	15,000	9,000	9,000	None
Bypass Flows (% of Sacramento River at Freeport)	Jan–Dec	O	X	X	X	X	X	X	X	X	O

Note:

"X" indicates that a BDCP alternative incorporates an operational rule.

"O" indicates that a BDCP alternative does not incorporate that operational rule.

[a] In computing the E/I ratio for these scenarios, the Sacramento River inflow is considered to be downstream of the north Delta intakes, with the exception of Scenarios H2 and H4, for which Sacramento River inflow was assumed to be upstream of the proposed north Delta intakes.

[b] Under these scenarios, a different strategy was applied to achieve similar objectives as the SJR I/E ratio.

[c] SJR I/E ratio is applicable December through June and therefore would apply for five months longer than under the No Action Alternative.

[d] SJR I/E ratio is applicable when the San Joaquin River flow at Vernalis is greater than 10,000 cfs.

[e] More restrictive/protective than Scenario A.

[f] More restrictive/protective than Scenario B.

[g] More restrictive/protective than in the No Action Alternative; the Delta outflow requirement is expressed as a percent of unimpaired flow.

[h] For Alternative 4, additional spring outflow will be determined based on the results of the decision tree process. Maximum Fall X2 Location will also be determined by the decision tree process under Alternative 4.

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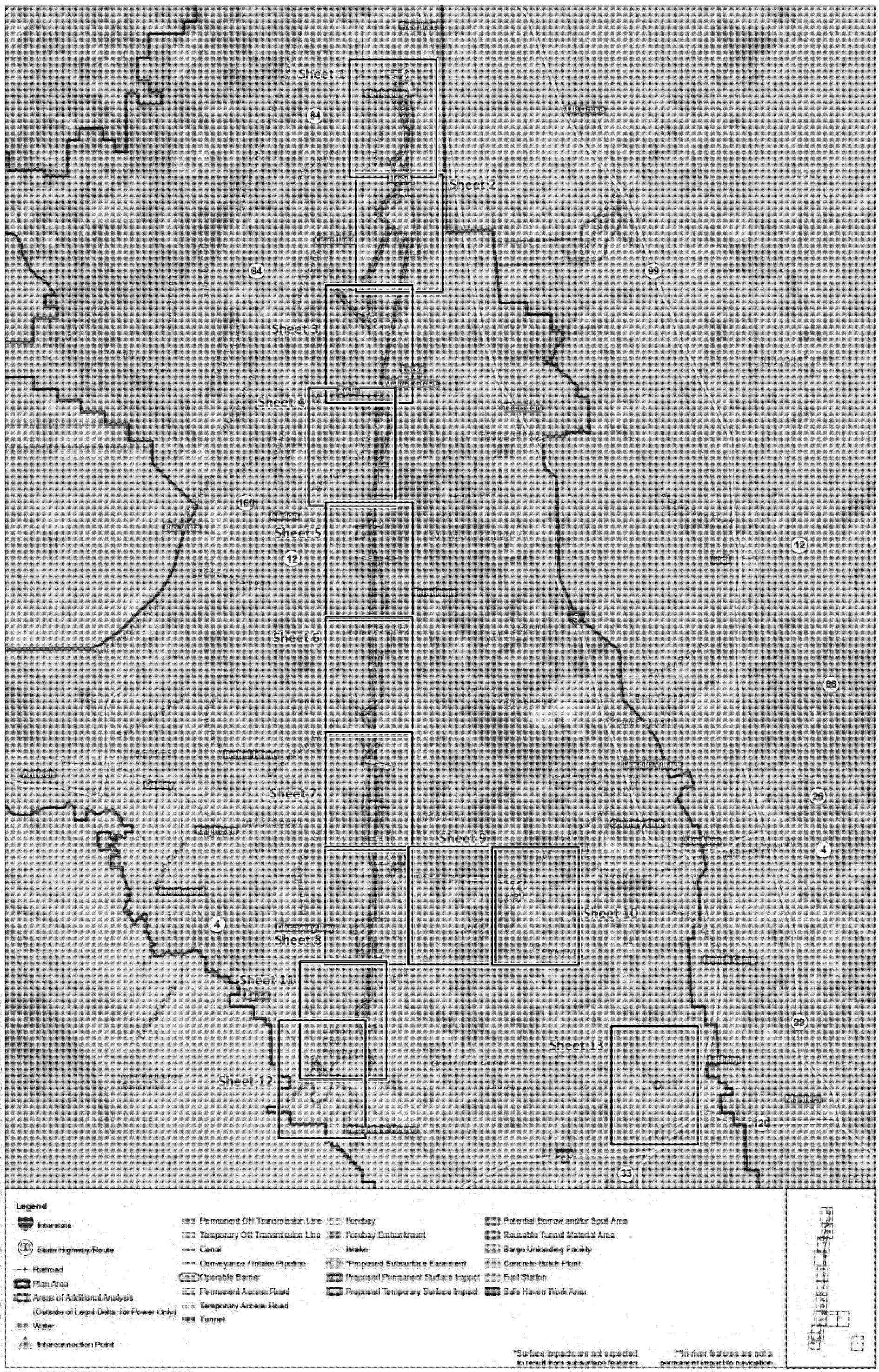
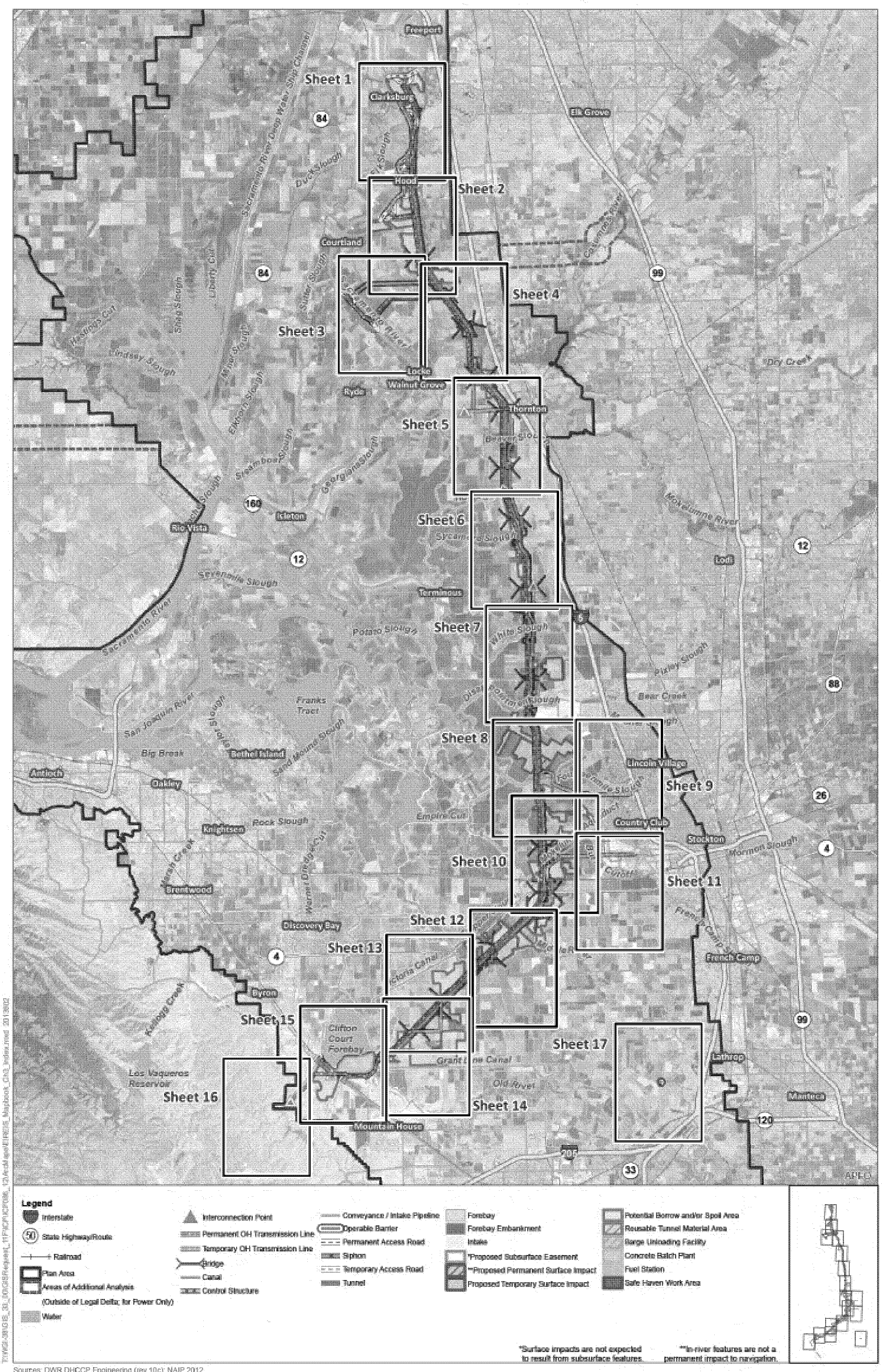


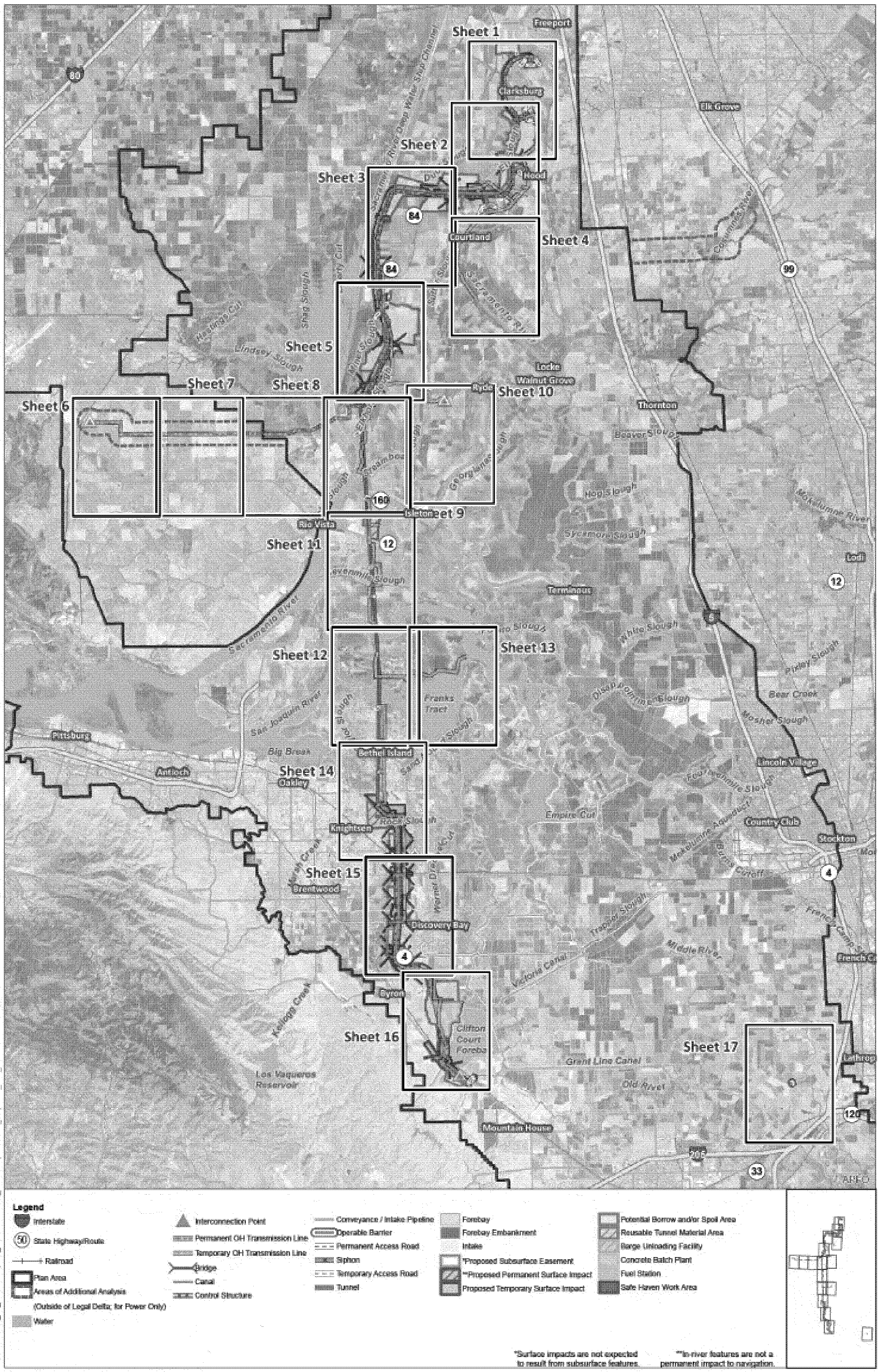
Sources: DWR DHCCP Engineering (rev 3b); NAP 2012

Figure M3-1: Index
Pipeline/Tunnel Alignment (Alternatives 1A, 2A, 3, 5, 6A, 7, and 8)



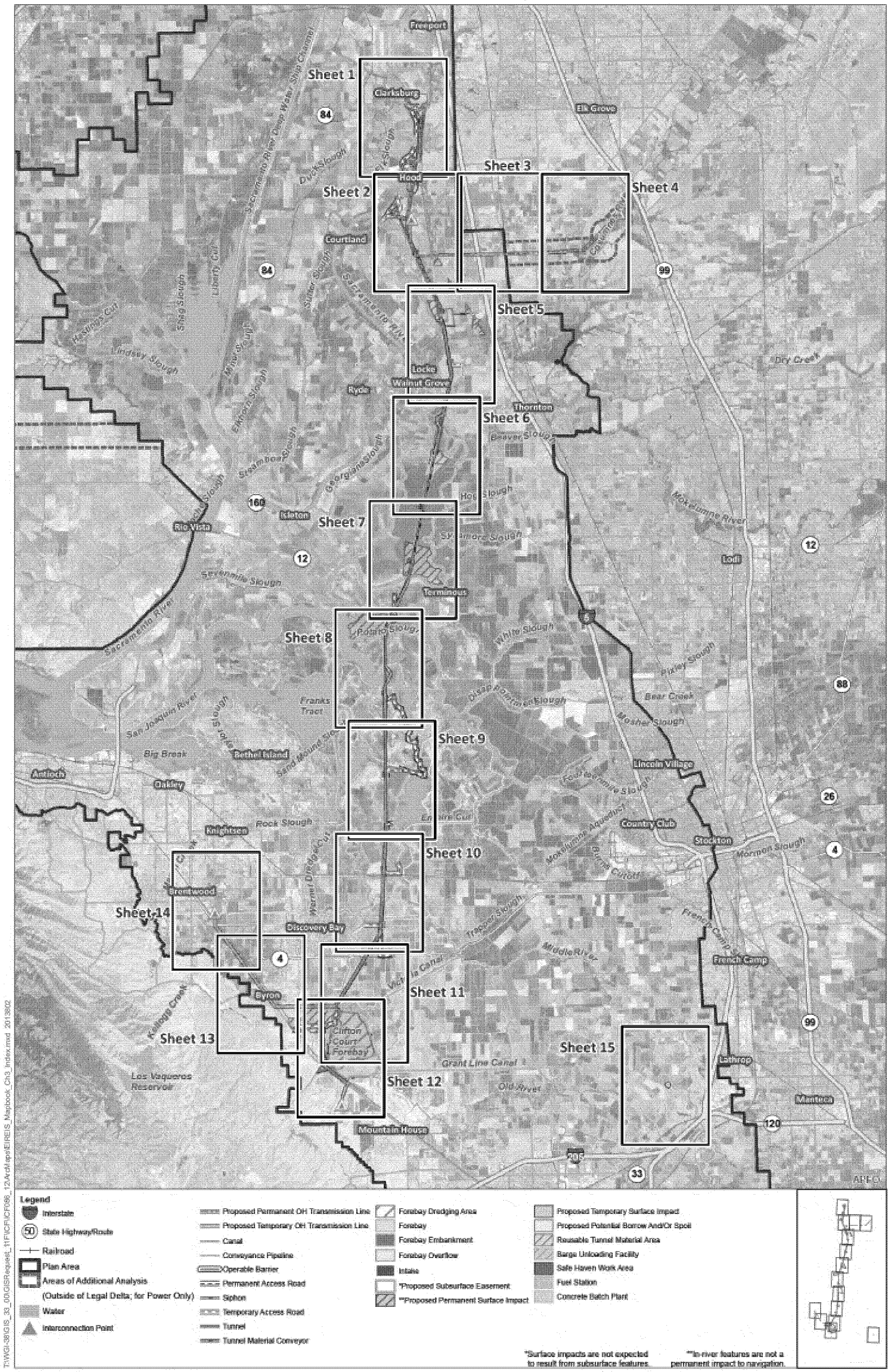
Sources: DWR DHCCP Engineering (rev 10c); NAIP 2012

Figure M3-2: Index
East Alignment (Alternatives 1B, 2B, and 6B)



Sources: DWR DHCCP Engineering (rev 10c); NAIP 2012

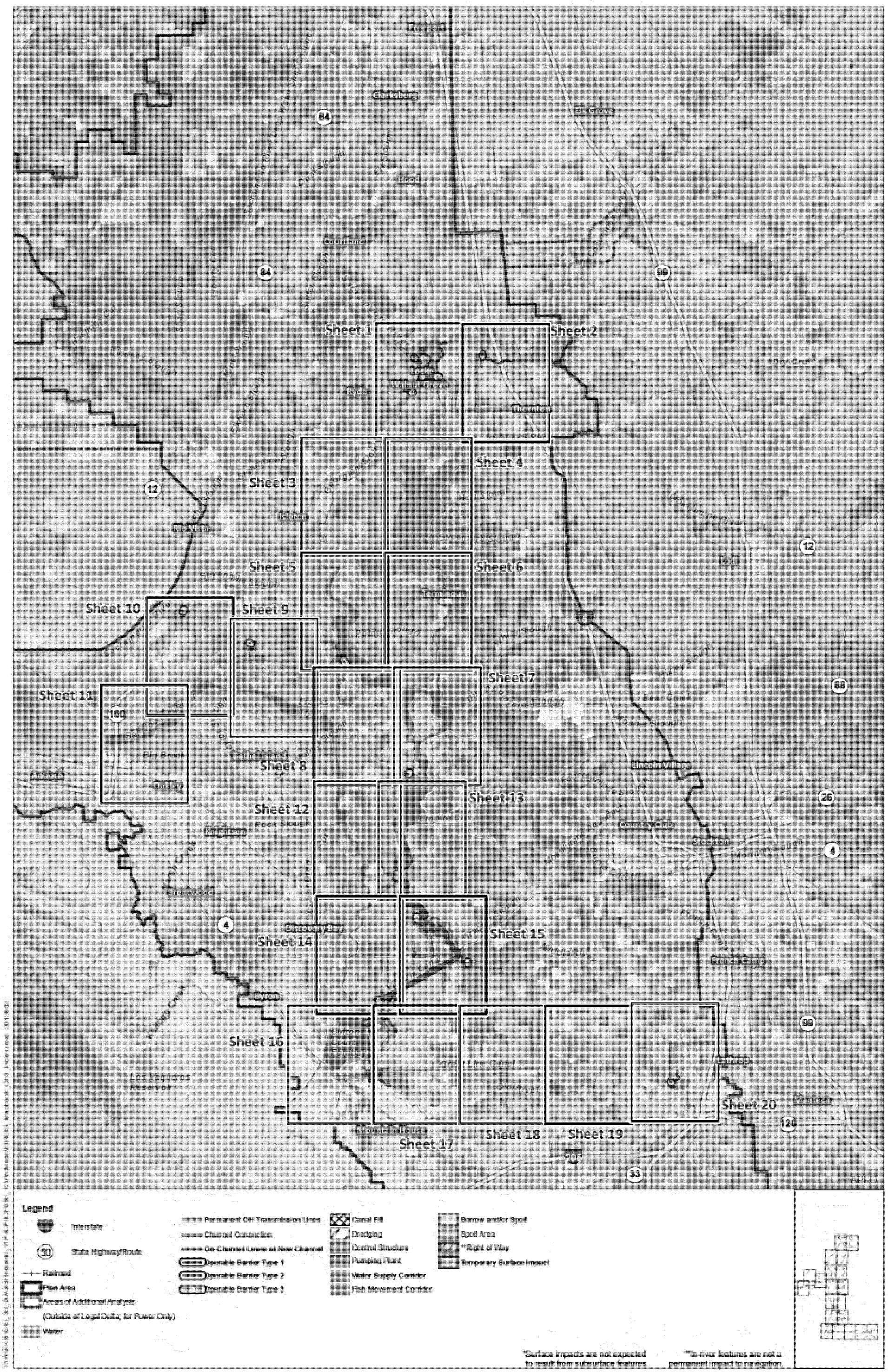
Figure M3-3: Index
West Alignment (Alternatives 1C, 2C, and 6C)



T:\WGI-38\GIS_33_00\GISRequest_11F\ICF\ICF086_12\Arcl\aps\EIR\EIS_Mapbook_Ch3_Index.mxd 2013802

Sources: DWR DHCCP Engineering (rev 2c); NA P 2012

Figure M3-4: Index
Modified Pipeline/Tunnel Alignment (Alternative 4)



Sources: DWR DHCCP Engineering (rev 3b); NAIP 2012

Figure M3-5: Index
Through Delta / Separate Corridors

To: Rader, Cliff[Rader.Cliff@epa.gov]
Cc: Hessert, Aimee[Hessert.Aimee@epa.gov]
From: Wright, Justin
Sent: Thur 2/20/2014 1:54:06 PM
Subject: RE: BDCP alternatives summary
Alternatives Summary from EIS.pdf

I'm sorry... My understanding was COB today.

I'm sorry if I misunderstood. Yesterday I put together a PDF of tables and maps excepted from the EIS (attached) and was planning on putting together some explanatory language today: I'll write this language ASAP.

From: Rader, Cliff
Sent: Wednesday, February 19, 2014 8:23 PM
To: Wright, Justin
Cc: Hessert, Aimee
Subject: BDCP alternatives summary

Justin -

On Tuesday, I asked for a summary of the alternatives that under consideration for the BDCP for Susan.

Earlier today (Wednesday), I explained that we needed to get that to Susan today. I'm sorry if there was some misunderstanding on when I needed to get this to Susan.

Can you have a summary to me by Thursday, 9:30 am?

thanks.

Cliff Rader

Director, NEPA Compliance Division

202-564-7159

1 **Table 3-1. Action Alternatives Evaluated in the BDCP EIR/EIS**

EIR/EIS Alternative Number	Conveyance	Conveyance Alignment	Intakes Selected for Analysis	North Delta Diversion Capacity (cfs)	Operations[e]	Conservation Components	Measures to Reduce Other Stressors	Associated NMFS and USFWS Action
1A	Dual[a]	Pipeline/ Tunnel	1, 2, 3, 4, 5	15,000	Scenario A	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species
1B	Dual[a]	East	1, 2, 3, 4, 5	15,000	Scenario A	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species
1C	Dual[a]	West	West side intakes 1, 2, 3, 4, 5[g]	15,000	Scenario A	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species
2A	Dual[a]	Pipeline/ Tunnel	1, 2, 3, 4, 5 (or 1,2, 3, 6, 7)[b]	15,000	Scenario B	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species
2B	Dual[a]	East	1, 2, 3, 4, 5 (or 1, 2, 3, 6, 7)[b]	15,000	Scenario B	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species
2C	Dual[a]	West	West side intakes 1, 2, 3, 4, 5[g]	15,000	Scenario B	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species
3	Dual[a]	Pipeline/ Tunnel	1, 2[i]	6,000	Scenario A	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species

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EIR/EIS Alternative Number	Conveyance	Conveyance Alignment	Intakes Selected for Analysis	North Delta Diversion Capacity (cfs)	Operations[e]	Conservation Components	Measures to Reduce Other Stressors	Associated NMFS and USFWS Action
4 (CEQA Preferred Alternative)	Dual[a]	Modified Pipeline/ Tunnel	2, 3, 5	9,000	Scenario H	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species
5	Dual[a]	Pipeline/ Tunnel	1	3,000	Scenario C	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f]); tidal habitat restoration limited to 25,000 acres	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species
6A	Isolated[c]	Pipeline/ Tunnel	1, 2, 3, 4, 5	15,000	Scenario D	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species
6B	Isolated[c]	East	1, 2, 3, 4, 5	15,000	Scenario D	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species
6C	Isolated[c]	West	West side intakes 1, 2, 3, 4, 5[g]	15,000	Scenario D	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species
7	Dual[a]	Pipeline/ Tunnel	2, 3, 5 [i]	9,000	Scenario E	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f]); additional 20 linear miles of channel margin habitat enhancement and 10,000 acres of seasonally inundated floodplain	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species

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EIR/EIS Alternative Number	Conveyance	Conveyance Alignment	Intakes Selected for Analysis	North Delta Diversion Capacity (cfs)	Operations[e]	Conservation Components	Measures to Reduce Other Stressors	Associated NMFS and USFWS Action
8	Dual[a]	Pipeline/ Tunnel	2, 3, 5 [i]	9,000	Scenario F	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species
9	Through Delta[d]	Through Delta/ Separate Corridors[d]	Screened intakes at Delta Cross Channel and Georgiana Slough	15,000[d]	Scenario G	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f]); changes in the south Delta[h]	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species

[a] The *Dual Conveyance* water delivery system would consist of the new north Delta diversion facilities and the existing SWP/CVP export facilities in the south Delta. The north Delta diversion would be the primary diversion point using specific operating criteria and would be operated in conjunction with the existing south Delta diversion. The existing south Delta diversion would only operate on its own when the north Delta diversion is nonoperational during infrequent periods for maintenance or repair.

[b] Under Alternatives 2A, 2B, and 2C a total of five intakes would be constructed and operated. Intake locations 1–5 or 1, 2, 3, 6, and 7 are analyzed for these alternatives.

[c] The *Isolated Conveyance* water delivery system would consist only of the new north Delta diversion facilities. The SWP/CVP south Delta diversion points would no longer be operated. For the SWP this means the gated intake on Old River, Clifton Court Forebay, and the Skinner Fish Facility would no longer be operated. For the CVP this means the diversion point on Old River and the Tracy Fish Collection Facility would no longer be operated.

[d] The *Through Delta/Separate Corridors* water delivery system would convey water from the Sacramento River through the Delta using existing Delta channels for diversion by the SWP and CVP pumping plants. While the north Delta diversion capacity associated with this alternative is up to 15,000 cfs, it differs from the other action alternatives in that this capacity would be provided by flows through existing channels.

[e] See Table 3-6 for a summary of the individual rules that comprise the operational scenarios and a comparison by scenario and alternative. An overview of operational scenarios is provided in Section 3.4.1.2, *Operational Components*, while a more detailed description appears in Section 3.6.4.2, *North Delta and South Delta Water Conveyance Operational Criteria*.

[f] The BDCP Steering Committee Handout of 3/25/10 is available at: <http://baydeltaconservationplan.com/Library/ArchivedDocuments/SteeringCommittee/SteeringCommitteeAgendasAndHandouts.aspx>.

[g] The west side intakes would be located on the west bank of the Sacramento River.

[h] Under this alternative, lands acquired for restoration or enhancement in the south Delta would not be located alongside corridors designated for water supply.

[i] The intake locations listed represent those locations selected for the analysis of each BDCP alternative. Based on the results of an October 2011 workshop on the Phased Construction of North Delta Intake Facilities (see Appendix 3F, *Intake Location Analysis*), different combinations of intakes could be constructed under these alternatives. Once an alternative is selected as part of the final BDCP, a decision regarding intake locations would be made.

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Table 3-5. Water Conveyance Facilities Components of Each Alternative

Component	Alternative															
	No Action	1A	1B	1C	2A	2B	2C	3	4	5	6A	6B	6C	7	8	9
New north Delta fish-screened intakes		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
New intake pumping plants		X	X	X	X	X	X	X	X	X	X	X	X	X	X	
New diversion pumping plants																X
New intermediate pumping plant		X	X	X	X	X	X	X		X	X	X	X	X	X	
Use of existing SWP and CVP south Delta intake facilities	X	X	X	X	X	X	X	X	X	X				X	X	X
Operations of North Bay Aqueduct Alternative Intake Project	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Byron Tract Forebay[a]		X	X	X	X	X	X	X		X	X	X	X	X	X	
Expanded Clifton Court Forebay[b]									X							
Intermediate forebay		X			X			X	X	X	X			X	X	
Primary Conveyance Facility																
Pipelines/tunnels		X		X	X		X	X	X	X	X		X	X	X	
Canals			X	X		X	X					X	X			
Channels	X															X
New operable barrier(s)					X	X	X		X							X
Fish movement and habitat corridor around Clifton Court Forebay																X

[a] *Byron Tract Forebay* currently refers to proposed forebays both north and south of Clifton Court Forebay.

[b] *Expanded Clifton Court Forebay* refers to modifications to Clifton Court Forebay and expansion on Byron Tract 2.

- Intakes
  - New on-bank intake facilities would be constructed on the Sacramento River between Clarksburg and Walnut Grove. Alternatives 1A through 8 would entail between one and five 3,000 cfs-diversion-capacity facilities in 12 possible locations—7 locations on the east bank of the river (for pipeline/tunnel, modified pipeline/tunnel, and east alignment alternatives) and 5 locations on the west bank (for west alignment alternatives). Any single action alternative would include the construction of between one and five intakes. These intakes would rise approximately 55 feet from river bottom to top of structure with a length of approximately 700–2,300 feet, depending on location; fish screen heights would vary with location. Construction of the on-bank intakes would require the installation of cofferdams. Each intake site would require a temporary cofferdam to create a dewatered construction area encompassing the entire intake site. A portion of the cofferdam would remain in place as an integral part of the intake structure within the existing water side levee. Under Alternative 9, two 2,800-foot-long intakes, each with a capacity of 7,500 cfs, would be placed at the entrances to the Delta Cross Channel and Georgiana Slough (described in more detail in Section 3.5.16.1). At the Delta Cross Channel location, there would potentially be a new replacement intake control structure with gates. At the Georgiana Slough location, a new gated intake control structure with a flood flow capacity of 20,600 cfs would be constructed. Construction of Alternative 9 intakes would also require the installation of temporary

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Table 3-6. Comparison of Operational Rules under BDCP Operational Scenarios and Alternatives

Operational Scenario Alternative	Applicable Months	No Action	Scenario A Alt 1	Scenario B Alt 2	Scenario A Alt 3	Scenario H Alt 4	Scenario C Alt 5	Scenario D Alt 6	Scenario E Alt 7	Scenario F Alt 8	Scenario G Alt 9
Delta Operational Rules Controlling Maximum Allowable CVP and SWP South Delta Exports											
Physical/Permitted Limit for CVP (4,600 cfs)	Jan–Dec	X	X	X	X	X	X	X	X	X	X
Physical Limit for SWP (10,300 cfs)	Jan–Dec	X	X	X	X	X	X	X	X	X	X
Permitted Limit for SWP (6,680 cfs plus 1/3 of San Joaquin River Dec 15–March 15)	Jan–Dec	X	O	O	O	O	X	O	O	O	X
Export/Inflow Ratio (65% Jul–Jan; 35% Feb–Jun)	Jan–Dec	X	X[a]	X[a]	X[a]	X[a]	X[a]	O	X[a]	X[a]	X
SJR Inflow/Export Ratio	Apr–May	X	O	O[b]	O	O[b]	X	O	X[c]	X[c]	O[d]
Reverse Old and Middle River Flows	Dec–Jun	X	X	X[e]	X	X[e]	X	O	X[f]	X[f]	X
Available San Luis Reservoir Storage	Jan–Dec	X	X	X	X	X	X	X	X	X	X
SWP Article 21 Delivery (when San Luis Reservoir is Full)	Jan–Dec	X	X	X	X	X	X	X	X	X	X
Seasonal CVP and SWP Delivery Pattern	Jan–Dec	X	X	X	X	X	X	X	X	X	X
Delta Operational Rules Controlling Minimum Required Delta Outflow											
Minimum Monthly Specified Outflow	Jan–Dec	X	X	X	X	X	X	X	X	X[g]	X
Maximum Salinity (EC) for Delta Diversions	Jan–Dec	X	X	X	X	X	X	X	X	X	X
Maximum Spring X2 Location	Feb–Jun	X	X	X	X	X[h]	X	X	X	X	X
Maximum Fall X2 Location	Sep–Oct	X	O	X	O	X[h]	X	X	X	X	X

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Operational Scenario Alternative	Applicable Months	No Action	Scenario A Alt 1	Scenario B Alt 2	Scenario A Alt 3	Scenario H Alt 4	Scenario C Alt 5	Scenario D Alt 6	Scenario E Alt 7	Scenario F Alt 8	Scenario G Alt 9
New Operational Rules Controlling Maximum North Delta Intake Diversions											
Maximum Capacity of North Delta Intakes (cfs)	N/A	None	15,000	15,000	6,000	9,000	3,000	15,000	9,000	9,000	None
Bypass Flows (% of Sacramento River at Freeport)	Jan–Dec	O	X	X	X	X	X	X	X	X	O

Note:

"X" indicates that a BDCP alternative incorporates an operational rule.

"O" indicates that a BDCP alternative does not incorporate that operational rule.

[a] In computing the E/I ratio for these scenarios, the Sacramento River inflow is considered to be downstream of the north Delta intakes, with the exception of Scenarios H2 and H4, for which Sacramento River inflow was assumed to be upstream of the proposed north Delta intakes.

[b] Under these scenarios, a different strategy was applied to achieve similar objectives as the SJR I/E ratio.

[c] SJR I/E ratio is applicable December through June and therefore would apply for five months longer than under the No Action Alternative.

[d] SJR I/E ratio is applicable when the San Joaquin River flow at Vernalis is greater than 10,000 cfs.

[e] More restrictive/protective than Scenario A.

[f] More restrictive/protective than Scenario B.

[g] More restrictive/protective than in the No Action Alternative; the Delta outflow requirement is expressed as a percent of unimpaired flow.

[h] For Alternative 4, additional spring outflow will be determined based on the results of the decision tree process. Maximum Fall X2 Location will also be determined by the decision tree process under Alternative 4.

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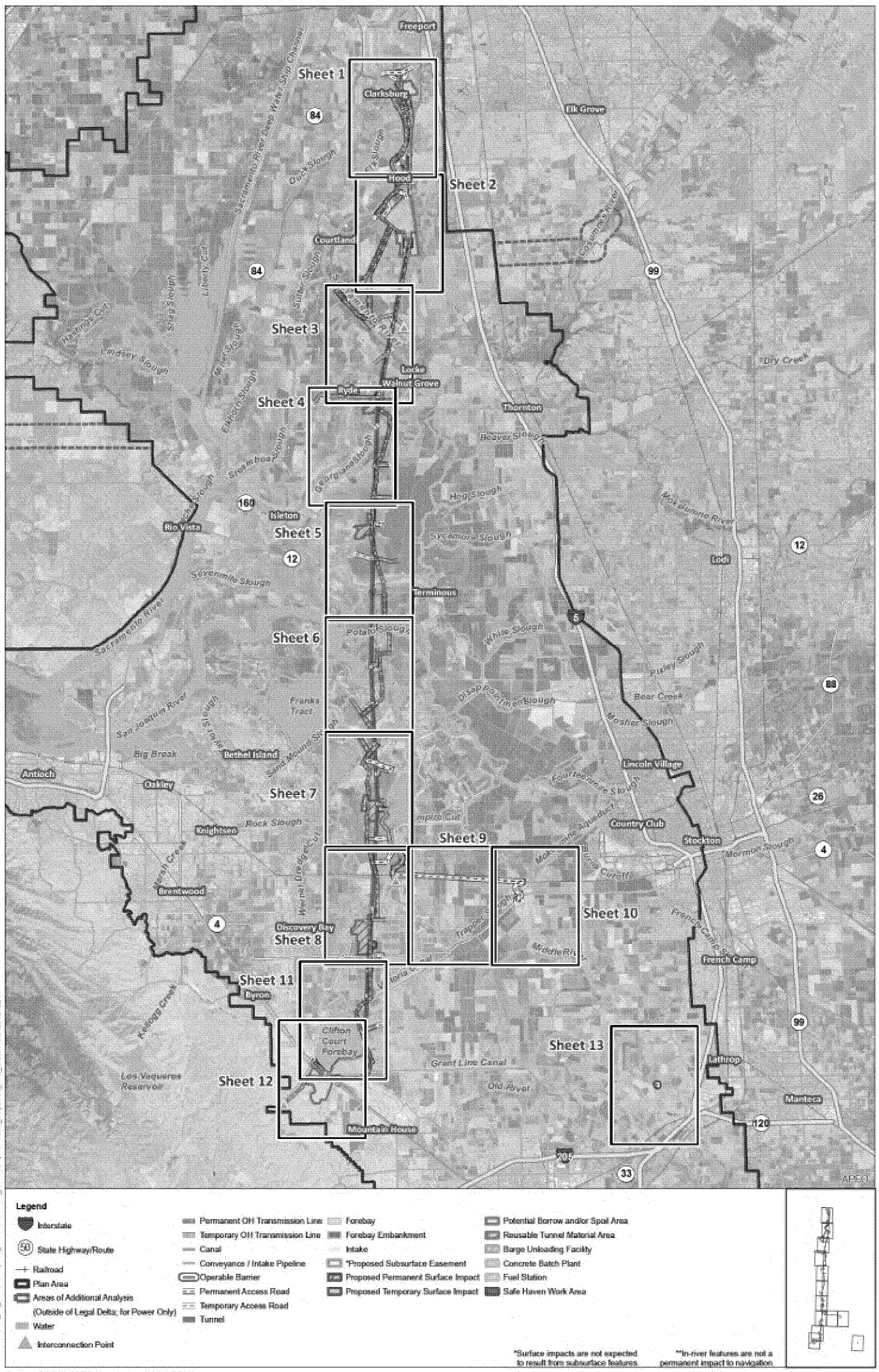
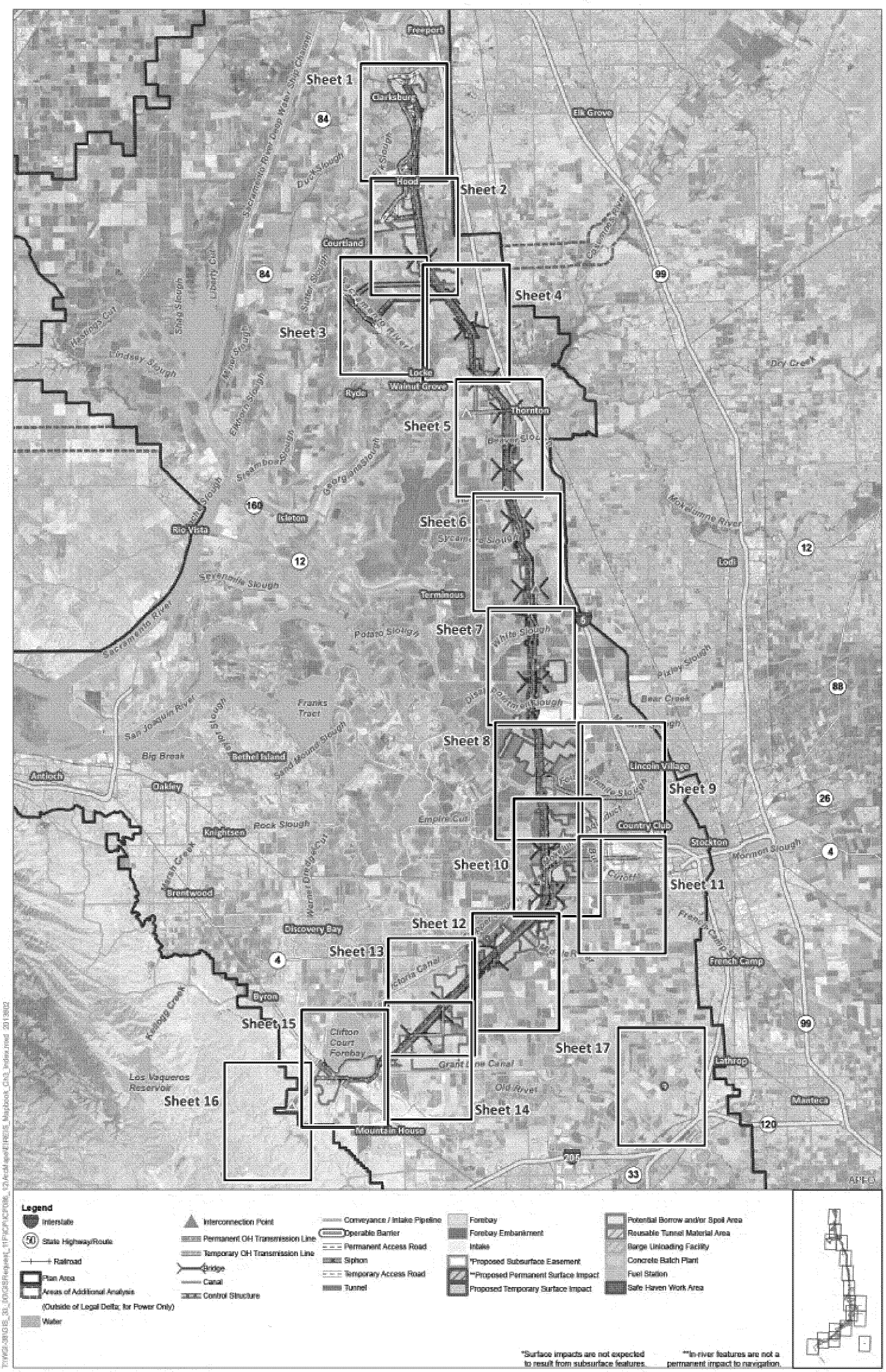


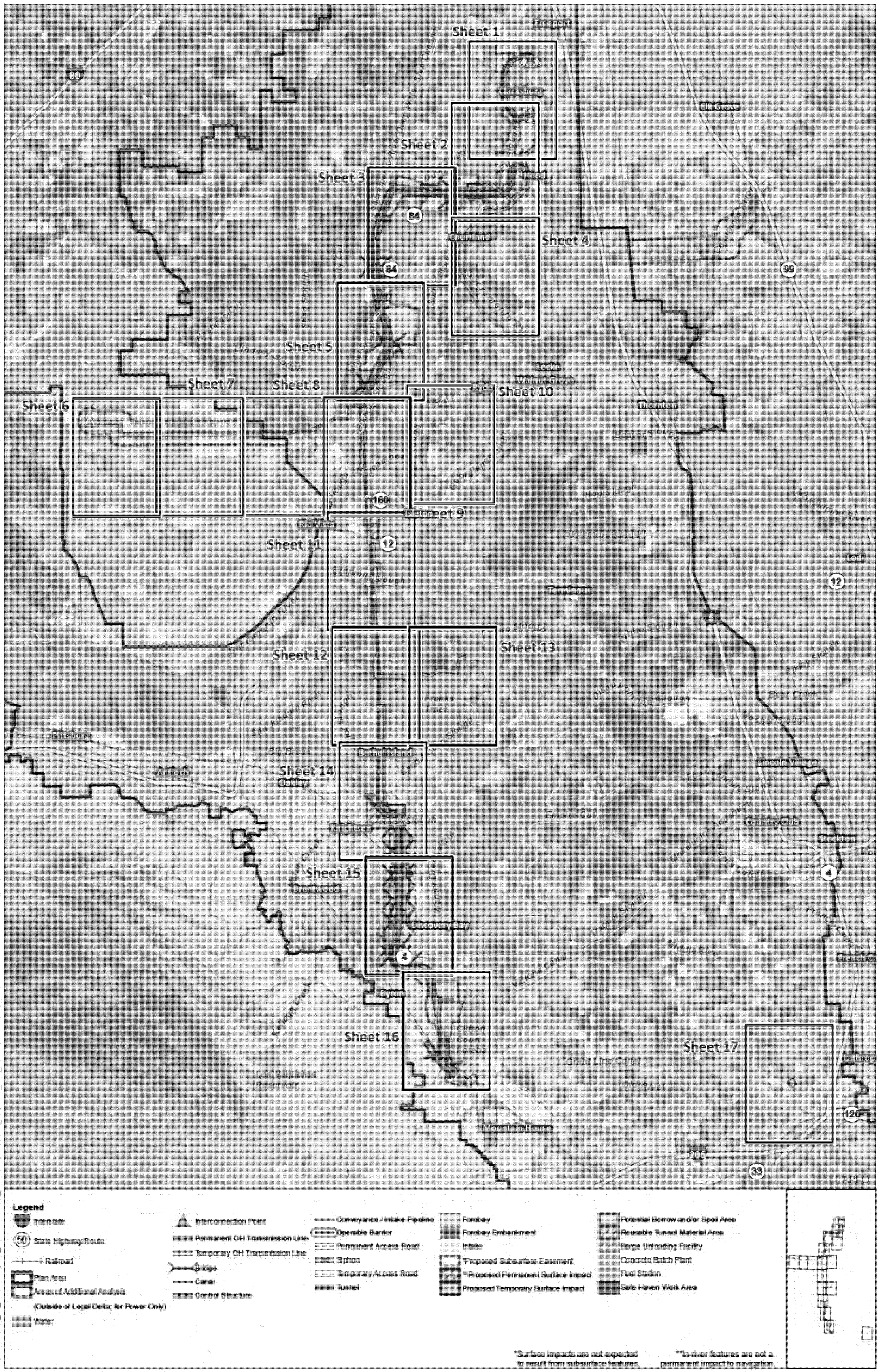
Sources: DWR DHCCP Engineering (rev 3b); NAP 2012

Figure M3-1: Index
Pipeline/Tunnel Alignment (Alternatives 1A, 2A, 3, 5, 6A, 7, and 8)



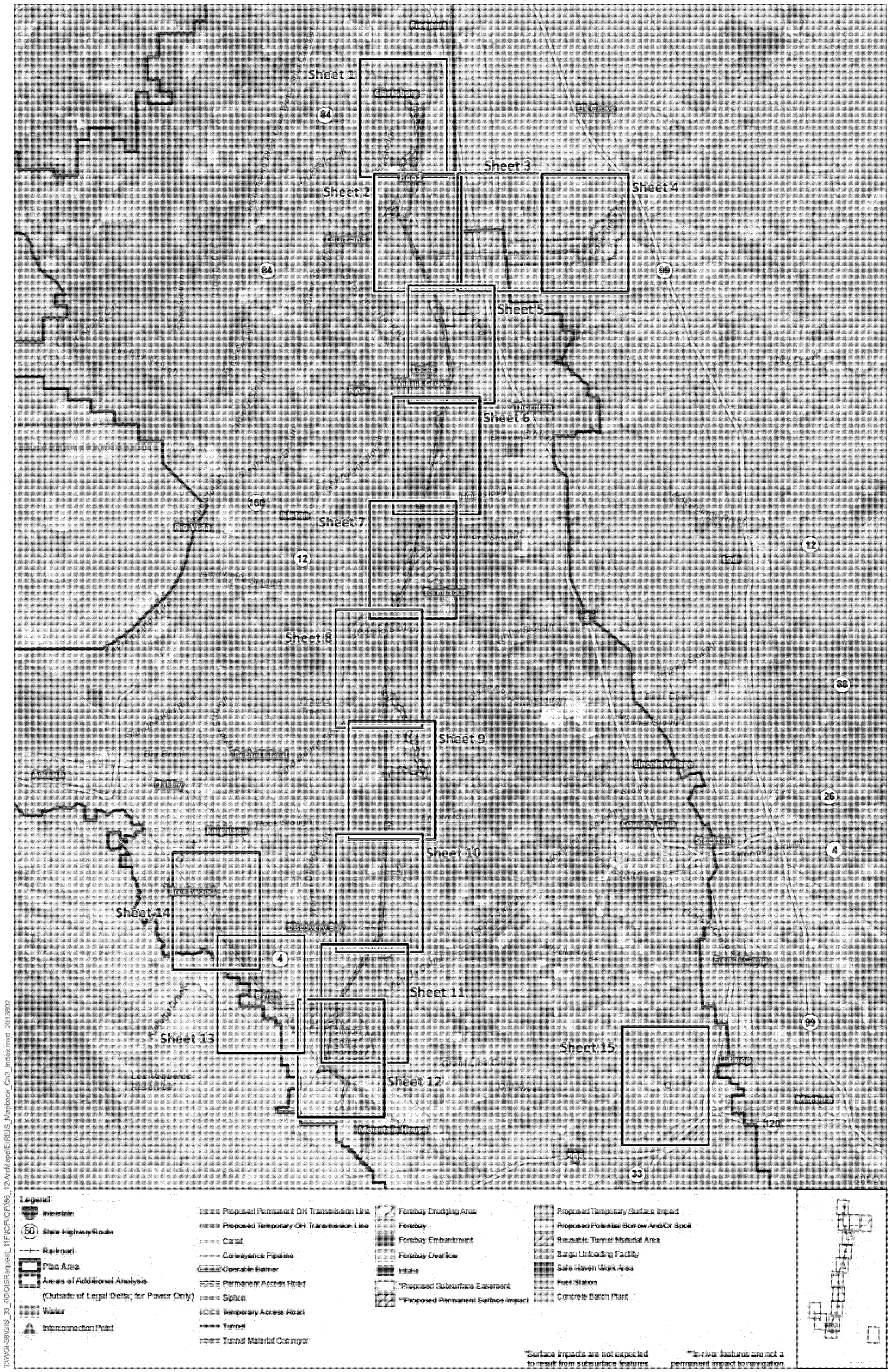
Sources: DWR DHCCP Engineering (rev 10c); NAIP 2012

Figure M3-2: Index
East Alignment (Alternatives 1B, 2B, and 6B)



Sources: DWR DHCCP Engineering (rev 10c); NAIP 2012

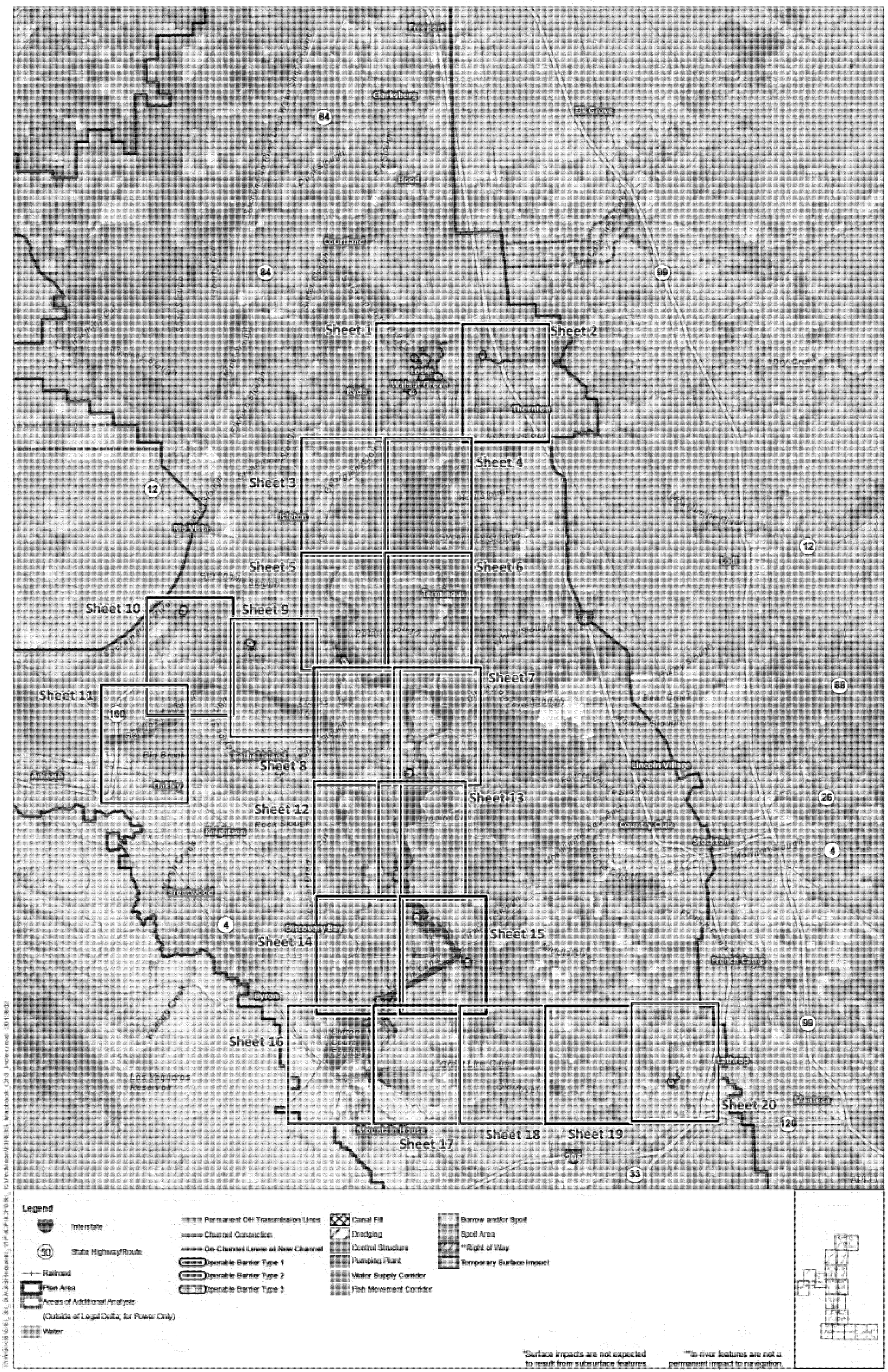
Figure M3-3: Index
West Alignment (Alternatives 1C, 2C, and 6C)



T:\WGI-38\GIS_33_00\GISRequest_11F\ICF\ICF086_12\Arc\Maps\EIR\EIS_Mapbook_Ch3_Index.mxd 20130902

Sources: DWR DHCCP Engineering (rev 2c); NA P 2012

Figure M3-4: Index
Modified Pipeline/Tunnel Alignment (Alternative 4)



Sources: DWR DHCCP Engineering (rev 3b); NAIP 2012

Figure M3-5: Index
Through Delta / Separate Corridors

To: Rader, Cliff[Rader.Cliff@epa.gov]
Cc: Hessert, Aimee[Hessert.Aimee@epa.gov]
From: Carney, Kimberley
Sent: Wed 2/19/2014 3:24:42 PM
Subject: FW: CMS Inactivity Notification - Sent Item(s)

Cliff,
Looks like we'll get ticklers of your CMS actions (even though we have until May to respond to #4793).
It's still a good reminder for #4733.

-----Original Message-----
From: cmsadmin@epa.gov [mailto:cmsadmin@epa.gov]
Sent: Tuesday, February 18, 2014 11:09 PM
To: Carney, Kimberley
Subject: CMS Inactivity Notification - Sent Item(s)

Kimberley Carney:

The following item(s) sent by you have not been acted upon for more than 5 days. Please contact the responsible CMS user(s) for proper action or reassign the control.

Control Number: AX-14-000-4793
Control Subject: DRF - Daily Reading File - Application for Presidential Permit by TransCanada Keystone Pipeline, L.P. to Construct, Connect, Operate and Maintain Pipeline Facilities on the Border of the United States and Canada
From: Bass, John R.
Task Name: New Assignment
Sent By: Kimberley Carney
Sent To: OECA-OFA-NCD
Date Sent: Feb 11 2014
Days Inactive: 6

Control Number: AL-14-000-4733
Control Subject: REQUEST THAT THE PUBLIC COMMENT PERIOD FOR THE BAY-DELTA CONSERVATION PLAN AND THE ENVIRONMENTAL IMPACT REPORT BE EXTENDED BEYOND THE CURRENT 120-DAY COMMENT PERIOD
From: Denham, Jeff
Task Name: New Assignment
Sent By: Kimberley Carney
Sent To: OECA-OFA-NCD
Date Sent: Feb 11 2014
Days Inactive: 6

Note: This Email was automatically generated. Please do not attempt to respond to it. You can access this control at https://cms.epa.gov/cms. Questions or comments concerning CMS should be directed to CMS Support at 202-564-4985 or CMS Information@epa.gov.

To: Rader, Cliff[Rader.Cliff@epa.gov]
From: Roberts, Dawn
Sent: Tue 2/18/2014 5:47:58 PM
Subject: FW: Request Extension on Comment Period for NOAA DEIS, EPA #20130365
NOAA DEIS Extension Request_EPA_20130365.pdf

From: Steve Kokkinakis - NOAA Federal [mailto:steve.kokkinakis@noaa.gov]
Sent: Wednesday, February 12, 2014 12:57 PM
To: Roberts, Dawn
Cc: Steve Kokkinakis - NOAA Federal; Shelby Mendez - NOAA Federal; Ryan Wulff - NOAA Federal
Subject: Request Extension on Comment Period for NOAA DEIS, EPA #20130365

Dear Dawn,

Please find attached a letter from our NOAA NEPA Coordinator requesting a 60 day extension on the Bay Delta Conservation Plan DEIS, which was originally filed under EPA #20130365 (current deadline 4/14/2014, extended to 6/13/2014). I appreciate your assistance in getting this extension notice published in EPA next EIS notices publication on February 21, 2014.

Thanks,

Steve

Steve Kokkinakis

Senior Advisor on NEPA Coordination and Compliance

Office of Program Planning and Integration

National Oceanic & Atmospheric Administration

US Department of Commerce

1315 East-West Highway
Silver Spring, MD 20910
Phone: 240-533-9021
Fax: (301) 713-0585

Website: www.nepa.noaa.gov

Please consider the environment before printing this e-mail

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
PROGRAM PLANNING AND INTEGRATION
Silver Spring, Maryland 20910

FEB 12 2014

Ms. Susan Bromm
US Environmental Protection Agency
Office of Federal Activities
EIS Filing Section
Ariel Rios Building (South Oval Lobby), Mail Code 2252-A
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Dear Ms. Bromm:

We are requesting a 60 day extension to the current 120 day comment period on the Bay Delta Conservation Plan Draft Environmental Impact Statement (EIS #20130365). This request is based on multiple requests from the public to extend the comment period. Therefore, we would like to extend the comment period from April 14, 2014 through June 13, 2014. Please include this extension to the comment period in the next available posting of the EPA weekly notices.

Sincerely,

Patricia A. Montanio
NOAA NEPA Coordinator

Printed on Recycled Paper

To: Rader, Cliff[Rader.Cliff@epa.gov]
From: Goforth, Kathleen
Sent: Fri 2/14/2014 6:03:13 PM
Subject: FW: Final One Pager on BDCP
BDCPOnePager021214Final.docx

FYI.

Kathleen Martyn Goforth, Manager

Environmental Review Section

EPA Region 9 (ENF-4-2)

75 Hawthorne Street

San Francisco, CA 94105

415-972-3521

From: Hagler, Tom
Sent: Wednesday, February 12, 2014 6:10 PM
To: Gorke, Roger; Ryerson.Teddy
Cc: Vendlinski, Tim; Goforth, Kathleen; Moyer, Robert
Subject: Final One Pager on BDCP

Per your request, here is a final version (as edited by Kathy Goforth (309 Office) and Tim Vendlinski (Water Division)) of the one page summary you had each asked for independently.

****

Tom Hagler

Assistant Regional Counsel

U.S. Environmental Protection Agency

Region 9

75 Hawthorne Street, RC-2

San Francisco, California 94105-3901

Phone (415)972-3945

Email: hagler.tom@epa.gov

To: Rader, Cliff[Rader.Cliff@epa.gov]
From: Carney, Kimberley
Sent: Tue 2/11/2014 8:16:23 PM
Subject: FW: CMS New Assignment - Erin Miles - AL-14-000-4733
14-000-4733 - Congressional-Bay Delta EIS.pdf

New Control for you. A Congressional request to extend the review period of a non-EPA EIS beyond 120 days. Aimee is bringing the hard copy cover sheet and letter to you now.

-----Original Message-----
From: cmsadmin@epa.gov [mailto:cmsadmin@epa.gov]
Sent: Tuesday, February 11, 2014 1:20 PM
To: melvin.loudean@epa.gov; Carney, Kimberley
Subject: CMS New Assignment - Erin Miles - AL-14-000-4733

Control AL-14-000-4733 has been assigned to your office on 2/11/14 1:19 PM by Erin Miles. Please go to the CMS webpage to view the details of the control.

Summary Information -
Control Number: AL-14-000-4733
Control Subject: REQUEST THAT THE PUBLIC COMMENT PERIOD FOR THE BAY-DELTA CONSERVATION PLAN AND THE ENVIRONMENTAL IMPACT REPORT BE EXTENDED BEYOND THE CURRENT 120-DAY COMMENT PERIOD
From: Denham, Jeff

Note: This Email was automatically generated. Please do not attempt to respond to it. You can access this control at https://cms.epa.gov/cms. Questions or comments concerning CMS should be directed to CMS Support at 202-564-4985 or CMS Information@epa.gov.

JEFF DENHAM
10TH DISTRICT, CALIFORNIA

E-MAIL VIA WEBSITE:
Denham.house.gov

HOUSE AGRICULTURE COMMITTEE

HOUSE TRANSPORTATION AND INFRASTRUCTURE COMMITTEE

CHAIRMAN, SUBCOMMITTEE ON RAILROADS, PIPELINES AND HAZARDOUS MATERIALS

HOUSE VETERANS' AFFAIRS COMMITTEE

Congress of the United States
House of Representatives
Washington, DC

January 29, 2014

The Honorable Sarah "Sally" Jewell
Secretary
U.S. Department of the Interior
1849 C Street, NW, Room 6156
Washington, DC 20240

The Honorable Regina A. "Gina" McCarthy
Administrator
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, NW, Room 3000
Washington, DC 20460

The Honorable Penny S. Pritzker
Secretary
U.S. Department of Commerce
1401 Constitution Avenue, NW
Washington, DC 20230

Mr. John Laird
Secretary
California Natural Resources Agency
1416 Ninth Street, Suite 1311
Sacramento, CA 95814

Dear Secretaries Jewell, Pritzker and Laird, and Administrator McCarthy:

The recent release of the Bay-Delta Conservation Plan (BDCP) and the associated Environmental Impact Report and Environmental Impact Statement (EIR/EIS) marks the first time the public can truly review the Plan. Constituents of mine, many of which reside within the Sacramento-San Joaquin Bay-Delta region, believe they have not been provided with a complete and detailed description of the project, an assessment and characterization of the potential impacts, and the specific elements of a comprehensive mitigation strategy to compensate for the impacts of the project.

The BDCP and the Public Review Draft EIR/EIS amount to nearly 40,000 pages. Given the size, complexity and potential impacts of the project, the 120-day public comment period I feel is inadequate.

On behalf of concerned constituents within my district I respectfully request that the public comment period for the BDCP EIR/EIS be extended beyond the current 120-day comment period.

Thank you for your consideration.

Sincerely,

JEFF DENHAM
United States Representative

Cc: San Joaquin County
San Luis & Delta-Mendota Water Authority

MODESTO
4701 SISK ROAD, SUITE 202
MODESTO, CA 95356
PHONE: (209) 579-5458
FAX: (209) 579-5028

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WASHINGTON, DC
1730 LONGWORTH HOUSE OFFICE BUILDING
WASHINGTON, DC 20515
PHONE: (202) 225-4540
FAX: (202) 225-3402

To: Rader, Cliff[Rader.Cliff@epa.gov]; Hessert, Aimee[Hessert.Aimee@epa.gov]
Cc: Hanf, Lisa[Hanf.Lisa@epa.gov]; Dunning, Connell[Dunning.Connell@epa.gov]; Skophammer, Stephanie[SKOPHAMMER.STEPHANIE@EPA.GOV]
From: Goforth, Kathleen
Sent: Fri 2/7/2014 12:40:35 AM
Subject: FW: R9 brieifng materials for Administrator's Feb. 10 briefing on CA Water/Bay Delta
briefing paper_G.M._CA map & water facts_TJV_02 06 14.pdf
briefing paper_G.M. BDCP map & text_02 06 14.docx
briefing paper_G.M._Amazing Bay Delta Facts_02 06 14.docx
BDCP Briefing paper Feb 4 2014.docx

Cliff -

FYI, just in case you are not aware (we just found out yesterday): The Administrator requested a briefing on the Bay-Delta. Per Ken Kopocis: "She will need an intro on CA water situation, current issues, and politics to give context. Current drought also as context. Then, the status and issues associated with BDCP. BDCP+if we think we can fit it in." The briefing has been scheduled for 3:45-4:30 your time on Monday, 2/10. **OW has the lead**. Jared will participate via phone. Our Water Division managers will all be out of the office that day at a retreat, but they compiled the materials above as the Region's contribution to the briefing package. Stephanie Skophammer and I will sit in, along (I think) with Tom Hagler (ORC) who has a lot of institutional knowledge about the Bay Delta. Has OFA been invited to participate?

-Kathy

Kathleen Martyn Goforth, Manager

Environmental Review Office

EPA Region 9

75 Hawthorne Street

San Francisco, CA 94105

415-972-3521

From: Diamond, Jane
Sent: Thursday, February 06, 2014 2:49 PM
To: Blumenfeld, Jared
Cc: Gaudario, Abigail; Johnson, Kathleen; Hanf, Lisa; Goforth, Kathleen; Hagler, Tom; Kermish, Laurie; Moyer, Robert; Ryerson.Teddy; Vendlinski, Tim; Martynowicz, Trina
Subject: R9 brieifng materials for Administrator's Feb. 10 briefing on CA Water/Bay Delta

Importance: High

I am bringing up two hardcopies of the materials we discussed with you yesterday. We will also provide them to Roger Gorke in OW. If you want us to send them to anyone else in HQ, please let us know.

Let us know if you want any changes. In the meantime, Tim will be returning his attention to a paper on drought for the Administrator's visit to L.A. next week.

Tim will be in tomorrow; I'll be out but available. Tim and I will both be at the Lab on Monday for first day of Water managers retreat, so will miss the briefing, but I anticipate NEPA and ORC will be on hand to assist you as needed. You can always reach me on Monday if you need anything.

The U.S. Army Corps of Engineers and the **U.S. Bureau of Reclamation** (USBR) began construction of the federal **Central Valley Project (CVP)** in the late 1930s, and the project comprises more than 35 dams, reservoirs, and canals (with the Delta-Mendota Canal serving as the primary conveyance). USBR operates the CVP and delivers an annual average of 7.4 million acre feet (MAF) to agricultural users (5 MAF) on 3 million acres of farmland, municipal users (600,000 AF) for 2 million people, and for environmental requirements (800,000 AF).

The California **Department of Water Resources** (DWR) began construction of the **State Water Project (SWP)** in 1960, and the project comprises 29 dams and reservoirs (with the California Aqueduct serving as the primary conveyance). DWR operates the SWP and delivers 30% of the annual average allocation to agricultural users and 70% municipal users. The SWP is smaller than originally conceived, in part due to Wild & Scenic River designations on all or part of several North Coast rivers: Eel, Klamath, Mad, Salmon, Scott, Smith, Trinity, and Van Duzen. Consequently, the project carries an annual average of 2.4 MAF, but entitlements total 4.23 MAF. This disparity in the volume "developed" water versus "contracted" water has been a centerpiece of California's "water wars". An annual average of 4.4 MAF of freshwater is diverted from the Colorado River via the **Colorado River Aqueduct** to supply municipal and agricultural users within the Metropolitan Water District (MWD), and the Palo Verde, Imperial, and Coachella valleys, respectively. About 24 million people live on the South Coast. In 2014, Southern California received a relatively ample allocation from the Colorado River, and this will buffer the region from the drought emergency.

The **State Water Resources Control Board** governs the diversion of water from the Bay Delta by the CVP and the SWP, and mandates in-stream flows to protect *beneficial uses* (e.g., fishable, swimmable waters) in the Delta and in the Sacramento and San Joaquin river basins through the Bay Delta Water Quality Control Plan.

Groundwater: In some regions, groundwater provides 60% or more of the supply during dry years. Many towns and small cities depend entirely on groundwater for drinking water supplies, and 40% - 50% of Californians rely on groundwater for at least part of their water supply. Approximately 450 groundwater basins are used to store 850 MAF of water; and an average of 16.6 MAF were used annually -- 2 MAF more than was naturally recharged.

To: Jones-Coleman, Diane[Jones-Coleman.Diane@epa.gov]; Lousberg, Macara[Lousberg.Macara@epa.gov]
Cc: Klasen, Matthew[Klasen.Matthew@epa.gov]; Spraul, Greg[Spraul.Greg@epa.gov]; Rader, Cliff[Rader.Cliff@epa.gov]
From: Gorke, Roger
Sent: Thur 2/6/2014 1:08:51 PM
Subject: Re: Courtesy Copy of AL-14-000-4733 (Jeff Denham)

I'll work with Greg on how to proceed. The comment period will be extended per what I heard on the call yesterday. Not sure if that is public yet or not.

Roger Gorke
Senior Policy Advisor
Office of Water
U.S. Environmental Protection Agency
PH: 202-564-0470
FAX: 202-564-0500
gorke.roger@epa.gov

From: Jones-Coleman, Diane
Sent: Thursday, February 06, 2014 7:57:54 AM
To: Lousberg, Macara; Gorke, Roger
Cc: Klasen, Matthew
Subject: RE: Courtesy Copy of AL-14-000-4733 (Jeff Denham)

Good morning ,

I have retrieved the control from OWOW. I am standing by awaiting next steps.

Thanks all.

Diane

Diane C. Coleman

OW Correspondence Team Leader
(202) 564-0379
E-mail: Jones-Coleman.Diane@epa.gov

From: Klasen, Matthew
Sent: Thursday, February 06, 2014 7:37 AM
To: Lousberg, Macara; Gorke, Roger
Cc: Jones-Coleman, Diane
Subject: RE: Courtesy Copy of AL-14-000-4733 (Jeff Denham)

OK thanks; glad we all had similar thoughts. I'll stand down on this, and just let me know if there's anything I can help with as the process proceeds.

Thanks,

Matt

Matt Klasen
U.S Environmental Protection Agency
Office of Water
(202) 566-0780
Cell (202) 505-0787

From: Lousberg, Macara
Sent: Thursday, February 06, 2014 7:24 AM
To: Gorke, Roger; Klasen, Matthew
Cc: Jones-Coleman, Diane
Subject: RE: Courtesy Copy of AL-14-000-4733 (Jeff Denham)

FYI Matt - Greg Spraul is looking into having it re-controlled to Interior too, after Diane Jones-Coleman asked him about the procedure for doing an interagency reassignment. Roger – can you please connect directly with Greg so that both of you are on the same page about how to handle this? I told him you were going to try and raise this at yesterday's meeting, but since there wasn't time to do that, we're back to square one in terms of figuring out how to proceed. I'd hate to have both of you going down different paths to figure this out, and I'm happy to turn this over to OCIR to resolve. Thx.

From: Gorke, Roger
Sent: Thursday, February 06, 2014 6:52 AM
To: Klasen, Matthew

Cc: Lousberg, Macara
Subject: RE: Courtesy Copy of AL-14-000-4733 (Jeff Denham)

Yeah Matt,

We are trying to get it controlled over to DoI or at least say what they say. There was a BDCP Principals call yesterday but I did not get a chance to bring it up. The call was abruptly cut short because someone scheduled a call with high level officials from the State right after that one on the same line. Oops...

I will send a note to Interior and Commerce about it today.

Roger

From: Klasen, Matthew
Sent: Wednesday, February 05, 2014 10:25 PM
To: Gorke, Roger
Cc: Lousberg, Macara
Subject: FW: Courtesy Copy of AL-14-000-4733 (Jeff Denham)

Hey Roger – FYI, this letter came into EPA today via CMS.

I presume OWOW is not the right organization to take this one, and that it would likely be up to another agency to respond to this (presumably DOI) rather than having us respond. Does that make sense to you? Has this been circulated among the interagency group?

Thanks,
Matt

Matt Klasen
U.S Environmental Protection Agency
Office of Water
(202) 566-0780
Cell (202) 505-0787

From: Jones-Coleman, Diane
Sent: Wednesday, February 05, 2014 11:09 AM
To: Stoner, Nancy; Kopocis, Ken; Gilinsky, Ellen; Peck, Gregory
Cc: Lousberg, Macara; Klasen, Matthew
Subject: Courtesy Copy of AL-14-000-4733 (Jeff Denham)

FROM: Congressman Jeff Denham

RECEIVED: February 5, 2014

SUBJECT: Request that Public Comment Period for Bay-Delta Conservation Plan and the EIR/EIS be Extended Beyond 120-Days

ASSIGNED: OWOW to prepare response for AA-OW signature

DUE TO OW-IO: Tuesday, February 18, 2014

Diane

Diane C. Coleman

OW Correspondence Team Leader

(202) 564-0379
E-mail: Jones-Coleman.Diane@epa.gov

To: Rader, Cliff[Rader.Cliff@epa.gov]; Gorke, Roger[Gorke.Roger@epa.gov]
From: Lousberg, Macara
Sent: Wed 2/5/2014 5:50:41 PM
Subject: RE: BDCP Re: Courtesy Copy of AL-14-000-4733 (Jeff Denham)
AL-14-000-4733_Jeff Denham.pdf

Hi Cliff - see attached. The letter was sent to DOI, Commerce, us and the California Natural Resources Agency. Sounds like Interior and Commerce should respond, but it may be that EPA is asked to send a short response indicating that those 2 agencies are the appropriate respondents. If so, should that come from OW, or from OECA? What would your advice be on this?

Macara

From: Rader, Cliff
Sent: Wednesday, February 05, 2014 12:00 PM
To: Gorke, Roger; Lousberg, Macara
Subject: RE: BDCP Re: Courtesy Copy of AL-14-000-4733 (Jeff Denham)

The lead agencies, i.e.. those that prepared the EIS. In this case, BuRec, FWS, and NMFS.

Did the letter come only to EPA, or all the agencies?

From: Gorke, Roger
Sent: Wednesday, February 05, 2014 11:55 AM
To: Lousberg, Macara; Rader, Cliff
Subject: BDCP Re: Courtesy Copy of AL-14-000-4733 (Jeff Denham)

Cliff,

Is this our decision? Or your? Or who?

Thanks

Roger Gorke
Senior Policy Advisor
Office of Water
U.S. Environmental Protection Agency
PH: 202-564-0470
FAX: 202-564-0500
gorke.roger@epa.gov

From: Lousberg, Macara
Sent: Wednesday, February 05, 2014 11:41:06 AM
To: Gorke, Roger
Subject: FW: Courtesy Copy of AL-14-000-4733 (Jeff Denham)

FYI, just got notified about this. Who makes the decision regarding an extension request?

From: Jones-Coleman, Diane
Sent: Wednesday, February 05, 2014 11:09 AM
To: Stoner, Nancy; Kopocis, Ken; Gilinsky, Ellen; Peck, Gregory
Cc: Lousberg, Macara; Klasen, Matthew
Subject: Courtesy Copy of AL-14-000-4733 (Jeff Denham)

FROM: Congressman Jeff Denham

RECEIVED: February 5, 2014

SUBJECT: Request that Public Comment Period for Bay-Delta Conservation Plan and the EIR/EIS be Extended Beyond 120-Days

ASSIGNED: OWOW to prepare response for AA-OW signature

DUE TO OW-IO: Tuesday, February 18, 2014

Diane

Diane C. Coleman

OW Correspondence Team Leader
(202) 564-0379
E-mail: Jones-Coleman.Diane@epa.gov

JEFF DENHAM
10TH DISTRICT, CALIFORNIA

E-MAIL VIA WEBSITE:
Denham.house.gov

Congress of the United States
House of Representatives
Washington, DC

HOUSE AGRICULTURE COMMITTEE

HOUSE TRANSPORTATION AND INFRASTRUCTURE COMMITTEE

CHAIRMAN, SUBCOMMITTEE ON RAILROADS, PIPELINES AND HAZARDOUS MATERIALS

HOUSE VETERANS' AFFAIRS COMMITTEE

January 29, 2014

The Honorable Sarah "Sally" Jewell
Secretary
U.S. Department of the Interior
1849 C Street, NW, Room 6156
Washington, DC 20240

The Honorable Regina A. "Gina" McCarthy
Administrator
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, NW, Room 3000
Washington, DC 20460

The Honorable Penny S. Pritzker
Secretary
U.S. Department of Commerce
1401 Constitution Avenue, NW
Washington, DC 20230

Mr. John Laird
Secretary
California Natural Resources Agency
1416 Ninth Street, Suite 1311
Sacramento, CA 95814

Dear Secretaries Jewell, Pritzker and Laird, and Administrator McCarthy:

The recent release of the Bay-Delta Conservation Plan (BDCP) and the associated Environmental Impact Report and Environmental Impact Statement (EIR/EIS) marks the first time the public can truly review the Plan. Constituents of mine, many of which reside within the Sacramento-San Joaquin Bay-Delta region, believe they have not been provided with a complete and detailed description of the project, an assessment and characterization of the potential impacts, and the specific elements of a comprehensive mitigation strategy to compensate for the impacts of the project.

The BDCP and the Public Review Draft EIR/EIS amount to nearly 40,000 pages. Given the size, complexity and potential impacts of the project, the 120-day public comment period I feel is inadequate.

On behalf of concerned constituents within my district I respectfully request that the public comment period for the BDCP EIR/EIS be extended beyond the current 120-day comment period.

Thank you for your consideration.

Sincerely,

JEFF DENHAM
United States Representative

Cc: San Joaquin County
San Luis & Delta-Mendota Water Authority

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To: Rader, Cliff[Rader.Cliff@epa.gov]
Cc: Goforth, Kathleen[Goforth.Kathleen@epa.gov]; Dunning, Connell[Dunning.Connell@epa.gov]
From: Skophammer, Stephanie
Sent: Tue 2/4/2014 10:06:35 PM
Subject: FW: BDCP one-pager
BDCP Briefing paper Feb 4 2014.docx

From: Ryerson.Teddy
Sent: Tuesday, February 04, 2014 2:05 PM
To: Skophammer, Stephanie; Goforth, Kathleen; Vendlinski, Tim; Hanf, Lisa; Hagler, Tom
Cc: Johnson, Kathleen; Diamond, Jane; Martynowicz, Trina; Gaudario, Abigail
Subject: Fw: BDCP one-pager

Nancy J. ("Teddy") Ryerson
Chief of Staff to the Regional Administrator
U.S. EPA, Pacific Southwest Office
Office: 415-947-8702
Cell: 415-254-5381

From: Blumenfeld, Jared
Sent: Tuesday, February 04, 2014 1:57:03 PM
To: Giles-AA, Cynthia; Kopocis, Ken
Subject: BDCP one-pager

Dear Ken and Cynthia – per our conversation last Friday, here is the one-pager on the BDCP in preparation for tomorrow's meeting with CEQ. Please let us know if you have any questions. Thanks for all your support!

Jared Blumenfeld
U.S. EPA
Regional Administrator
Pacific Southwest

415-947-8702

To: Rader, Cliff[Rader.Cliff@epa.gov]
From: Gorke, Roger
Sent: Wed 1/29/2014 7:27:15 PM
Subject: FW: draft briefing paper for Gina McCarthy (Bay Delta)
breifing papers_Gina McCarthy_Region 9 Bay Delta issue_01 29 14 v2.docx

FYI

Roger Gorke

Senior Policy Advisor

Office of Water

U.S. Environmental Protection Agency

PH: 202-564-0470

FAX: 202-564-0500

gorke.roger@epa.gov

From: Vendlinski, Tim
Sent: Wednesday, January 29, 2014 1:56 PM
To: Gorke, Roger
Subject: draft briefing paper for Gina McCarthy (Bay Delta)
Importance: High

Here you go, Roger.

A great deal of information is imbedded with hyperlinks.

Thanks, Tim

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Tim Vendlinski

Senior Policy Advisor;

Bay Delta Program Manager

EPA Region 9

75 Hawthorne Street (WTR-1)

San Francisco, CA 94105-3901

(415) 972-3469 desk

><((((º>·´¯`·.¸¸..><((((º>·´¯`·.¸¸..><((((º>

To: Rader, Cliff[Rader.Cliff@epa.gov]; Goforth, Kathleen[Goforth.Kathleen@epa.gov]; Skophammer, Stephanie[SKOPHAMMER.STEPHANIE@EPA.GOV]; Skophammer, Stephanie[SKOPHAMMER.STEPHANIE@EPA.GOV]
Cc: Hessert, Aimee[Hessert.Aimee@epa.gov]; Wright, Justin[wright.justin@epa.gov]; Aresta-DaSilva, Jessica[Aresta-DaSilva.Jessica@epa.gov]
From: Dunning, Connell
Sent: Mon 1/27/2014 8:23:38 PM
Subject: RE: CA drought

Thanks Cliff.

See recent article about CEQA being suspended.

Connell

http://www.kcet.org/news/redefine/rewild/agencies/brown-suspends-environmental-law-in-drought-declaration.html

Brown Suspends Environmental Law in Drought Declaration

by Chris Clarke

on January 17, 2014 10:58 AM

Jerry Brown suspended CEQA in his drought declaration today. | Photo: Steve Rhodes/Flickr/Creative Commons License

The state's foremost environmental law no longer protects wildlife or the environment from the effects of the state's response to the drought, after an emergency drought declaration was signed by Governor Brown at a press event in San Francisco Friday morning.

Buried in the language of the declaration, unmentioned at the press event which focused on voluntary conservation programs, is a clause exempting the state's responses from having to comply with the California Environmental Quality Act (CEQA), the backbone of the state's environmental protection law.

The declaration claims that compliance with CEQA would get in the way of swift reaction to the effects of the drought emergency.

Here's the text in question, section 9 of Friday's drought declaration:.

9.The Department of Water Resources and the Water Board will take actions necessary to make water immediately available, and, for purposes of carrying out directives 5 and 8, Water Code section 13247 and Division 13 (commencing with section 21000) of the Public Resources Code and regulations adopted pursuant to that Division are suspended on the basis that strict compliance with them will prevent, hinder, or delay the mitigation of the effects of the emergency.

Division 13 of the state's Public Resources Code is the technical, "codified" name for CEQA.

The section also exempts the Department of Water Resources and the Water Board from compliance with section 13247 of the state's Water Code, which means the agencies don't have to comply with water quality plans.

The exemptions apply to the agencies in carrying out orders in the drought declaration relating to dam releases and transfers of water between the State Water Project and the federal Central Valley Project. Both CEQA and the requirement that agencies follow water quality plans serve to protect California's beleaguered fish populations, including the Central Valley's salmon runs and the Delta smelt, which is listed as Endangered under the California Endangered Species Act.

Water quality violations in the smelt's habitat have recently restricted agricultural water diversions from the Sacramento River: if more water is diverted as a result of exemptions from state environmental law, the smelt -- whose population fell to a near-record low in the past year -- could be history: its range is restricted to a narrow band in the delta where seawater and freshwater mix, and diversions in a drought year could push that "mixing zone" too far inland for the fish to survive.

Meanwhile, exempting the state's water agencies' drought measures from CEQA means that diversions and transfers won't be subject to third-party scientific analysis or public comment.

Though the exemptions went unmentioned at the San Francisco press conference, they aren't a particular surprise from Brown, a longtime foe of CEQA. We'll be tracking the implementation of this exemption and reporting on comment from water and wildlife activists as the story develops.

Connell Dunning

Environmental Review Office

US EPA Region IX, Pacific Southwest

75 Hawthorne St (CED-2), SF, CA 94105

dunning.connell@epa.gov

phone - 415-947-4161 fax- 415-947-8026

From: Rader, Cliff
Sent: Monday, January 27, 2014 12:11 PM
To: Goforth, Kathleen; Dunning, Connell; Skophammer, Stephanie; Skophammer, Stephanie
Cc: Hessert, Aimee; Wright, Justin; Aresta-DaSilva, Jessica
Subject: CA drought

I just heard from Roger Gorke that there is an effort to set up a briefing for the Administrator, as early as next week, on the CA drought, and the BDCP will be part of it. Roger has contacted R9 water folks (not sure who), but I wanted to make sure you are aware so you can start coordinating.

When I learn more I'll let you know

Cliff Rader

Director, NEPA Compliance Division

202-564-7159

Chapter 3
Description of Alternatives

3.1 Introduction

The BDCP sets out a comprehensive conservation strategy for the Delta designed to restore and protect ecosystem health, water supply, and water quality within a stable regulatory framework. The BDCP reflects the outcome of a multiyear collaboration among California Department of Water Resources (DWR), the Bureau of Reclamation (Reclamation), state and federal fish and wildlife agencies, state and federal water contractors, nongovernmental organizations, agricultural interests, and the general public.

As described in detail in Chapter 2, *Project Objectives and Purpose and Need*, the proposed BDCP (also referred to as the Plan) is intended to address federal Endangered Species Act (ESA) and California Natural Community Conservation Planning Act (NCCPA) compliance for the operation of the existing State Water Project (SWP) Delta facilities and for the construction and operation of conveyance facilities for the movement of water entering the Delta from the Sacramento Valley watershed to the existing SWP and federal Central Valley Project (CVP) pumping plants in the southern Delta. The BDCP is also proposed to provide for the conservation and management of covered species[1] through *conservation measures*, including the construction and operation of north Delta water conveyance facilities, within the area covered by the BDCP, i.e., the BDCP Plan Area (Plan Area) and the Areas of Additional Analysis. These actions—designed to contribute to the recovery of the covered species—include protecting, restoring, creating, and/or enhancing aquatic and terrestrial species habitat, natural communities, and landscape, as well as reducing the adverse effects of water diversions on certain covered species while providing a more reliable water supply.

As described in Chapter 1, Section 1.6, *Intended Uses of this EIR/EIS and Agency Roles and Responsibilities*), the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) are considering whether to issue incidental take permits (ITPs) under ESA Section 10(a)(1)(B) for the incidental take of federally listed species from the construction, operation, and maintenance associated with water conveyance, ecosystem restoration, and other covered activities as described in the BDCP. The applicant's proposed duration of the ITPs is 50 years. USFWS and NMFS would issue separate ITPs covering species within their respective authority. A habitat conservation plan (HCP) will be submitted as part of the ITP applications. The HCP describes activities that would be covered by the ITPs, the species for which incidental take would be authorized, and measures that would, to the maximum extent practicable, minimize the adverse effects on the covered species resulting from implementation of the covered activities, and mitigate any remaining adverse effects through the protection, restoration, creation, and/or enhancement of habitat for the covered species. The California Department of Fish and Wildlife (CDFW) would be responsible for approving the BDCP as a Natural Community Conservation Plan (NCCP). Reclamation's action in relation to the BDCP would be to adjust CVP operations specific to the Delta to accommodate new conveyance facility operations and/or flow requirements under the BDCP, in coordination with SWP operations.

[1] Covered species are species addressed in the BDCP. The BDCP covered species are listed in Chapter 1, *Introduction,* Table 1-1.

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This chapter describes the 15 action alternatives and the No Action Alternative being considered for the Plan. The action alternatives for the EIR/EIS have been developed to meet all or most of the project objectives and purpose and need statement of the BDCP described in Chapter 2, *Project Objectives and Purpose and Need*. The 15 action alternatives are variations of conservation plans that differ primarily in the location, design, conveyance capacity, and rules that would determine the operation of conveyance facilities implemented under BDCP Conservation Measure (CM) 1. For instance, the alternatives range from the proposed construction of one 3,000-cfs intake to five such intake facilities, representing a range of north Delta conveyance capacities from 3,000 cfs to 15,000 cfs. The operational rules also include varying requirements for Delta outflow and river flows in the south Delta. The range of alternatives also includes different amounts and types of habitat restoration and enhancement proposed under CM2 through CM11. One alternative includes 40,000 fewer acres of tidal habitat restoration compared to the other alternatives. Another includes 10,000 more acres of seasonally inundated floodplain restoration and 20 more miles of channel margin enhancement compared to the other alternatives. Other proposed conservation measures (CM12–CM22) do not vary among alternatives, but they are similarly considered in a conservation package. Issuance of 50-year ITPs and an NCCP permit is common to all of the alternatives, with the exception of the No Action Alternative. In addition, Section 3.8, *SWP Long-Term Water Supply Contract Amendment*, describes options to implement SWP funding mechanisms for a BDCP (or an alternative) conveyance facility and any other activities, such as mitigation for construction impacts, that may be selected and funded by the SWP water agencies. Options for funding methods include charging the SWP water agencies under the existing terms of the SWP long-term water supply contracts, amending the SWP long-term water supply contracts, or entering into agreements with water agencies for funding. Under any action alternative for the Plan, one or a combination of these methods would be used to fund the costs allocated to the SWP water agencies for the alternative action. The potential that any of these funding methods would reallocate and redistribute SWP water, such as from agricultural to municipal uses, is discussed in Chapter 30, *Growth Inducement and Other Indirect Effects*.

The BDCP sets out a comprehensive conservation strategy for the Delta designed to restore and protect ecosystem health, water supply, and water quality within a stable regulatory framework. The proposed BDCP conservation strategy has been developed to meet a range of specific biological goals and objectives. The BDCP includes a description of each element of the conservation strategy and its associated rationale. However, only CM1 facilities and operations are described at a *project level* in this EIR/EIS. This EIR/EIS is intended to provide CEQA and NEPA support for approval of the proposed BDCP and to inform permit decisions for the issuance of the proposed ITPs/NCCP permit. The EIR/EIS is thus intended to provide complete project level analysis for actions by USFWS and NMFS permitting the BDCP under the ESA, and for action by CDFW approving the BDCP as an NCCP under the NCCPA. With respect to particular components of the BDCP that must be implemented separately through individual permit actions or other discretionary decisions, the EIR/EIS intends to provide a mixture of project- and program-level components. Specifically, the EIR/EIS is intended to provide project-level assessment of the potential effects of modified and/or new conveyance facilities (CM1), including project-specific mitigation. All other conservation measures are presented and analyzed at a *program level*, with the expectation that more detailed, site-specific analysis and associated site-specific environmental documents will be prepared later, prior to implementation of specific projects, as the BDCP (or an alternative) is implemented over time, as appropriate. (See Chapter 4, *Approach to the Environmental Analysis*, for more detail on agency decision making related to project- and program-level approvals using this EIR/EIS.) The operation and maintenance of the SWP and CVP related to implementation of the BDCP, after the proposed water facilities

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defined in CM1 become operational, are also considered in this EIR/EIS. These changes in operation of the SWP and CVP are presented and analyzed at a project level (using CALSIM and DSM2 modeling); maintenance of these facilities, which presumably would be similar to existing activities, is described and analyzed at a program level.

The alternatives development process is described in Section 3.2, *Alternatives Development Process*, and in Appendix 3A, *Identification of Water Conveyance Alternatives for Bay Delta Conservation Plan Environmental Impact Report/ Environmental Impact Statement (Screening Report) (Conservation Measure 1)*. This discussion discloses how the range of alternatives was developed for evaluation and describes those alternatives considered but rejected from further consideration, as well as how the alternatives described in this chapter were selected. Appendix 3A includes consideration of potential alternatives to the proposed BDCP as well as consideration of potential alternatives to the federal fish and wildlife agencies' action of issuing ITPs. Section 3.3, *Proposed Bay Delta Conservation Plan*, provides a brief summary of the overall conservation strategy and the conservation measures that are collectively intended to address the impacts of take on species covered by the Plan and to contribute to the recovery of the covered species. The reader is referred to the Plan[2] for a more detailed discussion of the proposed conservation strategy, conservation measures, and covered activities. Section 3.4, *Components of the Alternatives: Overview*, presents an overview of the facilities and other project components that constitute the conservation measures and, in turn, the alternatives. Section 3.5, *Alternatives*, describes the No Action Alternative and each action alternative in detail. Section 3.6, *Components of the Alternatives: Details*, provides a detailed description of each component of the action alternatives, common to some or all of the alternatives. Section 3.7 and Appendix 3B, *Environmental Commitments*, present the environmental commitments that are incorporated into the BDCP and all action alternatives.

As of this Draft EIR/EIS, the federal Lead Agencies have not identified a Preferred Alternative for the purposes of NEPA; however, the identification of a Preferred Alternative for the purposes of CEQA is described below.

3.1.1 Preferred Alternative Under CEQA

From the standpoint of DWR as CEQA Lead Agency and the project applicant for the BDCP, Alternative 4, as described later in this chapter, is the *Preferred Alternative* for purposes of CEQA and is consistent with the proposed BDCP published concurrently with the publication of this Draft EIR/EIS.[3] Although, from an organizational standpoint, it might seem more logical to make the Preferred Alternative the first one addressed in an EIR/EIS (i.e., Alternative 1), in this case Alternative 4 did not emerge as the Preferred Alternative until well after the overall organization of this Draft EIR/EIS (including the numbering and placement of Alternatives) was already in place. Alternative 4 as described herein, moreover, represents a refinement (and improvement) on an earlier version of Alternative 4 that was found in a previous publicly available administrative draft of this Draft EIR/EIS.[4] The present version of Alternative 4 represents substantial refinements and additional scientific work and analysis to identify a form of the proposed BDCP that is grounded in solid science and reaches what DWR considers to be an optimal balance between ecological and

[2] http://baydeltaconservationplan.com/Home.aspx

[3] As described in Chapter 1, *Introduction*, Section 1.1, the full Draft EIR/EIS should be understood to include not only the EIR/EIS itself and its appendices but also the proposed BDCP documentation including all appendices.

[4] The February 28, 2012 administrative draft EIR/EIS was made available on the BDCP website: http://baydeltaconservationplan.com.

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water supply objectives in the Plan Area. Notably, identification of Alternative 4 as the preferred CEQA alternative is tentative only, and is subject to change as DWR and the CEQA responsible agencies, as well as the NEPA Lead Agencies, receive and consider public and agency input on this EIR/EIS. It is therefore possible that the final version of the BDCP may differ from Alternative 4 as described herein, either because Alternative 4 itself was refined, because another alternative was determined to be preferable, or because the Lead Agencies, in response to input, developed a new alternative with some features from some existing alternatives and other features from other existing alternatives.[5]

3.2 Alternatives Development Process

CEQA and NEPA require that an EIR and EIS include a detailed analysis of a range of reasonable alternatives to a proposed project or action. CEQA requires that an EIR evaluate alternatives to the proposed project that are potentially feasible and would attain most of the basic project objectives while avoiding or substantially lessening project impacts. NEPA generally requires that a range of reasonable alternatives that meet the purpose and need statement of the action, to which the federal Lead Agencies are responding, be analyzed at an equivalent level of detail in the EIS. A range of reasonable alternatives is analyzed to define the issues and provide a clear basis for choice among the options. The CEQA/NEPA analysis must also include an analysis of the No Project (for CEQA) or No Action Alternative (for NEPA).

CEQA requires that the Lead Agency consider alternatives that would avoid or substantially lessen any of the significant impacts of the proposed project. Section 15126.6[a] of the State CEQA Guidelines provides that:

> [a]n EIR shall describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives. An EIR need not consider every conceivable alternative to a project. Rather it must consider a reasonable range of potentially feasible alternatives that will foster informed decision making and public participation. An EIR is not required to consider alternatives which are infeasible. The lead agency is responsible for selecting a range of project alternatives for examination and must publicly disclose its reasoning for selecting those alternatives. There is no ironclad rule governing the nature or scope of the alternatives to be discussed other than the rule of reason.

Under these principles, the EIR needs to describe and evaluate only those alternatives necessary to permit a reasonable choice and "to foster meaningful public participation and informed decision making" (State CEQA Guidelines Section 15126.6[f]). Consideration of alternatives focuses on those that can either eliminate significant adverse environmental impacts or substantially reduce them; alternatives considered in this context may include those that are more costly and those that could

[5] Just as further public and agency input may result in a new preferred CEQA alternative or a modification of Alternative 4 in its current form, the same is true of the text of the proposed Bay Delta Conservation Plan (BDCP) published contemporaneously with this Draft EIR/EIS. In particular, Chapter 9 of the BDCP, entitled *Alternatives to Take*, may be revised in light of further input regarding the practicability of the alternatives tentatively rejected therein. In other words, the current analysis in BDCP Chapter 9 of the impracticability of various alternatives to take, though representing DWR's best thinking as of the date of its release, remains subject to change. It should be noted that the alternatives set out in Chapter 9 of the BDCP are not identical to the EIR/EIS alternatives; nor are they subject to the same analysis. Within Chapter 9 of the BDCP, the analysis of the alternatives is focused solely on the potential for each of these alternatives to reduce the take of federally listed species in relationship to the proposed action. The alternatives addressed in the EIR/EIS, in contrast, are subject to a far broader analysis.

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impede to some degree the attainment of the project objectives (Section 15126.6[b]). CEQA does not require the alternatives to be evaluated at the same level of detail as the proposed project.

Even so, due to the complex nature of the BDCP and associated environmental issues, the Lead Agencies have included far more information about project alternatives than required by CEQA. For example, the environmental review process for the BDCP, beginning in 2007, involved input from a large group of stakeholders and an extensive evaluation of various options and ongoing effects analysis that goes beyond the normal scope of a CEQA review. This process has been helpful in informing the public and gathering input on a project that will affect a very complex estuary and a statewide water supply system. For more details regarding what was evaluated, see Appendix 3A, *Identification of Water Conveyance Alternatives for Bay Delta Conservation Plan Environmental Impact Report/Environmental Impact Statement (Screening Report) (Conservation Measure 1)*.

Under CEQA, as noted above, the inclusion of an alternative in an EIR requires only that the alternative be "potentially feasible." The ultimate determination of "actual feasibility" can only be made by final agency decision makers, who have the discretion under CEQA to reject as infeasible alternatives that embody what the decision makers believe to be unacceptable policy tradeoffs. After weighing "economic, environmental, social, and technological factors," such decision makers "may conclude that a mitigation measure or alternative is impractical or undesirable from a policy standpoint and reject it as infeasible on that ground." Similarly, "an alternative 'may be found infeasible on the ground it is inconsistent with the project objectives as long as the finding is supported by substantial evidence in the record.'"[6] As for the BDCP, DWR will be the CEQA decision maker in determining the final form of what it ultimately chooses to propose to CDFW as an NCCP. CDFW, in considering DWR's proposal in light of the NCCPA, will be a responsible agency under CEQA for purposes of approving the BDCP.

The Council on Environmental Quality (CEQ) regulations for implementing NEPA (40 CFR 1502.14) require all reasonable alternatives to be objectively evaluated in an EIS, so that each alternative is evaluated at an equal level of detail (40 CFR 1502.14[b]). Although this standard differs from that under CEQA, alternatives in this document are evaluated to an equivalent level of detail as required by NEPA. An EIS must "[d]evote substantial treatment to each alternative considered in detail including the proposed action" and "should present the environmental impacts of the proposal and alternatives in comparative form." Alternatives that cannot reasonably meet the purpose and need do not require detailed analysis. An EIS must briefly describe alternatives to the proposed action where unresolved resource conflicts exist. NEPA does not necessarily require alternatives to offer some environmental benefit over the proposed action; however, neither does it discourage consideration of alternatives with lesser effects. Reclamation's action in relation to the BDCP would be to adjust CVP operations specific to the Delta to accommodate new conveyance facility operations and/or flow requirements under the BDCP, in coordination with SWP operations. USFWS and NMFS are considering whether to issue ITPs under ESA Section 10(a)(1)(B) for the incidental take of federally listed species from the construction, operation, and maintenance associated with water conveyance, ecosystem restoration, and other covered activities as described in the BDCP. Agency roles and responsibilities are discussed further in Chapter 1, Section 1.6, *Intended Uses of this EIR/EIS and Agency Roles and Responsibilities.*

The following sections describe, in a general way, the screening/development process and criteria used to develop the final range of alternatives to be considered for CM1. This process is described in

[6] *California Native Plant Society v. City of Santa Cruz* (2009) 177 Cal.App.4th 957, 1001.

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detail in Appendix 3A, *Identification of Water Conveyance Alternatives for Bay Delta Conservation Plan Environmental Impact Report/Environmental Impact Statement (Screening Report) (Conservation Measure 1)*. The development process for CM2–CM22 is described in Appendix 3G, *Background on the Process of Developing the BDCP Conservation Measures*. A detailed description of the process and steps used in identifying and refining proposed intake locations is described in Appendix 3F, *Intake Location Analysis*.

3.2.1 Development of Alternatives

The process for developing the BDCP was initiated in 2006. A primary objective is to meet the purpose and need and to achieve long-term compliance with ESA and NCCPA with respect to the operation of existing SWP facilities in the Sacramento–San Joaquin Delta (Delta), and the construction and operation of new conveyance facilities for the movement of water entering the Delta from the Sacramento Valley watershed to the existing SWP and CVP pumping plants in the southern Delta. The primary component of the BDCP related to development of alternatives was CM1—the water conveyance facilities combined with the operational scenarios under which they would be managed.

3.2.1.1 Delta Water Conveyance Alternatives Identified in the BDCP Steering Committee Process

The BDCP Steering Committee (Steering Committee) was established in order to provide a public forum where key policies and strategy issues could be publicly discussed and met between 2006 and 2010.[7] The Steering Committee established several working groups and technical teams to develop and evaluate potential alternatives. The Steering Committee conducted a preliminary analysis of broadly defined conveyance alignment alternatives to consider benefits and constraints of different conveyance alignment approaches and completed a *Conservation Strategy Options Evaluation Report* in September 2007 (BDCP Steering Committee 2007). This preliminary analysis refined the range of conveyance alignment alternatives to four Conservation Strategy Options.

- Option 1—Existing through-Delta conveyance with opportunistic Delta operations and potential new storage.
- Option 2—Through-Delta conveyance with San Joaquin River isolation (separate corridors for water supply and fish passage).
- Option 3—Dual conveyance: isolated conveyance between the Sacramento River and SWP and CVP pumping plants *and* through-Delta conveyance with San Joaquin River isolation (as in Option 2).
- Option 4—Isolated conveyance between the Sacramento River and SWP and CVP pumping plants.

[7] The Steering Committee comprised the following agencies: Department of Water Resources, Bureau of Reclamation, Santa Clara Valley Water District, Kern County Water Agency, Metropolitan Water District of Southern California, San Luis & Delta-Mendota Water Authority, Mirant Energy, Westlands Water District, Zone 7 Water Agency, American Rivers, Defenders of Wildlife, Environmental Defense Fund, Natural Heritage Institute, The Bay Institute, The Nature Conservancy, Delta Stewardship Council, North Delta Water Agency, California Farm Bureau Federation, California Resources Agency, Contra Costa Water District, Friant Water Authority, U.S. Fish and Wildlife Service (ex officio), California Department of Fish and Wildlife (ex officio), and National Marine Fisheries Service (ex officio).

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3.2.1.2 Water Conveyance Alternatives Identified in EIR/EIS Scoping Comments

The EIR/EIS process initiated scoping in early 2008 and re-opened the process in early 2009. During the scoping process, 2,950 comments were received. The majority of the comments related to BDCP water supply components referred to as conveyance alignment approaches. The results of the scoping process, along with the conveyance alignment alternatives identified in the Steering Committee process, and conveyance alignment alternatives identified in correspondence to the California Natural Resource Agency between 2006 and June 2012, were considered and resulted in the development of 15 water conveyance alternatives (Appendix 3A, *Identification of Water Conveyance Alternatives for Bay Delta Conservation Plan Environmental Impact Report/ Environmental Impact Statement [Screening Report] [Conservation Measure 1]*). These conveyance alternatives focused on alignment of the CM1 water conveyance since, at the time of the EIR/EIS scoping process, no operational scenarios had been either considered or developed.

3.2.1.3 First (Initial) Screening Analysis of Water Conveyance Alternatives

The water conveyance alternatives identified following the EIR/EIS scoping process were then subjected to a multi-level screening process based upon legal considerations under CEQA and NEPA. This initial or first screening was completed prior to consideration of a range of operations for each of the conveyance alignment alternatives.

First, Second, and Third Level Screening Criteria

Three levels of screening criteria were applied to the 15 water conveyance alternatives during the initial screening. The first and second level screening processes facilitated the identification of alternatives under CEQA and NEPA. The first level screening criteria were based on the purpose and need and focused on allowing for the conservation and management of covered species; protecting, restoring, and enhancing certain aquatic, riparian, and associated terrestrial natural communities/ecosystems; reducing adverse effects on certain covered species through modified use of existing SWP and CVP diversion facilities and use of new SWP intakes; and restoring and protecting SWP and CVP water reliability (Appendix 3A, *Identification of Water Conveyance Alternatives for Bay Delta Conservation Plan Environmental Impact Report/Environmental Impact Statement [Screening Report] [Conservation Measure 1]*). The second level screening criteria focused on avoiding or substantially lessening expected significant environmental effects of the proposed project, and addressing *significant issues* related to the proposed action.

The third level screening process entailed defining potentially feasible alternatives under CEQA and reasonable alternatives under NEPA. The third level screening criteria were focused on consideration of the technical and economic feasibility/practicality of alternatives; whether an alternative would violate federal or state statutes or regulations; and whether an alternative balanced relevant economic, environmental, social, and technological factors.

First (Initial) Screening Analysis Results

Eight of the 15 water conveyance alternatives were eliminated through the first screening process (for description of the alternatives that were eliminated, see Appendix 3A, *Identification of Water Conveyance Alternatives for Bay Delta Conservation Plan Environmental Impact*

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Report/Environmental Impact Statement [Screening Report] [Conservation Measure 1]). The remaining seven alternatives are listed below.

- **Second Screening Dual Conveyance Alignment Alternative A.** Dual conveyance with a tunnel between north Delta intakes and the SWP and CVP pumping plants, and continued use of existing south Delta intakes.
- **Second Screening Dual Conveyance Alignment Alternative B.** Dual conveyance with a lined or unlined east canal between north Delta intakes and the SWP and CVP pumping plants, and continued use of existing south Delta intakes.
- **Second Screening Dual Conveyance Alignment Alternative C.** Dual conveyance with a lined or unlined west canal between north Delta intakes and the SWP and CVP pumping plants, and continued use of existing south Delta intakes.
- **Second Screening Isolated Conveyance Alignment Alternative A.** Isolated Conveyance with a tunnel between north Delta intakes and the SWP and CVP pumping plants, and abandonment of existing south Delta intakes.
- **Second Screening Isolated Conveyance Alignment Alternative B.** Isolated conveyance with a lined or unlined east canal between north Delta intakes and the SWP and CVP pumping plants, and abandonment of existing south Delta intakes.
- **Second Screening Isolated Conveyance Alignment Alternative C.** Isolated conveyance with a lined or unlined west canal between north Delta intakes and the SWP and CVP pumping plants, and abandonment of existing south Delta intakes.
- **Second Screening Through Delta Conveyance Alignment Alternative.** Separate corridors with new fish screens along the Sacramento River at the Delta Cross Channel and Georgiana Slough to convey water through the lower Mokelumne River system and across the San Joaquin River to Middle River and Victoria Canal; a siphon under Old River for continued conveyance to the existing SWP and CVP pumping plants; operable barriers on Snodgrass Slough, head of Old River, Threemile Slough or Sevenmile Slough, and between Old River and Middle River (at Woodward Canal, Railroad Cut, and Connection Slough); dredging and setback levees along portions of Middle River; and continued use of the existing SWP and CVP south Delta intakes during flood periods.

The general approaches to conveyance could be implemented with facilities of different diversion and conveyance capacities (i.e., 3,000, 6,000, 9,000, or 15,000 cubic feet/second [cfs]). The ultimate decisions regarding what capacities should be addressed in particular EIR/EIS alternatives would depend in large part on how differing capacities would affect overall SWP/CVP systems operations. Operational issues are discussed in the following sections.

3.2.1.4 Identification of Operations Alternatives

Steering Committee workgroups and technical teams developed screening evaluations considering operations and restoration activities in the context of the following topics (discussed in detail in Appendix 3A).

- Fluctuating Delta salinity.
- Flooded western island.
- Preferential diversion on the Sacramento River at Hood compared to south Delta diversions.

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- Increased spring river flows.
- Increased spring Delta outflow.
- Increased Fall X2 Delta outflow.
- Preferred south Delta diversion.
- Fully isolated Hood diversion.

In 2008, the Steering Committee approved a draft set of elements of a conservation strategy, which was evaluated in a scientific evaluation process very similar to that created under the CALFED Delta Regional Ecosystem Restoration Implementation Plan (DRERIP) to refine existing, and develop new, Delta-specific restoration actions, provide Delta-specific implementation guidance, program tracking, performance evaluation, and adaptive management feedback (Appendix 3A, Section 3A.8.2). Based on the results of this modified DRERIP analysis, the Steering Committee performed additional analyses to further evaluate water conveyance and operations, taking into account climate change; north Delta bypass flows and operations; tidal marsh and Delta simulations; daily operations; and Delta island consumptive use.

In 2011, state and federal agencies and environmental organizations identified a range of north Delta intake capacities and the following additional conveyance operations alternatives to be analyzed (See Appendix 3A, for detail on these operations alternatives).

- DWR, CDFW, Reclamation, USFWS, and NMFS developed *Scenario 6* for south Delta operations and retained operations similar to those in the *January 2010 BDCP Operations* for the north Delta, with the addition of Fall X2 as set forth in the USFWS 2008 Long-Term Operation Biological Opinion (USFWS BiOp), modifications of Old and Middle River (OMR) criteria, modifications of the Head of Old River Barrier operations, and implementation of south Delta temporary agricultural barriers as under Existing Conditions.
- CDFW, USFWS, and NMFS developed an *Enhanced Ecosystem Conveyance Operations* approach—similar to *January 2010 BDCP Operations* with Fall X2 as set forth in the USFWS 2008 BiOp, reduced ability to divert water at the north Delta intakes through more stringent north Delta intake bypass criteria and Sacramento River flow requirements at Rio Vista, changes to OMR criteria, and reduced ability to divert water at the south Delta intakes.
- The State Water Resources Control Board (State Water Board) provided additional information related to the scoping comments submitted in 2008 and 2009. The proposal—*Enhanced Spring Delta Outflow*—would provide additional spring Delta outflow in all water year types to promote abundance and productivity of longfin smelt and other estuarine species, and Delta inflows would be modified to promote a more natural hydrograph.
- Several environmental organizations proposed three alternatives.
    - An alternative to (1) achieve Fall X2 protections in the south Delta; (2) reestablishment of a more natural hydrograph during winter and spring months; and (3) conduct reservoir operations to prevent unintended drawdowns with a range of potential conveyance capacities. The operations would be similar to Scenario 6 with (1) Fall X2 as under the USFWS 2008 BiOp; (2) modifications to OMR flow criteria; (3) proportional inflow bypasses from Shasta Lake, Folsom Lake, and Oroville Reservoir into the Sacramento River; and (4) additional pulse flows in the late winter and through the spring to protect outmigrating fall-run and spring-run Chinook salmon.

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- Operations to provide Delta outflow as described in the State Water Board Flow Recommendations for the Sacramento–San Joaquin Delta Ecosystem, published in 2010.
- Operations as described above under Scenario 6 with a conveyance capacity of 9,000 cfs.

- Contra Costa Water District (CCWD) and other commenters proposed a *Limited Dual Conveyance Facility* —similar to *January 2010 BDCP Operations* but with only 3,000 cfs capacity for the north Delta intakes, addition of Fall X2 as under the USFWS 2008 BiOp, and modifications to the San Joaquin River inflow/export ratio.
- The Water Advisory Committee of Orange County proposed an Isolated Conveyance facility previously described as Initial Screening Conveyance Alternative B6. This alternative included an isolated conveyance with a tunnel between the Sacramento River near Fremont Weir and the SWP and CVP Pumping Plants, isolated conveyance with a tunnel between the Sacramento River near Decker Island to Clifton Court Forebay and Bethany Reservoir, and continued use of the south Delta intakes. This alternative was similar to alternatives suggested during the scoping process, and was evaluated.

3.2.1.5 Second Screening Analysis

As previously described, the first or initial screening of conveyance alternatives focused on water conveyance alternative alignments. Once the operational concepts were identified, a second screening process was implemented. For the second screening process, the conveyance concepts developed through the first screening process were combined with the operational concepts identified in 2011. This synthesis generated the following list of possible alternatives.

- **Second Screening Dual Conveyance Alternative 1A.** Dual conveyance with a tunnel—January 2010 BDCP Operations—15,000 cfs north Delta intake capacity.
- **Second Screening Dual Conveyance Alternative 1B.** Dual conveyance with a lined or unlined east canal—January 2010 BDCP Operations—15,000 cfs north Delta intake capacity.
- **Second Screening Dual Conveyance Alternative 1C.** Dual conveyance with a lined or unlined west canal—January 2010 BDCP Operations—15,000 cfs north Delta intake capacity.
- **Second Screening Dual Conveyance Alternative 2A.** Dual conveyance with a tunnel—Scenario 6 Operations—15,000 cfs north Delta intake capacity.
- **Second Screening Dual Conveyance Alternative 2B.** Dual conveyance with a lined or unlined east canal—Scenario 6 Operations—15,000 cfs north Delta intake capacity.
- **Second Screening Dual Conveyance Alternative 2C.** Dual conveyance with a lined or unlined west canal—Scenario 6 Operations—15,000 cfs north Delta intake capacity.
- **Second Screening Dual Conveyance Alternative 3A.** Dual conveyance with a tunnel—January 2010 BDCP Operations—6,000 cfs north Delta intake capacity.
- **Second Screening Dual Conveyance Alternative 3B.** Dual conveyance with a lined or unlined east canal—January 2010 BDCP Operations—6,000 cfs north Delta intake capacity.
- **Second Screening Dual Conveyance Alternative 3C.** Dual conveyance with a lined or unlined west canal—January 2010 BDCP Operations—6,000 cfs north Delta intake capacity.
- **Second Screening Dual Conveyance Alternative 4A.** Dual conveyance with a tunnel—Scenario 6 Operations—9,000 cfs north Delta intake capacity.

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- **Second Screening Dual Conveyance Alternative 4B.** Dual conveyance with a lined or unlined east canal—Scenario 6 Operations—9,000 cfs north Delta intake capacity.
- **Second Screening Dual Conveyance Alternative 4C.** Dual conveyance with a lined or unlined west canal—Scenario 6 Operations—9,000 cfs north Delta intake capacity.
- **Second Screening Dual Conveyance Alternative 5A.** Dual conveyance with a tunnel—Limited Conveyance Operations Alternative—January 2010 BDCP Operations and Fall X2—3,000 cfs north Delta intake capacity.
- **Second Screening Dual Conveyance Alternative 6A.** Dual conveyance with a tunnel—Enhanced Ecosystem Alternative —9,000 cfs north Delta intake capacity.
- **Second Screening Dual Conveyance Alternative 7A.** Dual conveyance with a tunnel—Enhanced Spring Delta Outflow Alternative—9,000 cfs north Delta intake capacity.
- **Second Screening Dual Conveyance Alternative 8A.** Dual conveyance with a tunnel—Proportional North Delta Inflow Bypass Alternative—9,000 cfs north Delta intake capacity.
- **Second Screening Dual Conveyance Alternative 9A.** Dual conveyance with a tunnel—State Water Board 2010 Flow Recommendations for Delta Ecosystem—9,000 cfs north Delta intake capacity.
- **Second Screening Isolated Conveyance Alternative 1A.** Isolated conveyance with a tunnel—January 2010 BDCP Operations—15,000 cfs north Delta intake capacity.
- **Second Screening Isolated Conveyance Alternative 1B.** Isolated conveyance with a lined or unlined east canal—January 2010 BDCP Operations—15,000 cfs north Delta intake capacity.
- **Second Screening Isolated Conveyance Alternative 1C.** Isolated conveyance with a lined or unlined west canal—January 2010 BDCP Operations—15,000 cfs north Delta intake capacity.
- **Second Screening Through Delta Conveyance Alternative 1D.** Separate Corridors Operations—15,000 cfs north Delta intake capacity.

These 21 potential EIR/EIS alternatives were then evaluated according to the first, second, and third level screening criteria and the requirements of the Sacramento–San Joaquin Delta Reform Act (Delta Reform Act). They were also evaluated for finding of consistency with scoping comments from responsible and cooperating agencies related to a range of alternatives, and relative to legal rights and entitlements of entities that are not BDCP participants. The relationship of the BDCP to the Delta Reform Act is described in Chapter 1, Section 1.4.3, *Relationship to the Delta Reform Act and Delta Plan,* and in Appendix 3I, *BDCP Compatibility with the Delta Reform Act*. Details and results of the second screening process are provided in Appendix 3A, *Identification of Water Conveyance Alternatives for Bay Delta Conservation Plan Environmental Impact Report/Environmental Impact Statement (Screening Report) (Conservation Measure 1).* Conveyance alternatives eliminated as a result of the second screening analysis are discussed in Section 3.2.2.

3.2.2 Alternatives Considered and Dismissed from Further Evaluation

Because, as set forth in NEPA regulations and CEQA case law, an analysis need not consider every possible alternative to a project, but rather a range of reasonable alternatives, the alternatives listed above were evaluated to narrow them to a more manageable field by eliminating similar or

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duplicative features (i.e., based on conveyance facilities or operations), or because the alternative would fail to meet the purpose and need for the BDCP or would likely violate federal and state statutes or regulations. Accordingly, the following conveyance alternatives were dismissed from further evaluation, as detailed in Appendix 3A.

- Second Screening Dual Conveyance Alternative 3B.
- Second Screening Dual Conveyance Alternative 3C.
- Second Screening Dual Conveyance Alternative 4B.
- Second Screening Dual Conveyance Alternative 4C.
- Second Screening Dual Conveyance Alternative 8A.
- Second Screening Dual Conveyance Alternative 9A.

The remaining alternatives were renumbered for clarity and carried forward for analysis in the EIR/EIS as BDCP action alternatives.

3.2.3 Development of DWR "Proposed Project" in 2012

On July 25, 2012, California Governor Edmund G. Brown Jr., Secretary of the Interior Ken Salazar, and National Oceanic and Atmospheric Administration (NOAA) Assistant Administrator for Fisheries Eric Schwaab outlined revisions to the proposed BDCP. As revised, the proposed conveyance alternative for CM1 includes the following: (1) the construction of water intake facilities with a total capacity of 9,000 cfs, down from an earlier proposal of 15,000 cfs; (2) operations that would be phased in over several years; and (3) a conveyance system designed to use gravity flow to maximize energy efficiency and to minimize environmental impact. Based on this information, the BDCP analyzed Intakes 2, 3, and 5; two tunnels to convey water by gravity; no intermediate pumping plant; and operations guided by Scenario H. The EIR/EIS analyzes the proposed BDCP as Alternative 4.[8]

This proposal is analyzed in the BDCP effects analysis and this EIR/EIS. The proposed project, as embodied in the draft BDCP document published together with the EIR/EIS, will form a major portion of the HCP and NCCP that support applications for take authorization and other permits needed to proceed with implementation of the BDCP.

DWR's goal in this last step in the process of formulating alternatives was to identify a proposed version of CM1 that would be part of an overall BDCP that met the standards of the ESA and NCCPA while achieving the project objectives and meeting the project purpose and need. In order to minimize impacts in the Delta, DWR decided to propose only three (rather than five) intake facilities, thereby greatly reducing the potential CM1 footprint within the Delta itself. In doing so, DWR willingly reduced the export capacity of the proposed new north Delta diversions and conveyance structures while providing enough export capacity in the north to permit dual operations that could minimize adverse effects associated with operation of south Delta water conveyance facilities.

DWR also sought to identify proposed operations that provide balance maintaining exports and addressing ecological issues in the Delta, such that flow changes, habitat restoration, and other

[8] In February 2012, Alternative 4 included Intakes 1, 2, and 3 and an intermediate pumping plant, along with a set of operational criteria including provisions for Fall X2. This alternative has been updated to reflect the elements introduced in the July 2012 announcement.

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conservation measures may give all aquatic species what they need to reverse their declining population trends and contribute to their recovery. DWR and the fish and wildlife agencies used as their starting point the alternative described above as *Alternative 4A. Dual conveyance with a tunnel—Scenario 6 Operations—9,000 cfs north Delta intake capacity* because that option included only three new intakes with a total of 9,000 cfs capacity and included Scenario 6 operations developed with active input from USFWS, NMFS, and CDFW.

In reviewing the February 2012 effects analysis, including the evaluation of the preliminary BDCP proposal, the fish and wildlife agencies identified a number of concerns with the preliminary proposal. As a result of these concerns, a new set of operational criteria was developed and is presented in BDCP Section 3.4.1.4.3, *Flow Constraints*. These criteria are intended to meet the ESA requirement to minimize and mitigate incidental take to the maximum extent practicable, and the NCCPA requirement to conserve each of the covered species in the Plan Area.

To support the selection of a revised operational scenario, the fish and wildlife agencies conducted modeling to examine the recovery needs of the covered fish throughout their range in the absence of habitat restoration. This analysis was refined over multiple runs to explore the operational flexibility of the BDCP to help meet the rangewide recovery needs without adversely affecting upstream reservoir operations. The fish and wildlife agencies worked collaboratively with DWR to develop an operational scenario that contributed to the recovery of the covered fish and fit within the constraints of the BDCP. As a result, it has been agreed that the uncertainties about level of needed spring and fall outflow are to be addressed by adopting *decision trees* prescribing selection of criteria at the time the north Delta diversions become operational. The decision trees set criteria for spring outflow and fall outflow. Under the decision tree structure, one of four possible operational criteria will be implemented initially based on the results of targeted research and studies. Targeted research and studies will proceed until the north Delta intakes become operational, with the results of those studies forming the basis for determining the outcome of each decision tree. Operating criteria may also be modified after that time, based on concurrence by the permittees and the fish and wildlife agencies, by means of the adaptive management process specified in the Plan. The decision tree concept is discussed in detail in Appendix 3A, Section 3A.10.6, and the decision tree process and outcomes are described further in Section 3.6.4.2, *North Delta and South Delta Water Conveyance Operational Criteria,* for Scenario H.

3.3 Proposed Bay Delta Conservation Plan

As described in Section 3.2, *Alternatives Development Process*, and Appendix 3A, *Identification of Water Conveyance Alternatives for Bay Delta Conservation Plan Environmental Impact Report/Environmental Impact Statement (Screening Report) (Conservation Measure 1)*, a detailed process of considering alternatives has been ongoing as part of the development of the proposed BDCP. During summer 2011, the alternatives were reduced to five action alternatives (with subalternatives) and the No Action/No Project Alternative. As part of the preparation of this EIR/EIS, these alternatives and subalternatives were renumbered to better represent the alternatives related to the particular alignment and conveyance option. Table 3-1 presents an overview of the alternatives for presentation in the EIR/EIS.

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1 **Table 3-1. Action Alternatives Evaluated in the BDCP EIR/EIS**

EIR/EIS Alternative Number	Conveyance	Conveyance Alignment	Intakes Selected for Analysis	North Delta Diversion Capacity (cfs)	Operations[e]	Conservation Components	Measures to Reduce Other Stressors	Associated NMFS and USFWS Action
1A	Dual[a]	Pipeline/ Tunnel	1, 2, 3, 4, 5	15,000	Scenario A	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species
1B	Dual[a]	East	1, 2, 3, 4, 5	15,000	Scenario A	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species
1C	Dual[a]	West	West side intakes 1, 2, 3, 4, 5[g]	15,000	Scenario A	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species
2A	Dual[a]	Pipeline/ Tunnel	1, 2, 3, 4, 5 (or 1,2, 3, 6, 7)[b]	15,000	Scenario B	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species
2B	Dual[a]	East	1, 2, 3, 4, 5 (or 1, 2, 3, 6, 7)[b]	15,000	Scenario B	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species
2C	Dual[a]	West	West side intakes 1, 2, 3, 4, 5[g]	15,000	Scenario B	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species
3	Dual[a]	Pipeline/ Tunnel	1, 2[i]	6,000	Scenario A	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species

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EIR/EIS Alternative Number	Conveyance	Conveyance Alignment	Intakes Selected for Analysis	North Delta Diversion Capacity (cfs)	Operations[e]	Conservation Components	Measures to Reduce Other Stressors	Associated NMFS and USFWS Action
4 (CEQA Preferred Alternative)	Dual[a]	Modified Pipeline/ Tunnel	2, 3, 5	9,000	Scenario H	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species
5	Dual[a]	Pipeline/ Tunnel	1	3,000	Scenario C	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f]); tidal habitat restoration limited to 25,000 acres	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species
6A	Isolated[c]	Pipeline/ Tunnel	1, 2, 3, 4, 5	15,000	Scenario D	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species
6B	Isolated[c]	East	1, 2, 3, 4, 5	15,000	Scenario D	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species
6C	Isolated[c]	West	West side intakes 1, 2, 3, 4, 5[g]	15,000	Scenario D	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species
7	Dual[a]	Pipeline/ Tunnel	2, 3, 5 [i]	9,000	Scenario E	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f]); additional 20 linear miles of channel margin habitat enhancement and 10,000 acres of seasonally inundated floodplain	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species

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EIR/EIS Alternative Number	Conveyance	Conveyance Alignment	Intakes Selected for Analysis	North Delta Diversion Capacity (cfs)	Operations[e]	Conservation Components	Measures to Reduce Other Stressors	Associated NMFS and USFWS Action
8	Dual[a]	Pipeline/ Tunnel	2, 3, 5 [i]	9,000	Scenario F	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species
9	Through Delta[d]	Through Delta/ Separate Corridors[d]	Screened intakes at Delta Cross Channel and Georgiana Slough	15,000[d]	Scenario G	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f]); changes in the south Delta[h]	per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout[f])	Issuance of 50-year Incidental Take Permits for BDCP Covered Species

[a] The *Dual Conveyance* water delivery system would consist of the new north Delta diversion facilities and the existing SWP/CVP export facilities in the south Delta. The north Delta diversion would be the primary diversion point using specific operating criteria and would be operated in conjunction with the existing south Delta diversion. The existing south Delta diversion would only operate on its own when the north Delta diversion is nonoperational during infrequent periods for maintenance or repair.

[b] Under Alternatives 2A, 2B, and 2C a total of five intakes would be constructed and operated. Intake locations 1–5 or 1, 2, 3, 6, and 7 are analyzed for these alternatives.

[c] The *Isolated Conveyance* water delivery system would consist only of the new north Delta diversion facilities. The SWP/CVP south Delta diversion points would no longer be operated. For the SWP this means the gated intake on Old River, Clifton Court Forebay, and the Skinner Fish Facility would no longer be operated. For the CVP this means the diversion point on Old River and the Tracy Fish Collection Facility would no longer be operated.

[d] The *Through Delta/Separate Corridors* water delivery system would convey water from the Sacramento River through the Delta using existing Delta channels for diversion by the SWP and CVP pumping plants. While the north Delta diversion capacity associated with this alternative is up to 15,000 cfs, it differs from the other action alternatives in that this capacity would be provided by flows through existing channels.

[e] See Table 3-6 for a summary of the individual rules that comprise the operational scenarios and a comparison by scenario and alternative. An overview of operational scenarios is provided in Section 3.4.1.2, *Operational Components*, while a more detailed description appears in Section 3.6.4.2, *North Delta and South Delta Water Conveyance Operational Criteria*.

[f] The BDCP Steering Committee Handout of 3/25/10 is available at: <http://baydeltaconservationplan.com/Library/ArchivedDocuments/SteeringCommittee/SteeringCommitteeAgendasAndHandouts.aspx>.

[g] The west side intakes would be located on the west bank of the Sacramento River.

[h] Under this alternative, lands acquired for restoration or enhancement in the south Delta would not be located alongside corridors designated for water supply.

[i] The intake locations listed represent those locations selected for the analysis of each BDCP alternative. Based on the results of an October 2011 workshop on the Phased Construction of North Delta Intake Facilities (see Appendix 3F, *Intake Location Analysis*), different combinations of intakes could be constructed under these alternatives. Once an alternative is selected as part of the final BDCP, a decision regarding intake locations would be made.

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3.3.1 Covered Activities and Associated Federal Actions

The BDCP and its alternatives include *covered activities* and *associated federal actions*. Covered activities are those actions that are carried out by nonfederal entities, such as the DWR, and that are expected to be covered by regulatory authorizations under ESA Section 10 and the NCCPA (California Fish and Game Code Section 2835). The covered activities (Table 3-2) consist of activities in the Plan Area associated with the conveyance and export of water supplies from the SWP's Delta facilities and with implementation of the BDCP conservation strategy. Each of these activities falls into one of six categories: (1) new water conveyance facilities construction, operation, and maintenance; (2) operation and maintenance of SWP facilities; (3) nonproject diversions[9]; (4) habitat protection, restoration, creation, enhancement, and management; (5) monitoring activities; and (6) research.

Table 3-2. BDCP Covered Activities

Covered Activities	Description
New water facilities construction, operations, and maintenance	This includes construction and operations of a new north Delta water conveyance facility to bring water from the Sacramento River in the north Delta to the existing water export pumping plants in the south Delta. In addition, the proposed intake facilities will require routine maintenance and periodic adjustment and tuning to ensure that operations are managed in accordance with governing fish passage criteria. This covered activity would also include improvements and routine maintenance of the Fremont Weir and Yolo Bypass and operation (not construction) of the North Bay Aqueduct Alternative Intake Project. Water operations measures, through the management of flows, will support ecosystem functions associated with aquatic resources.
Operations and maintenance of SWP facilities[a]	This includes activities that would be carried out by DWR to operate and maintain SWP facilities in the Delta after the BDCP (or an alternative) is approved and implemented.
Nonproject diversions	This includes the ongoing operation of the existing nonproject diversions, consistent with implementation of *CM21 Nonproject Diversions.*
Habitat restoration, creation, enhancement, and management activities	These activities include all actions that may be undertaken to implement the physical habitat conservation measures.
Activities to reduce effects of methylmercury contamination	These activities include actions to minimize the methylation and mobilization of inorganic mercury in BDCP habitat restoration areas.
Activities to reduce predation and other sources of direct mortality	These activities include control of nonnative aquatic vegetation; predator control for covered fish species; and installation and operation of nonphysical fish barriers in the Delta.
Adaptive management and monitoring programs	Various types of monitoring activities would be conducted during BDCP implementation, including preconstruction surveys, construction monitoring, compliance monitoring, effectiveness monitoring, and system monitoring.
Other conservation actions	These actions may include (1) the continued operation and maintenance of an existing oxygen aeration facility in the Stockton Deep Water Ship Channel, which serves to increase dissolved oxygen concentrations and thereby minimize a potential fish passage barrier; and (2) the development of a delta and longfin smelt conservation hatchery by USFWS.

[a] ESA and California Endangered Species Act (CESA) coverage for existing operation and maintenance of the SWP and coordinated operations with the CVP prior to operation of new water conveyance facilities are addressed through separate compliance processes.

[9] This includes the ongoing operation of the existing nonproject diversions consistent with implementation of *CM21 Nonproject Diversions*. Under this conservation measure, some nonproject diversions would be removed, consolidated, or modified.

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As noted in Chapter 1, Section 1.5, *BDCP EIR/EIS Project Area*, the Plan Area consists mainly of the statutory Delta, the Suisun Marsh, and the Yolo Bypass. The Areas of Additional Analysis are two areas outside the defined Plan Area that encompass power transmission corridors. One area lies west of the Plan Area and is considered in the analysis of proposed BDCP alternatives that include the western alignment for the water conveyance facility (Alternatives 1C, 2C, and 6C). The other area lies east of the Plan Area and represents the potential transmission line alignment analyzed for Alternative 4. Implementation of the BDCP (or an alternative) could also affect regions upstream of the Delta and throughout the SWP/CVP Export Service Areas. Consequently, the *project area* encompasses a larger geographic area than the Plan Area, comprising three defined regions: the Upstream of the Delta Region, the Delta Region (as defined in Chapter 1, Section 1.5, *BDCP EIR/EIS Project Area*—generally referred to as the Plan Area), and the SWP and CVP Export Service Areas (Figure 1-4).

BDCP-associated federal actions are those BDCP-related actions that are carried out, funded, or authorized by Reclamation within the Plan Area and that would receive appropriate ESA coverage through Section 7. These actions would be (1) operation of existing CVP Delta facilities to convey and export water in coordinated operations with the SWP after the BDCP (or an alternative) is approved and implemented; (2) associated maintenance activities; and (3) the creation of habitat.

Nonfederal actions are categorized as covered activities under ESA Section 10 and the NCCPA for DWR because of DWR's involvement in these actions. The federal actions by Reclamation would not be covered activities for the purposes of the ESA Section 10(a)(1)(B) permit. These federal actions are actions that occur within the Delta that would be coordinated with DWR to support DWR's compliance with the ESA Section 10 permit. Reclamation's activities are subject to ESA Section 7. The Section 7 consultation would also include other CVP operation and maintenance activities that are not within the Plan Area. Further discussion of the approval process and the process for implementation of the conservation measures appears in Chapter 1, Section 1.6, *Intended Uses of this EIR/EIS and Agency Roles and Responsibilities*.

BDCP covered activities are outlined in this section and presented in detail in Section 3.6, *Components of the Alternatives: Details*. Federal actions associated with the Plan are outlined in Section 3.6.4.1. Unless specifically identified otherwise, these activities would be the same under all the action alternatives.

3.3.2 Conservation Measures

The BDCP conservation measures comprise specific actions that would be implemented to achieve the biological goals and objectives of the proposed Plan, and are a component of the Plan's conservation strategy. The BDCP conservation strategy consists of multiple components that are designed to collectively achieve the overall BDCP planning goals of ecosystem conservation and water supply reliability. The conservation strategy includes biological goals and objectives; conservation measures; avoidance and minimization measures; and a monitoring, research, and adaptive management program. The covered activities outlined in Table 3-2 are included in the conservation measures (Table 3-3) and are discussed in detail in Section 3.6, *Components of the Alternatives: Details*. The conservation measures address stressors at the scale of ecosystems, natural communities, and species. CM1–CM3 are intended to manage the routing, timing, and flow through the Delta while establishing an interconnected system of conserved lands across the Plan Area. CM4–CM11 were developed to restore, create, enhance, and manage physical habitat to expand the extent and quality of intertidal, floodplain, and other habitats across defined

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conservation zones (CZs) and tidal Restoration Opportunity Areas (ROAs) (Figure 3-1). The Plan Area is subdivided into 11 CZs within which conservation targets for natural communities and covered species' habitats have been established. ROAs encompass those locations in the Plan Area considered most appropriate for the restoration of tidal habitats and within which restoration goals for tidal and associated upland natural communities will be achieved. The remaining conservation measures, CM12–CM21, may reduce the adverse effects of various stressors on covered species; these include toxic contaminants, nonnative predators, illegal harvest, and nonproject water diversions. CM22 includes activities intended to avoid or minimize direct take of covered species and minimize impacts on natural communities that provide habitat for covered species.

Table 3-3. Summary of Proposed BDCP Conservation Measures of All Action Alternatives

CM	Title/Description	Primary Focus
1	Water Facilities and Operation	Manage the routing, timing, and amount of flow through the Delta while establishing an interconnected system of conservation lands across the Plan Area.
2	Yolo Bypass Fisheries Enhancement	
3	Natural Communities Protection and Restoration	
4	Tidal Natural Communities Restoration	Restore, enhance, and manage physical habitat to expand the extent and quality of intertidal, floodplain, and other habitats across defined conservation zones (CZs) and Restoration Opportunity Areas (ROA).
5	Seasonally Inundated Floodplain Restoration	
6	Channel Margin Enhancement	
7	Riparian Natural Community Restoration	
8	Grassland Natural Community Restoration	
9	Vernal Pool and Alkali Seasonal Wetland Complex Restoration	
10	Nontidal Marsh Restoration	
11	Natural Communities Enhancement and Management	
12	Methylmercury Management	Reduce the adverse effects of various stressors on covered species, such as toxic contaminants, nonnative predators, illegal harvest, and nonproject water diversions.
13	Invasive Aquatic Vegetation Control	
14	Stockton Deep Water Ship Channel Dissolved Oxygen Levels	
15	Localized Reduction of Predatory Fishes (Predator Control)	
16	Nonphysical Fish Barriers	
17	Illegal Harvest Reduction	
18	Conservation Hatcheries	
19	Urban Stormwater Treatment	
20	Recreational Users Invasive Species Program	
21	Nonproject Diversions	
22	Avoidance and Minimization Measures	Avoid or minimize direct take of covered species and minimize impacts on natural communities that provide habitat for covered species.

3.3.2.1 Implementation Schedule

An example of possible schedules for implementation of the conservation measures within BDCP alternatives is provided in Chapter 6 of the BDCP, *Plan Implementation*. It is recognized that there

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would be some variation among alternatives. The schedule in Chapter 6 is for implementation of the proposed project (BDCP) and was developed to meet the following goals.

- Ensure that key implementation actions occur early in the permit term to offset expected effects of covered activities and meet the NCCPA requirement for rough proportionality of effects and conservation.
- Ensure that implementation actions occur by the implementation deadlines established in BDCP Chapter 3, *Conservation Strategy*.
- Ensure that implementation actions occur on a feasible schedule and allow adequate time for landowner negotiation for acquisition, project planning, permitting, funding, design, and construction.
- Group the related implementation actions or covered activities together or in the proper sequence (e.g., implementing riparian restoration and channel margin enhancement together).
- Require natural community protection and restoration to occur in almost every time period to ensure that progress is always being made toward the total conservation requirement in year 40.

The schedule for natural community protection and restoration establishes milestones for both restoration and protection to stay ahead of impacts. For restoration, these milestones are defined by when restoration construction is completed, not the time at which a restoration site must meet its performance criteria, because it will take years or even decades for restored natural communities to be fully functioning biologically.

The conservation strategy is divided into near-term (NT) and long-term (LT) implementation stages (see BDCP Chapter 6, *Plan Implementation*, for a detailed schedule of Plan implementation). The NT implementation would last until the north Delta diversions and the new water conveyance facilities are constructed and operational. LT implementation would last 40 years—that is, through the remainder of the proposed 50-year BDCP permit duration. The long-term (LT) implementation stage is further divided into two sub-phases: Early long-term (Year 11 through Year 15) and Late long-term (Year 16 through Year 50). This division of the implementation period was used because dual conveyance from north and south Delta intakes would bring significant flexibility and ecological changes to the system. As a result, many of the conservation measures are interrelated with operations of the new conveyance.

NT implementation of conservation measures would be intended to provide a response to currently degraded or absent ecological functions, while building the foundation to improve long-term ecological functions. The NT measures include early habitat creation or restoration actions, implementation of conservation measures that address other stressors on covered fish species, and acquisition of terrestrial and wetland habitat to facilitate conservation of covered wildlife and plant species.

The BDCP implementation schedule was informed by the data and analyses used to develop the conservation strategy, as summarized below.

- The near-term, early long-term, and late long-term restoration targets established for tidal, seasonally inundated floodplain, and channel margin habitats (BCDP Chapter 3, Section 3.4, *Conservation Measures*) and the extent of habitat restoration effects on natural communities and covered species habitats (BDCP Chapter 5, *Effects Analysis*).

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- Vernal pool complex and grassland restoration targets (BCDP Chapter 3, Section 3.4, *Conservation Measures*) and the extent of habitat restoration effects on natural communities and covered species habitats (BDCP Chapter 5, *Effects Analysis*).
- Vernal pool complex, alkali seasonal wetland complex, grassland, and cultivated lands protection/preservation targets (BDCP Chapter 3, Section 3.4, *Conservation Measures*).
- The pipeline/tunnel construction schedule and the extent of construction effects on natural communities and covered species habitats (BDCP Chapter 5, *Effects Analysis*).

The duration and schedule for construction of the BDCP water conveyance facilities is provided in Appendix 3C, *Construction Assumptions for Water Conveyance Facilities*. Construction of the water conveyance facilities would begin approximately 2 years after permit issuance and continue for an estimated 9–10 years. Operations could begin as early as Year 11. The BDCP implementation schedule for CM3–CM10 (natural community restoration) and amount of acreage by conservation measure is provided in Table 3-4. The acreages shown in Table 3-4 would vary depending on the alternative selected. A total of 65,000 acres of tidal habitat would be restored under all action alternatives except Alternative 5 (25,000 acres). A total of 10,000 acres of seasonally inundated floodplain habitat would be restored under all action alternatives except Alternative 7 (20,000 acres). A total of 20 linear miles of channel margin habitat would be enhanced under all action alternatives except Alternative 7 (40 linear miles). The implementation schedule for CM2 and CM11–CM22 is provided in Section 3.6.2, *Conservation Components*.

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Table 3-4. Implementation Schedule for Natural Community Protection and Restoration Conservation Measures (acres)

		Near-Term		Early Long-Term	Late Long-Term						
	Total	1 to 5	6 to 10	11 to 15	16 to 20	21 to 25	26 to 30	31 to 35	36 to 40	41 to 45	46 to 50
BDCP Reserve System											
CM3: Natural Communities Protection and Restoration											
Valley/Foothill Riparian	750	400	350								
Vernal pool complex	600	200	200	200							
Alkali seasonal wetland complex	150		120	5	5	5	5	5	5		
Grassland	8,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000		
Managed wetland	1,500	500	1,000								
Managed wetland (natural community)	6,600	1,400	1,900	600	550	550	550	550	500		
Cultivated lands (non-rice)	48,125	7,700	7,700	6,700	5,200	5,200	5,200	5,200	5,225		
Cultivated lands (rice)	500	100	100	100	100	100					
Cultivated lands (rice or equivalent)	3,000	300	400	400	400	400	400	400	300		
Nontidal marsh	50	10	15	5	5	5	5	5			
Total Acquisition	**69,275**	**11,610**	**12,785**	**9,010**	**7,260**	**7,260**	**7,160**	**7,160**	**7,030**		
CM4: Tidal Natural Communities Restoration [1]											
Tidal brackish emergent wetland	6,000	1,000	1,000	2,050	350	400	400	400	400		
Tidal freshwater emergent wetland	24,000	4,425	4,425	4,450	2,150	2,150	2,150	2,150	2,100		
Tidal perennial aquatic (below MLLW)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
Tidal wetland of any type and transitional uplands	35,000	4,150	4,150	4,150	4,150	4,600	4,600	4,600	4,600		
Subtotal: Tidal wetland restoration	**65,000**	**9,575**	**9,575**	**10,650**	**6,650**	**7,150**	**7,150**	**7,150**	**7,100**		
CM5: Seasonally Inundated Floodplain Restoration [2]	10,000			1,000	1,800	1,800	1,800	1,800	1,800		
CM6: Channel Margin Enhancement (miles) [3]	20	5	5		5		5				
CM7: Riparian Natural Community Restoration	5,000	400	400	300	750	750	750	800	850		
CM8: Grassland Natural Community Restoration	2,000	570	570	340	100	100	100	100	120		
CM9: Vernal Pool and Alkali Seasonal Wetland Complex Restoration											
Vernal Pool Complex	67	20	20	27							
Alkali Seasonal Wetland	72	29	29	5	5	4					
CM10: Nontidal Marsh Restoration											
Nontidal Marsh Restoration	1,200	200	200	100	100	150	150	150	150		
Managed wetland	500	250	250								
Total Restoration	**83,839**	**11,044**	**11,044**	**12,422**	**9,405**	**9,954**	**9,950**	**10,000**	**10,020**		
Total Acquisition and Restoration	**153,114**	**22,654**	**23,829**	**21,432**	**16,665**	**17,214**	**17,110**	**17,160**	**17,050**		

[1] Under Alternative 5, 25,000 acres of tidal habitat would be restored under CM4.
[2] Under Alternative 7, 20,000 acres of seasonally inundated floodplain would be restored under CM5.
[3] Under Alternative 7, 40 linear miles of channel margin habitat would be enhanced under CM6.

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3.3.2.2 Adaptive Management and Monitoring Program

As described above, the BDCP conservation strategy under all the action alternatives consists of 22 conservation measures that are designed to achieve the biological goals and objectives described in Chapter 3 of the BDCP, Section 3.3, *Biological Goals and Objectives*. The conservation measures include actions to improve flow conditions, increase aquatic food production, restore habitat for the covered species, and reduce the adverse effects of many biological and physical stressors on those species. This strategy also recognizes the considerable uncertainty that exists regarding the understanding of the Delta ecosystem and the likely outcomes of implementing the conservation measures, in terms of both the nature and the magnitude of the response of covered species and of ecosystem processes that support the species.

As a component of the conservation strategy, the adaptive management and monitoring program has been designed to use new information and insight gained during the course of Plan implementation to develop and implement alternative strategies to achieve the biological goals and objectives. It is possible that some of the conservation measures will not achieve their expected outcomes, while others will produce better results than expected. The adaptive management process describes how changes to the conservation measures will be made to improve the effectiveness of the Plan over time.

Monitoring and research will be used to confirm Plan implementation and to measure the Plan's effectiveness, as well as to assess uncertainties and increase understanding of Delta ecosystems. Extensive monitoring and research are currently underway in the Delta. To address the specific requirements of the Plan, some of these monitoring activities will continue and, in some cases, be expanded. In other cases, existing monitoring activities will be modified to reflect specific implementation needs of the Plan. The BDCP will also require that new types of monitoring activities be conducted in the Delta to support Plan implementation. To guide these efforts, detailed monitoring and research plans will be developed that identify specific metrics and protocols.

Adaptive management and monitoring activities will be implemented through a single, comprehensive program. Information obtained from monitoring and research activities will be used by decision makers to improve the effectiveness of the conservation measures toward advancing the biological goals and objectives. The adaptive management and monitoring program is directly related to several key components of the BDCP, as fully described in Chapter 3 of the BDCP, *Conservation Strategy*, Section 3.6, and Chapter 7, *Implementation Structure*, of the BDCP.

3.4 Components of the Alternatives: Overview

As described in Chapter 1, Section 1.6.1, *Overview of BDCP Approval Process*, USFWS and NMFS are considering whether to issue ITPs under ESA Section 10(a)(1)(B) for the incidental take of federally listed species from the construction, operation, and maintenance associated with water conveyance, ecosystem restoration, and other covered activities as described in the BDCP. The applicant's proposed duration of the ITPs is 50 years. USFWS and NMFS would issue separate ITPs covering species within their respective authority (see Table 1-1 in Chapter 1, *Introduction*, for a list of the species for which BDCP proponents are seeking coverage). Issuance of ITPs is common to all of the action alternatives. An HCP will be submitted as part of the ITP applications. The HCP describes activities that would be covered by the ITPs, the species for which incidental take would be

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authorized, and measures that would, to the maximum extent practicable, minimize the adverse effects on the covered species resulting from implementation of the covered activities, and mitigate any remaining adverse effects through the protection, restoration, creation, and/or enhancement of habitat for the covered species. CDFW would be responsible for approving the BDCP as an NCCP. Reclamation's action in relation to the BDCP would be to adjust CVP operations specific to the Delta to accommodate new conveyance facility operations and/or flow requirements under the BDCP, in coordination with SWP operations.

The proposed BDCP consists of water conveyance facility components combined with water conveyance operational components (collectively CM1); conservation components (CM2–CM11); components related to reducing other stressors (CM12–CM21); and avoidance and minimization measures (CM22). Depending on the alternative, the water conveyance facility components would create a new conveyance mechanism or use existing water corridors to divert water from the north Delta to existing SWP and CVP export facilities in the south Delta, within operational rules to achieve the biological goals and objectives of the BDCP. The water conveyance facility components, which are analyzed at a project level in this EIR/EIS, are described in greater detail in Section 3.6.1, *Water Conveyance Facility Components (CM1)*. Conservation components and components to address other stressors would support a number of the specific biological goals and objectives identified in the Plan. These sets of conservation components are described in greater detail in Sections 3.6.2 and 3.6.3, respectively. When making a decision on the alternatives under CEQA and NEPA, Lead Agencies may make modifications to alternatives based on information provided in the EIR/EIS, so long as the resultant impacts have been evaluated.

The scenario characterized as *no federal action* (the No Action Alternative) means that the federal ITPs related to the proposed BDCP would not be issued and that the applicant would remain subject to the take prohibition for listed species and other ESA requirements. Ongoing activities or future actions that may result in the incidental take of federally listed species would need to be permitted through ESA Section 7 or Section 10. Similarly, permits would not be issued by CDFW under Section 2835 of the Fish and Game Code.

3.4.1 Overview of Water Conveyance Facility Components

3.4.1.1 Physical Components

The following is a comprehensive list of possible water diversion and conveyance facilities that could be included in one or more of the action alternatives. Not all components listed below would be found in each alternative. A number of these components are identified in Table 3-5 by alternative, and all are described in detail in Section 3.6.1, *Water Conveyance Facility Components (CM1)*. Appendix 3C, *Construction Assumptions for Water Conveyance Facilities*, provides details about construction procedures and other related specifications. Assumptions regarding construction activity timing and duration are also provided in Appendix 3C. Detailed depictions of the physical components of the BDCP action alternatives are provided in Figures M3-1, M3-2, M3-3, M3-4, and M3-5 in the Mapbook Volume of this EIR/EIS.

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Table 3-5. Water Conveyance Facilities Components of Each Alternative

Component	Alternative															
	No Action	1A	1B	1C	2A	2B	2C	3	4	5	6A	6B	6C	7	8	9
New north Delta fish-screened intakes		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
New intake pumping plants		X	X	X	X	X	X	X	X	X	X	X	X	X	X	
New diversion pumping plants																X
New intermediate pumping plant		X	X	X	X	X	X	X		X	X	X	X	X	X	
Use of existing SWP and CVP south Delta intake facilities	X	X	X	X	X	X	X	X	X	X				X	X	X
Operations of North Bay Aqueduct Alternative Intake Project	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Byron Tract Forebay[a]		X	X	X	X	X	X	X		X	X	X	X	X	X	
Expanded Clifton Court Forebay[b]									X							
Intermediate forebay		X			X			X	X	X	X			X	X	
Primary Conveyance Facility																
Pipelines/tunnels		X		X	X		X	X	X	X	X		X	X	X	
Canals			X	X		X	X					X	X			
Channels	X															X
New operable barrier(s)					X	X	X		X							X
Fish movement and habitat corridor around Clifton Court Forebay																X

[a] *Byron Tract Forebay* currently refers to proposed forebays both north and south of Clifton Court Forebay.

[b] *Expanded Clifton Court Forebay* refers to modifications to Clifton Court Forebay and expansion on Byron Tract 2.

- Intakes
  - New on-bank intake facilities would be constructed on the Sacramento River between Clarksburg and Walnut Grove. Alternatives 1A through 8 would entail between one and five 3,000 cfs-diversion-capacity facilities in 12 possible locations—7 locations on the east bank of the river (for pipeline/tunnel, modified pipeline/tunnel, and east alignment alternatives) and 5 locations on the west bank (for west alignment alternatives). Any single action alternative would include the construction of between one and five intakes. These intakes would rise approximately 55 feet from river bottom to top of structure with a length of approximately 700–2,300 feet, depending on location; fish screen heights would vary with location. Construction of the on-bank intakes would require the installation of cofferdams. Each intake site would require a temporary cofferdam to create a dewatered construction area encompassing the entire intake site. A portion of the cofferdam would remain in place as an integral part of the intake structure within the existing water side levee. Under Alternative 9, two 2,800-foot-long intakes, each with a capacity of 7,500 cfs, would be placed at the entrances to the Delta Cross Channel and Georgiana Slough (described in more detail in Section 3.5.16.1). At the Delta Cross Channel location, there would potentially be a new replacement intake control structure with gates. At the Georgiana Slough location, a new gated intake control structure with a flood flow capacity of 20,600 cfs would be constructed. Construction of Alternative 9 intakes would also require the installation of temporary

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cofferdams to create a dry work area within the subject waterway. All intakes would be equipped with self-cleaning, positive barrier fish screens designed to be protective of salmonids and delta smelt. Fish screens would comply with CDFW and National Marine Fisheries Service (NMFS) fish screening criteria (refer to the July 2011 BDCP Fish Facilities Technical Team Technical Memorandum for additional detail on fish screening criteria[10]).

  - New intake facilities would necessitate the widening of existing levees on the landside to increase crest width, to facilitate intake construction and accommodate the realignment of State Route 160. Minor dredging and channel modification activities would also take place along the face of the intakes.
  - New intake facilities would include gantry cranes, log boom and log boom piles, riprap, and electrical buildings.

- Pumping plants
  - Intake pumping plants with a capacity of 3,000 cfs each would be constructed to convey water from intake facilities into pipelines, eventually connecting to the rest of the conveyance structures. Each plant and its associated facilities would encompass approximately 20 to 60 acres adjacent to the intake facility. Pipeline/tunnel, modified pipeline/tunnel, east alignment, and west alignment alternatives would entail construction of between one and five intake pumping plants.
  - An intermediate pumping plant would convey the water collected from the intake facilities between intermediate conveyance structures such as tunnels, canals, and forebays, depending on the design of the particular alternative. One intermediate pumping plant would be constructed for the pipeline/tunnel, east alignment, and west alignment alternatives. Under the modified pipeline/tunnel alignment (Alternative 4), water would be fed by gravity from the intermediate forebay to the major tunnel segment. This approach could be applied to other alternatives as the Lead Agencies make their final decisions regarding the BDCP and associated permits.
  - Diversion pumping plants with a capacity of 250 cfs would provide dilution flow at the confluence of the San Joaquin River and the head of Old River and upstream of the confluence of Middle River and Victoria Canal. These plants would be constructed under the through Delta/separate corridors alternative.
  - Pumping plant facilities would include sedimentation basins, solids handling facilities, transition structures, surge towers, one or two substations, transformers, a mechanical room, access roads, and other associated facilities and utilities. Some or all of these facilities would be associated with pumping plants under each alternative.

- Pipelines
  - Intake gravity collector pipelines would carry water between intakes and intake pumping plants. Each intake facility would convey water through six 12-foot-diameter pipelines to the adjacent pumping plant. Each intake site associated with the pipeline/tunnel, modified pipeline/tunnel, east alignment, and west alignment alternatives would include these

[10] Available here: <http://baydeltaconservationplan.com/Libraries/Dynamic_Document_Library/Fish_Facilities_Team_Technical_Memo_Final_7_15_2011.sflb.ashx>

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pipelines. The gravity collector pipelines would convey water into the sedimentation basin before reaching the intake pumping plant.

  - Conveyance pipelines would carry water between intake pumping plants and other conveyance facilities such as tunnels, canals, and forebays. Two or four 16-foot-diameter conduits (or one 20-foot-diameter conduit) would be used for conveyance pipelines. Each intake site associated with the pipeline/tunnel, east alignment, and west alignment alternatives would include these pipelines. Intakes 2 and 3 under Alternative 4 (the modified pipeline/tunnel alignment) would include short segments of these pipelines between pumping plants and tunnels.

- Tunnels
  - A single-bore 29-foot-inside-diameter tunnel would convey water approximately 3.8 miles from intake pumping plants to a new intermediate forebay immediately west of South Stone Lake. This tunnel would be constructed under each pipeline/tunnel alternative using Intakes 1 and/or 2.
  - A 29-foot-inside-diameter tunnel and a single-bore 20-foot-diameter tunnel would convey water nearly 9 miles from intake pumping plants to a new intermediate forebay on Glannvale Tract. These tunnels would be constructed under Alternative 4.
  - A dual-bore 33-foot-inside-diameter tunnel would convey water 34.5 miles from the new intermediate forebay to a new Byron Tract Forebay adjacent to Clifton Court Forebay. This feature would be constructed for all pipeline/tunnel alternatives except Alternative 5, which would use a single-bore tunnel. Alternatives 1A, 2A, 3, 6A, 7, and 8 would have dual 33-foot-inside-diameter tunnels and Alternative 5 would have a single 33-foot-diameter tunnel.
  - A dual-bore 40-foot-inside-diameter tunnel would convey water 30.2 miles from the new intermediate forebay on Glannvale Tract to an expanded Clifton Court Forebay. These tunnels would be constructed under Alternative 4 (modified pipeline/tunnel alignment) and would be wider than tunnels constructed for the alternatives under the pipeline/tunnel alignment to facilitate the gravity-fed system proposed under Alternative 4 (instead of being pressurized and pumped through an intermediate pumping plant).
  - One dual-bore 33-foot-inside-diameter tunnel would convey water between the intermediate pumping plant on Ryer Island and a proposed canal segment on Hotchkiss Tract under the west alignment alternatives.
  - Three tunnel segments would be used as siphons to carry water under Lost Slough/Mokelumne River, San Joaquin River, and Old River, connecting canal segments under the east alignment alternatives.
- Canals
  - Canals would be unlined (earthen) or lined with concrete.
  - An approximately 2,000-foot-long canal would carry water from the Byron Tract Forebay to the existing approach canal to the Harvey O. Banks Pumping Plant (Banks Pumping Plant). This canal would be constructed for pipeline/tunnel, east alignment, and west alignment alternatives. For west alignment alternatives, this canal would be extended to convey water into the existing approach canal for the C. W. "Bill" Jones Pumping Plant (Jones pumping plant).

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- An approximately 4,000-foot-long canal would carry water from the north cell of the expanded Clifton Court Forebay, under the Byron Highway through a siphon, and to the existing approach canal to the Banks pumping plant. From this canal, another 6,000-foot-long canal would carry water to the existing approach canal for the Jones pumping plant. These canals would be constructed for the modified pipeline/tunnel alignment (Alternative 4).
- An approximately 44-mile canal would convey water between the intake pumping plants and the Byron Tract Forebay across the east Delta, generally between Interstate (I-) 5 and the South Mokelumne and Middle Rivers. Canal segments would generally have a maximum top width of 700 feet and a depth of 23.5 feet. This canal would be constructed for the east alignment alternatives.
- An approximately 17-mile canal would convey water between intake pumping plants and an intermediate pumping plant/tunnel entrance on Ryer Island. Canal segments would generally have a maximum top width of 700 feet and a depth of 23.5 feet. This canal would be constructed for the west alignment alternatives.
- An approximately 10-mile canal would convey water between the tunnel exit portal on the Hotchkiss Tract and Byron Tract Forebay. Canal segments would generally have a maximum top width of 700 feet and a depth of 23.5 feet. This canal would be constructed for the west alignment alternatives.
- A new 4,000-foot-long canal on Coney Island, adjacent to Victoria Canal, would connect the water supply corridor between siphons at Old River and West Canal across Coney Island. This canal would be constructed for the through Delta/separate corridors alternative.
- A 4,000-foot-long intertie canal would be constructed from Clifton Court Forebay to the Tracy Fish Collection Facility (Tracy Fish Facility) for the through Delta/separate corridors alternative.

- Forebays
  - A 760-acre intermediate forebay would store water between intake facilities and the tunnel conveyance segment between South Stone Lake and the Sacramento River, just south of Hood. An emergency spillway would prevent the intermediate forebay from overtopping by spilling to an approximately 350-acre inundation area adjacent to the forebay (to the south). This forebay would be constructed for pipeline/tunnel alternatives. Pierson Tract is another potential site for this forebay. See Appendix 3H, *Intermediate Forebay Location Analysis*, for more information on siting of the intermediate forebay.
  - A 40-acre intermediate forebay would store water between intake facilities and the main tunnel conveyance segment on Glannvale Tract, adjacent to Twin Cities Road. An emergency spillway would prevent the intermediate forebay from overtopping by spilling to an approximately 120-acre inundation area adjacent to and surrounding the forebay. This forebay would be constructed for Alternative 4 (modified pipeline/tunnel alignment).
  - Byron Tract Forebay, adjacent to Clifton Court Forebay, would store water between the new conveyance structures and existing SWP/CVP south Delta export facilities. For west alignment alternatives, this new forebay would be constructed northwest of Clifton Court Forebay. For pipeline/tunnel and east alignment alternatives, the new forebay would be constructed southeast of Clifton Court Forebay. The water surface area of Byron Tract

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Forebay would be 600 acres for the pipeline/tunnel, east alignment, and west alignment alternatives (Alternatives 1A–1C, 2A–2C, 6A–6C, 7, and 8); under Alternative 5, the water surface area would be 200 acres (see descriptions of individual alternatives in Section 3.5, *Alternatives*).

- Clifton Court Forebay would be expanded to the south and would be dredged to provide additional storage capacity. New embankments would be constructed around the forebay and an embankment would be constructed across the forebay to create a north cell and a south cell. The north cell would receive water pumped from the north Delta through the proposed tunnels, while the south cell would receive water conveyed through the existing through Delta system. The north cell water surface area would be approximately 1,300 acres, while the south cell would have a water surface area larger than 1,400 acres. This represents an expansion of approximately 700 acres. An emergency spillway at the north cell of Clifton Court Forebay would prevent the forebay from overtopping by spilling to Old River. This forebay expansion would be constructed under Alternative 4 (the modified pipeline/tunnel alternative).

- Fixed and operable barriers utilizing a range of gate technologies would variously allow the passage of fish, water, and boats through existing Delta channels. Operable barriers would be constructed for the through Delta/separate corridors alternative and those alternatives using Operational Scenarios B and H.
- Vertical, structurally reinforced wedge wire screen panels of stainless steel with 1.75-millimeter (0.069-inch) openings (i.e., fish screens) would be sized to reduce effects on fish and aquatic resources. All intakes, including the North Bay Aqueduct alternative intake, under all alternatives would incorporate fish screens.
- Levees would protect new channel fill areas and serve modified channels and intake facility sites. Minor levee modifications would be necessary under all alternatives; the through Delta/separate corridors alternative would entail additional levee-related activities.
- Culvert siphons would convey water under existing channels and between sections of canals (e.g., through tunnels) or other conveyance facilities. These would be constructed for the modified pipeline/tunnel alignment, east alignment, west alignment, and through Delta/separate corridors alternatives.
- Gates and similar control structures would control the flow of water through conveyance facilities and facilitate maintenance of conveyance structures. Control structures would be constructed under all action alternatives.
- Concrete batch plants and fuel stations would be built to support construction. The volume of concrete needed for the conveyance options would require locating concrete batch plants at the work site rather than importing concrete from outside suppliers. A suitable source of clean water would be required for each batch plant. Batch plants and fuel stations would be located side by side and would range in size from approximately 2 acres to 40 acres. Depending on the alternative selected, concrete batch plants and fuel stations would be constructed at one or more of the following locations. While it is anticipated that precast tunnel segments would be purchased and transported from existing plants, it is possible that one or more temporary plants would be constructed. If it is necessary to construct precast segment yards, they would be located adjacent to concrete batch plants.
    - Pipeline/tunnel alignment (Alternatives 1A, 2A, 3, 5, 6A, 7, and 8)

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- An approximately 2-acre concrete batch plant and 2-acre fuel station at Intake 2.
- An approximately 2-acre concrete batch plant and 2-acre fuel station at Intake 4.
- An approximately 40-acre concrete batch plant and 2-acre fuel station approximately 2.5 miles north of SR 12.
- An approximately 40-acre concrete batch plant and 2-acre fuel station along the pipeline/tunnel alignment approximately 8.5 miles south of SR 12.
- An approximately 2-acre concrete batch plant and 2-acre fuel station along the pipeline/tunnel alignment on Byron-Bethany Road.

- Modified pipeline/tunnel alignment (Alternative 4)
  - An approximately 2-acre concrete batch plant and 2-acre fuel station at Intake 2 (within the work area identified for Intake 2).
  - An approximately 2-acre concrete batch plant and 2-acre fuel station at Intake 5 (within the work area identified for Intake 5).
  - An approximately 40-acre concrete batch plant and 2-acre fuel station near Twin Cities Road and Interstate 5 (within a designated reusable tunnel material storage site). (Reusable tunnel material [RTM] is the by-product of tunnel excavation using an earth pressure balance [EPB] tunnel boring machine [TBM]; for additional description of the potential reuse of this material, see Appendix 3B, *Environmental Commitments*).
  - An approximately 40-acre concrete batch plant and 2-acre fuel station between Byron Highway and Italian Slough (within a designated RTM storage site).
- East Alignment (Alternatives 1B, 2B, and 6B)
  - An approximately 2-acre concrete plant and 2-acre fuel station at Intake 2.
  - An approximately 2-acre concrete plant and 2 acre fuel station at Intake 4.
  - An approximately 25-acre concrete plant and 2-acre fuel station along the canal alignment just south of Snodgrass Slough.
  - An approximately 40-acre concrete plant and 2-acre fuel station along the tunnel alignment approximately 8.5 miles south of SR 12.
- West Alignment (Alternatives 1C, 2C, and 6C)
  - An approximately 2-acre concrete plant and 2-acre fuel station along the canal alignment adjacent to Willow Point Road.
  - An approximately 2-acre concrete plant and 2-acre fuel station between Intakes 3 and 4.
  - An approximately 40-acre concrete plant and 2-acre fuel station along the canal alignment approximately 1 mile south of the SR 84/SR 220 junction.
  - An approximately 40-acre concrete plant and 2-acre fuel station along the canal alignment just north of Franks Tract.
  - An approximately 2-acre concrete plant and 2-acre fuel station along the canal alignment approximately 1 mile north of the Byron Highway.
- Through Delta/Separate Corridors (Alternative 9)

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- An approximately 2-acre concrete plant and 2-acre fuel station the east bank of the Sacramento River between The Meadows Slough and the community of Locke.
- An approximately 2-acre concrete plant and 2-acre fuel station on eastern Webb Tract near the San Joaquin River, north of a proposed operable barrier.
- An approximately 2-acre concrete plant and 2-acre fuel station adjacent to and north of Highway 4 on Victoria Island.

- Temporary barge unloading facilities would be constructed at locations adjacent to construction work areas along the conveyance alignments for the delivery of construction materials. These facilities would be sized to accommodate various deliveries (e.g., tunnel segments, batched concrete, major equipment). Access roads from these facilities to the construction work area would be necessary. The barge unloading facilities would be removed following construction.
- Other facilities to support the function of the conveyance may include new bridges to connect existing roads and highways, new access roads, improvements to existing roads or bridges, improvements to local drainage systems affected by the alternatives, and other utilities improvements. Some areas would be temporarily or permanently dedicated to borrow, spoil, dredged material, or RTM. Where specific locations for these facilities are known, such areas are identified in Mapbook Figures M3-1 through M3-5.

3.4.1.2 Operational Components

The BDCP would include modifying operations of CVP and SWP facilities in the Delta (covered activities and BDCP-associated federal actions). The modified operation of the existing CVP and SWP Delta facilities and the operation of the proposed new conveyance facilities are described in this section. These modifications are summarized in Table 3-6.

Each of the BDCP action alternatives would modify the existing operation of the CVP and SWP in the Delta to further protect fish populations and to accommodate new Delta facilities and proposed habitat restoration. The existing operation of the CVP and SWP in the Delta is determined by rules and objectives that guide daily Delta operational activities. Many of these rules are included in D-1641 (which implemented the 1995 Bay-Delta Water Quality Control Plan [WQCP] objectives). Several additional rules have been added by the 2008 USFWS BiOp and the 2009 NMFS BiOp for long-term operation of the CVP and SWP. The existing operation of the CVP and SWP in the Delta is briefly summarized here, so that the modifications to these existing (No Action) operations can be identified for the BDCP action alternatives.

Currently, several different operational criteria influence exports and Delta outflow. The proposed BDCP north Delta intake operations would include additional rules governing allowable north Delta diversions. Delta operations for each of the alternatives can be described and compared by the applicable rules under each category (see Table 3-6). The BDCP alternatives comprise a range of operational rules for the SWP/CVP in the Delta that would require additions to, modification of, or elimination of some of the existing Delta operational rules, as described in detail below.

While meeting biological goals and objectives of the Plan, the applicable Delta operational rules evaluated for BDCP alternatives are intended to address the following questions.

- How much of the Delta inflow can be exported at the south Delta CVP and SWP pumping plants?
- How much of the Delta inflow can be exported at the BDCP north Delta intakes?

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- How much of the inflow is needed for Delta outflow?

Answering these questions requires determining the most limiting (lowest) objective for south Delta exports, the most limiting (lowest) objective for north Delta intakes, and the most limiting (highest) objective for outflow. Because each alternative has a slightly different set of applicable rules with varying north Delta intake capacities, each BDCP alternative would have different Delta operations in many months.

Operational Requirements Influencing Maximum Allowable Exports

The first two rules govern the maximum CVP and SWP pumping capacities. Each alternative includes the CVP capacity of 4,600 cfs and assumes the existing south Delta SWP pumping capacity, as constrained by the Clifton Court Forebay limits (Rivers and Harbors Section 10) with additional diversions dependent on the San Joaquin River. SWP pumping to the maximum Banks pumping plant physical capacity of 10,300 cfs was assumed for BDCP alternatives that include north Delta intakes.

The export/inflow (E/I) ratio represents the volume of water pumped out of the Delta relative to the level of water flowing into the Delta. The E/I ratio, introduced in the 1995 WQCP, limits the CVP and SWP combined pumping to between 35% and 65% of the Delta inflow, varying by month and runoff conditions. This ratio was assumed to apply only to south Delta exports; BDCP north Delta intake diversions were assumed to be exempt from this rule. This parameter is therefore referred to as the *south Delta E/I ratio* as it has been applied to modeling for BDCP alternatives. In calculating the south Delta E/I ratio, then, Sacramento River inflow is considered to be downstream of the north Delta intakes.[11]

An additional limit that was imposed by the 2009 NMFS BiOp was a San Joaquin River inflow/export ratio that effectively limits the combined exports based on the SJR inflows during April and May.

Pumping from the south Delta can create upstream flows on the Old and Middle Rivers (OMR flow). These are also referred to as reverse or negative flows. The USFWS and NMFS BiOps introduced new limits on the reverse OMR flow in the months of December–June of many years (adaptively managed based on fish monitoring). The north Delta diversions that are proposed for each BDCP action alternative would allow these OMR limits to be satisfied while diverting additional water from the Sacramento River. The OMR limits will vary each year with fish and turbidity conditions. In addition, the CALSIM modeling assumed less negative OMR monthly limits that vary with water year type for some of the BDCP alternatives, reducing the allowable south Delta exports for those alternatives.

While physically outside the Delta, a final set of constraints on Delta exports is related to the storage capacity of San Luis Reservoir and seasonal (monthly) water supply deliveries that are assumed for south of Delta CVP and SWP contractors. The San Luis Reservoir provides about 2 million acre-feet (MAF) of seasonal storage for meeting the peak summer water demands. The San Luis Reservoir storage allows exports to continue through the fall and winter period. The No Action (described below) and BDCP action alternatives have similar assumptions about the seasonal water demands;

[11] With the exception of Scenarios H2 and H4, under which Sacramento River inflow was assumed to be upstream of the proposed north Delta intakes.

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SWP exports include Article 21[12] deliveries to contractors with local storage capacity (e.g., surface reservoirs or groundwater storage). BDCP alternatives that allow the highest exports and fill San Luis Reservoir earlier each year will have the greatest Article 21 deliveries.

Operational Requirements Influencing Minimum Required Delta Outflow

In addition to rules controlling exports from the Delta, there are also several sets of rules governing Delta outflow. These include the minimum monthly outflows specified in D-1641 for each month, which often depend on the water year type (i.e., runoff conditions). These flow objectives were set to protect beneficial uses of Delta water for fish habitat. All the BDCP alternatives include these same D-1641 rules.

Delta outflow is also controlled by the maximum salinity objectives specified in D-1641 for each month or period. For example, salinity objectives are specified at certain Delta locations to protect agricultural diversions and drinking water supplies. Because Delta outflow is the major factor determining salinity within the Delta channels, these salinity objectives are satisfied by increasing Delta outflow. The Delta outflow required to meet these salinity objectives is simulated by evaluating historical outflow records (i.e., DAYFLOW) and salinity (electrical conductivity [EC] monitoring) to establish the relationship between these two metrics for each compliance location. The D-1641 salinity objectives are assumed to apply to the Existing Conditions, the No Action Alternative, and the BDCP action alternatives.[13]

Another set of rules controlling Delta outflow are the spring X2 objectives introduced in the 1995 WQCP. *X2*, the location of the 2 parts per thousand (ppt) salinity isohaline (i.e., the upstream edge of the low salinity zone), is specified on the basis of the month and the (unimpaired) runoff in the previous month. This objective supports several estuarine species whose abundance has been correlated with X2. This was formulated as an adaptive objective; the required outflow increased with higher runoff conditions.

The 2008 USFWS BiOp included an outflow requirement for September, October, and November of wet and above normal water year types. The *Fall X2* rule requires X2 to be at or downstream of Collinsville in above normal years and downstream of Chipps Island in wet years. The Fall X2 rule applies to the No Action Alternative and some of the BDCP action alternatives.

In addition, the State Water Board has recently explored additional operational rules that would require Delta outflow to be a specified percentage of monthly unimpaired flow (California State Water Resources Control Board 2010). This rule would be similar to the E/I ratio, but would be less negative in months with moderate runoff that was stored in upstream reservoirs. Because this possible Delta outflow rule would limit the total water diverted to storage or exported, higher

[12] Article 21 water is one of several types of SWP water supply made available to SWP contractors under the long-term water supply contracts between DWR and SWP contractors. Article 21 water is provided for under Article 21 of the contracts. Unlike Table A water, which is an allocated annual supply made available for scheduled delivery throughout the year, Article 21 of each contract provides for delivery of water in addition to the Table A amounts when excess water is available in the Delta. Excess water is water reaching the Delta in excess of that needed to (i) meet in-basin needs (including fishery requirements), (ii) fill storage in San Luis Reservoir, and (iii) meet SWP contractor requests for Table A amounts. Article 21 water becomes available during wetter months of the year, generally December through March.

[13] An exception to D-1641 objectives is the proposal to change the compliance point from Emmaton to Threemile Slough. For the purposes of modeling, this assumption has been incorporated into the No Action Alternative, as well as each action alternative.

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outflows might be expected in many months. BDCP Alternative 8 includes a monthly outflow/unimpaired flow percentage of 55% from January through June.

New Operational Rules for North Delta Intake Diversions

Fish protection at the proposed BDCP north Delta intakes would be provided by operational parameters that are related to maintaining seaward flow in the river and to continue the variability in flow that accompanies flow pulses, especially in key migratory months. Fish protection at the proposed BDCP north Delta intakes would also be provided by operational parameters that are screen approach velocity and sweeping velocity requirements. General daily or monthly rules for maximum allowable north Delta diversions were incorporated into the CALSIM modeling of each BDCP alternative. These new operational rules are referred to as *bypass flow* rules for the north Delta intakes. The bypass flow rule for July–September is assumed to be 5,000 cfs in all years. During these months, Sacramento River flow above 5,000 cfs could be diverted at the north Delta intakes, subject to the other Delta rules requiring minimum required Delta outflow. The minimum bypass flow in October and November was assumed to be 7,000 cfs in all years unless or until a pulse flow occurs on the Sacramento River near Wilkins Slough.

The BDCP north Delta intake diversion rules in December–June allow bypass flows to increase with the river inflow. Low-level pumping of 6% of the river flow would be allowed most of the time, but major diversions could not begin until the Sacramento River flow was greater than a specified threshold. The same set of monthly bypass rules was assumed for BDCP operational Scenarios A, B, C, D, and H. A different set of bypass rules is shared by operational Scenarios E and F. These bypass rules control how much of the Delta exports are diverted from the north Delta intakes. While the physical facilities and capacities are specified for each BDCP alternative, these bypass rules could be modified in the future under the adaptive management program as the results of fish monitoring in the vicinity of the new intakes are evaluated. For the evaluation of BDCP alternatives in this EIR/EIS, the north Delta intake bypass rules are assumed to be identical for Alternatives 1A through 6C, with a different set of rules applying to Alternatives 7 and 8 (none are needed for Alternative 9 [Scenario G]).

Summary Comparison of BDCP Operational Scenarios for Alternatives

Table 3-6 provides a summary of the major Delta objectives (rules) for determining the maximum allowable exports and the minimum required outflow under each BDCP alternative. The existing rules are included in the No Action Alternative operations. Each BDCP operational scenario includes many of the No Action rules as well as several modified or new rules. The operational scenarios are described briefly below and in more detail in Section 3.6.4.2, *North Delta and South Delta Water Conveyance Operational Criteria*.

- Operational elements common to all scenarios include physical limits of SWP and CVP south Delta pumping plants, available San Luis Reservoir storage, SWP Article 21 delivery, seasonal SWP and CVP delivery patterns, minimum monthly specified outflow, maximum salinity for Delta diversions, and maximum Spring X2 location.
- Scenario A would include most No Action objectives for south Delta exports and required Delta outflow; however, Scenario A does not include Fall X2 objectives nor the SJR inflow/export ratio. Scenario A includes new criteria for north Delta diversion bypass flows and assumed operations of the proposed Fremont Weir (notch) during high Sacramento River flows. The minimum bypass flow ranges from 5,000 to over 15,000 cfs, depending on time of year. Numerical bypass

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rules are described in more detail later in this chapter. Scenario A was used in the CALSIM modeling for Alternatives 1A, 1B, 1C, and 3. Different north Delta diversion capacities would influence the volume of pumping from the south Delta, resulting in variation of Delta operations.

- Scenario B would include the Fall X2 criteria, but not the SJR inflow/export ratio. Scenario B would also include less negative OMR flow limits, and an operable barrier at the head of Old River. All other No Action rules were assumed to apply, and the north Delta intake bypass rules would be the same as those under Scenario A. Operational Scenario B was used in the CALSIM modeling for Alternatives 2A, 2B, and 2C.
- Scenario C would incorporate all the No Action rules. The north Delta intake bypass flow rules would be the same as those under Scenario A. Operational Scenario C was used in the CALSIM modeling for Alternative 5. The north Delta operations were limited because of the reduced conveyance capacity, entailing a single 3,000 cfs intake on the Sacramento River.
- Scenario D would eliminate use of the south Delta intakes (i.e., an isolated north Delta conveyance only) and would use the same north Delta intake bypass flow rules as those under Scenario A. None of the existing south Delta export rules would apply, including the E/I ratio. All the No Action outflow rules would apply. Operational Scenario D was used in the CALSIM modeling for Alternatives 6A, 6B, and 6C.

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Table 3-6. Comparison of Operational Rules under BDCP Operational Scenarios and Alternatives

Operational Scenario Alternative	Applicable Months	No Action	Scenario A Alt 1	Scenario B Alt 2	Scenario A Alt 3	Scenario H Alt 4	Scenario C Alt 5	Scenario D Alt 6	Scenario E Alt 7	Scenario F Alt 8	Scenario G Alt 9
Delta Operational Rules Controlling Maximum Allowable CVP and SWP South Delta Exports											
Physical/Permitted Limit for CVP (4,600 cfs)	Jan–Dec	X	X	X	X	X	X	X	X	X	X
Physical Limit for SWP (10,300 cfs)	Jan–Dec	X	X	X	X	X	X	X	X	X	X
Permitted Limit for SWP (6,680 cfs plus 1/3 of San Joaquin River Dec 15–March 15)	Jan–Dec	X	O	O	O	O	X	O	O	O	X
Export/Inflow Ratio (65% Jul–Jan; 35% Feb–Jun)	Jan–Dec	X	X[a]	X[a]	X[a]	X[a]	X[a]	O	X[a]	X[a]	X
SJR Inflow/Export Ratio	Apr–May	X	O	O[b]	O	O[b]	X	O	X[c]	X[c]	O[d]
Reverse Old and Middle River Flows	Dec–Jun	X	X	X[e]	X	X[e]	X	O	X[f]	X[f]	X
Available San Luis Reservoir Storage	Jan–Dec	X	X	X	X	X	X	X	X	X	X
SWP Article 21 Delivery (when San Luis Reservoir is Full)	Jan–Dec	X	X	X	X	X	X	X	X	X	X
Seasonal CVP and SWP Delivery Pattern	Jan–Dec	X	X	X	X	X	X	X	X	X	X
Delta Operational Rules Controlling Minimum Required Delta Outflow											
Minimum Monthly Specified Outflow	Jan–Dec	X	X	X	X	X	X	X	X	X[g]	X
Maximum Salinity (EC) for Delta Diversions	Jan–Dec	X	X	X	X	X	X	X	X	X	X
Maximum Spring X2 Location	Feb–Jun	X	X	X	X	X[h]	X	X	X	X	X
Maximum Fall X2 Location	Sep–Oct	X	O	X	O	X[h]	X	X	X	X	X

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Operational Scenario Alternative	Applicable Months	No Action	Scenario A Alt 1	Scenario B Alt 2	Scenario A Alt 3	Scenario H Alt 4	Scenario C Alt 5	Scenario D Alt 6	Scenario E Alt 7	Scenario F Alt 8	Scenario G Alt 9
New Operational Rules Controlling Maximum North Delta Intake Diversions											
Maximum Capacity of North Delta Intakes (cfs)	N/A	None	15,000	15,000	6,000	9,000	3,000	15,000	9,000	9,000	None
Bypass Flows (% of Sacramento River at Freeport)	Jan–Dec	O	X	X	X	X	X	X	X	X	O

Note:

"X" indicates that a BDCP alternative incorporates an operational rule.

"O" indicates that a BDCP alternative does not incorporate that operational rule.

[a] In computing the E/I ratio for these scenarios, the Sacramento River inflow is considered to be downstream of the north Delta intakes, with the exception of Scenarios H2 and H4, for which Sacramento River inflow was assumed to be upstream of the proposed north Delta intakes.

[b] Under these scenarios, a different strategy was applied to achieve similar objectives as the SJR I/E ratio.

[c] SJR I/E ratio is applicable December through June and therefore would apply for five months longer than under the No Action Alternative.

[d] SJR I/E ratio is applicable when the San Joaquin River flow at Vernalis is greater than 10,000 cfs.

[e] More restrictive/protective than Scenario A.

[f] More restrictive/protective than Scenario B.

[g] More restrictive/protective than in the No Action Alternative; the Delta outflow requirement is expressed as a percent of unimpaired flow.

[h] For Alternative 4, additional spring outflow will be determined based on the results of the decision tree process. Maximum Fall X2 Location will also be determined by the decision tree process under Alternative 4.

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- Scenario E would use north Delta bypass rules modified from those under Scenario A. Scenario E assumed less negative OMR limits and more restrictive SJR inflow/export ratios (December–March and June) and would eliminate south Delta exports in April and May. Scenario E would include all of the No Action outflow rules, including Fall X2. Operational Scenario E was used in the CALSIM modeling for Alternative 7.
- Scenario F would use the same rules as Scenario E, but would be modified to include specific Delta outflow criteria and cold water pool management criteria for specific reservoirs. Operational Scenario F was used in the CALSIM modeling for Alternative 8.
- Scenario G would include all the No Action rules for south Delta exports and Delta outflow, including the Fall X2 criteria. There would not be any north Delta bypass flow rules; diversions at the proposed fish screens on Delta Cross Channel and Georgiana Slough would be controlled by tidal hydraulics and the Delta Cross Channel gate closure rules. Operational Scenario G was used in the CALSIM modeling for Alternative 9. All the south Delta export rules were applied for CALSIM modeling, although the SJR inflow/export ratio would not be required because the migrating SJR fish would be separated from the exports. The No Action OMR flow restrictions would apply.
- Scenario H would include less negative OMR flow limits and an operable barrier at the head of Old River. All other No Action rules were assumed to apply except the SJR inflow/export ratio, and the north Delta intake bypass rules would be the same as those under Scenario A. Delta Outflow under Scenario H would be determined by the outcome of the decision tree process needed to account for scientific uncertainties related to spring outflow and Fall X2 requirements for delta and longfin smelt, salmonids, and sturgeon. Thus, there are different potential outflow requirements that could be used for spring and fall. The decision tree process and outcomes are described further in Section 3.6.4.2, *North Delta and South Delta Water Conveyance Operational Criteria*, for Scenario H. Operational Scenario H was used in the CALSIM modeling for Alternative 4.

Each of the BDCP operational scenarios can be compared with the assumed No Action Delta operational rules listed in Table 3-6. Chapter 5, *Water Supply*, and Chapter 6, *Surface Water,* provide a more detailed description and evaluation of the different Delta operations that resulted from the CALSIM modeling of each BDCP alternative. Delta operations are the combination of the Delta inflow, the assumed Delta operational rules, and the assumed capacity and bypass flow rules for the new BDCP facilities.

3.4.2 Overview of Conservation Components

A primary conservation goal of the BDCP is to protect, restore, enhance, and manage tidal, riparian, and seasonally inundated floodplain habitats for the benefit of fish, wildlife, plants, and ecosystem processes in the Plan Area. Habitat restoration, enhancement, and management activities are covered activities under the BDCP; they include all actions that may be undertaken to implement the physical habitat conservation measures. Each action alternative includes activities intended to address conservation needs across a variety of habitat types and locations. This EIR/EIS describes and analyzes these components at a program level. These activities are described in detail in Section 3.6.2, *Conservation Components*.

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The BDCP physical habitat conservation program is organized geographically across the northern, eastern, southern, and western regions of the Plan Area. It is also organized by habitat type, as well as temporally into NT and LT implementation phases.

Each of the action alternatives would include implementation of protection, restoration, enhancement, and management activities, as summarized below.

- Restoration, protection, and enhancement of the following natural community/habitat types would be undertaken under all action alternatives: freshwater and brackish tidal, subtidal, and transition habitats; seasonally inundated floodplain; channel margin; riparian habitat; grassland communities; vernal pool complex; alkali seasonal wetland complex; managed seasonal wetland; nontidal perennial emergent wetland and nontidal perennial aquatic; inland dune scrub; and cultivated lands. Target acreages would vary for some alternatives; these are discussed in detail in Section 3.6.2.
- Management plans would be prepared and implemented for protected natural communities and covered species that occupy those communities. The following natural communities would receive protection, restoration, creation, and enhancement, and would be incorporated into a conservation reserve system: tidal perennial aquatic; tidal mudflat; tidal brackish and emergent wetland; tidal freshwater emergent wetland; valley/foothill riparian; grassland; nontidal freshwater perennial emergent wetland; nontidal perennial aquatic habitat; alkali seasonal wetland complex; vernal pool complex; managed wetland; and inland dune scrub. Although not considered a natural community, cultivated lands are nonetheless a part of the BDCP conservation strategy because, in certain instances, they provide value as habitat for covered species.

3.4.3 Overview of Conservation Components Related to Reducing Other Stressors

The BDCP has identified several issues, beyond water exports and habitat conditions, that affect the survival of covered fish species in the Delta. These *other stressors* include but are not limited to exposure to contaminants, competition, predation and other changes to the ecosystem caused by nonnative species, entrainment at water intake pumps not operated by SWP and CVP, and fish passage. BDCP will implement measures intended to address the effects of other stressors (CM12–CM21; Tables 3-3 and 3-4) under all alternatives except the No Action Alternative.[14] Section 3.6.3 provides a detailed description of these components.

- Control of methylmercury load in BDCP conservation sites.
- Control of nonnative submerged and floating aquatic vegetation in BDCP tidal habitat restoration.
- Improvement of dissolved oxygen levels in the Stockton Deep Water Ship Channel (DWSC) when covered species are present.
- Temporary reduction of local effects of predators on covered fish species.

[14] With the BiOps, specific species' recovery plans, and the federal and state regulatory agency actions that monitor some of the other stressors listed (e.g., invasive species control, stormwater runoff), the No Action Alternative could involve reduction of several of these other stressors; however, it would be speculative to assess which would be substantively addressed and to what extent.

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- Installation of nonphysical barriers to improve survival of emigrating juvenile salmonids at channel junctions.
- Fund efforts to reduce illegal harvest of covered fish species.
- Establishment of new and expansion of existing conservation propagation programs for delta smelt and longfin smelt.
- Fund efforts to treat pollutant runoff from urban stormwater.
- Support current efforts to reduce the risk of introduction of invasive species by recreational vessels.
- Support installation of screens and alteration of nonproject diversions, as appropriate, to reduce the risk of entrainment of covered fish species.
- Implement avoidance and minimization measures to minimize effects on covered species and natural communities that could result from BDCP covered activities, rather than from other stressors.

3.5 Alternatives

As described in Chapter 1, Section 1.6.1, *Overview of BDCP Approval Process*, USFWS and NMFS are considering whether to issue ITPs under ESA Section 10(a)(1)(B) for the incidental take of federally listed species from the construction, operation, and maintenance associated with water conveyance, ecosystem restoration, and other covered activities as described in the BDCP (see Table 1-1 in Chapter 1, *Introduction*, for a list of the species for which BDCP proponents are seeking coverage). An HCP will be submitted as part of the ITP applications. The HCP describes activities that would be covered by the ITPs, the species for which incidental take would be authorized, and measures that would, to the maximum extent practicable, minimize the adverse effects on the covered species resulting from implementation of the covered activities, and mitigate any remaining adverse effects through the protection, restoration, creation, and/or enhancement of habitat for the covered species. Reclamation's action in relation to the BDCP would be to adjust CVP operations specific to the Delta to accommodate new conveyance facility operations and/or flow requirements under the BDCP, in coordination with SWP operations. CDFW is considering whether to issue permits under Section 2835 of the Fish and Game Code.

The 15 action alternatives for BDCP differ in the location, design, and operation of conveyance facilities/improvements implemented under CM1. With the exception of the NEPA No Action Alternative, which also functions as the CEQA No Project Alternative, each alternative selected for detailed evaluation in this EIR/EIS would involve some level of construction of conveyance facilities/improvements to the system for diverting water to the existing SWP and CVP south Delta export facilities. Additionally, as noted above, each action alternative would include operational criteria for the water supply infrastructure, habitat conservation components, and measures to mitigate the impact of other stressors on covered species. Issuance of ITPs and an NCCP permit is also a common element of all of the action alternatives. Table 3-1 provides a summary of the alternatives evaluated in the EIR/EIS.

In general, the numbering of alternatives in this EIR/EIS reflects the fact that three sets of three alternatives share many common elements and only one or a handful of differences. Thus, Alternatives 1A, 1B, and 1C would all involve *dual conveyance* scenarios with a total of 15,000 cfs of

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capacity operated under *Operational Scenario A*, developed in early 2010. They differ only in that Alternative 1A would use a pipeline/tunnel, rather than a surface canal, as its major conveyance facility. Alternative 1B would entail an eastside canal, while Alternative 1C would entail a combination of a westside canal and pipeline/tunnel. Similarly, Alternatives 2A, 2B, and 2C would use the same three dual conveyance designs as 1A, 1B, and 1C with a total capacity of 15,000 cfs, but they would be operated under Operational Scenario B rather than Scenario A. Scenario B was developed in early 2011 and reflects a greater degree of input from USFWS, NMFS, and CDFW than does Scenario A. Alternatives 6A, 6B, and 6C represent a similar approach—that is, they use the same respective physical alignments as 1A, 1B, and 1C—but they would constitute an *isolated conveyance* facility with 15,000 cfs of capacity operated under Scenario D, which is a modification of Scenario A, eliminating the use of south Delta intakes. Most action alternatives share the same set of conservation components, with variations incorporated into Alternatives 5, 7, and 9. All action alternatives share the same measures to reduce other stressors.

As described in more detail in Appendix 3A, *Identification of Water Conveyance Alternatives for Bay Delta Conservation Plan Environmental Impact Report/Environmental Impact Statement (Screening Report) (Conservation Measure 1)*, these alternatives, with the exception of the No Action/No Project Alternative, which is required by CEQA and NEPA, have each been formulated to meet the purpose and need; achieve all or most of the BDCP objectives (which incorporate and add to the BDCP purpose statement; see Chapter 2, *Project Objectives and Purpose and Need,* for more detail); and have some potential to avoid or substantially lessen the adverse effects of the proposed BDCP. Accordingly, they were carried forward for detailed evaluation in this EIR/EIS. (For ease of reference, the No Action/No Project Alternative is hereinafter referred to simply as the No Action Alternative.)

The alternatives differ primarily in their physical conveyance facility infrastructure/improvements, the locations of facilities, and diversion capacities. Other differences are associated with operational criteria for water supply facilities and the acreage of habitats that would be restored or enhanced. The major physical/structural components of each alternative are summarized in Table 3 -5. The alternatives are described in detail below.

3.5.1 No Action Alternative

CEQ regulations for implementing NEPA require an EIS to include evaluation of a No Action Alternative (40 CFR 1502.14). At the Lead Agencies' discretion under NEPA, the No Action Alternative may be described as the future circumstances without the proposed action and can also include predictable actions by persons or entities, other than the federal agencies involved in a project action, acting in accordance with current management direction or level of management intensity. When the proposed action involves updating an adopted management plan or program, the No Action Alternative includes the continuation of the existing management plan or program. The CEQ suggests that the No Action Alternative may provide a benchmark that allows decision makers to compare the magnitude of environmental effects of the action alternatives (46 Fed. Reg. 18026 [March 23, 1981]). Accordingly, this EIR/EIS uses the No Action Alternative as the point of comparison for determining impacts of the federal action under NEPA.

Under CEQA, an EIR is required to analyze the No Project Alternative. The No Project Alternative allows decision makers to use the EIR to compare the impacts of approving the proposed project with the future conditions of not approving the proposed project. Under CEQA, the No Project Alternative is not the baseline for assessing the significance of impacts of the proposed project. The

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CEQA baseline for assessing significance of impacts of any proposed project is normally the environmental setting, or existing conditions, at the time a Notice of Preparation (NOP) is issued (State CEQA Guidelines Section 15125[a]). State CEQA Guidelines Section 15126.6, Subdivision (e)(2) indicates that No-Project conditions may include some reasonably foreseeable changes in existing conditions and changes that would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services.

Under the No Action Alternative, DWR and Reclamation would continue to operate the SWP and the CVP, respectively, to divert, store, and convey SWP and CVP water consistent with applicable laws and contractual obligations. The SWP and the CVP are major water storage and delivery systems that divert water from the southern portion of the Delta. The SWP and CVP both include major reservoirs upstream of the Delta and transport water via natural watercourses and canal systems to areas south and west of the Delta. The CVP also includes facilities and operations on the Stanislaus and San Joaquin Rivers.

Under the No Action Alternative, existing CVP facilities in the Delta, including Delta Cross Channel, the Jones Pumping Plant (formerly Tracy Pumping Plant), the Tracy Fish Collection Facility, and the Delta Mendota Canal (DMC) would continue to be operated consistent with applicable laws and contractual obligations. The Delta Cross Channel is a gated diversion channel in the Sacramento River near Walnut Grove and Snodgrass Slough. Flows into the Delta Cross Channel from the Sacramento River are controlled by two 60-foot by 30-foot radial gates. When the gates are open, water flows from the Sacramento River through the cross channel to channels of the lower Mokelumne and San Joaquin Rivers toward the interior Delta. The Delta Cross Channel operation improves water quality in the interior Delta by improving circulation patterns of good quality water from the Sacramento River towards Delta diversion facilities. The CVP uses the Sacramento River, San Joaquin River, and Delta channels to transport water to the export pumping plant located in the south Delta. The CVP's Jones Pumping Plant, about 5 miles north of Tracy, consists of six available pumps. The Jones Pumping Plant is located at the end of an earth-lined intake channel about 2.5 miles in length. At the head of the intake channel, louver screens intercept fish, which are then collected, held, and transported by tanker truck to release sites far away from the pumping plants. Jones Pumping Plant has a permitted diversion capacity of 4,600 cfs with historical maximum pumping rates typically ranging from 4,500 to 4,300 cfs during the peak of the irrigation season and approximately 4,200 cfs during the winter non-irrigation season. The winter-time constraints at the Jones Pumping Plant are the result of a DMC freeboard constriction between Jones Pumping Plant and O'Neill Forebay, O'Neill Pumping Plant capacity, and the current water demand in the upper sections of the DMC.

Similarly, under the No Action Alternative, SWP facilities in the Delta, including Clifton Court Forebay, John E. Skinner Fish Protective Facility, and the Banks Pumping Plant, would continue to be operated consistent with applicable laws and contractual obligations. Clifton Court Forebay is a 31,000 acre-foot reservoir located in the southwestern edge of the Delta, about 10 miles northwest of Tracy. Clifton Court Forebay provides storage for off-peak pumping, moderates the effect of the pumps on the fluctuation of flow and stage in adjacent Delta channels, and collects sediment before it enters the California Aqueduct. Diversions from Old River into Clifton Court Forebay are regulated by five radial gates. The Skinner Fish Facility is located west of the Clifton Court Forebay, 2 miles upstream of the Banks Pumping Plant. The Skinner Fish Facility screens fish away from the pumps that lift water into the California Aqueduct. Large fish and debris are directed away from the facility by a 388-foot long trash boom. Smaller fish are diverted from the intake channel into bypasses by a

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series of metal louvers, while the main flow of water continues through the louvers and towards the pumps. These fish pass through a secondary system of screens and pipes into seven holding tanks, where a subsample is counted and recorded. The salvaged fish are then returned to the Delta in oxygenated tank trucks. The Banks Pumping Plant is in the south Delta, about 8 miles northwest of Tracy, and marks the beginning of the California Aqueduct. By means of 11 pumps, including two rated at 375 cfs capacity, five at 1,130 cfs capacity, and four at 1,067 cfs capacity, the plant provides the initial lift of water 244 feet into the California Aqueduct. The nominal capacity of the Banks Pumping Plant is 10,300 cfs. Further description of CVP and SWP facilities and their operation is provided in Chapter 5, Section 5.1.2, *SWP and CVP Facilities and Operations*.

Under the No Action Alternative, the federal ITPs related to the proposed BDCP would not be issued and the applicant would remain subject to the take prohibition for listed species and other ESA requirements. Ongoing activities or future actions that may result in the incidental take of federally listed species would need to be permitted through ESA Section 7 or Section 10. Similarly, permits would not be issued by CDFW under Section 2835 of the Fish and Game Code. For this analysis, the No Action Alternative assumptions are limited to Existing Conditions, programs adopted during the early stages of development of the EIR/EIS, facilities that are permitted or under construction during the early stages of development of the EIR/EIS, projects that are permitted or are assumed to be constructed by 2060, and changes due to climate change and sea level rise that would occur with or without the proposed action or alternatives (Appendix 3D, *Defining Existing Conditions, the No Action/No Project Alternative, and Cumulative Impact Conditions*). These assumptions represent continuation of the existing plans, policies, and operations and conditions that represent continuation of trends in nature.

Because the BDCP No Action Alternative assumptions are consistent with the requirements and limitations prescribed by CEQA, from this point forward in this document, the No Action Alternative also represents the No Project Alternative. For ease of reference, the joint No Action/No Project Alternative is referred to as the No Action Alternative. The No Action Alternative assumptions include the basic description of the No Action Alternative, assumptions related to the SWP and CVP, ongoing programs and policies by governmental and nonprofit entities, projections related to climate change, and assumptions related to annual actions that vary every year. Among the ongoing programs by governmental entities which are included in the No Action Alternative are many of the actions required by the 2008 and 2009 USFWS and NMFS BiOps. The following summarizes which actions are reflected in the No Action Alternative.

- The anticipated effects of actions required by the 2008 and 2009 BiOps that have already occurred or are expected to be implemented prior to BDCP approval are assumed in the No Action Alternative.
- The anticipated effects of actions required by the 2008 and 2009 BiOps that change water operations in the Plan Area or upstream were assumed in the No Action Alternative if they were reasonably certain to occur and enough was known about the effects of the action in early 2010 (when the No Action Alternative for hydrodynamic modeling was established) to define modeling assumptions for the change in water operations.[15]
- The anticipated effects of some actions required by the 2008 and 2009 BiOps in the Plan Area are also included in the BDCP conservation strategy. In some cases, these actions are included in

[15] For a detailed explanation about these modeling assumptions, see EIR/EIS Appendix 5A, *BDCP EIR/EIS Modeling Technical Appendix*.

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the No Action Alternative and in other cases they are not. A key reason for these assumptions is that the 2008 and 2009 USFWS and NMFS BiOps will be superseded by the BDCP and associated BiOps. As described in Chapter 1, *Introduction*, the current operation of the CVP/SWP is governed by requirements that include the 2008 and 2009 BiOps. The requirements of these BiOps may be modified in response to a court ordered remand process, depending on the schedule approved by the court. The new operation of BDCP will occur once the new north Delta intakes are constructed. Once the new intakes are operational, the BDCP and any corresponding BiOps will replace the then-current BiOps for long-term operation of the CVP/SWP.

- Examples of effects assumed in the No Action Alternative, but that are also associated with BDCP conservation measures, include the effects of operations of the Delta Cross-Channel Gates (NMFS Action IV.12) and those related to measures to reduce entrainment at the south Delta export facilities (NMFS Action IV.3). An example of the effects of actions that are attributable to the BDCP and not assumed in the No Action Alternative include Yolo Bypass improvements and tidal marsh restoration (NMFS Actions I.6.1, I.6.2, and I.7; USFWS Action Reasonable and Prudent Alternative Component 4). More discussion of these assumptions is provided below.
- In some cases, RPA actions also included in BDCP were modified to take into account new scientific information available since the BiOps were issued, or additional planning done for BDCP beyond what was developed for the BiOps. Examples of this include *CM16 Non-physical Fish Barriers*, which is similar to, but much more defined and specific than, NMFS Action IV.1.3.
- Requirements of the 2008 and 2009 BiOps that call for conducting planning or feasibility studies with undefined outcomes were not assumed in the No Action Alternative. By themselves, these planning or feasibility studies would have no effect on environmental conditions. Their outcomes are unknown at this time and therefore too speculative to include in the No Action Alternative. Further environmental compliance, permitting, and ESA and California Endangered Species Act (CESA) compliance would be needed to implement any recommendations of these future studies. Examples include fish passage over SWP/CVP terminal dams such as Shasta (NMFS Actions NF4.4 and LF2).
- Requirements of the 2008 and 2009 BiOps that involve reporting, monitoring, or research actions are not assumed in the No Action Alternative because they are not expected to affect the environment or covered species (monitoring and research actions required by the BiOps are discussed in Section 3.6, *Adaptive Management and Monitoring Program* in Chapter 3 of the BDCP).

As mentioned above, the BiOp actions related to the Yolo Bypass improvements and floodplain restoration were not included in the No Action Alternative and have been assumed to occur under the BDCP in *CM2 Yolo Bypass Fisheries Enhancement*. This decision was made for the following reasons:

- At the time the 2009 BiOp was issued, the RPA actions (NMFS Actions I.6.1, I.6.2, and I.7) did not contain detail sufficient to include them in the hydrodynamic modeling or to determine the future effects of the actions. Action I.6.1 required Reclamation and DWR to submit to NMFS by December 31, 2011, a "plan to implement this action." The Action specified a range of options to consider and a list of potential constraints on those options (e.g., operations of Shasta). A similar plan was required in the related Actions I.6.2 and I.7. Reclamation and DWR submitted a plan in compliance with these RPA actions.

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- As described above, portions of the 2008 and 2009 USFWS and NMFS BiOps would be superseded by the BDCP and its associated BiOp for operation of CVP/SWP in the Delta, including the operations of the Yolo Bypass. Therefore, the requirements in the 2008 and 2009 BiOps in the Plan Area that overlap with BDCP, including the Yolo Bypass Actions, will apply until the new north Delta intakes are operational.
- Early in the BDCP planning process, it was assumed that the BDCP may become the vehicle to implement actions in the Yolo Bypass. However, Reclamation and DWR continue to develop environmental documents consistent with the RPA in coordination with the BDCP process.
- The BDCP proposes actions in the Yolo Bypass that go beyond those in the NMFS 2009 BiOp actions. *CM2 Yolo Bypass Fisheries Enhancement* includes 20 *component projects* that are to be implemented in four phases (years 1 to 5, 6 to 10, 11 to 25, and 26 to 50). The NMFS BiOp Actions in the Yolo Bypass are subsumed within these component projects, but at a much greater level of detail and analysis than presented in the 2009 NMFS BiOp. CM2 also includes more actions in the Yolo Bypass than proposed in the 2009 NMFS BiOp. An example of the additional detail and analysis in BDCP is provided by CM2 Component Projects 6 (*Experimental Sturgeon Ramps at Fremont Weir*) and 7 (*Auxiliary Fish Ladders at Fremont Weir*). While these projects would be considered similar to NMFS Action I.7 (*Reduce Migratory Delays and Loss of Salmon, Steelhead, and Sturgeon at Fremont Weir and Other Structures in the Yolo Bypass*), BDCP includes more detail about how and where these structures would be built (e.g., location, conceptual designs) and what performance measures they would have (e.g., BDCP biological objectives specify maximum passage delay times for salmon and sturgeon at the Fremont Weir) than is found in the NMFS Action I.7. This additional detail was not known at the time of the NMFS 2009 BiOp and therefore could not be modeled in the No Action Alternative. Similarly, the 2008 USFWS Action RPA Component 4 related to the restoration of 8,000 acres of tidal habitat was not included in baseline modeling assumptions. Although tidal habitat restoration may occur prior to the implementation of the BDCP, generally, this restoration will be part of CM4 and is analyzed at a program level in this EIR/EIS.

The detailed elements of the No Action Alternative are presented in Appendix 3D, *Defining Existing Conditions, No Action Alternative, No Project Alternative, and Cumulative Impact Conditions*.

As noted above, the assumptions for the No Action Alternative, as they relate to ongoing operation of the SWP/CVP, are limited to what is reasonably foreseeable under existing and adopted programs in light of predicted conditions reflecting ongoing climate change. The inherent challenge in envisioning No Action conditions nearly half a century away (2060) has required the Lead Agencies to make some informed judgments about what might happen outside the immediate SWP/CVP context during such an extended time period. It is likely that, over the course of nearly five decades, conditions influencing water supply throughout California will change in numerous ways. Since such changes could affect how the SWP and CVP under the BDCP would operate within a larger water supply framework, the analysis of the No Action Alternative in this EIR/EIS is intended to identify the predictable or foreseeable actions of California water suppliers other than DWR and Reclamation under a long-term scenario in which a BDCP is not approved or implemented. As is explained throughout this EIR/EIS, such conditions would likely entail continuing uncertainty of SWP/CVP south Delta exports, continuing vulnerability in the south Delta to long-term reductions in water quality due to sea level rise, and continuing vulnerability resulting from a major seismic event harming Delta facilities so as to temporarily halt export operations. Further discussion of these risks

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and their potential consequences is incorporated in Appendix 3 E, *Potential Seismic and Climate Change Risks to SWP/CVP Water Supplies*.

3.5.2 Alternative 1A—Dual Conveyance with Pipeline/Tunnel and Intakes 1–5 (15,000 cfs; Operational Scenario A)

3.5.2.1 Physical and Operational Components

Under Alternative 1A, water would primarily be conveyed from the north Delta to the south Delta through pipelines/tunnels. Water would be diverted from the Sacramento River through five fish-screened intakes on the east bank of the Sacramento River between Clarksburg and Walnut Grove. Water would travel in pipelines from the intakes to a sedimentation basin and solids lagoon before reaching the intake pumping plants. From the intake pumping plants water would be pumped into another set of pipelines to an intermediate forebay (via a transition structure) or to a tunnel (Tunnel 1) that would also carry water to the intermediate forebay. An emergency spillway would prevent the intermediate forebay from overtopping by spilling to an adjacent approximately 350-acre inundation area. From this forebay, water would be pumped by an intermediate pumping plant or conveyed by a gravity bypass system into a dual-bore tunnel (Tunnel 2) that would run south to a new forebay near Byron Tract, adjacent to Clifton Court Forebay. This arrangement would enhance water supply operational flexibility, using forebay storage capacity to regulate flows from north Delta intakes and flows to south Delta pumping plants. Byron Tract Forebay would be designed to provide water to Jones pumping plant 24 hours per day.

A map and a schematic diagram depicting the conveyance facilities associated with Alternative 1A are provided in Figures 3-2 and 3-3. Figure 3-2 shows the major construction features associated with this proposed water conveyance facility alignment; a detailed depiction is provided in Figure M3-1 in the Mapbook Volume. Note that not all these structures would be constructed under this alternative. An overview of the proposed water conveyance features and characteristics (e.g., lengths, volumes) is presented in Table 3-7.

New connections would be constructed between the new Byron Tract Forebay and the Banks and Jones pumping plants, along with control structures to regulate the relative quantities of water flowing from the north Delta and the south Delta. Alternative 1A would entail the continued use of the SWP/CVP south Delta export facilities.

Alternative 1A would include the following new water conveyance facilities components, which are described in detail in Section 3.6.1, *Water Conveyance Facility Components (CM1)*.

- Five north Delta intakes with fish screens along the east bank of the Sacramento River (Intakes 1–5).
- Pipelines conveying water from intakes to intake pumping plants.
- Sedimentation basins and solids handling facilities.
- Intake pumping plants at each intake location; associated facilities include an access road, electrical substation, communication devices, and transformers.
- Discharge pipelines conveying water from intake pumping plants to an initial tunnel (Tunnel 1) or a transition structure.
- Two surge towers at pumping plants for Intakes 1 and 2.

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- Transition structures, such as stop logs and vents, between discharge pipelines and larger conveyance pipelines.
- Conveyance pipelines between transition structures and intermediate forebay transition structures with radial gates and stop logs.
- An intermediate forebay.
- An intermediate forebay gravity bypass that would allow water in the intermediate forebay to be diverted by gravity to either bore of Tunnel 2.
- An approximately 350-acre designated inundation area to temporarily contain overflow, conveyed by an emergency spillway, from the intermediate forebay.
- An intermediate pumping plant that would pump water from the intermediate forebay into Tunnel 2; associated features would include an access road, electrical substations, and transformers.
- Two tunnels (Tunnel 2) between the intermediate pumping plant and Byron Tract Forebay.
- Byron Tract Forebay, adjacent to and south of Clifton Court Forebay, with large-diameter TBM launch/retrieval shafts and vent shafts at approximately 3-mile intervals.
- Connections and control structures to the Banks and Jones pumping plants.
    - A canal and set of gates between Byron Tract Forebay and the approach canal to the Banks pumping plant.
    - A set of gates in the approach canal to the Banks Pumping Plant upstream of the connection to Byron Tract Forebay.
    - A set of gates at the outlet between the embankment of the Byron Tract Forebay and the approach canal to the Jones pumping plant.
    - A set of gates in the approach canal to the Jones Pumping Plant upstream of the connection to Byron Tract Forebay.
- Transmission lines running from the existing electrical grid to project substations.
- Borrow, spoils, and RTM storage/disposal areas.

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Table 3-7. Summary of Physical Characteristics under Alternatives 1A, 2A, and 6A

Feature Description/Surface Acreage[a]	Approximate Characteristics
Overall project	
Conveyance capacity (cfs)	15,000
Overall length (miles)	45
Intake facilities/approximately 60 acres average per site	
Number of on-bank fish-screened intakes	5
Maximum diversion capacity at each intake (cfs)	3,000
Intake pumping plants/(included with intake facilities)	
Six pumps per intake plus one spare, capacity per pump (cfs)	500
Total dynamic head (ft)	30–57
Tunnels/370 acres (permanent subsurface easement = 1,860 acres)	
Tunnel 1 connecting Intakes 1 and 2 to the intermediate forebay, maximum flow 6,000 cfs	
Tunnel length (ft)	20,000
Number of tunnel bores; number of shafts (total)	1; 2
Tunnel finished inside diameter (ft)	29
Tunnel 2 connecting intermediate pumping plant to Byron Tract Forebay, maximum flow 15,000 cfs	
Tunnel length (ft)	183,000
Number of tunnel bores; number of shaft sites (total)	2; 13
Tunnel finished inside diameter (ft)	33
Intermediate forebay/925 acres	
Water surface area (acres)	760
Active storage volume (af)	5,250
Emergency spillway inundation area (acres)	350
Intermediate pumping plant (at southern end of intermediate forebay)	
Number of pumps, capacity per pump (cfs)	10 at 1,500 (high head) 6 at 1,500 (low head)
Total dynamic head (ft)	0–90
Byron Tract Forebay/840 acres	
Water surface area (acres)	600
Active storage volume (af)	4,300
Power requirements	
Total conveyance electric load (MW)	182

af = acre-feet.
cfs = cubic feet per second.
ft = feet.
MW = megawatt.

[a] Acreage estimates represent the permanent surface footprints of selected facilities. Characteristics of other areas including temporary work areas and those designated for borrow, spoils, and resuable tunnel material storage are reported in Appendix 3C. Overall project acreage includes some facilities not listed, such as permanent access roads.

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Facilities under Alternative 1A would be operated to provide diversions up to a total of 15,000 cfs from the new north Delta intakes. The total diversion capacity for the south Delta export facilities would remain constant at 15,000 cfs due to the limited capacity of downstream conveyance structures, but the north Delta facilities would provide flexibility in where water is being diverted from (north vs. south Delta). Operations of the existing SWP/CVP south Delta export facilities would continue as described in Section 3.5.1 for the No Action Alternative.

Alternative 1A water conveyance operations would follow the criteria described as Operational Scenario A and would include criteria for north Delta diversion bypass flows, south Delta OMR flows, south Delta E/I ratio[16], flows over Fremont Weir into Yolo Bypass via operable gates, Delta inflow and outflow, Delta Cross Channel gate operations (in addition to NMFS BiOp Action IV.1.2), additional Rio Vista minimum flow requirements, operations for Delta water quality and residence, and water quality for agricultural and municipal/industrial diversions. These criteria are discussed in detail in Section 3.6.4.2, *North Delta and South Delta Water Conveyance Operational Criteria*.

3.5.2.2 Conservation Components

Alternative 1A includes activities intended to address conservation needs across a variety of habitat types and locations. Activities would be carried out in the habitat types and amounts listed below. These activities are described in detail in Section 3.6.2.

- 65,000 acres of restored tidal perennial aquatic, tidal mudflat, tidal freshwater emergent wetland, and tidal brackish emergent wetland natural communities within the BDCP ROAs (CM4).
- 10,000 acres of seasonally inundated floodplain habitat within the north, east, and/or south Delta ROAs (CM5).
- 20 linear miles of channel margin habitat enhancement in the Delta (CM6).
- 5,000 acres of restored native riparian forest and scrub habitat (CM7).
- 2,000 acres of restored grassland and 8,000 acres of protected or enhanced grassland within BDCP CZs 1, 8, and/or 11 (CM8 and CM3).
- Up to 67 acres of restored vernal pool complex and 72 acres of restored alkali seasonal wetland within CZs 1, 8, and/or 11 (CM9), 600 acres of protected vernal pool complex within CZs 1, 8, and/or 11 (CM3).
- 1,200 acres of restored nontidal marsh within CZs 2 and 4 and/or 5, and the creation of 500 acres of managed wetlands (CM10).
- 50 acres of protected nontidal marsh (CM3).
- 150 acres of protected alkali seasonal wetland complex in CZs 1, 8, and 11 (CM3 and CM11)
- 1,500 acres of protected managed wetlands (CM3 and CM11)
- 6,600 acres of protected managed wetland natural community (CM3)
- 48,125 acres of cultivated land (non-rice), up to 500 acres of cultivated land (rice), and 3,000 acres of cultivated land (rice or equivalent) protected (CM3 and CM11).

[16] In computing the E/I ratio for this alternative, the Sacramento River inflow is considered to be downstream of the north Delta intakes.

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3.5.2.3 Measures to Reduce Other Stressors and Avoidance and Minimization Measures

Measures to Reduce Other Stressors

Alternative 1A includes the following conservation measures (CM12–CM21) related to reducing other stressors (exposure to contaminants, competition, predation and changes to the ecosystem caused by nonnative species, entrainment at intake pumps not operated by SWP and CVP, and fish passage). These conservation measures are described in detail in Section 3.6.3.

- Methylmercury Management (CM12) – Actions implemented under this conservation measure would minimize conditions that promote production of methylmercury in restored areas and the subsequent introduction of methylmercury to the foodweb and to covered species.
- Invasive Aquatic Vegetation Control (CM13) – Actions implemented under this conservation measure would control the introduction and spread of invasive aquatic vegetation in BDCP aquatic restoration areas.
- Stockton Deep Water Ship Channel Dissolved Oxygen Levels (CM14) – Through funding provisions, this conservation measure would ensure that the DWSC Aeration Facility continues operations to maintain dissolved oxygen (DO) concentrations in the Stockton DWSC in accordance with total maximum daily load (TMDL) objectives.
- Localized Reduction of Predatory Fishes (Predator Control) (CM15) – Actions implemented under this conservation measure would reduce populations of predatory fishes at specific locations and eliminate or modify holding habitat for predators at selected locations of high predation risk.
- Nonphysical Fish Barriers (CM16) – Implementation of this conservation measure would entail the installation of nonphysical barriers (structures combining sound, light and bubbles) at the head of Old River, the Delta Cross Channel, and Georgiana Slough, and potentially at Turner Cut and Columbia Cut, to direct outmigrating juvenile salmonids away from Delta channels in which survival is lower.
- Illegal Harvest Reduction (CM17) – Under this conservation measure, funding would be provided to CDFW to increase the enforcement of fishing regulations to reduce illegal harvest of Chinook salmon, Central Valley steelhead, green sturgeon, and white sturgeon in the Delta, bays, and upstream waterways.
- Conservation Hatcheries (CM18) – This conservation measure would establish new conservation propagation programs and expand the existing program for delta smelt and longfin smelt to ensure the existence of refugial captive populations of both delta smelt and longfin smelt, thereby helping to reduce risks of extinction for these species.
- Urban Stormwater Treatment (CM19) – Under this conservation measure, the BDCP Implementation Office would provide a mechanism, through funding, for implementing stormwater treatment measures in urban areas that would result in decreased discharge of contaminants to the Delta.
- Recreational Users Invasive Species Program (CM20) – Under this conservation measure, the BDCP Implementation Office would fund a Delta Recreational Users Invasive Species Program, which would implement actions to prevent the introduction of new aquatic species and reduce

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the spread of existing aquatic invasive species via recreational watercraft, trailers, and other mobile recreational equipment used in aquatic environments in the Plan Area.

- Nonproject Diversions (CM21) – Under this conservation measure, the BDCP Implementation Office would fund actions that would minimize the potential for entrainment of covered fish species associated with operation of nonproject diversions (diversions other those related to the SWP and CVP).

Avoidance and Minimization Measures

The primary purpose of *CM22 Avoidance and Minimization Measures* is to incorporate measures into BDCP activities that will avoid or minimize direct take of covered species and minimize impacts on natural communities that provide habitat for covered species. This conservation measure would entail the implementation of avoidance and minimization measures (AMMs) (e.g., best management practices [BMPs] to avoid erosion, sedimentation, and contaminant spills) for each BDCP project, based on the comprehensive avoidance and minimization measures described in the BDCP Appendix 3.C, *Avoidance and Minimization Measures*.

3.5.2.4 Issuance of Federal Incidental Take Permits

USFWS and NMFS would issue 50-year ITPs under ESA Section 10(a)(1)(B) to DWR for the incidental take of federally listed species from the construction, operation, and maintenance associated with water conveyance, ecosystem restoration, and other activities as described in the BDCP and under Alternative 1A (see Table 1-1 in Chapter 1, *Introduction*, for a list of the species for which BDCP proponents are seeking coverage).

3.5.2.5 Issuance of State Incidental Take Permits

CDFW would approve the BDCP as an NCCP and issue permits pursuant to Fish and Game Code Section 2835 to DWR for the incidental take of covered species from the construction, operation, and maintenance associated with water conveyance, ecosystem restoration, and other activities as described in the BDCP and under Alternative 1A (see Table 1-1 in Chapter 1, *Introduction*, for a list of the species for which BDCP proponents are seeking coverage).

3.5.3 Alternative 1B—Dual Conveyance with East Alignment and Intakes 1–5 (15,000 cfs; Operational Scenario A)

3.5.3.1 Physical and Operational Components

Under Alternative 1B, five fish-screened intakes on the east bank of the Sacramento River between Clarksburg and Walnut Grove would divert water into pipelines leading to intake pumping plants. Water would travel through sedimentation basins and be pumped into another set of pipelines, eventually reaching a lined or unlined canal. Once in the canal, gravity would carry water south along the eastern side of the Delta to an intermediate pumping plant, where it would be raised to an elevation allowing gravity to carry it through a continuing canal to the new Byron Tract Forebay, adjacent to and south of Clifton Court Forebay. Along the way, diverted water would travel under existing watercourses through culvert siphons or tunnel siphons. This arrangement would enhance water supply operational flexibility, using forebay storage capacity to regulate flows from north Delta intakes to south Delta pumping plants. Byron Tract Forebay would be designed to provide

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water to Jones pumping plant 24 hours per day. A map and schematic depicting the conveyance facilities associated with Alternative 1B are provided in Figures 3-4 and 3-5; characteristics of this alternative are summarized in Table 3-1. Figure 3-4 shows the major construction features associated with this proposed water conveyance facility alignment. A detailed depiction is provided in Figure M3-2 in the Mapbook Volume. Note that not all these structures would be constructed under this alternative.

New connections would be created between the new Byron Tract Forebay and the Banks and Jones pumping plants, along with control structures to regulate the relative quantities of water flowing from the north Delta and the south Delta. Use of existing SWP/CVP south Delta export facilities would continue. This facility could convey up to 15,000 cfs from the north Delta. The total diversion capacity for the south Delta export facilities would remain constant at 15,000 cfs due to the limited capacity of downstream conveyance structures, but the north Delta facilities would provide flexibility in where water is being diverted from (north vs. south Delta). The water conveyance alignment would be approximately 49 miles long from the north Delta intakes to the Byron Tract Forebay.

Alternative 1B water conveyance operations would follow criteria described as Operational Scenario A and would include criteria for north Delta diversion bypass flows, south Delta OMR flows, south Delta E/I ratio,[17] flows over Fremont Weir into Yolo Bypass via operable gates, Delta inflow and outflow, Delta Cross Channel gate operations (in addition to NMFS BiOp Action IV.1.2), additional Rio Vista minimum flow requirements, operations for Delta water quality and residence, and water quality for agricultural and municipal/industrial diversions. Water conveyance operational criteria are discussed in detail in Section 3.6.4.2, *North Delta and South Delta Water Conveyance Operational Criteria*.

As shown in Table 3-5, Alternative 1B would have the same water conveyance facility components as Alternative 1A between the intakes and the start of the primary conveyance, except that the primary conveyance would be a lined or unlined canal in the east Delta rather than pipelines/ tunnels, and there would be no intermediate forebay. Additionally, Alternative 1B would include the following new water facility components.

- Conveyance pipelines between transition structures and canal transition structures with radial gates and stop logs.
- Lined or unlined canal between the intake pumping plants and an intermediate pumping plant.
- An intermediate pumping plant just north of the town of Holt would lift diverted water from the northern two-thirds of the canal to the southern one-third; the plant would include a small forebay or transition from the upstream canal to the pump bays, an electrical substation, and transformers.
- A transition structure and discharge pipelines connecting the intermediate pumping plant to the downstream canal.
- A lined or unlined canal between the intermediate pumping plant and Byron Tract Forebay.
- Eight inverted culvert siphons along the conveyance alignment to convey diverted water under existing shallow watercourses.

[17] In computing the E/I ratio for this alternative, the Sacramento River inflow is considered to be downstream of the north Delta intakes.

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- Three tunnel siphons along the conveyance alignment to convey diverted water under existing deep watercourses.
- Nineteen bridge crossings (two state highway and seventeen local, county, or private road bridges) along the conveyance alignment.
- Other road, rail, and utility crossings, including drainage and irrigation facilities.

An overview of the proposed water conveyance features and characteristics (e.g., lengths, volumes,) is presented in Table 3-8. Detailed discussions of water conveyance facility components, including construction detail, are provided in Section 3.6.1, *Water Conveyance Facility Components (CM1)*.

Table 3-8. Summary of Physical Characteristics under Alternatives 1B, 2B, and 6B

Feature Description/Acreage[a]	Approximate Characteristics
Overall project	
Potential export capacity (cfs)	15,000
Overall length (miles)	49
Intake facilities/ approximately 60 acres average per site	
Number of on-bank fish-screened intakes	5
Maximum diversion capacity at each intake (cfs)	3,000
Intake pumping plants/(included with intake facilities)	
One pumping plant with sedimentation basin per intake (each)	5
Six pumps per intake plus one spare, capacity per pump (cfs)	500
Total dynamic head (ft)	21
Isolated conveyance canal/6,610 acres	
Type	Unlined or lined
Top width (approximate maximum, ft)	700 (location-specific)
Invert width (ft)	340
Depth (bottom to water surface, ft)	23.5
Side slopes (H:V)	3:1, 8:1
Average permanent ROW width (ft)	1,400
Culvert siphons (comprised of four box culverts, each 26 by 26 feet)/160 acres (surface)	
Stone Lakes Drain, length (ft)	1,740
Beaver Slough, length (ft)	1,930
Hog Slough, length (ft)	1,970
Sycamore Slough, length (ft)	2,010
White Slough, length (ft)	2,300
Disappointment Slough, length (ft)	2,410
BNSF Railroad, length (ft)	1,470
Middle River, length (ft)	2,410
Tunnel siphons/95 acres (subsurface)	
Lost Slough/Mokelumne River	
Tunnel siphon length (ft)	7,450
Number of tunnel siphon bores; number of shafts (total)	2; 4
Tunnel siphon finished inside diameter (ft)	33

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Feature Description/Acreage[a]	Approximate Characteristics
San Joaquin River	
Tunnel siphon length (ft)	3,240
Number of tunnel siphon bores; number of shafts (total)	2; 4
Tunnel siphon finished inside diameter (ft)	33
Old River	
Tunnel siphon length (ft)	1,920
Number of tunnel siphon bores; number of shafts (total)	2; 4
Tunnel siphon finished inside diameter (ft)	33
Intermediate pumping plant/(within canal footprint on Lower Roberts Island)	
Number of pumps, capacity per pump (cfs)	15 at 1,000 2 at 500
Total dynamic head (ft)	31
Byron Tract Forebay/860 acres	
Type	Unlined
Water surface area (acres)	600
Active storage volume (af)	4,300
Power requirements	
Total conveyance electric load (MW)	82

af = acre-feet.
BNSF = Burlington Northern and Santa Fe Railroad.
cfs = cubic feet per second.
ft = feet/foot.
H:V = horizontal to vertical ratio.
MW = megawatt.
ROW = right-of-way.

[a] Acreage estimates represent the permanent footprints of selected facilities. Characteristics of other areas including temporary work areas and those designated for borrow, spoils, and reusable tunnel material storage are reported in Appendix 3C. Overall project acreage includes facilities not listed, such as bridge abutments.

3.5.3.2 Conservation Components

Conservation components under Alternative 1B would be identical to those under Alternative 1A.

3.5.3.3 Measures to Reduce Other Stressors and Avoidance and Minimization Measures

Measures to reduce other stressors and AMMs under Alternative 1B would be the same as those under Alternative 1A.

3.5.3.4 Issuance of Federal Incidental Take Permits

USFWS and NMFS would issue 50-year ITPs under ESA Section 10(a)(1)(B) to DWR for the incidental take of federally listed species from the construction, operation, and maintenance associated with water conveyance, ecosystem restoration, and other activities as described in the BDCP and under Alternative 1B (see Table 1-1 in Chapter 1, *Introduction*, for a list of the species for which BDCP proponents are seeking coverage).

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3.5.3.5 Issuance of State Incidental Take Permits

CDFW would approve the BDCP as an NCCP and issue permits pursuant to Fish and Game Code Section 2835 to DWR for the incidental take of covered species from the construction, operation, and maintenance associated with water conveyance, ecosystem restoration, and other activities as described in the BDCP and under Alternative 1B (see Table 1-1 in Chapter 1, *Introduction*, for a list of the species for which BDCP proponents are seeking coverage).

3.5.4 Alternative 1C—Dual Conveyance with West Alignment and Intakes W1–W5 (15,000 cfs; Operational Scenario A)

3.5.4.1 Physical and Operational Components

Under Alternative 1C, five fish-screened intakes on the west bank of the Sacramento River between Clarksburg and Walnut Grove would divert water into pipelines leading to intake pumping plants. Water would travel through sedimentation basins and be pumped into another set of pipelines to a lined or unlined canal. Water would be carried south along the western side of the Delta to an intermediate pumping plant and then pumped through a tunnel to a continuing canal to the proposed Byron Tract Forebay immediately northwest of Clifton Court Forebay. Along the conveyance route, diverted water would travel under existing watercourses and one rail crossing through culvert siphons. This arrangement would enhance water supply operational flexibility, using forebay storage capacity to regulate flows from north Delta intakes to south Delta pumping plants. As under Alternative 1B, Byron Tract Forebay would be designed to provide water to Jones pumping plant 24 hours per day. A map and schematic depicting the conveyance facilities associated with Alternative 1C are provided in Figures 3-6 and 3-7; characteristics of this alternative are summarized in Table 3-1. Figure 3-6 shows the major construction features associated with this proposed water conveyance facility alignment. A detailed depiction is provided in Figure M3-3 in the Mapbook Volume.

New connections would be created between Byron Tract Forebay and the Banks and Jones pumping plants, along with control structures to regulate the relative quantities of water flowing from the north Delta and the south Delta. Use of existing SWP/CVP south Delta export facilities would continue. This facility could convey up to 15,000 cfs from the north Delta. The total diversion capacity for the south Delta export facilities would remain constant at 15,000 cfs due to the limited capacity of downstream conveyance structures, but the north Delta facilities would provide flexibility in where water is being diverted from (north vs. south Delta). The west alignment would be approximately 52 miles long from the north Delta intakes to the Byron Tract Forebay.

Alternative 1C water conveyance operational criteria include north Delta diversion bypass flow criteria, south Delta OMR flow criteria, south Delta E/I ratio,[18] flows over Fremont Weir into Yolo Bypass via operable gates, Delta inflow and outflow criteria, Delta Cross Channel gate operations (in addition to NMFS BiOp Action IV.1.2), additional Rio Vista minimum flow requirements, operations for Delta water quality and residence criteria, and water quality criteria for agricultural and

[18] In computing the E/I ratio for this alternative, the Sacramento River inflow is considered to be downstream of the north Delta intakes.

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municipal/industrial diversions. Water conveyance operational criteria are discussed in detail in Section 3.6.4.2, *North Delta and South Delta Water Conveyance Operational Criteria*.

As shown in Table 3-5, Alternative 1C would have the same water conveyance facility components as Alternative 1A, except that the primary conveyance would be a combination of lined or unlined canal segments and pipelines/tunnels; the five intakes and associated intake facilities (e.g., sedimentation basins, solids handling facilities, intake pumping plants, and associated pipelines) would be located on the west bank of the Sacramento River; and there would be no intermediate forebay. Additionally, Alternative 1C would include the following new water facility components.

- Conveyance pipelines between transition structures and canal transition structures with radial gates and stop logs.
- A lined or unlined canal between the intake pumping plants and an intermediate pumping plant.
- An intermediate pumping plant at the entrance of a tunnel to convey diverted water through the tunnel.
- A dual-bore tunnel extending 17 miles between the intermediate pumping plant and a second canal segment.
- A lined or unlined canal between the tunnel exit portal and Byron Tract Forebay.
- Byron Tract Forebay immediately northwest of Clifton Court Forebay.
- Connections to the Banks and Jones pumping plants, comprising a canal between Byron Tract Forebay and the approach canals to the Banks and Jones Pumping Plants and sets of gates in the approach canals upstream of the connection to the canal from Byron Tract Forebay.
- Nine inverted culvert siphons along the conveyance alignment to convey diverted water under ten existing shallow watercourses and one rail line.
- Sixteen bridge crossings along the conveyance alignment.
- Other road and utility crossings, including drainage and irrigation facilities.

An overview of the proposed water conveyance features and characteristics (e.g., lengths, volumes) is presented in Table 3-9. Detailed discussions of water conveyance facilities components, including construction detail, are provided in Section 3.6.1, *Water Conveyance Facility Components (CM1)*, and a detailed depiction of the physical components is provided in Figure M3-3 in the Mapbook Volume.

Table 3-9. Summary of Physical Characteristics under Alternatives 1C, 2C, and 6C

Feature Description/Acreage[a]	Approximate Characteristics
Overall project	
Potential export capacity (cfs)	15,000
Overall length (miles)	52
Intake facilities/approximately 60 acres average per site	
Number of on-bank fish-screened intakes	5
Maximum diversion capacity at each intake (cfs)	3,000
Intake pumping plants/(included with intake facilities)	
One pumping plant with sedimentation basin per intake (each)	5
Six pumps per intake plus one spare, capacity per pump (cfs)	500

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Feature Description/Acreage[a]	Approximate Characteristics
Total dynamic head (ft)	26–30
Isolated conveyance canals/4,490 acres	
Type	Unlined or lined
Top width (approximate maximum, ft)	700 (location-specific)
Invert width (ft)	340
Depth (bottom to water surface, ft)	23.5
Side slopes (H:V)	3:1, 8:1
Average permanent ROW width (ft)	1,400
Culvert siphons (comprised of four box culverts, each 26 by 26 feet)/170 acres (surface)	
Elk Slough, length (ft)	1,300
Duck Slough, length (ft)	1,300
Miner Slough, length (ft)	2,000
Rock Slough, length (ft)	2,000
BNSF Railroad, length (ft)	1,880
Main Canal, length (ft)	1,410
Kellogg Creek, length (ft)	1,380
Kendall Creek Overflow, length (ft)	1,740
Italian Slough, length (ft)	1,610
Intermediate pumping plant/(within canal footprint on Ryer Island)	
Number of pumps, capacity per pump (cfs)	15 at 1,000 2 at 500
Total dynamic head (ft)	55
Concrete-lined soft ground tunnel/75 acres (permanent subsurface easement = 780 acres)	
Tunnel length (ft)	89,650
Number of tunnel bores	2
Tunnel finished inside diameter (ft)	33
Byron Tract Forebay/780	
Type	Unlined
Water surface area (acres)	600
Active storage volume (af)	4,300
Power requirements	
Total conveyance electric load (MW)	138 MW

af = acre-feet
BNSF = Burlington Northern and Santa Fe Railroad
cfs = cubic feet per second
ft = feet/foot
H:V = horizontal to vertical ratio
MW = megawatt
ROW = right-of-way

[a] Acreage estimates represent the permanent footprints of selected facilities. Characteristics of other areas including temporary work areas and those designated for borrow, spoils, and reusable tunnel material storage are reported in Appendix 3C. Overall project acreage includes some facilities not listed, such as bridge abutments.

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3.5.4.2 Conservation Components

Conservation components under Alternative 1C would be identical to those under Alternative 1A.

3.5.4.3 Measures to Reduce Other Stressors and Avoidance and Minimization Measures

Measures to reduce other stressors and AMMs under Alternative 1C would be the same as those under Alternative 1A.

3.5.4.4 Issuance of Federal Incidental Take Permits

USFWS and NMFS would issue 50-year ITPs under ESA Section 10(a)(1)(B) to DWR for the incidental take of federally listed species from the construction, operation, and maintenance associated with water conveyance, ecosystem restoration, and other activities as described in the BDCP and under Alternative 1C (see Table 1-1 in Chapter 1, *Introduction*, for a list of the species for which BDCP proponents are seeking coverage).

3.5.4.5 Issuance of State Incidental Take Permits

CDFW would approve the BDCP as an NCCP and issue permits pursuant to Fish and Game Code Section 2835 to DWR for the incidental take of covered species from the construction, operation, and maintenance associated with water conveyance, ecosystem restoration, and other activities as described in the BDCP and under Alternative 1C (see Table 1-1 in Chapter 1, *Introduction*, for a list of the species for which BDCP proponents are seeking coverage).

3.5.5 Alternative 2A—Dual Conveyance with Pipeline/Tunnel and Five Intakes (15,000 cfs; Operational Scenario B)

3.5.5.1 Physical and Operational Components

Like Alternative 1A, Alternative 2A would consist of pipelines and tunnels generally located in the central Delta with an intermediate forebay; however, Alternative 2A could potentially entail two different intake and intake pumping plant locations. As an alternative to Intakes 1–5, intake locations 1, 2, 3, 6, and 7 are being considered. Unlike the other intakes, Intakes 6 and 7 would be downstream of Sutter and Steamboat Sloughs. This alternative would convey water from five fish-screened intakes between Clarksburg and Walnut Grove to a new Byron Tract Forebay adjacent to Clifton Court Forebay. Use of existing SWP and CVP south Delta export facilities would continue. A map and schematic depicting the conveyance facilities associated with Alternative 2A are provided in Figures 3-2 and 3-3; the alternative's characteristics are summarized in Table 3-1 (the draft map and original schematic for Alternative 2A is the same as that for Alternative 1A). Figure 3-2 shows the major construction features associated with this proposed water conveyance facility alignment. A detailed depiction of these features is provided in Figure M3-1 in the Mapbook Volume. Note that not all these structures would be constructed under this alternative.

This facility could convey up to 15,000 cfs from the north Delta. Alternative 2A water conveyance operational criteria would be modified from those described under Alternatives 1A, 1B, and 1C. The modifications, developed considering input from USFWS, NMFS, and CDFW, are summarized as Operational Scenario B and include incorporation of Fall X2 criteria and less negative south Delta

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OMR flows, as described in Section 3.6.4.2, *North Delta and South Delta Water Conveyance Operational Criteria*. Operational Scenario B also includes north Delta diversion bypass flow criteria, south Delta E/I ratio,[19] flows over Fremont Weir into Yolo Bypass via operable gates, Delta inflow and outflow criteria, Delta Cross Channel gate operations (in addition to NMFS BiOp Action IV.1.2), additional Rio Vista minimum flow requirements, operations for Delta water quality and residence criteria, and water quality criteria for agricultural and municipal/industrial diversions.

An overview of the proposed water conveyance features and characteristics (e.g., lengths, volumes) is presented in Table 3-7. Detailed discussions of water conveyance facilities components, including construction detail, are provided in Section 3.6.1, *Water Conveyance Facility Components (CM1)*.

3.5.5.2 Conservation Components

Conservation components under Alternative 2A would be the same as those under Alternative 1A.

3.5.5.3 Measures to Reduce Other Stressors and Avoidance and Minimization Measures

Measures to reduce other stressors and AMMs under Alternative 2A would be the same as those under Alternative 1A.

3.5.5.4 Issuance of Federal Incidental Take Permits

USFWS and NMFS would issue 50-year ITPs under ESA Section 10(a)(1)(B) to DWR for the incidental take of federally listed species from the construction, operation, and maintenance associated with water conveyance, ecosystem restoration, and other activities as described in the BDCP and under Alternative 2A (see Table 1-1 in Chapter 1, *Introduction*, for a list of the species for which BDCP proponents are seeking coverage).

3.5.5.5 Issuance of State Incidental Take Permits

CDFW would approve the BDCP as an NCCP and issue permits pursuant to Fish and Game Code Section 2835 to DWR for the incidental take of covered species from the construction, operation, and maintenance associated with water conveyance, ecosystem restoration, and other activities as described in the BDCP and under Alternative 2A (see Table 1-1 in Chapter 1, *Introduction*, for a list of the species for which BDCP proponents are seeking coverage).

3.5.6 Alternative 2B—Dual Conveyance with East Alignment and Five Intakes (15,000 cfs; Operational Scenario B)

3.5.6.1 Physical and Operational Components

Alternative 2B would include the same physical/structural water conveyance components and eastern alignment as Alternative 1B, but, like Alternative 2A, could entail two different intake and intake pumping plant locations downstream of Steamboat and Sutter Sloughs. Currently, as an alternative to Intakes 1–5, intake locations 1, 2, 3, 6, and 7 are being considered. Proposed water

[19] In computing the E/I ratio for this alternative, the Sacramento River inflow is considered to be downstream of the north Delta intakes.

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supply operations under Alternative 2B would follow Operational Scenario B, and could convey up to 15,000 cfs from the north Delta. Use of existing SWP/CVP south Delta export facilities would continue.

A map and schematic depicting the conveyance facilities associated with Alternative 2B are provided in Figures 3-4 and 3-5 (the draft map and original schematic for Alternative 2B is the same as that for Alternative 1B); characteristics of this alternative are summarized in Table 3-1. Figure 3-4 shows the major construction features (including work and borrow/spoil areas) associated with this proposed alignment. A detailed depiction of these features is provided in Figure M3-2 in the Mapbook Volume. Note that not all these structures would be constructed under this alternative. An overview of the proposed water conveyance features and characteristics (e.g., lengths, volumes) is presented in Table 3-8. Detailed discussions of water conveyance facilities components, including construction detail, are provided in Section 3.6.1, *Water Conveyance Facility Components (CM1)*.

3.5.6.2 Conservation Components

Conservation components under Alternative 2B would be the same as those under Alternative 1A.

3.5.6.3 Measures to Reduce Other Stressors

Measures to reduce other stressors under Alternative 2B would be the same as those under Alternative 1A.

3.5.6.4 Issuance of Federal Incidental Take Permits

USFWS and NMFS would issue 50-year ITPs under ESA Section 10(a)(1)(B) to DWR for the incidental take of federally listed species from the construction, operation, and maintenance associated with water conveyance, ecosystem restoration, and other activities as described in the BDCP and under Alternative 2B (see Table 1-1 in Chapter 1, *Introduction*, for a list of the species for which BDCP proponents are seeking coverage).

3.5.6.5 Issuance of State Incidental Take Permits

CDFW would approve the BDCP as an NCCP and issue permits pursuant to Fish and Game Code Section 2835 to DWR for the incidental take of covered species from the construction, operation, and maintenance associated with water conveyance, ecosystem restoration, and other activities as described in the BDCP and under Alternative 2B (see Table 1-1 in Chapter 1, *Introduction*, for a list of the species for which BDCP proponents are seeking coverage).

3.5.7 Alternative 2C—Dual Conveyance with West Alignment and Intakes W1–W5 (15,000 cfs; Operational Scenario B)

3.5.7.1 Physical and Operational Components

Alternative 2C would include the same physical/structural water conveyance components and western alignment as Alternative 1C. Proposed water supply operations under Alternative 2C would follow Operational Scenario B, and could convey up to 15,000 cfs from the north Delta. Use of existing SWP/CVP south Delta export facilities would continue.

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A map and schematic depicting the conveyance facilities associated with Alternative 2C are provided in Figures 3-6 and 3-7 (the draft map and original schematic for Alternative 2C is the same as that for Alternative 1C); characteristics of this alternative are summarized in Table 3-1. An overview of the proposed water conveyance features and characteristics (e.g., lengths, volumes) is presented in Table 3-9. Figure 3-6 shows the major construction features associated with this proposed water conveyance facility alignment. A detailed depiction of these features is provided in Figure M3-3 in the Mapbook Volume. Note that not all these structures would be constructed under this alternative. Detailed discussions of water conveyance facilities components, including construction detail, are provided in Section 3.6.1, *Water Conveyance Facility Components (CM1)*.

3.5.7.2 Conservation Components

Conservation components under Alternative 2C would be the same as those under Alternative 1A.

3.5.7.3 Measures to Reduce Other Stressors

Measures to reduce other stressors under Alternative 2C would be the same as those under Alternative 1A.

3.5.7.4 Issuance of Federal Incidental Take Permits

USFWS and NMFS would issue 50-year ITPs under ESA Section 10(a)(1)(B) to DWR for the incidental take of federally listed species from the construction, operation, and maintenance associated with water conveyance, ecosystem restoration, and other activities as described in the BDCP and under Alternative 2C (see Table 1-1 in Chapter 1, *Introduction*, for a list of the species for which BDCP proponents are seeking coverage).

3.5.7.5 Issuance of State Incidental Take Permits

CDFW would approve the BDCP as an NCCP and issue permits pursuant to Fish and Game Code Section 2835 to DWR for the incidental take of covered species from the construction, operation, and maintenance associated with water conveyance, ecosystem restoration, and other activities as described in the BDCP and under Alternative 2C (see Table 1-1 in Chapter 1, *Introduction*, for a list of the species for which BDCP proponents are seeking coverage).

3.5.8 Alternative 3—Dual Conveyance with Pipeline/Tunnel and Intakes 1 and 2 (6,000 cfs; Operational Scenario A)

3.5.8.1 Physical and Operational Components

Alternative 3 would comprise physical/structural components similar to those under Alternative 1A, but would entail only two fish-screened intakes (Intakes 1 and 2; Figure 3-2) and intake pumping plants. These intake locations represent those locations selected for the analysis of this alternative. Based on the results of an October 2011 workshop on the Phased Construction of North Delta Intake Facilities (see Appendix 3F, *Intake Location Analysis*), different combinations of intakes could be constructed under this alternative.[20] Once an alternative is selected as part of the final

[20] For example, Intakes 2 and 3, Intakes 2 and 5, or Intakes 3 and 5 could be proposed when a final BDCP EIR/EIS is approved.

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BDCP EIR/EIS, a decision regarding intake locations would be made. Conveyance pipelines and the initial tunnel between the intake pumping plants and the intermediate forebay would be adjusted to the intake locations. Water would be conveyed from two intakes between Clarksburg and Walnut Grove to a new Byron Tract Forebay adjacent to Clifton Court Forebay. Water supply operations would be guided by criteria under Operational Scenario A (Table 3-1), except that this alternative would convey up to 6,000 cfs rather than up to 15,000 cfs from the north Delta. Use of existing SWP/CVP south Delta export facilities would continue.

A map and schematic depicting the conveyance facilities associated with Alternative 3 are provided in Figures 3-2 and 3-8 (the draft map for Alternative 3 is identical to the map of Alternative 1 A); characteristics of this alternative are summarized in Table 3 -1. An overview of the proposed water conveyance features and characteristics (e.g., lengths, volumes) is presented in Table 3 -10. Detailed discussions of water conveyance facilities components, including construction detail, are provided in Section 3.6.1, *Water Conveyance Facility Components (CM1)*. Figure 3-2 shows the major construction features associated with this proposed water conveyance facility alignment. A detailed depiction of these features is provided in Figure M3-1 in the Mapbook Volume. Note that not all these structures would be constructed under this alternative.

Table 3-10. Summary of Physical Characteristics under Alternative 3

Feature Description/Surface Acreage[a]	Approximate Characteristics
Overall project	
Conveyance capacity (cfs)	6,000
Overall length (miles)	45
Intake facilities/approximately 60 acres average per site	
Number of on-bank fish-screened intakes	2
Maximum diversion capacity at each intake (cfs)	3,000
Intake pumping plants/(included with intake facilities)	
Six pumps per intake plus one spare, capacity per pump (cfs)	500
Total dynamic head (ft)	30–57
Tunnels/370 acres (permanent subsurface easement = 1,860 acres)	
Tunnel 1 connecting Intakes 1 and 2 to the intermediate forebay, maximum flow 6,000 cfs	
Tunnel length (ft)	20,000
Number of tunnel bores; number of shafts (total)	1; 2
Tunnel finished inside diameter (ft)	26
Tunnel 2 connecting intermediate pumping plant to Byron Tract Forebay, maximum flow 6,000 cfs	
Tunnel length (ft)	183,000
Number of tunnel bores; number of shaft sites (total)	2; 13
Tunnel finished inside diameter (ft)	23
Intermediate forebay/925 acres	
Water surface area (acres)	760
Active storage volume (af)	5,250
Emergency spillway inundation area (acres)	350
Intermediate pumping plant (at southern end of intermediate forebay)	
Number of pumps, capacity per pump (cfs)	6 at 1,000 cfs and 1 at 500 cfs
Total dynamic head (ft)	0–90

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Feature Description/Surface Acreage[a]	Approximate Characteristics
Byron Tract Forebay/840 acres	
Water surface area (acres)	600
Active storage volume (af)	4,300
Power requirements	
Total conveyance electric load (MW)	33

af = acre-feet.
cfs = cubic feet per second.
ft = feet.
MW = megawatt.
[a] Acreage estimates represent the permanent surface footprints of selected facilities. Characteristics of other areas including temporary work areas and those designated for borrow, spoils, and resuable tunnel material storage are reported in Appendix 3C. Overall project acreage includes some facilities not listed, such as permanent access roads.

3.5.8.2 Conservation Components

Conservation components under Alternative 3 would be the same as those under Alternative 1A.

3.5.8.3 Measures to Reduce Other Stressors and Avoidance and Minimization Measures

Measures to reduce other stressors and AMMs under Alternative 3 would be the same as those under Alternative 1A.

3.5.8.4 Issuance of Federal Incidental Take Permits

USFWS and NMFS would issue 50-year ITPs under ESA Section 10(a)(1)(B) to DWR for the incidental take of federally listed species from the construction, operation, and maintenance associated with water conveyance, ecosystem restoration, and other activities as described in the BDCP and under Alternative 3 (see Table 1-1 in Chapter 1, *Introduction*, for a list of the species for which BDCP proponents are seeking coverage).

3.5.8.5 Issuance of State Incidental Take Permits

CDFW would approve the BDCP as an NCCP and issue permits pursuant to Fish and Game Code Section 2835 to DWR for the incidental take of covered species from the construction, operation, and maintenance associated with water conveyance, ecosystem restoration, and other activities as described in the BDCP and under Alternative 3 (see Table 1-1 in Chapter 1, *Introduction*, for a list of the species for which BDCP proponents are seeking coverage).

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3.5.9 Alternative 4—Dual Conveyance with Modified Pipeline/Tunnel and Intakes 2, 3, and 5 (9,000 cfs; Operational Scenario H; CEQA Preferred Alternative)

3.5.9.1 Physical and Operational Components

Under Alternative 4, water would primarily be conveyed from the north Delta to the south Delta through pipelines/tunnels. Water would be diverted from the Sacramento River through three fish-screened intakes on the east bank of the Sacramento River between Clarksburg and Courtland. Water would travel in gravity collector pipelines from the intakes to a sedimentation basin before reaching the intake pumping plants. From the intake pumping plants water would be pumped into short segments of conveyance pipelines, and then through an initial single-bore tunnel, which would lead to an intermediate forebay on Glannvale Tract. From the southern end of this forebay, water would pass through an outlet structure into a dual-bore tunnel where it would flow by gravity to the south Delta. Water would then be conveyed through a siphon under Italian Slough, and then into the north cell of the expanded Clifton Court Forebay, which would be dredged and redesigned to provide an area isolating water flowing from the new north Delta facilities. The expanded Clifton Court Forebay would be designed to provide water to Jones pumping plant 24 hours per day.

A map and a schematic diagram depicting the conveyance facilities associated with Alternative 4 are provided in Figures 3-2, 3-9, and 3-10. Figure 3-2 shows the major construction features associated with this proposed water conveyance facility alignment; a detailed depiction is provided in Figure M3-4 in the Mapbook Volume. New siphon and canal connections would be constructed between the north cell of the expanded Clifton Court Forebay and the Banks and Jones pumping plants, along with control structures to regulate the relative quantities of water flowing from the north Delta and the south Delta. Alternative 4 would entail the continued use of the SWP/CVP south Delta export facilities.

Alternative 4 would include the following new water conveyance facilities components, which are described in detail in Section 3.6.1, *Water Conveyance Facility Components (CM1)*. An overview of the proposed water conveyance features and characteristics (e.g., lengths, volumes) is presented in Table 3-11.

- Three north Delta intakes with fish screens along the east bank of the Sacramento River (Intakes 2, 3, and 5).
- Pipelines conveying water from intakes to intake pumping plants.
- Sedimentation basins and solids handling facilities.
- Intake pumping plants at each intake location; associated facilities include an access road, electrical substation with transformers, switching equipment, communication devices, and surge towers.
- Discharge pipelines conveying water from intake pumping plants to initial tunnels.
- One single-bore tunnel connecting Intake Pumping Plant 2 to Intake Pumping Plant 3, and the intermediate forebay (Tunnel 1a), with a launch, retrieval, and vent shaft. The segment of this tunnel between Intake Pumping Plants 2 and 3 would have an inside diameter of 20 feet and the segment between Intake Pumping Plant 3 and the intermediate forebay would have an inside diameter of 29 feet.

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- One 20-foot-inside-diameter single-bore tunnel between Intake Pumping Plant 5 and the intermediate forebay (Tunnel 1b), with a launch, retrieval, and vent shaft.
- Valve vaults, flowmeter vaults, and discharge headers between discharge pipelines and larger conveyance tunnels, junction structures, or tunnel shafts.
- Transition structures, such as stop logs and vents, between tunnel shafts and the intermediate forebay.
- Inlet structures with roller gates, trashracks, gate hoist gantry, and stop logs.
- An intermediate forebay, a pass-through facility.
- An outlet structure to convey water from the intermediate forebay into each main tunnel bore (Tunnel 2) via a vertical shaft.
- Two 40-foot-inside-diameter tunnels (Tunnel 2) between the intermediate forebay and a culvert siphon leading to the expanded Clifton Court Forebay, with large-diameter TBM launch/retrieval shafts, safe haven work areas, and vent shafts at approximately 4-mile intervals.
- An expanded Clifton Court Forebay with new embankments and an embankment dividing the forebay into a north cell and a south cell.
- Connections and control structures to the Banks and Jones pumping plants.
    - A culvert siphon between the north cell of Clifton Court Forebay and a new canal segment.
    - A canal and set of gates between the siphon leading from the north cell and the approach canal to the Jones Pumping Plant.
    - A culvert siphon, two segments of canal, and a set of gates between the siphon leading from the north cell of Clifton Court Forebay and the approach canal to Banks Pumping Plant, downstream of Skinner Fish Facility.
    - A set of gates in the existing approach canal to the Banks Pumping Plant downstream of the connection to the north cell of Clifton Court Forebay.
    - A set of gates in the existing approach canal to the Jones Pumping Plant downstream of the connection to Old River.
- Transmission lines running from the existing electrical grid to project substations. Under Alternative 4, the method of delivering power to construct and operate the water conveyance facilities is assumed to be a "split" system that would connect to the existing grid in two different locations—one in the northern section of the alignment, and one in the southern section of the alignment.
- Borrow areas and areas identified for the storage and/or disposal of spoil, RTM, and dredged material.

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Table 3-11. Summary of Physical Characteristics under Alternative 4

Feature Description/Surface Acreage[a]	Approximate Characteristics
Overall project/2,000 acres	
Conveyance capacity (cfs)	9,000
Overall length (miles)	45
Intake facilities/approximately 90 acres average per site	
Number of on-bank fish-screened intakes	3
Maximum diversion capacity at each intake (cfs)	3,000
Intake pumping plants/(included with intake facilities)	
Six pumps per intake plus one spare, capacity per pump (cfs)	500
Total dynamic head (ft)	59–73
Tunnels/170 acres (permanent subsurface easement = 1,720 acres)	
Tunnel 1a connecting Intakes 2 and 3 to the intermediate forebay	
Tunnel length (ft)	47,400
Number of tunnel bores; number of shafts (total)	1; 4
Tunnel finished inside diameter (ft)	20 (between Intakes 2 and 3); 29 (between Intake 3 and the intermediate forebay)
Tunnel 1b connecting Intake 5 to the intermediate forebay	
Tunnel length (ft)	24,900
Number of tunnel bores; number of shafts (total)	1; 3
Tunnel finished inside diameter (ft)	20
Tunnel 2 connecting intermediate forebay to Clifton Court Forebay	
Tunnel length (ft)	159,000
Number of tunnel bores; number of shaft sites (total)	2; 9
Tunnel finished inside diameter (ft)	40
Intermediate forebay/245 acres	
Water surface area (acres)	41
Active storage volume (af)	710
Emergency spillway inundation area (acres)	125
Expanded Clifton Court Forebay/2,950 acres (total finished area)	
Forebay dredging area (acres)	2,030
Expanded water surface area (acres)	690
Active storage volume (af)	9,260 (north cell) 8,110 (south cell)
Power requirements	
Total conveyance electric load (MW)	50–60

af = acre-feet.
cfs = cubic feet per second.
ft = feet.
MW = megawatt.

[a] Acreage estimates represent the permanent surface footprints of selected facilities. Characteristics of other areas including temporary work areas and those designated for borrow, spoils, and reusable tunnel material are reported in Appendix 3C. Overall project acreage includes some facilities not listed, such as permanent access roads.

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Facilities under Alternative 4 would be operated to provide diversions up to a total of 9,000 cfs from the new north Delta intakes. The total diversion capacity for the south Delta export facilities would remain constant at 15,000 cfs due to the limited capacity of downstream conveyance structures, but the north Delta facilities would provide flexibility in where water is being diverted from (north vs. south Delta). Operations of the existing SWP/CVP south Delta export facilities would continue as described in Section 3.5.1 for the No Action Alternative.

Alternative 4 water conveyance operations would follow the criteria described as Operational Scenario H and would include criteria for north Delta diversion bypass flows, south Delta OMR flows, south Delta E/I ratio,[21] flows over Fremont Weir into Yolo Bypass via operable gates, Delta inflow and outflow, Delta Cross Channel gate operations (in addition to NMFS BiOp Action IV.1.2), additional Rio Vista minimum flow requirements, operations for Delta water quality and residence (per D-1641), and water quality for agricultural and municipal/industrial diversions (per D-1641). Delta outflow under Scenario H would be determined by the outcome of a decision tree process being used to account for potential uncertainties related to flow requirements. The decision tree process and outcomes are described further in Section 3.6.4.2, *North Delta and South Delta Water Conveyance Operational Criteria*, for Scenario H.

3.5.9.2 Conservation Components

Alternative 4 includes activities intended to address conservation needs across a variety of habitat types and locations. Activities would be carried out in the habitat types and amounts listed below. These activities are described in detail in Section 3.6.2.

- 65,000 acres of restored tidal perennial aquatic, tidal mudflat, tidal freshwater emergent wetland, and tidal brackish emergent wetland natural communities within the BDCP ROAs (CM4).
- 10,000 acres of seasonally inundated floodplain habitat within the north, east, and/or south Delta ROAs (CM5).
- 20 linear miles of channel margin habitat enhancement in the Delta (CM6).
- 5,000 acres of restored native riparian forest and scrub habitat (CM7).
- 2,000 acres of restored grassland and 8,000 acres of protected or enhanced grassland within BDCP CZs 1, 8, and/or 11 (CM8 and CM3).
- Up to 67 acres of restored vernal pool complex and 72 acres of restored alkali seasonal wetland in CZs 1, 8, and/or 11 (CM9), and 600 acres of protected vernal pool complex within CZs 1, 8, and/or 11 (CM3).
- 1,200 acres of restored nontidal marsh within CZs 2 and 4 and/or 5, and the creation of 500 acres of managed wetlands (CM10).
- 50 acres of protected nontidal marsh (CM3).
- 150 acres of protected alkali seasonal wetland complex in CZs 1, 8, and 11 (CM3 and CM11).
- 1,500 acres of protected managed wetlands (CM3 and CM11).

[21] In computing the E/I ratio for Scenarios H1 and H3, the Sacramento River inflow is considered to be downstream of the north Delta intakes. However, in computing the E/I ratio for Scenarios H2 and H4, the Sacramento River inflow was assumed to be upstream of the proposed north Delta intakes.

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- 6,600 acres of protected managed wetland natural community (CM3)
- 48,125 acres of cultivated land (non-rice), up to 500 acres of cultivated land (rice), and 3,000 acres of cultivated land (rice or equivalent) protected (CM3 and CM11).

3.5.9.3 Measures to Reduce Other Stressors and Avoidance and Minimization Measures

Measures to Reduce Other Stressors

Alternative 4 includes the following conservation measures (CM12–CM21) related to reducing other stressors (exposure to contaminants, competition, predation and changes to the ecosystem caused by nonnative species, entrainment at intake pumps not operated by SWP and CVP, and fish passage). These conservation measures are described in detail in Section 3.6.3.

- Methylmercury Management (CM12) – Actions implemented under this conservation measure would minimize conditions that promote production of methylmercury in restored areas and the subsequent introduction of methylmercury to the foodweb and to covered species.
- Invasive Aquatic Vegetation Control (CM13) – Actions implemented under this conservation measure would control the introduction and spread of invasive aquatic vegetation in BDCP aquatic restoration areas.
- Stockton Deep Water Ship Channel Dissolved Oxygen Levels (CM14) – Through funding provisions, this conservation measure would ensure that the Stockton DWSC Aeration Facility continue operations to maintain DO concentrations in the DWSC in accordance with TMDL objectives.
- Localized Reduction of Predatory Fishes (Predator Control) (CM15) – Actions implemented under this conservation measure would reduce populations of predatory fishes at specific locations and eliminate or modify holding habitat for predators at selected locations of high predation risk.
- Nonphysical Fish Barriers (CM16) – Implementation of this conservation measure would entail the installation of nonphysical barriers (structures combining sound, light and bubbles) at the head of Old River, the Delta Cross Channel, and Georgiana Slough, and potentially at Turner Cut, Columbia Cut, the Delta-Mendota Canal intake, Clifton Court Forebay, and other locations, to direct outmigrating juvenile salmonids away from Delta channels in which survival is lower.
- Illegal Harvest Reduction (CM17) – Under this conservation measure, funding would be provided to CDFW to increase the enforcement of fishing regulations to reduce illegal harvest of Chinook salmon, Central Valley steelhead, green sturgeon, and white sturgeon in the Delta, bays, and upstream waterways.
- Conservation Hatcheries (CM18) – This conservation measure would establish new conservation propagation programs and expand the existing program for delta and longfin smelt to ensure the existence of refugial captive populations of both delta and longfin smelt, thereby helping to reduce risks of extinction for these species.
- Urban Stormwater Treatment (CM19) – Under this conservation measure, the BDCP Implementation Office would provide a mechanism, through funding, for implementing stormwater treatment measures in urban areas that would result in decreased discharge of contaminants to the Delta.

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- Recreational Users Invasive Species Program (CM20) – Under this conservation measure, the BDCP Implementation Office would fund a Delta Recreational Users Invasive Species Program, which would implement actions to prevent the introduction of new aquatic species and reduce the spread of existing aquatic invasive species via recreational watercraft, trailers, and other mobile recreational equipment used in aquatic environments in the Plan Area.
- Nonproject Diversions (CM21) – Under this conservation measure, the BDCP Implementation Office would fund actions that would minimize the potential for entrainment of covered fish species associated with operation of nonproject diversions (diversions other those related to the SWP and CVP).

Avoidance and Minimization Measures

The primary purpose of *CM22 Avoidance and Minimization Measures*, is to incorporate measures into BDCP activities that will avoid or minimize direct take of covered species and minimize impacts on natural communities that provide habitat for covered species. This conservation measure would entail the implementation of AMMs (e.g., BMPs to avoid erosion, sedimentation, and contaminant spills) for each BDCP project, based on the comprehensive avoidance and minimization measures described in the BDCP Appendix 3.C, *Avoidance and Minimization Measures*.

3.5.9.4 Issuance of Federal Incidental Take Permits

USFWS and NMFS would issue 50-year ITPs under ESA Section 10(a)(1)(B) to DWR for the incidental take of federally listed species from the construction, operation, and maintenance associated with water conveyance, ecosystem restoration, and other activities as described in the BDCP and under Alternative 4 (see Table 1-1 in Chapter 1, *Introduction*, for a list of the species for which BDCP proponents are seeking coverage).

3.5.9.5 Issuance of State Incidental Take Permits

CDFW would approve the BDCP as an NCCP and issue permits pursuant to Fish and Game Code Section 2835 to DWR for the incidental take of covered species from the construction, operation, and maintenance associated with water conveyance, ecosystem restoration, and other activities as described in the BDCP and under Alternative 4 (see Table 1-1 in Chapter 1, *Introduction*, for a list of the species for which BDCP proponents are seeking coverage).

3.5.10 Alternative 5—Dual Conveyance with Pipeline/Tunnel and Intake 1 (3,000 cfs; Operational Scenario C)

3.5.10.1 Physical and Operational Components

Alternative 5 would comprise physical/structural components similar to those of Alternative 1A, but would entail a single 3,000 cfs fish-screened intake between Clarksburg and Walnut Grove. Water would be conveyed through a single-bore rather than a dual-bore tunnel from the intermediate pumping plant to a new Byron Tract Forebay adjacent to Clifton Court Forebay. The intermediate forebay and Byron Tract Forebay would have smaller capacities than those under Alternative 1A. Use of existing SWP/CVP south Delta export facilities would continue. A map and schematic depicting the conveyance facilities associated with Alternative 5 are provided in Figures 3-2 and 3-12 (the draft map for Alternative 5 is identical to the map of Alternative 1A); characteristics of this

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alternative are summarized in Table 3-1. Figure 3-2 shows the major construction features associated with this proposed alignment. A detailed depiction of these features is provided in Figure M3-1 in the Mapbook Volume. Note that not all these structures would be constructed under this alternative.

Table 3-12. Summary of Physical Characteristics under Alternative 5

Feature Description/Surface Acreage[a]	Approximate Characteristics
Overall project	
Conveyance capacity (cfs)	3,000
Overall length (miles)	45
Intake facilities/approximately 60 acres	
Number of on-bank fish-screened intakes	1
Maximum diversion capacity at each intake (cfs)	3,000
Intake pumping plants/(included with intake facilities)	
Six pumps per intake plus one spare, capacity per pump (cfs)	500
Total dynamic head (ft)	30–57
Tunnels/370 acres (permanent subsurface easement = 1,860 acres)	
Tunnel 1 connecting Intake 1 to the intermediate forebay, maximum flow 3,000 cfs	
Tunnel length (ft)	20,000
Number of tunnel bores; number of shafts (total)	1; 2
Tunnel finished inside diameter (ft)	23
Tunnel 2 connecting intermediate pumping plant to Byron Tract Forebay, maximum flow 3,000 cfs	
Tunnel length (ft)	183,000
Number of tunnel bores; number of shaft sites (total)	1; 13
Tunnel finished inside diameter (ft)	23
Intermediate forebay/480–925 acres	
Water surface area (acres)	300–760
Active storage volume (af)	2,100–5,250
Emergency spillway inundation area (acres)	350
Intermediate pumping plant (at southern end of intermediate forebay)	
Number of pumps, capacity per pump (cfs)	7 at 500
Total dynamic head (ft)	0–90
Byron Tract Forebay/300–840 acres	
Water surface area (acres)	200–600
Active storage volume (af)	1,433–4,300
Power requirements	
Total conveyance electric load (MW)	16

af = acre-feet.
cfs = cubic feet per second.
ft = feet.
MW = megawatt.
[a] Acreage estimates represent the permanent surface footprints of selected facilities. Characteristics of other areas including temporary work areas and those designated for borrow, spoils, and resuable tunnel material storage are reported in Appendix 3C. Overall project acreage includes some facilities not listed, such as permanent access roads.

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Water supply operations could convey up to 3,000 cfs from the north Delta. Alternative 5 water conveyance operational criteria would be guided by criteria under Operational Scenario C. These operations include Fall X2, south Delta OMR flows, and San Joaquin I/E ratios consistent with the No Action Alternative.

Conveyance pipelines and the initial tunnel between the intake pumping plant and the intermediate forebay would be adjusted to the intake location. An overview of the proposed water conveyance features and characteristics (e.g., lengths, volumes) is presented in Table 3-12. Detailed discussions of water conveyance facilities components, including construction detail, are provided in Section 3.6.1, *Water Conveyance Facility Components (CM1)*.

3.5.10.2 Conservation Components

Conservation components under Alternative 5 would be the same as those under Alternative 1A, except that 25,000 rather than 65,000 acres of tidal habitat would be restored.

3.5.10.3 Measures to Reduce Other Stressors and Avoidance and Minimization Measures

Measures to reduce other stressors and AMMs under Alternative 5 would be the same as those under Alternative 1A.

3.5.10.4 Issuance of Federal Incidental Take Permits

USFWS and NMFS would issue 50-year ITPs under ESA Section 10(a)(1)(B) to DWR for the incidental take of federally listed species from the construction, operation, and maintenance associated with water conveyance, ecosystem restoration, and other activities as described in the BDCP and under Alternative 5 (see Table 1-1 in Chapter 1, *Introduction*, for a list of the species for which BDCP proponents are seeking coverage).

3.5.10.5 Issuance of State Incidental Take Permits

CDFW would approve the BDCP as an NCCP and issue permits pursuant to Fish and Game Code Section 2835 to DWR for the incidental take of covered species from the construction, operation, and maintenance associated with water conveyance, ecosystem restoration, and other activities as described in the BDCP and under Alternative 5 (see Table 1-1 in Chapter 1, *Introduction*, for a list of the species for which BDCP proponents are seeking coverage).

3.5.11 Alternative 6A—Isolated Conveyance with Pipeline/Tunnel and Intakes 1–5 (15,000 cfs; Operational Scenario D)

3.5.11.1 Physical and Operational Components

Like Alternative 1A, Alternative 6A would convey water from five fish-screened intakes in the Sacramento River between Clarksburg and Walnut Grove in the north Delta through tunnels to a new Byron Tract Forebay adjacent to Clifton Court Forebay in the south Delta. However, this would be an *isolated conveyance*, no longer involving operation of the existing SWP/CVP south Delta points of diversion at Clifton Court Forebay and the Tracy Fish Facility on Old River. A map and schematic

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depicting the conveyance facilities associated with Alternative 6A are provided in Figures 3-2 and 3-13 (the draft map for Alternative 6A is identical to the map of Alternative 1A); characteristics of this alternative are summarized in Table 3-1. Figure 3-2 shows the major construction features associated with this proposed water conveyance facility alignment. A detailed depiction of these features is provided in Figure M3-1 in the Mapbook Volume. Note that not all these structures would be constructed under this alternative.

The proposed water operations under Alternative 6A would discontinue use of the existing SWP/CVP south Delta points of diversion at Clifton Court Forebay and the Tracy Fish Facility on Old River and convey up to 15,000 cfs from the north Delta using proposed water operations described under Operational Scenario D. Scenario D would be modified from Scenario A to eliminate use of south Delta intakes and add criteria related to Fall X2 (described in detail in Section 3.6.4.2, *North Delta and South Delta Water Conveyance Operational Criteria*).

Under Alternative 6A, physical and structural components would be similar to those under Alternative 1A. However, the existing hydraulic connections between the SWP/CVP south Delta points of diversions at Clifton Court Forebay and the Tracy Fish Facility on Old River would be closed. An overview of the proposed water conveyance features and characteristics (e.g., lengths, volumes) is presented in Table 3-7. Detailed discussions of water conveyance facilities components, including construction detail, are provided in Section 3.6.1, *Water Conveyance Facility Components (CM1)*.

3.5.11.2 Conservation Components

Conservation components under Alternative 6A would be the same as those under Alternative 1A.

3.5.11.3 Measures to Reduce Other Stressors and Avoidance and Minimization Measures

Measures to reduce other stressors and AMMs under Alternative 6A would be the same as those under Alternative 1A.

3.5.11.4 Issuance of Federal Incidental Take Permits

USFWS and NMFS would issue 50-year ITPs under ESA Section 10(a)(1)(B) to DWR for the incidental take of federally listed species from the construction, operation, and maintenance associated with water conveyance, ecosystem restoration, and other activities as described in the BDCP and under Alternative 6A (see Table 1-1 in Chapter 1, *Introduction*, for a list of the species for which BDCP proponents are seeking coverage).

3.5.11.5 Issuance of State Incidental Take Permits

CDFW would approve the BDCP as an NCCP and issue permits pursuant to Fish and Game Code Section 2835 to DWR for the incidental take of covered species from the construction, operation, and maintenance associated with water conveyance, ecosystem restoration, and other activities as described in the BDCP and under Alternative 6A (see Table 1-1 in Chapter 1, *Introduction*, for a list of the species for which BDCP proponents are seeking coverage).

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3.5.12 Alternative 6B—Isolated Conveyance with East Alignment and Intakes 1–5 (15,000 cfs; Operational Scenario D)

3.5.12.1 Physical and Operational Components

Like Alternative 1B, Alternative 6B would convey water from five fish-screened intakes in the Sacramento River between Clarksburg and Walnut Grove in the north Delta through lined or unlined canals to a new Byron Tract Forebay adjacent to Clifton Court Forebay in the south Delta. However, like Alternatives 6A and 6C, this would be an isolated conveyance, no longer involving operation of the existing SWP/CVP south Delta points of diversion at Clifton Court Forebay and Tracy Fish Facility on Old River. A map and schematic depicting the conveyance facilities associated with Alternative 6B are provided in Figures 3-4 and 3-14 (the draft map for Alternative 6B is identical to the map of Alternative 1B); characteristics of this alternative are summarized in Table 3-1. Figure 3-4 shows the major construction features associated with this proposed water conveyance facility alignment. A detailed depiction of these features is provided in Figure M3-2 in the Mapbook Volume. Note that not all these structures would be constructed under this alternative.

The proposed water conveyance operations would be guided by criteria under Operational Scenario D. Water supply operations could convey up to 15,000 cfs from the north Delta.

Under Alternative 6B, physical and structural components would be similar to those under Alternative 1B. However, the existing hydraulic connections between the SWP/CVP south Delta points of diversion at Clifton Court Forebay and the Tracy Fish Facility on Old River would be closed. An overview of the proposed water conveyance features and characteristics (e.g., lengths, volumes) is presented in Table 3-8. Detailed discussions of water conveyance facilities components, including construction detail, are provided in Section 3.6.1, *Water Conveyance Facility Components (CM1)*.

3.5.12.2 Conservation Components

Conservation components under Alternative 6B would be the same as those under Alternative 1A.

3.5.12.3 Measures to Reduce Other Stressors and Avoidance and Minimization Measures

Measures to reduce other stressors and AMMs under Alternative 6B would be the same as those under Alternative 1A.

3.5.12.4 Issuance of Federal Incidental Take Permits

USFWS and NMFS would issue 50-year ITPs under ESA Section 10(a)(1)(B) to DWR for the incidental take of federally listed species from the construction, operation, and maintenance associated with water conveyance, ecosystem restoration, and other activities as described in the BDCP and under Alternative 6B (see Table 1-1 in Chapter 1, *Introduction*, for a list of the species for which BDCP proponents are seeking coverage).

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3.5.12.5 Issuance of State Incidental Take Permits

CDFW would approve the BDCP as an NCCP and issue permits pursuant to Fish and Game Code Section 2835 to DWR for the incidental take of covered species from the construction, operation, and maintenance associated with water conveyance, ecosystem restoration, and other activities as described in the BDCP and under Alternative 6B (see Table 1-1 in Chapter 1, *Introduction*, for a list of the species for which BDCP proponents are seeking coverage).

3.5.13 Alternative 6C—Isolated Conveyance with West Alignment and Intakes W1–W5 (15,000 cfs; Operational Scenario D)

3.5.13.1 Physical and Operational Components

Like Alternative 1C, Alternative 6C would convey water from five fish-screened intakes in the Sacramento River between Clarksburg and Walnut Grove in the north Delta through a tunnel and two canal segments to a new Byron Tract Forebay adjacent to Clifton Court Forebay in the south Delta. However, like Alternatives 6A and 6B, this would be an isolated conveyance, no longer involving operation of the existing SWP/CVP south Delta points of diversion at Clifton Court Forebay and Tracy Fish Facility on Old River. A map and schematic depicting the conveyance facilities associated with Alternative 6C are provided in Figures 3-6 and 3-15 (the draft map for Alternative 6C is identical to the map of Alternative 1C). Figure 3-6 shows the major construction features associated with this proposed water conveyance facility alignment. A detailed depiction of these features is provided in Figure M3-3 in the Mapbook Volume. Note that not all of these structures would be constructed under this alternative.

The proposed water operations under Alternative 6C would be guided by criteria under Operational Scenario D. Water supply operations could convey up to 15,000 cfs from the north Delta.

Under Alternative 6C, physical and structural components would be similar to those under Alternative 1C. However, the existing hydraulic connections between the SWP/CVP south Delta points of diversion at Clifton Court Forebay and the Tracy Fish Facility on Old River would be closed. An overview of the proposed water conveyance features and characteristics (e.g., lengths, volumes) is presented in Table 3-9. Detailed discussions of water conveyance facilities components, including construction detail, are provided in Section 3.6.1, *Water Conveyance Facility Components (CM1)*.

3.5.13.2 Conservation Components

Conservation components under Alternative 6C would be the same as those under Alternative 1A.

3.5.13.3 Measures to Reduce Other Stressors

Measures to reduce other stressors and AMMs under Alternative 6C would be the same as those under Alternative 1A.

3.5.13.4 Issuance of Federal Incidental Take Permits

USFWS and NMFS would issue 50-year ITPs under ESA Section 10(a)(1)(B) to DWR for the incidental take of federally listed species from the construction, operation, and maintenance

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associated with water conveyance, ecosystem restoration, and other activities as described in the BDCP and under Alternative 6C (see Table 1-1 in Chapter 1, *Introduction*, for a list of the species for which BDCP proponents are seeking coverage).

3.5.13.5 Issuance of State Incidental Take Permits

CDFW would approve the BDCP as an NCCP and issue permits pursuant to Fish and Game Code Section 2835 to DWR for the incidental take of covered species from the construction, operation, and maintenance associated with water conveyance, ecosystem restoration, and other activities as described in the BDCP and under Alternative 6C (see Table 1-1 in Chapter 1, *Introduction*, for a list of the species for which BDCP proponents are seeking coverage).

3.5.14 Alternative 7—Dual Conveyance with Pipeline/Tunnel, Intakes 2, 3, and 5, and Enhanced Aquatic Conservation (9,000 cfs; Operational Scenario E)

3.5.14.1 Physical and Operational Components

Alternative 7 would comprise physical/structural components similar to those under Alternative 1A, but would entail only three fish-screened intakes (Intakes 2, 3, and 5) between Clarksburg and Walnut Grove. Based on the results of a workshop on the Phased Construction of North Delta Intake Facilities, Intake 1 could be constructed instead of Intake 5 under this alternative. Once an alternative is selected as part of the final BDCP EIR/EIS, a decision regarding intake locations would be made. Water would be conveyed from the intakes to a new Byron Tract Forebay adjacent to Clifton Court Forebay. Use of existing SWP/CVP south Delta export facilities would continue.

A map and schematic depicting the conveyance facilities associated with Alternative 7 are provided in Figures 3-2 and 3-11 (the schematic for Alternative 7 is the same as that for Alternative 8 and the draft map for Alternative 7 is identical to the map of Alternative 1A); characteristics of this alternative are summarized in Table 3-1. Figure 3-2 shows the major construction features associated with this proposed water conveyance facility alignment. A detailed depiction of these features is provided in Figure M3-1 in the Mapbook Volume. Note that not all of these structures would be constructed under this alternative.

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Table 3-13. Summary of Physical Characteristics under Alternatives 7 and 8

Feature Description/Surface Acreage[a]	Approximate Characteristics
Overall project	
Conveyance capacity (cfs)	9,000
Overall length (miles)	45
Intake facilities/approximately 60 acres average per site	
Number of on-bank fish-screened intakes	3
Maximum diversion capacity at each intake (cfs)	3,000
Intake pumping plants/(included with intake facilities)	
Six pumps per intake plus one spare, capacity per pump (cfs)	500
Total dynamic head (ft)	30–57
Tunnels/370 acres (permanent subsurface easement = 1,860 acres)	
Tunnel 1 connecting Intakes 1 and 2 to the intermediate forebay, maximum flow 6,000 cfs	
Tunnel length (ft)	20,000
Number of tunnel bores; number of shafts (total)	1; 2
Tunnel finished inside diameter (ft)	26
Tunnel 2 connecting intermediate pumping plant to Byron Tract Forebay, maximum flow 9,000 cfs	
Tunnel length (ft)	183,000
Number of tunnel bores; number of shaft sites (total)	2; 13
Tunnel finished inside diameter (ft)	26
Intermediate forebay/925 acres	
Water surface area (acres)	760
Active storage volume (af)	5,250
Emergency spillway inundation area (acres)	350
Intermediate pumping plant (at southern end of intermediate forebay)	
Number of pumps, capacity per pump (cfs)	9 at 1,000 cfs; 2 at 500 cfs
Total dynamic head (ft)	0–90
Byron Tract Forebay/840 acres	
Water surface area (acres)	600
Active storage volume (af)	4,300
Power requirements	
Total conveyance electric load (MW)	80

af = acre-feet.
cfs = cubic feet per second.
ft = feet.
MW = megawatt.

[a] Acreage estimates represent the permanent surface footprints of selected facilities. Characteristics of other areas including temporary work areas and those designated for borrow, spoils, and resuable tunnel material storage are reported in Appendix 3C. Overall project acreage includes some facilities not listed, such as permanent access roads.

The water supply operations could convey up to 9,000 cfs from the north Delta. Alternative 7 water conveyance operational criteria are modified from those outlined under Alternatives 1A, 1B, and 1C and are described by Operational Scenario E (Section 3.6.4.2, *North Delta and South Delta Water*

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Conveyance Operational Criteria). Scenario E would use north Delta bypass rules modified from those under Scenario A. Scenario E assumed less negative OMR flow and a longer implementation period for SJR inflow/export ratios (December–March and June) and would eliminate south Delta exports in April and May. Scenario E would include all of the No Action outflow rules. The modifications under this enhanced aquatic alternative are intended to further improve fish and wildlife habitat, especially along the San Joaquin River.

Conveyance pipelines and the initial tunnel between the intake pumping plants and the intermediate forebay would be adjusted to the intake locations. An overview of the proposed water conveyance features and characteristics (e.g., lengths, volumes) is presented in Table 3-13. Detailed discussions of water conveyance facilities components, including construction detail, are provided in Section 3.6.1, *Water Conveyance Facility Components (CM1)*.

3.5.14.2 Conservation Components

Conservation components under Alternative 7 would be similar to those under Alternative 1A, but 40 rather than 20 linear miles of channel margin habitat would be enhanced, and 20,000 rather than 10,000 acres of seasonally inundated floodplain would be restored to further improve fish and wildlife habitat, particularly along the San Joaquin River.

3.5.14.3 Measures to Reduce Other Stressors and Avoidance and Minimization Measures

Measures to reduce other stressors and AMMs under Alternative 7 would be the same as those under Alternative 1A.

3.5.14.4 Issuance of Federal Incidental Take Permits

USFWS and NMFS would issue 50-year ITPs under ESA Section 10(a)(1)(B) to DWR for the incidental take of federally listed species from the construction, operation, and maintenance associated with water conveyance, ecosystem restoration, and other activities as described in the BDCP and under Alternative 7 (see Table 1-1 in Chapter 1, *Introduction*, for a list of the species for which BDCP proponents are seeking coverage).

3.5.14.5 Issuance of State Incidental Take Permits

CDFW would approve the BDCP as an NCCP and issue permits pursuant to Fish and Game Code Section 2835 to DWR for the incidental take of covered species from the construction, operation, and maintenance associated with water conveyance, ecosystem restoration, and other activities as described in the BDCP and under Alternative 7 (see Table 1-1 in Chapter 1, *Introduction*, for a list of the species for which BDCP proponents are seeking coverage).

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3.5.15 Alternative 8—Dual Conveyance with Pipeline/Tunnel, Intakes 2, 3, and 5, and Increased Delta Outflow (9,000 cfs; Operational Scenario F)

3.5.15.1 Physical and Operational Components

Alternative 8 would comprise physical/structural components similar to those under Alternative 1A, but would entail only three fish-screened intakes (Intakes 2, 3, and 5) between Clarksburg and Walnut Grove. These intake locations represent those locations selected for the analysis of this alternative. Based on the results of an October 2011 workshop on the Phased Construction of North Delta Intake Facilities (see Appendix 3F, *Intake Location Analysis*), different combinations of intakes could be constructed under this alternative. Once an alternative is selected as part of the final BDCP EIR/EIS, a decision regarding intake locations would be made. Water would be conveyed from the intakes to a new Byron Tract Forebay adjacent to Clifton Court Forebay. Use of existing SWP/CVP south Delta export facilities would continue. The water operations could convey up to 9,000 cfs from the north Delta and would be designed to provide up to 1.5 MAF in increased Delta outflow.

A map and schematic depicting the conveyance facilities associated with Alternative 8 are provided in Figures 3-2 and 3-11 (the schematic for Alternative 8 would be the same as that for Alternative 7, and the draft map for Alternative 8 is identical to the map of Alternative 1A); characteristics of this alternative are summarized in Table 3-1. Figure 3-2 shows the major construction features associated with this proposed water conveyance facility alignment. A detailed depiction of these features is provided in Figure M3-1 in the Mapbook Volume. Note that not all these structures would be constructed under this alternative.

Alternative 8 water conveyance operational criteria are described by Operational Scenario F. The goal is to provide an increased Delta outflow of up to 1.5 MAF utilizing existing SWP and CVP water rights and not affect any other water rights holders.

Conveyance pipelines and the initial tunnel between the intake pumping plants and the intermediate forebay would be adjusted to the intake locations. An overview of the proposed water conveyance features and characteristics (e.g., lengths, volumes) is presented in Table 3-7. Detailed discussions of water conveyance facilities components, including construction detail, are provided in Section 3.6.1, *Water Conveyance Facility Components (CM1)*.

3.5.15.2 Conservation Components

Conservation components under Alternative 8 would be the same as those under Alternative 1A.

3.5.15.3 Measures to Reduce Other Stressors and Avoidance and Minimization Measures

Measures to reduce other stressors and AMMs under Alternative 8 would be the same as those under Alternative 1A.

3.5.15.4 Issuance of Federal Incidental Take Permits

USFWS and NMFS would issue 50-year ITPs under ESA Section 10(a)(1)(B) to DWR for the incidental take of federally listed species from the construction, operation, and maintenance

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associated with water conveyance, ecosystem restoration, and other activities as described in the BDCP and under Alternative 8 (see Table 1-1 in Chapter 1, *Introduction*, for a list of the species for which BDCP proponents are seeking coverage).

3.5.15.5 Issuance of State Incidental Take Permits

CDFW would approve the BDCP as an NCCP and issue permits pursuant to Fish and Game Code Section 2835 to DWR for the incidental take of covered species from the construction, operation, and maintenance associated with water conveyance, ecosystem restoration, and other activities as described in the BDCP and under Alternative 8 (see Table 1-1 in Chapter 1, *Introduction*, for a list of the species for which BDCP proponents are seeking coverage).

3.5.16 Alternative 9—Through Delta/Separate Corridors (15,000 cfs; Operational Scenario G)

3.5.16.1 Physical and Operational Components

Under Alternative 9, the through Delta/separate corridors alternative, there would be four basic corridors: (1) the north Delta separate water supply corridor that conveys water from the Sacramento River to Middle River; (2) the south Delta separate water supply corridor along Middle River and Victoria Canal that conveys water from San Joaquin River to Clifton Court Forebay; (3) the San Joaquin separate fish movement corridor that provides for fish migration from upper San Joaquin River to the lower San Joaquin River downstream of Franks Tract; and (4) the Mokelumne separate fish movement corridor that diverts from the Mokelumne River through Lost Slough and Meadows Slough to the Sacramento River.

Alternative 9 includes changes to SWP and CVP water conveyance infrastructure and operations; habitat conservation; measures related to reducing other stressors; monitoring; research; and an adaptive management program, as described in detail in Section 3.6.2.

Under Alternative 9, two fish-screened intakes would be constructed: one each at the Delta Cross Channel and Georgiana Slough. The intakes would be divided into bays to support consistent diversion capacity across the intake. Water would travel through a flow collection channel and radial gates, eventually reaching the existing channel. Once in the channel, water would flow south through the Mokelumne River and San Joaquin River to Middle River and Victoria Canal, which would be dredged to accommodate increased volumes of water. Along the way, diverted water would be guided by operable barriers. Water flowing through Victoria Canal would lead into two new canal segments and pass under two existing watercourses through culvert siphons, eventually reaching Clifton Court Forebay. From there, water would flow through existing SWP facilities, and a new intertie canal would be constructed to connect the forebay to CVP facilities. A map and schematics depicting the conveyance facilities associated with Alternative 9 are provided in Figures 3-16, 3-17, and 3-18; characteristics of this alternative are summarized in Table 3-1. A detailed depiction of the through Delta/separate corridors alternative is provided in Figure M3-5 in the Mapbook Volume.

The water supply operations of this conveyance facility could convey up to 15,000 cfs from the north Delta. The total diversion capacity for the south Delta export facilities would remain constant at 15,000 cfs due to the limited capacity of downstream conveyance structures. Water conveyance operational criteria under Alternative 9 would be guided by criteria under Operational Scenario G.

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Alternative 9 includes the following water conveyance-related facilities.

- Operable barriers on the Mokelumne River near Lost Slough and on Snodgrass Slough near the Mokelumne River, extension of Meadows Slough to the Sacramento River, and installation of an operable barrier on Meadows Slough. These facilities would provide a path for fish migration from the Mokelumne and Cosumnes Rivers through Lost Slough and Meadows Slough to the Sacramento River, except during flood flows.
- On-bank diversions with fish screens at Delta Cross Channel and Georgiana Slough.
- A boat lock and channel at the diversion structure at Georgiana Slough.
- An operable barrier at Threemile Slough to reduce salinity in the San Joaquin River during low Delta outflow and potentially to reduce fish movement from the Sacramento River to the San Joaquin River.
- Operable barriers along Middle River at Connection Slough, Railroad Cut, Woodward Canal, and immediately downstream of Victoria Canal to isolate Middle River from Old River. Dredging would occur at each of these locations.
- Dredging along Middle River from Mildred Island to Victoria Canal and along Victoria Canal for a siphon to provide gravity flow into Clifton Court Forebay.
- Expansion and extension, through dredging, of Victoria Canal under West Canal, across Coney Island, and under Old River to Clifton Court Forebay.
- Intertie canal with a control gate between Clifton Court Forebay and the Tracy Fish Facility.
- Closure of the Clifton Court Forebay inlet gate from Old River except during flood flows.
- Closure of channel between Old River and the Tracy Fish Facility except during flood flows. Closure would include channel modification to allow continued access to River's End Marina from Old River.
- Operable barriers along the San Joaquin separate fish movement corridor at the upstream confluence of Old River and the San Joaquin River (head of Old River), Fisherman's Cut at False River, and Franks Tract to isolate Old River (San Joaquin separate fish movement corridor) from the San Joaquin River.
- A pumping plant on the San Joaquin River at the head of Old River to convey additional flows with organic material into Old River.
- A pumping plant on Middle River upstream of Victoria Canal to convey additional flows with lower salinity than Old River into Old River.

An overview of conveyance features and characteristics (e.g., lengths, volumes) is presented in Table 3-14.

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Table 3-14. Summary of Physical Characteristics under Alternative 9

Feature Description/Acreage[a]	Characteristics
Overall project/1,250	
Export capacity (cfs)	15,000
Water supply corridor from DCC to Clifton Court Forebay overall length (miles)	35
Intake facilities (Sacramento River)/90	
Number of on-bank fish-screened intakes	2
Maximum diversion capacity at each intake (cfs)	7,500
Screen length at each intake (ft)	2,800
Screen height (ft)	15
Operable barriers[b]/110	
Mokelumne River system	
Mokelumne River near Lost Slough	Type I
Meadows Slough near Sacramento River	Type II
Snodgrass Slough north of Delta Cross Channel	Type I
Sacramento River system	
Delta Cross Channel	Type II
Georgiana Slough	Type II
Threemile Slough	Type III
South of San Joaquin River	
San Joaquin River at head of Old River	Type I
Middle River south of Victoria Canal	Type I
Victoria Canal/North Canal	Type III
Woodward Canal/North Victoria Canal	Type III
Railroad Cut	Type III
Connection Slough	Type III
Franks Tract	Type III
Fisherman's Cut	Type III
Channel Enlargement	
Middle River, between Mildred Island and Railroad Cut (enlarged area, sq. feet)	4,777
Middle River, between Railroad Cut and Woodward Canal (enlarged area, sq. feet)	4,319
Middle River, between Woodward Canal and Victoria Canal (enlarged area, sq. feet)	3,201
Victoria Canal (enlarged area, sq. feet)	8,145
Culvert Siphons (comprised of four box culverts, each 26 by 26 feet)/(area included with canals)	
Old River, length (ft)	1,560
"West" Canal, length (ft)	1,260
Canal/440 (includes canal and siphon areas)	
Total length of new canal (miles), Coney Island Canal, and CCF Intertie Canal	2.1
Levees	
Total length of new levees constructed near River's End Marina (miles)	1.1
Old River and Middle River diversion pumping plants	
Number of diversion pumping plants	2
Total pumping capacity at each pumping plant (cfs)	250

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Feature Description/Acreage[a]	Characteristics
Three pumps per pumping plant plus one spare, capacity per pump (cfs)	83
Drive type	CS
Total dynamic head at Old River diversion pumping plant (ft)	30
Total dynamic head at Middle River diversion pumping plant (ft)	20
Power requirements	
Total option electric load (MW)	2

CCF = Clifton Court Forebay.
cfs = cubic feet per second.
cy = cubic yard.
DCC = Delta Cross Channel.
ft = feet/foot.
H:V = horizontal to vertical ratio.
MW = megawatt.
MDC = Through-Delta facility.
CS = Constant speed.

[a] Acreage estimates represent the permanent footprints of selected facilities. Characteristics of other areas including temporary work areas and those designated for borrow and spoils are reported in Appendix 3C. Overall project acreage includes some facilities not listed, such as bridge abutments.

[b] Type I: Obermeyer gate, full waterway width.
Type II: Selected from radial, miter, or wicket gates, full waterway width.
Type III: Obermeyer gate boat lock with rock wall.

3.5.16.2 Conservation Components

Conservation components under Alternative 9 would be similar to those under Alternative 1A, but it is expected that different locations for restoration or enhancement activities could be chosen in the south Delta based on the creation of separate corridors with differing purposes. Under this alternative, lands acquired for restoration or enhancement in the south Delta would generally not be located adjacent to corridors designated for water supply because the increased biological productivity that could result from implementation of these measures would be exported instead of supporting other biological goals and objectives. However, the detailed locations of these modifications have not been delineated, and these components are analyzed on a program level consistent with Alternative 1A.

3.5.16.3 Measures to Reduce Other Stressors and Avoidance and Minimization Measures

Measures to reduce other stressors and AMMs under Alternative 9 would be the same as those under Alternative 1A.

3.5.16.4 Issuance of Federal Incidental Take Permits

USFWS and NMFS would issue 50-year ITPs under ESA Section 10(a)(1)(B) to DWR for the incidental take of federally listed species from the construction, operation, and maintenance associated with water conveyance, ecosystem restoration, and other activities as described in the

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BDCP and under Alternative 9 (see Table 1-1 in Chapter 1, *Introduction*, for a list of the species for which BDCP proponents are seeking coverage).

3.5.16.5 Issuance of State Incidental Take Permits

CDFW would approve the BDCP as an NCCP and issue permits pursuant to Fish and Game Code Section 2835 to DWR for the incidental take of covered species from the construction, operation, and maintenance associated with water conveyance, ecosystem restoration, and other activities as described in the BDCP and under Alternative 9 (see Table 1-1 in Chapter 1, *Introduction*, for a list of the species for which BDCP proponents are seeking coverage).

3.6 Components of the Alternatives: Details

This section describes the components of all the action alternatives: the location, configuration, and construction of water conveyance facility components; the specific criteria for water conveyance operational components; the general location, character, and management of conservation activities; and the implementation strategies for components related to reducing other stressors.

3.6.1 Water Conveyance Facility Components (CM1)

The permanent and temporary physical/structural components related to water conveyance facilities would vary with alternative. During construction, temporary work areas and facilities throughout the Delta would be needed to construct the conveyance facilities. Temporary facilities would be removed following construction, and the work areas would be returned to their preconstruction condition to the extent possible. Demolition and/or removal of existing infrastructure (e.g., buildings and fences) would be required prior to the construction of some water conveyance facilities. Due to the relatively high groundwater level in some proposed work areas, dewatering would be necessary to provide a dry workspace. Dewatering and activities associated with tunneling were assumed to occur 7 days per week and 24 hours per day, while other construction activities would occur 5 days per week (Monday through Friday) up to 24 hours per day.

The major components of CM1, both permanent and temporary, are listed below; detailed descriptions follow. Additional construction detail is provided in Appendix 3C, *Construction Assumptions for Water Conveyance Facilities*.

- North Delta Intakes
  - Concrete intake structure
  - Fish screens
  - Sedimentation basin
  - Solids lagoon
  - Intake pumping plant
  - Intake pipelines
  - New access roads

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- New perimeter berm/levee modifications
- Parking, lighting, fencing, and landscaping
- New utility corridors

- Conveyance Facilities
  - Pipelines/tunnels
    - Pipelines
    - Concrete-lined soft ground tunnel
    - Permanent right-of-way (ROW)/subsurface easements
    - Ventilation and tunnel access shafts
    - RTM conveyors and storage/disposal areas
  - Canals
    - Canal
    - Culvert siphons
    - Intermediate pumping plant
    - Tunnel siphons (concrete-lined soft ground tunnel)
    - New bridges
    - New access roads
- Operable barriers
- Forebays
  - Intermediate forebay, emergency spillway, embankment, and intermediate pumping plant
  - Byron Tract Forebay
  - Expanded Clifton Court Forebay
  - Gate control structures
- New utility corridors
- New bridges
- New access roads
- Connections to Banks and Jones pumping plants
- Power supply and grid connections
- Through Delta/separate corridors conveyance—levee construction and modification
  - Screened intakes (without pumping plants)
  - Diversion pumping plants
  - Operable barriers (some with boat locks)
  - Fixed barriers

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- New access roads
- New utility corridors
- New levee sections

- Temporary access and work areas for intake, canal, and pipeline/tunnel construction
  - Temporary barge unloading facilities
  - Road haul routes and temporary access roads
  - Concrete batch plants and fuel stations (and potentially precast segment plants)
  - General construction work areas, including field offices, warehouse, and maintenance shops.

Habitat restoration, protection, creation, and enhancement; stressor reduction conservation measures; and avoidance and minimization measures (CM2–CM22) could also include physical/structural components related to new roads for site access, levee work, and similar elements. These conservation measures are analyzed at the program level in this EIR/EIS.

3.6.1.1 North Delta Intakes

Depending on the alternative, CM1 would include construction of up to five new intakes on the east or west bank of the Sacramento River. A total of 17 potential intake locations were identified, based on discussions with the Lead Agencies regarding specific fishery considerations as described in the Fish Facility Technical Team (FFTT) Report.[22] These original 17 sites were narrowed to 12 sites, of which 7 are located along State Route (SR) 160/River Road on the east bank of the Sacramento River from south of Freeport to the historical community of Vorden, and 5 are located on the west bank from the Pocket Area south to near Randall Island. Along with the criteria previously identified in the FFTT report, sites were recommended based on the site's ability to minimize effects on aquatic and terrestrial species, maintain a diversion structure's functionality, provide adequate river depth, provide adequate sweeping flows, maintain flood neutrality, and minimize impacts on land use and local communities. A detailed description of the process and steps used in identifying and refining proposed intake locations is described in Appendix 3F, *Intake Location Analysis*. A maximum of five intake sites would be selected for any given alternative; each intake would divert a maximum of 3,000 cfs from the Sacramento River. Each intake site would comprise a concrete structure, a fish screen, a sedimentation basin, a solids lagoon, a pumping plant, conveyance pipelines to a point of discharge into the conveyance facility (pipelines/tunnels or canals, depending on the alternative), a 69-kilovolt (kV) substation, and new access roads. These construction activities would necessitate realignment of existing roadways, employee parking, lighting, fencing, control and communication devices, and landscaping. A new perimeter berm would be constructed, and the space enclosed by the existing levee and new perimeter berm would be backfilled up to the elevation of the top of the perimeter berm, creating a building pad for the intake structure and adjacent pumping plant.

A conceptual rendering of the intake design is provided in Figure 3-19. A schematic of a typical intake structure is shown in Figure 3-20.

[22] BDCP Fish Facilities Technical Team. 2011. Bay Delta Conservation Plan Technical memorandum. July. Access date: October 16, 2013. Available: http://baydeltaconservationplan.com/Libraries/Dynamic_Document_Library/Fish_Facilities_Team_Technical_Memo_Final_7_15_2011.sflb.ashx

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Two 7,500 cfs intake structures and two pumping plants would be constructed under Alternative 9. These intakes would be located where the Sacramento River meets the Delta Cross Channel and Georgiana Slough; the pumping plants, which include their own small intake structures, would be located on the San Joaquin River at the head of Old River and on Middle River upstream of Victoria Canal. However, these facilities differ substantially from those that would be incorporated into other alternatives. The differences are noted at the end of each subsection below.

Description

Intake Perimeter Berm

The intakes would be sited along the existing Sacramento River levee system, requiring levee modifications to facilitate intake construction and to provide continued flood management. At each intake pumping plant site, a new perimeter berm would be constructed on the landside (see Figure 3-20). The space enclosed by the perimeter berm would be filled up to the elevation of the top of the perimeter berm, creating a building pad for the adjacent pumping plant. The new perimeter berms would be designed to provide the same level of flood protection as the existing levee. Transition levees would be constructed to connect the existing levees to the new perimeter berms.

A typical new perimeter berm would have a broad-based, generally asymmetrical triangular cross section. The berm height, as measured from the adjacent ground surface on the landside vertically up to the elevation of the berm crest, would range from approximately 20 to 45 feet to provide adequate freeboard above anticipated water surface elevations. The width of the perimeter berm (toe of berm to toe of berm) would range from approximately 180 to 360 feet. The minimum crest width of the berm would be 20 feet; however, in some places it would be larger to accommodate roadways and other features. Cut-off walls would be constructed to avoid seepage, and the minimum slope of levee walls would be three units horizontal to one unit vertical. All levee reconstruction will comply with applicable state and federal flood management engineering and permitting requirements.

Construction of the Georgiana Slough intake for Alternative 9 would require the relocation of a levee and associated road to create space for a boat channel and lock to allow continued boat access between the Sacramento River and Georgiana Slough. Both diversion pumping plants, along with their associated facilities, would be constructed on engineered fill, with a final ground level of approximately 25 feet for the Old River plant and 15 feet for the Middle River plant.

Intake Structure

The intake structure would consist of a reinforced concrete structure subdivided into individual bays that can be isolated and individually managed. Water would be diverted from the river by gravity into the screened bays and routed from each bay through multiple parallel conveyance conduits to a receiving partitioned or channelized sedimentation basin. Each bay would be fitted at opposing faces with screen panels, flow control baffles, and provisions for bulkhead isolation. The bank of vertical stainless steel screen panels with stainless steel wire fabric would prevent impingement and entrainment of fry-sized salmonids and juvenile smelt. The series of self-contained flow control baffle assemblies would be located behind the screens and would uniformly distribute approach velocities at the screen face. Log booms and/or deflector equipment would protect the intakes from debris and other floating objects.

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From the river bottom to the top of the structure, the intake structure would be approximately 55 feet tall, with the top deck elevation aligning with the top of the adjacent levee to maintain flood protection and provide access. Depending on the height of the river at the intake location, the intake would rise above the river's surface by 20–30 feet. At Intakes 1 and 2 for alternatives using the pipeline/tunnel alignment, the pumping plants would require a surge tower in lieu of an air vent; the elevation of the top rim of the surge tower would be approximately 65–70 feet (North American Vertical Datum of 1988 [NAVD 88]). For Alternative 4, surge towers would be required at all three intake pumping plant sites (Intakes 2, 3, and 5). The elevation of the top of the surge towers would range from approximately 70 to 105 feet.

The intakes would be sized to provide screen area, in accordance with federal and state standards, sufficient to prevent entrainment and impingement of salmonids and delta smelt. The intake sizes (length along the river at the face of the intake) would vary depending on intake location from approximately 700 to 2,500 feet for the pipeline/tunnel, modified pipeline/tunnel, and east alignments; and from 850 to 2,300 feet for the west alignment. Each intake, with the exception of the intakes proposed for Alternative 9, would have a maximum conveyance capacity of 3,000 cfs.

For the purposes of this EIR/EIS, it is assumed that the fish screens would be designed to meet delta smelt criteria, which require 5 square feet/cfs. The fish screen sizes, like the individual intake sizes, would vary depending on intake location and would range from 10 to 22 feet in height and from 915 to 1,935 feet in length. It is anticipated that the screen cleaning system would include several traveling brush cleaning systems installed on the waterside of the intake. As an alternative to the fixed screen panel and brushing system, a traveling screen system with a screen belt and stationary brush/water jet system could be used.

The two intake structures for Alternative 9 would not divert water toward a pumping plant but into existing channels. These structures would be 2,800 feet wide and 15 feet high. Each intake would divert up to 7,500 cfs. Radial gates downstream of the intakes would limit flow to this maximum, while slide gates on each bay would equalize approach velocity across the face of the fish screen. The intake at Georgiana Slough would entail construction of a boat lock to allow continued passage between the slough and the Sacramento River. Two smaller intake structures would not include fish screens; these would divert up to 250 cfs into the diversion pumping plants, redirecting flows of existing channels, and would include automatic self-cleaning trash racks, along with sluice gates between the intake and the pumps.

Sedimentation Basins and Solids Handling Facilities

Although the intake fish screens would remove debris and sediment from the intake inflow, a sedimentation basin would be constructed between the intake structure and the pumping plant to remove the suspended solids that pass through the screen. Settled sediment in the sedimentation basin would be collected by solids collection equipment in the sedimentation basin and conveyed by positive displacement/progressive cavity pumps to up to three solids lagoons for further settling and disposal. Water would be conveyed from the solids lagoons by gravity to the inlet structure of the sedimentation basin.

The sedimentation basin would be approximately 120 feet long by 40 feet wide by 55 feet deep, and would have interior concrete walls to create separate sedimentation channels. The channels would divide the flow, and each channel would be capable of being independently isolated for maintenance. Under the modified pipeline/tunnel alignment (Alternative 4), the sedimentation basin would be divided into three sedimentation channels. Each channel would be 500 feet long by

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200 feet wide by 23 feet deep. The structural system for the basins would consist of reinforced concrete walls and mat slab foundation supported on piles. The walls would be designed to retain external soil loads and contain internal hydrostatic and dynamic loads. The bottom of the basin would be at an elevation between -28.0 and -20.9 feet (NAVD 88) and the top of the walls would be at the flood protection elevation.

The solids lagoons would be concrete lined to prevent seepage to the groundwater or adjacent riverbed, would be approximately 10 feet deep, and would have sloped sides with a top width of 86 feet and a top length of 165 feet. Under the modified pipeline/tunnel alignment (Alternative 4), the solids lagoons would be approximately 15 feet deep and would have a bottom width of 200 feet and a bottom length of 400 feet. Up to three solids lagoons would be used in a rotating cycle with one basin filling, one settling, and the third being emptied of settled and dewatered solids. The volume of solids generated on a daily basis would depend on the volume of water pumped through the intakes, as well as on the sediment load within the river. It is anticipated that during most periods when five intakes are operating at about 3,000 cfs each, approximately 137,000 dry pounds of solids per day would be pumped to the solids lagoons. During periods of high sediment load in the Sacramento River, the daily mass of solids would be expected to increase up to 253,000 dry pounds per day. The annual volume of solids is anticipated to be 486,000 cubic feet (dry solids basis).

Intake structures built as part of Alternative 9 would not require sedimentation basins or solids lagoons. However, typical maintenance activities associated with river intakes would be performed to ensure that sediment buildup is controlled. These activities may include those listed below.

- Suction dredging around the intake structures using raft- or barge-mounted equipment and pumping sediment to a landside spoils area.
- Mechanical excavation around intake structures using track-mounted equipment and a clamshell dragline from the top deck after installing a floating turbidity control curtain to isolate the work area.
- Dewatering the intake bays to remove sediment buildup using small front-end loading equipment and manual labor.

Intake Pumping Plant and Facilities

All pumping plants would include a cast-in-place- (CIP-) reinforced concrete structure and a superstructure, a 230 kV power substation and transformer to supply power, an access road, flood protection embankments, parking, outdoor lighting, security fencing, and communication equipment. In addition, intake pumping plants would have concrete sedimentation basins, associated solids handling facilities, and conveyance piping to a point of discharge into the proposed conveyance structure (i.e., pipelines/tunnels or canals). These structures/facilities would be located on the landside of the levee. To protect the structures from flood waters, the sedimentation basins, solids lagoons, and pumping plant would be constructed on engineered fill above design flood condition. All construction and modifications will comply with applicable state and federal flood management, engineering, and permitting requirements.

Each of the pumping plant sites would be approximately 1,000 by 1,000 feet (approximately 20 acres). The pumping plant would be approximately 262 feet long by 98 feet wide. Under the modified pipeline/tunnel alignment (Alternative 4), each of the pumping plant sites would be approximately 1,800 by 1,500 feet (approximately 60 acres). The pumping plant would be approximately 400 by 150 feet. Intake pumping plants would be constructed of reinforced concrete

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and have multiple floors to house mechanical and electrical equipment. The primary structural support systems used for the pumping plants would consist of reinforced concrete slabs and walls at and below grade, with steel framing and exterior metal wall and roof panels for the above-grade building. The pumping plant mechanical building system design criteria would conform to the requirements of Title 24, the California Mechanical Code, and other applicable codes, and would include heating, ventilation, air conditioning, plumbing, and fire protection systems.

The intake pumping plant would include seven 500-cfs pumps, including one standby pump. The intake pumps would be orientated vertically and would operate in parallel. Each pump would discharge into an individual 96-inch-diameter (8-foot) pipe. Pumping capacity could be varied by reducing the number of pumps on line and/or adjusting the pump operating speed. Variable frequency drives (VFDs) and flow meters would be required on all pumps to vary the pumping rate.

Conceptual engineering indicates that the intake pumping plants would require a deep foundation supporting a common concrete mat. Based on a preliminary pile foundation evaluation, using a 24-inch concrete-filled pipe pile, an estimated pile length of 40–45 feet below the founding level of the intake pumping plant would be necessary. Under the modified pipeline/tunnel alignment (Alternative 4), 42-inch diameter pipe piles filled with reinforced concrete would be driven to a length of 65–75 feet below the founding level of the pumping plant. Foundation types and dimensions will be refined further when site-specific subsurface geotechnical data becomes available. Ground improvements would also be needed to improve foundation materials that are susceptible to liquefaction.

A facility control system could provide local and remote automatic and manual control and monitoring of the facilities. It is anticipated that the control system would use a combination of buried fiber optic systems, microwave radio, and leased telecommunications lines. A global positioning satellite (GPS)-based time clock at each pumping plant would support the control system. This equipment would require that a small dish antenna be mounted on the roof of the pumping plant. Two additional antennae would be mounted on the pumping plant at Intake 1 to support a communications system.

A communications system would connect to the existing DWR Delta Field Division Operations and Maintenance Center near Banks Pumping Plant and the DWR communications headquarters in Sacramento. Buried fiber optic conduit would be installed from the southern end of the new conveyance facility at Byron Tract Forebay (or, under Alternative 4, Clifton Court Forebay) along the inlet canal to the Banks Pumping Plant and the Delta Field Division Operations and Maintenance Center. The conduit route would be adjacent to roads, highways, railroads, utilities, or other easements.

Pumping plants constructed for Alternative 9 would not pump water from intake facilities into other conveyance facilities. Rather, these pumping plants would provide diversion flow into existing channels. Each of the pumping plants would have three pumps plus one spare; each plant would have a 250 cfs capacity. The San Joaquin River plant would convey additional flows with organic material into Old River. The Middle River plant would convey additional flows with lower salinity levels into Old River. These plant sites would include a dewatering sump and discharge piping, flow meter vaults, outfall piping, an electrical and control building, an access road, and a transformer.

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Intake Pumping Plant Substation

Each intake pumping plant would be served by a 69 kV substation with a footprint of about 150 by 150 feet. Here, transformers would convert power from 69 kV to the voltage needed for the pumps and auxiliary equipment at the adjacent structures. For Alternatives 1B, 2B, and 6B, one intake pumping plant would also house a 230 kV substation, which would be located in a 268- by 267-foot enclosure. This substation and its transformers would convert power from the conveyance facility's main 230 kV transmission line to 69 kV, for use by the pumping plants and other facilities.

The substations would be constructed adjacent to the pumping plants on concrete pads with sufficient ground preparation. The substation would be at the same elevation as the pumping plant operating floor and at the flood protection level; excavation is not anticipated.

To supply power during construction of the intake and pumping plant structures and power for the tunneling and excavating machines, substations would be constructed early in the overall construction schedule.

Intakes and pumping plants constructed for Alternative 9 would not necessitate substations but would incorporate transformers.

Fencing, Lighting, and Landscaping

Security fencing and lighting would be installed at all pumping plants. Outdoor lighting fixtures would be luminaries with individual photocells. Critical paths, entrances, and walkways would be illuminated. High bay lighting fixtures would be high-pressure sodium vapor, instant-on lamps.

The need for fencing will be determined in accordance with DWR's Water Resources Engineering Memorandum (WREM) No. 41a to protect the public from hazards associated with the conveyance facilities and ensure security of the facilities and operational personnel. Fencing would be placed within the ROWs of the facilities.

Vegetation and signage are to be determined in accordance with DWR's sensitivity to their impact on the Delta environment, guided by DWR's WREM No. 30a, *Architectural Motif, State Water Project*. All proposed vegetation and signage will be coordinated with local agencies through an architectural review process.

Intake Access

The intakes would all be sited on the existing Sacramento River levee and levee roads. The intake design includes parking for employees during operations and maintenance. Along with the levee modifications discussed above, the levee roads would need to be realigned. Temporary access roads would be needed to connect the existing road network to the intake site for delivery of materials and construction equipment and personnel. Temporary access roads around the building site would also be necessary during construction. The existing levee roads are public roads that carry traffic through the Delta, and include SR 160 and various county roads. Access for travelers through the Delta on these existing roadways would be maintained by use of temporary new road detours around the intake sites. The existing alignment of these roadways would be modified to accommodate the intake structure, and the roadways would be reopened to traffic following construction.

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Operations and Maintenance

The proposed intake facilities (including intake pumping plants, sedimentation basins, and solids lagoons) would require scheduled routine or periodic adjustment and tuning to remain consistent with design intentions. Emergency maintenance is also anticipated. Routine facility maintenance would consist of activities such as painting, cleaning, repairs, and other tasks to operate facilities in accordance with design standards after construction and commissioning. It is anticipated that major equipment repairs and overhauls would be conducted at a centralized maintenance shop at one of the intake facilities sites or at the intermediate pumping plant site.

Routine visual inspection of the facilities would be conducted to monitor performance and prevent mechanical and structural failures of project elements. Maintenance activities associated with river intakes could include removal of sediments, debris, and biofouling materials. These maintenance actions could require suction dredging or mechanical excavation around intake structures; dewatering; or use of underwater diving crews, boom trucks or rubber wheel cranes, and raft- or barge-mounted equipment. Periodic mussel cleaning in the sedimentation basins and solids removal from solids lagoons for off-site disposal would be required. Sediment in channels would also be removed periodically.

Construction

Intake Construction

Depending on foundation material, foundation improvements would require excavation and replacement of soil below the new levee footprint and potential ground improvement. The levees would be armored with riprap—small to large angular boulders—on the waterside. All construction and modifications will comply with applicable state and federal flood management, engineering and permitting requirements.

Intake construction would begin during the first construction season. Each intake would require approximately 3.5–4.5 years to complete; construction of multiple intakes would overlap such that several intakes could undergo simultaneous construction, depending on the alternative. Intakes would be constructed using a sheetpile cofferdam in the river to create a dewatered construction area that would encompass the intake site. The cofferdam would lie approximately 10–35 feet from the footprint of the intake. The distance between the face of the intake and the face of the cofferdam would be dependent on the foundation design and overall dimensions. The length of each temporary cofferdam would vary by intake location, but would range from 740 to 2,440 feet. Cofferdams would be supported by steel sheet piles and/or king piles (heavy H-section steel piles). Installation of these piles would require both impact and vibratory pile drivers; piles would be driven using barge-mounted cranes and cranes mounted on temporary decks (see Chapter 1, *Introduction*, Table 1-3 for a summary of permits relevant to BDCP). Approximately 8–12 piles would be driven per day per intake site.

Some clearing and grubbing of levees would be required prior to installation of the sheet pile cofferdam, depending on site conditions. Additionally, if stone bank protection, riprap, or mature vegetation is present at intake construction site, it would be removed prior to sheet pile installation.

Once the cofferdam is completed, the enclosed area would be excavated to the level of design subgrade using clam shell or long-reach backhoe before ground improvements and installation of foundation piles. The anticipated ground improvement methods may include jet grouting and deep

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soil mixing. The foundation construction would either be carried out by in-the-wet construction or conventional construction using dewatering methods. Electric-powered dewatering wells would be installed throughout the site. Diesel-powered standby power generator(s) would be used to power the dewatering pumps during power outages. A backup pump would be provided at every dewatering location with pumps. Dewatering pumping may occur 24 hours per day, 7 days per week, and would continue throughout intake construction. Water would be pumped out of the cofferdam and stored in sedimentation tanks at landside work areas. Groundwater removed with the dewatering system would ultimately be treated as necessary and disposed of in surface waters under a National Pollutant Discharge Elimination System (NPDES) permit. Prior to dewatering, fish rescue and salvage plans (discussed in Appendix 3B, *Environmental Commitments*) would be implemented, as necessary, for dewatering operations. Velocity dissipation facilities, such as rock or grouted riprap, would be used to reduce velocity/energy and prevent scour where dewatering discharges reenter the river.

The area behind the cofferdam would be excavated to the necessary depth and cast-in-drilled-hole (CIDH) or concrete-filled steel pipe foundation piles would be installed to support the intake structures. CIDH piles are installed by drilling a shaft, installing rebar, and filling the shaft with concrete; no pile driving is necessary with CIDH methods. Use of concrete filled steel piles would involve vibratory or impact-driving hollow steel piles, and then filling them with concrete. The required number of piles would vary by intake length from 450 (for short intakes) to 800 (for long intakes). The number of intake piles driven in a day would range from approximately 8 to 12 per intake site. Minor channel work would be necessary to install the intake fish screens; the channel disturbance area would vary by intake location and would range from approximately 2.5 to 7.1 acres. Foundation type, dimensions, and construction methods will be revised further when additional site-specific subsurface geotechnical data becomes available.

To the extent possible, all in-water construction activities would take place between June 1 and October 31. No additional in-water work would be conducted for construction of the intakes until the cofferdam is removed and rock protection is installed during the in-water work window. In-water work would not occur every season over the duration of construction.

After intake structure construction is complete, the cofferdam would be flooded by removing the sheet pile walls in front of the intake structure. The removal of sheet pile walls would be performed by underwater divers using torches or plasma cutters to trim at the intake structure slab. Rock protection would be installed along the river banks upstream and downstream and along the front of the intakes to protect the intakes, prevent bank and channel erosion, and provide a transition from the river bottom to the intake structure. The length of bank protection required on either side of the intake would vary by intake location but would range from approximately 100 to 2,200 feet for the pipeline/tunnel, modified pipeline/tunnel, and east alignments, and from 500 to 1,800 feet for the west alignment. The intake structures and associated bank protection would permanently change existing substrates and local hydraulic conditions in the immediate vicinity of the intakes.

The Sacramento River would remain navigable during construction of the intakes. River channel width at several intake sites varies from about 400 to 600 feet. The anticipated protrusion of cofferdams into the river is about 40 to 60 feet. Cofferdams would be installed around intake construction sites. Warning signs and buoys would be posted upstream of, downstream of, and at the construction sites. Buoy lights would also be provided for nighttime navigation during construction. The completed intake structures would have proper lighting to prevent boat collisions with the structure at night.

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Intake Gravity Collector Pipelines

To allow for the installation of pipe segments to connect the intake to the sedimentation basin, construction could involve trenchless methods or open-cut trenching. If trenchless methods is employed, conduits would be constructed from inside the cofferdam or shaft to the landside of the levee prior to construction of the intake. Trenchless construction would be done using pipe ramming or tunnel boring machines. RTM from tunneling would be removed using conveyors or pumps and transferred to a separation plant to remove the suspended solids from the soil cuttings of the RTM. The RTM would be treated, drained, and transported to stockpiles consistent with the NPDES permit requirements.

If open-cut trenching is used and the native materials are generally of good quality in the area of conduit construction, excavated material from the trench would be used as embedment and backfill materials. If the native soils are not suitable as foundation materials for the trench, suitable materials would be imported to the site.

Cut and cover construction would likely be used for landside pipe placement using long reach backhoes, scrapers, and excavators placed on levees or on the landside of the levees. Dewatering systems, if required to control groundwater and ensure a stable excavation trench, would be similar to those described for the intake structure foundations.

3.6.1.2 Conveyance Facilities

Tunnels

Design

The tunnel conveyance would consist of a single bore, 29-foot inside diameter (ID) tunnel on the northern end of the alignment (Tunnel 1) and a dual-bore, 33-foot ID tunnel on the longer, southern end of the alignment (Tunnel 2); Alternative 5 would convey water through a single-bore tunnel on the southern end. For Alternative 4, Tunnel 1a would be a single bore 20-foot ID tunnel between Intakes 2 and 3 and a 29-foot ID tunnel between Intake 3 and the intermediate forebay. Tunnel 1b would be a single bore 20-foot ID tunnel between Intake 5 and the intermediate forebay. Tunnel 2 for Alternative 4 would be constructed with a dual-bore 40-foot ID tunnel. An intermediate forebay would be constructed to provide a hydraulic break before the diverted water enters the common tunnel conveyance system downstream. This hydraulic break would provide water conveyance operational flexibility and allow independent operation of each intake facility.

The tunnel system would be operated under pressurized conditions at a constant volume with isolation facilities to allow reducing the number of tunnels in operation during periods of lower flow and to maintain velocity in active tunnels. Under Alternative 4, the tunnel would be operated with a gravity feed system rather than with an intermediate pumping plant with an optional gravity bypass system at the outlet of the intermediate forebay.

In alluvial soils with high groundwater pressures, the tunnel would be constructed at depths greater than 60 feet using mechanized closed-face pressurized tunneling machines. The tunnel invert elevation is preliminarily assumed to be at 100 feet below mean sea level (msl), primarily to avoid peat deposits. It would be lowered to 160 feet below msl under the San Joaquin River and Stockton DWSC to maintain sufficient cover between the tunnel and dredging operations in the shipping channel. The final depth and profile of the tunnel would be set in the preliminary design phase for

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CM1, after detailed geotechnical investigations have been completed. A minimum horizontal separation of two outside tunnel diameters would be maintained in reaches with two tunnel bores. Because of the high groundwater level throughout the proposed tunnel alignment area, extensive dewatering (by means of dewatering wells along the tunnel alignment) and groundwater control in the tunneling operation and shaft construction would likely be necessary.

The main construction or launching shafts for each tunnel would be about 120 feet in diameter to accommodate construction and construction support operations. The TBM retrieval shaft would be approximately 90 feet in diameter, and 50-foot-diameter intermediate ventilation shafts would be located approximately every 3 miles. Tunnel ventilation would adhere to California Division of Occupational Health and Safety (Cal-OSHA) tunnel ventilation requirements. The tunnels would be lined with precast concrete bolted-and-gasketed segments. The tunnel concrete liner would serve as permanent ground support and would be installed immediately behind the tunnel-boring machine, thereby forming a continuous watertight vessel.

Upon completion of construction, launching, retrieval, and ventilation shafts would be converted to permanent access shafts so that personnel can gain access to the tunnel for inspections and maintenance. The large-diameter construction shafts would be modified to approximately 20-foot diameter access shafts that would rise approximately 20 feet above existing grade. The twin-bore tunnels would have two shafts, and would be surrounded by an earthen pad with approximate dimensions of 250 feet by 125 feet, and approximately 20 feet high. Road access to the top of the pad will be provided for maintenance vehicles.

Refer to Table 3-7 for a description of the physical characteristics of the tunnel conveyance facility under Alternatives 1A, 2A, and 6A; Tables 3-10 and 3-12 for Alternatives 3 and 5 respectively; and Table 3-13 for Alternatives 7 and 8. Details of the conveyance facility under Alternative 4 are shown in Table 3-11. A conceptual drawing of the configuration of a typical tunnel segment is shown in Figure 3-21.

Operation and Maintenance

Maintenance requirements for the tunnels have not yet been finalized. Some of the critical considerations include evaluating whether the tunnels need to be taken out of service for inspection and, if so, how frequently. Typically, new water conveyance tunnels are inspected at least every 10 years for the first 50 years and more frequently thereafter. In addition, the equipment that the facility owner must put into the tunnel for maintenance needs to be assessed so that the size of the tunnel access structures can be finalized. Equipment such as trolleys, boats, harnesses, camera equipment, and communication equipment would need to be described prior to finalizing shaft design, as would ventilation requirements. As described above, it is anticipated that, following construction, large-diameter construction shafts would be modified to approximately 20-foot diameter access shafts.

At the time of preparation of this EIR/EIS, the use of remotely operated vehicles or autonomous underwater vehicles is being considered for routine inspection, reducing the number of dewatering events and reserving such efforts for necessary repairs.

Construction

Construction staging areas would include space for offices, parking, shops, segment storage, fan line storage, daily spoils pile, power supply, water treatment, and other space requirements. Depending

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on the method selected to construct the walls for the shafts, the staging areas may also include space for the slurry ponds required for slurry wall construction. Work areas for RTM handling and spoils storage would also be necessary.

On occasion, access to the face of a TBM may be required for maintenance or emergency purposes. Such maintenance interventions for the TBM cutterhead would be performed in discrete areas—*safe havens*—within the tunnel alignments. The precise locations of the safe haven areas have not yet been determined because the locations would depend on site-specific mining conditions. At minimum, there would be one safe haven area between each tunnel shaft (launching and vent shafts). Intervention (or safe haven) zones could be situated at intervals of 2,000 feet along the tunnel alignment. These subsurface intervention sites would be constructed by injecting grout from the surface to a point in front of the TBM. The TBM would then bore into the grouted area. The purpose of grouting an intervention site is to allow pressures to be equalized between the face of the TBM and the tunnel, facilitating access and eliminating the need for working in hyperbaric conditions.

Surface disturbance activities at each of these intervention sites would be limited to an area no larger than 1 acre. Surface equipment would include a small drill rig and grout mixing and injection equipment. The surface drilling and grouting operation would typically be completed within 2 weeks. Once complete, all equipment would be removed and the surface features reestablished. Access to most intervention sites would be over established roadways. If access is not readily available over surface routes, surface sites would be accessed by helicopter.

Because the need for TBM maintenance or emergency access is dependent on the condition of the cutting face, the number and locations of intervention sites are not known. Impacts will be minimized or avoided by locating the intervention on disturbed sites either associated with construction of the tunnel or other activities or agricultural lands used to grow lower value crops. Discharge of drilling muds or other materials required for drilling and grouting would be confined to the work site and would be disposed of offsite at a permitted facility. Disturbed areas would be returned to preconstruction conditions by careful grading, reconstruction of features such as irrigation and drainage facilities, and replanting of crops and/or compensating farmers for crop losses.

To the greatest extent possible, intervention sites would be located to avoid sensitive terrestrial and aquatic habitats. In the event these areas cannot be avoided, DWR will ensure that impacts are minimized to the greatest extent possible. DWR would work with the appropriate permitting agencies to ensure that impacts are minimized and/or compensated and that permits allowing surface disturbance are secured. If needed, supplemental environmental compliance documentation will be completed.

The proposed tunnels are anticipated to be constructed in soft, alluvial soils with high groundwater pressures. Because of this, the tunnels would be constructed using mechanized soft ground tunneling machines. Each tunnel would require appropriately sized launching and TBM retrieval shafts to accommodate equipment. If dense gravels, cobbles, or boulders are encountered in the older alluvium at depth, other mining methods may be utilized, such as grouting, jet grouting, use of a slurry TBM, or freezing and hand mining. All shaft locations may also require dewatering activities, which would be implemented in a similar manner to dewatering for the construction of intake facilities, as described above. Dewatering systems would be designed and operated to control seepage pressures in the vicinity of the main bore and the vertical shafts to ensure that excavations

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remain stable. Discharge water would be conveyed to aboveground treatment facilities to comply with permit conditions before being discharged into the river. A diesel-powered train would transport construction workers through the tunnel during construction.

During construction, all shaft locations would be protected from flooding caused by failure of a levee. This protection would be achieved by constructing a raised earthen pad at each shaft site (or by use of another suitable method). The size of the pad would vary from site to site, depending on specific location conditions. It is anticipated that the height of the shaft protection pads will be at the 100-year design flood elevation for each island.

After construction of the tunnels, the launching and retrieval shafts would be backfilled around steel pipes or formed concrete pipes, or would be cast against reusable forms to the required finished diameter and geometry. The intermediate shafts would be excavated using conventional augers and would be supported using steel casings. The shafts would be drilled to below the tunnel invert elevation before the boring machine reaches the shaft stationing.

As previously indicated, RTM is the by-product of tunnel excavation using a TBM. The RTM would be a plastic mix consisting of soil cuttings, air, and water, and may also include soil conditioning agents. Soil conditioning agents such as foams, polymers, and bentonite may be used to make soils more suitable for excavation by a TBM. Before the RTM can be reused or disposed of, it must be managed and, at a minimum, go through a drying process. Additional RTM processing, beyond the conventional atmospheric drying process, would be implemented if deemed necessary to comply with regulatory requirements. For further discussion of this process, please see the description of "Disposal and Reuse of Spoils, Reusable Tunnel Material (RTM), and Dredged Material," in Appendix 3B, *Environmental Commitments.*

The daily volume of RTM that would be withdrawn from the tunneling operations at any one shaft location would vary, with an average volume of approximately 6,000 cubic yards per day. It is assumed that the transport of the RTM out of the tunnels and to the RTM storage sites would be nearly continuous during mining or advancement of the TBM. The RTM would be carried on a conveyor belt from the TBM to the base of the launching shaft. The RTM would be withdrawn from the tunnel shaft with a vertical conveyor and placed directly into the RTM work area using another conveyor belt system. From the RTM handling area, the RTM would be rough segregated for transport to RTM storage and water treatment (if required) areas as appropriate. RTM would be transported and deposited via conveyor and/or truck to designated RTM storage areas, ranging in size from approximately 100 to 1,100 acres, depending on the action alternative. In total, approximately 1,595 acres may be needed for RTM storage for the pipeline/tunnel alignment. Under this alignment, it was assumed that RTM would be stacked to a height of 10 feet and that storage areas would be located adjacent to main tunnel shafts north of Scribner Road, east of the Sacramento River, on northern Brannan-Andrus Island, on southeastern Tyler Island, on eastern Bacon Island, and on northwestern Victoria Island, as shown in Mapbook Figure M3-1. Under the modified pipeline/tunnel alignment (Alternative 4), approximately 3,500 acres may be needed for storage of tunnel material and spoils from dredging Clifton Court Forebay. This area also includes land that would be required for access roads, staging and laydown areas, and other ancillary facilities required for the processing and storage of RTM. Therefore, the area required for storage of the material itself would be closer to 2,800 acres. Under this alignment, it was assumed that RTM and dredged material would be stacked to a height of 6 feet and that storage areas would be located adjacent to tunnel shafts, including sites just north of Intake 2, several parcels west of Interstate 5 near the intermediate forebay, on northern Staten Island, on southern Staten Island, on

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southwestern Bouldin Island, and on Byron Tract west of Clifton Court Forebay, as shown in Mapbook Figure M3-4. During future stages of engineering, it may be determined that it is preferable to store RTM at a height of 10 feet, as was assumed for alternatives under the pipeline/tunnel alignment. Using this assumption, approximately 1,800 acres would be required for the storage of RTM and dredged material under Alternative 4.

RTM Drying and Storage

Once the RTM is removed from the tunnel, it must be suitably dewatered prior to final long-term storage or reuse. Atmospheric drying by tilling and rotating the material, combined with subsurface collection of excess liquids is typically sufficient to render the material dry and suitable for long-term storage or reuse. Only for those areas where controlled and contained storage of material is deemed to be required, a retaining dike and underdrain liquid collection system (composed of a berm of compacted soil, gravel and collection piping, as described below), may be built at the RTM storage area(s). The purpose of this berm and collection system would be to contain any liquid runoff from the drying material. The berm geometry would conform to applicable design guidelines and standards. Based on the soil properties, the volume of material to be processed, and the size of the material storage area, the area may be subdivided into a system of dewatering or processing areas. The dewatering process would consist of surface evaporation and draining through a drainage blanket consisting of rock, gravel, or other porous drain material. The drainage system would be designed per applicable permit requirements. Treatment of liquids (primarily water) extracted from the material could be done in several ways, including conditioning, flocculation, settlement/sedimentation, and/or processing at a package treatment plant to ensure compliance with discharge requirements.

Once the material has been suitably dewatered, and depending on the constituents of the material, the RTM would be placed in either a lined or unlined storage area, suitable for long-term storage. These long-term storage areas may be the same area in which the material was previously dewatered or it may be a new site adjacent to the dewatering site. The storage areas would be created by excavating and stockpiling the native topsoil for future reuse. Once the area has been suitably excavated, and if a lined storage area is required, an impervious liner would be placed on the invert of the material storage area and along the interior slopes of the berms surrounding the pond. Due to the expected high groundwater tables, it is anticipated that there would be minimal excavation for construction of the long-term material storage areas. Additional features of the long-term material storage areas would include berms and erosion protection measures to contain storm runoff if necessary and provisions to allow for truck traffic during construction, as appropriate.

Depending on the type of soil removed through tunneling, the type of soil conditioners added, and the material management and water treatment processes required, RTM may be reused locally (e.g., for levee reinforcement or as fill material in support of restoration activities) or transported to another location for reuse. Dried material that is not reused may be graded, covered with previously-stockpiled topsoil, and seeded for vegetation. RTM would be tested per applicable standards and assessed for usability prior to reuse. Treated water from RTM could be reclaimed, discharged, or disposed according to NPDES and other applicable codes and regulations. Further discussion of the process for disposal and reuse of RTM is provided in Appendix 3B, *Environmental Commitments*.

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Canals

Design

The canal conveyance would consist of a trapezoidal, open channel, earthen or concrete-lined canal formed by embankments constructed of compacted engineered fill. Details for a lined canal would be finalized in the preliminary design phase for CM1; however, in this EIR/EIS, impacts for lined and unlined canal are analyzed in resource chapters where applicable (e.g., Chapter 7, *Groundwater*).

A cross section of a typical canal segment is shown in Figure 3-22. The canal would require new access roads for maintenance, a drainage system to carry surface runoff and floodwater, and irrigation ditches to maintain existing agricultural ditches. Short segments of buried pipeline would also be utilized to convey water from the intake pumping plants to the canal. A new access toe road would be constructed on each side of the canal embankment to provide maintenance access to the drainage and irrigation ditches and to areas otherwise cut off by the canal. The toe road would be paved where existing paved roads have been disrupted by the canal. In other areas where existing roads are gravel or not surfaced, the toe road is assumed to be gravel. The toe road would connect to the embankment maintenance road at locations where the embankment maintenance road is interrupted at the ends of the embankments and at bridges. The toe roads would tie into existing public roads and may or may not be publicly accessible.

In areas where the existing ground slopes toward the canal on both sides, a drainage ditch would be constructed along both sides of the canal to collect water and direct it to collection points for removal by pumping. It is anticipated that these new ditches would be approximately 5 feet deep and would connect to the existing drainage system. In areas where the ground slopes away from the canal on both sides, or if surface runoff would be intercepted and conveyed around the canal by an existing drainage feature, no new drainage areas would be constructed.

Where the canal water surface elevation is generally above existing ground, the canal would be formed by earth embankments constructed of compacted engineered fill. The crests of the embankments would be wide enough to allow for two maintenance vehicles traveling in opposite directions to pass each other. The canal would be designed with 2 feet of concrete-lined freeboard[23] plus 2 feet of unlined freeboard for a total of 4 feet of freeboard on the waterside. Waterside embankments could include wind and wave erosion control, such as concrete lining, riprap, or lining with articulated concrete mat.

Seepage from the canal could occur where the normal water level in the canals is higher than the groundwater levels of the adjacent areas. Seepage could potentially raise the water table on the landside of the embankments through more permeable lenses of sand and/or gravel in the foundation. Control of seepage could include the following methods.

- Installation of a slurry cutoff wall through the canal embankments and foundation. A cutoff wall would be most effective in areas where a canal cuts through layers of permeable sands and gravels.
- Use of a drainage ditch parallel to the canal to control seepage and groundwater levels. Water in the drainage ditch would then be pumped into the sloughs or back into the canals.

[23] Vertical distance between the design water surface elevation and the elevation of the bank or levee that contains the water.

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- Installation of pressure relief wells along the drainage ditch to collect subsurface water and direct it into the parallel drainage ditch.

The risk to the canal from flooding in the adjacent islands may be reduced by providing a means for drainage water to pass from one side of the canal to the other. The water could be routed by any of the means listed below.

- Under the canal with a culvert to existing drainage systems.
- Over the canal with an overchute to existing drainage systems. Overchutes require piers similar to those supporting bridges to support the structure and span the width of the canals.
- Around the canal and through a gap between the existing levee and the ends of the canal embankments.
- To new storm drain pumps that would pump the water to sloughs or the canal.

Construction of irrigation ditches to supply water for agricultural use may be required in areas where irrigation water supply ditches are separate from drainage ditches. The irrigation ditches would likely need to be elevated above the existing ground to allow for gravity flow. New pumps or siphons may be required to supply the irrigation ditches.

Inverted culvert siphons would be used to convey diverted water from canals under major waterways and railroads. The 15,000 cfs culvert siphons would consist of reinforced concrete rectangular cells 26 by 26 feet each. Siphon length would vary from 595 to 2,400 feet, including concrete portions and upstream and downstream transition structures. The water velocity would be approximately 2 feet per second in the canal approaching the culvert siphon and 5–6 feet per second in the culvert. The culvert size and shape were selected as a compromise between head loss and potential sedimentation. The top of the culvert would be situated about 15 feet below the lowest elevation of the crossing to prevent exposure resulting from scour in the water body and to prevent uplift by the groundwater in the vicinity of the crossing. Culvert siphons would be installed using a cut and cover method, where one half of the water body to be crossed would be isolated with a cofferdam. Once the culvert(s) are placed and buried, the cofferdam would be removed and the same process would be repeated from the opposite bank. The installation of culvert siphons would require driving precast concrete foundation piles within a dewatered cofferdam using a combination of vibratory and/or impact driving. It is estimated that approximately 8–12 foundation piles would be driven per day.

Because the culvert siphons would need to be placed during low-flow periods (approximately August through November), it may be necessary to conduct this in-water work outside the June 1–October 31 in-water work window. Control structures would be provided at the inlet to the culvert siphon to allow for regulation of upstream water surface elevation. Control structures would also be provided at intermittent locations along the canal to provide for improved control of the water surface elevations where siphons are not required. For this analysis, it was assumed that radial gates with electric motors would be utilized to provide for control of the water surface elevation in the canal. A conceptual drawing of a typical culvert siphon is shown in Figure 3-23.

Where canals cross existing water bodies, tunnels would be used to convey water between canal segments. For the west alignment (Alternatives 1C, 2C, and 6C), a 17-mile-long tunnel segment would convey water from Ryer Island to Hotchkiss Tract. In the east alignment (Alternatives 1B, 2B, and 6B), shorter tunnel siphons would connect canal segments, crossing Lost Slough/Mokelumne River (5,400 feet), San Joaquin River (2,700 feet), and Old River (1,700 feet).

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Tables 3-8 and 3-9 present a description of the physical characteristics of the canal conveyance features (Alternatives 1B, 2B, and 6B for the east alignment and Alternatives 1C, 2C, and 6C for the west alignment). A conceptual drawing of a typical canal segment is shown in Figure 3-24.

Three culvert siphons would be constructed under Alternative 4. One would serve as a transition between Tunnel 2 and the expanded Clifton Court Forebay under Italian Slough, one would connect the north cell of the expanded Clifton Court Forebay to a new approach canal to the Banks and Jones Pumping Plants under the south cell of the Forebay, and one would connect the new approach canal to the existing approach canal to Banks Pumping Plant under Byron Highway.

Two canal segments would be constructed for Alternative 9. One canal would be constructed on Coney Island to connect the south Delta separate water supply corridor from an enlarged and realigned Victoria Canal to Clifton Court Forebay, with culvert siphons conveying water under the existing West Canal and Old River. The Coney Island Canal would run approximately 4,000 feet, beginning at the downstream end of the siphon under Old River and ending at the upstream end of the siphon under West Canal. The second canal, with a control gate, would be constructed to connect Clifton Court Forebay to the Tracy Fish Facility. This canal, also approximately 4,000 feet long, would begin at the southeast corner of Clifton Court Forebay, cross Byron Tract, and connect to the Tracy Fish Facility utilizing a new levee (embankment) to close off the existing connection to Old River.

Operation and Maintenance

The flow rate and water level in the canal would be controlled by control structures such as radial gates to divide the canal into pools. Drawdown rates of water within the pools would be determined on the basis of the stability of the conveyance side embankment slopes.

Maintenance requirements for an unlined canal would include control of vegetation and rodents, embankment repairs in the event of flooding and wind wave action, and monitoring of seepage flows.

Sediment would be expected to build up on the bottom of the canal and require periodic removal by dredging. Sediment traps may be constructed to reduce the sediment that would collect in the siphons and tunnels.

Construction

Construction of the canal and pipeline segments connecting the intakes to the canal are assumed to be constructed at approximately 30 foot depths in open-trench excavations for the majority of the alignment, except where crossing a major waterway. As discussed above for tunnel construction, major waterways would be crossed using deep tunnel siphons at depths of approximately 120 feet msl. For the canal, excavation would proceed first with the excavated materials initially being hauled to storage areas or stockpiled nearby. Once a sufficient area has been excavated, the foundation for the embankments would be prepared and the embankments constructed. The canal and embankments would be constructed in independent segments. In addition to excavation for the canal, borrow areas, haul roads at the toe of the embankments, grading for drainage, and drainage pumping stations would be required to construct the canal.

Excavation of unsaturated soils could be performed using scrapers or excavators loading into large dump trucks. Excavations below the groundwater table using the same types of equipment would require extensive dewatering. Pipeline dewatering wells would be installed as part of construction

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(1) to provide a dry, stable excavation bottom for placement of bedding, pipe material, and backfill; (2) to dewater the lenses of silts and sands encountered during excavation; and (3) to dewater highly permeable prolific sand layers below the excavation. In addition, due to the high level of the groundwater table, dewatering facilities may also be considered postconstruction for inspection, maintenance, or in the case of emergency.

Excavated materials that are suitable for embankment fill could be hauled and placed directly into areas ready for embankment construction or stockpiled for future use; unusable material would be hauled to spoils disposal areas. However it is unlikely that excavation of the canal would yield sufficient quantities of suitable material to build the embankments. Therefore, additional embankment material from borrow locations would be needed. The imported embankment materials would be placed and compacted on the dewatered foundation. Moisture conditioning of the embankment materials would generally be performed in the borrow areas prior to hauling and placement in the embankments.

The most likely method for construction of the shallower culvert siphon crossings is a cut-and-cover type excavation. Water in the slough would be diverted by use of a partial cofferdam across the slough (with continuous flow pumping of typical irrigation or flood flows) or by a temporary realignment of the slough during construction.

3.6.1.3 Operable Barriers

Design

An operable barrier at the head of Old River would be constructed to support operations of Alternatives 2A, 2B, 2C, and 4. This control structure is intended to prevent migrating and outmigrating salmon from entering Old River from the San Joaquin River, minimizing exposure to the SWP and CVP pumping facilities. It would be located at the divergence of the head of Old River and the San Joaquin River and would be approximately 210 feet long and 30 feet wide, with top elevation of 15 feet msl (NAVD 88). This structure would include seven bottom-hinged gates, totaling approximately 125 feet in length. Other components associated with this barrier are a fish passage structure, a boat lock, a control building, a boat lock operator's building, and a communications antenna. Appurtenant components include floating and pile-supported warning signs, water level recorders, and navigation lights. The barrier would also have a permanent storage area (180 by 60 feet) for equipment and operator parking. Fencing and gates would control access to the structure. A communications antenna for telephone and telemetered data transmission would also be constructed, and a propane tank would supply emergency power backup.

The boat lock would be 20 feet wide and 70 feet long and would have floating boat docks for temporary mooring, navigation signs and lights, warning signs, and video surveillance capability. The fishway would be designed according to guidelines established by NOAA Fisheries and USFWS for several species including salmon, steelhead, and green sturgeon. The fishway would be approximately 40 feet long and 10 feet wide and would be constructed with reinforced concrete. Stoplogs would be used to close the fishway during the spring when not in use to protect it from damage.

When the gate is partially closed, flow would pass through the fishway traversing a series of baffles. The fishway is designed to maintain a 1-foot-maximum head differential across each set of baffles. The historical maximum head differential across the gate is 4 feet; therefore, four sets of baffles are required. The vertical slot fishway is entirely self-regulating and operates without mechanical

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adjustments to maintain an equal head drop through each set of baffles regardless of varying upstream and downstream water surface elevations.

Physical operable barriers would be primary structures to support water conveyance under Alternative 9. Under this alternative, operable barriers would serve to hydraulically isolate the corridors dedicated to fish movement and estuary habitat from those dedicated to diverting water from the Sacramento River and conveying it toward existing SWP and CVP facilities in the south Delta. The operable nature of the barriers would allow adjustments to channel flows to correct for changes in water quality and quantity in the Delta. Alternative 9 would use three types of barriers to accomplish different goals: inlet flow control, fish isolation, irrigation level control, flood control, and boat passage.

Depending on the characteristics of a specific barrier site and the intended function of the barrier, a variety of gate styles could be used. Depth of water, differences in water elevation between gate sides, whether the gates would be used to vary flow, and whether gates would permit boat passage are all factors that would determine the gate type(s) selected for any particular barrier. Similarly, the number of gate bays required at any given barrier would depend on the width and bottom profile of the channel.

Each barrier would tie into levees on both sides of the waterway. For those gates providing a flood protection function, the top elevation of the gates and barrier walls would be set to the same elevation as the existing levee crest adjacent to the barrier. Otherwise, gates would be slightly higher than normal waterway flow. All construction and modifications will comply with applicable state and federal flood management, engineering, and permitting requirements.

Type I barriers would use bottom-hinged navigable gates in locations where the majority of the waterway width requires gates and where depth is less than 20 feet. Type II barriers involve the use of nonnavigable radial gates for flow control and navigable wicket or miter gates for the operable portions; these would be used where waterway depth exceeds 20 feet. Type III barriers, like Type I barriers, would use bottom-hinged navigable gates for operable portions but would use rock walls for the fixed portions. This type of barrier would be used where gates are only required for recreational boat passage and where flood neutrality is not an issue.

Each barrier location would be accompanied by a 15-foot-wide by 53-foot-long control building. For those barriers requiring boat locks, the control building would also include an operations room on a second floor. Each site would also include a ground-mounted transformer and emergency generator.

Table 3-14 lists the operable barrier locations and types for Alternative 9.

Operation and Maintenance

For the operable barrier proposed under Alternative 4, periodic maintenance of the gates would occur every 5 to 10 years. Maintenance of the motors, compressors, and control systems would occur annually and require a service truck. Maintenance dredging around the gate would be necessary to clear out sediment deposits. Dredging around the gates would be conducted using a sealed clamshell dredge. Depending on the rate of sedimentation, maintenance would occur every 3 to 5 years, removing no more than 25% of the original dredged amount, using a sealed clamshell dredge. Because of constraints related to fish and other species of concern, the timing and duration of maintenance dredging would be limited. Spoils would be dried in the areas adjacent to the gate site. A formal dredging plan with further details on specific maintenance dredging activities will be

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developed prior to dredging activities. Guidelines related to dredging activities, including compliance with in-water work windows and turbidity standards are described further in Appendix 3B, *Environmental Commitments,* under *Disposal and Reuse of Spoils, Reusable Tunnel Material (RTM), and Dredged Material*.

Gates constructed for Alternative 9 would also require routine annual inspection of gate facilities and systems, as well as associated equipment. Some gates may not be required to operate for extended periods and would be operated at least two times per year. Each gate bay would be inspected annually at the end of the wet season for sediment accumulation. Sediment would be removed during the summer. Each miter or radial gate bay would include stop log guides and pockets for stop log posts to facilitate the dewatering of individual bays for inspection and maintenance. Major maintenance could require a temporary cofferdam upstream and downstream for dewatering.

Construction

For construction of the barrier at the head of Old River under Alternatives 2A, 2B, 2C, and 4, one of two methods would be chosen: (1) cofferdam construction, which creates a dewatered construction area for ease of access and egress; and (2) in-the-wet construction, which allows the river to flow unimpeded and eliminates the time, material, and cost of constructing a cofferdam. To ensure the stability of the levee, a sheetpile retaining wall would be installed in the levee where the gate would be constructed.

The cofferdam construction method would enable the gates to be constructed in two phases and would allow in-water work to continue through the winter. The first phase would involve the placement of a cofferdam in half of the channel and then dewatering the area so the bottom of the channel could be used as a project construction site. The gates would be constructed within this area and on the adjacent levee. The cofferdam would remain in the water until the completion of half of the gate. It would then either be removed or cut off at the required invert depth and another cofferdam would be installed in the other half of the channel. In the second phase, the gate would be constructed using the same methods, with the cofferdam either removed or cut off, and incorporated into the final gate layout. Cofferdam construction would begin in August and last approximately 35 days. Construction activities within the cofferdam project area would last until approximately early November or could occur throughout the winter, depending upon weather and river flow conditions. The temporary barriers at this site would continue to be installed and removed as they are currently until the permanent gates are fully operable.

The in-the-wet method would involve working within the natural channel as it flows. No cofferdam or dewatering of the construction site would occur. Each gate would be constructed within the confines of the existing channel, and there would be no levee relocation. The channel invert would be excavated to grade using a sealed clamshell excavator working off the levee or from a barge. H-piles or other suitable deep foundation would be placed in the channel. Gravel and tremie concrete would be placed for the foundation within the confines of the H-piles. Reinforced concrete structures would then either be floated in or cast in place using prefabricated forms to be placed on top of the gravel, tremie concrete, and H-piles. Divers would complete the final connections between the concrete structures and the piles.

The boat lock for the Head of Old River Barrier would be constructed using sheetpiles and include two bottom-hinged gates on each end, measuring 20 feet wide and 10 feet high. Each gate would weigh approximately 8 tons and would be opened and closed using an air-inflated bladder. The

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invert of the lock would be at elevation –8.0 feet msl, and the top of the lock wall would be at elevation 15 feet. The boat lock would transport boats with the use of the bottom-hinged gates and a valve system for equalizing water levels, and would function by filling and emptying the lock chamber with a 36-inch valve. For boats traveling upstream, the lock chamber would be emptied to the downstream water level. The downstream gates would be opened and boats would enter the lock chamber. With the gates closed, the lock chamber would be filled to the upstream water level and the upstream gates would be opened to allow boat passage. For boats traveling downstream, the procedure would be reversed.

The construction of operable barriers under Alternative 9 would require dredging several hundred feet upstream and downstream of gate structures to transition the channel sides to fit the depth and width of the gates. Riprap would then be installed in these areas to control erosion. The majority of dredged material under Alternative 9 (including dredgings from channel expansion activities) would be stored in upland storage sites, and approximately 0.5% may be disposed of in an offsite landfill. Gates for Type I and III barriers could be constructed with existing waterways either wet or dry. Wet construction would require offsite prefabrication with attachment of concrete sills. The site would be dredged and sheet piles and H-piles installed. Then the sills and gates would be lifted into place using either barge-mounted cranes or catamarans made of sectional barges. Type II barriers would be constructed during summer low-flow periods. A closed steel sheet pile cofferdam would be constructed across part of the waterway. After dewatering, the structure would be constructed. Then the cofferdam would be removed and a new one installed for construction of the adjacent section. Construction through the winter high-flow periods is not anticipated. Additional temporary cofferdams may also be necessary upstream and downstream of deeper gate bays to allow dewatering and gate panel installation to take place. Barrier structures for Type II miter gates would include reinforced concrete walls, piers, and foundation mats. For the purposes of this analysis, it is assumed that a 60-ton bearing capacity would guide the depth of pile driving for foundation piles, anticipated to be between 60 and 80 feet below foundation level. A barge-mounted crane would install the rock walls for Type III barriers. The rocks may need a prepared foundation, depending on local site conditions.

A temporary work area of up to 15 acres would be required in the vicinity of each barrier for such uses as storage of materials, fabrication of concrete forms or gate panels, stockpiles, office trailers, shops, and construction equipment maintenance.

3.6.1.4 Forebays

Design

Intermediate Forebay and Intermediate Pumping Plant

Under the pipeline/tunnel alignment, an intermediate forebay near Hood would provide storage of approximately 5,250 af with a surface area of 760 acres and would provide a transition between the north Delta intakes and the intermediate pumping plant. Under Alternative 4 (the modified pipeline/tunnel alignment), the proposed intermediate forebay would be located on Glannvale Tract, would provide storage of 368 af with a surface area of 40 acres, and would feed into an outlet control structure to Tunnel 2. Under both alignments, this feature would also include a seepage cutoff wall to the depth of the impervious layer and a toe drain would surround the forebay embankment to capture water and pump it back into the forebay. The forebay would allow the intermediate pumping plant to operate efficiently over a wide range of flows and hydraulic heads in

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the pipelines/tunnels. Limitations on delivery of water from the intakes into the intermediate forebay and the need to operate the intermediate pumping plant efficiently would limit the ability to deliver flow from the pipelines/tunnels during portions of the day to the existing Banks and Jones pumping plants. For the Banks Pumping Plant, this would entail operating at low flows during hours with high electrical costs and at maximum capacity during "off-peak" periods to minimize electrical power costs. The Jones Pumping Plant must operate continuously (i.e., 24 hours per day, 7 days per week). The Byron Tract Forebay (see description below) would alleviate some of the impacts of these operational constraints and provide storage to balance inflow with outflow.

The intermediate pumping plant would include ten 1,500-cfs pumps to be used in higher hydraulic head condition, and six 1,500-cfs pumps for lower hydraulic head conditions. The pumping plant would include an approach channel from the forebay to the pump bays, the pumping plant structure, discharge pipes with flow measurement, transition manifold, and transition pipelines for discharge to the tunnel. The pipeline/tunnel alignment would require two 33-foot diameter (minimum) surge towers, the elevation of which would be approximately 105 feet (NAVD 88) at the rim. The intermediate pumping plant for the west alignment would also require two 33-foot diameter surge towers, the elevation of which would be as high as 70 to 80 feet (NAVD 88) at the rim, depending on the final pump selection and pipe arrangement. No surge towers would be required at the intermediate pumping plant for the east alignment.

The intermediate forebay allows for operation of a gravity bypass of the intermediate pumping plant by balancing the difference in water surface elevations between the intermediate forebay and the Byron Tract Forebay. Under Alternative 4, the passage of water from the intermediate forebay would rely exclusively on gravity flow. Under this alternative, therefore, the intermediate pumping plant, along with its associated surge towers and other facilities, would not be constructed. Instead, the intermediate forebay would be designed as a pass-through facility.

The intermediate pumping plant would be staffed 24 hours each day and would require similar maintenance activities to the intake pumping plants, as described in Section 3.6.1.2, *Conveyance Facilities*. It is assumed that the intermediate pumping plant would require periodic harvesting of pond weeds to maintain flows and forebay capacity. The harvesting would occur in the forebay and at the trashracks immediately upstream of the intermediate pumping plant.

The east and west alignments (Alternatives 1B, 2B, and 6B and 1C, 2C, and 6C, respectively) would incorporate a similar intermediate pumping plant. The east alignment plant would be approximately 3 miles south of the point where the alignment crosses the San Joaquin River. The west alignment plant would be at the entrance to the tunnel segment on Ryer Island, approximately 1.2 miles east of the Sacramento River DWSC. The intermediate pumping plant under these conveyance alignments would provide diverted water with the necessary head to flow into the Byron Tract Forebay.

Byron Tract Forebay

The Byron Tract Forebay (Alternatives 1A, 1B, 1C, 2A, 2B, 2C, 3, 5, 6A, 6B, 6C, 7, and 8) would be adjacent to Clifton Court Forebay and would provide storage of approximately 4,300 af with a surface area of 600 acres. The Byron Tract Forebay would be used to balance variations in pipeline/tunnel inflow with outflow on a daily basis. For the Banks pumping plant, this includes operating at low flows during hours with high electrical cost and at maximum capacity during off-peak periods to minimize electrical power costs. The Jones pumping plant would operate continuously. For Alternatives 1A, 1B, 2A, 2B, 3, 4, 5, 6A, 6B, 7, and 8, the Byron Tract Forebay would

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be constructed on the southeast side of Clifton Court Forebay. For Alternatives 1C, 2C, and 6C, the Byron Tract Forebay would be constructed on the northwest side of Clifton Court Forebay.

Expanded Clifton Court Forebay

Under the modified pipeline/tunnel alignment (Alternative 4), Clifton Court Forebay would be dredged and expanded by approximately 690 acres to the southeast of the existing forebay. Additionally, a new embankment would be constructed around the perimeter of the forebay, as well as an embankment dividing the forebay into a northern cell and a southern cell. The northern end would receive water from Tunnel 2 (from the north Delta intakes), which would pass under Italian Slough in a culvert siphon before entering Clifton Court Forebay (north). The northern cell would provide storage of approximately 6,070 af. The southern cell of the forebay would continue to provide functionality for the existing through-Delta conveyance system and would provide storage of approximately 26,000 af.

Operation and Maintenance

New forebays would be dredged to remove sediment and maintain design capacity. Maintenance requirements for the forebay embankments would include control of vegetation and rodents, embankment repairs in the event of island flooding and wind wave action, and monitoring of seepage flows. Maintenance of control structures could include roller gates, radial gates, and stop logs. Maintenance requirements for the spillway would include the removal and disposal of any debris blocking the outlet culverts. Dredging may be necessary to remove sediments in the forebays. As designed, both forebays are expected to have capacity to store sediment accumulated over a 50-year period. However, depending on the actual sedimentation rate, dredging may be necessary more or less often.

Construction

Under the pipeline/tunnel alignment, approximately 6 million cubic yards of earth would be excavated from portions of the intermediate forebay, and approximately 14 million cubic yards would be excavated from the Bryon Tract Forebay. Under the modified pipeline/tunnel alignment (Alternative 4), approximately 700,000 cubic yards of earth would be excavated from portions of the intermediate forebay, and approximately 4 million cubic yards of earth would be excavated for the expanded portion of the Clifton Court Forebay. These excavation amounts include the embankment foundation. Dewatering would be required for excavation operations. Much of the excavated material at both locations is expected to be high in organics and unsuitable for use in embankment construction. Some of the excavated material below the peat layers at both locations may be suitable for use in constructing the embankments. To the extent possible, spoils to be used for the embankments would be stored onsite. Under the modified pipeline/tunnel alignment, nearly 8 million cubic yards of material would be dredged from Clifton Court Forebay, equivalent to an average of about 2 feet throughout the forebay. Dredged material would be transported to and stored at an area also designated for storage of RTM to the west of Clifton Court Forebay. Guidelines for the disposal and reuse of dredged material are provided in Appendix 3B, *Environmental Commitments.*

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3.6.1.5 Connections to Banks and Jones Pumping Plants

Design

For Alternatives 1A, 1B, 2A, 2B, 3, 5, 6A, 6B, 7, and 8, an approximately 2,000-foot-long canal would be constructed to connect the Byron Tract Forebay with the existing approach canal to the Banks pumping plant, with a series of radial gates to isolate the facilities. Under these alternatives, another series of radial gates constructed in an opening in the embankment of Byron Tract Forebay would allow for the control of water flow between the forebay and the approach canal to the Jones pumping plant. For Alternative 4, a culvert siphon (similar to those described above in relation to canals), would be constructed to connect the northern cell of the expanded Clifton Court Forebay to a new canal leading to the approach canal to the Jones Pumping Plant. An additional siphon would be constructed under the Byron Highway and into a short segment of canal before leading into the approach to the Banks Pumping Plant. For Alternatives 1C, 2C, and 6C, a canal would stretch from Byron Tract Forebay to approach canals for both existing pumping plants. The dual conveyance alternatives would also include the construction of gates in the existing approach canals upstream of the connections with the new facilities. These structures would allow operational flexibility between pumping from the north Delta and pumping from the south Delta.

Operations and Maintenance

Maintenance requirements for the canal would include erosion control, control of vegetation and rodents, embankment repairs in the event of island flooding and wind wave action, and monitoring of seepage flows. Sediment traps may be constructed by overexcavating portions of the channel upstream of the structures where the flow rate would be reduced to allow suspended sediment to settle at a controlled location. The sediment traps would be periodically dredged to remove the trapped sediment.

Construction

Canal construction would include use of scrapers, excavators, and/or draglines. The top layer of soil along some portions of the canal could consist of up to 25 feet of organic and peat soils deemed unsuitable for support of the canal embankments. In such areas, these soils would be removed and disposed of offsite; it is estimated that approximately 0.1% of spoil may need to be disposed of in a landfill. The removal of the full depth of the peat and organic soil could be limited to the area of the embankment foundations. In other areas, potentially liquefiable sands could be present below the organic soils. It would be necessary to remove or stabilize the liquefiable soils as part of the excavation for the canal embankments.

3.6.1.6 Power Supply and Grid Connections

Electric power would be required for intakes, pumping plants, operable barriers, boat locks, and gate control structures throughout the various proposed conveyance alignments. Temporary power would also be required during construction of water conveyance facilities.

New temporary power lines to power construction activities would likely be built prior to construction of permanent transmission lines to power conveyance facilities (see Mapbook Figures M3-1 through M3-5 to see the assumed alignment of both temporary and permanent lines under the various alternatives). These lines would extend existing power infrastructure (lines and substations) to construction areas, generally providing electrical capacity of 12 kV at work sites.

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Main shafts for the construction of deep tunnel segments would require the construction of 69 kV temporary power lines. Under Alternatives 1A through 8, electrical power to operate the new north Delta pumping plant facilities would be delivered through 230 kV transmission lines that would interconnect with a local utility at a new or existing utility substation depending on the conveyance alignment. The alignment of this transmission line and its interconnection point would be based on the selection of a power provider for the BDCP following selection of a conveyance alignment. Possible alignments for the 230 kV transmission lines are shown in Figure 3-25. For the purposes of analysis, one sub-option has been selected for each of the four conveyance alignments that would require a 230 kV line. For the west alignment, this line would extend west from the intermediate pumping plant on Ryer Island. For the pipeline/tunnel alignment, the line would extend south from the intermediate pumping plant and would generally follow the tunnel connecting to existing utility facilities at the Banks pumping plant. The 230 kV line for the east alignment would also connect to the existing grid at this point, but would follow alongside the Byron Tract Forebay and canal ROW northeast to the intermediate pumping plant.

Under Alternative 4, the modified pipeline/tunnel alignment, the method of delivering power to construct and operate the water conveyance facilities is assumed to be a "split" system that would connect to the existing grid in two different locations. The northern point of interconnection would be located north of Lambert Road and west of Highway 99. From here, a 230 kV transmission line would run west, along Lambert Road, where one segment would run south to the intermediate forebay on Glannvale Tract, and then on to tunnel shaft locations on Staten Island; and one segment would run north to connect to a substation where 69 kV lines would connect to the intake pumping plants. At the southern end of the modified pipeline/tunnel alignment, the point of interconnection may be in one of two possible locations: southeast of Brentwood near Brentwood Boulevard or adjacent to the Jones pumping plant. While only one of these points of interconnection would be used, both are depicted in figures, and the effects of constructing transmission lines leading from both sites are combined and accounted for in resource-specific impact analysis. A 230 kV line would stretch from one of these locations to a tunnel shaft northwest of Clifton Court Forebay, and would then continue north, following tunnel shaft locations, to Bouldin Island, where a 34.5 kV line would continue to the southern end of Staten Island. Because the power required during operation of the water conveyance facilities would be much less than that required during construction, and because it would largely be limited to the intake pumping plants and intermediate forebay, the "split" system would enable all of the power lines extending from the southern point of interconnection to be temporary, limited to the construction schedule for the relevant tunnel reaches and features associated with Clifton Court Forebay. Additionally, those segments extending south of the intermediate forebay on McCormack-Williamson Tract and Staten Island would also be removed following construction of associated tunnel facilities.

It is assumed that a new substation would be constructed within or adjacent to the utility's existing transmission ROW. Some utility grid reinforcement and upgrade may be needed to accommodate this large new pumping load. The 230 kV transmission line would terminate at the BDCP's main 230 kV substation, which would be adjacent to one of the new pumping plants in a 268- by 267-foot enclosure. At the main 230 kV substation, the electrical power would be transformed from 230 kV to 69 kV and delivered to the adjacent main 69 kV substation to power the adjacent pumping plant. Additionally, the main 69 kV substation would deliver power on a new overhead 69 kV subtransmission line, looping into each of the other intake substations. Each 69 kV substation would have a footprint of approximately 150 by 150 feet. The subtransmission line would generally follow the alignment ROW. At the main 69 kV substation and at each of the intake substations, electrical

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power would be transformed from 69 kV to the voltage needed for the pumps and auxiliary equipment at the adjacent structures.

For Alternatives 1B, 1C, 2B, 2C, 6B, and 6C, a main 69 kV substation would be constructed at the intermediate pumping plant, and an overhead 69 kV subtransmission line would be constructed along a route parallel to the canal and within the project ROW. To supply power for communications, monitoring, and control of the gates at the tunnel and siphon entrances along the canal, 12 kV distribution lines would be extended along the canal from the 69 kV substations. Wherever possible, this 12 kV line would be constructed on the same poles as the 69 kV subtransmission line. A local utility distribution line would provide power for gate controls along the south canal of Alternatives 1C, 2C, and 6C. For Alternatives 1A, 2A, 3, 4, 5, 6A, 7, and 8, the main 69 kV substation would be built at the intermediate forebay with 69 kV subtransmission lines looping into each intake plant substation.

Three utility grids could supply power to the BDCP (or an alternative) conveyance facilities: Pacific Gas and Electric Company (PG&E) (under the control of the California Independent System Operator), the Western Area Power Administration (Western), and/or the Sacramento Municipal Utility District (SMUD). The electrical power needed for the conveyance facilities would be procured in time to support construction and operation of the facilities. As the operator of the SWP, DWR is an active participant in the activities of the California electric grid, from long-term planning to day-to-day operation. The power will be provided from the SWP power portfolio of existing physical generation facilities, long-term power contracts, and short-term power contracts—including Day-Ahead market purchases. Purchased energy may be supplied by existing generation, or by new generation constructed to support the overall energy portfolio requirements of the western electric grid. It is unlikely that any new generation will be constructed solely to provide power to the BDCP conveyance (or an alternative) facilities.

PG&E's distribution system would likely provide power for the through Delta/separate corridors alignment (Alternative 9) because the system currently reaches most of the proposed facilities. The pumping plants and intakes would receive 12 kV service from the local distribution system, while service to other facilities, including operable barriers, siphons, control gates, intakes, and boat locks would be at 480 volts. Operable barriers under this alignment would also have backup generation to ensure continued operational control during outages. Wood poles for the 12 kV service would be spaced 300 feet apart, on average, with a height of 40–45 feet, and would result in a disturbed area 2 feet in diameter. Facilities receiving 480 volt service require a three phase service drop (three or four wires) from a utility pole with a 12 kV/480 volt three phase transformer mounted on it. Alternatively, the utility may choose to site the transformer on a pad (ground level) at the point of service and bring 12 kV utility service to the transformer. For a pad-mounted transformer, there would be a disturbed area of 8 feet by 8 feet.

Towers for 230 kV transmission lines employed in other conveyance alignments would be spaced, on average, 750 feet apart. Their physical footprint would be approximately 30 feet square, with foundations at each leg measuring 3.5 to 5 feet in diameter. If a horizontal conductor configuration is chosen, the average tower height will be 95–100 feet, while towers configured for vertical conductors would be 130 feet high. Based on the potential utility providers' design practices, the 230 kV towers would most likely be monopoles (both utilities), with H-frame and lattice towers being options for a Western interconnection. The configuration may need to be a dual circuit design to accommodate future expansion for the utility. To discourage raptor perching, a dipped cross-arm configuration could be used in place of davit arms on monopole structures.

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The 69 kV transmission lines would almost certainly be monopoles of either steel or wood depending on the utility. To meet the raptor-safe design guidelines, the 69 kV wood pole structure should be 60 inches minimum between the conductor (end of insulator) and pole face in areas of raptor concern. Poles for the 69 kV lines would be spaced 450 feet apart, on average. Wood poles would result in a disturbed area with a diameter of 2 feet while steel poles typically entail foundations 5–6 feet in diameter. Poles would typically be about 60 feet above ground (70-foot poles, embedded 10 feet). A shield wire (at the top of the structure) may be required by either utility for both 230 kV and 69 kV transmission. Analysis assumes that 34.5 kV power lines would be constructed to similar specifications.

For the electrical transmission facilities provided from the utility interconnection to and between the BDCP facilities, industry standard techniques will be incorporated into power line designs to minimize impacts on birds. For monopole and lattice structures, the material coating would be selected for color and reflectivity consistent with meeting visibility goals to mitigate bird strikes and collisions.

Construction

New transmission lines would generally follow the conveyance alignments and would be constructed within or adjacent to the alignment ROW. Temporary lines would be constructed from existing facilities to each worksite where power is necessary for construction. Construction of all transmission lines would require three phases: site preparation, tower or pole construction, and line stringing. For 12 kV and 69 kV lines, cranes would be used during the line stringing phase. For stringing transmission lines between 230 kV towers, cranes and helicopters would be used.

Construction of 230 kV and 69 kV transmission lines would require a corridor width of 100 feet and, at each tower or pole, 100 feet on one side and 50 feet on the other side for construction laydown, trailers, and trucks. Construction would also require about 350 feet along the corridor (measured from the base of the tower or pole) at conductor pulling locations, which includes any turns greater than 15 degrees and/or every 2 miles of line.

For construction of 12 kV lines (when not sharing a 69 kV line), a corridor width of 25–40 feet is necessary, with 25 feet in each direction along the corridor at each pole. Construction would also require 200 feet along the corridor (measured from the base of the pole) and a 50-foot-wide area at conductor pulling locations, which includes any turns greater than 15° and/or every 2 miles of line. For a pole-mounted 12 kV/480 volt transformer, the work area is only that normally used by a utility to service the pole (typically about 20 by 30 feet adjacent to pole). For pad-mounted transformers, the work area is approximately 20 by 30 feet adjacent to the pad (for construction vehicle access).

Consideration of underground transmission lines

As part of the transmission line planning process, DWR evaluated a number of locations and options for power transmission to CM1 conveyance intakes and other facilities. One option that has been considered and is the subject of ongoing discussion is the potential to underground all or portions of the temporary and permanent transmission lines that could pose bird strike risks. This option has not yet been incorporated into any of the alternatives assumptions for CM1 facilities but DWR is continuing to evaluate its feasibility at the request of wildlife agencies, and because AMM20 in the Plan accounts for potentially locating some existing transmission lines underground to reduce

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impacts on greater sandhill cranes. The following key feasibility factors would be evaluated to determine if underground transmission lines are a viable option for this project.

- Consequences for critical water infrastructure associated with the time and process to repair faults or breaks in overhead lines versus underground lines.
- Potential for additional construction and environmental impacts related to underground lines and associated facilities.
- Costs associated with construction, operation, and maintenance of aboveground lines versus underground lines.

The following is a brief summary of these feasibility issues.

Critical Infrastructure

The SWP and CVP are critical infrastructure for the state of California. Operation of the SWP and CVP relies on interconnection to the power grid, and any disruption to power requires coordination among operators, power grid operators, and grid controllers. This is necessary to plan for reliable return to service, including resuming or replenishing water deliveries, after either a planned or unplanned power outage. One of the primary concerns with underground lines is the additional time necessary to repair outages. Faults or breaks in overhead lines can usually be located almost immediately and repaired within hours or, at most, 1 or 2 days. The duration of underground outages can vary widely, from several days to several months, depending on the circumstances of the failure, type of underground line, and availability of skilled repair personnel.

Outages of a few days or less generally present fewer effects, require less stringent coordination protocols, and may allow a portion of the effect to be avoided or minimized through short-term operational adjustments. A prolonged disruption or outage generally requires greater coordination to ensure that grid operators and grid controllers can manage other grid infrastructure, resources, and loads reliably during the outage. The larger the load or aggregate load interrupted for a prolonged time, the more likely there would be a need to re-evaluate the expected electrical system behavior. Power is also needed to maintain communications and controls systems during both normal and emergency situations. While backup power may temporarily and partially provide power to these critical systems during an outage, return to normal power would be necessary to reliably support these systems and their security, especially information systems networked to the SWP and CVP.

Construction and Environmental Impacts

The design and construction of underground transmission lines differ from overhead lines because two significant technical challenges need to be overcome: (1) providing sufficient insulation so that cables can be within inches of grounded material, and (2) dissipating the heat produced during the operation of the electrical cables. Overhead lines are separated from each other and surrounded by air. Open air circulating between and around the conductors cools the wires and very effectively dissipates heat. Air is also an insulator that can recover if there is a flashover. In contrast, a number of different systems, materials, and construction methods have been used during the last century to achieve the necessary insulation and heat dissipation required for underground transmission lines.

Different types of cables require different ancillary facilities. When assessing the impacts of underground transmission line construction and operation, the impacts of the ancillary facilities

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must also be considered. Ancillary features may include vaults, transition structures, and pressurizing systems. Some of these facilities are constructed underground, while others are aboveground and may have a significant footprint. Installation of an underground transmission cable generally involves the following sequence of events: (1) ROW clearing, (2) trenching/blasting, (3) laying and/or welding pipe, (4) duct bank and vault installation, (5) backfilling, (6) cable installation, (7) adding fluids or gas, and (8) site restoration. Trenching for the construction of underground lines would create greater soil disturbance than constructing overhead lines. Overhead line construction disturbs the soil mostly at the site of each transmission pole, while underground lines require 6- to 8-foot deep trenching along the entire line. Trenching an underground line through farmlands, forests, wetlands, and other natural areas can cause significant land disturbances. Other construction impacts include dirt, dust, noise, and traffic disruption. In non-urban areas, soil compaction, erosion, and mixing may also be problematic. The special soils often placed around an underground line may slightly change the responsiveness of surface soils to farming practices. Post-construction, trees and large shrubs would not be allowed within the ROW due to potential problems with roots, although some herbaceous vegetation and agricultural crops may be allowed to return to the ROW. The ROW also must be kept safe from accidental contact by subsequent construction activities.

In addition to environmental impacts from construction, impacts may occur from fluid leaks. Fluid-filled lines must have a spill control plan. The estimate for potential line leakage is about one leak every 25 years. Soil contaminated with leaking dielectric oil is classified as a hazardous waste. This means that contaminated soils and water would have to be remediated. The types of dielectric fluid used in underground transmission lines include alkylbenzene and polybutene. These are not toxic, but are slow to degrade. The release and degradation of alkylbenzene could cause benzene compounds, a known carcinogen, to appear in plants or wildlife. In areas with a relatively high groundwater table, such as the Delta, the potential for groundwater contamination could be high. A nitrogen leak from a gas-filled line would not affect the environment, but would be a safety concern; workers would need to check oxygen levels in the vaults before entering.

Costs

Costs for construction and maintenance of underground lines are substantially higher than those associated with aboveground lines. Cost estimates for constructing underground transmission lines range from 4 to 14 times greater than those associated with overhead lines of the same voltage and same length, especially when traveling through challenging geographic regions containing certain soil and rock formations, mountains, urban areas, and protected wetland habitats. In a 2011 report prepared by the Public Service Commission of Wisconsin, the cost of a typical new 69 kV overhead single-circuit transmission line was approximately $285,000 per mile as opposed to $1.5 million per mile for a new 69 kV underground line (Public Service Commission of Wisconsin 2011). A new 138 kV overhead line cost approximately $390,000 per mile as opposed to $2 million per mile for underground. Many engineering factors significantly increase the cost of underground transmission facilities. As the voltage increases, engineering constraints and costs dramatically increase. This is one reason why underground distribution lines (12–24 kV) are not uncommon, while underground transmission lines are constructed far less frequently. Repair costs for underground lines also tend to be greater than costs for an equivalent segment of overhead line. Finally, underground cables tend to have a substantially shorter service life than those used for overhead lines.

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3.6.1.7 Through Delta/Separate Corridors Levee Construction and Modification

Description

The through Delta/separate corridors alternative (Alternative 9) would rely on existing levees to contain and convey water to existing diversion facilities in the south Delta.

This alignment would entail construction of a 4,000-foot segment of new on-channel levee at Old River, isolating Old River from the Tracy Fish Collection Facility and connecting Clifton Court Forebay to the fish facility. Setback levees (approximately 2,000 feet total) on the south side of Victoria Canal would also be constructed to accommodate the dredged and expanded canal under this alternative. The majority of dredged material under Alternative 9 would be stored in upland storage sites, and approximately 0.5% may be disposed of in an offsite landfill. Spoils would be disposed of in designated spoils areas, and approximately 0.1% of spoils may be disposed of in offsite landfills.

New facilities protection levees would be constructed around pumping plants and equipment for the operable barriers. New levees or levee modifications constructed for the through Delta/separate corridors alternative would be designed to meet similar flood protection levels as the existing levees.

A typical new levee would share the shape, slope, and dimensions of those described above for intake facilities. A notable difference is that the height of the levees would be approximately 10 –15 feet, matching the height of existing levees in the Delta. This corresponds to a base width of approximately 80–260 feet. All construction and modifications will comply with applicable state and federal flood management, engineering, and permitting requirements.

Refer to Table 3-14 for a description of the physical characteristics of the through Delta/separate corridors alternative.

Operation and Maintenance

Levee maintenance facilities would typically be composed of material stockpile areas, sized to accommodate materials, equipment, and sufficient area for staging and loading of materials. Such areas would typically be rectangular in plan and range from approximately 50 to 500 feet on a side, depending on the length of levee serviced by the maintenance facility.

Access roads would be used regularly for inspection of the levees. Inspection would be performed for both the waterside and landside slopes and features. Maintenance activities include periodic addition of waterside armoring material, which may necessitate access and work either from the levee crest (e.g., using an excavator to place riprap) or from the water (e.g., using a barge and crane to place rip-rap). Levee maintenance may also include operations designed to prevent and repair damage from animal burrowing within the levee. Vegetation control measures would be performed as part of levee maintenance.

Construction

To construct levees, compacted lean clayey and/or silty soils would be imported to the site. Excavation and foundation improvement activities would be similar to those described above, with the use of riprap for waterside armoring. Access roads would be maintained along the landside levee

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toe or along the levee crest, while a dedicated ROW would preclude encroachment from features that could compromise levee integrity. Where levees cross existing agricultural channels, new channels would need to be constructed.

Beneath the levee, a zone of native soils would typically be removed and replaced. The depth of replacement is estimated to range from approximately 5 to 15 feet, but is expected to be 5 feet typically. The width of replacement would be slightly greater than the width of the base of the levee. This zone would be replaced with compacted clayey or silty soils as described above. The typical configuration would include some type of *in situ* foundation improvement to strengthen and stiffen the relatively weak and compressible soils present underneath most of the levee alignments. A zone of improved foundation materials would extend from the waterside levee toe to the landside toe. The zone of improved foundation materials would extend down to depths ranging from approximately 20 to 60 feet. The zone of improved foundation materials would typically be composed of a combination of existing *in situ* materials and added materials, mixed together. Armoring material would be rip-rap, which generally is composed of small to large angular boulders. The on-channel levee would be subject to waterway flows and could be armored for the full slope length on the waterside.

An access road would be maintained either along the landside toe of the levee, along the levee crest, or along a combination of these locations. A dedicated ROW would extend along the landside levee to preclude encroachment of channels, ditches, trenches, or pits near the levee.

3.6.1.8 Temporary Access and Work Areas for Intake, Canal, and Pipeline/Tunnel Construction

Temporary Barge Unloading Facilities

Temporary barge unloading facilities would be constructed at locations adjacent to construction work areas along the conveyance alignments for the delivery of construction materials. These facilities would be sized to accommodate various deliveries (e.g., tunnel segments, batched concrete, major equipment). The docks would be approximately 50 by 300 feet and supported on approximately 32 two-foot-diameter steel piles. Piles would be driven within the allowable window for in-river construction.

Access roads from these facilities to the construction work area would be necessary. The barge unloading facilities would be removed following construction. Depending on the alternative selected, barge unloading facilities could be constructed at one or more of the following locations.

- SR 160 west of Walnut Grove (Alternatives 1A, 2A, 3, 5, 6A, 7, and 8).
- Venice Island (Alternatives 1A, 2A, 3, 5, 6A, 7, and 8).
- Bacon Island (Alternatives 1A, 2A, 3, 4, 5, 6A, 7, 8, and 9).
- Woodward Island (Alternatives 1A, 2A, 3, 5, 6A, 7, and 8. Two barge facilities would be constructed at this location under Alternative 9).
- Victoria Island (Alternatives 1A, 2A, 3, 4, 5, 6A, 7, 8, and 9).
- Tyler Island (Alternatives 1A, 2A, 3, 5, 6A, 7, and 8).
- Hog Island (Alternatives 1B, 2B, and 6B).

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- Ryer Island (Alternatives 1C, 2C, and 6C).
- Brannan Island (Alternatives 1C, 2C, and 6C).
- Byron Tract on Italian Slough (Alternative 4).
- Bouldin Island on San Joaquin River (Alternative 4).
- Staten Island on South Mokelumne River (Alternative 4).
- Webb Tract (two barge facilities would be constructed on Webb Tract under Alternative 9 —one at the northwest corner and one on the eastern side).
- Upper Jones Tract (Alternative 9).

In addition, there is an existing dock at Hood that would likely be used during construction for Alternatives 1A, 1B, 2A, 2B, 3, 4, 5, 6A, 6B, 7, and 8. The barge unloading facilities would be used for the delivery and removal of construction materials and equipment. A pier would be built within the worksite footprint of the intake or tunnel for these activities. The barge unloading facility at each location is assumed to be used for the duration of the construction of the intake or tunnel (for approximately 5–6 years). Piers would be disassembled and removed from the site at the end of construction. Under Alternative 4, it is assumed that barge activities would take place on levees using a ramp barge in conjunction with a crane/excavator barge or a crane or excavator positioned on or near the levee.

Road Haul Routes

It is assumed that the majority of haul routes would include interstates, state routes, and local arterial roadways, depending on the location of the work area and the origin/destination of the trip. Key roadways to be utilized as haul routes are assumed to be the federal and state facilities and their intersecting roadways listed below.

- I-5
- I-80
- I-580
- I-205
- SR 160
- SR 12
- SR 4

The reader is referred to Chapter 19, *Transportation*, for a more detailed discussion of potential existing public roads that may be used as haul routes.

In addition, haul routes could include all-weather access roads. All-weather roads would be required for year-round construction and for access to delivery areas and permanent spoils areas, including RTM areas. All-weather roads are typically surfaced with a minimum of 24 inches of gravel.

General Construction Work Areas

Work areas during construction would include areas for construction equipment and worker parking, field offices, a warehouse, maintenance shops, equipment and materials laydown and

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storage, RTM spoils areas, and stockpiles. Under Alternative 4, one of these areas would be located adjacent to Hood on the southern side of the community, and would serve as a staging area during the construction phase. It would consist of facilities such as parking areas, offices, and construction equipment storage. Materials to be stockpiled may include those listed below.

- Strippings from various excavations for possible reuse in landscaping.
- RTM that is slated for reuse after treatment for embankment or fill construction.
- Peat spoils for possible use on agricultural land, as safety berms on the landside of haul roads, or as toe berms on the landside of embankments (cannot be part of the structural section).
- Other materials being stockpiled on a temporary basis prior to hauling to permanent stockpile areas.

Such materials can be stockpiled in the construction areas of the project for later use. Some stockpiles may be used for material conditioning and potential reuse. Temporary stockpile areas may also allow for staging deliveries (offloading), for equipment/materials storage, and for temporary field offices for construction.

Site clearing and grubbing, work area limits, and site access to stockpile locations will be developed. Silt fencing and straw bale dikes will be installed, as needed, to address drainage issues. Dust abatement and other environmental concerns relating to stockpiles will be addressed by environmental commitments (Appendix 3B, *Environmental Commitments*) and mitigation measures introduced throughout the impact analysis. Stockpile areas may require security fences, gates, and/or cameras.

Depending on the selected RTM handling method, RTM areas may be permanent. Similarly, borrow or spoils areas that cannot be returned to previous uses may constitute permanent physical effects, subject to appropriate environmental permitting (see Table 1-3 in Chapter 1, *Introduction*, for a summary of permits relevant to the BDCP). While these areas are treated as "permanent surface impacts" throughout the assessment of impacts, it is anticipated that much of the RTM and spoil material could be reused, as described further in Appendix 3B, *Environmental Commitments.*

A potable water supply system would be necessary at main construction work areas. Accordingly, wells would be drilled to provide approximately 500 gallons per minute during construction activities. Geotechnical studies would be performed prior to drilling. If necessary, package water treatment plants would be brought to the site. These facilities would be anticipated to be located within the tunnel work areas.

3.6.1.9 SWP and CVP South Delta Export Facilities

Under most alternatives, existing SWP and CVP conveyance facilities would continue to be active physical components of the water conveyance system; as such, these facilities are described below. Operation and maintenance of these facilities and modifications proposed under the alternatives are detailed in Section 3.6.4. These facilities include the SWP Clifton Court Forebay, Skinner Fish Facility, Banks Pumping Plant, Tracy Fish Facility, Delta Cross Channel, Jones Pumping Plant, south Delta temporary barriers, Barker Slough Pumping Plant and North Bay Aqueduct, portions of the CCWD Diversion Facilities, and Suisun Marsh Facilities. Because CCWD's facilities are not operated or maintained by the CVP, the BDCP does not include modifications to them. Coverage under ESA and CESA for existing operation and maintenance of the SWP, coordinated operations of the SWP with

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the CVP, and operation and maintenance of CCWD's facilities are addressed through separate compliance processes and not addressed in the BDCP.

Clifton Court Forebay

Clifton Court Forebay is a 31,000-af regulatory reservoir for the SWP about 10 miles northwest of Tracy. Water flows through Grant Line Canal and Old River and into Clifton Court Forebay through radial gates near the confluence of Grant Line Canal and West Canal. The gates are operated on the tidal cycle to reduce approach velocities, prevent scour in adjacent channels, and minimize water elevation fluctuation in the south Delta by taking water in through the gates at times other than low tide. When a large head differential (difference in water surface elevation) exists between the outside and the inside of the gates, theoretical inflow can be as high as 15,000 cfs for a short time, though actual inflow would be constrained in accordance with the BDCP conservation strategy. The intake gates enable incoming flow into Clifton Court Forebay to be measured and conveyed to the Banks Pumping Plant. Water can be stored in Clifton Court Forebay to be conveyed at a later time to maximize pumping during off-peak hours. The off-peak hours are typically 10:00 p.m. to 7:00 a.m. Monday through Saturday, all day Sunday, and many holidays. The gates prevent reverse flow back into Old River.

The period of the tidal cycle in which the Clifton Court Forebay intake gates are opened is selected to minimize impacts on south Delta water users. DWR reports that the surface water elevation in Clifton Court Forebay varies throughout the day, typically between -2 feet and +0 to +2 feet depending on tidal conditions and predetermined gate opening priority for the forebay. Typical operation is targeted to restore the surface elevation to -1 foot each day at midnight. This water level creates the required hydraulic head differential between the available water in the Delta and Clifton Court Forebay to allow water to flow from the Delta into the forebay to provide sufficient water for SWP's Delta Export Allocation for the following day. The Clifton Court Forebay gates are closed once DWR's daily water allocation has been achieved. If tidal or other conditions prevent DWR's daily allocation from being achieved, the schedule for the following day's water conveyance operation is adjusted to minimize impacts on DWR deliveries.

The maximum design operating storage at Clifton Court Forebay is 28,653 af at the water surface elevation of +5 feet. The minimum design operating storage is 13,965 af at the minimum water surface elevation of -2 feet. DWR has indicated that unless engineering improvements are made to the perimeter embankment around Clifton Court Forebay, the maximum operating water surface elevation for future water operations should be limited to +4 feet. For the modified pipeline/tunnel alignment (Alternative 4), Clifton Court Forebay will be reconfigured by dividing it into two cells, a north cell and a south cell. The south cell will continue to function using existing operating rules for Clifton Court Forebay. The maximum design operating storage will be reduced to about 26,000 af. The perimeter embankment however will be completely rebuilt to current flood protection and seismic design standards, thereby improving its reliability.

Skinner Fish Facility and Banks Pumping Plant

Water from Clifton Court Forebay is conveyed through Skinner Fish Facility to the California Aqueduct Intake Channel, which extends to the Banks Pumping Plant. Large fish and debris are directed away from the Banks Pumping Plant by a 388-foot-long trash boom. Smaller fish are diverted from the intake channel into bypasses by a series of metal louvers into a secondary system of screens and pipes, and then into holding tanks. The salvaged fish are returned to the Delta in

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oxygenated tank trucks. For the modified pipeline/tunnel alignment (Alternative 4), only water from the south cell will be conveyed through the Skinner Fish Facility.

The 2009 NMFS BiOp requires DWR to initiate studies to develop predator controls in Clifton Court Forebay to reduce salmonid and steelhead losses in the forebay by March 31, 2014, such that losses do not exceed 40%, and to remove predators in the secondary channel at least once per week. The NMFS BiOp also requires modifications to operations of the Skinner Fish Facility to achieve at least 75% salvage efficiency for Central Valley salmonids, steelhead, and the southern Distinct Population Segment of North American green sturgeon.

Banks Pumping Plant has an installed pumping capacity of 10,670 cfs. It discharges into five pipelines that convey water into a roughly 1-mile-long canal, which in turn conveys water to Bethany Reservoir. Bethany Reservoir serves as a regulating reservoir for the downstream canals that deliver SWP water.

The maximum daily pumping rate at Banks Pumping Plant is controlled by a combination of the State Water Board's D-1641, an adaptive management process described in the 2008 USFWS and the 2009 NMFS BiOps, and permits issued by USACE that regulate the rate of diversion of water into Clifton Court Forebay. The diversion rate is normally restricted to 6,680 cfs as a 3-day average inflow and 6,993 cfs as a 1-day average inflow to Clifton Court Forebay. The diversions may be greater in the winter and spring, depending on San Joaquin River flows at Vernalis.

The Byron-Bethany Irrigation District diverts water from the California Aqueduct Intake Channel through a canal between the Skinner Fish Facility and Banks Pumping Plant. This diversion occurs under an agreement related to historical water rights to the waters near Clifton Court Forebay.

Tracy Fish Facility and Jones Pumping Plant

The Tracy Fish Facility, located at the Delta-Mendota Canal intake, and Jones Pumping Plant operate continuously because the CVP facilities do not include a regulating reservoir such as Clifton Court Forebay. Water is diverted from Old River upstream of its confluence with Grant Line Canal, through the Tracy Fish Facility into the 2.5-mile unlined upper reach of the Delta-Mendota Canal, which conveys water to the Jones Pumping Plant. The Tracy Fish Facility uses louver screens to divert fish into holding tanks, where they are then placed in tanker trucks and released into the Delta. The salvaged fish are returned to the Sacramento River near Horseshoe Bend and the San Joaquin River upstream of the Antioch Bridge.

The CVP facilities do not include storage capacity in the south Delta. Consequently, the facilities usually operate continuously when diversions are allowed. Water supply operations of the Jones Pumping Plant are constrained by tidal fluctuations and the capacity of the Delta-Mendota Canal between the Jones Pumping Plant and the San Luis Reservoir complex. This capacity, including pumping capacity at the O'Neill Pump-Generating Plant, is about 4,200 cfs. Accordingly, operations of the Jones Pumping Plant are limited to 4,200 cfs unless deliveries are required for CVP water service contractors that divert upstream of the O'Neill Pump-Generating Plant. In many months, operations criteria limit the Jones Pumping Plant to diversions of less than 4,200 cfs; however, in summer, fall, and winter months, there are opportunities to divert up to 4,600 cfs.

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Delta-Mendota Canal/California Aqueduct Intertie

Construction of the Delta-Mendota Canal/California Aqueduct Intertie (Intertie) was completed in April 2012. The Intertie was designed to include a pipeline between the Delta-Mendota Canal and the California Aqueduct south of the Banks and Jones Pumping Plants, and a new pumping plant on the Delta-Mendota Canal that allows up to 467 cfs to be pumped from the Delta-Mendota Canal to the California Aqueduct. Prior to operation of this facility, the O'Neill Pump-Generating Plant, farther south along the Delta-Mendota Canal, created a bottleneck due to a design capacity of 4,200 cfs, causing Jones Pumping Plant to pump below capacity in fall and winter. Diverting an additional 400 cfs to the California Aqueduct allows the Jones Pumping Plant to pump at a maximum monthly average of about 4,600 cfs throughout the year. This operational modification is intended to be implemented primarily September through March. Conversely, up to 900 cfs can be conveyed from the California Aqueduct to the Delta-Mendota Canal along the same pipeline by gravity. Operations of the Intertie are subject to all applicable export pumping restrictions for water quality and fisheries protection.

South Delta Temporary Barriers Project

The existing South Delta Temporary Barriers Project consists of seasonal installation and removal of three temporary rock barriers in Middle River near Victoria Canal, Old River near Tracy, and Grant Line Canal near Tracy Boulevard Bridge. These rock barriers are designed to act as flow-control structures, trapping tidal waters behind them following high tide. These barriers improve water levels and circulation for local south Delta farmers. A fourth barrier, installed at the head of Old River at the divergence from the San Joaquin River, is designed to improve migration conditions for salmon originating in the San Joaquin River watershed during adult and juvenile migrations, which occur annually in the fall and spring, respectively. In the fall, the head of Old River barrier improves downstream dissolved oxygen conditions; during the spring, the barrier is intended to prevent downstream migrating salmon smolt in the San Joaquin River from entering Old River. In 2009 and 2010, DWR installed and operated a nonphysical barrier at the head of Old River as an alternative to the spring rock barrier at this location. The nonphysical barrier uses underwater bubbles, light, and sound as a behavioral deterrent and tests the effectiveness of excluding outmigrating smolts from entering the south Delta via Old River without having to physically block the flow of water into the channel with a rock structure. In the future, DWR may install and operate the nonphysical barrier at the head of Old River as an alternative to the spring rock barrier.

Joint Point of Diversion

Under State Water Board D-1641 (December 1999, revised March 2000), Reclamation and DWR are authorized to use/exchange diversion capacity between the SWP and CVP to enhance the beneficial uses of both projects. The sharing of the SWP and CVP export facilities is referred to as Joint Point of Diversion (JPOD). In general, JPOD capabilities are used to accomplish the following four objectives.

- When wintertime excess pumping capacity is available during Delta excess conditions, and total SWP and CVP San Luis Reservoir storage is not projected to fill before the spring pulse flow period, the project with the deficit in San Luis Reservoir storage may elect to use JPOD capabilities.
- When summertime pumping capacity is available at the Banks Pumping Plant and CVP reservoir conditions can support additional releases, the CVP may elect to use JPOD capabilities to enhance annual CVP releases for south of Delta water supplies.

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- When summertime pumping capacity is available at the Banks or Jones Pumping Plant to facilitate water transfers, the JPOD may be used to further facilitate the water transfer.
- During certain coordinated SWP and CVP operation scenarios for fish entrainment management, the JPOD may be used to shift SWP and CVP exports to the facility with the least fish entrainment impact and minimize exports at the facility with the most fish entrainment impact.

Barker Slough Pumping Plant and North Bay Aqueduct

The Barker Slough Pumping Plant diverts water from Barker Slough into the North Bay Aqueduct for delivery in Napa and Solano Counties. The North Bay Aqueduct intake is approximately 10 miles from the mainstem Sacramento River at the end of Barker Slough in the Cache Slough area. The maximum pumping capacity is 175 cfs (pipeline capacity). During the last few years, daily pumping rates have ranged between 0 and 140 cfs.

Currently, DWR and the Solano County Water Agency are evaluating an alternative intake for the pumping plant because operations have been limited by water quality constraints and provisions in the USFWS and NMFS BiOps. Water conveyance operations of this potential new facility are incorporated in this analysis and discussed in Section 3.6.4.

Water Transfers

State and federal laws governing water use in California promote the use of water transfers to manage water resources, particularly water shortages, provided that certain conditions of the transfer are met to protect source areas and users. Transfers requiring export from the Delta are conducted at times when pumping and conveyance capacity at the SWP or CVP export facilities are available to move the water. Additionally, operations to accomplish these transfers must be carried out in coordination with SWP and CVP operational criteria, such that the capabilities of the projects to exercise their own water rights or to meet their legal and regulatory requirements are not diminished or limited in any way.

SWP and CVP contractors have independently acquired water and arranged for its pumping and conveyance through SWP facilities. State Water Code provisions grant other parties access to unused conveyance capacity, although SWP contractors have priority access to capacity not being used by DWR to meet SWP operational demands, including SWP water deliveries.

Conveyance of transfer water by Authorized Entities is a covered activity provided that the transfers are consistent with the operational criteria described in CM1 and the effects analysis described in BDCP Chapter 5, *Effects Analysis*. However, the withdrawal of transfer waters from source areas is outside the scope of the covered activity. Additional information regarding water transfers is provided in Appendix 1E, *Water in California: Types, Recent History, and General Regulatory Setting*; Appendix 5C, *Historical Background of Cross-Delta Water Transfers and Potential Source Regions*; and Appendix 5D, *Water Transfer Analysis Methodology and Results.*

Suisun Marsh Facilities

The existing Suisun Marsh facilities comprise the Suisun Marsh Salinity Control Gates, Morrow Island Distribution System, Roaring River Distribution System, Goodyear Slough Outfall, and various salinity monitoring and compliance stations throughout the marsh. Since the early 1970s, the California Legislature, State Water Board, Reclamation, CDFW, Suisun Resource Conservation District (SRCD), DWR, and other agencies have engaged in efforts to preserve beneficial uses of

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Suisun Marsh to mitigate the potential impacts on salinity regimes associated with reduced freshwater flows to the marsh. Initially, salinity standards for Suisun Marsh were set by State Water Board D-1485 to protect production of alkali bulrush, a primary waterfowl plant food. Subsequent standards set under State Water Board D-1641 reflect the intention of the State Water Board to protect multiple beneficial uses. A contractual agreement between DWR, Reclamation, CDFW, and SRCD includes provision for measures to mitigate the effects of operation of the SWP and CVP and other upstream diversions on Suisun Marsh channel water salinity. The Suisun Marsh Preservation Agreement requires DWR and Reclamation to meet specified salinity standards, sets a timeline for implementing the Plan of Protection, and delineates monitoring and mitigation requirements. Maintenance activities for existing facilities include levee repairs, vegetation removal, fish screen cleaning and installation of new screens, mechanical repairs, structural repairs, removal or replacement of monitoring and compliance stations (including in-water work), and instrumentation installation on or near existing facilities.

3.6.2 Conservation Components

This section describes the proposed habitat conservation components associated with the action alternatives. The descriptions include the general locations proposed for implementation of each conservation measure, as well as the potential physical modifications and construction efforts necessary to implement habitat conservation–related activities. These descriptions include enough detail to support program-level impact analyses related to habitat and land use conversions. Any differences in conservation components among the action alternatives (e.g., different target acreages for restored habitat) are noted in the descriptions in the subsections below. A screening evaluation of alternatives for these conservation components is detailed in Appendix 3G, *Background on the Process of Developing the BDCP Conservation Measures*.

While general locations are provided, specific locations for these conservation actions have not been identified at this time. Therefore, the analyses consider typical construction, operation, and maintenance activities that would be undertaken for implementation of the habitat restoration and enhancement efforts. As appropriate, project-level implementation of the conservation actions would be subject to additional environmental review.

Activities associated with the implementation of the proposed habitat restoration and enhancement conservation measures are anticipated to include, but would not be limited to, the following.

- Grading, excavation, and placement of fill material.
- Breaching, modification, or removal of existing levees and construction of new levees.
- Modification, demolition, and removal of existing infrastructure (e.g., buildings, roads, fences, electric transmission and gas lines, irrigation infrastructure).
- Construction of new infrastructure (e.g., buildings, roads, fences, electric transmission and gas lines, irrigation infrastructure).
- Removal of existing vegetation and planting/seeding of vegetation.
- Controlling the establishment of nonnative vegetation to encourage the establishment of target native plant species.
- Control of nonnative predator and competitor species (e.g., feral cats, rats, nonnative foxes).

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Habitat management actions include all activities undertaken to maintain the intended functions of protected, restored, and enhanced habitats over the term of the BDCP. Habitat management actions are anticipated to include, but are not limited to, the activities listed below.

- Minor grading, excavation, and filling to maintain infrastructure and habitat functions (e.g., levee maintenance; grading or placement of fill to eliminate fish stranding locations).
- Maintenance of infrastructure (e.g., buildings, roads, fences, electric transmission and gas lines, irrigation infrastructure, fences).
- Maintaining vegetation and vegetation structure (e.g., grazing, mowing, burning, trimming).
- Ongoing control of terrestrial and aquatic nonnative plant and wildlife species.

As part of the proposed BDCP, AMMs and BMPs would be implemented to avoid and minimize potential adverse effects of habitat restoration, enhancement, and management activities. These measures are described in Appendix 3B, *Environmental Commitments*.

3.6.2.1 Yolo Bypass Fisheries Enhancement (CM2)

Many covered species depend upon periodic inundation of floodplains to complete their life cycles, for rearing, or to support emigration or dispersal. Loss of floodplain habitat and river connectivity in recent decades has been linked with decreasing abundance of these species. Under CM2, the Fremont Weir and Yolo Bypass would be modified to increase the frequency, duration, and magnitude of floodplain inundation and improve fish passage in the Yolo Bypass. During periods when the bypass is inundated, a relatively high production of zooplankton and macroinvertebrates serves, in part, as the forage base for many of the covered fish species. CM2 is expected to advance the following benefits.

- Provide access to additional spawning habitat for Sacramento splittail. Because splittail are primarily floodplain spawners, successful spawning is predicted to increase with increased floodplain inundation.
- Provide additional juvenile rearing habitat for Chinook salmon, Sacramento splittail, and possibly steelhead. Growth and survival of larval and juvenile fish has been shown to be higher within the inundated floodplain compared to those rearing in the mainstem Sacramento River (Sommer et al. 2001).
- Improve downstream juvenile passage conditions for Chinook salmon, Sacramento splittail, river lamprey, and possibly steelhead and Pacific lamprey. An inundated Yolo Bypass is used as an alternative to the mainstem Sacramento River for downstream migration of juvenile salmonids, Sacramento splittail, river lamprey, and sturgeon; rearing conditions and protection from predators are believed to be better in this area. The expected increased habitat and productivity resulting from increased inundation of Yolo Bypass are likely to also provide some benefits to covered species, including steelhead and lamprey.
- Improve adult upstream passage conditions of migrating fish using the bypass such as Chinook salmon, steelhead, sturgeon, and lamprey. An inundated Yolo Bypass is used as an alternative route by upstream migrating adults of these species when Fremont Weir is spilling. Increasing the frequency and duration of inundations will provide these improved conditions for more covered species over longer portions of their migrations. A modified Fremont Weir can be operated to minimize stranding potential as flows are reduced. The overall benefits of providing additional flow in the bypass will be assessed through adaptive management. Monitoring for fish

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stranding will also be implemented, and fish salvage and rescue operations will be carried out, as necessary, to avoid stranding and migration delays for covered fish species.

- Increase food for rearing salmonids, Sacramento splittail, and other covered species on the floodplain.
- Potential exists for exported organic material and phytoplankton, zooplankton, and other organisms produced from the flooded bypass to increase the availability and production of food in the Delta, Suisun Marsh, and bays downstream of the bypass.
- Increase the duration of floodplain inundation and the amount of associated rearing and migration habitat during periods that the Yolo Bypass is receiving water from both the Fremont Weir and the westside tributaries (e.g., Cache and Putah Creeks).
- Reduce losses of adult Chinook salmon, sturgeon, and other fish species to stranding and illegal harvest by improving upstream passage at the Fremont Weir (*CM17 Illegal Harvest Reduction*) and monitoring for fish stranding below Fremont Weir as flow into Yolo Bypass from the Sacramento River recedes. As necessary, implement fish salvage and rescue operations to avoid stranding and migration delays for covered fish species.
- Reduce the exposure and risk of juvenile fish migrating from the Sacramento River into the interior Delta through the Delta Cross Channel and Georgiana Slough, by decreasing the number of fish passing through these areas.
- Reduce the exposure of outmigrating juvenile fish to entrainment or other adverse effects associated with the proposed north Delta intakes and the proposed Barker Slough Pumping Plant facilities by passing juvenile fish into and through the Yolo Bypass upstream of the proposed intakes.
- Improve fish passage, and possibly increase and improve seasonal floodplain habitat availability, by retrofitting Los Rios Check Dam with a fish ladder, or creating another fish-passable route by which water from Putah Creek can reach the Toe Drain.

To achieve these benefits, CM2 includes modifications to the Yolo Bypass that, in balance with existing uses, would benefit covered fish by increasing the frequency, duration, and magnitude of floodplain inundation and improving fish passage. Any modification to the Yolo Bypass or other CM2 actions would be required to be designed and implemented to maintain flood conveyance capacity at the design flow level and to comply with other flood management standards and permitting processes. These activities would be coordinated, as appropriate, with USACE, DWR, Central Valley Flood Protection Board (CVFPB), and other flood management agencies.

Other planning actions are also proposed within the Yolo Bypass, including the Central Valley Flood Protection Plan (CVFPP) and the Yolo Bypass Salmonid Habitat Restoration and Fish Passage Implementation Plan (HRFPIP), including an associated EIS/EIR, which is under development as of the publication of the BDCP EIR/EIS Public Draft. The integration of these separate, but overlapping processes will occur formally once BDCP has been approved. Until that time, coordination will occur through the Yolo Bypass Fishery Enhancement Working Group. This working group provides the forum to coordinate and discuss integration and the consideration of these and other planning efforts that are ongoing in the Yolo Bypass.

Yolo Bypass fisheries enhancement would be achieved with site-specific component projects to construct fish passage improvements and facilities to introduce and manage additional flows for seasonal floodplain habitat. Prior to construction for each project, necessary preparatory actions

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would include interagency coordination, feasibility evaluations, site or easement acquisition, coordination related to any required modifications to agricultural practices, development of site-specific plans, and regulatory compliance.

Actions to be implemented as part of CM2 fall into one of three categories. The component projects described in the pages below identify the category into which each action would fall.

- Category 1—Actions are generally small in scale, address a known problem and can be implemented relatively easily, or will provide an interim solution until a more permanent solution can be implemented. Category 1 actions would proceed immediately after BDCP permits are issued and before the Yolo Bypass Fisheries Enhancement Plan (YBFEP) is completed.
- Category 2—Actions are larger in scale and may require further evaluation, research, design, and coordination with the fish and wildlife agencies and stakeholders to refine the action to provide the greatest biological benefit while also addressing stakeholder concerns and accommodating stakeholder needs. Category 2 Actions will be further defined in the YBFEP, and will not proceed until the YBFEP is completed.
- Category 3—Actions may affect stakeholders or may be controversial and/or substantially change the existing conditions of the Yolo Bypass. Category 3 Actions would also be defined within the YBFEP, but would proceed only after an Environmental Impact Report /Environmental Impact Statement (EIR/EIS) for the YBFEP is completed and the Record of Decision/Notice of Determination (ROD/NOD) is signed (i.e., CEQA/NEPA compliance) and all permits have been received.

The YBFEP would propose a sustainable balance among important uses of the Yolo Bypass and consideration of existing conservation easements. Important uses of the Yolo Bypass include flood protection, agriculture, threatened and endangered terrestrial species habitat, fisheries habitat, the Yolo Natural Heritage Program, and managed wetlands habitat, as described in existing state and federal land management plans associated with the Yolo Bypass Wildlife Area and existing conservation easements on private land. With stakeholder and scientist input, the YBFEP would further refine CM2 and the component projects that would be evaluated. The YBFEP and an associated YBFEP EIR/EIS would be completed by year 4 of BDCP implementation. During their development, the component projects would be evaluated, individually or grouped as alternatives, to ensure the component projects would provide the greatest biological benefit to the covered fish species, consistent with the goals of this measure and the biological goals and objectives of the BDCP. Projects must also minimize impacts on other uses of the Yolo Bypass, such as flood control, agriculture, waterfowl use and hunting, and habitat for covered and non-covered species. Project design and environmental compliance documentation would also be completed, including the YBFEP EIR/EIS.

The BDCP identifies a number of anticipated component projects, which are summarized below. The component projects that are expected to achieve the desired biological outcomes of CM2 would be further developed and implemented. If the YBFEP evaluation does not support implementation of one or more of the component projects, they would not be implemented. Reasons that implementation may not be supported by the YBFEP include, but are not limited to, the following: the action would not be effective; the action is not needed because of the effectiveness of other actions; the action would have unacceptable negative effects on flood control; the action would have

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unacceptable negative effects on land use, species (both covered and non-covered native species), or habitat; or landowner agreement cannot be achieved with respect to implementing the action.

Many component projects will be evaluated in a parallel environmental compliance process because they are required by the RPA. Selected component projects that trigger EIR/EIS-level evaluation under CEQA/NEPA (Category 3 Actions) would be brought to a preliminary level of design for the YBFEP EIR/EIS. Permitting and the remainder of engineering design would begin after the YBFEP EIR/EIS is complete. Component projects requiring USACE Section 408 permissions may require that any real estate transactions have been completed, and Section 408 permissions may delay finalization of the ROD/NOD until USACE accepts final design.

Completion of the YBFEP and associated project-specific YBFEP EIR/EIS is anticipated to take 3 to 4 years. Full engineering design and permitting of multiple component projects are anticipated to take up to 3 additional years, depending upon the scope and scale of component projects. Preparing and letting construction contracts, and constructing the component projects within appropriate work windows are anticipated to span approximately 2 calendar years.

This conservation measure would be implemented under all action alternatives. CM2 actions are proposed for implementation in four phases: Phase 1—year 1 to year 5 of BDCP implementation; Phase 2—year 6 to year 10; Phase 3—year 11 to year 25; and Phase 4—year 26 to year 50. The discussion below identifies and summarizes the various conceptual component projects that would be implemented as part of CM2 and identifies which projects are currently considered Category 1, 2, or 3 actions. The Category 2 and 3 actions would be more fully defined and evaluated in the YBFEP and/or YBFEP EIR/EIS, as appropriate.

Phases 1 and 2 (Year 1 to Year 10)

Projects to be Implemented

- **Component Project 1: Fish Rescue.** Provide funding to accelerate fish rescue and improvements to fish stranding assessments (Phase 1, Category 1 Action).
- **Component Project 2: Monitoring and Research.** Perform compliance and effectiveness monitoring, research actions, and adaptive management (Phase 1, Category 1 or 2 Action).
- **Component Project 3: Fish-Rearing Pilot Project at Knaggs Ranch (not to exceed 10 acres).** Evaluate the use of water from Knights Landing Ridge Cut to solely provide or supplement flows, and evaluate the effectiveness of applying water pond by pond, rather than across a contiguously inundated, heterogeneous floodplain (Phase 1 or before, Category 1 Action).
- **Component Project 4: Expanded Fish Rearing at Knaggs Ranch.** Expand pilot project fish rearing via supplemental or sole flows from Knights Landing Ridge Cut to broader area over multiple years (Phase 1 or 2, Category 2 Action).
- **Component Project 5: Fish Ladder Operations Study at Fremont Weir.** Experiment with different approaches to operating the existing ladder (e.g., removing wooden baffles and monitoring fish passage) (Phase 1 or before, Category 1 or 2 Action).
- **Component Project 6: Experimental Sturgeon Ramps at Fremont Weir.** Construct and study up to four experimental ramps at the Fremont Weir to test whether they can provide effective passage for adult sturgeon and lamprey from the Yolo Bypass over the Fremont Weir to the

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Sacramento River when the river overtops the weir by approximately 3 feet. The species-specific biological goals and objectives for both green and white sturgeon include the reduction of stranding at the Fremont Weir. Developing effective passage through experimental sturgeon ramps would contribute toward reducing stranding at Fremont Weir. Monitoring technologies would be used to collect information on fish passage to evaluate its efficacy at passing adult fishes (Phase 1, Category 3 Action).

- **Component Project 7: Auxiliary Fish Ladders at Fremont Weir.** Construct up to three sets of auxiliary fishways. At least one set would serve the western length of Fremont Weir. Because Fremont Weir is nearly 2 miles long and is constructed in two distinct lengths, these auxiliary fish ladders would help fish pass the weir regardless of the location from which they approach it. At least one of the fish ladders would replace, and possibly increase the width of, the existing Fremont Weir fish ladder. At least one multistage, multispecies fishway would be placed adjacent to the main gated seasonal floodplain inundation channel (in its ultimate location) to provide passage when velocities or partially opened gates would otherwise be impassable or provide poor fish passage. Fish ladder placement would result in positive drainage from the stilling basin, with very little, if any, additional work on the stilling basin (Phase 1 or 2, Category 3 Action).
- **Component Project 8: Fish Screens for Small Yolo Bypass Diversions.** If YBFEP determines screening small Yolo Bypass diversions to be an appropriate means to hold existing irrigation practices harmless, construct fish screens on small Yolo Bypass diversions. Such work would be applied toward the 100 cfs per year remediation target identified in *CM21 Nonproject Diversions* (Phase 2, Category 2 Action).
- **Component Project 9: New or Replacement Impoundment Structures and Agricultural Crossings at the Tule Canal and Toe Drain.** Replace agricultural crossings of the Tule Canal and Toe Drain with fish-passable structures such as flat car bridges or earthen crossings with large, open culverts. Construct new or replacement operable check-structures to facilitate continued agriculture in the Yolo Bypass while promoting fish passage in season (Phase 1, Category 3 Action).
- **Component Project 10: Lisbon Weir Improvements.** Replace the Lisbon Weir with a structure that improves fisheries management and improves the ability to impound water for irrigation, while reducing maintenance (Phase 1, Category 3 Action).
- **Component Project 11: Lower Putah Creek Improvements.** Lower Putah Creek would be realigned to improve upstream and downstream passage of Chinook salmon and steelhead. The action would also include floodplain habitat restoration to provide benefits for multiple species on existing public lands. This action would be designed so that it would not create stranding or migration barriers for juvenile salmon (Phase 1, Category 3 Action).[24] This action would be covered in the YBFEP, and may be covered in separate environmental analysis because it is a required action under the 2009 BiOp.
- **Component Project 12: Water Supply Improvement for the Yolo Bypass Wildlife Area.** Improve Yolo Bypass Wildlife Area water supply at Lisbon Weir to support wildlife management

[24] Improvements to Upper Putah Creek, outside the Plan Area, will be included as part of the YBFEP. Improvements to Upper Putah Creek will support fish passage, water quality, and spawning habitat improvements in Putah Creek upstream of the Yolo Bypass Wildlife Area and downstream of Solano Diversion Dam (Phase 1).

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in the Yolo Bypass Wildlife Area (by reducing reverse flows in the Toe Drain) and potentially benefit the aquatic foodweb and downstream fish. Other actions not yet fully defined or developed would be considered. These may include a subsidy of Yolo Bypass Wildlife Area pumping costs or procurement of additional water from western tributary sources. This project incorporates goals of the Westside Concept (Phase 1 or 2, Category 3 Action).

- **Component Project 13: Use of Supplemental Flow through Knights Landing Ridge Cut.** Evaluate the desirability of using supplemental flows through Knights Landing Ridge Cut, introduced by means of redesigning Colusa Basin Drain Outfall Gates, increased operation of upstream unscreened pumps, or other means. If currently unscreened pumps were to be used for more than a pilot period, the pumps would need to be screened or replaced with fish-friendly pumps. This project incorporates goals of the Westside Concept (Phases 1 and 2, Category 3 Action).
- **Component Project 14: Flood-Neutral Fish Barriers.** Construct and test flood-neutral fish barriers to prevent fish from straying into Knights Landing Ridge Cut and the Colusa Basin Drain. These barriers would be most effective when employed in association with attraction flows to a location, such as at Fremont Weir, that is fish-passable and leads to the mainstem Sacramento River. This project incorporates goals of the Westside Concept (Phase 2, Category 3 Action).
- **Component Project 15: Gated Seasonal Floodplain Inundation Channel Past Fremont Weir.** Modify a section of the Fremont Weir to enable introducing managed flows to the Yolo Bypass at times when Fremont Weir is not overtopping. The Fremont Weir would continue to passively overtop when the Sacramento River stage exceeds the height of the weir. In the BDCP effects analysis, it is assumed that a section of the Fremont Weir would be lowered to 17.5 feet (NAVD 88). Lower elevations may be considered if necessary to satisfy inundation targets or fish passage needs. For operational modeling purposes, an additional opening at 11.5 feet was assumed. Because the Fremont Weir is perched on the natural levee that bounds the Yolo Basin, including the northern edge of the Yolo Bypass, it would be necessary to excavate through that area of higher ground to hydraulically connect the Sacramento River to the Yolo Bypass at these lower flow stages. Thus, the new section of gates would replace the former section of Fremont Weir and also extend below it, to govern flows in the excavated channel. The new section of operable gates would allow for controlled flow into the Yolo Bypass when the Sacramento River stage at the weir exceeds approximately 17.5 feet NAVD88, leaving the remaining portion of Fremont Weir to overtop passively when the Sacramento River stage is higher than the top of the weir (32.8 feet NAVD 88). The seasonal floodplain inundation flows will attract fish migrating upstream. Therefore, the gates and the fishways immediately adjacent to them would be designed so that when they are operated to provide seasonal floodplain inundation flows, they also allow the efficient upstream and downstream passage of sturgeon and salmonids between the Yolo Bypass and the Sacramento River. If additional work to ensure positive drainage of the entire length of Fremont Weir is required, it would be completed as part of this project (Phase 2, Category 3 Action).
- **Component Project 16: Nonphysical or Physical Barriers to Attract Juvenile Salmon into the Yolo Bypass.** If deemed necessary to enhance capture of juveniles into Yolo Bypass through the gated seasonal floodplain inundation channel (described in Component Project 15), construct and operate nonphysical or physical barriers in the Sacramento River. Examples of such barriers include bubble curtains or log booms (Phase 2 or 3, Category 3 Action).

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- **Component Project 17: Support Facilities.** Construct associated support facilities (e.g. operations buildings, parking lots, access facilities such as roads and bridges) throughout the Yolo Bypass necessary to provide safe access for maintenance, monitoring, and fish rescue (Phase 2, Category 3 Action).
- **Component Project 18: Levee Improvements.** Improve levees adjacent to the Fremont Weir Wildlife Area, as necessary, to maintain existing level of flood protection, or to beneficially reuse excavated earth (Phase 2, Category 3 Action).
- **Component Project 19: Yolo Bypass Modifications to Direct or Restrain Flow.** Through modeling and further concept development, determine which of the following actions are necessary to improve the distribution (e.g., wetted area) and hydrodynamic characteristics (e.g., residence times, flow ramping, and recession) of water moving through the Yolo Bypass: grading, removal of existing berms, levees, and water control structures (including inflatable dams); construction of berms or levees; reworking of agricultural delivery channels; and earthwork or construction of structures to reduce Tule Canal and Toe Drain channel capacities. The project would include modifications that would allow water to inundate certain areas of the bypass to maximize biological benefits and reduce stranding of covered fish species in isolated ponds, minimize effects on terrestrial covered species, including giant garter snake, and accommodate other existing land uses (e.g., wildlife, public, recreation and agricultural use areas). Necessary lands would be acquired in fee-title or through conservation or flood easement (Phase 2, Category 3 Action).

Phase 3 (Year 11 to Year 25)

Final permissions/permits from the permitting agencies for construction of the component projects directly affecting flood control structures (Fremont Weir, Sacramento Weir, and Colusa Basin Drain Outfall Gates, if affected, as well as project levees) not obtained in Phase 1 or 2 would be received by Phase 3 at the latest. Those component projects that are not able to obtain permits and be constructed during Phases 1 and 2 would do so in Phase 3. Full buildout is estimated to be completed in years 10, 11 or 12, at which time operations of these component projects would begin.

The following project would be designed, permitted, and if feasible, constructed in Phase 3.

- **Component Project 20: Sacramento Weir Improvements.** At a minimum, modifications would be made to reduce leakage at the Sacramento Weir and thereby reduce attraction of fish from the Yolo Bypass to the weir, where they cannot access the Sacramento River and could become stranded. The YBFEP would review the benefits and necessity of constructing fish passage facilities at the Sacramento Weir to improve upstream adult fish passage and positive drainage to reduce juvenile fish stranding. This action may require excavation of a channel to convey water from the Sacramento River to the Sacramento Weir and from the Sacramento Weir to the Toe Drain; construction of new gates at all or a portion of the weir; and modifications to the stilling basin (Phase 3, Category 3 Action).

Phase 4 (Year 26 to Year 50)

Phase 4 would encompass project operation, monitoring, and continued adaptive management. A matrix of criteria would be developed and tested prior to Phase 4, and operations would be adjusted accordingly. For example, if results of monitoring and studies indicate that shorter or earlier gate operations within the adaptive management range yield equivalent or better fish benefits, operation

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of the gated channel at Fremont Weir would be modified accordingly and additional environmental analysis completed, as appropriate. If scientific results indicate that the wetter, later end of the adaptive management range is more effective biologically, operations would shift accordingly.

3.6.2.2 Natural Communities Protection and Restoration (CM3)

CM3 provides the mechanism and guidance to establish a system of conservation lands in the Plan Area—a *reserve system*—by acquiring lands for protection and restoration. Such a system is needed to meet natural community and species habitat protection objectives described in Section 3.3, *Biological Goals and Objectives*, of the BDCP document. The reserve system would be assembled over the BDCP permit term to accomplish the following aims (see BDCP Chapter 3, Section 3.4.3).

- Protect and enhance areas of existing natural communities and covered species habitat.
- Protect and maintain occurrences of selected covered plant species with limited distributions.
- Provide sites suitable for restoration of natural communities and covered species habitat (some restoration would occur on lands already publicly owned).
- Provide habitat connectivity among the lands in the reserve system and connectivity to existing conservation lands inside and outside the Plan Area.

A variety of mechanisms through which lands could be acquired are listed below; however, this is not an exhaustive list.

- Purchase in fee title.
- Purchase or application of permanent conservation easements (on public or private lands).
- Change of state- or federally-owned lands to more protective land use designation.
- Permanent agreements with state, federal, and local agencies (e.g., flood control agencies) that commit the parties to the restoration, enhancement, and management of public lands in the reserve system in a manner supporting BDCP biological objectives.
- Purchase of suitable mitigation credits from approved private mitigation banks.

The BDCP alternatives' commitments of habitat conservation acreage targets for the various natural communities are listed below. These targets represent the minimum extent of land that would be acquired; the actual extent acquired would likely be greater because acquired parcels may not consist wholly of habitat types that contribute to achieving conservation targets. Restoration under Alternative 5 would result in 40,000 fewer acres of restored tidal habitat than the other action alternatives; total tidal habitat restoration under Alternative 5 would be 25,000 acres. The general amounts of natural community protection and restoration provided for in CM4–CM10 are listed below. A detailed description of CM3 is provided in Chapter 3, *Conservation Strategy* (Section 3.4.3), of the BDCP document.

- 65,000 acres of tidal habitat restored (CM4).
- 5,000 acres of valley/foothill riparian habitat restored (CM7) and 750 acres protected.
- 2,000 acres of grassland habitat restored (CM8), and 8,000 acres of grassland habitat protected.
- Up to 67 acres of vernal pool complex restored and 72 acres of restored alkali seasonal wetland (CM9); at least 600 acres vernal pool complex protected and 150 acres alkali seasonal wetland complex protected.

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- 8,100 acres of managed wetland protected.
- 50 acres of nontidal marsh protected.
- 48,125 acres of cultivated land (non-rice), up to 500 acres of cultivated land (rice), and 3,000 acres of cultivated land (rice or equivalent) protected (CM3 and CM11).

The implementation schedule for actions to preserve natural communities assumes that acquisition, protection/preservation, enhancement, and management of existing vernal pool complex, alkali seasonal wetland complex, grassland habitat, and agricultural habitats would be initiated prior to BDCP authorization. CM3 will be implemented according to the schedule in Table 3-4. This schedule was designed to ensure that mitigation and conservation occurs in rough proportion to impacts on natural communities and habitat for covered species.

It is anticipated that lands used for habitat restoration actions would primarily be those that are currently in public ownership or those that are acquired in fee title because restoration activities have a high potential to preclude other land uses. Lands acquired for the protection and maintenance of existing habitat functions may be acquired through conservation easements that specify permitted land uses and practices in sufficient detail to maintain the intended habitat functions of the acquired lands, although enhancements may also be implemented on conservation easement lands as opportunities arise.

Implementation of this conservation measure will be informed through compliance and effectiveness monitoring, and adaptive management, as described in Chapter 3 (Section 3.4.3) of the BDCP.

3.6.2.3 Tidal Natural Communities Restoration (CM4)

CM4 would provide for the restoration of 65,000 acres of tidal natural communities and transitional uplands. Some or all of the transitional uplands may become tidal during the 50-year permit term and beyond. The tidal natural communities restoration will be focused within the ROAs. However, tidal restoration projects may be implemented outside of the ROAs, as needed, to meet the biological goals and objectives, provided that take limits resulting from such restoration do not exceed those established for the BDCP. The transitional upland areas, which are included in the 65,000-acre total, may accommodate sea level rise by evolving into tidal marsh plain if sea level rises as expected in the future.

The 65,000 acres of restored tidal natural communities and protected transitional uplands must include 6,000 acres of tidal brackish emergent wetland and 24,000 acres of tidal freshwater emergent wetland. The remainder of the 65,000 acres would consist of a combination of any of the restored tidal natural communities (tidal brackish emergent wetland, tidal freshwater emergent wetland, and tidal perennial aquatic) and protected transitional uplands to accommodate sea level rise during and after the 50-year permit term. The intent of this conservation measure is to gain tidal wetlands and accommodate sea level rise, and while a portion of the 65,000 acres will consist of subtidal aquatic areas (tidal perennial aquatic natural community), these areas are expected to be a byproduct of the tidal restoration and not the primary restoration goal. Therefore, restoration will be designed to maximize tidal emergent wetlands and minimize deep subtidal areas. Under Alternative 5, 25,000 acres of tidal habitat would be restored.

Of the 65,000-acre target for restored tidal natural communities, 20,600 acres must occur in particular ROAs, consistent with the following minimum restoration targets. The rationale for the

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tidal natural community targets is provided in Appendix 3G, *Background on the Process of Developing the BDCP Conservation Measures*.

- Restore 7,000 acres of brackish tidal natural communities, of which at least 6,000 acres are tidal brackish emergent wetland and the remainder can be any combination of tidal brackish emergent wetland, tidal perennial aquatic, and tidal mudflat, in Suisun Marsh ROA.
- Restore 5,000 acres of freshwater tidal natural communities (tidal freshwater emergent wetland, tidal perennial aquatic, tidal mudflat) in the Cache Slough ROA.
- Restore 1,500 acres of freshwater tidal natural communities (tidal freshwater emergent wetland, tidal perennial aquatic, and tidal mudflat) in the Cosumnes/Mokelumne ROA.
- Restore 2,100 acres of freshwater tidal natural communities (tidal freshwater emergent wetland, tidal perennial aquatic, and tidal mudflat) in the West Delta ROA.
- Restore 5,000 acres of freshwater tidal natural communities (tidal freshwater emergent wetland, tidal perennial aquatic, and tidal mudflat) in the South Delta ROA.

The remaining 44,400 acres of restored tidal natural communities and protected transitional uplands will be distributed among the ROAs, or may occur outside the ROAs in order to meet the biological goals and objectives, provided the restoration does not result in effects on terrestrial covered species habitats that exceed the incidental take limits established for terrestrial covered species described in the BDCP, Chapter 5, *Effects Analysis*.

Although specific locations have not been confirmed, the conceptual locations listed below have been identified for all the action alternatives except Alternative 9. A brief discussion of each ROA follows the summary of the conservation measure. The complete details of the conservation measure are available in Chapter 3, *Conservation Strategy* (Section 3.4.4), of the BDCP document.

The following restoration variables would be considered in the design of restored freshwater tidal natural communities.

- Distribution, extent, location, and configuration of existing and proposed restored tidal natural communities.
- Potential for improving habitat linkages that allow covered and other native species to move among protected habitats in and adjacent to the Plan Area.
- For tidal brackish restoration, distribution of restored tidal natural communities along salinity gradients to optimize the range and habitat conditions for covered species and food production.
- For tidal brackish restoration, elevation and location along the existing Suisun Marsh fringe to maximize opportunities for restoring middle and high marsh (as opposed to subtidal and low marsh), with a minimum of 1,500 acres, but more as feasible.
- Predicted tidal range at tidal natural communities restoration sites following reintroduction of tidal exchange.
- Size and location of levee breaches necessary to restore tidal action.
- Cross-sectional profile of tidal natural communities restoration sites (elevation of marsh plain, topographic diversity, depth, and slope).
- Density and size of restored tidal channels appropriate to each restoration site.
- Potential hydrodynamic and water quality effects on other areas of the Delta.

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- Ability to accommodate sea level rise.
- Cost of the restoration project relative to benefits

The following general methods and techniques may be used to achieve the purposes of CM4.

- Restore natural remnant meandering tidal channels.
- Excavate channels to encourage the development of sinuous, high-density dendritic channel networks within restored marsh plain.
- Modify ditches, cuts, and levees to encourage more natural tidal circulation and better flood conveyance based on local hydrology.
- Prior to levee breaching, recontour the ground surface to maximize the extent of surface elevation suitable for establishment of tidal marsh vegetation (marsh plain) by scalping higher-elevation land to provide fill for placement on subsided lands to raise surface elevations (taking into consideration that the surface sediment in higher elevation land that is seasonally inundated can be a significant source for zooplankton and aquatic invertebrates, and scalping may temporarily remove that resource).
- Prior to breaching, import dredge or fill and place it in shallowly subsided areas to raise ground surface elevations to a level suitable for establishment of tidal marsh vegetation (marsh plain).
- Prior to breaching, cultivate stands of tules through flood irrigation for sufficiently long periods to raise subsided ground surface to elevations suitable to support marsh plain; breach levees when target elevations are achieved.

Additional methods specific to freshwater and brackish tidal natural communities are discussed in Chapter 3, *Conservation Strategy* (Section 3.4.4), of the BDCP.

Suisun Marsh Restoration Opportunity Area

Suisun Marsh ROA encompasses the Suisun Marsh and is located at the western end of the Plan Area, in Conservation Zone 11. Brackish tidal natural communities will be restored in Suisun Marsh ROA in coordination with the *Suisun Marsh Habitat Restoration and Management Plan*. Those areas suitable for tidal natural communities restoration in Suisun Marsh ROA consist of diked wetlands that are managed for waterfowl and experience little natural tidal action. These managed areas are separated from tidal sloughs by gated culverts and other gated structures that control water exchange and salinity. Waterfowl club managers control the timing and duration of flooding to promote growth of food plants for waterfowl. Some of these are managed as perennial wetlands, others are dry-managed during the summer and early fall months then prepared for waterfowl habitat and hunting with a series of flood-drain-flood cycles. The periodic flooding and discharge of managed wetlands can lead to periods of severely low DO events in adjoining water bodies, which cause acute mortality in at-risk fish species and impair valuable fish nursery habitat (Siegel 2007). Co-occurring with these low DO levels are elevated levels of methylmercury, a toxin prevalent in the Delta that bioaccumulates in the foodweb and adversely affects fish and wildlife.

Cache Slough Restoration Opportunity Area

The Cache Slough ROA includes the southern end of the Yolo Bypass in Conservation Zone 1 and lands to the west in Conservation Zone 2 supporting a complex of sloughs and channels. This ROA supports multiple covered fish species and may currently be the only area where delta smelt spawn

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and rear successfully. The Cache Slough ROA has been recognized as possibly containing the best functioning tidal natural communities in the Delta. The complex includes Liberty Island, which is likely the best existing model for freshwater tidal natural communities restoration in the Delta for native fishes. Additionally, this ROA encompasses a substantial area of land with elevations suitable for freshwater tidal natural communities restoration that would involve few impacts on existing infrastructure or permanent crops relative to other areas of the north Delta. The Cache Slough ROA provides an excellent opportunity to expand the natural communities supporting multiple aquatic and terrestrial covered species. Based on existing land elevations, approximately 21,000 acres of public and private lands in the area are potentially suitable for restoration of tidal natural communities. Areas suitable for restoration in this ROA include, but are not limited to, Haas Slough, Hastings Cut, Lindsey Slough, Barker Slough, Calhoun Cut, Little Holland, Yolo Ranch, Shag Slough, Little Egbert Tract, and Prospect Island.

Cosumnes/Mokelumne Restoration Opportunity Area

The Cosumnes/Mokelumne ROA is located in the eastern portion of the Plan Area, in Conservation Zone 4. This ROA consists primarily of cultivated lands and a complex of sloughs and channels at the confluence of the Cosumnes and Mokelumne Rivers, providing an opportunity to create extensive gradients of tidal and nontidal wetlands. Suitable restoration sites in this ROA include McCormack-Williamson, New Hope, Canal Ranch, Bract, and Terminous Tracts north of State Highway 12, and lands adjoining Snodgrass Slough, South Stone Lake, and Lost Slough.

West Delta Restoration Opportunity Area

The West Delta ROA consists of multiple small areas where tidal natural communities can be restored in the western Delta, in Conservation Zones 5 and 6. It primarily supports cultivated lands and grasslands in areas that were historically tidal wetlands but have been diked and hydrologically altered, isolating tidal natural communities in the Cache Slough ROA from Suisun Marsh. Areas suitable for restoration include Dutch Slough, Decker Island, portions of Sherman Island, Jersey Island, Bradford Island, Twitchell Island, Brannon Island, Grand Island, and along portions of the north bank of the Sacramento River where elevations and substrates are suitable.

South Delta Restoration Opportunity Area

The South Delta ROA, located in Conservation Zone 7, consists primarily of cultivated lands and a riverine system including the San Joaquin River and its tributaries. Potential sites for restoring freshwater tidal natural communities include Fabian Tract, Union Island, Middle Roberts Island, and Lower Roberts Island.

Site Preparation, Earthwork, and Other Site Activities

Construction site preparation could require clearing and grubbing, demolition of existing structures, surface water quality protection, dust control, establishment of storage areas and stockpile areas, temporary utilities and fuel storage, and erosion control.

Earthwork activities for development of the restoration habitat areas could include the construction activities described below on the landside and waterside of existing levees in areas that would be selected for tidal habitat restoration.

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Modification of Landforms

Existing land elevations could be modified through grading and filling or subsidence reversal. These activities could be completed prior to breaching of levees and associated inundation of the site, as well as in the water.

Grading activities performed as part of restoration actions could include excavation and filling of material, shaping disturbed soils to smoothly transition into existing elevations at boundaries of construction areas, and smoothing and contouring of the disturbed ground surfaces to provide shallow elevation gradients from marsh plain to upland transition habitat. The specific landform plans would be developed for each location and evaluated in future environmental documentation.

Soil could be moved from higher elevations in the area to provide fill for placement on subsided lands for establishment of tidal marsh. Fill could also be imported to fill the subsided areas. In some areas, tules could be planted and farmed for several years to raise the elevation of subsided lands.

In adjacent areas that would not be inundated, grading could occur to ensure positive drainage and provide more diverse geomorphic surfaces for habitat.

As described in Appendix 3B, *Environmental Commitments*, erosion and dust control measures would be implemented during construction, and a Stormwater Pollution Prevention Plan (SWPPP) would be developed for each site.

Breaching and Modification of Levees

Levee modifications, including levee breaching or lowering, could be performed to reintroduce tidal exchange, reconnect remnant sloughs, restore natural remnant meandering tidal channels, encourage development of dendritic channel networks, and improve floodwater conveyance. Levee modifications could involve the removal of vegetation and excavation of levee materials. Excess earthen materials could be temporarily stockpiled, then respread on the surface of the new levee slopes where applicable or disposed of offsite. Any breaching or other modifications would be required to be designed and implemented to maintain the integrity of the levee system and to comply with flood management standards and permitting processes. This would be coordinated with the appropriate flood management agencies. Those agencies may include USACE, DWR, CVFPB, and other flood management agencies.

During detailed analyses of each location, levee breach sizes necessary to provide full tidal exchange between sloughs, open water, and restored tidal marsh areas would be identified. Breach lengths would be developed for each site depending on channel hydraulic geometry. In larger inundated areas (e.g., more than 200 acres), the breaches could be more than 100 feet long and extend below the water elevations during high or low tides. The edges of the breaches would be protected from erosion and related failure of the adjacent levee. Erosion protection could include geotextile fabrics, rock revetments, riprap, or other material selected during future evaluations for each location. Aggregate rock could be placed on the remaining levees to provide an access road to the breach location.

Levee lowering could involve removal of material in the upper sections of an existing levee, re-contouring of the levee slopes to provide stability for the shorter levee, placement of erosion protection on the slopes and specifically on the top of the levee that was previously subject to tidal action. Lowering levees provides opportunities for seasonal or periodic inundation of lands during high flows or high tides. This technique could be used to improve habitat or to reduce velocities and

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elevations of floodwaters. To reduce erosion potential on the new levee crest, a paved or gravel access road could be constructed with short (approximately 1 foot) retaining walls on each edge of the crest to reduce undercutting of the roadway by high tides. Levee modifications could also include excavation of watersides of the slopes to allow placement of slope protection, such as riprap or geotextile fabric, and to modify slopes to provide levee stability. Erosion and scour protection could be placed on the landside of the levee and continued for several feet onto the land area away from the levee toe.

Exit channels would be excavated on lands to be inundated to allow fish to leave the inundated area as waters recede.

Neighboring levees could require modification to accommodate increased flows or to reduce effects of changes in water elevation or velocities along channels following inundation of tidal marshes. Hydraulic modeling would be used during subsequent analyses to determine the need for such measures.

New Levees

New levees would be constructed to separate lands to be inundated for tidal marsh from non-inundated lands, including lands with substantial subsidence. Levees could be constructed as described for the new levees at intake locations. Any new levees would be required to be designed and implemented to comply with applicable flood management standards and permitting processes. This would be coordinated with the appropriate flood management agencies, which may include USACE, DWR, CVFPB, and local flood management agencies.

Dredging

Restoration actions may include channel dredging, drying dredged spoils before hauling or placement, placement of dredged material on lands or levees, and disposal in spoils areas. Depending on the locations and restrictions related to habitat and channel configuration, dredging operations may be staged from a barge floating in the channel or from the top of the levee. Dredging could be required periodically to maintain tidal circulation. Dredging methods can generally be classified in two categories: hydraulic dredging and mechanical dredging.

Hydraulic Dredging

Hydraulic dredging utilizes barge-mounted pumps equipped with hydraulic cutter jets to mobilize sediments and a siphon with a pump to move the water and dredge spoils, referred to as slurry, to settling ponds for dewatering. The size of the dewatering areas depends on slurry flow rate, amount of total dredge spoils, and settling rate of the material. This type of dredging results in the lowest developed sediment plumes in waterways; however, it requires management of large volumes of water. Hydraulic dredging is used in situations where there are large areas to be dredged, the concern for induced turbidity and harm to benthic vegetation is great, and there is ample area available for drying basins, as this method entrains more water in the sediment and requires greater drying capacity.

Mechanical Dredging

Mechanical dredging utilizes barge-mounted clamshell-type buckets or land-based drag line buckets to excavate the dredge spoils. Typically, the spoils are placed in holding areas on the barge for dewatering and transferred to a land disposal area for disposal. This dredging method results in

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more sediment in the waterway than does hydraulic dredging. However, the amount of water to be removed from the sediment prior to transport and disposal is less.

The clamshell dredging method excavates a water-sediment mix from the channel bottom with a clamshell bucket and deposits it to a drying basin or onto a barge to be transported to a drying basin. The operation may be staged from a barge floating in the channel or from the top of the levee, depending on restrictions in habitat and channel width. This method would likely be used in situations where there is limited space for drying basins, the likelihood of major disruption to vegetation and other organisms in the channel bottom is minimal, the area to be dredged is small, there are channel islands, or there is limited concern regarding temporary turbidity and sedimentation in the water.

The dragline dredging method excavates a water-sediment mix from the channel bottom with a bucket and deposits it either into a drying basin or onto a barge to be transported to a drying basin. The use of the dragline method requires sufficient height and swing clearance for the crane. The dragline method is effective in shaping the channel bottom with relative control.

Drying Operations

Dredged material may be placed into drying basins to be dried for beneficial reuse. Drying basins may be constructed on the landside of the levees, typically adjacent to the channel or suitable interior low areas. The basins would be constructed of onsite soil and compacted to reduce embankment erosion.

Three basins—primary, secondary, and return—are generally used for slurry from hydraulic dredging due to the amount of water in the slurry. The basins are typically connected by flashboard riser structures that control the overflow of water into the next basin and the waterway to ensure proper settling of sediments. The primary and secondary basins settle sediments over a period of 4–5 weeks in each basin. Water in the return basin is then returned to the waterway. Each unlined basin could be up to 100 acres in surface area and up to 6 feet deep with 2 feet of freeboard.

For mechanical dredging, a single basin could be used. The sediments settle over a period of 2–6 weeks. Dredged material would be tested to determine the presence of toxic materials prior to reuse. Clean dredge spoils could be hauled and placed on agricultural land or on low areas identified for subsidence reversal.

Construction Detour/Access Roads and Utilities Relocation

Relocation of existing roads and utilities could be required to support construction and postconstruction activities at the restoration project site or services to adjacent lands protected by levees. Roads and utilities on the levees to be breached or lands to be inundated that required modification would be constructed to a condition equal to or better than the preconstruction conditions.

Revegetation

Restored freshwater tidal marsh plains would be vegetated primarily with tules and other native freshwater emergent vegetation to reflect the historical composition and densities of Delta tidal marshes. Restored brackish tidal marsh plains, such as Suisun Marsh, would be dominated by native brackish marsh vegetation (e.g., pickleweed, saltgrass) appropriate to marsh plain elevations, mimicking the composition and densities of historical Suisun Bay brackish tidal marshes.

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To facilitate revegetation of disturbed areas, weed eradication could be used followed by a combination of passive and active revegetation approaches. Passive revegetation techniques could include altering the hydrologic regime to promote the establishment of desirable native vegetation. Active revegetation techniques may include direct seeding and planting of seedlings or containerized stock. Prior to revegetation, undesirable vegetation species could be treated or removed from the restoration site. Disking and ripping could be required to allow for water filtration and deeper penetration and faster growth of plant roots. Direct seeding could be done by broadcasting, hydroseeding, or drill seeding. Soil amendments could be applied to the revegetated area.

Implementation of this conservation measure will be informed through compliance and effectiveness monitoring, and adaptive management, as described in Chapter 3, *Conservation Strategy* (Section 3.4.4), of the BDCP.

3.6.2.4 Seasonally Inundated Floodplain Restoration (CM5)

Under CM5, the BDCP Implementation Office would modify flood conveyance levees and infrastructure to restore 10,000 acres of seasonally inundated floodplain along river channels throughout the Plan Area. The floodplain restoration is separate from fisheries enhancement in Yolo Bypass; CM2 augments existing flood flows in the Yolo Bypass, whereas CM5 restores floodplains that historically existed elsewhere in the Plan Area but have been lost as a result of flood management and channelization activities. These restored floodplains would intentionally be allowed to flood to provide the benefits described in Chapter 3, *Conservation Strategy* (Section 3.4.5.1), of the BDCP document. Restored floodplains would support valley/foothill riparian, nontidal freshwater perennial emergent and nontidal perennial aquatic natural communities. Restored floodplains can remain in agricultural production as long as such activities meet the requirements for agricultural use described in Chapter 3 (Section 3.4.5.3.2) of the BDCP. CM5 actions would be phased, with 1,000 acres restored by year 15 and 10,000 acres (cumulative) by year 40 of Plan implementation. Under Alternative 7, CM5 would provide for the restoration of an additional 10,000 acres of seasonally inundated floodplain habitat.

Although seasonally inundated floodplains may be restored along channels in the north, east, and south Delta, the most promising opportunities for large-scale floodplain restoration are in the south Delta.

Channel margin enhancement (CM6) and riparian natural community restoration (CM7) would be combined with floodplain restoration to provide a broad mosaic of natural communities and ecological functions. Floodplain restoration (CM5), channel margin enhancement (CM6), and riparian restoration (CM7) are interrelated. The implementation of CM7 depends partly on CM5, because 3,000 acres of riparian natural community would be implemented in restored floodplains. Seasonally inundated floodplain restoration (CM5) differs from channel margin enhancement (CM6) in that seasonally inundated floodplain restoration involves actions such as substantial levee setbacks (setbacks on the order of hundreds or thousands of feet) to allow for lateral channel migration and natural fluvial disturbances. While channel margin enhancement may involve levee setbacks in some cases, these setbacks would be relatively minor (setbacks on the order of a hundred feet or less) to provide for restoration of natural vegetation on the banks. Generally, these channel margin enhancement actions would do little to restore natural channel migration and the accompanying ecological benefits that accrue from eroding banks and altered channel morphology.

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Channel straightening and levee construction have disconnected river channels from their historic floodplains over much of the Plan Area, resulting in the reduction, degradation, and fragmentation of seasonally inundated floodplain and its associated natural communities. The result has been a decrease in rearing and juvenile foraging habitat for salmonids, a decrease in primary productivity and thus food resources available to planktivorous fishes, and a decline in the abundance and distribution of floodplain-associated species, including Sacramento splittail, Chinook salmon, and slough thistle.

Because restoration may require modification of levees that serve flood management functions, floodplain habitats would be required to be designed and implemented to maintain flood conveyance capacity at the design flow level and to comply with other flood management standards and permitting processes. This would be coordinated with USACE, DWR, CVFPB, and other flood management agencies.

Actions to restore seasonally inundated floodplain habitats may include but are not limited to the following.

- Set levees back along selected river corridors and remove or breach levees thereby rendered nonfunctional.
- Create and expand new floodway bypasses to expand floodplain habitat and redirect flood flows along distributary channel networks into the estuary.
- Remove existing riprap or other bank protection to allow for channel migration between the set-back levees through the natural processes of erosion and sedimentation. This would reestablish floodplain processes and support creation and maintenance of spawning and rearing habitat.
- Modify channel geometry in unconfined channel reaches or along channels where levees are set back in order to create backwater salmonid and Sacramento splittail rearing habitat.
- Secure lands, in fee-title or through conservation easements, suitable for restoration of seasonally inundated floodplain.
- Selectively grade restored floodplain surfaces to provide for drainage of overbank flood waters such that the potential for fish stranding is minimized.
- Lower the elevation of restored floodplain surfaces or modify river channel morphology to increase inundation frequency and duration and to establish elevations suitable for the establishment of riparian vegetation by either active planting or allowing natural establishment.
- Continue to farm in the floodplain consistent with achieving biological objectives, engaging in farming practices and crop types that provide high benefits for covered fish species.
- In cases where farming is no longer feasible or compatible with floodplain habitat goals, discontinue farming within the setback levees and allow native riparian vegetation to naturally establish on the floodplain or actively plant native riparian vegetation.

Site Preparation, Earthwork, and Other Site Activities

Site preparation could require clearing and grubbing, demolition of existing structures, surface water quality protection, dust control, establishment of storage areas and stockpile areas, temporary utilities and fuel storage, and erosion control.

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Earthwork activities for development of the seasonally inundated floodplains could include setting back levees, removal of existing levees, removal of riprap to allow for channel meander between the setback levees, grading to restore drainage patterns and increase inundation frequency and duration, and establishment of riparian habitat.

Seasonally inundated floodplain modifications would be required to be designed, implemented and maintained to allow the passage of flood flows at the required flood system design flow and to comply with other flood management standards and permitting processes. This would be coordinated with USACE, DWR, CVFPB, and other flood management agencies to assess the desirability and feasibility of channel modifications. To the extent consistent with floodplain land uses and flood management requirements, if applicable, woody riparian vegetation would be allowed to naturally establish, or plant stock would be derived from adjacent riparian vegetation.

During design, the need for grading to reduce risk of fish stranding as water recedes would be determined. Grading could also be required to convey water from the floodplain into tidal marsh restoration areas.

Implementation of this conservation measure will be informed through compliance and effectiveness monitoring, and adaptive management, as described in Chapter 3, *Conservation Strategy* (Section 3.4.5), of the BDCP.

3.6.2.5 Channel Margin Enhancement (CM6)

CM6 would entail restoration of 20 linear miles of channel margin by improving channel geometry and restoring riparian, marsh, and mudflat habitats on the waterside of levees along channels that provide rearing and outmigration habitat for juvenile salmonids. Linear miles of enhancement would be measured along one side or the other of a given channel segment (e.g., if both sides of a channel are enhanced for a length of 1 mile, this would account for a total of 2 miles of channel margin enhancement). At least 10 linear miles would be enhanced by year 10 of Plan implementation; enhancement would then be phased in 5-mile increments at years 20 and 30, for a total of 20 miles at year 30. Under Alternative 7, CM6 would provide for the enhancement of an additional 20 linear miles of channel margin.

Most channels in the Delta are flanked by levees. In these areas, channel margins lack the diversity and complexity of habitat conditions associated with unmodified channels. Because of the riprap armoring on many levees, adjacent channel margins are devoid of vegetation or have only low-quality vegetation that provides very limited benefits for covered species. Without vegetation along channel margins to provide shade and nutrient inputs, habitat value for covered fishes in these channels has declined. Both the quality and quantity of riparian, emergent wetland, and tidal mudflat habitat for covered terrestrial species have declined as a result of channel-margin levees.

Channel margin enhancement, as appropriate to site-specific conditions, includes the following actions.

- Modify the waterward side of levees or set back levees landward to create low floodplain benches. Construct the floodplain benches with variable surface elevations and water depths (laterally and longitudinally) to create hydrodynamic complexity, support emergent vegetation, and provide an ecological gradient of environmental conditions.
- Install large woody debris (e.g., tree trunks, logs, and stumps) into constructed benches to provide physical complexity. Use finely branched material to minimize refuge for aquatic

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predators. Large woody debris would be installed to replace debris lost during enhancement; woody debris is expected to increase or be replaced over time through recruitment from adjacent riparian vegetation.

- Plant native riparian and/or emergent wetland vegetation on created benches; open mudflat habitat may be appropriate too, depending on elevation and location.

These actions would be implemented along channels protected by levees in the Plan Area. Channel margin enhancements associated with federal project levees would not be implemented on the levee, but rather on benches to the waterward side of such levees, and flood conveyance would be maintained as designed.

Channel margin enhancement would be performed only along channels that provide rearing and outmigration habitat for juvenile salmonids. These include channels that are protected by federal project levees—including the Sacramento River between Freeport and Walnut Grove, the San Joaquin River between Vernalis and Mossdale, and Steamboat and Sutter Sloughs—and channels in the interior Delta that are protected by nonfederal levees—including the North and South Fork Mokelumne River.

The approximate total lengths of channel margin of the main water bodies in the Plan Area where channel margin habitat enhancement could occur are as follows.

- Sacramento River (top of North Delta subregion to Sacramento–San Joaquin confluence in the West Delta subregion): 116 miles
- Sutter Slough: 13 miles
- Steamboat Slough: 23 miles
- Miner Slough: 15 miles
- Georgiana Slough: 24 miles
- Mokelumne River (North and South Forks within the Plan Area): 77 miles
- San Joaquin River (Vernalis to Sacramento–San Joaquin confluence in the West Delta subregion): 240 miles

These water bodies represent around 500 linear miles of channel margin habitat, and therefore CM6 has the potential to enhance around 4–8% of this total.

Site Preparation, Earthwork, and Other Site Activities

Site preparation could require clearing and grubbing, demolition of existing structures, surface water quality protection, dust control, establishment of storage areas and stockpile areas, temporary utilities and fuel storage, and erosion control.

Earthwork activities for development of the channel margin habitat areas could include modification of levees or setting back levees to create low benches designed with variable surface elevations that would support emergent vegetation to provide an ecological gradient of habitat conditions, and higher elevation benches that would support riparian vegetation. Riprap would be removed where levees are set back to restore seasonally inundated floodplain habitat. Channel geometry would be modified in unconfined channel reaches or along channels where levees are set back to restore

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seasonally inundated floodplain habitat and create backwater salmonid and splittail rearing and splittail spawning habitat.

These activities would be completed in a manner similar to that discussed in Section 3.6.2.3, *Tidal Natural Communities Restoration* (CM4). Channel margin modifications would be required to be designed, implemented and maintained to allow the passage of flood flows at the required flood system design flow and to comply with other flood management standards and permitting processes. These activities would be coordinated with USACE, DWR, CVFPB, and other flood management agencies.

Riparian and emergent vegetation would be planted on the benches of setback levees. Large woody material, such as tree trunks and stumps, could be anchored into constructed low benches or into existing riprapped levees to provide similar habitat functions.

Implementation of this conservation measure will be informed through compliance and effectiveness monitoring, and adaptive management, as described in Chapter 3, *Conservation Strategy* (Section 3.4.6), of the BDCP. Because actions under CM6 have the potential to provide habitat for nonnative predatory fish, two monitoring actions are proposed to evaluate the use of enhanced channel margin sites and associated woody debris by predators.

3.6.2.6 Riparian Natural Community Restoration (CM7)

CM7 would entail restoration of 5,000 acres of native riparian forest and scrub in association with restoration of tidal and floodplain areas (CM4 and CM5, respectively) and channel margin enhancements (CM6). Riparian forest and scrub would be restored to include the range of conditions necessary to support habitat for each of the riparian-associated covered species. CM7 actions would be phased, with 1,100 acres restored by year 15 and 5,000 (cumulative) acres restored by year 40 of Plan implementation.

The substantial reduction in the extent, distribution, and diversity of valley/foothill riparian communities that historically occurred along the upper elevational margins of the Delta and along natural levees along Delta and Suisun Marsh channels and Delta islands has greatly reduced the availability of this natural community as habitat for associated covered and other native species. Design features of flood control levees such as steep slopes and the use of riprap generally preclude natural establishment or survival of native, woody riparian vegetation. These steep, riprapped surfaces provide little cover for covered fish species, and may contribute to increased predation losses. A lack of riparian habitat associated with existing and restored tidal aquatic and marsh habitats limits potential ecological benefits to fish and wildlife by limiting important ecological gradients and ecosystem functions that such ecotones would provide. Restoration of valley/foothill riparian habitats would increase the abundance and distribution of associated covered and other native species, improve connectivity among habitat areas within and adjacent to the Plan Area, improve genetic interchange among native riparian-associated species' populations, and contribute to the long-term conservation of riparian-associated covered species.

Riparian restoration sites would be prioritized in areas where they would improve linkages to allow terrestrial covered and other native species to move between protected habitats within and adjacent to the Plan Area. Some of this connectivity would be accomplished through planting native riparian vegetation along channel margins as described in *CM6 Channel Margin Enhancement*. However, channel margin enhancement would consist mostly of narrow riparian bands that would likely be flanked by agriculture and highways, with limited value for wildlife movement. Therefore, projects

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that involve restoration of large riparian areas would focus on connecting existing wildlife habitat along riparian corridors to meet the riparian habitat connectivity objective.

The 5,000 acres of restored riparian natural community must meet numerous requirements for mid- and late-successional stage vegetation structure, and for species habitat, as summarized in Chapter 3, *Conservation Strategy,* Section 3.4.7 of the BDCP. The location of riparian restoration would be determined during implementation in order to meet these specific geographic and species requirements. Site selection would also be guided, in part, by the needs of three other conservation measures, which have overlapping goals with riparian restoration: *CM4 Tidal Natural Communities Restoration*, *CM5 Seasonally Inundated Floodplain Restoration*, and *CM6 Channel Margin Enhancement*. Some riparian restoration would be accomplished in locations that can meet these dual requirements.

Riparian Restoration in Restored Floodplains

Three-thousand acres of the riparian restoration will take place in restored floodplains, consistent with CM5. The valley/foothill riparian natural community will actively be restored in some floodplains, and in other floodplains it will be allowed to naturally establish and grow where soils and hydrology are appropriate. Large patches of native riparian vegetation are expected to be established in floodplains in contrast to the existing narrow stringers of riparian vegetation that typically occur along channels and agricultural water conveyance features in much of the Plan Area.

Riparian Restoration in Restored Tidal Natural Communities

Native woody riparian vegetation would be allowed to naturally reestablish along the upper elevation margins of restored tidal natural communities in ROAs where soils and hydrology are suitable, including segments of stream channels that drain into restored marshes. Suitable soils for restoration are expected to be most extensive in the Cosumnes/Mokelumne and South Delta ROAs. In these ROAs, native riparian vegetation is expected to generally form as a band of variable width depending on site-specific soil and hydrologic conditions between high-marsh vegetation and herbaceous uplands.

Riparian Restoration on Enhanced Channel Margins

Where compatible with site-specific objectives for channel margin enhancement, native woody riparian vegetation would be planted along channel margins on benches on the waterward side of existing levees to enhance covered fish and wildlife species habitat. Native riparian vegetation restored in these locations is expected to form narrow stringers of riparian forest and scrub along enhanced channel margins. Riparian vegetation planted for channel margin enhancement (CM6) will also count toward the 5,000-acre requirement for CM7.

Due to these overlaps with CM4, CM5, and CM6, the area of land that would count only toward CM7 (and not toward another conservation measure) is 971 acres.

Site Preparation, Earthwork, and Other Site Activities

Site preparation could require clearing and grubbing, demolition of existing structures, surface water quality protection, dust control, establishment of storage areas and stockpile areas, temporary utilities and fuel storage, and erosion control.

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Earthwork activities for development of the riparian habitat areas would be minimal, focusing on removal of riprap and minor landform modifications to restore water circulation. The primary activities would entail either natural establishment or planting of riparian vegetation, irrigation and maintenance of plantings, and control of nonnative species.

Native riparian vegetation would be planted if site-specific restored floodplain conditions indicate that such plantings would substantially increase the establishment of valley/foothill riparian habitat. Elderberry shrubs would be a component of such plantings to provide habitat for valley elderberry longhorn beetle.

Irrigation systems and water supplies could be necessary to establish native vegetation. The type of irrigation and the water source would be site dependent. Irrigation system construction could include placement of aboveground or belowground irrigation piping. Erosion and dust control measures would be implemented during construction as described in Appendix 3B, *Environmental Commitments*.

Implementation of this conservation measure will be informed through compliance and effectiveness monitoring, and adaptive management, as described in Chapter 3, *Conservation Strategy,* (Section 3.4.7) of the BDCP.

3.6.2.7 Grassland Natural Community Restoration (CM8)

CM8 would entail restoration of 2,000 acres of grassland in CZs 1, 8, and/or 11, and other zones as needed to achieve the biological goals and objectives for covered species. Actions under CM8 would be phased, with 1,140 acres restored by year 10 and 2,000 acres (cumulative) restored by year 40 of Plan implementation.

Grassland habitat is distributed around the upland margin of the Sacramento–San Joaquin Delta and Suisun Bay system, and much has been lost to development and conversion to agriculture. Some covered activities would further remove the grassland natural community. Grassland restoration offers a way to offset these losses while improving habitat connectivity and increasing the diversity of grassland species.

Grassland restoration would include converting nongrassland areas (e.g., ruderal or cultivated lands) into grassland. Grasslands restored as a component of vernal pool complexes would also count toward the 2,000-acre restoration target for CM8.

Grassland restoration would focus on creating a mosaic of different grassland vegetation alliances, reflecting localized water availability, soil chemistry, soil texture, topography, and disturbance regimes, with consideration of historic site conditions. Grassland restoration sites would be selected that support soils suitable for grassland restoration and are adjacent to existing high-value grassland natural community (i.e., supporting covered species or high biodiversity) (Keeley 1993).

Sites that have been highly disturbed may require pretreatment before grassland restoration techniques are applied. For example, invasive weeds may need to be removed using a variety of techniques such as livestock grazing, herbicide treatment, tilling, soil removal and treatment (to remove the weed seed bank), or a combination of these or other treatments. Restoration may also require the recontouring of graded land as appropriate.

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Seed sown on grassland restoration sites would be collected from the nearest practicable natural site with similar ecological conditions. Seed nurseries may be established in some of the restored grasslands to produce seed for subsequent restoration projects.

Seeding would be done in fall or early winter after the first rains. Seed may be broadcast using a tractor-mounted or handheld broadcast seeder, or a seed drill may be used. Plugs may be used rather than seeding in some areas, especially on steep hillsides. Once seedlings are established, the restored grasslands would be managed consistent with long-term, site-specific management plans.

Implementation of this conservation measure will be informed through compliance and effectiveness monitoring, and adaptive management, as described in Chapter 3, *Conservation Strategy,* (Section 3.4.8) of the BDCP.

3.6.2.8 Vernal Pool and Alkali Seasonal Wetland Complex Restoration (CM9)

CM9 would entail restoration of vernal pool complex and alkali seasonal wetland complex in CZs 1, 8, or 11 (Figure 3-1) to achieve no net loss of vernal pool and alkali seasonal wetland acreage from BDCP covered activities (as shown in Table 3-4, it is assumed that 67 acres of restored vernal pool complex and 72 acres of restored alkali seasonal wetland would be restored under this measure). The restored vernal pool complexes would consist of vernal pools and swales within a larger matrix of grasslands. Similarly, the alkali seasonal wetland complex will consist of alkali seasonal wetlands within a larger matrix of grasslands. Specific restoration sites would be selected on the basis of their availability, suitability for restoration, biological value, and practicability considerations. Restored vernal pool complex and alkali seasonal wetland complex will complement other restoration and protection in the reserve system as well as existing conservation lands. In conjunction with protection of 600 acres of existing vernal pool complex and 150 acres of alkali seasonal wetland complex (under *CM3 Natural Communities Protection*), restoration actions will contribute to the establishment of a large, interconnected vernal pool complex and alkali seasonal wetland complex reserve in the Plan Area. The amount of vernal pool complex restoration would be determined during implementation based on the following criteria.

- If restoration is completed (i.e., restored natural community meets all success criteria) prior to impacts, then 1.0 wetted acre of vernal pools would be restored for each wetted acre directly affected (1:1 ratio).
- If restoration takes place concurrent with impacts (i.e., restoration construction is completed, but restored habitat has not met all success criteria, prior to impacts occurring), then 1.5 wetted acres of vernal pools would be restored for each wetted acre directly affected (1.5:1 ratio).

Restoration must offset loss of any wetland features exhibiting the hydrologic and vegetative characteristics of vernal pools whether or not they are occupied by covered species. Vernal pool complex restoration must also offset loss of wetland features that do not exhibit typical vernal pool hydrology and vegetation, but only if they are occupied by covered vernal pool crustaceans.

The restored vernal pools and surrounding upland natural community would be protected and managed in perpetuity. The surrounding upland natural community would consist of existing or restored grasslands.[25] The protected lands would include sufficient watershed surrounding the

[25] The surrounding grasslands will be a component of restored vernal pool complex and will not count toward the target acreages for grassland protection or restoration.

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restored vernal pools to sustain the hydrology characteristic of this natural community, at a density representative of intact vernal pool complexes in the vicinity of the restoration site. In lieu of restoration, an equivalent amount of vernal pool restoration credit may be purchased at a USFWS- and CDFW-approved mitigation bank if the bank occurs in the Plan Area and meets the site selection criteria described below.

- The site is in CZs 1, 8, or 11.
- The site has evidence of historical vernal pools based on soils, remnant topography, remnant vegetation, historical aerial photos, or other historical or site-specific data.
- The site supports suitable soils and landforms for vernal pool restoration.
- The adjacent land use is compatible with restoration and long-term management to maintain natural community functions (e.g., not adjacent to urban or rural residential areas).
- Sufficient land is available for protection to provide the necessary vernal pool complex restoration and surrounding grasslands to provide the local watershed for sustaining vernal pool hydrology, with a vernal pool density representative of intact vernal pool complex in the vicinity of the restoration site.

Acquisition of vernal pool restoration sites would be prioritized based on the following criteria.

- The site will contribute to establishment of a large, interconnected vernal pool and alkali seasonal wetland complex reserve system (e.g., adjacent to existing protected vernal pool complex or alkali seasonal wetland complex).
- The site is close to known populations of covered vernal pool species.

Alkali seasonal wetland complex restoration sites will meet the following site selection criteria.

- The site is in CZs 1, 8, or 11.
- The site has evidence of historical alkali seasonal wetlands based on soils, remnant topography, remnant vegetation, historical aerial photos, or other historical or site-specific data.
- The site supports suitable soils and landforms for alkali seasonal wetland restoration.
- The adjacent land use is compatible with restoration and long-term management to maintain natural community functions (e.g., not adjacent to urban or rural residential areas).
- Sufficient land is available for protection to provide the necessary alkali seasonal wetland complex restoration and surrounding grasslands to provide the local watershed for sustaining alkali seasonal wetland hydrology, with an alkali seasonal wetland density representative of intact alkali seasonal wetland complex in the vicinity of the restoration site.

Acquisition of alkali seasonal wetland restoration sites will be prioritized based on the following criteria.

- The site will contribute to establishment of a large, interconnected vernal pool complex and alkali seasonal wetland complex reserve system (e.g., adjacent to existing protected vernal pool complex or alkali seasonal wetland complex).
- The site is close to known populations of covered alkali seasonal wetland species.

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Site Preparation, Earthwork, and Other Site Activities

The following restoration techniques would be implemented for vernal pool restoration.

- Remnant natural vernal and swale topography would be restored by excavating or recontouring historical vernal pools and swales to natural bathymetry based on their characteristic visual signatures on historical aerial photographs, other historical data, and the arrangement and bathymetry of vernal pools and swales at a reference site.
- The reference site would consist of existing nearby, natural (i.e., unmodified by human activities) vernal pool complex supporting covered vernal pool species.
- To provide for high-functioning habitat, restored vernal pool complex would be vegetated with hand-collected seed from appropriate areas in the same conservation zone. Soil inocula would not be used to establish vernal pool plants and animals in these conservation zones unless the source vernal pools are free of undesirable nonnative plant species such as perennial pepperweed, waxy mannagrass, swamp timothy, and Italian ryegrass. These nonnative species establish more rapidly than native species, and create dense populations that are likely to reduce the establishment success of the native plants and also create thatch problems in the vernal pools.
- Vernal pool invertebrates are expected to be passively introduced into the restored vernal pools through the movement of other animals from pool to pool. If monitoring shows that passive introduction is insufficient for meeting restoration success criteria, active propagule (cyst) introduction may be implemented. Any introduction of propagules of covered vernal pool invertebrate species would be sourced from vernal pool soils that are free of undesirable nonnative species such as perennial pepperweed, swamp timothy, and Italian ryegrass.

The following restoration techniques will be implemented for alkali seasonal wetland complex restoration.

- Remnant natural vernal and swale topography will be restored by excavating or recontouring historical alkali seasonal wetlands and swales to natural bathymetry based on their characteristic visual signatures on historical aerial photographs, other historical data, and the arrangement and bathymetry of alkali seasonal wetlands and swales at a reference site.
- The reference site will consist of existing nearby, natural (i.e., unmodified by human activities) alkali seasonal wetland complex supporting covered species.
- To provide for high-functioning habitat, restored alkali seasonal wetland complex will be vegetated with hand-collected seed from appropriate areas in the same conservation zone. Soil inocula will not be used to establish alkali seasonal wetland plants and animals in these conservation zones unless the source wetlands are free of undesirable nonnative plant species such as perennial pepperweed, waxy mannagrass, swamp timothy, and Italian ryegrass. These nonnative species establish more rapidly than native species, and create dense populations that are likely to reduce the establishment success of the native plants and also create thatch problems in the alkali seasonal wetlands.

Implementation of this conservation measure will be informed through compliance and effectiveness monitoring, and adaptive management, as described in Chapter 3, *Conservation Strategy,* (Section 3.4.9) of the BDCP.

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3.6.2.9 Nontidal Marsh Restoration (CM10)

CM10 would entail restoration of 1,200 acres of nontidal marsh in CZs 2, 4 and/or 5 (Figure 3-1). CM10 actions would be phased, with 400 acres restored by year 10; 600 acres by year 20; and 1,200 (cumulative) acres restored by year 40 of Plan implementation. This CM also provides for creation of 500 acres of managed wetlands consisting of greater sandhill crane roosting habitat in the greater sandhill crane Winter Use Area in CZs 3, 4, 5, or 6 by year 10 (250 acres during years 1 through 5 and 250 acres during years 6 through 10).

Nontidal Marsh

Restored nontidal marsh (also referred to as *nontidal freshwater emergent wetland*) would be designed and managed primarily to support giant garter snake, but also to support other native wildlife functions including waterfowl foraging, resting, and brood habitat and shorebird foraging and roosting habitat, to the extent that management for these species does not reduce habitat value for the giant garter snake. Design measures will also be incorporated for western pond turtle. Although the restored nontidal marsh may provide nesting habitat value for tricolored blackbird, it will not be designed specifically for this species (which prefers large, dense patches of emergent vegetation). Instead, restoration sites will provide a mosaic of open water and relatively open emergent vegetation for the primary benefit of giant garter snake. Upland habitat consisting of grasslands would be restored or protected adjacent to restored freshwater emergent wetland, to provide upland habitat for giant garter snake and western pond turtle, and nesting habitat for waterfowl: this would be credited toward the 8,000 acres of grassland to be protected or the 2,000 acres of grassland to be restored.

Actions to restore nontidal freshwater emergent wetland natural community, as appropriate to site-specific conditions, would include, but would not be limited to, those listed below.

- Secure sufficient annual water to sustain habitat function.
- Establish connectivity with the existing irrigation and drainage conveyance system (i.e., agricultural ditches and canals) and habitats occupied by giant garter snakes.
- Prepare site, plant native marsh vegetation, and maintain plantings.
- Control nonnative invasive plants that impair achievement of reserve system objectives.

Nontidal marsh restoration sites will be designed to support the range of habitat conditions necessary for giant garter snake. By designing the restoration specifically for giant garter snake and ensuring adequate open basking opportunities, the restored nontidal marsh is also is expected to provide suitable habitat for western pond turtle. Existing cultivated lands will be converted to nontidal marsh in areas where hydrology and soils are suitable.

Restoration may include creating wetland topography by site grading or creation of depressions to hold water. Grading will establish an elevation gradient to support both open water, perennial aquatic habitat intermixed with shallower marsh habitat. Additional issues that will be addressed in each site-specific restoration plan include preventing fish from becoming stranded in the ponds (e.g., by the use of fish screens or other appropriate devices), if the hydrology source is a perennial water body that supports fish. Coarse woody debris or anchored basking platforms will be installed in open-water areas to improve habitat for western pond turtles. This will increase habitat value in locations with existing western pond turtles and in newly created ponds where it is hoped that new pond turtle populations will establish.

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Grassland natural community will be protected (pursuant to CM3) or restored adjacent to restored nontidal freshwater emergent wetland natural community to provide upland habitat for giant garter snakes and other native wildlife. The restored tidal marsh will consist of a combination of emergent, tule-dominated vegetation and open water, with variable bank slopes.

Nontidal freshwater emergent wetland natural community will be allowed to naturally reestablish along the edges of nontidal perennial aquatic natural community but will also be planted as needed to facilitate marsh development and to manage species composition. Approximately two-thirds of the restored nontidal marsh is expected to consist of nontidal perennial aquatic natural community, and approximately one-third is expected to consist of nontidal freshwater emergent wetland, although this proportion may shift as needed based on site conditions and as necessary to optimize habitat value for giant garter snake. The choice of plant species for the nontidal freshwater emergent wetland natural community restoration sites will be based on a palette of native wetland plants including freshwater emergent and aquatic species. The palette will be specified in each site restoration plan. The plants will preferentially be grown from soil, seed, or plant stock from local wetland sites. In addition, vegetation is expected to change after the original planting such that other native species may colonize the wetland over time. Colonization by undesirable nonnative invasive plants is also likely, so restoration plans will address management of nonnative invasives.

Managed Wetlands

The 500 acres of managed wetlands will be created for greater sandhill crane. The restored wetlands will be protected in association with other protected natural community types (excluding nonhabitat cultivated lands) at a 2:1 upland-to-wetland ratio to provide buffers around the wetlands. The protected uplands will count toward protection requirements for other natural communities. Sites that are not expected to be affected by sea level rise will be selected for restoration. Sites will also be selected to avoid areas that experience local seasonal flood events that may be incompatible with the habitat management needs for greater sandhill crane.

At least 320 of the 500 acres of managed wetlands will consist of roosting habitat in minimum patch sizes of 40 acres within the greater sandhill crane Winter Use Area (BDCP Appendix 2.A) in CZs 3, 4, 5, or 6.

At least 180 of the 500 acres of managed wetlands will consist of two 90-acre wetland complexes within the Stone Lakes National Wildlife Refuge project boundary.[26] The complexes will be no more than 2 miles apart and will help provide connectivity between the Stone Lakes and Cosumnes greater sandhill crane populations. Each complex will consist of at least three wetlands totaling at least 90 acres of greater sandhill crane roosting habitat. One of the 90-acre wetland complexes may be replaced by 180 acres of cultivated lands (e.g., cornfields) that are flooded following harvest to support roosting cranes and provide highest-value foraging habitat, provided such substitution is consistent with the long-term conservation goals of Stone Lakes National Wildlife Refuge for greater sandhill crane.

- Greater sandhill crane roost sites will be created as managed seasonal wetlands using the following specifications. A site-specific management plan will be prepared for each roost site, which will include details on water management, plant composition, timing of flood-up and drawdown, vegetation management and control, access, and spring-summer management.

[26] The project boundary delineates the area surrounding the existing refuge for which the refuge has authority to acquire land or easements.

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- Roost sites will be developed as a series of shallow, open ponds separated by a system of checks and levees. Small upland islands can also be created within the ponds. Cranes often congregate to roost or loaf on the checks and other areas of higher ground and forage in the shallow water contained within the ponds.
- The checks, levees, and other upland sites will be designed with sloping banks, which allow cranes to walk from the flooded pond to the adjacent uplands.
- In addition to the presence of water, food availability, and loafing opportunities, greater sandhill cranes select roosting sites based in part on predator avoidance. Therefore, the development of the ponds and checks will consider the ability of predators to access roosting cranes along checks and levees.
- Selected roost sites will have direct access to sufficient irrigation water to maintain required water depths.
- The wetlands will be maintained as described in *CM11 Natural Communities Enhancement and Management.*

Implementation of this conservation measure will be informed through compliance and effectiveness monitoring, and adaptive management, as described in Chapter 3, *Conservation Strategy,* (Section 3.4.10) of the BDCP.

3.6.2.10 Natural Communities Enhancement and Management (CM11)

CM11 would apply to all BDCP-protected and -restored habitats and would be implemented on permit issuance for certain conservation lands. The conservation measure would extend over time to cover new conservation lands as they are acquired. All lands in the reserve system (all natural communities protected and restored) would be managed or enhanced consistent with this conservation measure.

Natural communities and covered species habitat in the Plan Area have been degraded as a result of many human-related activities such as flood control and hydrologic alteration, urban and agricultural runoff, and introduction of invasive plant and wildlife species. Enhancement of natural communities and covered species habitat is necessary to reverse historical trends, and management is necessary to prevent further degradation in the reserve system.

Implementation of this conservation measure would include the following.

- Prepare and implement reserve unit management plans, in collaboration with fish and wildlife agencies, for protected natural communities and covered species habitats found within those communities.
- General enhancement and management actions, which would include the following.
    - Implement fire management plans as a component of each reserve unit management plan, which would include measures to avoid and minimize effects on covered species and their habitats during fire management activities on reserves.
    - Implement recreation plans as a component of each reserve unit management plan, which would identify sites where recreational use is compatible with the biological goals and objectives, along with acceptable forms of recreation and guidelines for management of recreational areas.

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- Implement invasive nonnative plant control (terrestrial invasive plants) to benefit covered species and enhance native biodiversity.
- Implement nonnative animal control in aquatic and emergent wetland communities, riparian natural communities, and in managed wetlands.
- Minimize mosquito production to protect human health.
- Use pesticides only to achieve biological goals and objectives (e.g., invasive plant or invasive animal control), in accordance with label instructions, and in compliance with state and local laws.
- Maintain levees within the reserve system in a manner that balances wildlife and habitat needs with the need to maintain the structural integrity of the levees.
- Design and maintain infrastructure (e.g. fences, culverts, roads) to allow wildlife movement throughout the reserve system.
- Control access to lands in the reserve system in areas that are vulnerable to disturbance by humans and pets. Human and pet access will be restricted in vernal pool and alkali seasonal wetland complexes, nontidal marsh restored for giant garter snake, greater sandhill crane roost sites, and locations that support rare plant populations. Signs will be posted to inform the public of the access restrictions. Access to areas that support nesting covered bird species will be restricted during the nesting season.

- Manage and enhance the aquatic and emergent wetland natural communities in the reserve system, including tidal brackish emergent wetland, tidal freshwater emergent wetland, nontidal freshwater perennial emergent wetland, tidal perennial aquatic, and nontidal perennial aquatic. The following actions would be included in each reserve unit management plan addressing aquatic and emergent wetland natural communities in the reserve system.
  - Control nonnative plants and supplement, through plantings, native vegetation in tidal freshwater emergent wetlands.
  - Maintain grasslands within 200 feet of tidal marshes, as refugia for salt marsh harvest mouse, Suisun shrew, and other covered species.
  - Control nonnative wildlife that threatens covered species in emergent wetland natural communities.
  - Enhance and maintain vegetation composition and structure in Suisun Marsh to support appropriate habitat conditions for covered species.
  - Enhance topographic heterogeneity to provide variation in inundation characteristics and vegetative composition.
  - Manage and enhance habitat for California black rail.
  - Implement seed banking for soft bird's-beak and Suisun thistle.
  - Manage and enhance habitat in Suisun Marsh for salt marsh harvest mouse.
  - Manage and enhance giant garter snake habitat.
  - Manage and enhance tricolored blackbird nesting habitat.
  - Manage roosting habitat for greater sandhill crane.

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- Manage and enhance riparian natural communities in the reserve system.
  - Manage and enhance structure and composition of restored riparian areas.
  - Reduce or eliminate riparian invasive species that threaten habitat value.
  - Manage and enhance habitat for riparian woodrat (San Joaquin Valley).
  - Manage and enhance habitat for riparian brush rabbit.
  - Control riparian nonnative animals.
  - Maintain rare plant alliances through nonnative plant control and supplemental plantings.
  - Manage and enhance stream channels and channel banks associated with the riparian natural community.
  - Create, enhance, and manage self-sustaining occurrences of delta button celery and slough thistle.
- Manage and enhance grasslands and associated natural communities, including vernal pool complex, alkali seasonal wetland complex, and other seasonal wetlands.
  - Enhance and manage vegetation to reduce fuel loads for wildfires, reduce thatch, minimize nonnative competition with native plant species, increase biodiversity and provide suitable habitat conditions for covered species.
  - Increase the availability of overwintering and nesting burrows for western burrowing owl, California red-legged frog, and California tiger salamander; and to increase prey availability for San Joaquin kit fox, Swainson's hawk, white-tailed kite, and other native wildlife predators.
  - Install artificial nesting burrows and structures, where appropriate, for western burrowing owl, Swainson's hawk, and white-tailed kite to facilitate use of unoccupied areas.
  - Install woody debris in stock ponds to provide cover and basking opportunities for western pond turtle.
  - Manage and enhance the hydrology of vernal pool complex, alkali seasonal wetland complex, and stock ponds.
  - Control invasive nonnative predatory wildlife that limit the abundance of covered amphibians in vernal pools, alkali seasonal wetlands, and ponds.
  - Enhance and manage vernal pool complexes to sustain suitable conditions for vernal pool pollinators.
- Manage and enhance cultivated landscapes.
  - Maintain crops to provide the required habitat acreages and values for covered species that use cultivated lands.
  - Maintain uncultivated seasonal or permanent buffers on cultivated lands in the reserve system that are adjacent to riparian and wetland habitats.
  - Maintain water in canals and ditches during the activity period (early spring through mid-fall) for the giant garter snake, western pond turtle, and other covered species using waterways.

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- Minimize or discontinue pesticide use, as needed, to reduce negative effects on wildlife.
- Retain patches of natural communities and habitat features in the cultivated lands matrix to benefit Swainson's hawk and white-tailed kite.

- Manage and enhance managed wetlands.
  - Manage and enhance habitat for salt marsh harvest mouse in the Grizzly Island Marsh Complex.
  - Manage wetlands for biodiversity of native species, including waterfowl and shorebirds.
  - Manage 5,000 acres as seasonal wetlands (wetlands that are dry during summer and fall months) to increase food value and density for overwintering waterfowl.
  - Manage 1,600 acres as permanent wetlands (wetlands that maintain some ponded water all year) to benefit breeding waterfowl and shorebirds.

Implementation of this conservation measure will be informed through compliance and effectiveness monitoring, and adaptive management, as described in Chapter 3, *Conservation Strategy,* (Section 3.4.11) of the BDCP.

3.6.3 Conservation Measures to Reduce Other Stressors

The BDCP has identified several issues, beyond water exports and habitat conditions, that affect the survival of covered species in the Delta. These other stressors include exposure to contaminants, competition, predation and changes to the ecosystem caused by nonnative species, entrainment at water intake pumps not operated by SWP and CVP, and fish passage. The proposed BDCP components related to reducing other stressors are described below. These components would be implemented under all action alternatives.

3.6.3.1 Methylmercury Management (CM12)

This measure would minimize conditions that promote production of methylmercury in restored areas and its subsequent introduction to the foodweb, and to covered species in particular. Implementation of this conservation measure would require the following actions.

- Define design elements that minimize conditions conducive to generation of methylmercury in restored areas.
- Define adaptive management strategies that can be implemented to monitor and minimize actual post-restoration creation and mobilization of methylmercury.
- Implement appropriate measures to monitor and minimize methylmercury in site-specific restoration designs.

The design elements would be integrated into site-specific BDCP restoration designs based on site conditions, community type (tidal marsh, nontidal marsh, floodplain), and potential concentrations of mercury in prerestoration sediments. The adaptive management strategies could be applied where site conditions indicate a high probability of methylmercury generation and effects on covered species. For each BDCP restoration project under CM4 *Tidal Habitat Restoration*, a project-specific methylmercury management plan would be developed and would incorporate all of the methylmercury management measures discussed below or would include an explanation of why a

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particular measure should not or cannot be incorporated. Each project-specific plan would include the following components.

- A brief review of available information on levels of mercury expected in site sediments /soils based on proximity to sources and existing analytical data.
- A determination if sampling for characterization of mercury concentrations and/or post-restoration monitoring is warranted.
- A plan for conducting the sampling, if characterization sampling is recommended.

The BDCP Implementation Office, in conjunction with the Central Valley Water Board Methylmercury TMDL program, would provide for a programmatic quality assurance/quality control (QA/QC) program specifying sampling procedures, analytical methods, data review requirements, a QA/QC manager, and data management and reporting procedures. Each project-specific plan would be required to comply with these procedures to ensure consistency and a high level of data quality.

Because methylmercury is an area of active research in the Delta, each new project-specific methylmercury management plan would be updated based on the latest information about the role of mercury in Delta ecosystems or methods for its characterization or management. Results from monitoring of methylmercury in previous restoration projects would also be incorporated into subsequent project-specific methylmercury management plans. This program would be developed and implemented within the context of Methylmercury TMDL and Mercury Basin Plan Amendment requirements. In each of the BDCP project-specific methylmercury management plans developed under CM12, relevant findings and mercury control measures identified as part of TMDL Phase I Control Studies will be considered and integrated into restoration design and management plans. CM12 would also be implemented to meet any requirements of the U.S. Environmental Protection Agency (EPA) or the California Department of Toxic Substances Control actions.

The timing and phasing of implementing CM12 would be contingent upon the timing and phasing of individual restoration projects developed under BDCP.

The purpose of CM12, the Methylmercury TMDL, and the Mercury Basin Plan Amendment is to coordinate research and inform future actions concerning mercury methylation and measures to reduce methylation. In particular, the control studies conducted as part of the Methylmercury TMDL will include a description of mercury management practices identified in Phase I, and an evaluation of the effectiveness, costs, potential environmental effects, and overall feasibility of the control actions. At this time, there is no proven method to reduce methylation and mobilization of mercury into the aquatic system resulting from inundation of restoration areas. The measures listed below are meant to provide a list of current research that has indicated potential to mitigate mercury methylation. This list would be updated as additional information is produced by the Phase I Methylmercury TMDL control studies and other related research.

- Characterize mercury concentrations in soil to inform restoration design, postrestoration monitoring, and adaptive management strategies.
- Sequester methylmercury using low-intensity chemical dosing.
- Minimize microbial methylation through restoration design or management.
- Design restoration sites to maximize photodegradation, which removes methylmercury by converting it to the biologically unavailable, inorganic form of mercury.

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- Remediate sulfur-rich sediments with iron to reduce the activity of sulfide and the methylation of mercury.
- Cap mercury-laden sediments to limit methylmercury flux into the water column and exposure to biota.

Implementation of this conservation measure will be informed through compliance and effectiveness monitoring, research actions, and adaptive management, as described in Chapter 3, *Conservation Strategy,* (Section 3.4.12) of the BDCP. Key uncertainties associated with CM12 include the effectiveness of the measure in minimizing production and mobilization of methylmercury from lands in the reserve system and the foodweb and whether actions under CM12 interfere with the potential of a restoration project to meet its intended purpose. Compliance monitoring will document completion and implementation of site-specific methylmercury management plans for restoration sites. Effectiveness monitoring will assess how well CM12 minimizes production and mobilization of methylmercury from BDCP activities into the aquatic system and the foodweb.

3.6.3.2 Invasive Aquatic Vegetation Control (CM13)

CM13 would entail actions to prevent the introduction and control the spread of invasive aquatic vegetation (IAV) in BDCP aquatic restoration areas. IAV includes both submerged aquatic vegetation (SAV) and floating aquatic vegetation (FAV). Invasive SAV and FAV impair covered fish habitat through several mechanisms.

- Alter habitat by reducing water flow, thereby decreasing turbidity.
- Provide suitable habitat for predatory fish that prey on covered fish.
- In conjunction with predatory centrarchid fishes, physically impair access and displace native fish from shallow-water habitats.
- Alter physical and chemical habitat attributes such as light penetration, DO, pH, and nutrient concentrations.
- Displace native plants that would otherwise create physical structure and a biological environment that supports native and nonnative fish species (e.g., aquatic habitat dominated native plants instead of IAV would enhance the diversity of native invertebrates that provide a forage base for native and nonnative fish).

CM13 would provide for the control of Egeria, water hyacinth, and other IAV throughout the Plan Area. Implementation of CM13 would focus first on areas where IAV has the greatest potential to impair habitat for covered species, including in ROAs. To implement CM13, the BDCP would apply existing methods developed and used in the Delta by the California Department of Boating and Waterways (CDBW), primarily applying herbicide treatments, but potentially also including mechanical removal, or using other methods of removal as dictated by site-specific conditions, current research, intended outcome, and techniques to minimize incidental harm to protected biological resources. The BDCP Implementation Office would fund treatment of between approximately 1,700 acres per year (low estimate) and 3,300 acres per year (high estimate). Egeria, or Brazilian waterweed (*Egeria densa*), is now the most extensive and problematic IAV species in the Delta, but the historical record shows a substantial risk that other IAV species may be introduced or that existing IAV species may become more prominent; thus the BDCP would implement an early detection and rapid response program to detect, evaluate, and eradicate or control early invasions of other IAV species. In addition, ongoing research would investigate potential biological control

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methods for these two species. This could minimize or avoid the need for use of herbicides. Recognizing the potential threat of other IAV species, the Implementation Office would implement an early detection and rapid response program to detect, evaluate, and treat early invasions of other IAV species.

The BDCP Implementation Office would partner with existing programs operating in the Delta (including CDBW, U.S. Department of Agriculture-Agricultural Research Service, University of California Cooperative Extension Weed Research and Information Center, California Department of Food and Agriculture, local Weed Management Areas, Resource Conservation Districts, and the California Invasive Plant Council) to perform risk assessment and subsequent prioritization of treatment areas to strategically and effectively reduce expansion of the multiple species of IAV in the Delta. This risk assessment would dictate where initial control efforts would occur to maximize the effectiveness of the conservation measure. Additionally, avoidance and minimization measures would be adopted and would likely be similar to those conditions identified in the existing CDBW program (including the associated biological opinion and EIR), which restrict where and when herbicide treatment may occur, establish allowable chemical concentrations in treated areas and adjacent water, and require extensive water quality monitoring. These are further described in Chapter 3, *Conservation Strategy,* (Section 3.4.13.2.3) of the BDCP.

It is expected that initial implementation actions would begin in year 2 of Plan implementation.

Implementation of this conservation measure will be informed through compliance and effectiveness monitoring, research actions, and adaptive management, as described in Chapter 3 (Section 3.4.13) of the BDCP. Uncertainties associated with this measure include questions regarding the most effective designs for tidal restoration sites that preclude invasive plants, effects of IAV on restored natural communities, and the feasibility of creating conditions that favor growth of native pondweeds rather than IAV.

3.6.3.3 Stockton Deep Water Ship Channel Dissolved Oxygen Levels (CM14)

CM14 would ensure that the Stockton DWSC Aeration Facility would operate as needed during the BDCP permit term in order to maintain the concentrations of DO above target levels during the entire BDCP permit term. The Implementation Office would develop annual work plans in coordination with fish and wildlife agencies, the Central Valley Water Board, and the current Aeration Facility operating entities that specify the extent of DO improvements to be implemented, and would monitor the effectiveness of measures intended to improve DO levels. Increasing DO concentrations in the Stockton DWSC in accordance with DO TMDL objectives would achieve the benefits listed below.

- Reduced delay and inhibition of upstream and downstream migration of fall-run Chinook salmon.
- Reduced physiological stress and mortality of fall-run Chinook salmon, steelhead, white sturgeon, other aquatic organisms and, once they are reestablished in the San Joaquin River, spring-run Chinook salmon.

As much as 60% of the natural historical inflow to Central Valley watersheds and the Delta has been diverted for human uses. This flow reduction has had varied effects, including contributing to higher water temperatures, lower DO levels, and decreased recruitment of gravel and large woody debris.

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Other factors have also contributed to low DO, including dredging to deepen and widen shipping channels and excessive algal and nutrient loading resulting from land use upstream. Periods of low DO concentrations have historically been observed in the San Joaquin River's Stockton DWSC, which is located downstream from Stockton, California.

The Aeration Facility would be operated to ensure that the Stockton DWSC would not present a passage delay for covered fish species due to low DO levels. The BDCP Implementation Office would work with the fish and wildlife agencies and the Central Valley Water Board to develop an annual work plan for the Aeration Facility that would define the thresholds for when the Aeration Facility would operate and the duration of operation. The BDCP Implementation Office would also coordinate with the Central Valley Water Board to ensure that the requirements of both BDCP biological goals and objectives and the DO TMDL are compatible and effectively met.

Under this conservation measure, the BDCP Implementation Office would ensure continued funding for and operation of the Aeration Facility, and the continued implementation of measures to improve the facility's effectiveness in meeting BDCP biological goals and objectives, as well as the objectives of the DO TMDL. The Implementation Office would make funding available for the continued long-term operation and maintenance of the Aeration Facility within 1 year of implementation of the BDCP (or an alternative). The methods for determining responsibility for the DO deficit within the DWSC and assigning proportional responsibilities for funding the operation of the Aeration Facility (or other implementation measures) that could increase the DWSC DO concentrations to meet the objectives of the DO TMDL have not been adopted; thus the long-term funding for operations and maintenance beyond testing has not been secured and currently the Central Valley Water Board has not mandated such funding. Under CM14, the BDCP Implementation Office would share in funding the long-term operation and maintenance costs associated with the operation of the Aeration Facility. The Implementation Office also would consider funding for modifications to the Aeration Facility and/or construction of additional aeration facilities to increase DO levels in the Stockton DWSC and would potentially implement additional recommendations, which could improve the effectiveness of CM14 beyond the test results and thus provide greater benefit to covered fish species.

Implementation of CM14 would be informed through effectiveness monitoring that would be conducted as described in BDCP Section 3.6, *Adaptive Management and Monitoring Program*. Results from monitoring DO levels at various distances from the diffuser(s) would be used to assess the performance of aeration facility operations at achieving the water quality objective. The Implementation Office would use effectiveness monitoring results to determine whether aeration facility operations result in measurable benefits to covered fish species.

Based on a review of performance and effectiveness monitoring results, the Implementation Office or Adaptive Management Team may recommend adjustments to funding levels, Aeration Facility operations, or other related aspects to improve the performance and/or biological effectiveness of the Aeration Facility through the adaptive management process. Such changes, if approved by the Authorized Entities Group and the Permit Oversight Group, would be addressed in annual work plans. The BDCP Implementation Office would also coordinate with the TMDL stakeholder effort, whose ongoing efforts would direct what elements the BDCP may want to contribute to (i.e., what is not required under the TMDL but is required to achieve the BDCP biological goals and objectives). For example, the Central Valley Water Board is currently discussing whether the current TMDL standard of 6 mg/L from September 1 through November 30 each year is appropriate, or whether a water quality objective of 5 mg/L year round is more appropriate. Because these decisions would

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affect the BDCP, the Implementation Office would participate in these conversations. Additionally, the BDCP Implementation Office would also coordinate with the Central Valley Water Board to discuss operations and triggers for initiating and halting operations the Aeration Facility to meet water quality objectives.

Implementation of CM14 will be informed through compliance and effectiveness monitoring, research actions, and adaptive management, as described in Chapter 3 , *Conservation Strategy,* (Section 3.4.14) of the BDCP.

3.6.3.4 Localized Reduction of Predatory Fishes (Predator Control) (CM15)

CM15 would reduce populations of predatory fishes at specific locations and eliminate or modify holding habitat for predators at selected locations of high predation risk (i.e., predation *hotspots*). This conservation measure seeks to benefit covered salmonids by reducing mortality rates of juvenile migratory life stages that are particularly vulnerable to predatory fishes. Predators are a natural part of the Delta ecosystem. Therefore, this conservation measure is not intended to entirely remove predators at any location, or substantially alter the abundance of predators at the scale of the Delta system. This conservation measure would also not remove piscivorous birds. Because of uncertainties regarding treatment methods and efficacy, implementation of CM15 would involve discrete pilot projects and research actions coupled with an adaptive management and monitoring program to evaluate effectiveness. Effects would be temporary, as new individuals would be expected to occupy vacated areas; therefore, removal activities would need to be continuous during periods of concern.

There are a number of sites throughout the Delta that are currently considered hotspots of predator aggregation or activity:

- Clifton Court Forebay
- CVP intakes
- Head of Old River
- Georgiana Slough
- Old and Middle Rivers
- Franks Tract
- Paintersville Bridge
- Human-made submerged structures (e.g., abandoned boats)
- Salvage release sites

In addition to these existing predation hotspots, the proposed BDCP is expected to create new hotspots:

- North Delta water diversion facilities – Large intake structures have been associated with increased predation by creating predator ambush opportunities and flow fields that disorient juvenile fish.
- Nonphysical fish barriers – Nonphysical fish barriers may attract predators such as striped bass.

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There are likely other hotspots in the Delta beyond those listed here. The actions in this conservation measure would be applied to other hotspots in the Plan Area if those actions would help to fulfill the purpose of this conservation measure and help to meet the applicable biological goals and objectives.

The proposed program for a BDCP predator control measure includes two elements.

- Hotspot Pilot Program – Implement experimental treatment at priority hotspots, monitor effectiveness, assess outcomes, and revise operations with guidance from the BDCP Adaptive Management Team.
- Research Actions – With the adaptive management program, support focused studies to quantify the population-level efficacy of the pilot program and any program expansion(s) intended to increase salmonid smolt survival through the Delta.

Under the Hotspot Pilot Program, physical reduction techniques, such as boat electrofishing, hook-and-line fishing, predator lottery fishing tournaments, and passive and active capture, would be employed. The pilot program would also evaluate the effectiveness of modifying or eliminating habitat features that provide holding habitat for predatory fish and/or increase capture efficiency by predators (e.g., abandoned boats and derelict structures). Because of the high degree of uncertainty regarding predation/competition dynamics for covered fish species and the feasibility and effectiveness of safely removing large fractions of existing predator populations, the proposed predator reduction program is envisioned as an experimental pilot program within an adaptive management framework. The pilot program would be carefully monitored and refined to determine which practices are effective. If the pilot program shows that the main issues are resolvable, a defined predator reduction program may be implemented (i.e., defined in terms of predator reduction techniques and the sites and/or areas of the Plan Area where techniques will be employed). Research and monitoring would continue throughout the duration of the program to address remaining uncertainties and ensure the measures are effective (i.e., that they reduce numbers and densities of predators and increase survival of covered salmonids).

The progress of the Hotspot Pilot Program and research activities would be documented annually in the Adaptive Management and Monitoring Report. During year 1, the Implementation Office would evaluate the strategies for logistical issues, relative effectiveness, incidental impacts on covered fish, and cost-effectiveness. After year 1 of pilot program implementation, the Implementation Office would refine the scope and methodology of the pilot program—based on review and coordination with the resource agencies—and continue with implementation for an additional 5 to 7 years. At the end of this pilot implementation period, program assessment would involve independent science review and publication of findings. After the reviews are considered, the Adaptive Management Team, in collaboration with the resource agencies, would refine operations and decide whether and in what form predator reduction and further adaptive management would continue. Key uncertainties associated with this measure include determining where predation is likely to occur in vicinity of new north Delta intakes, determining the best predator reduction techniques, determining predator density and distribution in vicinity of the north Delta intakes, prioritizing hotspots for localized predator reduction, and assessing the effects of localized predator reduction measures on covered fish species.

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3.6.3.5 Nonphysical Fish Barriers (CM16)

CM16 would be implemented to improve the survival of outmigrating juvenile salmonids by using nonphysical barriers to redirect the fish away from channels and river reaches in which survival is lower than in alternate routes. The BDCP Implementation Office may install nonphysical barriers that use a combination of sound, light, and bubbles at head of Old River, Delta Cross Channel, Georgiana Slough, and possibly Turner Cut and Columbia Cut. Barriers at these locations have a high potential to deter juvenile salmonids from using specific channels/migration routes that may contribute to decreased survival resulting from increased predation and/or entrainment, or to direct juvenile salmonids to areas that may increase their survival such as Yolo Bypass. Other locations may be considered in the future if, for example, future research demonstrates differential rates of survival in Sutter and Steamboat Sloughs or in Yolo Bypass relative to the mainstem Sacramento River. Nonphysical barrier placement may also be accompanied by methods to reduce local predator abundance, if monitoring results indicate that barriers attract predators or direct covered fish species away from potential entrainment hazards but toward predator hotspots. Nonphysical fish barriers have not been shown to be effective for other covered fish species; thus, this conservation measure is only expected to yield beneficial outcomes for salmonids.

Site-specific conditions will drive the design of nonphysical barrier in terms of techniques to anchor and secure the structure, measures to indicate the location of the structure for the safety of waterway users (i.e., recreational boaters), and preferences for fish migration routes. As described in the BDCP, Chapter 8, *Implementation Costs and Funding Sources,* (Section 8.4.16), the capital and operational costs of nonphysical barriers increase dramatically in deep and wide sections of channels. Therefore, the expected and measured benefits of the barrier at a particular location will be evaluated against its biological benefits.

Nonphysical barriers would be installed and operated from October to June or when monitoring determines that salmonid smolts are present in the target areas. Barriers would be removed and stored offsite while not in operation.

Implementation of this conservation measure by the BDCP Implementation Office would be informed through effectiveness monitoring that would be conducted as described in the BDCP Section 3.6, *Adaptive Management and Monitoring Program*. Monitoring would include studies to evaluate the effectiveness of nonphysical barriers using tagged juvenile salmonids. The studies would document the interaction of tagged fish with nonphysical barriers and the effectiveness of nonphysical barriers at directing fish toward preferred migration routes/channels and away from channels or migration routes that have higher mortality associated with either predation and/or entrainment.

Uncertainty regarding the potential attraction of predators to nonphysical barriers and the effectiveness of barriers under certain conditions (i.e., in high flow areas, areas with complex bathymetry or cover, or other areas that may have physical conditions that may limit their effectiveness) will be resolved as this conservation measure is implemented on an individual project level. Thus evaluating the potential attraction of predators and the effectiveness of nonphysical barriers under various conditions would also be part of the monitoring to be completed as part of this conservation measure. Changes, should any be warranted based upon the results of monitoring and evaluating the effectiveness of nonphysical barriers, would be approved through the adaptive management decision making process, and implemented through subsequent annual work plans.

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Implementation of this conservation measure will be informed through compliance and effectiveness monitoring, research actions, and adaptive management, as described in Chapter 3, *Conservation Strategy,* (Section 3.4.16) of the BDCP. Monitoring elements may be modified, as necessary, to best assess the effectiveness of CM16 based on the best available information at the time of implementation.

3.6.3.6 Illegal Harvest Reduction (CM17)

Implementation of CM17 would reduce illegal harvest of Chinook salmon, Central Valley steelhead, and sturgeon in the Delta, bays, and upstream waterways by providing funding to increase the enforcement of fishing regulations in the Delta and bays with the goal of reducing illegal harvest of covered salmonids and sturgeon. The BDCP Implementation Office would provide funds to CDFW to hire and equip 24 additional staff (17 game wardens and 7 supervisory and administrative staff) in support of the existing field wardens assigned to the Delta-Bay Enhanced Enforcement Program (DBEEP) over the term of the BDCP. These staff increases would be supported for the duration of the BDCP permit term. The additional game wardens would conduct patrols throughout the Delta wherever deemed necessary to reduce illegal harvest of adult salmonids and sturgeon. Increased enforcement as part of CM17 would be focused on the Bay-Delta area and its waterways; however, increased enforcement outside of the Plan Area may occur as part of CM17. Any reduction in illegal harvest of covered fish species, whether inside or outside the Plan Area, is expected to contribute to the achievement of the biological goals and objectives for the covered fish species. One location where increased patrols are expected to occur is the Fremont Weir, both before and following improvement to the structure planned as part of *CM2 Yolo Bypass Fisheries Enhancement*. There is increased risk of illegal harvest of adult salmonids and sturgeon when the fish become concentrated in the pool immediately downstream of the Fremont Weir. Increased enforcement would deter illegal fishing and contribute to a decrease in illegal harvest.

It is expected that it would take 2 to 3 years to achieve the staff increases, with the full increase in enforcement efforts associated with CM17 beginning in year 3 of BDCP implementation.

Implementation of CM17 would be monitored primarily by tracking program achievements recorded in the DBEEP annual reports, which summarize actions and accomplishments over the previous year, including the number of warnings and citations issued, reason for citations (e.g., the species associated with each of the violations), the number of arrests by violation, and compliance and effectiveness monitoring. The Implementation Office would coordinate with CDFW to adjust enforcement strategies and funding levels through the BDCP adaptive management process, based on review of DBEEP annual reports. DWR would coordinate with CDFW to ensure that information that could be important to the BDCP is included and summarized in the DBEEP annual reports upon BDCP permit authorization.

Implementation of this conservation measure will be informed through compliance and effectiveness monitoring and adaptive management, as described Chapter 3, *Conservation Strategy,* (Section 3.4.17) of the BDCP. Key uncertainties include whether increased enforcement reduces illegal harvest and whether increased enforcement has beneficial effects on anadromous fish stocks. Monitoring data would be used to answer these uncertainties by evaluating the incidence of illegal take of covered species (especially Chinook salmon, steelhead, and sturgeon) and whether changes in abundance and population dynamics can be attributed to reductions in illegal harvest.

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3.6.3.7 Conservation Hatcheries (CM18)

This conservation measure would establish new conservation propagation programs and expand the existing programs for delta and longfin smelt. The BDCP Implementation Office would support two programs.

- The development of a delta and longfin smelt conservation hatchery by USFWS to house a delta smelt refugial population and provide a continuing source of delta and longfin smelt for experimentation.
- The expansion of the refugial population of delta smelt and establishment of a refugial population of longfin smelt at the University of California (UC) Davis Fish Conservation and Culture Laboratory (FCCL) in Byron.

- The principal purpose of this measure is to ensure the existence of refugial captive populations of both delta and longfin smelt, thereby helping to reduce risks of extinction for these species. The use of two refugial facilities will decrease the likelihood of catastrophic loss of captive fish to disease. The refugial populations would also constitute a source of animals for experimentation, as needed, to address key uncertainties about delta and longfin smelt biology. This approach minimizes the need to harvest wild stock for research purposes. The refugial populations established and maintained by USFWS with funding from the BDCP could also function as a source of animals for reintroduction or supplementation of wild populations. Reintroduction or supplementation is not proposed by the BDCP. However, if deemed necessary by the fish and wildlife agencies, and if technically feasible, the hatcheries could be used for this purpose independent of the BDCP.

- Bay-Delta populations of both delta smelt and longfin smelt have experienced dramatic declines over the past five decades of monitoring, including further declines over the past decade or so due to a combination of factors (Sommer et al. 2007; Baxter et al. 2008, 2010). Delta smelt continue to decline. It is possible that very low population size could result in an Allee effect,[27] causing an even more rapid decline of the species due to factors unique to small populations (Baxter et al. 2008). Allee effects occur because, below a certain threshold, the individuals in a population can no longer reproduce rapidly enough to replace themselves, and the population spirals toward extirpation. Thus, if Allee effects are acting on the delta smelt population now, or do so in the future, then the risk of extirpation of delta smelt would increase. Longfin smelt abundance has followed a trend similar to delta smelt, culminating in record low abundance indices several times in the past decade (Sommer et al. 2007; Baxter et al. 2008, 2010), so there may also be a potential for Allee effects in the longfin smelt population.

The new facility proposed by USFWS would house genetically managed refugial populations of delta and longfin smelt. State-of-the-art genetic management practices would be implemented to maintain close genetic variability and similarity between hatchery-produced and natural-origin fish. The facility would be designed to provide captive propagation of other species, if necessary, in the future. The specifications and operations of this facility have not been developed, nor has the facility location been determined, though it is expected to be located within the Plan Area in the vicinity of Rio Vista. Additional permitting and environmental documentation would be needed to implement this conservation measure once facility designs and funding are available. Because of these challenges, it is expected that design, permitting, and construction of the facility would take approximately 6 years, with the facility becoming operational by year 7.

[27] Examples of Allee effects are when reproductive output per fish declines at low population levels and/or increases at high population levels (Allee 1931).

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The BDCP Implementation Office would enter into binding Memoranda of Agreement or similar instruments with USFWS and UC Davis. If and when populations of these species are considered recovered by USFWS, the Implementation Office would terminate funding for the propagation of the species and either fund propagation of other BDCP covered fish species, if necessary and feasible, or discontinue funds to this conservation measure and reallocate them to augment funding of other conservation measures identified in coordination with the fish and wildlife agencies through the BDCP adaptive management process.

Implementation of this conservation measure will be informed through compliance and effectiveness monitoring that will be conducted by the BDCP Implementation Office, as described in Chapter 3, *Conservation Strategy,* (Section 3.4.18) of the BDCP. There is one key uncertainty associated with CM18: Can refugial populations of both delta and longfin smelt be maintained with little or no supplementation from wild stocks? Answering this question will require the development of techniques for ensuring successful breeding and survivorship, so that refugial populations can be shown to increase without further supplementation from wild stocks.

3.6.3.8 Urban Stormwater Treatment (CM19)

Under CM19, the BDCP Implementation Office would provide a mechanism for implementing stormwater treatment measures that would result in decreased discharge of contaminants to the Delta. These measures would be focused on urban areas.

Reducing the amount of pollution in stormwater runoff entering Delta waterways would benefit covered fishes through the following mechanisms.

- Increasing aquatic productivity, which would support food abundance for splittail, delta and longfin smelt, green and white sturgeon, steelhead, and Chinook salmon (all races).
- Reducing loads of pesticides and herbicides, which can be toxic to the invertebrates and phytoplankton that form the base of the food web or are important prey species for covered fish species.
- Reducing sublethal effects (behavior, tissue and organ damage, reproduction, growth, and immune) of toxic contaminants (including metals and pesticides), which would improve the health of splittail, delta and longfin smelt, green and white sturgeon, steelhead, and Chinook salmon (all races).
- Reducing pyrethroids and other chemicals from urban areas and stormwater, which would improve the health of covered fish species.

The BDCP Implementation Office would oversee a program to provide funding grants to entities such as the Sacramento Stormwater Quality Partnership and/or counties and cities whose stormwater contributes to Delta waterways under NPDES Municipal Separate Storm Sewer System (MS4) stormwater permits, to implement actions from and in addition to their respective stormwater management plans. Projects would be funded if the Implementation Office determines that they are expected to benefit covered species. Interagency agreements and program development are expected to take 2 years, with the program becoming operational in year 3 of Plan implementation. Individual actions under the program are expected to take approximately 5 years each to fund, design, permit, and construct. This conservation measure would be in effect over the 50-year BDCP period. The BDCP Implementation Office would advertise and promote this grant program to ensure that the first awards are made within 2 years of Plan implementation, assuming

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qualified projects are considered. Some of the types of actions that could be funded under this conservation measure include, but are not limited to those listed below.

- Constructing retention or irrigation holding ponds for the capture and irrigation use of stormwater.
- Designing and establishing vegetated buffer strips to slow runoff velocities and capture sediments and other pollutants.
- Designing and constructing bioretention systems (grass buffer strips, sand bed, ponding area, mulch layer, planting soil, and plants) to slow runoff velocities and for removal of pollutants from stormwater.
- Constructing stormwater curb extensions adjacent to existing commercial businesses that are likely to contribute oil and grease runoff.
- Establishing stormwater media filters to remove particulates and pollutants, such as that located at the American Legion Park Pump Station in Stockton.
- Providing funds for moisture monitors to be installed during construction of sprinkler systems at commercial sites, that would eliminate watering when unnecessary.
- Providing support for establishment of onsite infiltration systems in lieu of new storm drain connections for new construction, such as pervious pavement in place of asphalt and concrete in parking lots and along roadways, and downspout disconnections to redirect roof water to beds of vegetation or cisterns on existing developed properties, including residential.

The BDCP Implementation Office would enter into binding memoranda of agreement or similar instruments with stormwater entities receiving grants under this conservation measure to ensure that their project is implemented. Individual stormwater entities would be responsible for conducting the monitoring necessary to assess the effectiveness of BDCP-supported elements of their stormwater management plans. Normally, such monitoring would be limited to that required by the applicable NPDES MS4 stormwater permit, which is intended to verify that discharges support applicable beneficial uses of the receiving waters. The BDCP Implementation Office may require further monitoring (e.g., to test effectiveness of experimental treatment measures), if such monitoring is determined appropriate during review of the project proposal.

Implementation of this conservation measure will be informed through compliance and effectiveness monitoring and adaptive management, as described in Chapter 3, *Conservation Strategy,* (Section 3.4.19) of the BDCP. The BDCP Implementation Office, in coordination with the fish and wildlife agencies, may discontinue effectiveness monitoring for this measure in future years if monitoring results indicate a strong correlation between reduction in stormwater pollution loads entering the Delta and responses of covered fish species.

3.6.3.9 Recreational Users Invasive Species Program (CM20)

Under CM20, the BDCP Implementation Office would fund a Delta Recreational Users Invasive Species Program designed to implement actions to prevent the introduction of new aquatic invasive species and reduce the spread of existing aquatic invasive species via recreational watercraft, trailers, and other mobile recreational equipment used in aquatic environments in the Plan Area. The BDCP Implementation Office would also implement such actions. The program would consist of two primary elements, described in more detail below: education and outreach, and watercraft inspection.

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Program actions are likely to be implemented on the ground by multiple agencies, including the BDCP Implementation Office, CDFW, Reclamation, local water districts, counties, and others. Implementing agencies would be determined by the BDCP Implementation Office based on a variety of factors including likely effectiveness, enforcement ability, and cost effectiveness.

Education and Outreach

The BDCP Implementation Office would provide information to recreational boaters in the Plan Area regarding the potential threat of introductions of new aquatic invasive species, the presence and range of existing aquatic invasive species, the various vectors of aquatic invasive species, and the potential threat of the spread of existing aquatic invasive species within the Plan Area. The BDCP Implementation Office would implement education and outreach following the actions listed in the Education and Outreach section of the *California Aquatic Invasive Species Management Plan* (Objective 6; CAISMP) (California Department of Fish and Game 2008). The first and most important of these actions is to inventory existing education and outreach efforts in the Plan Area, and then to use this information to prioritize new efforts and partner with existing efforts.

Watercraft Inspection

The BDCP Implementation Office would develop and implement protocols to screen, inspect, decontaminate, and if necessary, quarantine recreational watercraft, trailers, and other equipment prior to entering waters of the Plan Area to meet the goals of this conservation measure. The BDCP Implementation Office would design these actions for the Plan Area in accordance with the specifications for a Level 3 screening and inspection program, as set forth in the *Uniform Minimum Protocols and Standards for Watercraft Interception Programs for Dreissenid Mussels in the Western United States* (UMPS II) (Zook and Phillips 2012). UMPS II provides uniform minimum standards and protocols for developing and implementing aquatic invasive species watercraft inspection programs using the best available science, technology, and understanding. A Level 3 (Comprehensive) inspection program is recommended for all high-risk waters and large water bodies. This type of program involves screening interviews at the point of entry; a comprehensive inspection, performed by trained inspectors, of all high-risk watercraft, trailers, and equipment identified as high-risk during the screening interview; decontamination and/or quarantine or exclusion of watercraft, trailers, and equipment that are not clean, drained, and dry; and optional vessel certification. For an area the size of the Plan Area, seven inspection and decontamination stations are appropriate.

To design appropriate actions, the BDCP Implementation Office would conduct an inventory of existing aquatic invasive species within the Plan Area, including their general location, range, and population sizes; and determine the risk of aquatic invasive species invasion and spread within the Plan Area. The BDCP Implementation Office would then design watercraft inspection actions using the protocols and standards outlined in UMPS II. Concurrently, the BDCP Implementation Office would consult with operators of existing watercraft inspection programs in California and the western United States to gain an understanding of the benefits and challenges and resulting successes and failures of watercraft inspection programs, to help design BDCP actions. Throughout the permit term, the BDCP Implementation Office would continue to track other comparable programs in California and the western United States to ensure that the program continues to meet a "best available science" standard for inventory and implementation.

Compliance monitoring would be required to document the implementation of CM20. Annual budgets, reports, and work plans would be required in order to demonstrate appropriate use of available funds and actions accomplished.

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Implementation of this conservation measure would begin in year 1; full program development would likely take approximately 3 years.

Implementation of this conservation measure will be informed through compliance and effectiveness monitoring, research actions, and adaptive management, as described Chapter 3, *Conservation Strategy,* (Section 3.4.20) of the BDCP.

3.6.3.10 Nonproject Diversions (CM21)

Under CM21, the BDCP (or an alternative) would provide for the funding of actions that would reduce potential entrainment of covered fish that may result from the operation of nonproject diversions. Nonproject diversions consist of infrastructure used to divert surface waters within the Plan Area and that is not associated with operation of the SWP or the CVP. Most of these nonproject diversions are used to support agriculture or to provide water for waterfowl rearing areas. The purpose of this conservation measure is to avoid or minimize incidental take of BDCP covered fish species associated with nonproject diversions whose owners voluntarily participate in this conservation measure. Nonproject diversions could result in incidental take of covered fish species by entrainment or impingement. Remediation of these nonproject diversions could eliminate or reduce this entrainment or impingement, and improve Delta ecosystem health by reducing the diversion of plankton and other nutritional resources, thereby benefiting all covered fishes.

This conservation measure is intended to avoid or minimize the effect of those nonproject diversions that have the greatest potential to result in incidental take of covered fishes. This would be achieved by consolidating, relocating, screening, removing, or otherwise remediating the harmful diversions. Remediation would be achieved by the methods described below, and also through the removal of some diversions in areas where cultivated lands or managed wetlands are converted into natural community types that do not require consumptive use of surface waters. The number and size of the diversions that will be eliminated as a result of restoration of natural community types are not precisely known because the affected parcels have not yet been identified and, moreover, some existing diversions may be remediated before restoration actions occur. Diversions that are removed as a result of those restoration activities are included in the overall diversion remediation commitment.

This conservation measure has the potential to result in the remediation of an average estimated 100 cfs of diversion capacity per year, beginning in year 6 and continuing throughout the term of the Plan. The level and extent of remediation that occurs through this process will depend on the number participating diverters and the diversion capacity of those participants' diversion facilities. The estimate of an average of 100 cfs diversion capacity per year remediated is based on an evaluation of the level of landowner participation to date in the existing CDFW and Reclamation fish screen programs, and the expected increase in participation with the availability of new funds and the opportunity to obtain take authorization through BDCP.

Remediation is defined to include application of any of the following methods for treatment of unscreened diversions.

- Installation of screens.
- Consolidation of multiple unscreened diversions into a single or fewer screened diversions placed in lower-value habitat.

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- Relocation of diversions with substantial effects on covered species from high-value to lower-value habitat, in conjunction with screening.
- Reconfiguration and screening of individual diversions in high-value habitat to take advantage of small-scale distribution patterns and behavior of covered fish species relative to the location of individual diversions in the channel.
- Voluntary alteration of the daily and seasonal timing of diversion operation.
- Removal of individual diversions that have relatively large effects on covered fish species or as a consequence of transfer of cultivated lands or managed wetlands into the reserve system.

Additional methods may be implemented if the Program Manager determines those methods to be appropriate.

Under this conservation measure, the following actions will be implemented over the term of the BDCP.

- The BDCP Implementation Office will form a technical team to inventory potential projects and rank those potential projects in order of priority. The technical team will include BDCP staff designated by the Science Manager, USFWS and Reclamation representatives from the Anadromous Fish Screen Program, and a representative of CDFW's Fish Screen and Passage Program. Although the existing Reclamation and CDFW programs focus on achieving benefits to anadromous salmonids, the technical team will be charged to develop and apply criteria that consider potential effects on *all* covered fish species and that assign highest priority to cost-effective projects that maximize expected entrainment reductions.
- The Implementation Office will develop and publish criteria by which it will evaluate requests from landowners, on whose property nonproject diversions are located, for participation in this conservation measure. In its consideration of landowner requests, the Implementation Office will, at a minimum, take into account the following factors.
    - Demonstration by the landowner of a valid water right.
    - Use by the landowner of reasonable methods of diversion and water measurement.
    - Efforts by the landowner, or by the entity that receives water diverted through the landowner's diversion facility, to implement appropriate irrigation efficiency programs.
    - Demonstration by the landowner that the diverted water is being put to reasonable and beneficial use and not being wasted.
    - Demonstration by the landowner that subsurface drain water and/or surface return flow discharged into a Delta water way does not have an unreasonable impact on Delta water quality.
- Landowners who operate diversions identified by the technical team as a high priority for remediation, and whose diversions have been evaluated favorably by the Implementation Office pursuant to the aforementioned criteria, would be invited to participate in CM21. Operators who choose to be part of the program will sign a certificate of compliance committing them to the process and terms of this conservation measure. Operators who have signed a certificate of compliance will receive authorization for incidental take associated with diversion operation or remediation and will be referred to as Other Authorized Entities (see Chapter 7, *Implementation*

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Structure, of the BDCP). Participating landowners will be covered for take associated with the operation of these diversions.

- Remediation actions will be fully funded through the BDCP. These actions will be completed within 5 years of the execution of a certificate of compliance by the Implementation Office and the participating landowner.
- With regard to diversions selected for remediation, the BDCP Implementation Office will implement the remediation program consistent with all Anadromous Fish Screen Program and Fish Screen and Passage Program objectives.
- The BDCP Implementation Office will prepare, either internally or in conjunction with the Anadromous Fish Screen Program and Fish Screen and Passage Program, annual summary reports describing prior year achievements of supported programs. The remediation program, including the execution of associated interagency agreements, creation of a technical team, development of selection criteria, and establishment of priorities, is expected to be in effect within 2 years and fully operational in year 3. Individual actions under the program are expected to take approximately 3 to 5 years to design, permit, and construct. Based on performance of the Anadromous Fish Screen Program and Fish Screen and Passage Program during the past 20 years, the highest priority projects, at least initially, may address the larger nonproject diversions (more than 100 cfs) located along major channels in the Delta. It is also likely that priority may be given to some smaller diversions occurring in locations that support relatively large concentrations of covered fish, and that other diversions would be given higher priority because their timing of operations is conducive to high risk of take of covered species.

Implementation of this conservation measure would commence in year 1 and would continue throughout the term of the Plan. Budgeting for this program will be coordinated between the BDCP Implementation Office and the managers of the Reclamation and CDFW programs. See BDCP Chapter 6, *Plan Implementation*, (Section 6.1), for details on the timing and phasing of CM21.

Implementation of this conservation measure will be informed through compliance and effectiveness monitoring, research actions, and adaptive management, as described in Chapter 3, *Conservation Strategy,* (Section 3.4.21) of the BDCP.

The BDCP Implementation Office may adjust its approach to the selection of diversions to be relocated or consolidated, design of intakes, or the means by which the effects of these diversions on covered species will be minimized. If the results of monitoring indicate that remediation of nonproject diversions does not substantially and cost-effectively benefit covered fish species, the BDCP Implementation Office, in coordination with the fish and wildlife agencies, may recommend termination of this conservation measure to the Authorized Entity Group.

3.6.3.11 Avoidance and Minimization Measures (CM22)

Under CM22, the BDCP Implementation Office would implement measures to avoid and minimize effects on covered species and natural communities that could result from BDCP covered activities. The AMMs that would be implemented through this framework are detailed in the BDCP Appendix 3.C, *Avoidance and Minimization Measures*, and summarized in Table 3-15. These measures would be implemented for covered activities throughout the BDCP permit term.

Specific AMMs would be developed for each BDCP project, based on the comprehensive avoidance and minimization measures described in Appendix 3.C, *Avoidance and Minimization Measures* of the

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BDCP, and summarized in Table 3-15. Identification and implementation of the appropriate AMMs for each project would occur in four phases.

- **Planning-level surveys and project planning.** Site-specific surveys would be conducted during the project planning phase to identify natural communities, covered species habitat, and covered species to which AMMs apply. Projects would be designed to avoid and minimize impacts as described in Appendix 3.C, *Avoidance and Minimization Measures*, of the BDCP.
- **Preconstruction surveys.** Biological surveys may be necessary during the months or weeks prior to project construction, depending on the results of the planning surveys, as specified in Appendix 3.C, *Avoidance and Minimization Measures*, of the BDCP. Results of the planning surveys will be used to determine whether additional measures would be applied just prior to or during construction (e.g., establishing buffers around kit fox dens or covered bird species nests). Preconstruction surveys may also involve site preparation actions such as collapsing unoccupied burrows.
- **Project construction.** BMPs and other AMMs would be implemented during project construction as described in Appendix 3.C of the BDCP, *Avoidance and Minimization Measures*. For some activities, as specified in Appendix 3.C, a biological monitor will be present to ensure that the measures are effectively implemented. For some species (e.g., California red-legged frog), the biological monitor would relocate individuals from the construction area to specified nearby safe locations.
- **Operation and maintenance.** Some of the AMMs apply to long-term operation and maintenance activities, such as operation and maintenance of the water conveyance facilities and ongoing covered species' habitat enhancement and management. Appropriate measures would be identified during the project planning phase and implemented throughout the life of the project. AMMs applicable to long-term enhancement and management would be incorporated into site-specific management plans.

Table 3-15. Summary of the Avoidance and Minimization Measures

Number	Title	Summary
Benefit All Natural Communities and Covered Species		
1	Worker Awareness Training	Includes procedures to educate construction personnel on the types of sensitive resources in the project area, including sensitive timing windows for covered species, the applicable environmental rules and regulations, and specific training on the measures required to avoid and minimize effects on these resources.
2	Construction Best Management Practices and Monitoring	Standard practices and measures that will be implemented prior, during, and postconstruction to avoid or minimize effects of construction activities on sensitive resources (e.g., species, habitat), and monitoring protocols for verifying the protection provided by the implemented measures.
Primarily Benefit Covered Fishes		
3	Stormwater Pollution Prevention Plan	Includes measures that will be implemented to minimize pollutants in stormwater discharges during and after construction related to covered activities, and that will be incorporated into a Stormwater Pollution Prevention Plan to prevent water quality degradation related to pollutant delivery from project-area runoff to receiving waters.

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Number	Title	Summary
4	Erosion and Sediment Control Plan	Includes measures that will be implemented for ground-disturbing activities, to control short-term and long-term erosion and sedimentation effects and to restore soils and vegetation in areas affected by construction activities, and that will be incorporated into plans developed and implemented as part of the National Pollutant Discharge Elimination System permitting process for covered activities. It is anticipated that multiple erosion and sediment control plans will be prepared and implemented for BDCP construction activities, each taking into account site-specific conditions such as proximity to surface water, erosion potential, drainage, etc.
5	Spill Prevention, Containment, and Countermeasure Plan	Includes measures to prevent and respond to spills of hazardous material that could affect navigable waters, including actions used to prevent spills, in addition to specifying actions that will be taken should any spills occur, and emergency notification procedures. Measures in AMM5 will be included in site-specific plans.
6	Disposal and Reuse of Spoils, Reusable Tunnel Material (RTM), and Dredged Material	Includes measures for handling, storing, beneficial reuse, and disposing of excavation or dredge spoils and RTM, including procedures for the chemical characterization of this material or the decant water to comply with permit requirements, and reducing potential effects on aquatic habitat, as well as specific measures to avoid and minimize effects on species in the areas where RTM would be used or disposed.
7	Barge Operations Plan	Includes measures to avoid or minimize effects on aquatic species and habitat related to barge operations, by establishing specific protocols for the operation of all project-related vessels at the construction and/or barge landing sites. AMM7 also includes monitoring protocols to verify compliance with the plan and procedures for contingency plans. Measures in AMM7 will be included in a Barge Operations Plan.
8	Fish Rescue and Salvage Plan	Includes measures that detail procedures for fish rescue and salvage to avoid or minimize the number of Chinook salmon, steelhead, green sturgeon, and other covered fish stranded during construction activities, especially during placement and removal of cofferdams at intake construction sites. Measures in AMM8 include appropriate procedures for excluding fish from the construction zones and procedures for removing and handling fish should they become trapped, and will be included in a Fish Rescue and Salvage Plan.
9	Underwater Sound Control and Abatement Plan	Includes measures to minimize the effects of underwater construction noise on fish, particularly from impact-pile-driving activities. Potential effects of pile driving will be minimized by restricting work to the least sensitive period of the year and by controlling or abating underwater noise generated during pile driving.
Primarily Benefit Covered Plants, Wildlife, or Natural Communities		
10	Restoration of Temporarily Affected Natural Communities	Restore and monitor natural communities in the Plan Area that are temporarily affected by covered activities. Measures in AMM10, including methods for stockpiling and storing topsoil, restoring soil conditions, and revegetating disturbed areas; schedules for monitoring and maintenance; strategies for adaptive management; reporting requirements; and success criteria, will be incorporated into restoration and monitoring plans.
11	Covered Plant Species	Conduct botanical surveys during the project planning phase and implement protective measures, as necessary. Redesign to avoid indirect effects on modeled habitat and effects on core recovery areas.

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Number	Title	Summary
12	Vernal Pool Crustaceans	Design projects to minimize indirect effects on modeled habitat and avoid effects on core recovery areas. Where practicable, the project will be planned and designed to ensure no ground-disturbing activities or alterations to hydrology will occur within 250 feet of vernal pool crustacean habitat; over the 50-year permit term no more than 20 wetted acres will be indirectly affected by covered activities within 250 feet of vernal pools. If conservancy or longhorn fairy shrimps are detected in core recovery areas, conduct protocol-level surveys, and redesign projects to ensure that no suitable habitat within these areas is adversely affected, due to the rarity of these species.
13	California Tiger Salamander	During the project planning phase, identify suitable habitat in and within 1.3 miles of the project footprint and implement protective measures in those areas. During the planning phase, aquatic habitats in potential work areas will be surveyed (nonprotocol) for California tiger salamander larvae and eggs. If California tiger salamander larvae or eggs are found, the project will be designed to avoid and minimize impacts on the aquatic habitat. If the aquatic habitat cannot be avoided, measures will be developed to relocate larvae or eggs to the nearest suitable aquatic habitat, as determined by the USFWS- and CDFW-approved biologist.
14	California Red-Legged Frog	During the project planning phase, identify suitable habitat in and within 1 mile of the project footprint, conduct one preconstruction survey within 1 week of construction, and implement protective measures for areas where species presence is known or assumed. During the planning phase, appropriate buffer distances will be established around aquatic habitat to minimize direct and indirect effects on California red-legged frog. If aquatic habitat cannot be avoided, aquatic habitats in potential work areas will be surveyed (nonprotocol) for tadpoles and egg masses. If California red-legged frog tadpoles or egg masses are found, and the aquatic habitat cannot be avoided, measures will be developed to relocate tadpoles and eggs to the nearest suitable aquatic habitat, as determined by the USFWS- and CDFW-approved biologist.
15	Valley Elderberry Longhorn Beetle	During the project planning phase, conduct surveys for elderberry shrubs within 100 feet of covered activities involving ground disturbance, and design project to avoid effects within 100 feet of shrubs, if feasible. Implement additional protective measures, as stipulated in AMM2. Elderberry shrubs identified within project footprints that cannot be avoided will be transplanted to previously approved conservation areas in the Plan Area.
16	Giant Garter Snake	During the project planning phase, identify suitable aquatic habitat (wetlands, ditches, canals) in the project footprint. Conduct preconstruction surveys during active period (May 1 to September 30) of suitable habitat using survey protocols approved by USFWS and CDFW, and implement protective measures. To the extent practicable, construction activities will be avoided within 200 feet of the banks of giant garter snake aquatic habitat, particularly in areas with a moderate to high likelihood of giant garter snake presence.
17	Western Pond Turtle	Identify suitable aquatic habitat and upland nesting and overwintering habitat in and within the project footprint. Conduct preconstruction surveys in suitable habitat twice, including 1 week before and within 48 hours of construction. Implement protective measures as described.

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Number	Title	Summary
18	Swainson's Hawk and White-Tailed Kite	Conduct preconstruction surveys of potentially occupied breeding habitat in and within 0.25 mile of the project footprint to locate active nest sites. Surveys will be conducted to ensure nesting activity is documented prior to the onset of construction activity. Swainson's hawks nest in the Plan Area between approximately March 15 and September 15. Construction activity that is planned after March 15 of any year will require surveys during the year of the construction. If construction is planned before March 15 of any year, surveys will be conducted the year immediately prior to the year of construction. If construction is planned before March 15 of any year and subject to prior-year surveys, but is later postponed to after March 15, surveys will also be conducted during the year of construction.
19	California Clapper Rail and California Black Rail	Identify suitable habitat in and within 500 feet of the project footprint. Surveys will be initiated sometime between January 15 and February 1. A minimum of four surveys will be conducted. The survey dates will be spaced at least 2 to 3 weeks apart and will cover the time period from the date of the first survey through the end of March and mid-April. Surveys can be avoided if presence is assumed and protective measures are implemented as if the species is present. Implement protective measures in areas where species is present or assumed to be present. Activities within or adjacent to tidal marsh areas (and managed wetlands for California black rails) will be avoided during the rail breeding season (February 1 through August 31), unless surveys are conducted to determine rail locations and territories can be avoided.
20	Greater Sandhill Crane	Conduct preconstruction surveys within the identified greater sandhill crane winter use area to determine the presence of occupied winter roost sites in and within 0.5 mile of the project footprint during mid-September through March 7 of each construction year. Implement protective measures in occupied areas. Minimize indirect effects of conveyance facility construction through temporary (during construction) establishment of 700 acres of roosting/foraging habitat. The established habitat will consist of active cornfields that are sequentially flooded following harvest to support roosting cranes and provide highest-value foraging habitat. Individual fields will be at least 140 acres in 40-acre rotating blocks. These fields can shift locations throughout the Greater Sandhill Crane Winter Use Area, but will be located within 0.25 mile of the indirectly affected habitat.
21	Tricolored Blackbird	Conduct preconstruction surveys in breeding habitat in and within 1,300 feet of the project footprint if the project is to occur during the breeding season. Three surveys will be conducted within 15 days of ground disturbance during the breeding season (approximately mid-March through late August) prior to project activity, and during the construction year. Implement protective measures in occupied areas. Projects will be designed to avoid construction activity to the maximum extent practicable up to 1,300 feet, but not less than a minimum of 250 feet, from an active tricolored blackbird nesting colony.
22	Suisun Song Sparrow, Yellow-Breasted Chat, Least Bell's Vireo, Western Yellow-Billed Cuckoo	Conduct preconstruction surveys of potential breeding habitat in and within 500 feet of project activities. At least five surveys will be conducted in suitable habitats within 30 days prior to construction, with the last within 3 days prior to ground disturbance. It may be necessary to conduct the breeding bird surveys during the preceding year depending on when construction is scheduled to start. Implement protective measures in occupied areas.

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Number	Title	Summary
23	Western Burrowing Owl	Western burrowing owl habitat surveys will be required where burrowing owl habitat (or sign) is encountered within and adjacent to (within 150 meters [492 feet]) a proposed project area. Species surveys in suitable habitat are required in both breeding and nonbreeding seasons. If burrowing owls or suitable burrowing owl burrows are identified during the habitat survey, and if the project does not fully avoid direct and indirect impacts on the suitable habitat, preconstruction surveys will be required. Preconstruction surveys may be conducted up to 14 days before construction. Suitable habitat is fully avoided if the project footprint does not impinge on a designated nondisturbance buffer around the suitable burrow. For occupied burrowing owl nest burrows, this nondisturbance buffer could range from 50 to 500 meters (164 to 1,640 feet).
24	San Joaquin Kit Fox	Conduct habitat assessment in and within 250 feet of project footprint. If suitable habitat is present, implement USFWS guidelines. Within 14 to 30 days prior to ground disturbance conduct a preconstruction survey in areas identified by the habitat assessment as being suitable breeding or denning habitat. Surveys will be conducted within the project footprint and the area within 250 feet beyond the footprint to identify known or potential San Joaquin kit fox dens. Implement protective measures in occupied areas.
25	Riparian Woodrat and Riparian Brush Rabbit	Surveys will be conducted for projects occurring within suitable habitat as identified from habitat modeling and by additional assessments conducted during the planning phase of construction or restoration projects following USFWS *Draft Habitat Assessment Guidelines and Survey Protocol for the Riparian Brush Rabbit and the Riparian Woodrat*. Implement protective measures in suitable habitat.
26	Salt Marsh Harvest Mouse and Suisun Shrew	Identify suitable habitat in and within 100 feet of the project footprint for projects in the species range. Ground disturbance will be limited to the period between May 1 and November 30, to avoid destroying nests with young. Prior to ground-disturbing activities, vegetation will first be removed with nonmechanized hand tools (e.g., goat or sheep grazing, or in limited cases where the biological monitor can confirm that there is no risk of harming salt marsh harvest mouse or Suisun shrew). Implement protective measures in suitable habitat.
27	Selenium Management	Develop a plan to evaluate site-specific restoration conditions and include design elements that minimize any conditions that could be conducive to increases of bioavailable selenium in restored areas. Before ground-breaking activities associated with site specific restoration occur, identify and evaluate potentially feasible actions for the purpose of minimizing conditions that promote bioaccumulation of selenium in restored areas.
28	Geotechnical Studies	Conduct geotechnical investigations to identify the types of soil avoidance or soil stabilization measures that should be implemented to ensure that the facilities are constructed to withstand subsidence and settlement and to conform to applicable state and federal standards. The geotechnical investigation will also include a small-scale environmental screening to assess the presence or absence of dissolved gases that will help guide the tunnel ventilation design and disposal considerations for excavated materials and tunnel cuttings. Detailed subsurface investigations will be performed at the locations of the water conveyance alignment and facility locations and at material borrow areas.

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Number	Title	Summary
29	Design Standards and Building Codes	Ensure that the standards, guidelines, and codes, which establish minimum design criteria and construction requirements for project facilities, will be followed. Follow any other standards, guidelines, and code requirements that are promulgated during the detailed design and construction phases and during operation of the conveyance facilities.
30	Transmission Line Design and Alignment Guidelines	The location and design of the proposed new transmission lines will be conducted in accordance with electric and magnetic field (EMF) guidance adopted by the California Public Utility Commission, *EMF Design Guidelines for Electrical Facilities* (2006). The alignment of proposed transmission lines will be designed to avoid sensitive terrestrial and aquatic habitats when siting poles and towers to the maximum extent feasible. When not feasible, impacts will be minimized to the greatest degree feasible and disturbed areas will be returned, as near as reasonably and practically feasible, to preconstruction conditions. Tower and pole placement will avoid existing structures to the extent feasible. Where poles or towers are to be constructed in agricultural areas, the following BMPs will be implemented, as applicable and feasible.
31	Noise Abatement	Develop and implement a plan to avoid or reduce potential construction-, maintenance-, and operation-related in-air noise impacts. To the extent feasible, the contractor will employ best practices to reduce construction noise, particularly during daytime and evening hours (7:00 a.m. to 10:00 p.m.) such that construction noise levels do not exceed 60 dBA L_{eq} (1 hour) at the nearest residential land uses.
32	Hazardous Material Management	Develop and implement site specific plans that will provide detailed information on the types of hazardous materials used or stored at all sites associated with the water conveyance facilities (e.g., intake pumping plants, maintenance facilities); phone numbers of applicable city, county, state, and federal emergency response agencies; primary, secondary, and final cleanup procedures; emergency-response procedures in case of a spill; and other applicable information. The plan will include appropriate practices to reduce the likelihood of a spill of toxic chemicals and other hazardous materials during construction and facilities operation and maintenance. A specific protocol for the proper handling and disposal of hazardous materials will be established before construction activities begin.
33	Mosquito Management	To aid in mosquito management and control during construction of project facilities, consult with appropriate Mosquito and Vector Control Districts (MVCDs). Consultation will occur before the sedimentation basins, solids lagoons, and the intermediate forebay inundation area become operational. Once these components are operational, consult again with the MVCDs to determine if mosquitoes are present in these facilities, and implement mosquito control techniques as applicable. Develop and implement a mosquito management plan, in consultation with appropriate MVCDs, for designing and planning restoration and conservation activities.
34	Construction Site Security	All security personnel will receive environmental training similar to that of onsite construction workers so that they understand the environmental conditions and issues associated with the various areas for which they are responsible at a given time. Security operations and field personnel will be given the emergency contact phone numbers of environmental response personnel for rapid response to environmental issues resulting from vandalism or incidents that occur when construction personnel are not onsite.

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Number	Title	Summary
35	Fugitive Dust Control	Implement basic and enhanced control measures at all construction and staging areas to reduce construction-related fugitive dust and ensure the project commitments are appropriately implemented before and during construction, and that proper documentation procedures are followed. Ensure that measures will be implemented to the extent feasible to control dust during general construction activities.
36	Notification of Activities in Waterways	Before in-water construction or maintenance activities begin, appropriate agency representatives will be notified when these activities could affect water quality or aquatic species. The notification procedures will follow stipulations included in applicable permit documents for the construction operations.
37	Recreation	Implement measures to site and construct trails and other recreational facilities to avoid and minimize effects on sensitive habitat areas.

Implementation of this conservation measure will be informed through compliance and effectiveness monitoring and adaptive management, as described in Chapter 3, *Conservation Strategy,* (Section 3.4.22) of the BDCP.

3.6.4 Water Conveyance Operational Components

Water operations (CM1) were developed with the goals of improving aquatic habitat conditions and continuing SWP and CVP Delta exports in accordance with the concepts described below. The various operational scenarios introduced in Section 3.4.1.2 are defined in detail in Section 3.6.4.2, *North Delta and South Delta Water Conveyance Operational Criteria*.

- Provisions to limit diversions at north Delta intakes to periods when Sacramento River flows would provide fish screen sweeping velocities[28] that comply with NMFS and USFWS protective criteria for salmonids and delta smelt.
- Operational criteria for SWP and CVP south Delta export facilities including seasonal export limits to minimize OMR reverse flows that appear to be related to fish salvage rates at SWP and CVP south Delta export facilities, while reducing hydraulic residence times through the Delta and improving south Delta water quality in summer months.
- Provisions to protect downstream habitat with bypass flow requirements that reflect historical hydrologic conditions.
- Seasonally adjusted Delta inflow and outflow to improve estuarine habitat
- Increased frequency and duration of floodplain inundation in Yolo Bypass to improve habitat conditions for covered fish species and increase transport of phytoplankton, zooplankton, and other organic food supply material from the Yolo Bypass floodplain to Cache Slough, the lower Sacramento River, the west Delta, and Suisun Bay (while these actions are associated with CM2, the hydrodynamic effects of these proposed changes have been incorporated into modeling for CM1).

[28] Sweeping velocity is the flow velocity component parallel to the fish screen face.

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- Operational criteria for Delta Cross Channel gates to improve fish migration, hydraulic residence time, and food and organic material transport through the Delta while maintaining adequate water quality of SWP and CVP exports.
- Provisions for fish movement in the Sacramento River using bypass flow rules prior to diversion.
- Operational criteria to maintain sufficient Sacramento River flows at Rio Vista to minimize impacts on aquatic habitat conditions.
- Maintenance of water quality for in-Delta agricultural, municipal, and industrial water quality requirements.

3.6.4.1 Operations of Covered Activities and Associated Federal Actions

This section describes existing water conveyance facilities, related operations, maintenance, and monitoring activities, and how they are associated with the BDCP and its alternatives for the purposes of ESA and CESA compliance (e.g., as covered activities or as associated federal actions). Proposed modifications to the operations of these facilities as part of CM1 are described in Section 3.6.4.2, *North Delta and South Delta Water Conveyance Operational Criteria*, and in Appendix 5A, *BDCP EIR/EIS Modeling Technical Appendix*.

Covered Activities

The BDCP (or an alternative) would guide the continued water conveyance operations for each covered activity described in Section 3.3.1. These include operations and maintenance of SWP facilities in the Delta after the north Delta intakes become operational and operations of new water facilities constructed as part of CM1 or CM2. ESA and CESA coverage for existing operation and maintenance of the SWP and coordinated operations with the CVP prior to construction and operation of the north Delta intakes, however, are addressed through separate compliance processes and not addressed in the BDCP.

The BDCP (or an alternative) would cover operations, but not construction, of any new facility associated with the North Bay Aqueduct Alternative Intake Project. It is not yet known for certain when this facility will be constructed, nor have the details of construction been finalized. Construction of this facility will require separate environmental compliance, and compliance with ESA Section 7 and CESA. Operations will necessarily be an indirect effect to be evaluated under ESA Section 7 and compliance with applicable BiOps will ensure that the facility is operated in a manner that minimizes incidental take and avoids jeopardy or adverse modification of critical habitat. The BDCP addresses the possibility of providing further mitigation for permitted operational incidental take, and operational effects to non-ESA-listed covered species. The Proposed Authorized Entities will address these issues on behalf of the facility operator. This project includes an additional intake on the Sacramento River that would operate in conjunction with the existing North Bay Aqueduct intake at Barker Slough. The project would be used to accommodate projected future peak demand of up to 240 cfs.

Suisun Marsh Facilities Operations and Maintenance

The existing Suisun Marsh facilities are listed below.

- Suisun Marsh Salinity Control Gates.

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- Morrow Island Distribution System.
- Roaring River Distribution System.
- Goodyear Slough Outfall.
- Various salinity monitoring and compliance stations throughout the Marsh.

Since the early 1970s, the California State Legislature, State Water Board, Reclamation , CDFW, SRCD, DWR, and other agencies have engaged in efforts to preserve beneficial uses of Suisun Marsh to mitigate for potential impacts on salinity regimes associated with reduced freshwater flows to the marsh. Initially, salinity standards for Suisun Marsh were set by the State Water Board's Decision 1485 to protect alkali bulrush production, a primary waterfowl plant food. Subsequent standards set under the State Water Board's Decision-1641 reflect the intention of the State Water Board to protect multiple beneficial uses. A contractual agreement between DWR, Reclamation, CDFW, and SRCD includes provision for measures to mitigate the effects of operation of the SWP and CVP and other upstream diversions on Suisun Marsh channel water salinity. The Suisun Marsh Preservation Agreement requires DWR and Reclamation to meet specified salinity standards, sets a timeline for implementing the Plan of Protection, and delineates monitoring and mitigation requirements.

The existing operation of the Suisun Marsh Facilities is covered for ESA and CESA compliance under the NMFS and USFWS BiOps and the related consistency determination. Coverage under the BDCP (or an alternative) would supersede coverage under the NMFS and USFWS BiOps. The Suisun Marsh Facilities will be covered under the BDCP for existing operations criteria and for future criteria discussed below.

The BDCP and its alternatives include covered activities that would change land use and water operations in Suisun Marsh over time. See Section 3.6.2.3 for a description of tidal brackish marsh restoration (CM4 *Tidal Natural Communities Restoration*) and Section 3.6.4.2, *North Delta and South Delta Water Conveyance Operational Criteria*, for a description of water operations (*CM1 Water Facilities and Operation*). Other conservation measures may also be implemented in the Marsh. The existing operation and maintenance of the Suisun Marsh Salinity Control Gates and other facilities would not change until BDCP actions require changes in their operation. Operations of the Suisun Marsh Facilities under the existing operational criteria, as well as changes to operation as described in CM1, would be covered by BDCP. Generally, as habitat restoration in Suisun Marsh is conducted with the implementation of BDCP conservation measures, and changes in land uses occur, the Suisun Marsh Salinity Control Gates would be operated as open. While the BDCP proposes considering changes to the gate operations in coordination with the Suisun Principals, the impact analysis used a conservative approach, assuming no operation of the gates.

The BDCP and its alternatives cover operations of the Morrow Island Distribution System, Roaring River Distribution System, Goodyear Slough Outfall, and various salinity monitoring and compliance stations throughout the Marsh under the existing and future operational criteria, and future construction and maintenance of tidal habitat in Suisun Marsh identified in CM1 and CM4. These activities/actions are included as covered activities and associated federal actions and the effects of those activities/actions are addressed by the BDCP.

Monitoring Activities

Monitoring activities specific to BDCP include compliance monitoring, which verifies BDCP compliance with terms of the Plan, and effectiveness monitoring, which tracks status of covered

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species and natural communities, and also tracks Plan progress toward achieving the biological objectives. Monitoring protocols will be developed and proposed by the Adaptive Management Team and are subject to review and approval by the fish and wildlife agencies. All BDCP monitoring activities undertaken by the Implementation Office are covered activities authorized under the terms of the ESA Section 10(a)(1)(b) incidental take permit requested for nonfederal activities. All covered monitoring activities will be carried out in a manner consistent with protocols recommended by the Adaptive Management Team and approved by the fish and wildlife agencies.

Water Transfers

Water transfers are important water resource management measures to address water shortages, provided that certain protections to source areas and users are incorporated into the water transfer. Transfers requiring conveyance through the Delta are done at times when pumping and conveyance capacity at the SWP or CVP export facilities is available to move the water to areas south of the Delta such that the capabilities of the projects to exercise their own water rights or to meet their legal and regulatory requirements are not diminished or limited in any way. Water transfers of post-1914 water rights also must comply with State Water Board requirements, including not substantially injuring other legal users of water; and not causing an unreasonable effect on fish, wildlife, or other instream beneficial uses.

Transfers that convey water through the Delta are difficult to predict with certainty because of the many factors which parties must consider who are interested in a water transfer agreement. Each transfer is unique and is dependent upon (1) location and amount of the water available from the seller; (2) availability of the water in storage facilities, if applicable; (3) timing of the transfer; (4) surplus capacity in conveyance facilities, including SWP and CVP Delta conveyance facilities, which have a range of available capacity depending upon water year type and water demands; and (5) capability of conveying water through the Delta in accordance with regulatory requirements.

Entities currently request and will continue to request water transfers through the Delta, with or without the BDCP. However, because of the many factors affecting the ability to transfer water through the Delta, the actual quantities of water transfer water that may be facilitated as a result of the BDCP is speculative. In any case, with the BDCP, water operations with and without transfers would need to be compliant with any State Water Board or other regulatory requirements, including those that may be imposed on CM1.

There could be additional indirect effects of water transfers related to methods used to make the water available. However, these methods will be unique to each water transfer and frequently have varied annually. Methods of making water available for water transfers could include reservoir reoperation, crop idling or shifting, groundwater substitution, or other methods and combinations of methods. Therefore, it would be speculative to define specific methods or ranges of methods to be considered for future water transfers through the Delta. Future environmental documents and State Water Board approvals for transfers, as discussed above, would need to be completed in accordance with the requirements of the California Water Code, CEQA, NEPA, local requirements, and specific requirements related to use of SWP and CVP water and/or facilities. These processes are intended to prevent the implementation of water transfers that would result in harm to other legal users of water and to the aquatic species being protected under the BDCP (or an alternative), and provide the opportunity for public participation in the review of proposed transfers.

Additional information regarding water transfers is provided in Appendix 1E, *Water in California: Types, Recent History, and General Regulatory Setting*; Appendix 5C, *Historical Background of Cross-*

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Delta Water Transfers and Potential Source Regions; and Appendix 5D, *Water Transfer Analysis Methodology and Results.*

Federal Actions Associated with BDCP

As described in Chapter 1, Section 1.6.1, *Overview of BDCP Approval Process*, Reclamation's action in relation to the BDCP would be to adjust CVP operations specific to the Delta to accommodate new conveyance facility operations and/or flow requirements under the BDCP, in coordination with SWP operations. The activities described in this section have been designated as *federal actions associated with the BDCP*. These actions consist of certain CVP-related activities within the Delta that would be authorized, funded, or carried out by Reclamation. These federal actions differ from covered activities, which encompass those BDCP actions that are the responsibility of non-federal entities.

The CVP's Delta Division[29] facilities in the Plan Area include the Delta Cross Channel, the Tracy Fish Collection Facility, the northern portion of the Delta Mendota Canal, the joint point of diversion facilities to be constructed in the north Delta, and the associated conveyance to export facilities in the south Delta. These facilities are used to convey water from the Sacramento River in the north Delta to the south Delta and to export that water from the Delta into canals and pipelines that carry it to agricultural and municipal and industrial contractors to the south and west of the Delta. These facilities are integral components of the CVP and contribute to the functional capacity of the overall system. This section describes the existing facilities, their operational requirements, and the actions necessary to maintain their viability. The operation and maintenance of these facilities are not only integral to the water supply system, but are also important to the BDCP conservation strategy and the protection and conservation of the aquatic ecosystem and covered fish species.

The existing CVP facilities described in this section would continue to be operated under the BDCP. The BDCP operational criteria and adaptive operational range are described in Section 3.6.4.2, *North Delta and South Delta Water Conveyance Operational Criteria*, and include descriptions of operations of CVP facilities in the Plan Area.

All operations and maintenance of CVP facilities described in this section are federal actions associated with the BDCP (or an alternative).

Delta Cross Channel

The Delta Cross Channel is a gated diversion channel between the Sacramento River near Walnut Grove, and Snodgrass Slough. Flows into the Delta Cross Channel from the Sacramento River are controlled by two 60-foot-by-30-foot radial gates. When the gates are open, water flows from the Sacramento River through the cross channel to Snodgrass Slough and from there to channels of the lower Mokelumne River and into the central Delta. Once in the central Delta, the water is conveyed primarily via Old and Middle Rivers to the Jones Pumping Plant by the draw of the pumps. The Delta Cross Channel operation improves water quality in the interior Delta by improving circulation patterns of good-quality water from the Sacramento River towards Delta diversion facilities.

Reclamation operates the Delta Cross Channel in the open position to achieve the following objectives.

[29] The Delta Division is one of several CVP divisions covering various geographical areas and facilities of the CVP; these include the American River, Friant, East Side, Sacramento River, San Felipe, West San Joaquin, and Shasta/Trinity River Divisions. The CVP Delta Division includes facilities within the Plan Area (described in this chapter) and facilities outside the Plan Area (not described in this chapter).

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- Increase the transfer of water from the Sacramento River to the export facilities at the SWP Banks (see description of SWP facilities) and CVP Jones Pumping Plants.
- Improve water quality in the southern Delta by increasing deliveries of fresh water from the Sacramento River to the south Delta.
- Reduce salt water intrusion rates in the western Delta.

During the late fall, winter, and spring, the gates are often periodically closed to protect outmigrating salmonids from entering the interior Delta, where they may experience lower rates of survival due to a longer, less direct migration route with higher levels of predation and greater potential for entrainment at the CVP and SWP south Delta export facilities. When flows in the Sacramento River at Sacramento reach 20,000 to 25,000 cfs (on a sustained basis) the gates are closed to reduce potential scouring and flooding that might occur in the channels on the downstream side of the gates. See Section 3.6.4.2, *North Delta and South Delta Water Conveyance Operational Criteria*, for a description of operations of the Delta Cross Channel gates under the BDCP to provide for protection of salmon in conjunction with water conveyance.

Jones Pumping Plant

The CVP and SWP use the Sacramento River, San Joaquin River, and Delta channels to transport water to pumping plants located in the south Delta. The CVP's Jones Pumping Plant, about 5 miles northwest of Tracy, consists of six available pumps. The Jones Pumping Plant is located at the end of an earth-lined intake channel about 2.5 miles in length. The Jones Pumping Plant has a physical capacity of 5,100 cfs and the State Water Board-permitted diversion capacity of 4,600 cfs with maximum pumping rates ranging from 4,300 to 4,500 cfs during the peak of the irrigation season and approximately 4,200 cfs during the winter nonirrigation season (prior to operation of the Delta Mendota Canal/California Aqueduct Intertie). The wintertime physical constraints on the Jones Pumping Plant operations are the result of a Delta Mendota Canal freeboard constriction near O'Neill Forebay, O'Neill Pump-Generating Plant capacity, and the current water demand in the upper sections of the Delta Mendota Canal. See Section 3.6.4.2 for description of operation of SWP and CVP in the south Delta under the BDCP to provide for protection of covered fish species in conjunction with water conveyance and diversion.

Tracy Fish Facility

At the head of the intake channel leading to the Jones Pumping Plant, Tracy Fish Facility louver screens intercept fish that are then collected, held, and transported by tanker truck to Delta release sites away from the south Delta facilities. The Tracy Fish Facility uses behavioral barriers consisting of primary and secondary louvers to guide entrained fish into holding tanks. The primary louvers are located in the primary channel just downstream of the trashrack. The secondary louvers are located in the secondary channel just downstream of the traveling water screen. The louvers allow water to pass through onto the Jones Pumping Plant but the openings between the slats are tight enough and angled against the flow of water in such a way as to prevent most fish from passing between them and instead enter one of four bypass entrances along the louver arrays. The holding tanks on hauling trucks used to transport salvaged fish to release sites are injected with oxygen and contain an eight-parts-per-thousand salt solution to reduce stress on fish. The CVP uses two release sites, one on the Sacramento River near Horseshoe Bend and the other on the San Joaquin River immediately upstream of the Antioch Bridge.

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Central Valley Project Diversions

The volume of water delivered by the CVP is and will continue to be variable, but in any year will be equal to the amount of water that is hydrologically available and that can be diverted under current contractual rights consistent with the terms and conditions of the BDCP conservation strategy and then-existing permits and regulations. Reclamation delivers water transported through facilities in the Delta to senior water rights contractors, long-term CVP water service contractors, refuges and waterfowl areas, and temporary water service contractors south of the Delta. The total volume under contract, including Level 2 refuge supplies, is approximately 3.3 MAF. Additionally, the CVP provides Level 4 refuge water totaling approximately 100,000 af. In addition, as part of the San Joaquin River Restoration Program implementation, Reclamation anticipates submitting a petition to the State Water Board to add a point of diversion to allow diversion of the restoration flows either upstream of or in the Delta. Moreover, in wet hydrologic conditions when CVP storage space is not available and the Delta is in excess conditions, water is made available under temporary contracts for direct delivery. The volume of water available for conveyance through the Delta is a result of hydrologic conditions, upstream reservoir operations, upstream demands, regulatory constraints on CVP operations, and transfers of water from upstream water users to south of Delta water users.

See Section 3.6.4.2, *North Delta and South Delta Water Conveyance Operational Criteria*, for a description of operation of CVP and SWP under the BDCP to provide for protection of covered fish species in conjunction with water conveyance and diversion. All CVP diversions described in this section are federal actions associated with the BDCP.

Joint Point of Diversion Operations

Under State Water Board D-1641 (December 1999, revised March 2002), Reclamation and DWR are authorized to use/exchange diversion capacity between the SWP and CVP to enhance the beneficial uses of both projects. The use of one project's diversion facility by the other project is referred to as the JPOD. There are a number of requirements in D-1641 that restrict JPOD to protect water quality and fishery resources.

In general, JPOD capabilities are used to accomplish four basic SWP and CVP objectives.

- When wintertime excess pumping capacity becomes available during Delta excess conditions (i.e., all in-Delta conditions have been met) and total SWP/CVP San Luis storage is not projected to fill before the spring pulse flow period, the project with the deficit in San Luis storage may elect to use JPOD capabilities.
- When summertime pumping capacity is available at Banks Pumping Plant and CVP reservoir conditions can support additional releases, the CVP may elect to use JPOD capabilities to enhance annual CVP south of Delta water supplies.
- When summertime pumping capacity is available at Banks or Jones Pumping Plant to facilitate water transfers, JPOD may be used to further facilitate the water transfer.
- During certain coordinated SWP/CVP operation scenarios for fish species entrainment management, JPOD may be used to shift SWP/CVP exports to the facility with the least fishery entrainment effect while minimizing export at the facility with the most fish species entrainment impact.

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All in-Delta JPOD operations are included as either covered activities or federal actions associated with the BDCP (or an alternative) and the effects of those activities/actions are addressed by the BDCP.

Associated Maintenance Activities

Maintenance and replacement means those activities that maintain the capacity and operational features of the existing CVP water diversion and conveyance facilities described above, including the Delta Cross Channel, Jones Pumping Plant, Tracy Fish Collection Facility, and Contra Costa Diversion Facilities. Maintenance activities include maintenance of electrical power supply facilities; maintenance as needed to ensure continued operations and replacement of facility or system components when necessary to maintain system capacity and operational capabilities; and upgrades and technological improvements of facilities to maintain system capacity and operational capabilities, improve system efficiencies, and reduce operations and maintenance costs.

All CVP maintenance described in this section is a federal action associated with the BDCP (or an alternative) and will be covered in Section 7 consultation.

Operations of New Water Intake and Conveyance Facilities

Although DWR would own and operate the new intake and conveyance facilities, and their operations would be covered activities as described in Section 3.6.4.2, Reclamation would likely enter into an agreement with DWR to wheel CVP water through the new facilities, and this action by Reclamation would be an associated federal action.

All operations of new intake and conveyance facilities are included as either covered activities or federal actions associated with the BDCP (or an alternative) and the effects of those activities/actions are addressed by the BDCP and at a project-level of detail in this EIR/EIS.

3.6.4.2 North Delta and South Delta Water Conveyance Operational Criteria

Water conveyance operational criteria include north Delta diversion bypass flow criteria, south Delta OMR flow criteria, south Delta E/I ratio, flows over Fremont Weir into Yolo Bypass via operable gates, Delta inflow and outflow criteria, Delta Cross Channel gate operations, additional Rio Vista minimum flow requirements, operations for Delta water quality and residence criteria, and water quality criteria for agricultural and municipal/industrial diversions.

Scenario A

North Delta Diversion Bypass Flow Criteria

The objectives of the north Delta diversion bypass flow criteria include regulation of diversions so that river flows (1) maintain fish screen sweeping velocities; (2) reduce upstream transport from downstream channels; (3) support salmonid and pelagic fish transport to regions of suitable habitat; (4) reduce predation effects downstream; and (5) maintain or improve rearing habitat in the north Delta.

To ensure that these objectives are met, diversions must be reduced at certain times of the year (more severely from December through June) when juveniles are present. A process of preserving

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upstream pulse flows below the Freeport gage is described below. Protection of these pulses is intended to promote safe juvenile passage past the intakes and Georgiana Slough.

The initial pulse is a natural occurrence caused by the first runoff event of the season. Monitoring has shown that large numbers of juvenile salmonids migrate into the Delta during these pulses. When the initial pulse operation is triggered, flow (and fish) will be protected through initiation of low-level pumping rules, as described below. If the initial pulse operation is triggered prior to December 1, additional pulse protection would be initiated during the second pulse of the season. A flow condition will be categorized as an initial pulse based on real-time monitoring of fish movement (as described in BDCP Chapter 3, Section 3.4.1.4.5, *Rapid Response Operations*). The definition of the initial pulse for the purposes of modeling is provided below.

At the end of the initial pulse phase, a following phase termed *post-pulse operations* (December through June) will apply. The conditions that trigger the transition from the initial pulse protection phase to the post-pulse phase are described below, along with bypass operating rules for the post-pulse phase, which provide for restricted levels of pumping.

In July through September, the bypass rules allow for a greater portion of the Sacramento River to be diverted as described in Table 3-16. In October through November the bypass amount is increased.

To illustrate the effect of the bypass rules on amounts of Sacramento River flow that may be diverted, Table 3-17 shows the allowable north Delta diversions by month and by post-pulse phase, based on Sacramento River flows at Freeport.

The north Delta diversion bypass flow criteria comprise three parameters that are applied to the Sacramento River: constant low-level pumping, initial pulse protection, and three levels of post-pulse operations as summarized below.

- **Constant Low-Level Pumping** (could apply between December and June). Diversions of up to 6% of total Sacramento River flow such that bypass flow never falls below 5,000 cfs. No more than 300 cfs can be diverted at any one intake. While referred to as *constant*, pumping would vary with flows at Freeport. *Constant* refers to the percentage of river flow that could be diverted; it is not a continuous pumping level.
- **Initial Pulse Protection**. Under this concept, low-level pumping is maintained through the initial pulse period. After the flow pulse period has ended, water operations would be guided by post-pulse bypass flows presented in Table 3-16. (These parameters are for the purpose of modeling only; actual water operations would be based on real-time monitoring of fish movement, as described in BDCP Chapter 3, Section 3.4.1.4.5, *Rapid Response Operations*.)
    - If the initial pulse period begins before December 1, May post-pulse bypass criteria would be implemented following the initial pulse period; and the second pulse period would have the same protective operation as the initial pulse period. For the purposes of modeling only, the governing bypass flow criteria for the period between the initial and second pulse was used instead of the May post-pulse bypass criteria. This results in a flow condition that is more conservative for aquatic resource impact analysis.
    - For the purpose of modeling, the initiation of the pulse is defined by the following criteria: (1) increase in flow of the Sacramento River at Wilkins Slough by more than 45% within a 5-day period, and (2) Sacramento River flows greater than 12,000 cfs measured at Wilkins Slough. Low-level pumping continues until (1) Wilkins Slough returns to pre-pulse flows

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(flow on first day of 5-day increase); (2) Sacramento River at Wilkins Slough flows decrease for 5 consecutive days; or (3) bypass flows are greater than 20,000 cfs for 10 consecutive days. This second criteria was modeled as Wilkins Slough flow falls below 12,000 cfs. The modeling represents a more conservative approach regarding aquatic resource impact analysis.

- **Post-Pulse Water Operations** (could apply during any month, but are designed for between December and June and are most likely to apply between October and June). After initial pulse(s), implement Level I post-pulse bypass rule (Table 3-16) until the occurrence of 15 total days of bypass flows above 20,000 cfs. Then implement Level II post-pulse bypass rule (Table 3-16) until 30 total days of bypass flows occur above 20,000 cfs as measured at Freeport. At this point, implement Level III post-pulse bypass rule (Table 3-16) so that bypass flows are sufficient to prevent upstream tidal transport at two points of control: (1) Sacramento River upstream of Sutter Slough, and (2) Sacramento River downstream of Georgiana Slough. These points of control are used to prevent upstream transport toward the proposed intakes and to prevent upstream transport into Georgiana Slough.

South Delta Channel Flows Criteria

The objectives of the south Delta channel flows criteria are to minimize take at south Delta pumps by reducing incidence and magnitude of reverse flows during critical periods for covered fish species. The south Delta channel flow criteria are based on the parameters for OMR Flows, as summarized below.

- **OMR Flows.** The criteria are derived from fish protection triggers in the USFWS and NMFS BiOps RPA Actions. The criteria are consistent with the No Action Alternative.

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Table 3-16. North Delta Bypass Flow Criteria: Post-Pulse Water Operations

Level I Post-Pulse Operations			Level II Post-Pulse Operations			Level III Post-Pulse Operations		
If Sacramento River at Freeport flow is over…	But not over…	The bypass is…	If Sacramento River at Freeport flow is over…	But not over…	The bypass is…	If Sacramento River at Freeport flow is over…	But not over…	The bypass is…
October–November								
The bypass flow is the lesser of Sacramento River flow at Freeport and 7,000 cfs			The bypass flow is the lesser of Sacramento River flow at Freeport and 7,000 cfs			The bypass flow is the lesser of Sacramento River flow at Freeport and 7,000 cfs		
December–April								
0 cfs	5,000 cfs	100% of the amount over 0 cfs	0 cfs	5,000 cfs	100% of the amount over 0 cfs	0 cfs	5,000 cfs	100% of the amount over 0 cfs
5,000 cfs	15,000 cfs	Flows remaining after constant low level pumping	5,000 cfs	11,000 cfs	Flows remaining after constant low level pumping	5,000 cfs	9,000 cfs	Flows remaining after constant low level pumping
15,000 cfs	17,000 cfs	15,000 cfs plus 80% of the amount over 15,000 cfs	11,000 cfs	15,000 cfs	11,000 cfs plus 60% of the amount over 11,000 cfs	9,000 cfs	15,000 cfs	9,000 cfs plus 50% of the amount over 9,000 cfs
17,000 cfs	20,000 cfs	16,600 cfs plus 60% of the amount over 17,000 cfs	15,000 cfs	20,000 cfs	13,400 cfs plus 50% of the amount over 15,000 cfs	15,000 cfs	20,000 cfs	12,000 cfs plus 20% of the amount over 15,000 cfs
20,000 cfs	No limit	18,400 cfs plus 30% of the amount over 20,000 cfs	20,000 cfs	No limit	15,900 cfs plus 20% of the amount over 20,000 cfs	20,000 cfs	No limit	13,000 cfs plus 0% of the amount over 20,000 cfs
May								
0 cfs	5,000 cfs	100% of the amount over 0 cfs	0 cfs	5,000 cfs	100% of the amount over 0 cfs	0 cfs	5,000 cfs	100% of the amount over 0 cfs
5,000 cfs	15,000 cfs	Flows remaining after constant low level pumping	5,000 cfs	11,000 cfs	Flows remaining after constant low level pumping	5,000 cfs	9,000 cfs	Flows remaining after constant low level pumping
15,000 cfs	17,000 cfs	15,000 cfs plus 70% of the amount over 15,000 cfs	11,000 cfs	15,000 cfs	11,000 cfs plus 50% of the amount over 11,000 cfs	9,000 cfs	15,000 cfs	9,000 cfs plus 40% of the amount over 9,000 cfs

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Level I Post-Pulse Operations			Level II Post-Pulse Operations			Level III Post-Pulse Operations		
If Sacramento River at Freeport flow is over…	But not over…	The bypass is…	If Sacramento River at Freeport flow is over…	But not over…	The bypass is…	If Sacramento River at Freeport flow is over…	But not over…	The bypass is…
17,000 cfs	20,000 cfs	16,400 cfs plus 50% of the amount over 17,000 cfs	15,000 cfs	20,000 cfs	13,000 cfs plus 35% of the amount over 15,000 cfs	15,000 cfs	20,000 cfs	11,400 cfs plus 20% of the amount over 15,000 cfs
20,000 cfs	No limit	17,900 cfs plus 20% of the amount over 20,000 cfs	20,000 cfs	No limit	14,750 cfs plus 20% of the amount over 20,000 cfs	20,000 cfs	No limit	12,400 cfs plus 0% of the amount over 20,000 cfs
June								
0 cfs	5,000 cfs	100% of the amount over 0 cfs	0 cfs	5,000 cfs	100% of the amount over 0 cfs	0 cfs	5,000 cfs	100% of the amount over 0 cfs
5,000 cfs	15,000 cfs	Flows remaining after constant low level pumping	5,000 cfs	11,000 cfs	Flows remaining after constant low level pumping	5,000 cfs	9,000 cfs	Flows remaining after constant low level pumping
15,000 cfs	17,000 cfs	15,000 cfs plus 60% of the amount over 15,000 cfs	11,000 cfs	15,000 cfs	11,000 cfs plus 40% of the amount over 11,000 cfs	9,000 cfs	15,000 cfs	9,000 cfs plus 30% of the amount over 9,000 cfs
17,000 cfs	20,000 cfs	16,200 cfs plus 40% of the amount over 17,000 cfs	15,000 cfs	20,000 cfs	12,600 cfs plus 20% of the amount over 15,000 cfs	15,000 cfs	20,000 cfs	10,800 cfs plus 20% of the amount over 15,000 cfs
20,000 cfs	No limit	17,400 cfs plus 20% of the amount over 20,000 cfs	20,000 cfs	No limit	13,600 cfs plus 20% of the amount over 20,000 cfs	20,000 cfs	No limit	11,800 cfs plus 0% of the amount over 20,000 cfs
July–September								
The bypass flow is the lesser of Sacramento River flow at Freeport and 5,000 cfs			The bypass flow is the lesser of Sacramento River flow at Freeport and 5,000 cfs			The bypass flow is the lesser of Sacramento River flow at Freeport and 5,000 cfs		

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Table 3-17. Allowable Post-Pulse North Delta Diversions in Different Months for a Range of Sacramento River Flows at Freeport (cfs)

Months	Oct-Nov	Dec-Apr	Dec-Apr	Dec-Apr	May	May	May	Jun	Jun	Jun	Jul-Sep
Post-Pulse Level		I	II	III	I	II	III	I	II	III	
Sacramento River at Freeport Flow (cfs)		first 15 days of bypass flows greater than 20,000 cfs	second 15 days of bypass flows greater than 20,000 cfs	after 30 days of bypass flows greater than 20,000 cfs	first 15 days of bypass flows greater than 20,000 cfs	second 15 days of bypass flows greater than 20,000 cfs	after 30 days of bypass flows greater than 20,000 cfs	first 15 days of bypass flows greater than 20,000 cfs	second 15 days of bypass flows greater than 20,000 cfs	after 30 days of bypass flows greater than 20,000 cfs	
5,000	-	-	-	-	-	-	-	-	-	-	-
10,000	3,000	600	600	500	600	600	600	600	600	700	5,000
15,000	8,000	900	1,600	3,000	900	2,000	3,600	900	2,400	4,200	10,000
20,000	13,000	1,600	4,100	7,000	2,100	5,250	7,600	2,600	6,400	8,200	15,000
25,000	15,000	5,100	8,100	12,000	6,100	9,250	12,600	6,600	10,400	13,200	15,000
30,000	15,000	8,600	12,100	15,000	10,100	13,250	15,000	10,600	14,400	15,000	15,000
35,000	15,000	12,100	15,000	15,000	14,100	15,000	15,000	14,600	15,000	15,000	15,000
40,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000
Note: Low-level pumping is included in December–June estimates.											

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Fremont Weir and Yolo Bypass Criteria

The objectives of the Fremont Weir and Yolo Bypass criteria are based on considerations for (1) increasing the areal and temporal extent of spawning and rearing habitat for splittail and rearing habitat for salmonids for windows greater than 30 days; (2) providing an alternate migration corridor to the mainstem Sacramento River; and (3) improving habitat values and food transport in Cache Slough. The Fremont Weir and Yolo Bypass criteria use four parameters: Sacramento Weir, Lisbon Weir, Fremont Weir, and Fremont Weir Gate Operations, as summarized below.

- **Sacramento Weir.** No change in current operations. Improve upstream fish passage facilities.
- **Lisbon Weir.** No change in current operations. Improve upstream fish passage facilities.
- **Fremont Weir.** Improve fish passage by constructing an opening and installing operable gates and fish passage facilities at elevation 17.5 feet. In addition, construct a smaller opening with operable gates and fish passage enhancement at elevation 11.5 feet. While these assumptions were used for the purposes of modeling, CM2 is a programmatic element that will be further developed and analyzed in future technical and environmental reviews.
- **Fremont Weir gate operations.** From December 1 to April 30 (may be extended to May 15, depending on hydrologic conditions and measures to minimize land use and ecological conflicts), open the 17.5-foot and 11.5-foot elevation gates when Sacramento River flow at Freeport is greater than 25,000 cfs to provide local and regional flood management benefits, while coinciding with pulse flows and juvenile salmonid migration cues, and to provide seasonal floodplain inundation for salmonid food production, juvenile rearing, and spawning. This action based on modeling assumptions would cause Yolo Bypass inundation of 3,000–6,000 cfs depending on river stage.

The 17.5-foot elevation gates would be closed when Sacramento River flow at Freeport recedes to less than 20,000 cfs, but the 11.5-foot elevation gate would remain open to provide greater opportunity for fish in the Yolo Bypass to migrate upstream into the Sacramento River. The 11.5-foot elevation gates would be closed when Sacramento River flow at Freeport recedes to less than 15,000 cfs or the operational window closes.

Delta Cross Channel Gate Operations Criteria

The objectives of the Delta Cross Channel gate operations criteria, summarized below, are based on considerations to (1) reduce transport of outmigrating Sacramento River fish into the central Delta; (2) maintain flows downstream on the Sacramento River; and (3) provide sufficient Sacramento River flow into the interior Delta when water quality for municipal, industrial, and agricultural users may be of concern. For the purposes of modeling, the operational criteria for the Delta Cross Channel were assumed to be consistent with the No Action Alternative.

- **October–November.** Delta Cross Channel gates closed if fish are present (for modeling, assumed closed 15 days per month; may be longer depending upon actual presence of fish).
- **December–June.** Delta Cross Channel gates closed.
- **July–September.** Delta Cross Channel gates open.

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Rio Vista Minimum Instream Flow Criteria

The objectives of the Rio Vista minimum instream flow criteria, summarized below, are to maintain minimum flows for outmigrating salmonids and smelt.

- **September through December.** Operate in accordance with State Water Board D-1641.
- **January through August.** Minimum of 3,000 cfs.

Delta Inflow and Outflow Criteria

The objectives of the Delta inflow and outflow criteria are to (1) provide sufficient outflow to maintain a desirable salinity regime downstream of Collinsville during the spring, and (2) explore a range of approaches toward providing additional variability to Delta inflow and outflow. These criteria are intended to provide the basis to operate in accordance with State Water Board D-1641, with Sacramento River inflow downstream of the proposed north Delta intakes used for the purposes of the E/I ratio.

Operations for Delta Water Quality and Residence Criteria

The objectives of the operations for Delta water quality and residence criteria, summarized below, are to (1) maintain a minimum level of pumping from the south Delta during summer to provide limited flushing to reduce residence times and improve water quality; (2) provide salinity improvements for municipal, industrial, and agricultural water users; and (3) allow operational flexibility during other periods to operate either north or south diversions based on real-time assessments of benefits to fish and water quality.

- **July–September.** Preferentially operate SWP and CVP south Delta export facilities up to 3,000 cfs of diversions before diverting from north Delta intakes.
- **October–June.** Preferentially operate north Delta intakes.

In-Delta Municipal, Industrial, and Agricultural Water Quality Requirements Criteria

The in-Delta municipal, industrial, and agricultural water quality requirements criteria would require the SWP and CVP to comply with existing agreements with water rights holders related to operations of the SWP and CVP. These requirements include water operations in accordance with State Water Board D-1641 related to north Delta and western Delta agricultural and municipal and industrial requirements, except that the Sacramento River compliance point for the agreement with the North Delta Water Agency would be moved from Emmaton to Threemile Slough. Any change in the compliance point would need to be reviewed and approved by the State Water Board.

Scenario B

Scenario B would incorporate criteria for the same elements as those referenced under Scenario A. However, under this scenario, south Delta channel flow criteria would include less negative OMR flow criteria (Tables 3-19 and 3-20), and Fall X2 criteria, as under the USFWS 2008 BiOp, would be incorporated, as would operations for Head of Old River Barrier (Table 3-20). This scenario applies to Alternatives 2A, 2B, and 2C.

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North Delta Diversion Bypass Flow Criteria

The north Delta diversion bypass flow criteria under Scenario B would be the same as under Scenario A.

South Delta Channel Flows Criteria

The objectives of the south Delta channel flows criteria are to minimize take at south Delta pumps by reducing incidence and magnitude of reverse flows during critical periods for covered fish species. The south Delta channel flows criteria are based on OMR Flows and Head of Old River Barrier operations, as summarized below.

- **OMR Flows.** The criteria are derived from fish protection triggers in the USFWS and NMFS BiOps RPA Actions. It is assumed under Scenario B that the additional OMR criteria presented in Table 3-18 would be compared to the OMR criteria included in the No Action Alternative to select the greater OMR value for operations. In April, May, and June, OMR minimum allowable values would be based upon the San Joaquin River inflow relationship to OMR, as presented in Table 3-19. In October and November, OMR and south Delta export restrictions are based upon State Water Board D-1641 pulse trigger, as follows.[30]
    - Before State Water Board D-1641 pulse trigger: no OMR restrictions.
    - During State Water Board D-1641 pulse trigger: no south Delta exports.
    - Following State Water Board D-1641 pulse trigger: OMR operated up to -5,000 cfs through November.
- **Head of Old River Barrier Operations.** A permanent operable barrier would be constructed at the head of Old River, at the confluence of San Joaquin River and Old River. Scenario B assumes that all other existing agricultural barriers in the central and south Delta continue to be installed and removed seasonally. If San Joaquin River flows at Vernalis are greater than 10,000 cfs, the Head of Old River Barrier would remain open. For modeling of Scenario B, the installation and operations of the Head of Old River Barrier are assumed as summarized in Table 3-20. Beginning in January, the Head of Old River Barrier would be closed 50% if salmon fry are emigrating, which generally occurs during flood flow releases in the San Joaquin River watershed. For modeling purposes only, in November, operations are based upon State Water Board D-1641 pulse trigger, as follows.
    - Before State Water Board D-1641 pulse trigger: Head of Old River Barrier open.
    - During State Water Board D-1641 pulse trigger: Head of Old River Barrier closed.
    - Following State Water Board D-1641 pulse trigger: Head of Old River Barrier open 50% for 2 weeks.

[30] For the purposes of modeling, it was assumed that the D-1641 pulse in San Joaquin River occurs in the last 2 weeks of October.

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Table 3-18. Old and Middle River Flow Criteria – Scenario B

	Combined Old and Middle River Flows to be No Less than Values Below[a] (cfs)				
Month	Wet Water Year	Above Normal Water Year	Below Normal Water Year	Dry Water Year	Critical Dry Water Year
January	0	-3,500	-4,000	-5,000	-5,000
February	0	-3,500	-4,000	-4,000	-4,000
March	0	0	-3,500	-3,500	-3,000
April	see Table 3-19	see Table 3-19	see Table 3-19	see Table 3-19	see Table 3-19
May	see Table 3-19	see Table 3-19	see Table 3-19	see Table 3-19	see Table 3-19
June	see Table 3-19	see Table 3-19	see Table 3-19	see Table 3-19	see Table 3-19
July	N/A[b]	N/A[b]	N/A[b]	N/A[b]	N/A[b]
August	N/A[b]	N/A[b]	N/A[b]	N/A[b]	N/A[b]
September	N/A[b]	N/A[b]	N/A[b]	N/A[b]	N/A[b]
October[c]	Based on State Water Board D-1641 pulse trigger.	Based on State Water Board D-1641 pulse trigger.	Based on State Water Board D-1641 pulse trigger.	Based on State Water Board D-1641 pulse trigger.	Based on State Water Board D-1641 pulse trigger.
November[c]	Based on State Water Board D-1641 pulse trigger.	Based on State Water Board D-1641 pulse trigger.	Based on State Water Board D-1641 pulse trigger.	Based on State Water Board D-1641 pulse trigger.	Based on State Water Board D-1641 pulse trigger.
December[d]	-5,000	-5,000	-5,000	-5,000	-5,000

[a] Values are monthly averages for use in modeling. Under Scenario B, the model compares these minimum allowable OMR values to 2008 USFWS BiOp RPA OMR requirements and uses the less negative flow requirement.

[b] For the purposes of modeling, it was assumed that there would be no restrictions during these months. However, the expectatio n is that specific additional criteria would be developed for juvenile sturgeon protection, as described in BDCP Chapter 3, Section 3.4.1.4.5, *Rapid Response Operations*.

[c] The allowable OMR varies depending on the State Water Board D-1641 pulse timing.

- Before the D-1641 pulse: Head of Old River Barrier open 50% for two weeks and OMR must be greater than or equal to -5,000 cfs.
- During the D-1641 pulse (assumed to occur October 16-31 in the modeling): Head of Old River Barrier closed and no south Delta exports.
- Following the D-1641 pulse: Head of Old River Barrier open 50% for two weeks. OMR must be greater than or equal to -5,000 cfs all of November.

[d] OMR restrictions of -5,000 cfs for Sacramento River winter-run Chinook salmon when North Delta initial pulse is triggered, or OMR restrictions of -2,000 cfs when delta smelt triggers occur.

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Table 3-19. San Joaquin Inflow Relationship to Old and Middle River Flow Criteria

April and May		June	
If San Joaquin River flow at Vernalis is (cfs):	Average OMR flows would be at least the following[a] (cfs):	If San Joaquin flow at Vernalis is the following (cfs):	Average OMR flows would be at least the following[b] (cfs):
≤ 5,000	-2,000	≤ 3,500	-3,500
6,000	+1,000	3,501 to 10,000	0
10,000	+2,000		
15,000	+3,000	10,001 to 15,000	+1,000
≥30,000	+6,000	>15,000	+2,000

[a] Interpolated linearly between values.
[b] Based on a stepwise function.

Table 3-20. Head of Old River Operable Barrier Operations Criteria if San Joaquin River Flows at Vernalis are Equal to or Less Than 10,000 cfs

Month	Percent of Time Head of Old River Barrier is Open
Oct [a]	50% (except during the pulse) [a]
Nov [a]	100% (except during the post-pulse period) [a]
Dec	100%
Jan [b]	50%
Feb	50%
Mar	50%
April	50%
May	50%
Jun 1–15	50%
Jun 16–30	100%
Jul	100%
Aug	100%
Sep	100%

[a] The allowable OMR varies depending on the State Water Board D-1641 pulse timing.

- Before the D-1641 pulse: Head of Old River Barrier operation is triggered based upon State Water Board D-1641 pulse trigger. For the purposes of modeling, it was assumed that the Head of Old River Barrier is open 50% for two weeks and OMR requirement is greater than or equal to -5,000 cfs.
- During State Water Board D-1641 pulse trigger: Head of Old River Barrier closed and no south Delta exports. For the purposes of modeling, it was assumed that during the D-1641 pulse (assumed to occur October 16-31 in the modeling): Head of Old River Barrier closed and no south Delta exports.
- Following State Water Board D-1641 pulse trigger: Head of Old River Barrier open 50% for two weeks, and OMR operated up to 5,000 cfs through November. For the purposes of modeling, it was assumed that following the D-1641 pulse: Head of Old River Barrier open 50% for two weeks and OMR requirement is greater than or equal to -5,000 cfs all of November.

[b] The Head of Old River Barrier becomes operational at 50% when salmon fry are emigrating (based on real time monitoring). For the purposes of modeling, it was assumed that salmon fry are emigrating starting on January 1.

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Fremont Weir and Yolo Bypass Criteria

The Fremont Weir and Yolo Bypass Criteria use four parameters: Sacramento Weir, Lisbon Weir, Fremont Weir, and Fremont Weir Gate Operations, as summarized below.

- **Sacramento Weir.** No change in current operations. Improve upstream fish passage facilities.
- **Lisbon Weir.** No change in current operations. Improve upstream fish passage facilities.
- **Fremont Weir.** Improve fish passage by constructing an opening and installing operable gates and fish passage facilities at elevation 17.5 feet. In addition, construct a smaller opening with operable gates and fish passage enhancement at elevation 11.5 feet.
- **Fremont Weir gate operations.** Operations would be consistent to those described under Scenario A.

Delta Cross Channel Gate Operations Criteria

Delta Cross Channel gates would be operated in accordance with State Water Board D-1641 with additional closures in accordance with NMFS BiOp Action IV.1.2v and closed during flushing flows between October 1–December 14 unless water quality conditions would become adverse for other beneficial uses. For the purposes of modeling, the operational criteria for the Delta Cross Channel were assumed to be consistent with the No Action Alternative.

Rio Vista Minimum Instream Flow Criteria

The Rio Vista minimum instream flow criteria under Scenario B would be the same as under Scenario A.

Delta Inflow and Outflow Criteria

- **December–August.** Delta outflow in accordance with State Water Board D-1641.
- **September–November.** Delta outflow to implement Fall X2 in accordance with the USFWS 2008 BiOp, which applies to wet and above normal water year types. The Fall X2 rule requires X2 to be at or downstream of Collinsville in above normal years and downstream of Chipps Island in wet years.

Operations for Delta Water Quality and Residence Criteria

The operations for Delta water quality and residence criteria under Scenario B would be the same as under Scenario A.

In-Delta Municipal, Industrial, and Agricultural Water Quality Requirements Criteria

The in-Delta municipal, industrial, and agricultural water quality requirements criteria under Scenario B would be the same as under Scenario A.

Scenario C

Scenario C would incorporate all the No Action rules, including the Fall X2 criteria. The north Delta intake bypass flow rules would be the same as those under Scenario A. Operational Scenario C was used in the CALSIM modeling for Alternative 5. The north Delta operations were limited because of the reduced conveyance capacity, entailing a single 3,000 cfs intake on the Sacramento River.

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North Delta Diversion Bypass Flow Criteria

The north Delta diversion bypass flow criteria under Scenario C would be the same as under Scenario A.

South Delta Channel Flows Criteria

The OMR flow criteria under Scenario C would be the same as under Scenario A. The San Joaquin River inflow-south Delta export ratio under Scenario C would be assumed to be based upon San Joaquin River at Vernalis flows that limit exports in April and May in accordance with the N MFS BiOp RPA IV.2.1, as assumed in the No Action Alternative.

Fremont Weir and Yolo Bypass Criteria

The Fremont Weir and Yolo Bypass criteria under Scenario C would be the same as under Scenario A.

Delta Cross Channel Gate Operations Criteria

The Delta Cross Channel gate operations criteria under Scenario C would be the same as under Scenario A.

Rio Vista Minimum Instream Flow Criteria

The Rio Vista minimum instream flow criteria under Scenario C would be the same as under Scenario A.

Delta Inflow and Outflow Criteria

Under Scenario C, the Delta inflow and outflow criteria would be as follows.

- **December-August.** Delta outflow in accordance with State Water Board D-1641.
- **September-November.** Delta outflow to implement Fall X2 in accordance with the USFWS 2008 BiOp.

Operations for Delta Water Quality and Residence Criteria

The operations for Delta water quality and residence criteria would be the same under Scenario C as under Scenario A.

In-Delta Municipal, Industrial, and Agricultural Water Quality Requirements Criteria

The in-Delta municipal, industrial, and agricultural water quality requirements criteria under Scenario C would be the same as under Scenario A.

Scenario D

Scenario D would be similar to Scenario A, but would be modified to eliminate use of south Delta diversion points. For the SWP this means the gated intake on Old River, Clifton Court Forebay, and the Skinner Fish Facility would no longer be operated. For the CVP this means the diversion point on Old River and the Tracy Fish Collection Facility would no longer be operated. Therefore, there are no criteria related to south Delta channel flows or Delta water quality and residence time, as are included under other scenarios (e.g. preferential operation of south Delta export facilities between

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July and September). This scenario would also add criteria related to Fall X2 in accordance with the USFWS BiOp. This scenario applies to Alternatives 6A, 6B, and 6C.

North Delta Diversion Bypass Flow Criteria

Under Scenario D, the north Delta diversion bypass flow criteria would be the same as under Scenario A.

Fremont Weir and Yolo Bypass Criteria

The Fremont Weir and Yolo Bypass criteria under Scenario D would be the same as under Scenario A.

Delta Cross Channel Gate Operations Criteria

The Delta Cross Channel gate operations criteria under Scenario D would be the same as under Scenario A.

Rio Vista Minimum Instream Flow Criteria

The Rio Vista minimum instream flow criteria under Scenario D would be the same as under Scenario A.

Delta Inflow and Outflow Criteria

Under Scenario D, the Delta inflow and outflow criteria would be as follows:

- **December–August.** Delta outflow in accordance with State Water Board D-1641.
- **September–November.** Delta outflow to implement Fall X2 in accordance with the USFWS 2008 BiOp.

In-Delta Municipal, Industrial, and Agricultural Water Quality Requirements Criteria

The in-Delta municipal, industrial, and agricultural water quality requirements criteria under Scenario D would be the same as under Scenario A.

Scenario E

Scenario E criteria for bypass flows, Fremont Weir gate operations, Rio Vista minimum flows, Delta outflow, and south Delta export operations would be modified from Scenario A. This scenario applies to Alternative 7.

North Delta Diversion Bypass Flow Criteria

The objectives of the north Delta diversion bypass flow criteria include regulation of diversions so that river flows (1) maintain fish screen sweeping velocities; (2) reduce upstream transport from downstream channels; (3) support salmonid and pelagic fish transport to regions of suitable habitat; (4) reduce predation effects downstream; and (5) maintain or improve rearing habitat in the north Delta.

The north Delta diversion bypass flow criteria comprise three parameters: Constant Low Flow Pumping, Initial Pulse Protection, and three levels of post-pulse operations as summarized below.

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- **Constant Low Flow Pumping—December through June.** Diversions of up to 5% of river flow can occur in periods when flows are greater than 5,000 cfs, with no more than 300 cfs diverted at any one intake. While referred to as constant, pumping would vary with flows at Freeport. *Constant* refers to the percentage of river flow that could be diverted; it is not a continuous pumping level.
- **Initial Pulse Protection.** Under this concept, low-level pumping is maintained through the initial pulse period. After the pulse period has ended, water operations would return to the bypass flows presented in Table 3-16. (These parameters are for the purpose of modeling only; actual water operations would be based on real-time monitoring of fish movement as described in BDCP Chapter 3, Section 3.4.1.4.5, *Rapid Response Operations*).

  If the initial pulse period begins before December 1, May post-pulse bypass criteria would be implemented following the initial pulse period; and the second pulse period would have the same protective operation as the initial pulse period. For the purposes of modeling only, the governing bypass flow criteria for the period between the initial and second pulse was used instead of the May post-pulse bypass criteria. This results in a flow condition that is more conservative for aquatic resource impact analysis.

  For the purpose of modeling, the initiation of the pulse is defined by the following criteria: (1) increase in flow of the Sacramento River at Wilkins Slough by more than 45% within a 5-day period, and (2) Sacramento River flows greater than 12,000 cfs measured at Wilkins Slough. Low-level pumping continues until (1) Wilkins Slough returns to pre-pulse flows (flow on first day of 5-day increase); (2) Sacramento River at Wilkins Slough flows decrease for 5 consecutive days; or (3) bypass flows are greater than 20,000 cfs for 10 consecutive days. The first criteria was modeled as Wilkins Slough flow falls below 12,000 cfs. The modeling represents a more conservative approach regarding aquatic resource impact analysis.
- **Post-Pulse Water Operations.** After initial pulse(s), implement Level I post-pulse bypass rule (Table 3-16) until the occurrence of 20 total days of bypass flows above 20,000 cfs. Then implement Level II post-pulse bypass rule (Table 3-16) until 45 total days of bypass flows occur above 20,000 cfs as measured at Freeport. At this point, implement Level III post-pulse bypass rule (see Table 3-16) so that bypass flows are sufficient to prevent upstream tidal transport at two points of control: (1) Sacramento River upstream of Sutter Slough, and (2) Sacramento River downstream of Georgiana Slough. These points of control are used to prevent upstream transport toward the proposed intakes and to prevent upstream transport into Georgiana Slough.

South Delta Channel Flows Criteria

The objectives of the south Delta channel flows criteria are to minimize take at south Delta pumps by reducing incidence and magnitude of reverse flows during critical periods for covered fish species. The south Delta channel flows criteria use two parameters: OMR flows and San Joaquin River Inflow-South Delta Export Ratio, as summarized below. Under Scenario E, the south Delta channel flows criteria would be substantially different from those under Scenario A, and are as follows.

OMR Flows

- **December–March.** South Delta exports cannot cause OMR to be less than +1,000 cfs.
- **June.** South Delta exports cannot cause OMR to be less than +3,000 cfs.

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- **April–May and October–November.** No exports from south Delta intake facilities.
- **San Joaquin River Inflow-South Delta Export Ratio.** This ratio would be 50% in December–March and June.

Fremont Weir and Yolo Bypass Criteria

Operations of the Sacramento and Lisbon Weirs under Scenario E would be the same as under Scenario A. The Fremont Weir and Fremont Weir gate operations under Scenario E would be as summarized below.

- **Fremont Weir.** Install operable gates at elevation 17.5 feet.
- **Fremont Weir gate operations.** From December 1 to April 30 (may be extended to May 15, depending on hydrologic conditions and measures to minimize land use and ecological conflicts), open the 17.5-foot elevation gates to provide local and regional flood management benefits, while coinciding with pulse flows and juvenile salmonid migration cues, and to provide seasonal floodplain inundation for salmonid food production, juvenile rearing, and spawning. This action would cause Yolo Bypass inundation of 3,000–8,000 cfs depending on river stage. When the river stage is at or above the existing Fremont Weir crest elevation, the notch gates are assumed to be closed. While desired inundation period is 30–45 days, duration is governed by Sacramento River flow conditions. The opening at 11.5 feet is not included in the scenario.

Delta Cross Channel Gate Operations Criteria

The Delta Cross Channel gate operations criteria under Scenario E would be the same as under Scenario A.

Rio Vista Minimum Instream Flow Criteria

The Rio Vista minimum instream flow criteria under Scenario E would be similar to Scenario A. Like Scenario A, the September through December flow criteria would be in accordance with State Water Board D-1641. However, under this scenario the January through August flows would be a minimum of 5,000 cfs.

Delta Inflow and Outflow Criteria

The Delta inflow and outflow criteria under Scenario E would be as follows.

- **December–August.** Delta outflow in accordance with State Water Board D-1641.
- **September–November.** Delta outflow to implement Fall X2 in accordance with USFWS BiOp.

Operations for Delta Water Quality and Residence Criteria

Under Scenario E, the operations for Delta water quality and residence criteria would be the same as under Scenario A.

In-Delta Municipal, Industrial, and Agricultural Water Quality Requirements Criteria

The in-Delta municipal, industrial, and agricultural water quality requirements criteria under Scenario E would be the same as under Scenario A.

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Scenario F

Scenario F would be modified from Scenario E and would include specific Delta outflow criteria and cold water pool management criteria for specific reservoirs. This scenario applies only to Alternative 8.

North Delta Diversion Bypass Flow Criteria

The objectives of the north Delta diversion bypass flow criteria include regulation of diversions so that river flows (1) maintain fish screen sweeping velocities; (2) reduce upstream transport from downstream channels; (3) support salmonid and pelagic fish transport to regions of suitable habitat; (4) reduce predation effects downstream; and (5) maintain or improve rearing habitat in the north Delta.

The north Delta diversion bypass flow criteria comprise three parameters: Constant Low Flow Pumping, Initial Pulse Protection, and three levels of Post-Pulse Operations as summarized below.

- **Constant Low Flow Pumping—December through June.** Diversions of up to 5% of river flow can occur in periods when flows are greater than 5,000 cfs, with no more than 300 cfs diverted at any one intake. While referred to as constant, pumping would vary with flows at Freeport. *Constant* refers to the percentage of river flow that could be diverted; it is not a continuous pumping level.
- **Initial Pulse Protection.** Under this concept, low-level pumping is maintained through the initial pulse period. After the pulse period has ended, water operations would return to the bypass flows presented in Table 3-16. (These parameters are for the purpose of modeling only; actual water operations would be based on real-time monitoring of fish movement as described in BDCP Chapter 3, Section 3.4.1.4.5, *Rapid Response Operations*).

  If the initial pulse begins before December 1, May post-pulse bypass criteria would be implemented following the initial pulse period; and the second pulse period would have the same protective operation as the initial pulse period. For the purposes of modeling only, the governing bypass flow criteria for the period between the initial and second pulse was used instead of the May post-pulse bypass criteria. This results in a flow condition that is more conservative for aquatic resource impact analysis.

  For the purpose of modeling, the initiation of the pulse is defined by the following criteria: (1) increase in flow of the Sacramento River at Wilkins Slough by more than 45% within a 5-day period, and (2) Sacramento River flows greater than 12,000 cfs measured at Wilkins Slough. Low-level pumping continues until (1) Wilkins Slough returns to pre-pulse flows (flow on first day of 5-day increase); (2) Sacramento River at Wilkins Slough flows decrease for 5 consecutive days; or (3) bypass flows are greater than 20,000 cfs for 10 consecutive days. The first criteria was modeled as Wilkins Slough flow falls below 12,000 cfs. The modeling represents a more conservative approach regarding aquatic resource impact analysis.
- **Post-Pulse Water Operations.** After initial pulse(s), implement Level I post-pulse bypass rule (Table 3-16) until the occurrence of 20 total days of bypass flows above 20,000 cfs. Then implement Level II post-pulse bypass rule (Table 3-16) until 45 total days of bypass flows occur above 20,000 cfs as measured at Freeport. At this point, implement Level III post-pulse bypass rule (see Table 3-16) so that bypass flows are sufficient to prevent upstream tidal transport at two points of control: (1) Sacramento River upstream of Sutter Slough, and (2) Sacramento River downstream of Georgiana Slough. These points of control are used to prevent upstream

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transport toward the proposed intakes and to prevent upstream transport into Georgiana Slough.

South Delta Channel Flows Criteria

The objectives of the south Delta channel flows criteria are to minimize take at south Delta pumps by reducing incidence and magnitude of reverse flows during critical periods for covered fish species. The south Delta channel flows criteria use two parameters: OMR Flows and San Joaquin River Inflow-South Delta Export Ratio, as summarized below.

OMR Flows. The OMR flow criteria would be as follows.

- **December–March.** South Delta exports cannot cause OMR to be less than +1,000 cfs.
- **June.** South Delta exports cannot cause OMR to be less than +3,000 cfs.
- **April–May and October–November.** No exports from south Delta intake facilities.
- **San Joaquin River Inflow-South Delta Export Ratio.** This ratio would be 50% in December-March and June.

Fremont Weir and Yolo Bypass Criteria

The objectives of the Fremont Weir and Yolo Bypass criteria are based on considerations for (1) increasing the areal and temporal extent of spawning and rearing habitat for splittail and rearing habitat for salmonids for windows greater than 30 days; (2) providing an alternate migration corridor to the mainstem Sacramento River; and (3) improving habitat values and food transport in Cache Slough. The Fremont Weir and Yolo Bypass Criteria use four parameters: Sacramento Weir, Lisbon Weir, Fremont Weir, and Fremont Weir Gate Operations, as summarized below.

- **Sacramento Weir.** No change in current operations. Improve upstream fish passage facilities.
- **Lisbon Weir.** No change in current operations. Improve upstream fish passage facilities.
- **Fremont Weir.** Install operable gates at elevation 17.5 feet.
- **Fremont Weir gate operations.** From December 1 to April 30 (may be extended to May 15, depending on hydrologic conditions and measures to minimize land use and ecological conflicts), open the 17.5-foot elevation gates to provide local and regional flood management benefits, while coinciding with pulse flows and juvenile salmonid migration cues, and to provide seasonal floodplain inundation for salmonid food production, juvenile rearing, and spawning. This action would cause Yolo Bypass inundation of 3,000–8,000 cfs, depending on river stage, for 30–45 days. Flows of less than 3,000 cfs through the Fremont Weir gate could be implemented if physical modifications were completed in the Yolo Bypass and along the Toe Drain to achieve desired floodplain habitat.

Delta Cross Channel Gate Operations Criteria

The objectives of the Delta Cross Channel gate operations criteria, summarized below, are based on considerations to (1) reduce transport of outmigrating Sacramento River fish into the central Delta; (2) maintain flows downstream on the Sacramento River; and (3) provide sufficient Sacramento River flow into the interior Delta when water quality for municipal, industrial, and agricultural users may be of concern. For the purposes of modeling, the operational criteria for the Delta Cross Channel were assumed to be consistent with the No Action Alternative.

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- **October–November.** Delta Cross Channel gates closed if fish are present (for modeling, assumed closed 15 days per month; may be longer depending upon actual presence of fish).
- **December–June.** Delta Cross Channel gates closed.
- **July–September.** Delta Cross Channel gates open.

Rio Vista Minimum Instream Flow Criteria

The objectives of the Rio Vista minimum instream flow criteria, summarized below, are to maintain minimum flows for outmigrating salmonids and smelt.

- **September through December.** Operate in accordance with State Water Board D-1641.
- **January through August.** Minimum of 5,000 cfs.

Delta Inflow and Outflow Criteria

The objectives of the Delta inflow and outflow criteria are to (1) provide sufficient outflow to maintain a desirable salinity regime downstream of Collinsville during the spring, and (2) explore a range of approaches toward providing additional variability to Delta inflow and outflow.

- **January–June:** Delta outflow equal to the greater of 55% of Unimpaired Flow in the Sacramento River at Freeport (with an upper limit of 40,000 cfs) or State Water Board D-1641 Delta outflow requirements.
- **July–August, December.** Delta outflow in accordance with State Water Board D-1641.
- **September–November.** Delta outflow to implement Fall X2 in accordance with USFWS BiOp 2008.

In addition, during January through June months a minimum instream flow equal to the 55% of Unimpaired Flow in the Sacramento River at Freeport is maintained at Freeport, with an upper limit of 40,000 cfs. To balance SWP and CVP contributions to the Freeport requirement, a minimum requirement is applied simultaneously at the mouth of the Feather River that is a proportional amount of the 55% Unimpaired Flow at Freeport.

Cold Water Pool Storage Criteria

Storage criteria in Trinity, Shasta, and Folsom lakes and Oroville reservoir would be modified to enable more cold water pool storage. Project Storage below 75% of maximum storage would be limited to releases for environmental uses or superior water rights.

Operations for Delta Water Quality and Residence Criteria

The objectives of the operations for Delta water quality and residence criteria, summarized below, are to (1) maintain a minimum level of pumping from the south Delta during summer to provide limited flushing to reduce residence times and improve water quality; (2) provide salinity improvements for municipal, industrial, and agricultural water users; and (3) allow operational flexibility during other periods to operate either north or south diversions based on real-time assessments of benefits to fish and water quality.

- **July–September.** Preferentially operate SWP and CVP south Delta export facilities up to 3,000 cfs of diversions before diverting from north Delta intakes.

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- **October–June.** Preferentially operate north Delta intakes.

In-Delta Municipal, Industrial, and Agricultural Water Quality Requirements Criteria

The in-Delta municipal, industrial, and agricultural water quality requirements criteria would require the SWP and CVP to comply with existing agreements with water rights holders related to operations of the SWP and CVP. These requirements include water operations in accordance with State Water Board D-1641 related to north Delta and western Delta agricultural and municipal and industrial requirements, except that the Sacramento River compliance point for the agreement with the North Delta Water Agency would be moved from Emmaton to Threemile Slough.

Scenario G

Operations under Scenario G would be similar to those described under Scenario A, but would be modified to conform to the conveyance components of the separate corridors option. This scenario applies only to Alternative 9 and does not include new north Delta intakes. Instead, water continues to flow by gravity from the Sacramento River into two existing channels, Delta Cross Channel and Georgiana Slough. Therefore, this scenario does not include North Delta Diversion Bypass Flow Criteria and Operations for Delta Water Quality and Residence Time. Operational rules at the Delta Cross Channel and Georgiana Slough would be such that the gates would only be open under higher flow conditions. Additionally, these gates would not be overtopped during flood conditions. Additional criteria are provided for operations of operable barriers on the Mokelumne River system.

South Delta Channel Flows Criteria

OMR flow criteria under Scenario G would be the same as under Scenario A. However, the San Joaquin River inflow-south Delta export ratio would differ and would be as described below.

San Joaquin River Inflow-South Delta Export Ratio. This ratio is assumed be based upon San Joaquin River at Vernalis flows that limits exports in April and May in accordance with the NMFS BiOp, as assumed in the No Action Alternative.

Fremont Weir and Yolo Bypass Criteria

The Fremont Weir and Yolo Bypass criteria under Scenario G would be the same as under Scenario A.

Delta Cross Channel Gate Operations Criteria

The Delta Cross Channel gate operations criteria under Scenario G are summarized below.

- **Sacramento River flows at Delta Cross Channel are less than 11,000 cfs or greater than 25,000 cfs.** Delta Cross Channel gates closed.
- **Sacramento River flows at Delta Cross Channel 11,000–25,000 cfs.** Delta Cross Channel gates operated to divert up to 25% of Sacramento River flow at Delta Cross Channel.

Georgiana Slough Operations Criteria

The objectives of the Georgiana Slough gate operations would be limit flow from the Sacramento River into Georgiana Slough to less than 7,500 cfs to reduce impingement of fish onto fish screens at Georgiana Slough. Generally, flows are approximately 7,500 cfs in Georgiana Slough when flows in the Sacramento River at Georgiana Slough are approximately 45,000 cfs.

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Rio Vista Minimum Instream Flow Criteria

The Rio Vista minimum instream flow criteria under Scenario G would be the same as under Scenario A.

Delta Inflow and Outflow Criteria

The Delta inflow and outflow criteria under Scenario G would be as follows.

- **December–August.** Delta outflow in accordance with State Water Board D-1641.
- **September–November.** Delta outflow to implement Fall X2 in accordance with the USFWS BiOp.

Mokelumne River Barrier Operations Criteria

The objectives of the operations for new barriers on the Mokelumne River system near the confluence with the Sacramento River and Delta Cross Channel would be to protect migrating salmonids through the Mokelumne River system.

- **January–July. Operable barriers closed and possible inclusion of fish ladders at some barriers.**
- **August–December. Operable barriers open.**

In-Delta Municipal, Industrial, and Agricultural Water Quality Requirements Criteria

The in-Delta municipal, industrial, and agricultural water quality requirements criteria under Scenario G would be the same as under Scenario A.

Operational Criteria for Additional Facilities

Under Scenario G, these facilities would be operated in accordance with the following criteria.

- An operable barrier at Threemile Slough to reduce salinity in the San Joaquin River during low Delta outflow and potentially to reduce fish movement from the Sacramento River to the San Joaquin River.
- Operable barriers along Middle River at Connection Slough, Railroad Cut, Woodward Canal, and immediately downstream of Victoria Canal to isolate Middle River from Old River. These barriers would be closed unless San Joaquin River flow is greater than 10,000 cfs.
- Intertie canal with a control gate between Clifton Court Forebay and the Tracy Fish Facility.
- Closure of the Clifton Court Forebay inlet gate from Old River.
- Closure of channel between Old River and the Tracy Fish Facility except when San Joaquin River flow is greater than 10,000 cfs. Closure would include channel modification to allow continued access to River's End Marina from Old River.
- Operable barriers along the San Joaquin separate fish movement corridor at the upstream confluence of Old River and the San Joaquin River (head of Old River), Fisherman's Cut at False River, and Franks Tract to isolate Old River (San Joaquin separate fish movement corridor) from the San Joaquin River. These barriers would be closed unless San Joaquin River flow is greater than 10,000 cfs.

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- A pumping plant on the San Joaquin River at the head of Old River to convey additional flows with organic material into Old River. This plant would pump 250 cfs from downstream to upstream across the proposed operable barrier in the San Joaquin River near head of Old River unless San Joaquin River flow is greater than 10,000 cfs.
- A pumping plant on Middle River upstream of Victoria Canal to convey additional flows with lower salinity than Old River into Old River. This plant would pump 250 cfs from downstream to upstream across the proposed operable barrier in the Middle River upstream of Victoria Canal unless San Joaquin River flow is greater than 10,000 cfs. The existing temporary barrier in this location would be modified to be an operable barrier under this scenario.
- The two existing temporary barriers on the Old River and the barrier on the Grant Line Canal would be removed under this scenario.
- Passive culvert siphons would connect Victoria Canal to Clifton Court Forebay.

Scenario H

Scenario H would incorporate criteria for the same elements as those referenced under Scenario B (the south Delta components of which are also sometimes referred to as Scenario 6). However, under this scenario, Delta outflow requirements in the spring and fall would be determined by the outcome of the decision tree. This scenario consists of four possible combinations of spring and fall outflow criteria that could result from the decision tree. Although the EIR/EIS only applies this scenario to Alternative 4 (the CEQA Preferred Alternative), Scenario H could be implemented with any other project alternative in order to create a hybrid alternative within the bookends created by the entire range of alternatives addressed in the EIR/EIS. As discussed in Section 3A.10.6.3 in Appendix 3A, if such a hybrid alternative is ultimately identified, the analysis of Alternative 4 (and Scenario H) in the EIR/EIS will provide important evidence and analysis to assist the public and decision makers to determine the relative impacts of the hybrid in combination with such outflow criteria.

North Delta Diversion Bypass Flow Criteria

The north Delta diversion bypass flow criteria under Scenario H would be the same as under Scenario A.

South Delta Channel Flows Criteria

The objectives of the south Delta channel flows criteria are to minimize take at south Delta pumps by reducing incidence and magnitude of reverse flows during critical periods for covered fish species. The south Delta channel flows criteria are based on OMR Flows and Head of Old River Barrier operations, as summarized below.

- **OMR Flows.** The criteria are derived from fish protection triggers described in the USFWS and NMFS BiOps RPA Actions. It is assumed under Scenario H that the additional OMR criteria presented in Table 3-21 would be compared to the OMR criteria included in the No Action Alternative to select the greater OMR value for operations. In April, May, and June, OMR minimum allowable values would be based upon the San Joaquin River inflow relationship to

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OMR, as presented in Table 3-22. In October and November, OMR and south Delta export restrictions are based upon State Water Board D-1641 pulse trigger, as follows.[31]

- Before State Water Board D-1641 pulse trigger: no OMR restrictions.
- During State Water Board D-1641 pulse trigger: no south Delta exports.
- Following State Water Board D-1641 pulse trigger: OMR operated up to -5,000 cfs through November.

- **Head of Old River Barrier Operations.** A permanent operable barrier would be constructed at the head of Old River, at the confluence of San Joaquin River and Old River. Scenario H assumes that all other existing agricultural barriers in the central and south Delta continue to be installed and removed seasonally. If San Joaquin River flows at Vernalis are greater than 10,000 cfs, the Head of Old River Barrier would remain open. For modeling of Scenario H, the installation and operations of the Head of Old River Barrier are assumed as summarized in Table 3-23. In January, the Head of Old River Barrier would be open 50% if salmon fry are immigrating, which generally occurs when flood flow releases are occurring in the San Joaquin River watershed. For modeling purposes only, in November, operations are based upon State Water Board D-1641 pulse trigger, as follows.
  - Before State Water Board D-1641 pulse trigger: Head of Old River Barrier open.
  - During State Water Board D-1641 pulse trigger: Head of Old River Barrier closed.
  - Following State Water Board D-1641 pulse trigger: Head of Old River Barrier open 50% for two weeks.

[31] For the purposes of modeling, it was assumed that the D-1641 pulse in San Joaquin River occurs in the last 2 weeks of October.

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Table 3-21. Old and Middle River Flow Criteria – Scenario H

	Combined Old and Middle River Flows to be No Less than Values Below[a] (cfs)				
Month	Wet Water Year	Above Normal Water Year	Below Normal Water Year	Dry Water Year	Critical Dry Water Year
January	0	-3,500	-4,000	-5,000	-5,000
February	0	-3,500	-4,000	-4,000	-4,000
March	0	0	-3,500	-3,500	-3,000
April	see Table 3-22	see Table 3-22	see Table 3-22	see Table 3-22	see Table 3-22
May	see Table 3-22	see Table 3-22	see Table 3-22	see Table 3-22	see Table 3-22
June	see Table 3-22	see Table 3-22	see Table 3-22	see Table 3-22	see Table 3-22
July	N/A[b]	N/A[b]	N/A[b]	N/A[b]	N/A[b]
August	N/A[b]	N/A[b]	N/A[b]	N/A[b]	N/A[b]
September	N/A[b]	N/A[b]	N/A[b]	N/A[b]	N/A[b]
October[c]	Based on State Water Board D-1641 pulse trigger.	Based on State Water Board D-1641 pulse trigger.	Based on State Water Board D-1641 pulse trigger.	Based on State Water Board D-1641 pulse trigger.	Based on State Water Board D-1641 pulse trigger.
November[c]	Based on State Water Board D-1641 pulse trigger.	Based on State Water Board D-1641 pulse trigger.	Based on State Water Board D-1641 pulse trigger.	Based on State Water Board D-1641 pulse trigger.	Based on State Water Board D-1641 pulse trigger.
December[d]	-5,000	-5,000	-5,000	-5,000	-5,000

[a] Values are monthly averages for use in modeling. Under Scenario H, the model compares these minimum allowable OMR values to 2008 USFWS BiOp RPA OMR requirements and uses the less negative requirement.

[b] For the purposes of modeling, it was assumed that there would be no restrictions during these months. However, the expectation is that specific additional criteria would be developed for juvenile sturgeon protection, as described in BDCP Chapter 3, Section 3.4.1.4.5, *Rapid Response Operations*.

[c] The allowable OMR varies depending on the State Water Board D-1641 pulse timing.

- Before the D-1641 pulse: Head of Old River Barrier open 50% for two weeks and OMR must be greater than or equal to -5,000 cfs.
- During the D-1641 pulse (assumed to occur October 16-31 in the modeling): Head of Old River Barrier closed and no south Delta exports.
- Following the D-1641 pulse: Head of Old River Barrier open 50% for two weeks. OMR must be greater than or equal to -5,000 cfs all of November.

[d] OMR restrictions of -5,000 cfs for Sacramento River winter-run Chinook salmon when North Delta initial pulse is triggered, or OMR restrictions of -2,000 cfs when delta smelt triggers occur.

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Table 3-22. San Joaquin Inflow Relationship to Old and Middle River Flow Criteria

April and May		June	
If San Joaquin River flow at Vernalis is (cfs):	Average OMR flows would be at least the following[a] (cfs):	If San Joaquin flow at Vernalis is the following (cfs):	Average OMR flows would be at least the following[b] (cfs):
≤ 5,000	-2,000	≤ 3,500	-3,500
6,000	+1,000	3,501 to 10,000	0
10,000	+2,000		
15,000	+3,000	10,001 to 15,000	+1,000
≥30,000	+6,000	>15,000	+2,000

[a] Interpolated linearly between values.
[b] Based on a stepwise function.

Table 3-23. Head of Old River Operable Barrier Operations Criteria if San Joaquin River Flows at Vernalis are Equal To or Less Than 10,000 cfs

Month	Percent of Time Head of Old River Barrier is Open
Oct [a]	50% (except during the pulse) [a]
Nov [a]	100% (except during the post-pulse period) [a]
Dec	100%
Jan [b]	50%
Feb	50%
Mar	50%
April	50%
May	50%
Jun 1–15	50%
Jun 16–30	100%
Jul	100%
Aug	100%
Sep	100%

[a] The allowable OMR varies depending on the State Water Board D-1641 pulse timing.

- Before the D-1641 pulse: Head of Old River Barrier operation is triggered based upon State Water Board D-1641 pulse trigger. For the purposes of modeling, it was assumed that the Head of Old River Barrier is open 50% for two weeks and OMR requirement is greater than or equal to -5,000 cfs.
- During State Water Board D-1641 pulse trigger: Head of Old River Barrier closed and no south Delta exports. For the purposes of modeling, it was assumed that during the D-1641 pulse (assumed to occur October 16-31 in the modeling): Head of Old River Barrier closed and no south Delta exports.
- Following State Water Board D-1641 pulse trigger: Head of Old River Barrier open 50% for 2 weeks, and OMR operated up to 5,000 cfs through November. For the purposes of modeling, it was assumed that following the D-1641 pulse: Head of Old River Barrier open 50% for 2 weeks and OMR requirement is greater than or equal to -5,000 cfs all of November.

[b] The Head of Old River Barrier becomes operational at 50% when salmon fry are emigrating (based on real time monitoring). For the purposes of modeling, it was assumed that salmon fry are emigrating starting on January 1.

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Fremont Weir and Yolo Bypass Criteria

The Fremont Weir and Yolo Bypass Criteria use four parameters: Sacramento Weir, Lisbon Weir, Fremont Weir, and Fremont Weir Gate Operations, as summarized below.

- **Sacramento Weir.** No change in current operations. Improve upstream fish passage facilities.
- **Lisbon Weir.** No change in current operations. Improve upstream fish passage facilities.
- **Fremont Weir.** Improve fish passage by constructing an opening and installing operable gates and fish passage facilities at elevation 17.5 feet. In addition, construct a smaller opening with operable gates and fish passage enhancement at elevation 11.5 feet.
- **Fremont Weir gate operations.** Operations would be consistent to those described under Scenario A.

Delta Cross Channel Gate Operations Criteria

Delta Cross Channel gates would be operated in accordance with State Water Board D-1641 with additional closures in accordance with NMFS BiOp Action IV.1.2v and closed during flushing flows between October 1–December 14 unless water quality conditions would become adverse for other beneficial uses. For the purposes of modeling, the operational criteria for the Delta Cross Channel were assumed to be consistent with the No Action Alternative.

Rio Vista Minimum Instream Flow Criteria

The Rio Vista minimum instream flow criteria under Scenario H would be the same as under Scenario A.

Delta Inflow and Outflow Criteria

The Delta outflow criteria under Scenario H would be determined based on monitoring and research to support decision tree outcomes that would address uncertainties about spring outflow for longfin smelt and fall outflow for delta smelt (see BDCP Chapter 3, Section 3.4.1, *Conservation Measure 1 Water Facilities and Operation*). To address these key areas of uncertainty, Scenario H includes two decision trees, one for fall outflow and one for spring outflow, that specify alternative outcomes for each criterion. For spring outflow (March through May), the decision tree outcomes include operations consistent with D-1641 standards or average monthly outflow, depending on the expected hydrologic conditions as summarized in Table 3-24. For the purposes of modeling, the hydrologic condition, as indicated by the forecasted March-May Eight-River Index, was used to determine the outflow target.

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Table 3-24. March-May Average Outflow Criteria for "High Outflow" Outcome of Spring Outflow Decision Tree

Exceedance	Outflow criterion (cfs)
10%	>44,500
20%	>44,500
30%	>35,000
40%	>32,000
50%	>23,000
60%	17,200
70%	13,300
80%	11,400
90%	9,200

For fall outflow in September, October and November, the decision tree outcomes include either the existing BiOp requirements (FWS 2008) or D-1641 standards.

Decision Trees

The decision tree process is a focused form of adaptive management that will be used to determine, at the start of new operations the fall and spring, outflow criteria that are required to achieve the conservation objectives of the BDCP for delta smelt and longfin smelt and to promote the water supply objectives of the BDCP. Other BDCP-covered fish species, including salmonids and sturgeon, may also be affected by outflow. Their outflow needs will also be investigated as part of the decision tree process.

Under Scenario H, CM1 includes two decision trees, one for fall outflow and one for spring outflow, that specify potential alternative outcomes for each criterion. Because each decision tree identifies two possible outcomes, the decision trees lay out four potential outcomes in outflow criteria when the spring and fall outflow components are combined, as described in Table 3-25. These four outcomes will be aggressively investigated through the decision tree process. Project operating criteria will be subject to a new determination by the fish and wildlife agencies, consistent with the adaptive management process for the BDCP, based on best available science developed as described below, specifying what the spring and fall outflow criteria will be at the time CM1 operations begin.

Under the decision-tree process, hypotheses supporting each criterion will be tested in detail during the years before CM1 operations commence. The information gained during this period will be used to conduct a reevaluation of the initially specified criteria, based on all new scientific information, to decide what criteria will be selected for implementation at the beginning of CM1 operations. The decision-tree process will involve the following steps.

1. Clearly articulate scientific hypotheses designed to reduce uncertainty about what outflow criteria are needed to achieve the biological objectives for covered smelt species, salmonids, and sturgeon.
2. Develop and implement a science plan and data collection program based on the decision tree management alternatives to test the hypotheses and reduce uncertainties.
3. At the time CM1 operations begin, the fish and wildlife agencies identify spring and fall outflow criteria sufficient to meet the Plan's biological objectives for covered fish species.

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Once CM1 operations begin, the decision-tree process will end. Thereafter, the adaptive management and monitoring program will continue as the primary process for adjusting all aspects of the conservation strategies, including spring and fall outflow operating criteria for CM1 operations for all covered species.

The Spring Outflow Decision Tree

Current science indicates that the decline in longfin smelt abundance has been a result of food web changes and reductions of winter-spring outflow from the Delta. Studies dating as far back as the 1980s suggest that the spring (March–May) outflow is an important driver of longfin smelt abundance. Investigations related to the relationship between food, flow, and longfin smelt abundance continue in many venues; meanwhile, uncertainty exists regarding the mechanism through which higher Delta outflow improves the production and survival of early life stages of longfin smelt. Results of these investigations, including those directly related to the decision-tree process, will continue to be reviewed and considered in the coming years, in making management decisions regarding the contribution of winter-spring Delta outflow to meeting the population growth and abundance objectives for longfin smelt.

The Fall Outflow Decision Tree

How fall outflow affects delta smelt abundance and habitat quality is an active area of research, and understanding of these effects is expected to improve in the coming years. That improved understanding is likely to materially affect the conservation measures developed to achieve Objective DTSM2.1 (see Section 3.3.7.1.3 in Chapter 3, *Conservation Strategy*, of the BDCP) —which concerns availability of delta smelt habitat and is defined in terms of habitat area with a specific range of salinities, turbidities, flows, and other features—and Objective DTSM1.3 — which concerns increasing delta smelt abundance through management of Fall X2. Under the USFWS BiOp (2008), it is hypothesized that the fall habitat objective will be achieved by providing fall (September–November) flows necessary to position X2 in or near Suisun Bay in wet or above-normal years. This hypothesis is currently being tested in the FLaSH studies (Delta Stewardship Council 2010), and informed by annual reviews of USFWS (2008) BiOp effectiveness (Anderson et al. 2012); it will continue to be evaluated in the decision-tree process. Alternatively, it is hypothesized that new shallow-water habitat areas created through restoration of tidal natural communities (CM4) could accomplish this objective with lower outflow during the fall. If restoration of habitat for delta smelt is successful, there may be no need to provide the fall outflows prescribed under the high-outflow scenario (Table 3-25) to meet the biological objectives for this species. Collaborative scientific research to test each of these hypotheses will be conducted before initial operations of the north Delta facility.

Evaluation of the Decision Trees in Impact Analysis

As described in the sections above, Scenario H includes two decision trees and each decision tree has two possible outcomes. When combined, there are four possible outcomes (scenarios) in outflow criteria. Because the environmental effects resulting from each of these scenarios may differ, in some resource chapters, Scenario H is divided into four scenarios, as shown Table 3-25. The range of environmental effects that could result from these four scenarios of the decision trees is then presented.

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Table 3-25. Potential Outcomes for Delta Outflow under Scenario H Operations (Alternative 4)

		March–May	
		Outflows per D-1641 with adaptive management	Outflows per Table 3-24
September–November	Outflows per D-1641 with adaptive management	Scenario H1	Scenario H2
	Outflows per USFWS delta smelt BiOp for Fall X2	Scenario H3	Scenario H4

Operations for Delta Water Quality and Residence Criteria

The operations for Delta water quality and residence criteria under Scenario H would be the same as under Scenario A.

In-Delta Municipal, Industrial, and Agricultural Water Quality Requirements Criteria

The in-Delta municipal, industrial, and agricultural water quality requirements criteria under Scenario H would be the same as under Scenario A.

3.7 Environmental Commitments

As part of the project planning and environmental assessment process, DWR will incorporate certain environmental commitments and BMPs into the proposed action alternatives to avoid or minimize potential impacts. DWR will also coordinate planning, engineering, design and construction, operation, and maintenance phases of the Plan with the appropriate agencies. Environmental commitments that will be incorporated in the project are described in Appendix 3B, *Environmental Commitments*.

3.8 SWP Long-Term Water Supply Contract Amendment

DWR administers the SWP Long-term Water Contracts (Water Contracts), which are central to SWP construction, operation, and funding. In return for the state financing, construction, operation, and maintenance of the SWP facilities, the SWP water contractors contractually agree to repay all SWP capital and operating costs incurred for the water supply and fish and wildlife mitigation features. DWR annually charges its 29 SWP water agencies for costs of construction, operation, and maintenance of the SWP facilities. Various options, or funding methods, could be used separately or together to provide SWP funding for the construction, operation, and maintenance of a new conveyance facility described by any action alternative considered for the Plan or for other costs

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that the SWP contractors would be responsible to fund, such as mitigation for construction of the facility.

One funding method would be to use existing payment provisions of the SWP Water Contracts under which DWR would charge the SWP water agencies for the costs of the BDCP (or an alternative) conveyance facility as a project conservation facility. If SWP revenue bonds for the facility were issued, this approach by itself would suffice to provide funding. However, DWR could have interim funding needs pending issuance of revenue bonds, in which case additional funding mechanisms besides the SWP contract could be used.

As a second funding method, a separate funding mechanism or to meet interim or additional funding needs, DWR and SWP and CVP water agencies could enter into funding agreements similar to the funding agreement currently used for financing BDCP-Delta Habitat Conservation and Conveyance Program (DHCCP) planning costs.

A third method would be for DWR and the SWP water agencies to amend the SWP Water Supply Contracts to add new provisions that would modify methods for funding BDCP in a way different than would occur under the current contract. For example, the amendment could add a definition for the new conveyance facility and specific terms for its financing that may use conservation and transportation facility fees or new special fees. The amendment could identify allocation of benefits of the new conveyance facility that would be shared among contractors based on those who pay receiving the benefits attributed to BDCP.[32]

Any amendment of the Water Contracts would need to be agreed upon by DWR and the SWP contractors and could either be implemented by those willing to participate or conditioned on having all contractors participate. A consideration if all SWP contractors must participate in funding BDCP as a condition of an amendment is whether the costs to all contractors are feasible. Mechanisms to improve funding feasibility could be identified, which may require specific amendments to the contracts, or possibly be implemented through current Water Contract methods (such as exchanges or transfers of water), or possibly through separate agreements.

Water Contract amendments or new funding agreements for implementing BDCP that include provisions for allocating benefits, such as more reliable water supply, to contractors who pay for BDCP, could create the potential for redistributing SWP water south of the Delta. At this time, the potential for changes in SWP water distribution from a likely amendment or funding agreements are

[32] See SWP water agency funding agreements to pay for BDCP-DHCCP planning costs in which DWR and many SWP contractors agreed in principle that, among other things, they shall establish an agreement in principle of how the costs and benefits of the BDCP-DHCCP are to be determined and allocated. These agreements provide that: (1) if the BDCP-DHCCP is approved and implemented, then parties to the DHCCP SWP Funding Agreements or the BDCP-DHCCP Supplemental Funding Agreements who do not participate in implementation of the new conveyance will be reimbursed the funds they contributed under those agreements, and (2) if any SWP Water Contractor does not participate in implementation of the new conveyance, it shall not be entitled to any benefits provided by the new conveyance, including any new, existing, additional or incremental water supplies attributable to or made available by the BDCP-DHCCP in any given year. See section J.2 of DWR and SWP *Water Agency Agreement for Supplemental Funding For the Costs of Environmental Analysis, Planning and Design of Delta Conservation Measures, Including Delta Conveyance Options* (2012; "Agreement Funding Costs of Planning Delta Conveyance"). Furthermore, DWR and the water contractors intend that all SWP Water Supply Contractors, whether or not they were original parties to the DHCCP SWP Funding Agreements or the BDCP-DHCCP Supplemental Funding Agreements and whether or not they have withdrawn from either or both of those agreements, would be entitled to fully participate in the discussions and development of such an agreement. See section J.3 of Agreement Funding Costs of Planning Delta Conveyance.

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generally considered in the analysis of Chapter 30, *Growth Inducement and Other Indirect Effects*. If the final agreements or amendments have potential to have an environmental effect not already contemplated in the BDCP EIR/EIS, DWR would prepare additional analysis. Any further analysis of potential growth-related issues associated with potential future contract amendments would be speculative at this time.

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EPA-HQ-2016-004924
ED_000757_000012202-00212

To: Rader, Cliff[Rader.Cliff@epa.gov]
Cc: Goforth, Kathleen[Goforth.Kathleen@epa.gov]; Skophammer, Stephanie[SKOPHAMMER.STEPHANIE@EPA.GOV]
From: Dunning, Connell
Sent: Wed 1/15/2014 8:17:55 PM
Subject: FW: Red Folder AX-14-000-3796/3799 Due on 1/29/2014
AX-14-000-3796 Control Slip.pdf
AX-14-000-3796.pdf
AX-14-000-3799 Control Slip.pdf
AX-14-000-3799.pdf

Per our call today,

Can you let us know the exact process you used to get these letters off the "Red Folder" list?

Are you able to get these off the list for us?

As you know, we need to spending time reviewing Bay Delta plan, not sending letters about who needs to get requests for extensions!

Connell

Connell Dunning

Environmental Review Office

US EPA Region IX, Pacific Southwest

75 Hawthorne St (CED-2), SF, CA 94105

dunning.connell@epa.gov

phone - 415-947-4161 fax- 415-947-8026

From: Skophammer, Stephanie
Sent: Wednesday, January 15, 2014 11:52 AM
To: Dunning, Connell
Subject: FW: Red Folder AX-14-000-3796/3799 Due on 1/29/2014

Connell,

I received two red folders yesterday regarding a request for an extension of the BDCP comment period. What is the best way to respond to these since that decision is up to the lead agency?

Thank you,

Stephanie

Stephanie Skophammer

U.S. Environmental Protection Agency, Region 9

Environmental Review Office (CED-2)

75 Hawthorne St.

San Francisco, CA 94105

(415) 972-3098

From: Kwok, Frances
Sent: Tuesday, January 14, 2014 1:15 PM
To: Skophammer, Stephanie; Jackson, Clarice
Cc: Gaudario, Abigail
Subject: Red Folder AX-14-000-3796/3799 Due on 1/29/2014

Stephanie/Clarice,

ORA received the attached AX-14-000-3796/3799. The subject is Bay Delta Conservation Plan Public Comment Review Time Extension Request. The due date is January 29, 2014. I will put them in the same red folder that I put AX-14-000-3700.

Please pick up the red folder in the mail slot on the 18th Floor.

Thanks,

Frances Kwok

Office of the Regional Administrator

U.S. E.P.A. Region 9

75 Hawthorne Street

San Francisco, CA 94105

(415) 947-4232

kwok.frances@epa.gov

From: Kwok, Frances
Sent: Tuesday, January 14, 2014 11:06 AM
To: Skophammer, Stephanie; Jackson, Clarice
Cc: Gaudario, Abigail
Subject: Red Folder AX-14-000-3700 Due on 1/29/2014

Stephanie/Clarice,

ORA received the attached AX-14-000-3700. The subject is Bay Delta Conservation Plan Public Review and Comment Period Time Extension Request. The due date is January 29, 2014.

Please pick up the red folder in the mail slot on the 18th Floor.

Thanks,

Frances Kwok

Office of the Regional Administrator

U.S. E.P.A. Region 9

75 Hawthorne Street

San Francisco, CA 94105

(415) 947-4232

kwok.frances@epa.gov

Correspondence Management System
Control Number: AX-14-000-3796
Printing Date: January 14, 2014 02:38:46

Citizen Information

Citizen/Originator: **Hughes, Gary Graham**
Organization: EPIC - the Environmental Protection Information Center
Address: 145 G Street, Arcata, CA 95521

Constituent: N/A
Committee: N/A **Sub-Committee:** N/A

Control Information

Control Number:	AX-14-000-3796	**Alternate Number:**	N/A
Status:	Pending	**Closed Date:**	N/A
Due Date:	Jan 29, 2014	**# of Extensions:**	0
Letter Date:	Jan 13, 2014	**Received Date:**	Jan 14, 2014
Addressee:	AD-Administrator	**Addressee Org:**	EPA
Contact Type:	EML (E-Mail)	**Priority Code:**	Normal
Signature:	DX-Direct Reply	**Signature Date:**	N/A

File Code: 404-141-02-01_141_b Controlled and Major Corr. Record copy of the offices of Division Directors and other personnel.
Subject: Bay Delta Conservation Plan Public Comment Review Time Extension Request
Instructions: DX-Respond directly to this citizen's questions, statements, or concerns
Instruction Note: N/A
General Notes: N/A
CC: N/A

Lead Information

Lead Author: N/A

Lead Assignments:

Assigner	Office	Assignee	Assigned Date	Due Date	Complete Date
Jacqueline Leavy	OEX	R9	Jan 14, 2014	Jan 29, 2014	N/A
	Instruction: DX-Respond directly to this citizen's questions, statements, or concerns				

Supporting Information

Supporting Author: N/A

Supporting Assignments:

Assigner	Office	Assignee	Assigned Date
No Record Found.			

History

Action By	Office	Action	Date
Jacqueline Leavy	OEX	Assign R9 as lead office	Jan 14, 2014

Comments

Commentator	Comment	Date
No Record Found.		

Moritz, Brigette

From: Gary Graham Hughes [gary@wildcalifornia.org]
Sent: Monday, January 13, 2014 6:26 PM
To: Samuel.Rauch@NOAA.gov; mlconnor@usbr.gov; Gary_Frazer@FWS.gov; Mccarthy, Gina; Will.Stelle@noaa.gov; secretary@resources.ca.gov
Subject: Request for extension of public comment period for BDCP Draft EIR/EIS
Attachments: EPIC_BDCP_requestcommentextension.pdf

Dear responsible officials,

Please take into consideration the attached letter.

Thank you,

Gary
--
Gary Graham Hughes
Executive Director
EPIC -- the Environmental Protection Information Center
Office: 145 G St., Suite A, Arcata, CA 95521
Tel: 707-822-7711
Email: gary@wildcalifornia.org
Web: http://www.wildcalifornia.org
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epic

Keeping Northwest California wild since 1977

Transmitted via electronic mail

January 13, 2014

Samuel D. Rauch
Administrator for Fisheries
NOAA Fisheries Service
Samuel.Rauch@NOAA.gov

Michael L. Connor
Deputy Secretary
U.S. Bureau of Reclamation
mlconnor@usbr.gov

Gary Frazer
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U.S. Environmental Protection Agency
McCarthy.Gina@EPA.gov

William W. Stelle, Jr.
Acting Regional Administrator
NOAA Fisheries Service
Will.Stelle@noaa.gov

John Laird
Secretary
California Resources Agency
secretary@resources.ca.gov

Re: BDCP Public Comment Review Time Extension Request

Dear Responsible Officials:

I am writing on behalf of the Environmental Protection Information Center ("EPIC"), a nonprofit organization that works to protect human and natural communities in Northwest California. Consistent with this mission, and in representation of the staff, board of directors, and the 2000 individuals that make up the membership of EPIC, our organization submits the following comments in regards our request of an extension in the public comment review time currently provided for submitting informed comments on the Bay Delta Conservation Plan Draft EIR/EIS.

In a letter from November 21, 2013 (prior to the December 13, 2013, release of the BDCP Draft Plan and EIR/EIS), the Environmental Water Caucus, of which EPIC is an active participating member, requested that the public review and comment period be extended beyond the planned 120 days, based on the anticipated 25,000 page estimated volume of the BDCP documents. Staff at our organization has now begun review of the 40,214 actual pages of the released documents, and we reiterate the request that you extend the review and comment period for at least 120 additional days, due to the extraordinary size of the documents to be reviewed.

Environmental Protection Information Center
145 G Street, Suite A, Arcata, California 95521
Tel: (707) 822-7711
Fax: (707) 822-7712
www.wildcalifornia.org

Based on the dictated 120 day review time period, the public is being asked to review 473 pages per day during the 85 working days that are available during the comment period. Though our cursory review of the documentation has already revealed glaring omissions, such as the lack of analysis of impacts of the proposed water conveyance structures of the BDCP on Coho Salmon in the Trinity River, our organization finds in-depth review of the BDCP Draft EIR/EIS to be nearly impossible in the short time frame defined within the current public comment period. As was pointed out in the previous request, NEPA regulation 40 CFR 1502.7 declares that the text of an EIS for "proposals of unusual scope or complexity shall normally be less than 300 pages." As was also stated in that previous letter, it is impossible for organizations interested in thoughtfully responding to these BDCP documents to be staffed for a thorough NEPA/CEQA review based on the outlandish size and complexity of the documents to be reviewed. Our public interest conservation organization is community supported and grassroots scale; it is imperative that the public be granted an appropriate opportunity to understand, assess, and provide comment on a proposed project that would transform the nature of water management in our state for generations to come, with potentially very harmful outcomes for natural and human communities in the Northwest corner of the state.

In conclusion, our organization respectfully requests that the public review period be extended for an additional 120 days, until August 15, 2014, based on the size of the actual documents you released on December 13, 2013.

Respectfully,

Gary Graham Hughes
Executive Director
EPIC – the Environmental Protection Information Center
145 G St., Suite A, Arcata, CA 95521
Tel: 1-707-822-7711
Email: gary@wildcalifornia.org

Correspondence Management System
Control Number: AX-14-000-3799
Printing Date: January 14, 2014 02:33:39

Citizen Information

Citizen/Originator: **Childress, Reuben**
Organization: Foothill Conservancy
Address: PO Box 1255, Pine Grove, CA 95665

Constituent: N/A
Committee: N/A **Sub-Committee:** N/A

Control Information

Control Number:	AX-14-000-3799	**Alternate Number:**	N/A
Status:	Pending	**Closed Date:**	N/A
Due Date:	Jan 29, 2014	**# of Extensions:**	0
Letter Date:	Jan 13, 2014	**Received Date:**	Jan 14, 2014
Addressee:	AD-Administrator	**Addressee Org:**	EPA
Contact Type:	LTR (Letter)	**Priority Code:**	Normal
Signature:	DX-Direct Reply	**Signature Date:**	N/A

File Code: 404-141-02-01_141_b Controlled and Major Corr. Record copy of the offices of Division Directors and other personnel.
Subject: Bay Delta Conservation Plan Public Comment Review Time Extension Request
Instructions: DX-Respond directly to this citizen's questions, statements, or concerns
Instruction Note: N/A
General Notes: N/A
CC: N/A

Lead Information

Lead Author: N/A

Lead Assignments:

Assigner	Office	Assignee	Assigned Date	Due Date	Complete Date
Jacqueline Leavy	OEX	R9	Jan 14, 2014	Jan 29, 2014	N/A
	Instruction: DX-Respond directly to this citizen's questions, statements, or concerns				

Supporting Information

Supporting Author: N/A

Supporting Assignments:

Assigner	Office	Assignee	Assigned Date
No Record Found.			

History

Action By	Office	Action	Date
Jacqueline Leavy	OEX	Assign R9 as lead office	Jan 14, 2014

Comments

Commentator	Comment	Date
No Record Found.		

Moritz, Brigette

From: hotmail_574e4b1a61e8d669@live.com on behalf of Reuben Childress [reuben@foothillconservancy.org]
Sent: Monday, January 13, 2014 7:50 PM
To: Samuel.Rauch@NOAA.gov; mlconnor@usbr.gov; Gary_Frazer@FWS.gov; Mccarthy, Gina; Will.Stelle@noaa.gov; secretary@resources.ca.gov
Subject: BDCP Public Comment Review Time Extension Request
Attachments: Time Extension Request December.pdf

Please see attached PDF.

Thank you,

Reuben Childress
Watershed Conservation Associate
Foothill Conservancy
PO Box 1255
Pine Grove CA. 95665
209.295.4900

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January 13, 2014

Samuel D. Rauch
Administrator for Fisheries
NOAA Fisheries Service
Samuel.Rauch@NOAA.gov

Michael L. Connor
Deputy Secretary
U.S. Bureau of Reclamation
mlconnor@usbr.gov

Gary Frazer
Assistant Director-Endangered Species
U.S. Fish and Wildlife Service
Gary_Frazer@FWS.gov

Gina McCarthy
Administrator
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McCarthy.Gina@EPA.gov

William W. Stelle, Jr.
Acting Regional Administrator
NOAA Fisheries Service
Will.Stelle@noaa.gov

John Laird
Secretary
California Resources Agency
secretary@resources.ca.gov

Subject: BDCP Public Comment Review Time Extension Request

In a November 21 letter, prior to the December 13 release of the BDCP Draft Plan and EIR/EIS, the Environmental Water Caucus, of which the Foothill Conservancy is a member, requested that the public review and comment period be extended beyond the planned 120 days, based on the anticipated 25,000 page estimate of the BDCP documents. Having now counted the 40,214 actual pages of the released documents, our organization requests that you extend the review and comment period for at least 120 additional days, due to the extraordinary size and technical nature of the documents to be reviewed.

Based on the dictated 120 day review time period, the public is being asked to review 473 pages per day during the 85 working days that are available during the comment period. These documents represent 20% more pages than the 32 volumes of the last printed edition of the Encyclopedia Britannica. As was pointed out in the previous request, NEPA regulation 40 CFR 1502.7 declares that the text of an EIS for "proposals of unusual scope or complexity shall normally be less than 300 pages." As was also stated in that previous letter, it is impossible for organizations interested in thoughtfully responding to these BDCP documents to be staffed for a thorough NEPA/CEQA review based on the enormity of size and complexity of the documents to be reviewed.

Our organization respectfully requests that the public review period be extended for an additional 120 days, until August 15, based on the size of the actual documents you released on December 13.

Reuben Childress
Watershed Conservation Associate
Foothill Conservancy
Pioneer, California

To: Rader, Cliff[Rader.Cliff@epa.gov]
Cc: Scott, Jeff[Scott.Jeff@epa.gov]; McPherson, Ann[McPherson.Ann@epa.gov]; Ardillo, Anne[ARDILLO.ANNE@EPA.GOV]; Blonn, Jennifer[Blonn.Jennifer@epa.gov]; Sachs, Carol[Sachs.Carol@epa.gov]; Mulvihill, Carolyn[Mulvihill.Carolyn@epa.gov]; Jessop, Carter[JESSOP.CARTER@EPA.GOV]; meek, clifton[meek.clifton@epa.gov]; Dunning, Connell[Dunning.Connell@epa.gov]; Gerdes, Jason[Gerdes.Jason@epa.gov]; Prijatel, Jean[PRIJATEL.JEAN@EPA.GOV]; Geselbracht, Jeanne[Geselbracht.Jeanne@epa.gov]; Vitulano, Karen[Vitulano.Karen@epa.gov]; Kelly, ThomasP[Kelly.ThomasP@epa.gov]; Munson, James[MUNSON.JAMES@EPA.GOV]; Sysum, Scott[Sysum.Scott@epa.gov]; Skophammer, Stephanie[SKOPHAMMER.STEPHANIE@EPA.GOV]; Plenys, Thomas[Plenys.Thomas@epa.gov]; Appleton, Zac[Appleton.Zac@epa.gov]
From: Goforth, Kathleen
Sent: Mon 12/9/2013 9:43:49 PM
Subject: FW: FINAL: BDCP Desk Statement

FYI

From: Yogi, David
Sent: Monday, December 09, 2013 11:16 AM
To: Goforth, Kathleen; Herrera, Angeles; Vendlinski, Tim; Kemmerer, John; Skophammer, Stephanie; Foresman, Erin; Hagler, Tom; Marincola, JamesPaul; Stollman, Scott; Zito, Kelly
Subject: FINAL: BDCP Desk Statement
Importance: High

Hi Everyone,

Here's the final BDCP desk statement based on the comments received last week:

The U.S. EPA is reviewing the draft Environmental Impact Statement for the Bay Delta Conservation Plan and will provide comments to the lead federal agencies (U.S. Fish and Wildlife, National Oceanic and Atmospheric Administration's National Marine Fisheries Service, and U.S. Bureau of Reclamation) by the end of the review period.

If you receive any inquires on this topic, please pass them along to me. Thank you very much for your input drafting this statement.

- David

David Yogi • Public Information Officer • U.S. Environmental Protection Agency • Region 9
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From: Goforth, Kathleen
Sent: Wednesday, July 03, 2013 11:37 AM
To: FBarajas@usbr.gov
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Subject: EPA's Comments on BDCP ADEIS

Thank you for the opportunity to review the Second Consultant Administrative Draft Environmental Impact Statement (ADEIS) for the Bay Delta Conservation Plan (BDCP). The purpose of the general comments below is to highlight some of EPA's key concerns surrounding the proposed BDCP and ADEIS. We are providing these comments on the ADEIS for the proposed project in accordance with our role as cooperating agency for this process under the National Environmental Policy Act (NEPA). As requested, we are also providing detailed comments in the table format provided by the Bureau of Reclamation (see attached).

EPA fully understands the urgency of solving water supply and ecosystem problems facing the Bay Delta. We agree that the status quo is not sustainable and that a successful BDCP can be a key part of a comprehensive strategy to address the wide range of problems threatening both water supply reliability and the Bay Delta ecosystem.[1] Given the importance and complexity of this project, we appreciate this opportunity for early input. At the same time, we must note that this is a unique process. EPA does not typically review NEPA documents concurrent with the lead agency review.

We are aware that the lead Federal agencies have identified significant concerns in their recent Progress Assessments.[2] We also recognize that the Habitat Conservation Plan (HCP), which is incorporated by reference into the ADEIS, and the Preferred Alternative, evaluated in both, are works in progress. Accordingly, we anticipate substantial revisions to the documents as the lead agencies make revisions to the proposed project and analyses leading up to the publication of the DEIS. Finally, we note that this DEIS is intended to be a programmatic level analysis of the HCP as a whole, but also a site-specific analysis of the proposed tunnel export facility. This approach is unusual, and great clarity is needed in the DEIS to ensure that decision makers and the interested public are not confused by the different levels of analysis.

EPA has reviewed the ADEIS to the extent that workloads and scheduling allowed; however, given the evolving nature of the BDCP, the comments that we are submitting today should not be considered a comprehensive list of all EPA concerns and input related to this project. In this email, we are raising issues and making recommendations in eight key areas based on a focused review of the Preferred Alternative in the ADEIS: Alternatives Analysis; Adverse Impacts on Water Quality; Aquatic Species and Scientific Uncertainty; Impacts on Fish Populations; Programmatic vs. Project Level Analysis; Climate Change; Adaptive Management and Mitigation Commitments; and CWA Section 404. More detailed comments and recommendations are provided in the attached table. EPA will continue to participate in discussions with the co-lead and other cooperating agencies in the months ahead to assist in resolving these and other issues as the DEIS development proceeds. Pursuant to our independent review responsibility under Section 309 of the Clean Air Act, we will also review and comment on the DEIS when it is released for public review and comment.

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[1] See p. 21-22 of EPA's 2012 Action Plan http://www2.epa.gov/sites/production/files/documents/actionplan.pdf
[2] http://baydeltaconservationplan.com/BDCPPlanningProcess/DocumentsAndDrafts.aspx

I. Alternatives Analysis

The NEPA process is intended to help public officials make decisions that are based on an informed understanding of environmental consequences (40 CFR 1500.1(c)). Critical to this is a clear comparison of the impacts of the project alternatives. While the ADEIS contains a wealth of information and many project-level details, it does not clearly distinguish between alternatives with regard to their impacts. The ADEIS generally divides the impacts analyses for the numerous water quality constituents into two subsections: direct project-level impacts from facilities operations, and indirect programmatic-level impacts from tidal and nontidal marsh restoration and other conservation projects. Construction-related impacts and cumulative impacts are discussed in their own separate sections. The ADEIS further divides the direct project-level impacts into three subcategories based on location, i.e., upstream, in Delta, and export service area. Furthermore, all of this is done for each of the ten alternatives, including the No Action alternative, overlaid with the eleven different operational scenarios A-H4. No comprehensive comparison of alternatives is provided.

While Chapter 11's Summary of Effects compares each alternative's impacts on fish and aquatic resources to those of the Preferred Alternative, we found such comparisons to be of limited value. A more appropriate and informative approach would be to compare each alternative to the No Action alternative with regard to all impacts. We also recommend that the DEIS clarify cause-and-effect relationships between alternatives and impacts and include a comprehensive assessment of the relative magnitude and causes of the predicted decreases in water quality.

The DEIS should sharply distinguish between alternatives and evaluate their comparative merits, consistent with 40 CFR 1502.14(b). The linkages between impacts and their primary causes should be clearly identified, as these are critical to the development of appropriate and effective mitigation strategies. For example, a percentage decrease in salinity at the Jones and Banks pumping plant should be interpreted to make it meaningful, i.e., the DEIS should explain what aspect of the project would cause this. Would this occur because more water would be pumped from the Sacramento River pursuant to certain operations criteria? Would it be the result of increased or decreased flows at Vernalis due to climate change? Why would this impact be the same for all the Alternatives? (p. 8-424).

Changes in Delta hydrology can influence water quality across a broad range of constituents. All of the waterways of the Bay Delta are water-quality impaired for one or more constituents.[3] In our scoping comments for the BDCP, we suggested that the EIS evaluate the effect of the alternatives on the salinity regime ("X2") and other constituents including boron, total organic carbon, dissolved oxygen, pesticides, mercury, selenium, ammonia and dissolved oxygen.[4] These parameters were selected through a multiagency and stakeholder effort to identify water quality indicators of highest relevance to protecting the beneficial uses of waters in the Bay Delta system. The ADEIS provides many of the water quality analyses suggested in our scoping letter; however, the following significant improvements are needed to adequately support informed decision making:

- First, the DEIS should evaluate each alternative's expected impacts to determine whether the narrative and numeric water quality standards would be met.

- Second, the DEIS should provide a consistent level of evaluation for each of the parameters across the alternatives and sharply compare the alternatives.

[3] http://www2.epa.gov/sites/production/files/documents/actionplan.pdf
[4] http://www2.epa.gov/sites/production/files/documents/epa_comments_bdcp_3rdno_051409.pdf

- Third, the DEIS should provide a comprehensive evaluation and comparison of impacts each alternative will have on the quality and quantity of the Bay Delta's aquatic habitats. These habitats are comprised of a mosaic of aquatic and terrestrial features, and occur along a continuum from tidal sloughs to open water, and along a salinity gradient spanning the Estuary. The habitats are essential for the reproduction and survival of migratory and resident fish populations.

  Evaluations of aquatic habitats should focus on each alternative's impact on salinity gradients, dissolved oxygen, and/or hydrodynamics. Evaluating the changes to the salinity gradient throughout the year would provide information about the quality and quantity of salinity zones preferred by key fish species for all or parts of their life cycles. Similarly, the DEIS should evaluate potential changes in dissolved oxygen levels and hydrodynamics affecting the continuity and integrity of migratory corridors, which would either improve or degrade the ability of migratory fish to successfully reach the ocean and return to spawning sites. Such information is essential for understanding how each alternative would benefit or negatively impact fish populations.

II. Adverse Impacts on Water Quality

Chapter 8 of the ADEIS indicates that, as proposed, all project alternatives of the BDCP would result in adverse effects to one or more beneficial uses within the affected water bodies. Although incomplete, the material in the ADEIS suggests that the Preferred Alternative would have significant unmitigated adverse impacts on water quality in the Delta. For example:

- The proposed changes in water management would measurably exacerbate impairment of agricultural and aquatic life beneficial uses in the South Delta and Suisun Marsh (p. 425);
- Bromide, chloride, DOC, and salinity/EC levels are expected to increase due to seawater intrusion as a result of both climate change and the implementation of the Preferred Alternative (p. 8-407, 415, 425, 442). In addition, the effectiveness of mitigation actions for salinity/EC is uncertain (p. 426) making it difficult to understand the net effect to salinity/EC levels;
- Mercury, pesticide, and selenium exposure levels may increase and be cumulatively significant (p. 730); and
- Water quality degradation resulting from the increased pumping of freshwater from the North Delta could cause increases in water treatment costs (p.8-408).

As noted in EPA's Bay-Delta Action Plan, most of the water quality constituents identified above are already important stressors on the beneficial uses of the Delta. For example, sport fish in the Delta are already burdened with higher concentrations of mercury than anywhere else in the State,[5] and the occurrence of this powerful neurotoxin in the food web poses a threat to public health and the ecosystem as a whole. The State Water Resources Control Board (State Water Board) has observed that when the Yolo Bypass is flooded, it becomes the dominant source of methylmercury to the Delta, and that restoration activities could exacerbate the existing mercury problem.[6] While EPA strongly supports

[5] SWAMP- Surface Water Ambient Monitoring Program
http://www.waterboards.ca.gov/water_issues/programs/swamp/rivers_study.shtml
[6] P. 29 Periodic Review of the 2006 Water Quality Control Plan, State Water Resource Control Board

restoration of aquatic habitat in the Delta, care must be exercised to ensure that there are not unintended consequences of restoration actions that adversely affect water quality. The DEIS must include appropriate mitigation measures to address projected adverse impacts on water quality to ensure that beneficial uses would be protected.

The ADEIS appears to evaluate a broad range of construction elements for Conservation Measure 1 (CM1); however, the operational elements appear to be very similar to one another (Table 3-6 p. 3-33). Pursuant to its Strategic Plan, the State Water Board has recently initiated a review of the Bay Delta Water Quality Control Plan (Bay Delta WQCP), including an effort to update the flow standards that define freshwater flows through the Delta. It is reasonable to anticipate that several such State Water Board reviews, as well as significant changes in the regulatory regime affecting Delta exports and outflow, would occur during the fifty-year term of the HCP permit. Given the limited variability of the operational scenarios presented in the ADEIS, the extent to which the operation of CM1 would be able to adjust to such changes is not clear. The DEIS should explain how the operations plans for the BDCP would be adjusted to account for any new regulatory provisions prior to or during the life of the permit.

III. Aquatic Species and Scientific Uncertainty

Compared to the No Action alternative and existing conditions, many of the scenarios of the Preferred Alternative "range" appear to decrease Delta outflow (p. 5-82), despite the fact that several key scientific evaluations by federal and State agencies indicate that more outflow is necessary to protect aquatic resources and fish populations.[7] In addition, recent technical reports and emerging research raise questions about whether the proposed restoration of tidal marsh is feasible,[8] possible[9], or effective.[10] These are scientific questions about the assumptions used to support restoration proposals and projections of anticipated benefits to fish populations. We understand that the lead Federal and State agencies and project proponents are engaged in discussions to identify and resolve these scientific issues. Such scientific uncertainties should be disclosed and described in the DEIS, pursuant to NEPA regulations at 40 CFR 1502.22 and 1502.24.

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http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/periodic_review/docs/periodicreview2009.pdf

[7] State Water Resources Control Board's, 2010 Flows Report, p.2.

"Interior remains concerned that the San Joaquin Basin salmonid populations continue to decline and believes that flow increases are needed to improve salmonid survival and habitat." USFWS May 23, 2011 Phase I Scoping Comments, available at: http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/bay_delta_plan/water_quality_control_planning/cmmnts052311/amy_aufdemberge.pdf

"Inadequate flow to support fish and their habitats is directly and indirectly linked to many stressors in the San Joaquin river basin and is a primary threat to steelhead and salmon." NMFS February 4, 2011 Phase I Scoping Comments, available at: http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/bay_delta_plan/water_quality_control_planning/cmmnts020811/010411dpowell.pdf

"…current Delta water flows for environmental resources are not adequate to maintain, recover, or restore the functions and processes that support native Delta fish." Executive Summary in 2010 CDFG Flow Criteria.

"a strong majority of scientists prioritizes habitat and flow management actions that would restore more natural processes within and upstream of the delta" (p. 2) http://www.ppic.org/content/pubs/report/R_413EHR.pdf

[8] NMFS Progress Assessment and Remaining Issues Regarding the Administrative Draft BDCP Document (04/4/2013), page 15.

[9] U.S. Fish and Wildlife Service Staff BDCP. The broad concern is that the tidal prism would be diminished over time by the large increases in tidal habitat..

[10] Lucas, L. V., and J. K. Thompson. 2012. Changing restoration rules: Exotic bivalves interact with residence time and depth to control phytoplankton productivity. Ecosphere 3(12):117. http://www.esajournals.org/doi/pdf/10.1890/ES12-00251.1. The issue raised is whether the increaseed prodcution of plankton by the restored wetlands would be offset by the increased consumption by exotic bivalves as they spread into the restored wetlands..

IV. Impacts on Fish Populations

Federal and State agencies have been directed to make all reasonable efforts to at least double the natural production of anadromous fish in California's Central Valley streams on a long-term, sustainable basis.[11] The State has adopted this doubling goal as a water quality objective in its WQCP.[12] The ADEIS estimates, for all alternatives, the water supply benefits to those who receive water from the Central Valley Project (CVP) and State Water Project (SWP) under contract with Reclamation and DWR, respectively (p. 5-83), but provides no estimates of impacts on the sizes of imperiled fish populations that would result from the construction and operation of any alternative, nor under existing and no action conditions. EPA recommends that the DEIS provide a forecast of the potential responses of fish populations to the alternatives, based on a review of available scientific literature.[13] The DEIS should disclose how each alternative would achieve numeric targets associated with federal and State goals for increasing fish populations.

V. Programmatic vs Project Analysis

The ADEIS states that it takes a programmatic approach toward evaluating all elements of the HCP except for CM1 (the proposed new intakes, twin tunnels, and other infrastructure for new water conveyance), for which the ADEIS states that it takes a project-level approach. The level of engineering detail provided for the tunnels, however, is not commensurate with the level of site-specific information typically provided in an EIS for a project that will require federal permits.[14] For example, actions (such as grading, dredging, trench and fill, boring, spoils piles, levee work, excavation) that result in impacts to aquatic resources are not detailed (i.e. acres and/or linear feet of estimated impacts to waters of the US, volume of sediment proposed for disposal sites Part 3, p. 12-22). Thus, it is difficult to fully assess the project-level impacts and mitigation opportunities, and it is not clear whether the project, as proposed, would satisfy requirements for requisite authorizations and permits. We recommend that the DEIS provide a level of detail that supports meaningful calculations of anticipated direct and indirect effects of the project-level elements, and clarify whether this EIS is meant to support a permit decision for CM1.

VI. Climate Change

We appreciate the substantial consideration that climate change has been given in this document. Climate change impacts (sea level rise, shifts and timing of precipitation and snowpack, etc.) have been modeled and incorporated into the No Action and all the Action Alternatives. Project impacts (from the proposed construction and operation of the new conveyance, as well as the other restoration measures) have thus been compared to future conditions with and without climate change. The document concludes that the establishment of a North Delta diversion facility would provide substantial resiliency and adaptation benefits over the No Action alternative for dealing with the combined effects of sea level rise due to

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[11] 1992 Central Valley Protection Improvement Act. In its 2005 update to the implementation plan for the Anadromous Fish Restoration Program (AFRP), FWS estimated the flow volumes that would be necessary to 'double' the natural production of certain Central Valley salmonids.

[12] *"measures in the watershed, sufficient to achieve a doubling of natural production of Chinook salmon from the average production of 1967-1991, consistent with the provisions of State and federal law."* State Water Resources Control Board, 13 December 2006, Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary, (Bay-Delta WQCP). Table 3, pp. 14.

[13] Kimmerer, W. J. 2002. Effects of freshwater flow on abundance of estuarine organisms: Physical effects or trophic linkages? Marine Ecology Progress Series 243:39-55 United States Fish and Wildlife Service, September 27, 2005. http://www.int-res.com/abstracts/meps/v243/p39-55/

Recommended Streamflow Schedules To Meet the AFRP Doubling Goal in the San Joaquin River Basin (FWS 2005), pp. 27. http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/bay_delta_plan/water_quality_control_planning/docs/sjrf_spprtinfo/afrp_2005.pdf

[14] p. 6 NMFS Progress Assessment http://baydeltaconservationplan.com/BDCPPlanningProcess/DocumentsAndDrafts.aspx

climate change (p. 29-15).

EPA believes that, depending on how key components of the BDCP are designed and operated, the BDCP *could* provide climate change resiliency and adaptation benefits; however, we are concerned that the ADEIS attributes adverse effects on aquatic resources solely to climate change without adequate consideration of the extent to which the BDCP, as proposed, could exacerbate – or mitigate -- those impacts (e.g., p. Ch 11 SUM-45). Such an approach appears short-sighted and overlooks the fact that the Delta is a highly managed system with a vulnerability to climate change that is, to some degree, a function of its management. In keeping with the co-equal goals of the BDCP, we recommend that the DEIS discuss measures that could be taken to mitigate the impacts of climate change on the aquatic ecosystem (e.g., releasing cold water flows from reservoirs at critical times to protect beneficial uses), in addition to measures to mitigate the impacts of climate change on the water recipients. We look forward to working with the lead agencies and project proponents to identify mitigation strategies that will help buffer the Bay Delta ecosystem from the detrimental effects of climate change and the resulting sea level rise.[15]

VII. Adaptive Management and Mitigation Commitments

The ADEIS concludes that certain impacts would be reduced to insignificance by mitigation, but does not explain the basis for such conclusions (for example, construction impacts and water quality p. 8-473). Assertions are made that adequate mitigation will be ensured by, for example, the CWA §401 certification process. Any finding that a mitigation measure reduces an impact to a level of insignificance should be supported in the DEIS by a detailed discussion of the basis for that conclusion, including a clear explanation of the assumptions underlying the analysis of mitigation measure effectiveness. The analysis should specifically describe the mitigation measure, identify the source(s) of pollutants that are expected to be affected by the measure, clearly explain how and to what extent the measure will affect the source(s), and identify the basis for the estimate (empirical observations, computer modeling, case studies, etc.).

VIII. CWA Section 404

Although there is no statutory requirement that the NEPA document prepared for an HCP under the Endangered Species Act be used as the basis for permits and certifications required under CWA §404 to authorize and implement the project, EPA recognizes the importance of coordination in federal review. Toward this end, EPA and the Corps have met with the project proponent on numerous occasions over the past several years in the interest of using the BDCP EIS/EIR to inform the Corps' 404 regulatory decisions. Despite these efforts, significant unresolved issues remain about the scope of analysis for the proposed project, the level of detail required to trigger the consultation process and federal permitting, and the structure of a comprehensive permitting framework for the proposed project. We are prepared to continue working with the Corps and the project proponent in the months ahead to seek resolution of these issues.

EPA appreciates this early coordination opportunity and we look forward to continued constructive involvement in the development of the BDCP EIS/EIR. Please see our attached comments detailing some additional concerns and recommendations. If you have any questions about our comments, please call Stephanie Skophammer, the lead NEPA reviewer, or Erin Foresman, the Water Division lead, for this project. Stephanie can be reached at (415) 972-3098 and skophammer.stephanie@epa.gov and Erin can

[15] Climate Change Handbook for Regional Water Planning http://www.water.ca.gov/climatechange/CCHandbook.cfm
Vulnerability Assessments in Support of the Climate Ready Estuaries Program: A Novel Approach Using Expert Judgment, Volume I: Results for the San Francisco Estuary Partnership http://cfpub.epa.gov/ncea/global/recordisplay.cfm?deid=241556

be reached at (916) 930- 3722 and foresman.erin@epa.gov.

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[1] See p. 21-22 of EPA's 2012 Action Plan http://www2.epa.gov/sites/production/files/documents/actionplan.pdf
[2] http://baydeltaconservationplan.com/BDCPPlanningProcess/DocumentsAndDrafts.aspx
[3] http://www2.epa.gov/sites/production/files/documents/actionplan.pdf
[4] http://www2.epa.gov/sites/production/files/documents/epa_comments_bdcp_3rdno_051409.pdf
[5] SWAMP- Surface Water Ambient Monitoring Program
http://www.waterboards.ca.gov/water_issues/programs/swamp/rivers_study.shtml
[6] P. 29 Periodic Review of the 2006 Water Quality Control Plan, State Water Resource Control Board
http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/periodic_review/docs/periodicreview2009.pdf
[7] State Water Resources Control Board's, 2010 Flows Report, p.2.
"Interior remains concerned that the San Joaquin Basin salmonid populations continue to decline and believes that flow increases are needed to improve salmonid survival and habitat." USFWS May 23, 2011 Phase I Scoping Comments, available at:
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"Inadequate flow to support fish and their habitats is directly and indirectly linked to many stressors in the San Joaquin river basin and is a primary threat to steelhead and salmon." NMFS February 4, 2011 Phase I Scoping Comments, available at:
http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/bay_delta_plan/water_quality_control_planning/cmmnts020811/010411dpowell.pdf
"…current Delta water flows for environmental resources are not adequate to maintain, recover, or restore the functions and processes that support native Delta fish." Executive Summary in 2010 CDFG Flow Criteria.
"a strong majority of scientists prioritizes habitat and flow management actions that would restore more natural processes within and upstream of the delta" (p. 2) http://www.ppic.org/content/pubs/report/R_413EHR.pdf
[8] NMFS Progress Assessment and Remaining Issues Regarding the Administrative Draft BDCP Document (04/4/2013), page 15.
[9] U.S. Fish and Wildlife Service Staff BDCP. The broad concern is that the tidal prism would be diminished over time by the large increases in tidal habitat..
[10] Lucas, L. V., and J. K. Thompson. 2012. Changing restoration rules: Exotic bivalves interact with residence time and depth to control phytoplankton productivity. Ecosphere 3(12):117. http://www.esajournals.org/doi/pdf/10.1890/ES12-00251.1. The issue raised is whether the increaseed prodcution of plankton by the restored wetlands would be offset by the increased consumption by exotic bivalves as they spread into the restored wetlands..
[11] 1992 Central Valley Protection Improvement Act. In its 2005 update to the implementation plan for the Anadromous Fish Restoration Program (AFRP), FWS estimated the flow volumes that would be necessary to 'double' the natural production of certain Central Valley salmonids.
[12] *"measures in the watershed, sufficient to achieve a doubling of natural production of Chinook salmon from the average production of 1967-1991, consistent with the provisions of State and federal law*." State Water Resources Control Board, 13 December 2006, Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary, (Bay-Delta WQCP). Table 3, pp. 14.
[13] Kimmerer, W. J. 2002. Effects of freshwater flow on abundance of estuarine organisms: Physical effects or trophic linkages? Marine Ecology Progress Series 243:39-55 United States Fish and Wildlife Service, September 27, 2005. http://www.int-res.com/abstracts/meps/v243/p39-55/
Recommended Streamflow Schedules To Meet the AFRP Doubling Goal in the San Joaquin River Basin (FWS 2005), pp. 27.
http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/bay_delta_plan/water_quality_control_planning/docs/sjrf_spprtinfo/afrp_2005.pdf
[14] p. 6 NMFS Progress Assessment http://baydeltaconservationplan.com/BDCPPlanningProcess/DocumentsAndDrafts.aspx
[15] Climate Change Handbook for Regional Water Planning http://www.water.ca.gov/climatechange/CCHandbook.cfm
Vulnerability Assessments in Support of the Climate Ready Estuaries Program: A Novel Approach Using Expert Judgment, Volume I: Results for the San Francisco Estuary Partnership http://cfpub.epa.gov/ncea/global/recordisplay.cfm?deid=241556

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BDCP EIR/EIS Review Document Comment Form

Document: ***BDCP EIS Administrative Draft—***

Comment Source: U.S. EPA (contacts: Stephanie Skophammer, Erin Foresman)
Submittal Date: 07-03-13

Comment #	Chapter	Page	Line #	Comment	ICF Response
1	2		General	A more detailed discussion of delta ecosystem health and productivity, water reliability, and the role of water demand would substantially improve support for the Need Section of the Purpose and Need Chapter. This information includes aquatic life population trends and anticipated water demand. Some of this information is documented (e.g. in Ch 5) and readily available and should not be a cumbersome task to include in the Need section.	
2	3	3-3		Section 3.1.1 – is the Preferred Alternative also preferred under NEPA or just CEQA?	
3	3	3-3	16–1 9	This sentence refers to Alternative 4 of the BDCP. Is it really CM1 Alternative 4 that is being discussed in the sentence or BDCP Alternative 4?	

[1] Tables 5-7 and 5-8, Chapter 5 Water Supply Administrative Draft EIS for BDCP.
[2] (a) Public Policy Institute of California (2013) Scientist and Stakeholder Views on the Delta Ecosystem "*a strong majority of scientists prioritizes habitat and flow management actions that would restore more natural processes within and upstream of the delta*" (p. 2).
http://www.ppic.org/content/pubs/report/R_413EHR.pdf
(b) State Water Resources Control Board (2010) Development of Flow Criteria for the Sacramento-San Joaquin Delta Ecosystem Flows Report, p.7. "*both flow improvements and habitat restoration are essential to protecting public trust resources [defined as "native and valued resident and migratory species habitats and ecosystem processes*" p. 10].
(c) National Academy of Sciences Natural Resource Council Committee on Sustainable Water Management in California's Bay-Delta (2012) Report: Sustainable Water and Environmental Management in California's Bay-Delta "*...sufficient reductions in outflow due to diversions would tend to reduce the abundance of these organisms ["these organisms" = 8 Bay Delta aquatic species at various trophic levels].*" Page 60 and "*Thus, it appears that if the goal is to sustain an ecosystem that resembles the one that appeared to be functional up to the 1986-93 drought, exports of all types will necessarily need to be limited in dry years, to some fraction of unimpaired flows that remains to be determined.*" Page 105
(d) NMFS Progress Assessment and Remaining Issues Regarding the Administrative Draft BDCP Document http://baydeltaconservationplan.com/Libraries/Dynamic_Document_Library/NMFS_Progress_Assessment_Regarding_the_BDCP_Administrative_Draft_4-11-13.sflb.ashx; and NMFS February 4, 2011 Phase I Scoping Comments "*Inadequate flow to support fish and their habitats is directly and indirectly linked to many stressors in the San Joaquin river basin and is a primary threat to steelhead and salmon.*" available at:
http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/bay_delta_plan/water_quality_control_planning/cmmnts020811/010411dpowell.pdf
(e) U.S. Fish and Wildlife Service Staff BDCP Progress Assessment. April 3, 2013
http://baydeltaconservationplan.com/Libraries/Dynamic_Document_Library/U_S_Fish_and_Wildlife_Service_Staff_BDCP_Progress_Assessment_4-11-13.sflb.ashx; and "*Interior remains concerned that the San Joaquin Basin salmonid populations continue to decline and believes that flow increases are needed to improve salmonid survival and habitat.*" USFWS May 23, 2011 Phase I Scoping Comments, available at:
http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/bay_delta_plan/water_quality_control_planning/cmmnts052311/amy_aufdemberge.pdf

4	**3**	3-3	16–1 9	We recommend adding text to this section that explains the apparent difference in opinion about scientific knowledge regarding the relationship between Delta outflows and restoring ecosystem processes and fish populations and Delta outflows resulting from the preferred alternative operational scenario. The preferred Alternative 4 results in minor changes, -1% to 5%,[1] to Delta outflow relative to existing conditions. This suggests that BDCP applicants consider these changes sufficient to meet the ESA Section 10 requirement of "contributing to recovery of endangered and threatened species." There is broad scientific agreement that existing Delta outflow conditions are insufficient for protecting the aquatic ecosystem and multiple fish species, and that both increased freshwater flows and aquatic habitat restoration are needed to restore ecosystem processes in the Bay Delta and protect T & E fish populations.[2] This includes statements from lead federal agencies. If there is sound scientific information that supports the perspective that increased Delta outflows are not needed and habitat restoration alone would be able to restore ecosystem processes and protect fish species, it should be presented in this DEIS.	
5	**3**	3-3	16–1 9	The phrase "…DWR considers to be an optimal balance between ecological and water supply objectives" in reference to Alternative 4 implies that DWR is optimizing a balance between the aquatic ecosystem and water supply and throughout the entire water delivery system. We recommend modifying this sentence to more precisely communicate that a portion of the water supply system is being modified to improve reliability and that Alternative 4 is intended to optimize ecological and water supply objectives under a portion of the CVP-SWP delivery system. This would better communicate that adjusting deliveries north of the Delta is not included as a potential method of optimizing ecological and water supply objectives.	
6	**3**	3-11	17-19	The reasons for eliminating these alternatives	

(f) California Department of Fish and Wildlife (2010) Quantifiable Biological Objectives and Flow Criteria "…*current Delta water flows for environmental resources are not adequate to maintain, recover, or restore the functions and processes that support native Delta fish*." Page 1 in Executive Summary

[1] Tables 5-7 and 5-8, Chapter 5 Water Supply Administrative Draft EIS for BDCP.

				should be more clearly identified. The document refers to the screening analysis appendix but these decisions should be highlighted in the DEIS.	
7	**3**	3-17	Table 3-2	Are the activities to reduce the effects of methylmercury contamination also focused on minimizing transport of methylmercury? The text here only refers to formation.	
8	**3**	3-20	7	Will near term CMs include acquisition of terrestrial and wetland habitat only or will they include restoration actions too? If so, we recommend including restoration actions in this sentence. It appears that the action is only to acquire the land but not to actively restore it for benefits to fish and wildlife in the near term.	
9	**3**	3-30	6-9	What are the reasons for assuming that regulating the ratio of exports to imports would not apply to the north of delta intakes?	
10	**3**	3-31	28-29	Why is 55% unimpaired flow from **February** to June evaluated instead of a range of unimpaired flows from **January** to June as it is suggested in the State Water Board 2010 Flow Criteria Report? Is this a typographical error or is it really February to June 55% unimpaired flow? If so, why does it not include January?	
11	**3**	3-33	Table 3-6	The comparison among operational elements of the nine CM1 alternatives presented in this table appears to show that the operational elements of the nine alternatives are very similar to one another. This can be seen in Tables 5-5, 5-7, and 5-8 where we see that Delta Outflow varies between -2% to 14% relative to existing conditions. We anticipate high potential for positive and negative CM1 impacts on aquatic communities to be a direct result of the operational elements of the CM1 alternatives. Predicted water quality exceedences for all the alternatives are potentially a product of having very similar operational elements in the alternatives. One way to expand the operational elements would be to determine operational scenarios that mitigate water quality exceedences below the level of water quality standards or other relevant benchmarks.	
12	**3**	3-37	Whole section	Does the No Action Alternative include D-1641 spring flows at Vernalis or VAMP flows?	
13	**3**	3-158	Table 3-13, 3-14, and 3-15.	Information about historical flows should be provided with these tables to provide a frame of reference for understanding the North Delta Intake Bypass Flow Criteria, Post-Pulse criteria, and OMR flow criteria. This could be done using cumulative flow distributions that show how often flows identified in the operational rules are in the Rivers	

				at given locations, during certain times of the year. This information should be available for comparisons for all of the Scenarios.	
14	**3**	3-103	27-39	Are upgrades to the Fremont Weir part of the proposed project (p. 3-103) OR part of the No Action (p. 3D-19)? It seems like they cannot be both.	
15	**3**	3-100	Whole section	How often/how much would the Yolo Bypass be flooded across the different water year types and life of the permit?	
16	3	3-182	Table 3-23	Adaptive management should include operational elements that result in a broader range of freshwater flows through the Delta than are currently identified in H1-H4.	
17	**3**	3-181	General	Has an adaptive management strategy with targets been identified for any of the other alternatives?	
18	**3A**	3A	General	This screening analysis is relevant to a programmatic document and should be in a DEIS chapter directly instead of being placed in an appendix.	
19	**3A**		General	This is the first time EPA has reviewed this screening document. These screening criteria were not evaluated or agreed upon by EPA previously. We were not requested to provide any comments or suggestions prior to this review. These comments represent a first initial review of this document and are not likely to include all comments that emerge from a comprehensive reading of the entire document. In particular, we emphasize that our review and comments should not be read as agreeing that these screening criteria are being used appropriately to identify the alternative most likely to contain the Least Environmentally Damaging Practicable Alternative (LEDPA) at a programmatic level, consistent with the 404(b)(1) Guidelines at 40 CFR Section 230. We would like to meet with the lead and cooperating federal agencies to discuss how these criteria were developed and applied to determine whether or not they are consistent with NEPA and other regulatory requirements for evaluating project alternatives, the 404(b)(1) Guidelines in particular.	
20	**3A**	3A-14	12-33	The Purpose and Need statement in Appendix 3A is different from the statement in ADEIS/EIR Chapter 2 Purpose Statement (Chapter 2, page 2-4 and 2-5). Which version of the purpose statement was used for screening?	
21	**3A**	3A-14	13-38	The text should be clear about whether or not the screening process eliminated alternatives because they did not meet the these elements of the purpose statement in Appendix 3A:	

				"reducing the adverse effects to certain listed species of diverting water by relocating the In takes of the SWP and CVP." This element limits alternatives to only those that build new SWP and CVP pumps in the north Delta. This would eliminate Alternative 9, but that one was carried forward. "up to full contract amounts"	
22	**3A**	3A-17	16-36	Are these bullets the Third Level Screening Criteria? The topic sentence says the bullets below are "considerations reflected in the Third Level Screening Criteria." The Third Level Screening Criteria should be contained in one table with the metrics used to determine whether or not criteria are met.	
23	**3A**	3A-23	8-35	We would like to discuss this screening criterion with the lead federal agencies and discuss their perspective on how it is consistent with NEPA: "Would the potential alternative result in the impairment of existing senior water rights in the Sacramento - San Joaquin Rivers watershed who are not applicants for incidental take authorization through the proposed Bay Delta Conservation Plan?"	
24	**3A**	3A-23	8-35	We are concerned that the above criterion may result in the elimination of alternatives that are less damaging to the aquatic environment, which presents a substantial CWA Section 404 permitting problem because CWA Section 404 permits are restricted to the LEDPA.	
25	**3A**	3A-71	13-38	Unlike the preferred alternative for CM1, which would only minimally change flows through the estuary, this alternative would substantially increase flows through the estuary and provide greater protection for resident fishes. It is important to demonstrate that eliminating this alternative did not eliminate a potentially less environmentally damaging practicable alternative. If such documentation does not already exist, a more complete analysis of this alternative may be required for a CWA permit.	
26	**3A**	3A-84	Table 3A-1	Is there a quantitative definition of "most" that was used in the screening process? Is this greater than 50% of the criteria? Are all criteria considered equal?	
27	**5**	5-4	24	Information about water demand and population growth should be expanded to describe the relationship between water demand and population growth and the reasons it is assumed	

				that demand will grow. Similarly, a discussion about agricultural water use and estimated future changes in the use of SWP/CVP water is also appropriate to describe. This information would also be very useful as support for the Need Statement in Chapter 2.	
28	**5**	5-85	Also table 5-7	North of Delta M&I would increase up to 85% compared to existing conditions. This seems like a very large increase from past trends, and further explanation and support is needed for such an increase. If this is related to population growth, that should be explained here, too (related to table 30-6). And is this 85% increase included in the No Action as well as Alt 4? (p. 5-45).	
29	**5**	5-11	8-15	It may be more straightforward to use the words "shorten the route of Sacramento River Water to the export facilities" instead of "improve the transfer." Readers not familiar with the system will not understand how the transfer is improved by reading that and the word "transfer" can be confused with "water transfers" which are a very different concept than shortening the route of water from the Sac River to the export facilities.	
30	**5**	5-11	8-15	It would also be equitable to explain here that there are some negative impacts to the ability of adult San Joaquin River salmon to successfully navigate back to the San Joaquin River when Sacramento River Water is relocated into the south Delta including San Joaquin River channels.	
31	**7**	7-32	31-41	The topic sentence of this paragraph says that there will be minor changes in water supply availability that are equal to 2% of current groundwater production. Are these changes an increase or a decrease?	
32	**7**	7-81; 7-82	36-39; 1-12	Alternative 4 is compared to Alt 1 and Alt 2A. This is confusing to the reader because impacts should be directly stated and compared to the baseline. (ie No Action and Existing Conditions). H3 is said to represent the impacts of Alternative 4, but an explanation for why this is so is not provided here.	
33	**7**	7-53	Table 7-7	Why is this table not in the water supply chapter?	
34	**7**	7-83	34-36	Does it make sense to use H3 to represent all of Alt 4 just because it represents the original Alt 4? The operational criteria of H1 and H4 are very different, and yet, the impacts are not discussed in the following paragraphs.	
35	**7**	7-86	39-40	Why the comparison to 6A??	
	7	7-46	31-32	What kinds of contaminants can be expected to be discharged with this water? If it's in Ch 8, where is it located there (p.#)?	
36	**7**	7-47	27-28	Is this information unavailable at this time?	

37	**7**	7-50	23	Shouldn't this be described here first and the reference included secondly on the next page?	
38	**7**	7-48	14-17	What is the current status of seepage now at Byron tract forebay? This is not discussed in existing conditions. What kinds of land would potentially be impacted by seepage around the construction of a new intermediate forebay? Would the size of the forebay be smaller for Alt 4 (less intakes)	
39	**7**	7-49	41	These design features should be described in much more detail since they form the basis for the no adverse impact conclusion.	
40	**7**	7-110	37-41	What is the difference between those projects included in the cumulative impacts and those included in the No action alternative? (ie Grassland project is mentioned for the No Action (line 28) and for the cumulative impacts (table 7-8)	
41	**8**	General		Is there a section that explains how the 72 water quality constituents identified in Table SA-11 "WQ constituents for which detailed assessment were performed" (page 8C-40) were narrowed into the 15 WQ metrics evaluated for CM1?	
42	**8**	General		A table that shows how each CM1 alternative meets or exceeds narrative and numeric water quality standards for the water quality constituents that received more detailed analysis should be created. This comparison is important for NEPA disclosure and for permits, authorizations, and certifications that will be needed to build CM1.	
43	**8**	8-53	17-26	This discussion should include text that discloses concerns scientists have with existing selenium criteria not being protective enough of aquatic life (see discussion on page 17 in *US EPA Bay Delta Action Plan* available at http://www2.epa.gov/sites/production/files/documents/actionplan.pdf), and plans to update selenium criteria. A useful example of this information is on pages 32 and 33 of *US EPA Unabridged Advance Notice of Proposed Rulemaking for Water Quality Challenges in the San Francisco Bay/Sacramento-San Joaquin Delta* available at http://www2.epa.gov/sites/production/files/documents/baydeltaanpr-fr_unabridged.pdf	
44	**8**	8-394	19-43	Further describe the relationship between hydrodynamics and open water aquatic habitat such as year-round anticipated changes to the salinity gradient, quality and quantity of the low salinity zone, continuity of San Joaquin river water from Vernalis to the Delta and migratory corridors for returning adult salmon, and continuity of dissolved oxygen levels along that corridor. Aquatic habitat discussion may be better organized	

				into Chapter 11 but this section on Delta Hydrodynamics is connected and relevant to the relationship between WQ elements and the quality and quantity of open water habitats. It could be much more robust than the information presented, which is focused on meeting WQ objectives due to hydrodynamics changes. If this discussion is not included here, a reference should be provided to such a discussion in Chapter 11.	
45	**8**	8-395	1-10	This section should provide all of the changes to outflow associated with each alternative H1-H4 relative to existing conditions and no action alternative (some of this is in Ch 5 but since it is referenced here it should be discussed). It should also provide the percent change for H1-H4 relative to existing conditions and no action alternative.	
46	**8**	8-395	6-10	The conclusion that the preferred alternative results in increased sea water intrusion in all years in addition to conclusions about EC levels in the southern Delta (see page 8-425 and -426) shows a high potential for substantially negative impacts on the quality and quantity of open water aquatic habitats such as the low salinity zone (0.5-6 ppt salinity), and migratory corridors for salmonids. An analysis of changes to the salinity-gradient and the quality and quantity of open water aquatic habitats is necessary for evaluating impacts to aquatic resources that use specific zones along these gradients as part of their primary habitat for all of part of their life cycle.	
47	**8**	8-397	Table 8-67	We recommend making comparisons to the 2009 draft EPA ammonia aquatic life criteria.	
48	**8**	8-407	7-11	The project impacts from bromide to drinking water supplies appears to exceed water quality standards by reducing water quality for the municipal beneficial use below appropriate protection levels.	
49	**8**	8-413	22-26	Making beneficial use impairments measurably worse and exceeding chloride objectives presents significant challenges for concluding that the preferred alternative protects aquatic life and/or the Delta ecosystem. These conclusions also present a significant permitting challenge for CM1. Granting a CWA Section 404 permit is prohibited for projects that violate State Water Quality Standards (40 CFR 230.10(a)(b)(1) "no discharge of dredged or fill material shall be permitted if it causes or contributes, after consideration of disposal site dilution an dispersion, to violations of any applicable State water quality standard").	
50	**8**	8-432	14-17	The topic sentence concluding that there would be	

				no substantial, long-term increase in mercury or methylmercury concentrations or loads in the Delta is inconsistent with the preceding sentence that states that the potential for methylmercury creation in the Delta is adverse and previous statements in this section that the Delta does not have any assimilative capacity for increased loads of methylmercury transported to the Delta or formed within the Delta. The CEQA conclusion also appears to be inconsistent with the general understanding that restoring 20K acres of seasonal wetlands in Yolo Bypass will methylate mercury in the sediments and could become the largest source of methylmercury to the Delta when the bypass is flooded. Further explanation of the reason for this conclusion would be helpful. Or perhaps the topic sentence in the CEQA conclusion paragraph is an error?	
51	**8**	8-723		Please explain why the conclusions about cumulative water quality analyses are different than conclusions about water quality impacts from preferred operations: examples include dissolved oxygen, pesticides, mercury, and selenium.	
52	**8**	8-425 and 426	41-44 and 1-9	Making beneficial use impairments measurably worse and exceeding EC objectives present significant challenges for concluding that the preferred alternative protects agriculture and aquatic life beneficial uses and the Delta ecosystem. These impacts are also significant CWA permitting challenges, see previous comment on chloride and bromide.	
53	**8**	8-426	12-15	We recommend modifying the text to explain why mitigation measures are not available to the applicant. It seems that increasing flows is a mitigation measure that is available to the project applicant. Although doing so may mean that operations change enough to be considered a separate alternative, but the action of increasing flows is possible. This sentence suggests that the action is not something that could be done. It can be done, which makes the negative impact something that can be mitigated. It would be useful to remind the reader of the selection criterion in Chapter 3A which restricts operational elements of the CM1 alternatives to those that do not require changes to water rights other than CVP/SWP contractors. This seems to be the primary reason increased flows are not chosen as a potential source for mitigation.	
54	**8M**	8M-19	Table	The Kd values used (see Table 5M at page 8M-19)	

			5M	are too low; this tends to underestimate bioaccumulation. The values range from 1000 to 1760 for models 1 -8, and then 2840 for Model 9. EPA uses using Kd values of between 3000 and 5900 for EPA delta modeling (the actual range is much larger – approx. 1,300 – 13,000).	
55	8	8-89; 8-90	Tables 8-28, 8-29, para 4	The comparison of the tables underscores how little information we have about water quality in the Delta. This is acknowledged in the narrative. It must be remembered that assumptions are being made with no more than a snapshot of one day's measurements in some cases. These point strongly to the need to act conservatively until current conditions are better understood through more robust monitoring, and the impacts of the project alternative can be predicted with reasonable confidence.	
56	8	8-90	Para 4	The San Joaquin River currently contributes total ~10-15% of the flow to the Delta. The question is how much will that percentage change as a result of the project? Lower Sacramento River flow will increase the impact of higher selenium concentrations from the San Joaquin.	
57	8	8-93	Para 2	The food web preference of bass for insects explains why there was "….no difference in bass selenium concentrations in the Sacramento river at Rio Vista and in the San Joaquin River at Vernalis…" The statement that "…the reasons for this difference are unknown" suggests a lack of understanding of the basic assumptions of the selenium ecological model, i.e., that different food webs biomagnify selenium to greater or lesser extents.	
58	8	8-459	Para 6	The comment is made that nonpoint selenium sources in the San Joaquin Valley will be controlled through a TMDL. While it is true that the flows from the Grassland Bypass Project have reduced selenium inputs to the San Joaquin and, thus, the Delta, they have not yet achieved the TMDL limits. The project has had two extensions thus far, and has a "due date" of 2019. Besides the Grassland Area, the Westlands Area, which has not been able to discharge to the San Joaquin for many years, will receive drainage service by the US Bureau of Reclamation. The outcome is not certain for either of these areas to be able to meet TMDL limits that were set many years ago. Again, great progress has been made in the Grassland Area, but to imply that that the San Joaquin source will not continue to be an issue is rather speculative. The uncertainty around the issue should be acknowledged in the analysis.	

59	8	8-460-462	Impact WQ 26, Mitigation Measure WQ 26	It is well established that wetlands and other water bodies where flows are impeded by physical and biological barriers increase residence time and thus the likelihood of increasing the biotransformation of selenium sources. Proposing that the wetlands might be the problem implies that non-natural means (reducing access by wildlife, reducing organic matter build up) would be better suited as mitigation measures. This places the emphasis on the effect, rather than the cause. The Delta needs good quality water to support a healthy, non-selenium impacted ecosystem. Discussion of potential source-related solutions, such as delivering more low selenium water from Friant Dam to the San Joaquin River would be more realistic from an environmental perspective than developing wetlands where wildlife would not be welcome.	
60	**8M**	8M-19		The species used are largemouth bass which are not good bioaccumulators and are not particularly sensitive to selenium in their diet. A more sensitive species that bioaccumulates selenium, e.g., salmon or trout (both very toxicologically sensitive to selenium) would be a more appropriate indicator.	
61	**11**	11-1	2	The title of this chapter, Fish and Aquatic Resources, suggests it will include an assessment of impact to aquatic habitat; however, aquatic habitat is evaluated in "Chapter 12 Terrestrial Biology." The quality and quantity of aquatic habitat seems an important element of protecting T & E fish species. Why is the quality and quantity of aquatic habitat evaluated in the Terrestrial Biological Resources Chapter? This is confusing.	
62	**11**	11-1 and 11-2	28-34 and 1-24	This section describes aquatic habitat in the Delta and Suisun with a minor discussion about the salinity gradient and how it defines quality and quantity of aquatic habitat for target fishes. This section and this chapter should include an analysis of impacts to important open water aquatic habitats defined by the salinity gradient, e.g, marine and low salinity zones, and migratory corridors. These habitats should be included in the "Areas of Potential Environmental Effects" and included in the analysis of impacts to aquatic resources. The Low Salinity Zone is minimally described in this section but the quality and quantity of this habitat is not evaluated as primary and migratory habitat for target species. The salinity gradient, as approximated by X2, has an inverse relationship with many bay and estuarine species. For many species, fish	

				populations go down as X2 goes up (salinity intrusion into freshwater increases). Estimating changes to the salinity gradient for each operational scenario is important for understanding how the quantity and quality of estuarine habitats and fish populations change under CM1 operational scenarios A through G. This can be done using one-dimensional equations that calculate X2. Has X2 been calculated, seasonally or year round, for each of the operational scenarios A through G? A more holistic approach is using three-dimensional modeling (more equations) that maps the salinity gradient within the estuary. This makes it possible to estimate the size and location of salinity zones, such as the low salinity zone, under different operational scenarios.	
63	**11**	General		Estimates of relative fish population changes (increases or decreases relative to baseline) or estimates of absolute changes to fish populations are not estimated or disclosed in this section. Were these estimates generated? These evaluations are necessary for informed decision making regarding actions that contribute to recovery of endangered species and/or meet the biological goals and objectives in the HCP.	
64	**11**	General		Freshwater flow may be the best tool available to improve fish population response and protect aquatic life beneficial uses prior to the completion of planned restoration projects. Relative fish population responses to freshwater flow can be estimated using regression equations provided in the peer reviewed literature cited below. We recognize that these equations do not directly include the effects of tidal marsh and floodplain restoration on fish populations; however, we recommend that these tools be acknowledged in the EIS, with a explanation of why they were not used to estimate fish population responses to the proposed actions. Kimmerer, W. J. 2002. Effects of freshwater flow on abundance of estuarine organisms: Physical effects or trophic linkages? Marine Ecology Progress Series 243:39-55 United States Fish and Wildlife Service, September 27, 2005, Recommended Streamflow Schedules To Meet the AFRP Doubling Goal in the San Joaquin River Basin (FWS 2005), pp. 27 available at:	

				http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/bay_delta_plan/water_quality_control_planning/docs/sjrf_spprtinfo/afrp_2005.pdf Scientists will have improved ability to measure effects on fish populations as a function of tidal marsh and floodplain restoration projects after restoration projects are started and measurements and monitoring data become available.	
65	**11**	General		Comparing impacts on fish populations from project alternatives to existing conditions does not reflect the fact that existing conditions are very poor for fish populations and there is general agreement among scientists that native and migratory fish populations need to increase in order achieve self-sustaining population levels. Comparisons of fish population responses to project alternatives should be made to biological goals and objectives so that project alternatives can be distinguished from one another.	
66	**11**	General		Aquatic life benefits from the northern intake bypass flows are not clear and/or appear to be minimal. It appears that there is minimal improvement in fish entrainment and loss from operating a new Delta Conveyance because the times and conditions during which the entrainment effects of the present facilities are of greatest concern will continue to occur after the Delta Conveyance facilities are operating, since use of the northern intakes will be limited to times of higher Sacramento River flows per the North Delta Bypass criteria. At these times, entrainment at south Delta facilities has historically been low. South Delta intake facilities will continue to operate at times when Sacramento River flows are not high enough to operate the Sacramento intakes, which includes the conditions when entrainment effects of the south Delta facilities are greatest for T & E species.	
67	**11**	General		Estimated environmental benefits from dual diversion points (north and south Delta) may be reduced by issues that are not addressed in CM1. The current trash racks, fish screens and diversion facilities in the south Delta are not proposed to be changed. Invasive aquatic weeds and deferred maintenance have greatly impaired the effectiveness of the fish screens for much of the last 20 years. Redirecting diversions to these facilities will expose fish to the threats of salvage operations and ineffective screens. In addition, the impact of an invasion of Dreissenid mussles into	

				the Delta, specifically to the southern Delta, is not addressed in CM1. The invasion of these mussels is very probable and the southern Delta provides suitable habitat for Dreissenid mussels. Impacts from these mussels on freshwater diversions in the Great Lakes and Lake Mead would be informative.	
68	**12**	1	2	Title of the chapter is confusing when compared to the content of the chapter. For example, the majority of natural communities evaluated are aquatic habitat, e.g, "tidal perennial aquatic." The majority of the species evaluated are terrestrial. Potentially renaming it or reorganizing some of the information in this chapter to other chapters would be more appropriate. Chapter 11 is the Fish and Aquatic Resources but it does not evaluate changes to aquatic habitat that are evaluated in the Terrestrial Biological Resources Chapter.	
69	**12**	Part 3 12-21	10	A comprehensive frame of reference for impacts should be provided. Each of the impact assessments states the percent impact of BDCP CMs compared to the amount of each natural community remaining. The example here is, "These modifications represent less than 1% of the 82,266 acres of the community that is mapped in the study area." This gives the impression that BDCP impacts are not very much to this natural community. However, it is not apparent to readers without knowledge of historical aquatic habitat losses, that the majority of Bay Delta natural aquatic communities have been eliminated. The recent Historical Delta Ecology Report provides estimates of pre-development natural communities in the Delta. These estimates should be provided to give the reader a more ecologically appropriate frame of reference in which to understand the estimated impacts from the proposed project. This would make it apparent that project impacts, whether they are a small or large percentage of existing natural community distribution, are in addition to large-scale impacts of actions that occurred in the past.	
70	**12**	Part 3 12-22	1-15	Actions that result in impacts to the aquatic natural communities described in this section and the other aquatic communities are not detailed. The Mapbook does not provide much more detail than the narrative description. Details regarding project impacts should include things such as: estimated impacts to waters of the US (acres and/or linear feet) from project activities that are specifically described (e.g., grading, dredging, trench and fill, boring, spoils piles, levee work, excavation, etc..), volume (yd3) of sediment proposed for disposal	

				sites, volume (yd3) of sediment removal from waters for project impacts and expected maintenance dredging.	
71	**12**	Part 3 12-21		Table 12-4-1 and other aquatic natural community tables, especially 12-4-5 & 12-4-6. Impacts to aquatic communities seem fairly low. Evaluating the mapbooks verifies very few aquatic communities mapped on Bouldin and Bacon Islands. There are Corps of Engineers CWA 404 project-level delineations for these islands for the Delta Wetlands Project that show a much greater amount of aquatic habitat.	
72	**12**	Part 3 12-23	27 & 28	We recommend adding text that explicitly states that other federal regulations under Section 404 of the CWA restrict permits to the alternative that maximizes avoidance and then provides compensatory mitigation.	
73	**12**	P3 12-23	28	Here and other places in the document, aquatic natural community restoration is discussed with respect to eliminating any adverse affects under NEPA, assuming that the restoration is 100% successful. Is there an operating assumption that conservation CMs will be 100% successful? Is there an assumption of a success rate for any of the restoration projects? If so, those assumptions should be disclosed with supporting documentation. If not, a discussion of the success rate among restoration projects for each of the natural community types would be appropriate to provide the reader with context for understanding the potential success of restoration.	
74	**12**	P3	All	Why are CEQA conclusion paragraphs identified and NEPA conclusion paragraphs are not titled?	
75	**12**	P3 12-25	5-9	Is there information that tells us how much more often flows will be in the bypass and these floodplains will be activated? If so, could it be provided here to help the reader understand how often the bypass will be flooded and these benefits will be available for fish?	
76	**12**	P3 12-32	21-23	Table 12-4-3 – Do estimates of impacts here and in the other aquatic habitat natural community tables include impacts from spoils and tunnel muck or other material that is dug up for the tunnel alignment and discharged in adjacent areas that may have wetlands or waters of the US?	
77	**12**	P3 12-38	22-36	Are there quantitative estimates or details that support the conclusion that ongoing operation of new Delta conveyance would have no adverse effect on tidal freshwater emergent wetland natural community? The topic sentence of the paragraph indicates that operations and maintenance could alter acreage of this	

				community by changes in flow patterns. Can this be explained in further detail, including how these changes in flow will not have an adverse affect on the habitat of species that depend on it?	

To: Herrera, Angeles[Herrera.Angeles@epa.gov]; Rader, Cliff[Rader.Cliff@epa.gov]
From: Goforth, Kathleen
Sent: Mon 9/30/2013 3:56:21 PM
Subject: FW: NorCal Members of Congress raise serious questions about federal funding for Delta tunnels

FYI

From: Vendlinski, Tim
Sent: Friday, September 27, 2013 9:33 AM
To: Byous, Eric
Cc: Diamond, Jane; Kemmerer, John; Maier, Brent; Goforth, Kathleen; Gorke, Roger; Marincola, JamesPaul; Cabrera-Stagno, Valentina; Foresman, Erin; Hagler, Tom; Skophammer, Stephanie; Ziegler, Sam
Subject: NorCal Members of Congress raise serious questions about federal funding for Delta tunnels
Importance: High

Nicely done, Eric.

Yes; these messages should definitely come to me.

Brent, can you contact Brian Hooker and update him on the appropriate distribution list for R9?

Thanks, Tim

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Tim Vendlinski

Senior Policy Advisor;

Bay Delta Program Manager

EPA Region 9

75 Hawthorne Street (WTR-1)

San Francisco, CA 94105-3901

(415) 972-3469 desk

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From: Byous, Eric
Sent: Friday, September 27, 2013 8:25 AM
To: Vendlinski, Tim
Subject: FW: Questions on Federal Funding for Delta Tunnels Raised by Northern California Members of Congress

Hi Tim,

This was sent to me, I thought it might be relevant to your work. Sorry if duplicate.

-Eric

From: Hooker, Brian [mailto:Brian.Hooker@mail.house.gov]
Sent: Thursday, September 26, 2013 4:01 PM
To: brian.hooker@mail.house.gov
Subject: Questions on Federal Funding for Delta Tunnels Raised by Northern California Members of Congress

FYI

FOR IMMEDIATE RELEASE

September 26, 2013

Contact: Matthew Kravitz (202) 731-3017 (Garamendi)
Austin Vevurka 202-225-3311 (Thompson)
Jonelle Trimmer 202-225-7163 (Matsui)
Lauren Smith 202-225-1947 (McNerney)
Peter Whippy 202-225-2095 (Miller)
Allison Teixeira 202-225-5716 (Bera)

Northern California Members of Congress Ask About Federal Funding for the Sacramento Delta Tunnels

WASHINGTON, DC – As both chambers of Congress discuss federal spending for the next fiscal year, Congressman John Garamendi (CA-3) led a group of Northern California Members of Congress in sending a letter to the U.S. Department of the Interior requesting specific information on past and future federal funding for the proposed Peripheral Tunnel project in the Sacramento-San Joaquin Delta. The letter's signatories also expressed strong concerns about the plan's impact on Northern California's economy. A copy of the letter is linked here and included below.

The group has met with Interior Secretary Jewell previously. In this letter, they requested another meeting with the Secretary to discuss federal funding "to get an update from the agencies on their current work relating to" the Delta Tunnels project and to discuss how to find a more sustainable future for the Sacramento-San Joaquin Delta.

"By raising questions on the proposed $5 billion cost to the American taxpayer of the Delta Tunnels project, this letter is part of a productive dialogue on meeting California's water needs. I have made clear the major flaws of the current plan. I look forward to continued discussion with Secretary Jewell about approaches that would meet the needs of all state residents, especially water conservation, recycling, and storage, respect for water rights, and strengthened flood protection," **said Congressman John Garamendi (CA-3)**, a former Deputy Secretary of the U.S. Department of Interior.

"At a time when budgets are tight, we need to closely examine every dollar we spend. We've seen reports that show the proposed BDCP is not a workable solution to California's water challenges. It's rushed, not based on sound science, and hurts wildlife, sportsmen, farmers, fishers and small business owners. Until we have a transparent plan that is developed with all the stakeholders at the table, it would be reckless and wasteful to spend a single cent on a project that puts thousands of jobs at risk and could devastate the Delta and north-of-Delta communities," **said Congressman Mike Thompson (CA-5).**

"As the BDCP moves forward, serious questions need to be answered about where the federal government would find the billions needed to pay for the BDCP plan. Due to our nation's fiscal and political climate, the federal budget has seen deep cuts over the past few years, and we continue to see devastating cuts with sequestration. Critical infrastructure projects across the country are going unfunded because of the federal budget problems. Spending billions on the BDCP, which is headed in the wrong direction for California and especially those of us north of the Delta, just doesn't make sense," **said Congresswoman Doris Matsui (CA-06)**.

"We already know that Governor Brown's proposed plan for the Delta will devastate the region

and is not based on sound science. It will cost California residents billions of dollars, and does not ensure a reliable water supply for all of California. Until we have a solution that is based on an effective cost-benefit analysis and sound science, and that will not harm our most precious water resource, the Governor should not be rushing forward with his plan. The people of California deserve no less, and the people in the Delta region who stand to have their livelihoods decimated must be heard. With the potential investment of federal funding, the taxpayers of this country also deserve to know how much of their money will be dedicated to this project," **said Congressman Jerry McNerney (CA-9)**.

"The Governor's BDCP financing plan makes too many assumptions about an enormously expensive project. It's not reasonable for them to assume that other federal priorities will be pushed aside to finance a plan that does not create new water from local resources, does not include sufficient input from all stakeholders, and has been roundly criticized by federal and state agencies for being based on unsound science. Taxpayers deserve honest answers about where the money to finance this project will come from and what programs and regions will suffer as a result. I look forward to having that discussion with Secretary Jewell," **said Congressman George Miller (CA-11)**.

"I've consistently been concerned about the rush to implement the Bay Delta Conservation Plan before we look at all of our alternatives. Water is critical to California, and we must find a comprehensive, long-term solution that is based on sound science and doesn't put south-of-delta interests ahead of everyone in or north-of-delta. In addition to those concerns, we must also understand how we'll pay for any plan before committing to it. I'm very concerned about the availability of the substantial federal funds it could require to complete BDCP, and hope to discuss those costs with Secretary Jewell," **said Congressman Ami Bera (CA-7)**.

Text of the letter follows:

September 20, 2013

The Honorable Sally Jewell

Secretary

Department of the Interior

1849 C Street, NW

Washington, D.C. 20003

Dear Secretary Jewell:

We write today to ask for information regarding federal funding for the ongoing Bay Delta Conservation Plan (BDCP) as proposed by California's Governor Jerry Brown. Together with the California Department of Water Resources and Natural Resources Agency and a variety of other state and local agencies and organizations, the Governor has been working on this plan for over 6 years in an attempt to bring stability to the Sacramento-San Joaquin Delta. However, we have strong concerns with not only the plan itself, but also with the availability of the necessary funding to complete the plan in its current form, which would require close to $4 billion from the federal government.

We have several questions regarding past and potentially future funding for the project:

1) How much federal money has your department spent thus far on the development of BDCP since the Memorandum of Agreement was signed in 2006? It is our understanding that some of the funding has come through CALFED's Interim Federal Action Plan for the Bay-Delta, but we would like to know the specific accounts and amounts spent including and beyond CALFED. Has any additional money been spent to pay contractors to assist in the development of the BDCP, if yes, who are the contractors and how much were they paid?

2) The BDCP recently released financing documents for the plan and projected the amount of federal funding needed to complete the project. We are concerned that the substantial increases in federal spending that would be required under BDCP's financing plan may not be realistic given the ongoing funding constraints at DOI. As you know, the House Appropriations Committee's draft FY 2014 Interior/Environment funding bill would provide $2.9 billion less than the fiscal 2013 enacted level, and $4.3 billion less than competing legislation in the Senate. Given these financial realities, have you discussed the proposed funding with the California state government to determine the feasibility of meeting the needs they have listed in Chapter 8? How is the funding expected to be spread out over the 50-year period and how much is likely to be required up front or in the early years?

3) We are also extremely concerned that providing the level of funding requested for the BDCP could result in inadequate funding for critical water supply and fish and wildlife habitat programs. As such, do you anticipate a significant drop in funding needs for other activities in

coming years? If so, what specific needs do you believe will diminish? Do you anticipate being able to achieve the fish doubling goal under the 20+-year old Central Valley Project Improvement Act, which has not yet been achieved, while dedicating significant funds to the BDCP? If you do not expect such a drop in funding needs, do you expect to have adequate budgetary flexibility in the years ahead to maintain adequate funding for other activities while providing for a substantial increase in funding for BDCP-related programs? Also, will the proposed level of funding affect environmental restoration projects outside the BDCP project area? Please be specific.

4) Finally, we would like to request a meeting to discuss your responses to these questions and to get an update from the agencies on their current work relating to BDCP.

We look forward to hearing from you and to our continued work as California tries to find a solution for a more sustainable future for the Sacramento-San Joaquin Delta. Please contact Elizabeth Crow, Senior Policy Advisor for Congressman Garamendi, at (202) 225-1880 to arrange the meeting or if you need additional information.

Sincerely,

JOHN GARAMENDI

Member of Congress

GEORGE MILLER

Member of Congress

DORIS MATSUI
Member of Congress

MIKE THOMPSON

Member of Congress

JERRY MCNERNEY

Member of Congress

JARED HUFFMAN

Member of Congress

AMI BERA

Member of Congress

# # #

To: Rader, Cliff[Rader.Cliff@epa.gov]
From: Goforth, Kathleen
Sent: Wed 7/10/2013 6:18:55 PM
Subject: FW: BDCP Deputies meeting agenda
Agenda for 7-12-13 BDCP Mtg.docx

I don't see anyone in OECA/OFA among the addressees for the invitation from CEQ below. Were you aware of this meeting? My office is still only hearing about these events through our Water Division, which seems unnecessarily circuitous.

From: DIAMOND, JANE
Sent: Wednesday, July 10, 2013 9:49 AM
To: Kemmerer, John; Herrera, Angeles; Goforth, Kathleen; Hagler, Tom
Cc: Vendlinski, Tim
Subject: Fw: BDCP Deputies meeting agenda

Even though I will be on leave Friday, the timing should work for me to call in, so I will do so and report back.
Jane Diamond
Water Director
415-947-8707

From: Cohen, Ilana <Ilana_R_Cohen@ceq.eop.gov>
Sent: Wednesday, July 10, 2013 7:32:23 AM
To: DIAMOND, JANE
Subject: FW: BDCP Deputies meeting agenda

Hi Jane,

Sorry I did not include you on the original message. I hope you can attend this meeting!

Thank you,

-Ilana

From: Cohen, Ilana
Sent: Wednesday, July 10, 2013 10:08 AM
To: Ericsson, Sally C.; Perciasepe.Bob@epamail.epa.gov; joellen.darcy@us.army.mil; eric.schwaab@noaa.gov; will.stelle@noaa.gov; David_Hayes@ios.doi.gov; Connor, Michael L (MLConnor@usbr.gov); Letty_Belin@ios.doi.gov; Bonnie, Robert (Robert.Bonnie@osec.usda.gov) (Robert.Bonnie@osec.usda.gov) (Robert.Bonnie@osec.usda.gov); Boozer, Astor - NRCS, Washington, DC (Astor.Boozer@wdc.usda.gov)
Cc: Jensen, Jay (Jay_J_Jensen@ceq.eop.gov); Shuman, Catherine (Catherine_M_Shuman@ceq.eop.gov); Kopocis, Ken (Kopocis.Ken@epa.gov) (Kopocis.Ken@epa.gov); Gorke, Roger (Gorke.Roger@epa.gov); Chip.Smith@HQDA.Army.Mil; Leslie.Jones@osec.usda.gov; Colyar, Kelly T.; david_nawi@ios.doi.gov
Subject: BDCP Deputies meeting agenda

Good morning,

Attached please find the agenda for this Friday's BDCP Deputies meeting. Calendar invite to follow.

Best regards,

-Ilana

Ilana Cohen

Land & Water Ecosystems Advisor | Council on Environmental Quality
☎ 202.395.5944 ✉ Ilana_R_Cohen@ceq.eop.gov | www.whitehouse.gov/ceq

Please consider the environment before printing this e-mail.

CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

State Water Resources Control Board

JUL 0 5 2013

Mr. Russell Stein
California Department of Water Resources
3500 Industrial Blvd.
West Sacramento, CA 95691

Dear Mr. Stein

COMMENTS ON THE SECOND ADMINISTRATIVE DRAFT ENVIRONMENTAL IMPACT REPORT/ENVIRONMENTAL IMPACT STATEMENT FOR THE BAY DELTA CONSERVATION PLAN

Thank you for the opportunity to comment on the Second Administrative Draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the Bay Delta Conservation Plan (BDCP). The mission of the State Water Resources Control Board (State Water Board) and the Regional Water Quality Control Boards (Regional Water Boards) is to preserve, enhance, and restore the quality of California's water resources, and ensure their proper allocation and efficient use for the benefit of present and future generations. The State Water Board administers water rights in California, including water rights for the Department of Water Resources' State Water Project (SWP) and the U.S. Bureau of Reclamation's (USBR) Central Valley Project (CVP). The State and Regional Water Quality Control Boards also have primary authority over the protection of the State's water quality. The BDCP will require both water quality and water right approvals from the State Water Board, and possibly the Central Valley and San Francisco Bay Regional Water Quality Control Boards (collectively Water Boards). Accordingly, the Water Boards are responsible agencies for the BDCP pursuant to the California Environmental Quality Act (CEQA). As responsible agencies for the BDCP, the Water Boards conducted a preliminary review of parts of the BDCP and DEIR/EIS. The enclosure (BDCP EIR/EIS Review Document Comment Form) includes preliminary comments on these documents based on Water Board staff's limited review and current understanding of the project and environmental document. Staff has not reviewed all of the documents completely and also understands that additional changes are currently under development and consideration. Accordingly, once Water Board staff has additional time to review the BDCP and public draft EIR/EIS, we may amend these comments and provide additional detailed comments.

Water Board staff's review focused on:

- The CEQA analysis associated with Alternatives 4 (the preferred project) and 8 (the alternative requested by the State Water Board to provide a broad range of operational alternatives), including the associated impact analysis and mitigation measures.

- Information needed for the Water Boards to facilitate the processing of: (a) water right actions associated with the project, including information needed for conducting a review of the likelihood of potential injury to any other legal user of water and the extent to which fish and wildlife would be affected by the change; (b) water quality certifications for the construction and operation of the conveyance facilities and restoration projects (focused on CM1); and (c) National Pollutant Discharge Elimination System (NPDES) permits that might be needed for regulating pollutant discharges to surface waters during construction and operation of the conveyance facilities and restoration projects.

- Information to inform changes to the Water Quality Control Plan for the San Francisco Bay-Sacramento/San Joaquin Estuary (Bay-Delta Plan) and its implementation. The State Water Board is in the process of developing and implementing updates to the Bay-Delta Plan and flow objectives for priority tributaries to the Delta to protect beneficial uses in the Bay-Delta watershed. Phase 1 of this work involves updating San Joaquin River flow and southern Delta water quality requirements included in the Bay-Delta Plan. Phase 2 involves other comprehensive changes to the Bay-Delta Plan to protect beneficial uses not addressed in Phase 1, focused on fish and wildlife beneficial uses. Phase 3 involves changes to water rights and other measures to implement changes to the Bay-Delta Plan from Phases 1 and 2. Phase 4 involves developing and implementing flow objectives for priority Delta tributaries outside of the Bay-Delta Plan updates. Information from the BDCP process will primarily inform potential changes to the Bay-Delta Plan related to Phase 2 and likely changes to water rights in Phase 3.

In addition to reviewing the BDCP documentation, Water Board staff reviewed the comments on the December 2012 Administrative Draft BDCP that were prepared by National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS), and the 2012 Red Flag comments on the February 2012 version of the BDCP Effects Analysis that were submitted by the U.S. Bureau of Reclamation (USBR) and the California Department of Fish and Wildlife (CDFW), USFWS, and NMFS (collectively the fishery agencies). State Water Board staff generally support the fishery agencies' comments contained in these documents and agree that the issues identified should be resolved.

Water Board staff look forward to continue working with the BDCP environmental review effort for this project. To facilitate our review and consideration of approvals needed for the BDCP, Water Board staff requests the opportunity to participate in on-going technical discussions concerning the BDCP and environmental review process. Water Board staff are also available to continue discussions regarding the process for considering the various approvals needed from the Water Boards for the project. If you have any questions concerning this matter, please contact me at rich.satkowski@waterboards.ca.gov or (916) 341-5439, or Karen Niiya at karen.niiya@waterboards.ca.gov or (916) 341-5365. Written correspondence should be addressed as follows: State Water Resources Control Board; Division of Water Rights; Attn: Richard Satkowski or Karen Niiya; P.O. Box 2000; Sacramento, CA 95812.

Sincerely,

Richard Satkowski,
Senior Water Resources Control Engineer
Division of Water Rights

Enclosure

Enclosure to July 5, 2013 Letter from Water Board's Staff

BDCP EIR/EIS Review Document Comment Form

Document: ***Administrative Draft—Chapter No:__General Comments __***

Comment Source: SWRCB
Submittal Date: 7/5/2013

No.	Topic	Line #	Comment	ICF Response
1	Water Rights/ Bay-Delta Plan		As indicated in the EIR/EIS, the State and Regional Water Boards (Water Boards) have discretionary approval authority over the water right and water quality aspects of the proposed project and are responsible agencies for this project under the California Environmental Quality Act (CEQA). As responsible agencies under CEQA, the Water Boards must review and consider the environmental effects of the project identified in the EIR/EIS that are within their purview and reach their own conclusions on whether and how to approve the project involved. (Cal. Code Regs., tit. 14, § 15096, subd. (a).) In order for the Water Boards to determine whether the EIR/EIS adequately addresses all of the proposed actions, please identify all of the changes to water quality objectives, water rights, and other approvals that are needed for the BDCP. Specifically, please identify which water quality objectives are proposed to be changed, any new water rights that may be requested and any proposed changes to water rights. A table identifying the proposed changes in the beginning chapters of the EIR/EIS would be helpful. All of the proposed approvals that are needed by the BDCP must be identified and fully evaluated (including cumulative impacts) in the EIR/EIS and appropriate mitigation proposed in order for the Water Boards to consider those approvals. The Water Boards are available to work with the project proponents to develop the above information.	
2	Bay-Delta Plan		To consider changes to the Bay-Delta Plan needed for the BDCP, the State Water Board will need to independently review the scientific basis for any changes to the Bay-Delta Plan and make a determination that those changes are reasonably protective of beneficial uses. To support any changes needed for the BDCP, the scientific basis for those changes should be provided in the BDCP, EIR/EIS or other documentation (including changes to non-fish and wildlife flow objectives). The State Water Board will then independently evaluate this information and other relevant information to determine what, if any, changes to make to the Bay-Delta Plan to protect beneficial uses. The State Water Board will also need to conduct an anti-degradation analysis for any changes that may result in a degradation in water quality. Documentation and analysis to support that analysis should also be provided. Pursuant to state and federal law, the State Water Board is required to regularly review and update the Bay-Delta	

			Plan to assure that it is reasonably protective of beneficial uses. Future updates to the Bay-Delta Plan will continue to be based on best available science and may therefore modify any BDCP elements that are affected by the Bay-Delta Plan to assure the reasonable protection of beneficial uses.	
3	Water Rights		Before the State Water Board may approve a change in a water right permit or license needed to implement the BDCP, including a change to the point of diversion specified in the permit or license, the Board must find that the change will not injure any legal user of water. (Wat. Code, § 1702.) Information concerning the extent, if any, to which fish and wildlife would be affected by the change shall also be considered. (Wat. Code, § 1701.2) The State Water Board has an independent obligation to consider the effect of the BDCP on public trust resources and to protect those resources where feasible (*National Audubon Society v. Superior Court* (1983) 33 Cal.3d 419), and to prevent the waste, unreasonable use, unreasonable method of use, or unreasonable method of diversion of water (Cal. Const., art. X, § 2; Wat. Code, § 275). Pursuant to its authority under the Water Code, the State Water Board may request additional information outside of the CEQA process to meet the State Water Board's public trust and other obligations. Accordingly, while BDCP parties may determine that CEQA does not require an analysis of all of the issues pertaining to water right change petition approval (including impacts to other legal users of water and public trust resources), it would assist the State Water Board in its consideration of the BDCP if the EIR/EIS discussed these issues. Given the similarity of the scope of analyses, it would be efficient to address these issues in one document.	
4	Water Rights, Bay-Delta Plan		As indicated in several comment letters on the BDCP environmental review process, for the Water Boards to consider any water quality and water rights applications or petitions for the BDCP, environmental documentation prepared for the project must disclose the significant effects of the proposed project and identify a reasonable range of interim and long-term alternatives that would reduce or avoid the potential significant environmental effects. The BDCP does not appear to propose interim water project operational measures needed to protect fish and wildlife beneficial uses beyond those requirements associated with biological opinions. The measures required by the biological opinions are designed to avoid jeopardy of listed species which is not the same standard as the standard of reasonable protection of beneficial uses. Since the State Water Board is required by law to periodically review and update, as appropriate, the Bay-Delta Plan, it will continue its independent review and update of the Bay-Delta Plan, and will establish requirements during the interim that are based on the best available science at the time of the update. The Water Boards will also need to independently evaluate the long-term measures proposed by BDCP and reach an independent conclusion on whether to approve changes associated with the project.	

5	CWA 401		Section 401 of the Federal Clean Water Act (CWA) requires any applicant for a federal license or permit, which may result in any discharge to navigable waters, to obtain certification from the State that the discharge will comply with the applicable water quality parameters in the CWA. Under section 303 of the CWA and under the Porter-Cologne Water Quality Control Act, the State Water Board and U. S. Environmental Protection Agency approved, the Bay-Delta Plan. Additionally, the California Regional Water Quality Control Boards have adopted, and the State Water Board has approved, Water Quality Control Plans (basin plans) for each watershed basin in the State. These Basin Plans designate the beneficial uses of waters within each watershed basin, and water quality objectives designed to protect those uses pursuant to Section 303 of the Clean Water Act. (33 U.S.C. § 1313.) The beneficial uses together with the water quality objectives that are contained in the Basin Plans and state and federal anti-degradation requirements constitute California's water quality standards. If the Project does not comply with one or more of the water quality objectives or criteria, then DWR must identify the actions that it will take to bring its Project into compliance with the applicable water quality limits in order to fully protect and maintain the beneficial uses. When submitted, DWR's application for certification must meet the application filing requirements specified in Cal. Code Regs., tit. 23, section 3856. The State Water Board may request additional information to clarify, amplify, correct, or otherwise supplement the contents of the application. Supplemental information may include evidence of compliance with the water quality control plans. (Cal. Code Regs. tit. 23, § 3836.) A certification is issued when the State Water Board determines that an application for certification is complete and there is reasonable assurance the operation of the Project will comply with water quality standards and other appropriate requirements. The State Water Board must analyze potential Project-related environmental impacts to Project affected water bodies prior to making a determination that continued operation of the Project will be protective of the designated beneficial uses of the watershed.	
6	BDCP, EIR/EIS		As discussed in the State Water Board's letter to Gerald Meral of April 19, 2011 and other correspondence, in order for the State Water Board to consider changes to the Bay-Delta Plan and water rights, the BDCP must evaluate a sufficiently broad range of alternatives. Alternatives that reduce reliance on water from the Delta should be included in this range. Accordingly, it seems appropriate to include reduced reliance on water from the Delta as a conservation measure for the project and as mitigation for impacts associated with impacts related to inadequate water supplies to meet all needs for water within and outside of the Delta.	

7	BDCP		The decision tree for Delta outflow includes four operational scenarios. Compared to the no-project alternative (which appears to be the appropriate comparison point for long-term effects), it appears that all of these operational scenarios decrease total Delta outflow (see Attachment 1: State Water Board analysis) in the late-long term. The justification for this limited range of Delta outflow scenarios is not clear given that there is strong information on the possible need for more Delta outflow for the protection of aquatic resources and the uncertainty that other conservation measures will be effective in reducing the need for flow. Specifically, recent research indicates that restoration of tidal marsh may not be feasible, possible, or effective. Accordingly, it appears appropriate to include a broader range of Delta outflows under the decision tree process.	
8	BDCP		The Decision Tree process described in Table 3.4.1-1 of the BDCP indicates that structured hypothesis testing would be conducted through a collaborative science program (a) to determine whether or not additional spring outflow above D-1641 requirements is needed to achieve longfin smelt abundance objective; and (b) to determine whether or not the position of the fall low salinity zone needs to be in Suisun Bay and the lower Delta to achieve BDCP objectives for Delta smelt habitat and abundance. Although BDCP text on page 3.4-19, starting on line 22, indicates that, prior to commencement of dual conveyance operation, hypotheses supporting each criterion will be tested in detail, and data will be collected, it is unclear whether operational changes and adaptive management will be part of the testing. Interim and long-term provisions for these measures should be developed and included in the BDCP to better inform decision making regarding adaptive management for the protection of all of the covered species and those that may be listed in the future.	
9	BDCP		Although the Decision Tree process proposes hypothesis testing for delta smelt and longfin smelt, it does not appear to take into consideration the flows that might be needed for other aquatic species, such as sturgeon and salmonids. The decision tree process should include consideration of flow needs for other listed species, as appropriate.	
10	BDCP		Decision-making authority for the Decision Tree does not appear to be explained in either the BDCP or the EIR/EIS. The role of the fishery agencies, State Water Board and other groups should be specified in the BDCP and EIR/EIS. Any data, analysis, and conclusions developed as part of the decision tree process, including fishery agency review and recommendations should be included in regularly-scheduled reports as part of the Plan of Implementation.	
11	EIR/EIS		The environmental impacts associated with the range of potential adjustments to CM1 operations anticipated as part of adaptive management, and as part of potential real-time operations changes, do not appear to be included in the EIR/EIS. An	

			evaluation of the potential impacts should be included, especially potential impacts to species that were not the basis for the proposed operations.	
12	EIR/EIS		The EIR/EIS concludes that there are potentially significant impacts that are not mitigable. The EIR/EIS should describe how the BDCP is still consistent with the two coequal goals, especially the goal of protecting, restoring, and enhancing the Delta ecosystem. The BDCP proponents will also need to develop a statement of overriding considerations that explains how the benefits of the project outweigh the unavoidable adverse environmental effects.	
13	EIR/EIS		The EIR/EIS should provide tabular quantitative comparisons of the various alternatives, including flows, exports, temperatures, and other quantitative information. An example of such a table, prepared by State Water Board staff, is included as Attachment 2)	
14	BDCP/ EIS/EIR		The BDCP relies on habitat restoration to provide adequate ecosystem conditions to achieve the biological goals and objectives of the project. Available tidal energy, and the associated tidal exchange, might be attenuated as restoration projects begin to be constructed and put into operation. The reduction in tidal exchange might reduce the export of phytoplankton and reduce turbidity. Both of these effects might reduce the effectiveness of existing and future restoration areas. The BDCP and the EIR/EIS do not appear to analyze the effects of changes in tidal energy exchange that may result after construction and implementation of habitat restoration projects, and how those changes in tidal energy might affect transport of food and turbidity from the restored areas to locations where pelagic species are present. The Independent Science Board, in its Habitat Restoration Review (2013) suggested modeling research to evaluate how dissipations in tidal energy may reduce tidal ranges such that the effectiveness of restoration sites is reduced. Water Board staff support this approach.	
15	BDCP		Section 3.6.4.2 of the BDCP describes North Delta Diversion Bypass Flow Criteria. The proposed bypass flow criteria consist of constant low-level pumping, initial pulse protection, and three levels of post-pulse operations. Page 3-156, line 32 describes Post-Pulse Water Operations, which describes how Level I, Level II, and Level III bypass flows would be initiated. However, the process by which operations should return to Levels II and I pumping for the protection of fish species was not described, but should be.	
16	BDCP		Section 3.4.1.4 of the BDCP describes how operation of the conveyance facility will be controlled through criteria that are partly prescribed and partly adjustable through three processes: decision trees, adaptive management, and real-time operations. Although text starting at line 3 on Page 3.4-3 indicates that adaptive management would be used to modify operations after initiation of north Delta diversion operations, text on pages 3.4-19 through 3.4-20 does not specify that adaptive management will be implemented for either Spring Outflow or Fall Outflow	

			after initiation of north Delta diversion operations. Given the uncertainty regarding the quantity of Spring and Fall outflow needed to achieve biological objectives and the likelihood that this uncertainty will not be fully resolved by the time the conveyance facility is in operation, it seems appropriate to include these operational parameters in the adaptive management program. Text on Page 3.4-21, starting at line 15, identifies the operational parameters that would be subject to real-time operation adjustments within limits described in Section 3.4.1.4.3: Delta Cross Channel Gates, Head of Old River Gate, South Delta Diversions, and North Delta Diversions. It is not clear from the discussion whether these operational parameters would also be subject to adaptive management. These operational parameters should also be included in the adaptive management program. The North Delta Diversion's operational parameter is associated with north Delta bypass flows. The north Delta bypass flows should therefore be included in the text on Page 3.4-21, starting at line 15, for clarity. This will provide consistency with text on Page 3.4-23, starting at line 1, which states that north Delta Diversion bypass flows will be part of real-time operations. It is not clear how the real-time operational ranges described in Section 3.4.1.4.3 were considered in the environmental analysis contained in the EIR/EIS. Please explain. Text on Page 3.4-21 states that some operational parameters would not be subject to real-time adjustments, as they would be operated according to criteria described in Section 3.4.1.4.3. For clarity, the specific operational parameters that will not be subject to real-time adjustments should be listed here. It appears that the operational parameters that will not be subject to real-time adjustments are: Old and Middle River/San Joaquin inflow/export ratio, spring outflow, fall outflow, winter and summer outflow, and export to inflow ratio. To address uncertainty in the various measures these operational parameters should be included in the adaptive management program. Page 3.4-23, line 1: The text suggests real-time operations of the North Delta Diversion bypass flows between December and June would not operate according to the criteria described in Table 3.4.1-2. Specifically, the text would allow real-time operations to operate at lower bypass flows than those described in Table 3.4.1-2, and it would not allow three-level post-pulse operation. This discussion is confusing, and should be clarified. Page 3.4-23, line 10: The text should include real-time operations as another way of informing the implementation of CM1.	

17	BDCP		The BDCP, page 9-6, line 35 states the Combined Scenario 5 (CS5) alternative was developed to be an operational scenario focused on maximizing ecological benefits for aquatic covered species in the Delta, assuming that only flow changes would provide benefits, without consideration of the likely benefits provided by the BDCP's other conservation measures. The CS5 alternative became an "alternative to take" instead of a project alternative because the BDCP indicates this alternative would require water management operations outside of the BDCP Area, and that it would conflict with existing legal constraints, causing unresolvable conflicts between species needs and affecting upstream water rights. (Section 9.1.3.2.3 of the BDCP) The underlying science that was used to develop the CS5 alternative, and the modeling analysis that was performed to evaluate the alternative do not appear to be included in the BDCP and EIR/EIS documentation. This information should be made available.	

BDCP EIR/EIS Review Document Comment Form

Document: ***Administrative Draft—Executive Summary and Chapter No. 1__ Introduction***

Comment Source: SWRCB
Submittal Date: 7/5/2013

No.	Page	Line #	Comment	ICF Response
1	ES-34	34	This paragraph indicates a summary of existing CVP and SWP operations would be briefly summarized immediately following, but no summary was provided. Please provide the summary along with a summary of the proposed operations under the alternatives.	
2	ES-36	25	The section describing Scenario H does not refer the reader to a technical appendix where the underlying science can be found. An appendix with this information should be provided and referenced where appropriate in the document.	
3	ES-36	25	The section describing Scenario H refers to biological objectives, but does not tell the reader where the biological objectives can be found.	
4	ES-40	43	The Executive Summary indicates the project proponents anticipate approval from State Water Board for new SWP points of diversion in the Delta, which would likely be subject to conditions on DWR's and USBR's water rights to protect beneficial uses in the Delta. It further states that such changes "would not include changes in water rights; however, there are concerns that the BDCP could result in the potential for increased exports of water." This statement is incorrect. Implementation of the BDCP project will require changes to water rights and water right requirements. Further, the proposed project may affect other legal users of water through changes in salinity and flows. These issues are further discussed elsewhere in this comment letter.	
5	1-18 – 1-23		Section 1.6.1 describes the use of this EIR/EIS by other entities, and provides a table summarizing the agencies that might use this document, including their specific review, approval, or other responsibilities. Based on initial review of the second administrative draft EIR/EIS, the Water Boards will need additional information beyond what is provided in the document to implement their permitting authority. As currently written, section 1.6.1 does not state whether the project proponents intend to provide supplemental information at a later date to the individual approving agencies to augment the information in the EIR/EIS.	

6	1-24	18-22	Similar to the executive summary, the EIR/EIS states that the project proponents anticipate approval from the State Water Board for new points of diversion in the Delta for the proposed project. The EIR/EIS further states that such changes would not include changes in water rights, but there are concerns that the BDCP could result in the potential for increased exports of water. These statements are unclear and contradictory and should be clarified. The proposed project would result in changes to water rights and could potentially affect other legal uses of water. As explained above, these issues should be fully described and analyzed in the EIR/EIS.	

BDCP EIR/EIS Review Document Comment Form

Document: ***Administrative Draft—Chapter No. 2__ Project Objectives and Purpose and Need***

Comment Source: SWRCB
Submittal Date: 7/5/2013

No.	Page	Line #	Comment	ICF Response
			Possible Comments to be provided on public draft	

BDCP EIR/EIS Review Document Comment Form

Document: ***Administrative Draft—Chapter No. 3__ Description of Alternatives***

Comment Source: SWRCB
Submittal Date: 7/5/2013

No.	Page	Line #	Comment	ICF Response
1	General		Chapter 3 should include a table defining the specific operational assumptions under the various scenarios.	
2	3-155		The description of the objectives for the North Delta Diversion Bypass Flows contained on this page is different than the objectives description contained in Appendix 5A, page B-95. EIR/EIS Chapter 3, page 3-155 states: "The objectives of the north Delta diversion bypass flow criteria include regulation of flows to: (1) maintain fish screen sweeping velocities; (2) reduce upstream transport from downstream channels; (3) support salmonid and pelagic fish transport to regions of suitable habitat; (4) reduce predation effects downstream; and (5) maintain or improve rearing habitat in the north Delta." EIR/EIS Appendix 5A, page B-95 states: "Objectives include flows or the functional equivalent thereof to (1) provide North Delta bypass criteria with adaptive limits, (2) provide for Fall X2, (3) support salmonid and pelagic fish transport to regions of suitable habitat, (4) reduce predation effects downstream, and (5) maintain or improve rearing habitat in the north Delta." Please clarify.	
3	3A-7	All	Chapter 3A-7 was developed in May 2011, and it is not clear whether changes to operations have been made to the modeling since then. Please clarify whether Chapter 3A-7 has been modified to reflect the information contained in the fishery agencies' "Red Flag Letters"?	

BDCP EIR/EIS Review Document Comment Form

Document: ***Administrative Draft—Chapter No. 4__ Approach to the Environmental Analysis***

Comment Source: SWRCB
Submittal Date: 7/5/2013

No.	Page	Line #	Comment	ICF Response
1	4-3	32	The descriptions of the CEQA and NEPA baselines are unclear. A table would be helpful to summarize this information.	
2	4-5	7	The No Action Alternative is described, and its use in the NEPA analysis is described, but a corresponding description for the CEQA analysis is missing. Please provide.	
3	4-7	16	The first paragraph of this section appears to contain an error in its description of CEQA and NEPA regulations for assessing cumulative effects. For appropriate revisions, please refer to the Public Resources Code and CEQA Guidelines sections already cited in the paragraph.	

BDCP EIR/EIS Review Document Comment Form

Document: ***Administrative Draft—Chapter No. 5__ Water Supply (including water rights)***

Comment Source: SWRCB
Submittal Date: 7/5/2013

No.	Page	Line #	Comment	ICF Response
1	5-38 5-34 5-35 5-36 5-37	15-18 7-38 All All 1-32	CM1, the proposed project, includes three water diversions at Intakes 2, 4 and 5 on the Sacramento River near Hood in the north Delta. DWR's water right permits include only one point of diversion (near Intake 4). DWR may be required to file change petitions to add points of diversion and points of rediversion to its permits. The EIR/EIS does not include a section on DWR's and USBR's existing water rights, proposed changes to those water rights, and any new rights that DWR or USBR may seek to acquire. Such a write-up should be included within the water supply chapter or as an attachment to the document. The description of existing water rights, proposed changes to existing water rights, and any new rights needs to be specific and include (1) the water right and/or claim of water right, (2) the existing and proposed point(s) of diversion, point(s) of rediversion, place(s) of use, beneficial use(s) of water, and schedule to complete beneficial use of water, and (3) whether a petition for change or extension of time has been filed in connection with the water right and its status. To assist in describing the water rights and claim of water rights, the EIR/EIS should include maps that show the above items.	
2	5-34 5-35 5-36 5-37	7-38 All All 1-32	Implementation of CM2 may require water right change petitions on existing permits to add a point of rediversion on the Sacramento River at the Fremont Weir and to change the place of use by adding the Yolo Bypass. This should be coordinated with the State Water Board and addressed in the EIR/EIS or associated documents as discussed above.	
3	5-34 5-35 5-36 5-37	7-38 All All 1-32	According to the Division of Water Rights' records, DWR and USBR have 10 and 32 pending time extension petitions, respectively, for water rights within the Bay-Delta watershed or export areas. All of these petitions have been noticed and protested. It appears that only some of DWR's and USBR's time extension petitions are directly related to the BDCP. Please identify the existing time extension petitions that are directly related to the BDCP as well as their status. In addition, it appears that the existing time extension petitions that are directly related to the BDCP may need to be amended to allow more time for construction and operation of CM1. Normally, the baseline for determining significant effects of a petition for a time extension is the current environmental setting. (Cal. Code Regs., tit. 14, § 15125.) When the baseline is the current environmental setting, it includes the existing facility or ongoing project and whatever impacts it currently has on the environment. Because a time extension may allow construction of new or expanded facilities or application of water to beneficial use beyond what is currently occurring, an extension has the potential to have a significant effect on the environment that must undergo appropriate CEQA review.	

			The Board will evaluate the environmental impacts associated with approving the time extensions. Specifically, it will evaluate the difference between the amount of water already put to beneficial use and the total amount authorized to be used. An exemption from CEQA may apply in certain situations, but the State Water Board cannot evaluate whether one would apply to DWR's or USBR's permits without more information.	
4	5-34 5-35 5-36 5-37	7-38 All All 1-32	In order to approve petitions to extend the deadlines to complete construction and apply water to beneficial uses specified in water right permits, the State Water Board must make findings regarding diligence pursuant to California Code of Regulations, title 23, section 844, including a finding that due diligence has been exercised, that failure to comply with previous time requirements has been occasioned by obstacles which could not reasonably be avoided, and that satisfactory progress will be made if an extension of time is granted. While not required by CEQA, this information should be provided with any petitions.	
5	5-34 5-35 5-36 5-37	7-38 All All 1-32	While not required pursuant to CEQA, an injury analysis pursuant to Wat. Code, § 1702 is needed before the State Water Board can authorize changes to DWR's or USBR's water rights. It should include information to indicate that a change will not operate to the injury of any legal user of the water involved. Among the water users that may claim injury to their water supply or quality are (1) junior water right holders, including Water Right Term 91 permittees and licensees, (2) western, interior, and southern Delta agricultural users, and (3) western Delta municipal users. Information showing that injury will not occur to these and other legal users of water should be provided with any change petitions.	
6	8-421 App. 5A	All B-40	The EIR/EIS shows the projected increase in Suisun Marsh salinity under the proposed project. Please explain how such changes will reasonably protect fish and wildlife beneficial uses and not injure other legal users of water.	
7	App. 5A App. 5A	B-95 B-104	It is unclear what averaging period is proposed for the bypass flows on the Sacramento River. Without knowing what averaging period will be used, it is not possible to assess the proposed bypass flows. Will diversions be based on the monthly average flow, daily average flow, instantaneous flow, or some other metric? Please explain.	
8	App 5A	B-104 and C-738	Flows at Freeport reverse occasionally at ebb tide under current conditions. If proposed tunnel diversions are based on an average flow rather than instantaneous flow, reverse flows at Freeport would become more common and more extreme in the period from July to November. Additionally, flows at Freeport upstream of the intakes are projected to decrease during that time period, as compared to existing conditions. Please specify what metric (average or instantaneous) will be used in implementation and include an analysis of how the proposed diversions will affect the instantaneous flows at Freeport and, consequently, biological resources, rather than just the monthly average flows.	
9	App. 5A	B-99	The proposed OMR values listed are monthly average flows "for use in modeling," but it is unclear what averaging period would be used for actual operations. This is an important consideration that may affect the protection afforded by this action, so it should be explicitly addressed.	
10	App 5A	B-6 Table B-18	It appears from Table B-18 that all alternatives assume VAMP flow requirements at Vernalis. In the text starting on Pg B-6 this is unclear. Please clarify whether or not VAMP is included in each alternative.	

BDCP EIR/EIS Review Document Comment Form

Document: ***Administrative Draft—Chapter No. 6__ Surface Water (including water transfers)***

Comment Source: SWRCB
Submittal Date: 7/5/2013

No.	Page	Line #	Comment	ICF Response
1	6-8	27-31	The EIR/EIS states: "Suisun Marsh is located west of the Delta. Water Right Decision 1485 (D-1485) issued by the [State Water Board] in 1978 established channel water salinity standards and a water quality monitoring program and provided for the recently adopted Suisun Marsh Habitat Management, Preservation, and Restoration Plan (Bureau of Reclamation et al. 2010)." The EIR/EIS should add that the Suisun Marsh criteria are also contained in Revised Water Right Decision 1641 issued in 2000. The EIR/EIS should also clarify that the State Water Board has not taken any action to approve the Suisun Marsh Habitat Management, Preservation, and Restoration Plan to determine whether that plan as implemented provides for the reasonable protection of fish and wildlife beneficial uses.	
2	6-38	8-10 and 22-27	The EIR/EIS states that the State Water Project (SWP)/Central Valley Project (CVP) operations are managed to meet instream flow requirements, water right agreements, and refuge water supply agreements in the Sacramento and San Joaquin valleys. Furthermore, the EIR/EIS discusses alteration of SWP/CVP operations. The document identifies the project proponents to be DWR and the following six water contractors: Alameda County Flood Control and Water Conservation District, (Zone 7), Kern County Water Agency, Metropolitan Water District of Southern California, San Luis and Delta Mendota Water Authority, Santa Clara Valley Water District, and Westlands Water District. The document further states that additional water contractors may become project proponents in the future. If additional water contractors become water proponents, will the EIR/EIS be revised accordingly? Is the USBR considered a project proponent?	
3	6-63	9-13	The EIR/EIS refers to reservoir storage and water transfers. If the proposed project is implemented, DWR may be able to increase the frequency and amount of water transferred using the export pumps. The document should include a quantitative analysis of the maximum amount of water that can be transferred (exported) due to	

			construction and operation of proposed project. This includes water transfers of project water or other private party transfers. In addition, the document should include information on whether additional water transfers through the CM1's proposed north delta intakes would impact individual water right holders located between the proposed north and existing south Delta water intakes. Most water transfers are temporary, one-year transfers pursuant to Water Code section 1725. If DWR believes that water may be transferred under its rights in consecutive years due to the BDCP, DWR should file a petition for a long-term transfer pursuant to Water Code section 1735.	

BDCP EIR/EIS Review Document Comment Form

Document: ***Administrative Draft—Chapter No. 7__Groundwater***

Comment Source: SWRCB
Submittal Date: 7/5/2013

No.	Page	Line #	Comment	ICF Response
1	7-46, 7-47, 7-48	15-42 All, 1-8	Discharge of dewatered groundwater to surface water poses a threat to surface water quality and is regulated by the Water Boards. The construction of CM1 will require groundwater dewatering operations for the construction of intakes, intake pipelines, and conveyance facilities (tunnels). The groundwater pumping would occur 24 hours per day, 7 days a week. Dewatering requirements were assumed to range from approximately 240 to 10,500 gpm. Groundwater would be treated, as necessary, and discharged to surface waters in accordance with a National Pollutant Discharge Elimination System (NPDES) permit. The EIR/EIS describes the types of construction requiring dewatering and the range of dewatering pumping rates. However, the number of discharge locations and duration of discharges are not discussed. Dewatering discharges are typically considered a low or limited threat to water quality. However, the EIR/EIS should consider the possibility of encountering groundwater that has been polluted by leaking underground fuel storage tanks and spills of pesticides or other toxic or hazardous substances. It may be necessary to treat the water prior to surface water discharge to prevent impacts to water quality. The Water Boards would regulate these surface water discharges under an NPDES permit. The project proponent should plan to submit a Report of Waste Discharge at least one year prior to beginning construction. Based on the proposed discharge rates, the Water Boards may authorize discharge under an individual NPDES permit or Order R5-2008-0082-01, *General Order for Limited Threat Discharges of Treated/Untreated Groundwater from Cleanup Sites, Wastewater from Superchlorination Projects, and Other Limited Threat Wastewaters to Surface Water* (Limited Threat General Order).	

			Application requirements for the Limited Threat General Order are contained in Attachment G of Order R5-2008-0082-01, and can be found on the Central Valley Water Board website at http://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/general_orders/r5-2008-0082-01.pdf. In general, the applicant must include USEPA Application Forms 1 and 2D; State Water Board Form 200, including a project map which shows the location of the project, discharge point(s), and receiving water; a full description of the proposed project on official letterhead; blueprints of the proposed treatment system signed by a Registered Engineer or Geologist (if applicable); analysis of the proposed effluent for pollutants listed in Attachment B, Attachment C (if applicable), and any applicable 303(d) listed pollutants for the receiving water if proposing to discharge to an impaired waterbody; an evaluation of reclamation options; public notice requirements; and the appropriate fee. Water quality sampling for all constituents listed in Attachment B and C of the Limited Threat General Order and a sample of the 5-day biochemical oxygen demand (BOD_5).	

BDCP EIR/EIS Review Document Comment Form

Document: ***Administrative Draft—Chapter No. 8__Water Quality***

Comment Source: SWRCB
Submittal Date: 7/5/2013

No.	Page	Line #	Comment	ICF Response
1	8-9	23	Potential project related impacts on water quality due to selenium should be further evaluated. The project will result in significant increases of the San Joaquin River flow and subsequent selenium loading into the Delta and Suisun Bay that is listed as impaired by selenium. Yet, the forecasted selenium concentrations for various alternatives (e.g. Table M-10A) indicate no change in levels of selenium in Sacramento River at Mallard Island (0.21 and 0.30 mg/L), when compared to the existing conditions (0.21-0.25 mg/L). However, the transect data for the North San Francisco Bay TMDL (in preparation) indicate that measured selenium concentrations at Mallard Island could be lower than 0.1 mg/L, hence, the existing conditions in the analyzed scenarios are set too high. Moreover, the benchmarks used to evaluate impact of selenium on fish and aquatic birds may not be fully protective of the most sensitive species. For many years now, these concentrations have been questioned by scientists and agency staff as being too high for protection of some species, and especially the benthic fish such as white sturgeon and green sturgeon that are most vulnerable to selenium exposure. This prompted the US EPA to start work on derivation of the site-specific objectives for San Francisco Bay and California. Based on the work to date, it appears that to prevent bioaccumulation of selenium to toxic levels in sturgeon the water column concentrations must be at levels well below 0.25 mg/L that were used in the impact analysis. To the extent possible these potential impacts should be stated and evaluated in the EIR/EIS to allow for future more detailed analyses once the proposed new fish tissue criteria are announced. We intend to work collaboratively with the proponents of the EIR/EIS/S to fully address this issue.	
2	8-17	2-27	8.1.1.7 Water Quality Impairments section of the EIR/EIS/S does not clearly state that Suisun Marsh wetlands are listed on the 2010 303(d) list as impaired for low DO/organic enrichment, mercury, nutrients and salinity. As a result the impacts that are likely to change DO conditions, nutrient concentrations or mercury levels	

			are not fully realized or considered in the document. Only effects of changes in salinity levels are considered in detail. Please include this information in the document.	
3	8-108	9-23	The EIR/EIS describes the Clean Water Act Section 401 Water Quality Certifications, Clean Water Act Section 404 and Rivers and Harbors Act Section 10109. The project description provided for CM 1 in the BDCP should be consistent with the project description provided in the Clean Water Act Section 404/Rivers and Harbors Act Section 10 and Clean Water Act Section 401 Water Quality Certification application(s). The project description for the BDCP should be expanded to include clarification at the proposed geographical locations(s) for: modification of any transportation and/or utility routes, and/or levee systems to accommodate the construction and implementation of the proposed project; (2) estimated acreage and/or linear feet in impacts to waters of the United States, including, but not limited to, modifications of transportation and utility routes, and/or levee systems; physical project components (i.e., pump intakes, pumping plants, pipelines, tunnels and tunnel alignments, canals, forebays, concrete batch plans, fuel stations, barriers and gates); and operational components; (3) volume (cubic yards) and anticipated frequency of sediment removal activities; and (4) areal extent and anticipated frequency of vegetation removal and revegetation activities.	
4	8-54	15-19	The environmental evaluation for the project anticipates a cumulative adverse impact with respect to mercury contamination. Conservation Measure 12 is designed to reduce adverse impacts caused by Conservation Measures 2, 4, 5, and 10, which are associated with wetland and floodplain habitat restorations. Mitigation measures include, but are not limited to, conforming to the relevant requirements of the Delta Mercury Control Strategy and the Central Valley Regional Water Control Board Basin Plan such as: required participation in efforts to minimize risks to human consumers of contaminated fish, participation in monitoring methylmercury loading from wetlands, and implementing appropriate and site-specific methylmercury control measures. The analyses acknowledge that mercury and methylmercury control measures are still in development, and it assumes that all practical measures will be implemented if reasonable and feasible. The analyses anticipate that not all contributions of methylmercury can be mitigated, and that even after all feasible mitigation measures are implemented, some adverse cumulative impacts may	

			remain. No adverse impacts with respect with mercury contamination were found in the upstream project areas, however, adjustments to water management in upstream reservoirs may influence mercury transport, methylmercury production, and methylmercury bioaccumulation in reservoirs and downstream of reservoirs. Reservoir creation and operation has been shown to create local hotspots of mercury methylation and bioaccumulation. Some of the factors that have been found to likely influence methylmercury production or fish methylmercury bioaccumulation in California reservoirs include: reservoir depth, temperature, thermal stratification and hypolimnetic anoxia, water level fluctuations, aqueous and sediment inorganic mercury and methylmercury concentrations, chlorophyll-a concentrations, and specific conductivity (Louie et al. 2012; Negrey et al. 2012). Fish mercury levels have been found to be statistically proportional to the amount of land flooded and the ratio of surface area to volume flooded in reservoirs in the United States and Canada (Bodaly et al. 2007; Johnston et al. 1991; Selch et al. 2007). The magnitude of reservoir water level fluctuations have been identified worldwide as an important factor in determining fish mercury levels (Evers et al. 2007; Roulet et al. 2001; Sorensen et al. 2005). A similar relationship has been found in California reservoirs, where a statistically significant positive correlation has been observed between California reservoir fish mercury concentrations and annual mean reservoir fluctuations (Louie et al. 2012). If the magnitude and timing of reservoir releases increase the magnitude of reservoir level fluctuations in project reservoirs, then this could result in increased mercury contamination in Central Valley Project and State Water Project reservoirs. Staff recommends that the EIR/EIS address the potential changes to mercury and methylmercury in the upstream project areas and work with Water Board staff on needed measures to address mercury related concerns. References: Bodaly, D., W. Jansen, A. Majewski, R. Fudge, N. Strange, A. Derksen, and D. Green. 2007. Postimpoundment Time Course on Increased Mercury Concentrations in Fish in Hydroelectric Reservoirs on Northern Manitoba, Canada. Archives of Environmental Contamination and Toxicology, 53: 379-389. Evers, D., Y. Han, C. Driscoll, N. Kamman, M. Goodale, K. Lambert, T. Holsen, C. Chen, T. Clair, and T. Butler. 2007.	

			Biological Mercury Hotspots in the Northeastern United States and Southeastern Canada. Bioscience, 57(1): 29-43. Johnston, T., R. Bodaly, and J Mathis. 1991. Predicting Fish Mercury Levels from Physical Characteristics of Boreal Reservoirs. Canadian Journal of Fisheries and Aquatic Sciences, 48: 1468-1475. Louie, S., M. Wood, and C. Austin. 2012. Development of a Statewide Mercury Control Program for Reservoirs. Poster Presentation Abstract, 7th Biennial Bay-Delta Science Conference. Sacramento, California., Available at: http://scienceconf.deltacouncil.ca.gov/content/poster-abstracts Negrey, J., W. Heim, M. Stephenson, and K. Coale. 2012. Mercury in California Lakes and Reservoirs: Factors Influencing Bioaccumulation in Black Bass. . Poster Presentation Abstract, 7th Biennial Bay-Delta Science Conference. Sacramento, California., Available at: http://scienceconf.deltacouncil.ca.gov/content/poster-abstracts Roulet, M., J. Guimaraes, and M. Lucotte. 2001. Methylmercury Production and Accumulation in Sediments and Soils of an Amazonian Floodplain – Effect of Seasonal Inundation. Water, Air, and Soil Pollution, 128: 41-60. Selch, T., C. Hoagstrom, E. Weimer, J. Duehr, and S. Chipps. 2007. Influence of Fluctuating Water Levels on Mercury Concentrations in Adult Walleye. Bulletin of Environmental Contamination and Toxicology, 79: 36-40. Sorensen, J. A., L. W. Kellemeyn, and M. Sydor. 2005. Relationship between mercury accumulation in young-of-the-year yellow perch and water-level fluctuations. Environmental Science and Technology 39:9237–9243.	
5	8-146	38	The EIR/EIS states: "For the assessment of Alternatives 1–9, the Sacramento River at Emmaton compliance location is relocated to Three Mile Slough near the Sacramento River. For comparing effects of the alternatives on EC in this portion of the Delta, changes in EC in Three Mile Slough under the alternatives are compared to EC at Emmaton under Existing Conditions and the No Action Alternative." Three Mile Slough is approximately four miles upstream of Emmaton. Using different compliance location for the baseline than for the alternatives provides an	

			incomplete basis for comparison. Please provide comparable analyses and provide the scientific basis for this proposed change demonstrating that it provides equal or greater levels of protection. The State Water Board suggests using Emmaton as the compliance location in the modeling for all of the alternatives and then proposing separately, with scientific justification, that the compliance point be moved upstream.	
6	8-411 and 8-421	All	Impacts WQ-7 & WQ-11 for preferred Alternative 4 conclude that the BDCP may cause unavoidable adverse impacts to chloride and EC levels in the Delta and Suisun Marsh, which may increase the frequency of D1641 objectives violations and may be detrimental to municipal, agricultural, and fish & wildlife beneficial uses of water. The D-1641 requirements are legally binding for the protection of multiple beneficial uses of Delta water. If violating these standards is an unavoidable impact of the project, then the project proponents will need to work with the State Water Board to (1) demonstrate that the beneficial uses can be adequately protected by other means and (2) amend the Bay-Delta Plan and water rights requirements accordingly in coordination with the change petitions and other needed approvals for the project required from the Water Boards.	
7	App. 8H	All	The San Joaquin River compliance locations at Jersey Point and Prisoners Point are identified as being FWS objectives. The document should note that these objectives are also part of the Bay-Delta Plan and D-1641 and should be identified as such.	
8	8-172 to 8-723	6-42 All	The EIR/EIS should consider storage, management and disposal of wash water from concrete batch plants and associated equipment washing. Concrete wash water typically has very high pH, high salinity, and concentrations of dissolved metals (primarily hexavalent chromium) that could cause significant water quality impacts. If exposed to the environment, the solids that settle from concrete wash water may continue to leach alkalinity, dissolved solids, and/or dissolved metals after the water has been decanted. Although it identifies potential batch plant locations, the EIR/EIS does not provide specific details regarding the volume of concrete that would be used at each batch plant, nor does it discuss how the resulting wastewater and residual solids would be managed or disposed of. Wherever practical, generation of concrete wash water should be minimized and the wash water should be	

			recycled within the batch plant. It should not be discharged to either surface waters or land for disposal purposes, and short-term settling or storage containment features should be engineered to prevent percolation of the waste. For example, Caltrans' *Construction Site Best Management Practices Manual* standard storm water best management practices (BMPs), specifically BMP WM-8 (Concrete Waste Management), has been found to be adequate to protect surface water quality. With some additional modification to the wash water containment system design and operation, strict adherence to BMP WM-8 would also protect groundwater quality at the batch plant site. Specifically, we recommend the following: 1. Increasing the thickness of the wash water containment sump's polyethylene liner to 40 mils to improve liner durability; 2. Frequent (daily) decanting of liquid from the lined impoundment to a leak-free tank or bin for recycling in the batch plant; and 3. Providing a paved (or plastic-lined) and bermed area for curing waste or rejected concrete until the material has cured in place for at least one week. The Central Valley Water Board would regulate these facilities under Waste Discharge Requirements or a Conditional Waiver of Waste Discharge Requirements. The project proponent should plan to submit a Report of Waste Discharge at least one year prior to beginning this type of construction. In order to support adoption of WDRs or a waiver, the EIR/EIS should disclose (in general terms) the volume of concrete and Portland cement-based grout that the project would utilize for each type of construction; the expected volume of wash water per unit of concrete (e.g., gallons per 100 cubic yards); the methods of wash water containment and disposal that might be utilized; and the method(s) of residual solids handling, storage, and disposal. If recycling the wash water is not a viable option, the EIR/EIS should also discuss the expected chemical character of the waste with respect to pH, total dissolved solids, hexavalent chromium and other dissolved metals; and the methods of containment, treatment, and disposal that might be utilized.	
9	8-172 to 8-723	6-42 All	The EIR/EIS should consider storage, management and disposal of dewatering waste that has contacted uncured concrete or other cementitious materials. The construction of concrete structures involving placement of concrete in-stream or below the water table can generate dewatering waste that is similar in character to	

			concrete wash water. The EIR/EIS does not provide specific details regarding construction staging areas, the number of and type of subsurface concrete structures, or the volume of concrete that would be used, nor does it discuss how the resulting wastewater and residual solids would be managed or disposed of. Depending on the volume of water generated at each location, it may be possible to neutralize the water and then discharge to land discharge for disposal without causing significant impacts to water quality. Small discharges of this type could be regulated under the State Water Resources Control Board's *Statewide General Waste Discharge Requirements for Discharges to Land with a Low Threat to Water Quality* (Water Quality Order 2003-0003-DWQ or subsequent general WDRs order). In general, short-term containment should be provided to allow for pH testing and addition of the minimum required dose of neutralizing agent prior to discharge. If the waste will be discharged to land not owned by the state, the landowner's permission must be obtained. The Executive Officer of the Central Valley Water Board can authorize coverage under the Statewide General WDRs. The project proponent should plan to submit an application for coverage (known as a Notice of Intent) at least 90 days prior to beginning this type of construction. Larger discharges of dewatering waste contaminated by contact with uncured concrete may require additional treatment to reduce the concentration of dissolved metals and/or carefully controlled discharge, and individual Waste Discharge Requirements adopted by the Central Valley Water Board may be needed. The project proponent should plan to submit a Report of Waste Discharge at least one year prior to beginning this type of construction. In order to support coverage under the statewide general WDRs or adoption of individual WDRs or a waiver, the EIR/EIS should disclose (in general terms) the number of underground concrete structures that may require underwater placement on concrete; the expected volume of contaminated dewatering waste per location; the expected chemical character of the waste with respect to pH, total dissolved solids, hexavalent chromium and other dissolved metals; and the methods of containment, treatment, and disposal that might be utilized.	

10	8-469 8-470 8-473	25-26 35 10-13	The EIR/EIS should consider storage, management and disposal of water from construction dewatering. The EIR/EIS does not provide specific details regarding construction staging areas, the number of and type of excavations or in stream structures that would require dewatering during construction nor does it discuss how the resulting wastewater and residual solids would be managed or disposed of. Dewatering discharges to land often pose little or no threat to groundwater quality. However, the EIR/EIS should consider the possibility that excavation may encounter groundwater that has been polluted by leaking underground fuel storage tanks and spills of pesticides or other toxic or hazardous substances. Depending on the volume of water generated at each location, it may be necessary to treat the water prior to land disposal without causing significant impacts to water quality. Small, short term discharges of uncontaminated groundwater to land may qualify for coverage under the Central Valley Water Board's *Waiver of Reports of Waste Discharge and Waste Discharge Requirements for Specific Types of Discharge within the Central Valley Region* (Resolution R5-2008-0182 or subsequent general waiver). Longer term discharges or those that require treatment prior to discharge could be regulated under the State Water Resources Control Board's *Statewide General Waste Discharge Requirements for Discharges to Land with a Low Threat to Water Quality* (Water Quality Order No. 2003-0003-DWQ or subsequent general order). In general, short-term containment should be provided to allow for testing and treatment if required prior to discharge. If the waste will be discharged to land not owned by the state, the landowner's permission must be obtained. The Executive Officer of the Central Valley Water Board can authorize coverage under the Statewide General WDRs, and the project proponent to should plan to submit an application for coverage (known as a Notice of Intent) at least 90 days prior to beginning this type of construction. Very large or long term/permanent dewatering discharges to land may require individual Waste Discharge Requirements adopted by the Central Valley Water Board. The project proponent should plan to submit a Report of Waste Discharge at least one year prior to beginning this type of discharge.	

			In order to support coverage under the statewide general WDRs, coverage under the low threat waiver, or adoption of individual WDRs, the EIR/EIS should disclose (in general terms) the number and type of excavations that may require dewatering; the expected volume of dewatering waste per location; the expected chemical character of the waste with respect to any known or suspected contaminants; and the methods of containment, treatment, and disposal that might be utilized.	
11	8-469 8-673	41-46 31	The EIR/EIS does not provide details on how much material from the various options under consideration, will be classified as dredge spoils. This designation applies to material removed below the Mean High Water (MHW) tidal datum. Material classified as dredge spoils will require Waste Discharge Requirements (WDR's) for the removal, upland placement (including both temporary dewatering sites and long-term placement or disposal sites) and/or subsequent reuse. Dredged material removed by hydraulic cutterhead suction requires large dewatering ponds, and any discharge of the clarified slurry water will be regulated under the terms of the WDR to prevent water quality impacts to surface waters. Dredged material placement on land must satisfy the criteria of being inert waste, in the placement location. Material not classified as inert requires the installation of liners and/or other impervious barriers according to Title 27 guidelines for the protection of groundwater and/or surface waters. Pre-dredge sediment characterization and placement site soil sampling is required in order to determine if the dredged material meets the criteria of being inert at the placement site location. Material should be tested for leachable constituents, acid generation potential, and other constituents of concern that may be identified as being present. Approval of dredging WDR's by the Central Valley Regional Water Quality Control Board in a public hearing (scheduled approximately every two months), requires submittal of a complete Report of Waste Discharge (ROWD) a minimum of 4-6 months prior to the scheduled Board meeting. Currently no dredging General Order permits are in place to cover new-work projects of this nature.	
12	8-469	23-29	Material will be excavated according to the various options under consideration in the EIR/EIS. There are potential water quality issues at the point of excavation,	

			and at storage, disposal and reuse areas. Potential waste issues include: (1) Runoff of water from excavated materials to surface waters, which is discussed separately under NPDES Permits; (2) Percolation of water into groundwater. If the percolating water is similar to underlying groundwater, there may not be a water quality issue. However if the excavated material contains saline water or other contaminants, there may be a potential for pollution of underlying groundwater. The chemical and physical properties of the excavated materials will need to be assessed relative to the potential for groundwater impact. Waste Discharge Requirements may be needed to prevent groundwater pollution dependent upon the characteristics of the excavated material and the site conditions at the storage, reuse or disposal area; and if the excavated material has the potential to generate acidic conditions after excavation, the acidic conditions may dissolve metals and other materials in the soils that are normally insoluble, and thus not a groundwater threat. The acid generation potential of excavated materials must be assessed to determine if Waste Discharge Requirements are needed, and whether measures must be taken to prevent groundwater pollution. Dredged material placement on land must satisfy the criteria of being inert waste, in the placement location. Material not classified as inert requires the installation of liners and/or other impervious barriers according to Title 27 guidelines for the protection of groundwater and/or surface waters. Pre-excavation soil characterization and placement-site soil sampling is required in order to determine if the dredged material meets the criteria of being inert at the placement site location. Material should be tested for leachable constituents, acid generation potential, and other constituents of concern that may be identified as being present. Approval of WDR's by the Central Valley Regional Water Quality Control Board in a public hearing (scheduled approximately every two months), requires submittal of a complete Report of Waste Discharge (ROWD) a minimum of 4-6 months prior to the scheduled Board meeting. Currently no General Order permits are in place to cover new-work projects of this nature.	
13	8-108	9-23	USEPA regulations (NPDES, TMDL, Title 27, Non-15, etc.) require that certain types of industrial activity have an NPDES Industrial Stormwater Permit. Such activities	

			include corporation yards, equipment storage and maintenance areas, materials storage areas, and manufacturing facilities, such as concrete batch plants. Whether or not permit coverage is needed depends on the type of activity, size of the facility, and whether those activities have the potential of adding pollutants to stormwater runoff. The remainder of this comment addresses concrete batch plants specifically, but similar comments are applicable to a wide variety of industrial activities that could be part of the project. The draft EIR/EIS notes that temporary concrete batch plants may be used at various locations to support project construction. Storm water runoff from industrial concrete batch plant sites has the potential to carry industrial pollutants such as metals, suspended solids, oil and grease, and high pH water to surface and ground water. Concrete wash water typically has very high pH, high salinity, and concentrations of dissolved metals (primarily hexavalent chromium) that could cause significant water quality impacts. If exposed to the environment, the solids settling from concrete wash water may continue to leach alkalinity, dissolved solids, and/or dissolved metals after the water has been decanted. Batch plants are one of the many types of industrial activities required by federal Clean Water Act to obtain coverage under an NPDES permit for storm water discharges. In California, NPDES permit coverage for industrial sites is available through the State Water Board's *General Industrial Activities Storm Water Permit, Water Quality Order No. 97-03-DWQ* (Industrial General Permit or IGP). Please note that a new Industrial General Permit is in preparation at the State Water Board, and it may include additional or modified requirements than the current permit. Operators of industrial batch plants follow a site-specific Storm Water Pollution Prevention Plan (SWPPP) and monitoring program to identify sources of pollution that affect the quality of storm water discharges through grab sampling and visual observations. The SWPPP should include a description and implementation of best management practices (BMPs) to reduce or prevent pollutants in industrial storm water discharges. Good site management and properly installed BMPs reduce the amount of site related contaminants that will be discharged off an industrial site during rain events. Wherever practical, generation of concrete wash water should be minimized and the wash water should be recycled within the batch plant. It should not be discharged to either surface waters or land for disposal	

			purposes, and short-term settling or storage containment features should be engineered to prevent percolation of the waste. Containment and disposal of concrete waste and wastewater may be subject to other permit requirements from the Regional Board. Comments on those requirements are provided elsewhere. The EIR/EIS should address how the project proponent will comply with the IGP and how the batch plant wastewater and residual solids will be managed. Application for coverage under the Industrial General Permit is completed by submitting a complete Notice of Intent, site map, and the annual Industrial General Permit fee of $1,359 to the State Water Board. Although a Waste Discharge Identification Number (WDID) is generally issued within two to three weeks after a complete NOI and attachments are submitted, the project proponent should allow adequate time to develop a SWPPP prior to applying for permit coverage.	
14	General		Section 401 water quality certifications are issued by the Regional Water Quality Control Boards, the State Water Resources Control Board's Division of Water Quality, and the State Water Board's Division of Water Rights. Each entity has certification authority as defined by the California Code of Regulations, §3855. •The Division of Water Quality is responsible for issuing water quality certifications for projects which may fall under the jurisdiction of more than one regional board. •The Division of Water Rights is responsible for issuing water quality certifications associated with one or more of the following: 1. An appropriation of water; 2. A hydroelectric facility, and the proposed activity requires a Federal Energy Regulatory Commission (FERC) license or amendment to a FERC license; or 3. Any other diversion of water for domestic, irrigation, power, municipal, industrial, or other beneficial use. •The Regional Boards are responsible for all other projects within their regions for which a discharge may occur. Required items for issuance of a Clean Water Act Section 401 Water Quality Certification are based on Sections 3836 and 3856 of Title 23 of the California Code of Regulations.	

			The project proponents should note that: (a) there are no waivers for Clean Water Act Section 401 Water Quality Certifications in the state of California; (b) a Clean Water Act Section 401 Water Quality Certification serves as both a certification, in part or in whole, of a federal permit, under Section 401 of the Clean Water Act, and as a Waste Discharge Requirement under the Porter-Cologne Water Quality Control Act; and (c) under Section 401 of the Clean Water Act, the state of California can review and approve, condition, or deny all federal permits that may result in a discharge to waters of the State, including wetlands. The Water Boards will work with the project proponents to assure that the 401 certifications are coordinated.	
15	8A1-19	All	Appendix 8A consists of some tables without titles or reference citations. Please include the source(s) of the information, and which locations or water bodies the tables are referring to.	
16	8-8, 8-9	30-41, 1-33	This Section 8.1.1.4 lists the primary factors that affect water quality within the Delta. Some of the listed factors include land use in the upstream watersheds and Delta, and SWP and CVP operations. Please include other factors that affect water quality, such as non-SWP/CVP diversions	

BDCP EIR/EIS Review Document Comment Form

Document: ***Administrative Draft—Chapter No. 9__Geology and Seismicity***

Comment Source: SWRCB
Submittal Date: 7/5/2013

No.	Page	Line #	Comment	ICF Response
			Possible comments to be provided on public draft	

BDCP EIR/EIS Review Document Comment Form

Document: ***Administrative Draft—Chapter No. 10__Soils***

Comment Source: SWRCB
Submittal Date: 7/5/2013

No.	Page	Line #	Comment	ICF Response
1			Possible comments to be provided on public draft	

BDCP EIR/EIS Review Document Comment Form

Document: ***Administrative Draft—Chapter No. 11__Fish and Aquatic Resources***

Comment Source: SWRCB
Submittal Date: 7/5/2013

No.	Page	Line #	Comment	ICF Response
1	General		The EIR/EIS should provide an evaluation and comparison of changes to the quality and quantity of open water aquatic habitats and subsequent impacts on target fish populations under the alternatives, including changes in salinity gradients, dissolved oxygen levels and hydrodynamics.	
3	General		State Water Board staff reviewed the comments on the December 2012 Administrative Draft BDCP that were prepared by National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS), and the 2012 Red Flag comments on the February 2012 version of the BDCP Effects Analysis, that were submitted by the US Bureau of Reclamation (USBR) and the fishery agencies (California Department of Fish and Wildlife (CDFW), USFWS, and NMFS). Water Board staff support the fishery agencies' comments contained in these documents.	
4	General		The impact analysis does not appear to provide analysis for all decision tree scenarios (H1-H4). For instance, in the fish passage section, only scenarios H1, H3, and H4 were analyzed, while only H3 was analyzed in the water temperature section and upstream habitat section. If the detailed analyses provided in the document brackets the rest of the scenarios, a qualitative discussion should be provided that explains why the existing analyses brackets the impacts associated with the scenarios that did not undergo detailed analysis.	
5	General		The impacts for non-covered fish species appear to be copied from the impact summary for covered fish species. Please describe the basis for this analysis.	
6	General		The analysis assumes a specified construction schedule for assessing impacts to fishery and aquatic resources. Some of the impact analysis conclusions were based on assumptions regarding fish presence during the time of construction. It is not clear whether the analysis evaluates the potential impacts to fishery and aquatic resources associated with delayed construction schedules.	
7	General		The fishery and aquatic resources impact analysis does not appear to analyze scenarios in which conservation measures are not 100% successful.	

			Section 5.2 of the BDCP describes how the conservation measures were evaluated to determine if biological objectives could be met for covered fish. Table 5.2-8 of the BDCP indicates that out of the thirty-nine biological goals and objectives, only eleven could be assessed for feasibility, and fifteen could only be partially assessed for feasibility. However, the EIR/EIS appears to assume that all of the conservation measures will be successful in meeting biological goals and objectives. The lack of certainty regarding the success of the conservation measures should be a consideration in the impact analysis and significance determinations reported in the EIR/EIS.	
8	General		Significance thresholds are described on pages Part 1-11-117 and Part 1-11-118. These significance thresholds do not contain numeric values; however elsewhere in the text, the document refers to parameters such as "significance criterion", "upper tolerance threshold", and "level of biological significance". These appear to be numeric thresholds, but are not clearly identified. Please summarize the numeric thresholds that are used in the analysis, including the reasoning for the values chosen.	
9	General		Table 3.4.1-3 of the BDCP (pages 3.4-23 – 3.4-24) identifies four uncertainties associated with the North Delta Diversion Bypass Flows. These include: (1) Determine timing and rate of downstream passage by larval delta smelt, and effects on mortality; (2) Determine timing and rate of downstream passage by juvenile salmonids (all Chinook runs and steelhead), and effects on mortality; (3) Determine the effects of altered flows and resultant altered distribution and timing of salinity on dispersal and colonization by invasive species; and (4) Determine the effects of hydrodynamics near the intakes on behavior and energetics of covered fishes. These uncertainties appear to have potential for environmental impacts to aquatic species, but it is unclear whether these issues were examined in the EIR/EIS.	
10	Part 1, pages 11-114		The coldwater fish habitat analysis appeared to only analyze for impacts to fish living in reservoirs, and did not analyze for impacts to fish living downstream that may be dependent on reservoir releases. Please explain.	
11	Part 3, pages		Existing through-Delta (to Chipps Island) survival of juvenile salmon is estimated by the Delta Passage Model to be 16% – 28%, and does not change	

	11-75 and 11-128		markedly under any of the Alternative 4 decision tree scenarios. However, the BDCP (Table 3.3-1, page 3.3-17) indicates the BDCP Biological Objective for through-delta juvenile salmon survival is approximately 45% (varies somewhat by ESU, river of origin, and planning horizon). Although the BDCP seems to indicate this biological objective can be achieved by utilizing conservation measures 1, 2, 4, 5, 6, 14, 15, 16, 19, and 21, analysis of estimated survival improvements was provided for only conservation measure 1. It is not clear how the biological objective for through-delta juvenile salmon survival will be achieved because no estimates of survival improvements were provided for the other conservation measures.	
12	Part 3, pages 240-241		Significant decreases in the frequency of high spring Delta outflows are predicted under Scenario H3, which could impact sturgeon migration. Scenario H3 does not contain the enhanced spring outflow. However, the discussion of Scenario H4 (which does contain the enhanced spring outflow) states that no additional analyses are necessary because flows will be effectively the same under H4 as H3, except in May and June, when they will be lower under H4. It is unclear how this conclusion was reached, given that these two scenarios have very different spring outflow requirements.	
14	General		A better connection between the water quality chapter and the water quality issues addressed in chapter 11 should be provided. The discussion of temperature in Chapter 11 should identify any water bodies which have been 303(d) listed for temperature. This would include water bodies within the immediate Project area as well as those located in areas where water is delivered. This would be consistent with the information that is contained within the water quality chapter. Although temperature is discussed in Chapter 11, it is important that it is discussed in the same manner as other water quality constituents.	
15	General		The quality and quantity of aquatic habitat should be evaluated in the aquatic resources chapter and evaluated with respect to the impacts of the alternatives. Specifically, an analysis of impacts to open water habitat using 1D or preferably 3D modeling should be provided by evaluating changes in the salinity gradient (X2) and the change in area of preferred habitat for different species.	

BDCP EIR/EIS Review Document Comment Form

Document: ***Administrative Draft—Chapter No. 12__Terrestrial Biological Resources***

Comment Source: SWRCB
Submittal Date: 7/5/2013

No.	Page	Line #	Comment	ICF Response
1	General		The aquatic habitat evaluation should be included in the aquatics chapter rather than the terrestrials chapter to allow for a complete evaluation of impacts.	
2	General		The EIR/EIS should provide historical frames of reference for impacts to natural communities in addition to comparisons with existing conditions.	
3	General		Here and other places in the document, aquatic natural community restoration appears to assume 100% success. Is there an assumption of a success rate for any of the restoration projects? If so, it would be helpful to disclose that assumption and detail support for it. If not, a discussion of the success rate among restoration projects for each of the natural communities is appropriate for providing the reader an understanding of the potential for restoration to be successful and reduce impacts.	

BDCP EIR/EIS Review Document Comment Form

Document: ***Administrative Draft—Chapter No. 13__Land Use***

Comment Source: SWRCB
Submittal Date: 7/5/2013

No.	Page	Line #	Comment	ICF Response
1			Possible comments to be provided on public draft	

BDCP EIR/EIS Review Document Comment Form

Document: ***Administrative Draft—Chapter No. 14__Agricultural Resources***

Comment Source: SWRCB
Submittal Date: 7/5/2013

No.	Page	Line #	Comment	ICF Response
1			Possible comments to be provided on public draft	

BDCP EIR/EIS Review Document Comment Form

Document: ***Administrative Draft—Chapter No. 15__Recreation***

Comment Source: SWRCB
Submittal Date: 7/5/2013

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1			Possible comments to be provided on public draft	

BDCP EIR/EIS Review Document Comment Form

Document: ***Administrative Draft—Chapter No. 16__Socioeconomics***

Comment Source: SWRCB
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No.	Page	Line #	Comment	ICF Response
1			Possible comments to be provided on public draft	

BDCP EIR/EIS Review Document Comment Form

Document: ***Administrative Draft—Chapter No. 17__Aesthetics and Visual Resources***

Comment Source: SWRCB
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No.	Page	Line #	Comment	ICF Response
1			Possible comments to be provided on public draft	

BDCP EIR/EIS Review Document Comment Form

Document: ***Administrative Draft—Chapter No. 18__Cultural Resources***

Comment Source: SWRCB
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No.	Page	Line #	Comment	ICF Response
1			Possible comments to be provided on public draft	

BDCP EIR/EIS Review Document Comment Form

Document: ***Administrative Draft—Chapter No. 19__Transportation***

Comment Source: SWRCB
Submittal Date: 7/5/2013

No.	Page	Line #	Comment	ICF Response
1			Possible comments to be provided on public draft	

BDCP EIR/EIS Review Document Comment Form

Document: ***Administrative Draft—Chapter No.20 __Public Services and Utilities***

Comment Source: SWRCB
Submittal Date: 7/5/2013

No.	Page	Line #	Comment	ICF Response
1	20-29	16	The Methods for Analysis incudes bulleted lists that include some of the sources that were used to collect information, such as GIS data for law enforcement and fire protection facilities, contact with service agencies, aerial photography, and State databases. The State Water Board's eWRIMS water rights database may be useful to the BDCP since the BDCP area includes many water right holders as well as water diverters.	
2	20-116	1-43	The EIR/EIS states that field offices and concrete batch plants may need as much as 47.5 million gallons of potable water. In addition, the document also states that the sites are often in rural areas where public hookups are not always available, although the document describes the trucking of needed water. The source(s) of the potable water and, if applicable, the water rights associated with the source(s) should be identified and potential impacts evaluated.	

BDCP EIR/EIS Review Document Comment Form

Document: ***Administrative Draft—Chapter No.21 __Energy***

Comment Source: SWRCB
Submittal Date: 7/5/2013

No.	Page	Line #	Comment	ICF Response
1	21-15	6	The EIR/EIS assumes that upstream impacts due to project alternatives are zero because upstream hydropower operations are controlled by runoff. The chapter provides little support of the assumption that upstream impacts to hydropower will be null. Changes in release patterns, and therefore generation patterns, could impact hydropower production, even if average annual flows through the powerhouses remain constant. For example shifts if generation from summer to spring represents an impact to generation, even if the volumes remain constant. Please clarify.	

BDCP EIR/EIS Review Document Comment Form

Document: ***Administrative Draft—Chapter No.22 __Air Quality and Greenhouse Gases***

Comment Source: SWRCB
Submittal Date: 7/5/2013

No.	Page	Line #	Comment	ICF Response
1			Possible comments to be provided on public draft	

BDCP EIR/EIS Review Document Comment Form

Document: ***Administrative Draft—Chapter No.23 __Noise***

Comment Source: SWRCB
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No.	Page	Line #	Comment	ICF Response
1			Possible comments to be provided on public draft	

BDCP EIR/EIS Review Document Comment Form

Document: ***Administrative Draft—Chapter No.24 __Hazards and Hazardous Materials***

Comment Source: SWRCB
Submittal Date: 7/5/2013

No.	Page	Line #	Comment	ICF Response
1			Possible comments to be provided on public draft	

BDCP EIR/EIS Review Document Comment Form

Document: ***Administrative Draft—Chapter No.25 __Public Health***

Comment Source: SWRCB
Submittal Date: 7/5/2013

No.	Page	Line #	Comment	ICF Response
1			Possible comments to be provided on public draft	

BDCP EIR/EIS Review Document Comment Form

Document: ***Administrative Draft—Chapter No.26 __Mineral Resources***

Comment Source: SWRCB
Submittal Date: 7/5/2013

No.	Page	Line #	Comment	ICF Response
1			Possible comments to be provided on public draft	

BDCP EIR/EIS Review Document Comment Form

Document: ***Administrative Draft—Chapter No.27 __Paleontological Resources***

Comment Source: SWRCB
Submittal Date: 7/5/2013

No.	Page	Line #	Comment	ICF Response
1			Possible comments to be provided on public draft	

BDCP EIR/EIS Review Document Comment Form

Document: ***Administrative Draft—Chapter No.28 __Environmental Justice***

Comment Source: SWRCB
Submittal Date: 7/5/2013

No.	Page	Line #	Comment	ICF Response
1			Possible comments to be provided on public draft	

BDCP EIR/EIS Review Document Comment Form

Document: ***Administrative Draft—Chapter No.29 __Climate Change***

Comment Source: SWRCB
Submittal Date: 7/5/2013

No.	Page	Line #	Comment	ICF Response
1	2	25	The EIR/EIS mentions that the BDCP analyzes possible sea level rise of up to 55 inches. However, reading the modeling appendices, the amount of sea level rise used in the effects analysis was only 17.7 inches. We understand that 55 inches is a year 2100 projection and that 17.7 inches was chosen instead to represent the modeling baseline, year 2060. However, the EIR/EIS should clarify in Chapter 29 (and also in Chapter 3 where the No Action Alternative is described) that the effects analysis used 17.7 inches of sea level rise rather than 55 inches. Otherwise, the document could mislead readers into thinking that 55 inches of sea level rise was analyzed throughout.	

BDCP EIR/EIS Review Document Comment Form

Document: ***Administrative Draft—Chapter No.30 __Growth Inducement***

Comment Source: SWRCB
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No.	Page	Line #	Comment	ICF Response
1			Possible comments to be provided on public draft	

BDCP EIR/EIS Review Document Comment Form

Document: ***Administrative Draft—Chapter No.31 __Other CEQA/NEPA Required Sections***

Comment Source: SWRCB
Submittal Date: 7/5/2013

No.	Page	Line #	Comment	ICF Response
1			Possible comments to be provided on public draft	

Attachment 1. State Water Board Analysis of Alternatives 4 and 8

Sacramento River and Delta outflows are controlled within the CALSIM II modeling of the BDCP by cold water constraints, North Delta bypass rules, Delta outflow, minimum flow at Freeport and EC requirements. This section focuses on differences in modeling assumptions and results under Alternative 4 and Alternative 8 of the BDCP EIR/EIS. Differences between Alternative 4 and 8 can be broken up into two separate categories; physical and operational which are summarized in the table below. Physically, the two are very similar; the primary difference relating to fisheries is the presence of the operable barrier at the Head of Old River (HORB) in Alternative 4, and absence in Alternative 8. There are many operational differences between the two alternatives including minimum Sacramento River bypass flows, minimum OMR flows, minimum Delta outflow, minimum San Joaquin River inflow and maximum export restrictions listed in the table below.

Summary

Alternative	Conveyance	# North Delta Intakes	Capacity (cfs)	Operating Scenario	Avg Annual Exports	Fall X2[3]	OMR Protection[1]	South Delta Barriers	NMFS SJR E-I Ratio[2]
Existing Cond.	No Improvements	0	NA	NA	5.1 MAF	No	BiOps	Yes	Yes
	Notes: Year 2009 development; Includes all projects ongoing as of Feb 2009 plus the Jun 2009 NMFS BiOp. Does not include Freeport Regional Water Project or CCWD's Victoria Canal Intake (both recently completed)								
No Action	No Improvements	0	NA	NA	4.4 MAF	Yes	BiOps	Yes	Yes
	Notes: Year 2020 development; Full SWP & CVP build-out; Climate change; Sea level rise								
4	Tunnel & Through-Delta	3	9,000	H	4.4 - 5.3 MAF	Maybe	Intermed.	Yes	No
	Alt 4 Notes: Operable Head of Old River Barrier; Gravity fed tunnel, Enhanced Spring Delta outflow (maybe)								
8	Tunnel & Through-Delta	3	9,000	F	3.1 MAF	Yes	High	No	Enhanced
	Alt 8 Notes: Increased Delta outflow; Increased North Delta bypass flow; Coldwater pool management; 55% unimpaired flow at Freeport Jan - Jun[3]								

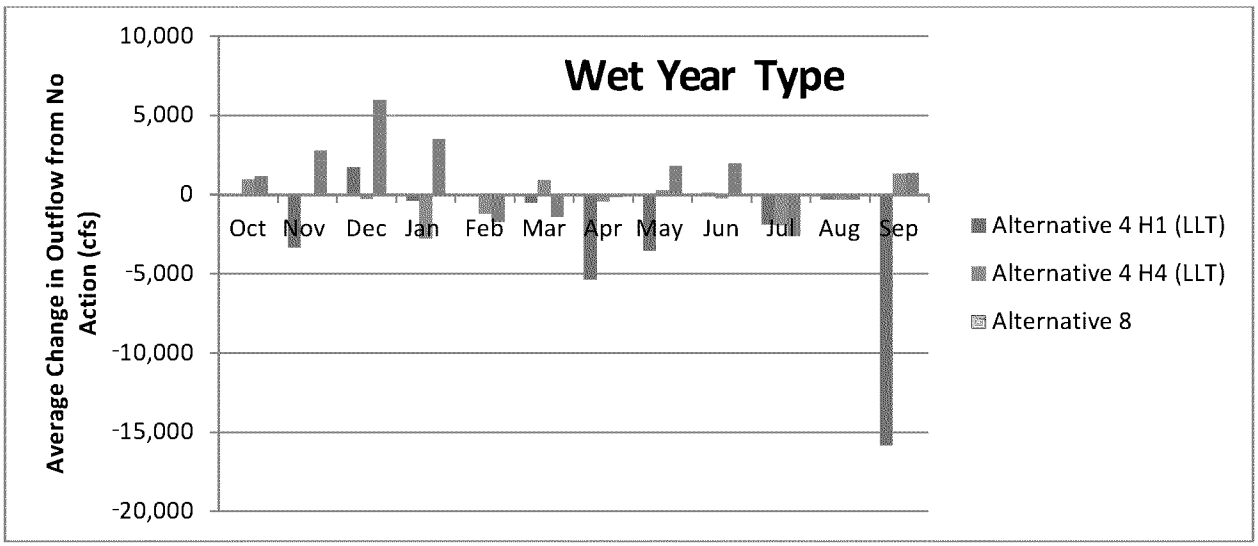
[1] Source: Table C-9-6. Old and Middle River, Monthly Flow (combined flows)
[2] Source: Table C-7-2-16. Sacramento/San Joaquin River Delta, Monthly Outflow Volume
[3] Source: Table C-7-1-1. Sacramento/San Joaquin River Delta, Monthly Outflow Rate

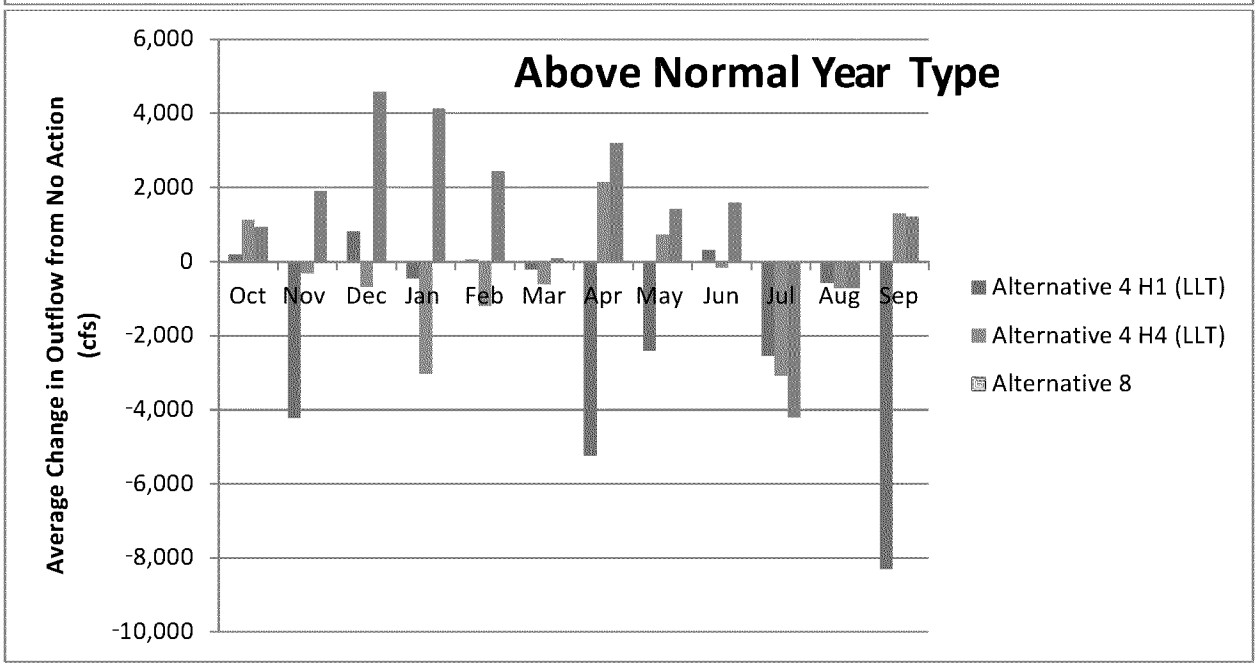
Delta Outflow

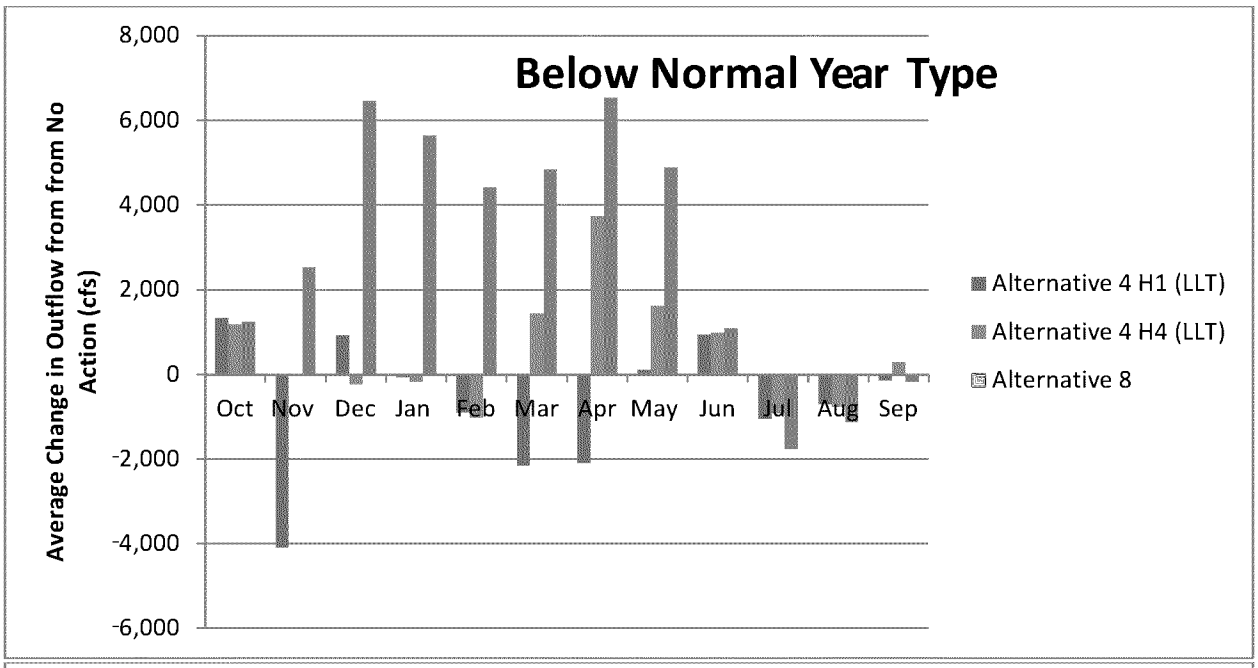
Delta Outflow for Alternative 4 has four different decision tree scenarios (H1-H4) ranging from D-1641 to enhanced spring and fall outflow. Delta outflow for Alternative 8 is based on D-1641 most of the year, plus fall X2 requirements and 55% unimpaired flow at Freeport (capped at 40,000 cfs) from January – June. The discussion here compares the most protective (H4) and least protective decision tree scenario (H1) with outflow for Alternative 8. Decision tree scenario H1 is identical with the current outflow conditions as set forth in D-1641. Decision tree scenario H4 outflow is D-1641 with Fall X2 and an "enhanced" March-May target that ranges from 9,200 cfs to 44,500 cfs based on percent exceedance of forecasted March-May eight river index. A large difference that should be noted is the length of time that the enhanced spring outflows cover; Alternative 8 covers 5 months whereas H4 covers only 3.

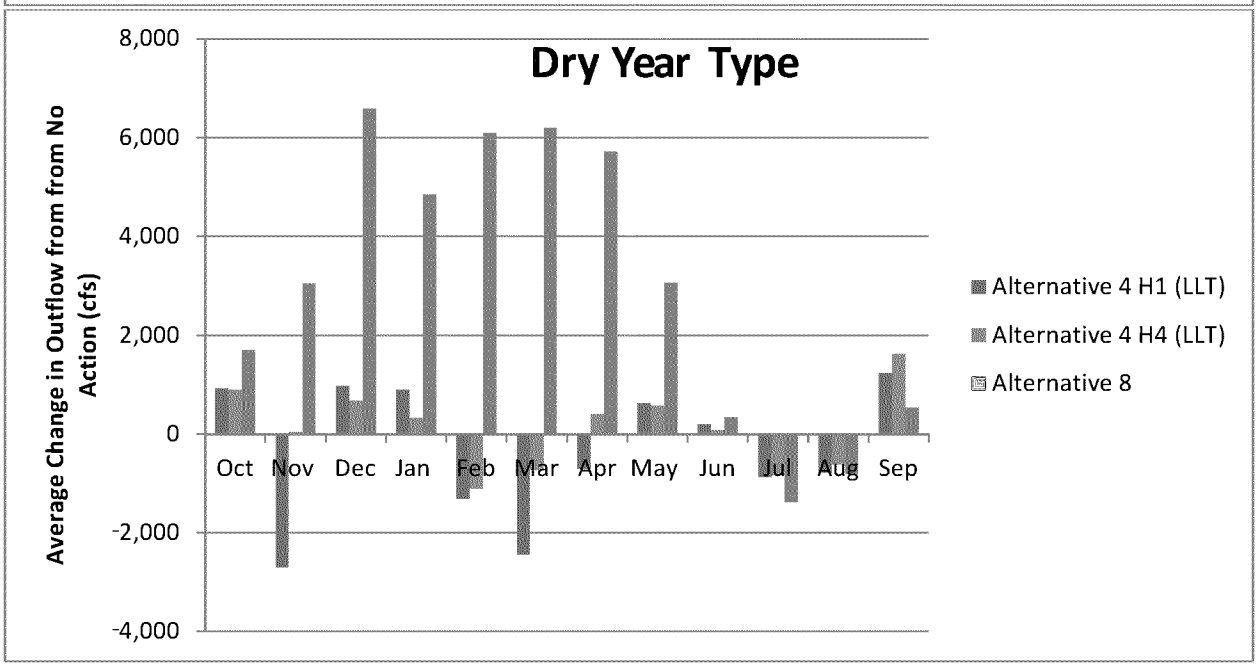
Below are CALSIM II results showing changes from No Action Alternative in average monthly outflow for each year type for scenarios H1, H4, and F. The wet year type shows very similar outflows for each of the scenarios which reflect the fact that the system is controlled in wet years by natural runoff. Unlike wet year types, however, there is a large difference in outflows between scenarios in critical years. Alternative 4 H1 (LLT) results in a decrease in outflow in November, Febuary – April, June – August and particlularly large increase in September and October. In critical year types, spring Delta outflow is lower under all Alternative 4 scenarios than the No Action Alternative which many studies have shown is the time when fishes currently need higher flows the most. The "enhanced" spring outflow only provides a significant increase in outflow in Below Normal year types which comprise of only 17% of the simulation period.

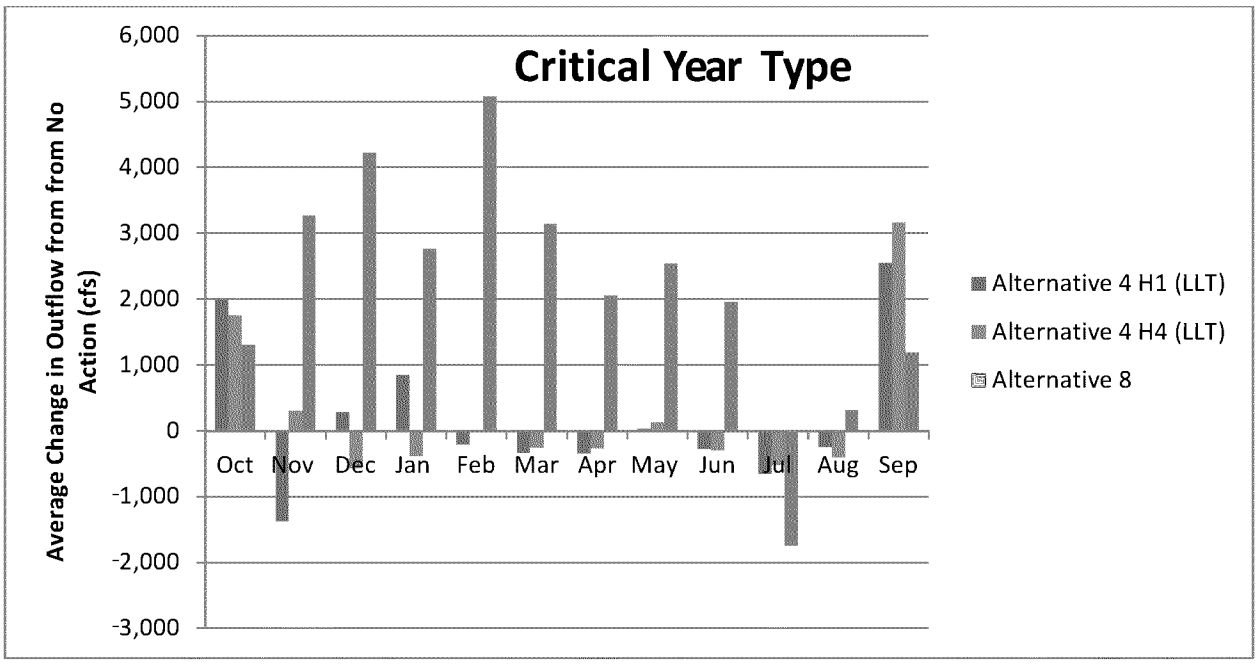
Possible explanations for the increase over No Action during the fall in Alternative 4 in Dry and Critical years could include increased flows to meet temperature requirements in the Sacramento River due to climate change or could be due to North Delta bypass restrictions, more clarification on why this occurs by the authors would be helpful.






Below Normal Year Type
Average Change in Outflow from from No Action (cfs)
8,000
6,000
4,000
2,000
0
-2,000
-4,000
-6,000
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Alternative 4 H1 (LLT)
Alternative 4 H4 (LLT)
Alternative 8


Dry Year Type
Average Change in Outflow from from No Action (cfs)
8,000
6,000
4,000
2,000
0
-2,000
-4,000
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Alternative 4 H1 (LLT)
Alternative 4 H4 (LLT)
Alternative 8



Alternative minus No Action		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Ave
Alternative 4 H1 (LLT)	Full Simulation Period	753	-3,172	1,083	109	-433	-1,148	-3,028	-1,325	257	-1,446	-509	-5,613	-1,206
	Wet	-1	-3,336	1,736	-423	97	-512	-5,353	-3,574	139	-1,910	-308	-15,832	-2,439
	Above Normal	207	-4,231	816	-468	67	-213	-5,242	-2,417	320	-2,552	-570	-8,302	-1,882
	Below Normal	1,339	-4,093	923	-68	-910	-2,167	-2,098	110	942	-1,049	-700	-139	-659
	Dry	929	-2,705	972	902	-1,313	-2,439	-707	628	207	-874	-782	1,242	-329
	Critical	1,987	-1,379	288	852	-205	-332	-345	37	-276	-655	-251	2,549	189
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Ave
Alternative 4 H4 (LLT)	Full Simulation Period	1,130	-10	-160	-1,338	-978	257	867	617	42	-1,487	-527	1,483	-8
	Wet	966	-51	-261	-2,778	-1,222	944	-438	275	-240	-1,949	-308	1,328	-311
	Above Normal	1,132	-315	-693	-3,029	-1,193	-613	2154	729	-168	-3,087	-713	1,314	-374
	Below Normal	1,190	-8	-241	-177	-1,025	1448	3743	1625	984	-920	-766	289	512
	Dry	905	45	678	332	-1,111	-736	409	580	83	-840	-619	1,630	113
	Critical	1,752	306	-571	-389	20	-258	-265	128	-299	-519	-399	3,164	223
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Ave
Alternative8	Full Simulation Period	1,291	2,749	5,742	4145	2650	2204	3091	2668	1415	-2,307	-527	870	2,000
	Wet	1,178	2,796	6,003	3490	-1716	-1441	-167	1827	1989	-2,625	-308	1,358	1,033
	Above Normal	941	1,914	4,583	4137	2449	103	3210	1422	1596	-4,208	-710	1,224	1,388
	Below Normal	1,247	2,530	6,463	5641	4420	4836	6531	4895	1093	-1,760	-1,134	-182	2,881
	Dry	1,711	3,060	6,592	4850	6095	6196	5727	3068	350	-1,376	-809	536	3,000
	Critical	1,310	3,270	4,223	2769	5076	3147	2060	2540	1958	-1,749	313	1,189	2,176

Source: Appendix 5A Modeling, pg C-184 - C-192

Attachment 2 – Example of Tabular Quantitative Comparisons of the Various Alternatives

Alternative	Conveyance	# North Delta Intakes	Capacity (cfs)	Operating Scenario	Avg Annual Exports	Fall X2	OMR Protection	South Delta Barriers	NMFS SJR E-I Ratio
Existing Cond.	No Improvements	0	NA	NA	5.1 MAF	No	BiOps	Yes	Yes
	Notes: Year 2009 development; Includes all projects ongoing as of Feb 2009 plus the Jun 2009 NMFS BiOp. Does not include Freeport Regional Water Project or CCWD's Victoria Canal Intake (both recently completed)								
No Action	No Improvements	0	NA	NA	4.4 MAF	Yes	BiOps	Yes	Yes
	Notes: Year 2020 development; Full SWP & CVP build-out; Climate change; Sea level rise								
1A	Tunnel & Through-Delta	5	15,000	A	5.5 MAF	No	BiOps	No	No
1B	East Canal & Through-Delta	5	15,000	A	5.5 MAF	No	BiOps	No	No
1C	West Canal & Through-Delta	5	15,000	A	5.5 MAF	No	BiOps	No	No
	Alt 1 Notes: None								
2A	Tunnel & Through-Delta	5	15,000	B	5.1 MAF	Yes	Intermed.	Yes	No
2B	East Canal & Through-Delta	5	15,000	B	5.1 MAF	Yes	Intermed.	Yes	No
2C	West Canal & Through-Delta	5	15,000	B	5.1 MAF	Yes	Intermed.	Yes	No
	Alt 2 Notes: Operable Head of Old River Barrier								
3	Tunnel & Through-Delta	2	6,000	A	5.4 MAF	No	BiOps	No	No
	Alt 3 Notes: Same as Alt 1								
4	Tunnel & Through-Delta	3	9,000	H	4.4 - 5.3 MAF	Maybe	Intermed.	Yes	No
	Alt 4 Notes: Operable Head of Old River Barrier; Gravity fed tunnel, Enhanced Spring Delta outflow (maybe)								
5	Tunnel & Through-Delta	1	3,000	C	4.8 MAF	Yes	BiOps	Yes	Yes
	Alt 5 Notes: Reduced tidal restoration (25,000 Acres); No Banks Pumping Plant capacity expansion								
6A	Tunnel Only	5	15,000	D	3.8 MAF	Yes	NA	No	No
6B	East Canal Only	5	15,000	D	3.8 MAF	Yes	NA	No	No
6C	West Canal Only	5	15,000	D	3.8 MAF	Yes	NA	No	No
	Alt 6 Notes: No South Delta diversions								
7	Tunnel & Through-Delta	3	9,000	E	3.1 MAF	Yes	High	No	Enhanced
	Alt 7 Notes: Increased restoration area; Increased North Delta bypass flow; Increased Rio Vista instream flow								
8	Tunnel & Through-Delta	3	9,000	F	3.1 MAF	Yes	High	No	Enhanced
	Alt 8 Notes: Increased Delta outflow; Increased North Delta bypass flow; Coldwater pool management; 55% unimpaired flow at Freeport Jan - Jun								
9	Fortified Through-Delta Only	0	15,000	G	4.4 MAF	Yes	BiOps	No	Weakened
	Alt 9 Notes: Screened intakes at Delta Cross-Channel & Georgiana Slough; Old River separated from Middle River, Victoria Canal, and Clifton Court by operable gates; Modified E:I ratio								

To: Rader, Cliff[Rader.Cliff@epa.gov]
From: Gorke, Roger
Sent: Tue 7/2/2013 6:37:28 PM
Subject: FW: Just In: latest version of the BDCP comments
BDCP ADEIS comment letter final.docx

Roger Gorke

Senior Policy Advisor

Office of Water

U.S. Environmental Protection Agency

PH: 202-564-0470

FAX: 202-564-0500

gorke.roger@epa.gov

From: Vendlinski, Tim
Sent: Tuesday, July 02, 2013 2:36 PM
To: Gorke, Roger
Subject: Just In: latest version of the BDCP comments

From: Skophammer, Stephanie
Sent: Tuesday, July 02, 2013 11:21 AM
To: Kemmerer, John
Cc: Herrera, Angeles; Goforth, Kathleen; Vendlinski, Tim
Subject: latest version of the BDCP comments

Hi John-

Here is the latest version of the memo to go out via email today. Angeles is giving it a final look and Kathy is making some edits to the table now.

Thanks,

Stephanie

Stephanie Skophammer

U.S. Environmental Protection Agency, Region 9

Environmental Review Office (CED-2)

75 Hawthorne St.

San Francisco, CA 94115

(415) 972-3098

MEMORANDUM via email

Subject: Comments on the Second Consultant Administrative Draft EIS on the Bay Delta Conservation Plan (BDCP) for the Sacramento-San Joaquin Delta, CA

From: Kathleen Martyn Goforth, Manager
Environmental Review Office, Communities and Ecosystems Division (CED-2)
Tim Vendlinksi, Bay Delta Program Manager
Water Division (WTR-1)

To: Federico Barajas, Deputy for the BDCP
U.S. Bureau of Reclamation

Thank you for the opportunity to review the Second Consultant Administrative Draft Environmental Impact Statement (ADEIS) for the BDCP. EPA is providing comments on this document in accordance with our role as a cooperating agency for the development of this EIS. As requested, we are providing detailed comments in the table format provided by the Bureau of Reclamation (see attached). The purpose of this letter is to highlight some key issues for the lead agencies' attention.

EPA fully understands the urgency of solving water supply and ecosystem problems facing the Bay Delta. We agree that the status quo is not sustainable and that a successful BDCP can be a key part of a comprehensive strategy to address the wide range of problems threatening both water supply reliability and the Bay Delta ecosystem.[1] Given the importance and complexity of this project, we appreciate this opportunity for early input. At the same time, we must note that this is a unique process. EPA does not typically review National Environmental Policy Act (NEPA) documents concurrent with the lead agency review. We are aware that the lead Federal agencies have identified significant concerns in their recent Progress Assessments.[2] We also recognize that the Habitat Conservation Plan (HCP), which is incorporated by reference into the ADEIS, and the Preferred Alternative, evaluated in both, are works in progress. Accordingly, we anticipate substantial revisions to the documents as the lead agencies make revisions to the proposed project and analyses leading up to the publication of the DEIS. Finally, we note that this DEIS is intended to be a programmatic level analysis of the HCP as a whole, but also a site-specific analysis of the proposed tunnel export facility. This approach is unusual, and will require particular attention to clarity to ensure that decision makers and the interested public are not confused by the different levels of analysis.

EPA has reviewed the ADEIS to the extent that workloads and scheduling allowed; however, given the evolving nature of the BDCP, the comments that we are submitting today should not be considered a comprehensive list of all EPA concerns and input related to this project. In this letter, we are raising issues and making recommendations in eight key areas based on a focused review of the Preferred Alternative in the ADEIS: Alternatives Analysis; Adverse Impacts on Water Quality; Aquatic Species and Scientific Uncertainty; Impacts on Fish Populations; Programmatic vs Project Level Analysis; Climate Change; Adaptive Management and Mitigation Commitments; and CWA Section 404. More detailed comments and recommendations are provided in the attached table. EPA will continue to participate in discussions with the co-lead and other cooperating agencies in the months ahead to assist in resolving these and other issues as the DEIS development

1 See p. 21-22 of EPA's 2012 Action Plan http://www2.epa.gov/sites/production/files/documents/actionplan.pdf
2 http://baydeltaconservationplan.com/BDCPPlanningProcess/DocumentsAndDrafts.aspx

proceeds. Pursuant to our independent review responsibility under Section 309 of the Clean Air Act, we will also review and comment on the DEIS when it is released for public review and comment.

I. Alternatives Analysis

The NEPA process is intended to help public officials make decisions that are based on an informed understanding of environmental consequences (40 CFR 1500.1(c)). Critical to this is a clear comparison of the impacts of the project alternatives. While the ADEIS contains a wealth of information and many project-level details, it does not clearly distinguish between alternatives with regard to their impacts. The ADEIS generally divides the impacts analyses for the numerous water quality constituents into two subsections: direct project-level impacts from facilities operations, and indirect programmatic- level impacts from tidal and nontidal marsh restoration and other conservation projects. Construction-related impacts and cumulative impacts are discussed in their own separate sections. The ADEIS further divides the direct project-level impacts into three subcategories based on location, i.e., upstream, in delta, and export service area. Furthermore, all of this is done for each of the ten alternatives, including the No Action, overlaid with the eleven different operational scenarios A-H4. No comprehensive comparison of alternatives is provided. While Chapter 11's Summary of Effects compares each alternative's impacts on fish and aquatic resources to those of the Preferred Alternative, we found such comparisons to be of limited value. A more appropriate and informative approach would be to compare each alternative to the No Action alternative with regard to all impacts. We also recommend that the DEIS clarify cause-and-effect relationships between alternatives and impacts and include a comprehensive assessment of the relative magnitude and causes of the predicted increases in water quality impairments.

The DEIS should sharply distinguish between alternatives and evaluate their comparative merits, consistent with 40 CFR 1502.14(b). The linkages between impacts and their primary causes should be clearly identified, as these are critical to the development of appropriate and effective mitigation strategies. For example, a percentage decrease in salinity at the Jones and Banks pumping plant should be interpreted to make it meaningful, i.e., the DEIS should explain what aspect of the project would cause this. Would this occur because more water would be pumped from the Sacramento River pursuant to certain operations criteria? Would it be the result of increased or decreased flows at Vernalis due to climate change? Why would this impact be the same for all the Alternatives? (p. 8-424).

Changes in Delta hydrology can influence water quality across a broad range of constituents. All of the waterways of the Bay Delta are water-quality impaired for one or more constituents.[3] Due to these impairments, EPA, in its scoping comments on the BDCP, requested significant water quality analyses, including salinity gradient ("X2"), boron, total organic carbon, dissolved oxygen, pesticides, mercury, selenium, ammonia and dissolved oxygen.[4] These parameters were selected through a multiagency and stakeholder effort to identify water quality indicators of highest relevance to protecting the beneficial uses of waters in the Bay Delta system. The Administrative DEIS provides many of the water quality analyses requested in our scoping letter; however, the following significant improvements are needed to adequately support informed decision making:

- First, the DEIS should evaluate each alternative's expected impacts to determine whether the narrative and numeric water quality standards would be met.

- Second, the DEIS should provide a consistent level of evaluation for each of the parameters across the alternatives and sharply compare the alternatives.

3 http://www2.epa.gov/sites/production/files/documents/actionplan.pdf
4 http://www2.epa.gov/sites/production/files/documents/epa_comments_bdcp_3rdno_051409.pdf

- Third, the DEIS should provide a comprehensive evaluation and comparison of impacts each alternative will have on the quality and quantity of the Bay Delta's aquatic habitats. These aquatic habitats are comprised of a mosaic of aquatic and terrestrial features, occur along a continuum from tidal sloughs to open water and along a salinity gradient spanning the Estuary. The habitats are essential for the reproduction and survival of migratory and resident fish populations. Evaluations of aquatic habitats should focus on each alternative's impact on salinity gradients, dissolved oxygen, and/or hydrodynamics. Evaluating the changes to the salinity gradient throughout the year would provide information about the quality and quantity of salinity zones preferred by target fish species for all or parts of their life cycles. Similarly, the DEIS should evaluate potential changes in dissolved oxygen levels and hydrodynamics affecting the continuity and integrity of migratory corridors, which would either improve or degrade the ability of migratory fish to successfully reach the ocean and return to spawning sites. Such information is essential for understanding how each alternative would benefit or negatively impact fish populations.

II. Adverse Impacts on Water Quality

Chapter 8 of the ADEIS indicates that, as proposed, all project alternatives of the BDCP would result in adverse effects to one or more beneficial uses within the affected water bodies. Although incomplete, the material in the ADEIS suggests that the Preferred Alternative would have significant unmitigated adverse impacts on water quality in the Delta. For example:

- The proposed changes in water management would measurably exacerbate impairment of agricultural and aquatic life beneficial uses in the South Delta and Suisun Marsh (p. 425);
- Bromide, chloride, DOC, and salinity/EC levels are expected to increase due to seawater intrusion as a result of both climate change and the implementation of the Preferred Alternative (p. 8-407, 415, 425, 442). In addition, the effectiveness of mitigation actions for salinity/EC is uncertain (p. 426) making it difficult to understand the net effect to salinity/EC levels;
- Mercury, pesticide, and selenium exposure levels may increase and be cumulatively significant (p. 730); and
- Water quality degradation resulting from the increased pumping of freshwater from the North Delta could cause increases in water treatment costs (p.8-408).

As noted in EPA's Bay-Delta Action Plan, most of the water quality constituents identified above are already important stressors on the beneficial uses of the Delta. For example, sport fish in the Delta are already burdened with higher concentrations of mercury than anywhere else in the State,[5] and the occurrence of this powerful neurotoxin in the food web poses a threat to public health and the ecosystem as a whole. The State Water Resources Control Board (State Water Board) has observed that when the Yolo Bypass is flooded, it becomes the dominant source of methylmercury to the Delta, and that restoration activities could exacerbate the existing mercury problem.[6] While EPA strongly supports restoration of aquatic habitat in the Delta, care must be exercised to ensure that there are not unintended consequences of restoration actions that adversely affect water quality. The DEIS must include appropriate mitigation measures to address projected adverse impacts on water quality to ensure that beneficial uses would be protected.

5 SWAMP- Surface Water Ambient Monitoring Program http://www.waterboards.ca.gov/water_issues/programs/swamp/rivers_study.shtml
6 P. 29 Periodic Review of the 2006 Water Quality Control Plan, State Water Resource Control Board http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/periodic_review/docs/periodicreview2009.pdf

The ADEIS appears to evaluate a broad range of construction elements for Conservation Measure 1 (CM1); however, the operational elements appear to be very similar to one another (Table 3-6 p. 3-33). The State Water Board, pursuant to its Strategic Plan, has recently initiated a review of the Bay Delta Water Quality Control Plan (Bay Delta WQCP), including an effort to update the flow standards that define freshwater flows through the Delta. Over the fifty-year term of the HCP permit, several such State Water Board reviews, as well as significant changes in the regulatory regime affecting Delta exports and outflow, should be anticipated. Given the limited variability of the operational scenarios presented in the ADEIS, the extent to which the operation of CM1 would be able to adjust to such changes is not clear. The DEIS should explain how the operations plans for the BDCP would be adjusted to account for any new regulatory provisions prior to or during the life of the permit.

III. Aquatic Species and Scientific Uncertainty

Compared to the No Action alternative and existing conditions, many of the scenarios of the Preferred Alternative "range" appear to decrease Delta outflow (p. 5-82), despite the fact that Federal and State agency and outside scientific evaluations indicate that more outflow is necessary for the protection of aquatic resources.[7] In addition, recent technical reports and emerging research raise questions about whether the proposed restoration of tidal marsh is feasible,[8] possible[9], or effective. [10] These are scientific questions about the assumptions used to support restoration proposals and projections of anticipated benefits to fish populations. We understand that the lead Federal and State agencies and project proponents are engaged in discussions to identify and resolve these scientific issues. Such scientific uncertainties should be disclosed and described in the DEIS, pursuant to NEPA regulations at 40 CFR 1502.22 and 1502.24.

IV. Impacts on Fish Populations

The Department of Interior, as well as the State of California, has been directed to make all reasonable efforts to at least double the natural production of anadromous fish in California's Central Valley streams on a long-term, sustainable basis.[11] The State has adopted this doubling goal as a water quality objective in its WQCP.[12] The

7 State Water Resources Control Board's, 2010 Flows Report, p.2.
"Interior remains concerned that the San Joaquin Basin salmonid populations continue to decline and believes that flow increases are needed to improve salmonid survival and habitat." USFWS May 23, 2011 Phase I Scoping Comments, available at: http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/bay_delta_plan/water_quality_control_planning/cmmnts052311/amy_aufdemberge.pdf
"Inadequate flow to support fish and their habitats is directly and indirectly linked to many stressors in the San Joaquin river basin and is a primary threat to steelhead and salmon." NMFS February 4, 2011 Phase I Scoping Comments, available at: http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/bay_delta_plan/water_quality_control_planning/cmmnts020811/010411dpowell.pdf
"…current Delta water flows for environmental resources are not adequate to maintain, recover, or restore the functions and processes that support native Delta fish." Executive Summary in 2010 CDFG Flow Criteria.
"a strong majority of scientists prioritizes habitat and flow management actions that would restore more natural processes within and upstream of the delta" (p. 2) http://www.ppic.org/content/pubs/report/R_413EHR.pdf
8 NMFS Progress Assessment and Remaining Issues Regarding the Administrative Draft BDCP Document (04/4/2013), page 15.
9 U.S. Fish and Wildlife Service Staff BDCP. The broad concern is that the tidal prism would be diminished over time by the large increases in tidal habitat..
10 Lucas, L. V., and J. K. Thompson. 2012. Changing restoration rules: Exotic bivalves interact with residence time and depth to control phytoplankton productivity. Ecosphere 3(12):117. http://www.esajournals.org/doi/pdf/10.1890/ES12-00251.1. The issue raised is whether the increaseed prodcution of plankton by the restored wetlands would be offset by the increased consumption by exotic bivalves as they spread into the restored wetlands..
11 1992 Central Valley Protection Improvement Act. In its 2005 update to the implementation plan for the Anadromous Fish Restoration Program (AFRP), FWS estimated the flow volumes that would be necessary to 'double' the natural production of certain Central Valley salmonids.
12 *"measures in the watershed, sufficient to achieve a doubling of natural production of Chinook salmon from the average production of 1967-1991, consistent with the provisions of State and federal law."* State Water Resources Control Board, 13 December 2006, Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary, (Bay-Delta WQCP). Table 3, pp. 14.

ADEIS estimates, for all alternatives, the water supply benefits to those who receive water from the Central Valley Project (CVP) and State Water Project (SWP) under contract with Reclamation and DWR, respectively (p. 5-83), but provides no estimates of impacts on the sizes of imperiled fish populations that would result from the construction and operation of any alternative, nor under existing and no action conditions. EPA recommends that the DEIS provide a forecast of the potential responses of fish populations to the alternatives, based on a review of available scientific literature.[13] The DEIS should disclose how each alternative would achieve numeric targets associated with state and federal fish population goals.

V. Programmatic vs Project Analysis

The ADEIS states that it takes a programmatic approach toward evaluating all elements of the HCP except for CM1 (the proposed new intakes, twin tunnels, and other infrastructure for new water conveyance), for which the ADEIS states that it takes a project-level approach. The level of engineering detail provided for the tunnels, however, is not commensurate with the level of site-specific information typically provided in an EIS for a project that will require federal permits.[14] For example, actions (such as grading, dredging, trench and fill, boring, spoils piles, levee work, excavation) that result in impacts to aquatic natural communities are not detailed (i.e. acres and/or linear feet of estimated impacts to waters of the US, volume of sediment proposed for disposal sites Part 3, p. 12-22). Thus, it is difficult to fully assess the project-level impacts and mitigation opportunities, and it is unclear whether the project, as proposed, would be able to obtain the requisite permits. We recommend that the DEIS provide a level of detail that supports meaningful calculations of anticipated direct and indirect effects of the project-level elements, and clarify whether this EIS is meant to support a permit decision for CM1.

VI. Climate Change

We appreciate the substantial consideration that climate change has been given in this document. Climate change impacts (sea level rise, shifts and timing of precipitation and snowpack, etc.) have been modeled and incorporated into the No Action and all the Action Alternatives. Project impacts (from the proposed construction and operation of the new conveyance, as well as the other restoration measures) have thus been compared to future conditions with and without climate change. The document concludes that the establishment of a North Delta diversion facility would provide substantial resiliency and adaptation benefits over the No Action alternative for dealing with the combined effects of sea level rise due to climate change (p. 29-15).

EPA believes that, depending on how key components of the BDCP are designed and operated, the BDCP *could* provide climate change resiliency and adaptation benefits; however, we are concerned that the ADEIS attributes adverse effects on aquatic resources solely to climate change without adequate consideration of the extent to which the BDCP, as proposed, could exacerbate – or mitigate -- those impacts (e.g., p. Ch 11 SUM-45). Such an approach appears short-sighted and overlooks the fact that the Delta is a highly managed system with a vulnerability to climate change that is, to some degree, a function of its management. In keeping with the co-equal goals of the BDCP, we recommend that the DEIS discuss measures that could be taken to mitigate the impacts of climate change on the aquatic ecosystem (e.g., releasing cold water flows from reservoirs at critical times to protect beneficial uses), in addition to measures to mitigate the impacts of climate change on the water

13 Kimmerer, W. J. 2002. Effects of freshwater flow on abundance of estuarine organisms: Physical effects or trophic linkages? Marine Ecology Progress Series 243:39-55 United States Fish and Wildlife Service, September 27, 2005. http://www.int-res.com/abstracts/meps/v243/p39-55/ Recommended Streamflow Schedules To Meet the AFRP Doubling Goal in the San Joaquin River Basin (FWS 2005), pp. 27. http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/bay_delta_plan/water_quality_control_planning/docs/sjrf_spprtinfo/afrp_2005.pdf

14 p. 6 NMFS Progress Assessment http://baydeltaconservationplan.com/BDCPPlanningProcess/DocumentsAndDrafts.aspx

recipients. We look forward to working with the lead agencies and project proponents to identify mitigation strategies that will help buffer the Bay Delta ecosystem from the detrimental effects of climate change and the resulting sea level rise.[15]

VII. Adaptive Management and Mitigation Commitments

The ADEIS concludes that certain impacts would be reduced to insignificance by mitigation (for example, construction impacts and water quality p. 8-473), but does not explain the basis for such conclusions. Assertions are made that adequate mitigation will be ensured by, for example, the CWA 401 certification process. Any finding that a mitigation measure reduces an impact to a level of insignificance should be supported in the DEIS by a detailed discussion of the basis for that conclusion, including a clear explanation of the assumptions underlying the analysis of mitigation measure effectiveness. The analysis should specifically describe the mitigation measure, identify the source(s) of pollutants that are expected to be affected by the measure, clearly explain how and to what extent the measure will affect the source(s), and identify the basis for the estimate (empirical observations, computer modeling, case studies, etc.).

VIII. CWA Section 404

Although there is no statutory requirement that the NEPA document prepared for an HCP under the Endangered Species Act be used as the basis for Clean Water Act Section 404 permits required to authorize and implement the project, EPA recognizes the importance of coordination in federal review. Toward this end, EPA and the Corps have met with the project proponent on numerous occasions over the past several years in the interest of using the BDCP EIS/EIR to inform the Corps 404 permitting decisions. Despite these efforts, significant unresolved issues remain about the scope of analysis for the proposed project, the level of detail required to trigger the consultation process and federal permitting, and the structure of a comprehensive permitting framework for the proposed project.[16] We are prepared to continue working with the Corps and the project proponent in the months ahead to seek resolution of these issues.

EPA appreciates this early coordination opportunity and we look forward to continued constructive involvement in the development of the BDCP EIS/EIR. Please see our attached comments detailing some additional concerns and recommendations. If you have any questions about our comments, please call Stephanie Skophammer, the lead NEPA reviewer, or Erin Foresman, the Water Division lead, for this project. Stephanie can be reached at (415) 972-3098 and skophammer.stephanie@epa.gov and Erin can be reached at (916) 930-3722 and foresman.erin@epa.gov.

To Federico Barajas: FBarajas@usbr.gov

CC addresses:

David Nawi: David_Nawi@ios.doi.gov

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15 Climate Change Handbook for Regional Water Planning http://www.water.ca.gov/climatechange/CCHandbook.cfm
Vulnerability Assessments in Support of the Climate Ready Estuaries Program: A Novel Approach Using Expert Judgment, Volume I: Results for the San Francisco Estuary Partnership http://cfpub.epa.gov/ncea/global/recordisplay.cfm?deid=241556
16 May 2012 letter from the Corps regarding the BDCP.

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Attached: BDCP EIR/EIS Review Document Comments

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OCT 2 2010

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Ren Lohoefener
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Pacific Southwest Region
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RE: Purpose Statement for Bay Delta Conservation Plan (BDCP)

Dear Messrs. Glaser, McInnis, and Lohoefener:

Since 2006, a large group of water export interests, nongovernmental organizations (NGOs), and state and federal agencies have been developing the Bay Delta Conservation Plan (BDCP), which will serve as a Habitat Conservation Plan (HCP) under the federal Endangered Species Act (ESA) and a Natural Communities Conservation Plan (NCCP) under California law. Broadly stated, the intention of the BDCP is to contribute to the recovery of listed species in the Delta system and to provide for ESA compliance for ongoing export operations and new Delta water conveyance facilities. In connection with the BDCP, the U.S. Fish and Wildlife Service (FWS), National Marine Fisheries Service (NMFS) and Bureau of Reclamation (USBR) have agreed to serve as joint leads in the preparation of the Environmental Impact Statement (EIS) analyzing the BDCP as required by the National Environmental Policy Act (NEPA).

The Environmental Protection Agency (EPA) has several roles in this process, but this letter will focus primarily on two.[1] Under NEPA and Section 309 of the Clean Air Act, EPA is

[1]EPA has also agreed to serve as a cooperating agency in the preparation of the federal Environmental Impact Statement for the BDCP. In addition, there is a possibility that Clean Water Act water quality standards may need to be revised by the California State Water Resources Control Board to facilitate construction and operation of new export water conveyance facilities in the Delta. The Board's actions on water quality standards are subject to EPA review and approval pursuant to Clean Water Act Section 303.

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charged with reviewing major federal actions significantly affecting the environment and the associated NEPA compliance by the action agencies. Under Clean Water Act Section (CWA) 404, EPA and the U.S. Army Corps of Engineers (Corps) have shared responsibility for reviewing projects that will need a Corps-issued 404 permit.

Over the past several months, EPA has been discussing the "purpose" statement for the BDCP with the action agencies, without final resolution. Given the time line for developing both the BDCP and the accompanying environmental review, and in light of the request from the Federal Bay-Delta Leadership Committee to identify and elevate issues expeditiously, we are taking this opportunity to summarize our concerns.

Background

A purpose statement is important under both NEPA and the 404 permitting process.

Under NEPA, the action agency must include a "purpose and need" statement that must "specify the underlying purpose and need to which the agency is responding...." 40 CFR Section 1502.13. The purpose and need statement drives the alternatives that must be analyzed in the Environmental Impact Statement, and the alternatives are "the heart of the environmental impact statements." 40 CFR Section 1502.14.

Under CWA Section 404, the permit applicant must demonstrate that the chosen alternative is the "least environmentally damaging practicable alternative" (LEDPA) for meeting the overall project purpose pursuant to the CWA Section 404(b)(1) Guidelines. "The overall project purpose is used for evaluating practicable alternatives under the Section 404(b)(1) Guidelines. The overall project purpose must be specific enough to define the applicant's needs, but not so restrictive as to preclude all discussion of alternatives." Army Corps of Engineers Standard Operating Procedures for the Regulatory Program, p. 7.

Under both acts, there is broad discretion for the action agency to define its project purpose, but that discretion is not unlimited. When disputes over project purpose arise, it is usually a dispute over whether the purpose statement is written so narrowly that it eliminates otherwise viable alternatives.[2]

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[2] The very recent 9th Circuit case Butte Environmental Council v. U.S. Army Corps of Engineers, et al., No. 09-15363 (9th Cir., June 1, 2010), is a good example of how the CWA 404 process works. It shows a strong deference to both the action agency and the Corps in making decisions under the 404 program. The history of that controversy also provides a good example of the iterative process between the applicant and the many regulatory agencies for defining a project purpose. As noted, the deference to action agencies is not unlimited. See, for example, Simmons v. U.S. Army Corps of Engineers, 120 F.3d 664, 666 (7th Cir. 1997) (Rejecting "single-source" definition of project purpose for water supply, noting that "[i]f the agency constricts the definition of the project's purpose and thereby excludes what truly are reasonable alternatives, the EIS cannot fulfill its role."). See also Border Power Plant Working Group v. DOE, 260 F. Supp. 3d 997 (S.D. Cal., 2003)(Rejecting and broadening agency's definition of project purpose.); Similarly, Davis v. Mineta, 302 F.3d 1104 (10th Cir. 2002).

Purpose Statement in the BDCP

The purpose statement for the BDCP has been evolving over the past two years.

The first amended[3] Notice of Intent (73 Fed. Reg. 20326 (April 15, 2008)) included the following discussion of the project purpose:

> "Specifically, Reclamation seeks to ***improve water supply reliability*** for its Federal water contractors, while meeting its [federal ESA] obligations."
>
> "The BDCP will have several core purposes:...conveyance facilities to ***enhance operational flexibility and water supply reliability***, while providing greater opportunities for habitat improvements.....water operations and management actions to achieve conservation and water supply goals.....Additional core purposes of the BDCP are....to ***provide for and restore water quality, water supplies***, and ecosystem health within a stable regulatory framework...."

The most recent Notice of Intent (74 Fed. Reg. 7257 (02/13/10)) added the reference to "full contract amounts."

> "...***Restore and protect the ability of the [State Water Project and Central Valley Project] to deliver up to full contract amounts***, when hydrologic conditions result in the availability of sufficient water, consistent with the requirements of state and federal law and the terms and conditions of water delivery contracts...."

As you know, it is this addition of the metric of "full contract amounts" that has inspired the many conversations between our agencies.

"Full Contract Amounts" as a Project Purpose Metric

Although it is not entirely clear what this reference to "full contract amounts" means (see discussion below), EPA first notes that "full contract amounts" has a special meaning in the Delta context, given the history of contracts and exports over the past 50 years. The attached chart (from the California Department of Water Resources) displays Central Valley Project (CVP) and State Water Project (SWP) exports out of the Delta over roughly the past 50 years. For our purpose, the relevant data in the chart are that the SWP and CVP have never exported more than approximately 6.3 million acre feet (MAF) annually.

Full contract amounts, however, are significantly higher. The State Water Project contract amount is 4,171,996 acre feet (AF) (DWR December 1, 2009 press release). South of

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[3]The first NOI (73 Fed. Reg. 4178 (January 24, 2008)) was issued by NMFS and FWS, and stated a general purpose as follows: "....allow for projects that restore and protect water supply, water quality, ecosystem, and ecosystem health to proceed within a stable regulatory framework....." The subsequent addition of the USBR as an additional lead agency on the NEPA evaluation generated the first amended Notice of Intent, quoted above.

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Delta CVP Water Rights Contractors (Exchange Contractors plus Contra Costa Water Rights Contracts) have full contract amounts totaling 893,277 AF and South of Delta CVP water service contractors (Contra Costa, DMC and SLC, San Felipe, San Luis and Cross Valley) have full contract amounts totaling 2,367610 AF.[4]

Combined, the SWP and CVP full contract amounts for Delta exports are around 7,432,883 AF. As noted above, historical exports by the CVP and SWP almost never exceed 6 MAF, so it appears that the "full contract amount" of exports is at least 1 million acre feet more *than has ever been exported historically.*

EPA Concerns

EPA has four broad concerns with using full contract amounts as a performance metric in the forthcoming EIS.

1. *There is significant disagreement as to what it means.* In our own discussions within the federal family, as well as in the broader debate, there seems to be little agreement on exactly what this term means. The most straightforward reading of the full contract language is that it is a performance metric.[5] Given the criticism leveled at the BDCP and, before that, at the CALFED Bay Delta Program for failing to identify performance goals, developing some form of performance metric for water supply reliability might make sense. Nevertheless, some participants insist that the focus should be on the "*up to*" full contract amounts, so that the phrase does not state a performance goal at all but merely a broad range. If this were true, then the project purpose would be met if the system were to deliver any amount of water between zero and full contract amounts. We doubt that such a loose project purpose was intended by either the action agencies or the water export interests. The inability of the action agencies to agree on what this language means is troubling. At a minimum, the purpose statement needs to be revised to provide clarity, or we risk creating even more controversy in the future.

2. *A significant increase in exports out of the Delta is inconsistent with recent state legislation.* California Water Code Section 85021, which was added last fall in the special session, states, in relevant part: "The policy of the State of California is to reduce reliance on the Delta in meeting California's future water supply needs through a statewide strategy of investing in improved regional supplies, conservation, and water use efficiency." Although complying with this statutory mandate is primarily an issue between the project proponents and the State Legislature,

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[4]These numbers are from a CVP-produced briefing binder from the 1990's. The current numbers may be a little different, but they suffice for illustrative purposes.

[5]Some participants at DWR apparently read it this way, and edited it to reflect more clearly the intention of regularly diverting full contract amounts. In discussions with EPA and the Corps under the 404 permit program, DWR provided a draft purpose statement that revised the language as follows: "restore and protect the ability of the SWP and CVP to ***reliably divert and deliver water up to full contract amounts.....***" Even this language is unclear, as discussed above.

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the federal action agencies need to address the apparent conflict between this state statute and the proposed purpose of increasing diversions out of the Delta by more than 1 million acre feet annually. The CEQ regulations, at 40 C.F.R. Section 1506.2(d), require that "[EISs] shall discuss any inconsistency of a proposed action with any approved State or local plan and laws (whether or not federally sanctioned.)"

3. *The scope of the alternatives and the effects analysis must match the scope of the project purpose.* Although this seems to be obvious, the participants seem to be having difficulty applying this to the proposed project. If the project purpose is to deliver full contract amounts, then the environmental documentation needs to analyze the effects of delivering full contract amounts. Similarly, the range of alternatives evaluated must mirror the project purpose. If, as some say, the project purpose is primarily to change the method of conveying the same amount (that is, the historical amount) of export water out of the Delta, that would be one set of alternatives. If, on the other hand, the project purpose is to increase diversions out of the Delta by 1 million acre feet, that would be a different, and probably much larger, set of alternatives. This concern implicates both the NEPA analysis and the LEDPA analysis under the CWA 404 permitting program.

4. *Significantly increasing exports out of a stressed Delta is the wrong policy.* Finally, as a straightforward policy matter, EPA questions the goal of increasing exports out of a severely distressed estuary.

The California Supreme Court, when it evaluated appeals of the CALFED Bay Delta Program, noted that the Program was an experiment.

> "The CALFED Program is premised on the theory, *as yet unproven*, that it is possible to restore the Bay-Delta's ecological health while maintaining and perhaps increasing Bay-Delta water exports through the CVP and SWP. If practical experience demonstrates that the theory is unsound, Bay-Delta water exports may need to be capped or reduced." *In re Bay-Delta Programmatic Environmental Impact Report Coordinated Proceedings,* 43 Cal.4th. 1143 (2008)(emphasis added).

The Court was looking at a program that was developed during the 1990's, and adopted in 2000. The intervening ten years have not proved the theory accurate, and, in fact, seem to point the other way. EPA does not believe that we can attain the goal of a sustainable estuary if we are simultaneously trying to export an additional 1 million acre feet from that estuary.[6]

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[6]EPA is not alone in questioning a policy of increasing exports out of the Delta. As noted above, the Legislature has weighed in on this subject. The Governor's Delta Vision Blue Ribbon Task Force also addressed this issue: "[T]he Task Force recommends...a two-channel approach....Increased storage capacity, surface and ground, plus changed operations are also required to improve water supply reliability. Concurrently, Californians need to become less dependent on water supply from the Delta, both to reduce risk from a failed Delta conveyance system and to reduce risks to the ecosystem." Strategic Plan, at vi (October 2008). Leading academic think-tanks have reached similar conclusions. The Public Policy Institute of California recently noted that "...a peripheral canal alone will fix neither the Delta nor California's water supply issues, and it is unlikely to improve native fish populations enough to allow immediate

We emphasize that we are not raising this issue of an oversubscribed Delta as an indirect attack on potential changes in Delta conveyance. *The real lesson of the past ten years of science is that the current conveyance for Delta exports is neither reliable nor sustainable, for either environmental or water supply purposes.* We believe that piggybacking on the conveyance problem to demand significantly increased exports out of the Delta risks delaying an expeditious response to this immediate and difficult conveyance problem.

Conclusion

EPA recognizes that defining a project purpose in a contentious arena is difficult. We note that the process for defining a project purpose in the CALFED Bay Delta Program lasted for more than two years, and generated a committee product that pleased no one. Nevertheless, for the reasons outlined above, we are concerned about the most recent change in the BDCP project purpose statement, and recommend it be revised.

We understand the federal action agencies have been discussing this issue. We suggest two options: first, the action agencies could return to the project purpose in the first amended Notice of Intent (quoted above); alternatively, the action agencies could start with the general "coequal goals" language articulated by the State Legislature in creating the new Delta Stewardship Council.[7] We would also be happy to discuss other approaches with you.

If you have questions about our comments, please refer your staff to Karen Schwinn, Associate Director in our Water Division, at (415)972-3472. We look forward to resolving this issue quickly, so that all agencies can turn their attention to completing the BDCP and the associated EIS/EIR on the proposed accelerated schedule.

Sincerely yours,

for Enrique Manzanilla
Director, Communities and Ecosystems Division

Alexis Strauss
Director, Water Division

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increases in exports above currently restricted levels." California Water Myths, PPIC (December 2009), at p. 11.

[7]"Coequal goals means the two goals of providing a more reliable water supply for California and protecting, restoring, and enhancing the Delta ecosystem. The coequal goals shall be achieved in a manner that protects and enhances the unique cultural, recreational, natural resource and agricultural values of the Delta as an evolving place." Cal. Water Code Section 8054.

EPA-HQ-2016-004924 ED_000757_000012282-00006

Enclosure

cc: David Nawi, U.S. Department of the Interior
Karen Scarborough, California Natural Resources Agency
Mark Cowin, California Department of Water Resources
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OCT 26 2010

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Mr. Enrique Manzanilla, Director, Communities and Ecosystems Division
Ms. Alexis Strauss, Director, Water Division
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RE: Purpose Statement for Bay Delta Conservation Plan (BDCP)

Dear Messrs. Blumenfeld and Manzanilla and Ms. Strauss:

This letter responds to the June 10, 2010, letter from the Environmental Protection Agency (EPA) to the Bureau of Reclamation, U.S. Fish and Wildlife Service, and National Marine Fisheries Service regarding the Purpose and Need Statement for the Bay Delta Conservation Plan (BDCP) Environmental Impact Statement (EIS).

The BDCP EIS Purpose and Need Statement is part of the Notice of Intent (NOI) to prepare an Environmental Impact Statement/Environmental Impact Report (EIS/EIR) on the BDCP. The NOI was prepared by the National Environmental Policy Act (NEPA) lead Federal agencies: Reclamation, U.S. Fish and Wildlife Service, and National Marine Fisheries Service. The NOI issued on February 13, 2009, stated that the intent of the BDCP is ". . . to secure authorizations that would allow projects that restore and protect water supplies, water quality, and ecosystem health to proceed within a stable regulatory framework." The NOI further explains that water supplies, water quality, and ecosystem health are currently threatened by the levees in the Delta which ". . . are at constant risk of failure from a number of causes, including seismic activity and sea level rise." The EIS will analyze a range of alternatives designed to address these needs and satisfy the intent of the BDCP.

The NOI stated that one purpose of the BDCP was to ". . . improve the ecosystem of the Delta . . ." by taking actions to contribute to the recovery of listed species, by ". . . protecting, restoring, and enhancing . . ." habitat and ecosystems, and by reducing the adverse impacts to listed species. In addition, the NOI included the following language describing the water supply aspects of the purpose of BDCP:

> *"Restore and protect the ability of the SWP and CVP (State Water Project and Central Valley Project) to deliver up to full contract amounts, when hydrologic conditions result in the availability of sufficient water, consistent with the*

requirements of state and Federal law and the terms and conditions of water delivery contracts . . ."

Our agencies have carefully reviewed the NOI's Purpose and Need Statement in light of the concerns expressed by the EPA and others. The Purpose and Need Statement does not state, and is not intended to imply, that increased quantities of water will be delivered under the BDCP. Rather, it reflects our intent to advance the coequal goals set forth in California's Delta Reform Act of providing a more reliable water supply for California and protecting, restoring, and enhancing the Delta ecosystem. See California Water Code Section 85300 et seq. In that regard, we expect the range of alternatives to be considered under NEPA and the California Environmental Quality Act to include one or more alternatives potentially capable of delivering full contract amounts when sufficient water is available, if such deliveries are consistent with ecological actions associated with the goal of restoring the Delta's ecosystem. However, as indicated by the "up to full contract amounts" phrase, alternatives need not be capable of delivering full contract amounts on average in order to meet the project purposes. Average annual south of Delta CVP and SWP deliveries over the past 30 years have been well below full contract amounts. We intend that the phrase "restore and protect . . . up to full contract amounts" delineates an upper bound for the alternatives, not a target. Alternatives that depict design capacities or operational parameters that would result in deliveries of less than full contract amounts are also consistent with this purpose.

In short, we intend that the EIS/EIR evaluate a range of alternatives designed to achieve both a more reliable water supply for the CVP and SWP and restoration of the Delta ecosystem. Consistent with Federal law and the NOI, the alternatives must represent a reasonable range of potential conveyance configurations, water operations, habitat restoration measures, and measures to reduce other stressors capable of achieving the two coequal goals of water supply reliability and Delta ecosystem restoration.

Sincerely,

Ren Lohoefener	Donald R. Glaser	Rodney McInnis
Regional Director	Regional Director	Regional Administrator
U.S. Fish and Wildlife Service	Bureau of Reclamation	National Marine Fisheries Service
Pacific Southwest Region	Mid-Pacific Region	Southwest Region

cc: See next page.

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THE WHITE HOUSE

WASHINGTON

May 24, 2013

MEMORANDUM FOR THE SECRETARY OF THE INTERIOR, SECRETARY OF AGRICULTURE, ACTING SECRETARY OF COMMERCE, ACTING ADMINISTRATOR OF THE ENVIRONMENTAL PROTECTION AGENCY, AND ASSISTANT SECRETARY OF THE ARMY (CIVIL WORKS)

FROM: Nancy H. Sutley, Chair
Council on Environmental Quality

SUBJECT: California Bay-Delta Conservation Plan Federal Review

The purpose of this memorandum is to reaffirm the importance of the Bay Delta Conservation Plan (BDCP) as an Administration priority and to request your continued attention to prioritizing federal support for its development. Since 2009, your agencies have been involved to various degrees in working closely with California to develop the BDCP, which has the co-equal goals of improving California's water supply reliability and restoring the Bay-Delta ecosystem. Thank you for your engagement on this important effort. As we enter the next phase of its development, your continued attention to the issue is critical.

The San Francisco Bay/Sacramento-San Joaquin Delta (Bay-Delta) region of California is an ecosystem of national significance. It is also the hub of the nation's largest water delivery system – infrastructure that is the foundation for economic activity in the agricultural, industrial, and recreational sectors of the economy, as well as providing drinking water to a population of over 25 million Californians. At present, the Bay-Delta is in crisis. After decades of steep and increasingly rapid decline, the ecosystem is reaching a point of collapse, with highly imperiled fish species and threats from climate change, seismic risks, and other stressors underscoring the system's vulnerability. Further complicating the situation is the serious nature of an ongoing drought this year, with the January through April time period being the driest on record. There is a scientific and political consensus that failure to take action to address these problems and continuing the deteriorating status quo of the Bay-Delta is not viable, and can only lead to economic and environmental detriment for both California and the nation.

The State of California is the primary architect of the BDCP, which includes conservation measures for new water supply conveyance infrastructure and operational criteria, extensive habitat restoration, reducing pollutants, predation and invasive species and extensive adaptive management and monitoring and research programs. We recognize that the overall success of the BDCP depends largely on actions and commitments by the State of California and other entities within the state. As the State's proposal has taken shape, the primary Federal role has been to provide technical support intended to ensure that the Plan meets legal requirements under the National Environmental Policy Act (NEPA) and the Endangered Species Act (ESA).

Last July, Governor Brown and Secretary Salazar announced a number of major revisions to the BDCP intended to address issues associated with previous versions of the Plan, and underscored the joint state-federal commitment to address scientific uncertainties through a rigorous science program that focuses on monitoring and adaptive management.

At this point in time, the State is finalizing the draft of its Plan, as well as an administrative draft of the joint Environmental Impact Statement/Environmental Impact Report (EIS/EIR), which includes a full range of alternative proposals. The Bureau of Reclamation, U.S. Fish & Wildlife Service, and National Marine Fisheries Service are the federal lead agencies for the EIS/EIR, working with the State co-leads: the California Department of Water Resources (DWR) and California Department of Fish & Wildlife. The U.S. Army Corps of Engineers and Environmental Protection Agency are cooperating agencies under NEPA.

Given the ongoing decline of the Bay-Delta ecosystem and the associated impacts to reliable water supplies, completing the BDCP in a timely fashion is an increasingly urgent matter. Most immediate is the need to complete work and publish the draft EIS/EIR by October 1, 2013 for public review and comment. The complexity of this matter and the involvement of a large number of agencies will necessitate high-level agency awareness and commitment. It also requires ongoing coordination in order to meet this time frame. Finally, it requires attention to other management measures to support the BDCP goals, including actions to increase demand management and water use efficiencies, water supplies and storage, and mechanisms to move water supplies from place to place during times of shortage.

The Council on Environmental Quality asks the following:

1. Continue to prioritize this effort so that the Draft EIS/EIR can be completed for public release by October 1, 2013.

2. Coordinate with all Federal agencies involved in this effort. The Council on Environmental Quality and White House Office of Intergovernmental Affairs will periodically convene senior agency officials to monitor progress.

3. Continue efforts to develop or review the other management measures.

Thank you for the efforts of your respective agencies to date. Overall, we have made tremendous progress to this point as a result of the committed work of your staff. Nonetheless, this is a multi-year effort and we must plan accordingly to bring it to fruition.
Please let us know if you have any questions regarding this request.

To: Gorke, Roger[Gorke.Roger@epa.gov]; Spraul, Greg[Spraul.Greg@epa.gov]
Cc: Spear, Kimisha[Spear.Kimisha@epa.gov]
From: Rader, Cliff
Sent: Thur 4/30/2015 9:32:06 PM
Subject: RE: Bay Delta question - QFR's from the House Energy and Commerce hearing

I like the "base budget" idea! thanks

From: Gorke, Roger
Sent: Thursday, April 30, 2015 3:05 PM
To: Spraul, Greg
Cc: Spear, Kimisha; Rader, Cliff
Subject: RE: Bay Delta question - QFR's from the House Energy and Commerce hearing

That makes sense to me…whatever it means…R9 didn't give me a funding amount.

Roger Gorke

Senior Policy Advisor

Office of Water

U.S. Environmental Protection Agency

PH: 202-564-0470

FAX: 202-564-0500

gorke.roger@epa.gov

From: Spraul, Greg
Sent: Thursday, April 30, 2015 3:03 PM

To: Gorke, Roger
Cc: Spear, Kimisha; Rader, Cliff
Subject: RE: Bay Delta question - QFR's from the House Energy and Commerce hearing

Thanks Roger. That answers the FTE Q, but what about the funding Q?

We could say something like…

The review of comprehensive environmental plans is part of EPA's programmatic work and is factored in as part of our base budget.

Greg Spraul

Acting Associate Director
Resource Management Staff

Office of Water

U.S. Environmental Protection Agency

Email: spraul.greg@epa.gov
Direct:(202) 564-0255

From: Gorke, Roger
Sent: Thursday, April 30, 2015 11:52 AM
To: Spraul, Greg
Cc: Spear, Kimisha; Rader, Cliff
Subject: RE: Bay Delta question - QFR's from the House Energy and Commerce hearing

Sorry, R9 sent this but it was buried at the bottom of an email. I put in the most time at HQ and it is probably nowhere near 10% of my time. I am sure it is even less of Ken's.

How much detail do we need?

2.25 FTE in R9

Region 9 FTE:

Diamond: 0.1

Kemmerer: 0.1

Foresman: 0.5

Goforth: 0.2

Hagler: 0.25

Hanf: 0.1

Johnson: 0.1

Skophammer: 0.7

Vendlinski: 0.25

Headquarters:

Bromm

Koposis:

Giles:

Gorke:

Rader:

Roger Gorke

Senior Policy Advisor

Office of Water

U.S. Environmental Protection Agency

PH: 202-564-0470

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gorke.roger@epa.gov

From: Spraul, Greg
Sent: Thursday, April 30, 2015 11:46 AM
To: Gorke, Roger
Cc: Spear, Kimisha
Subject: Bay Delta question - QFR's from the House Energy and Commerce hearing
Importance: High

Roger,

Most of the hearing follow ups are complete, but I don't think I ever got an answer on this Bay Delta question.

How many staff and how much funding has EPA designated for review of the Bay Delta Conservation Plan?"

Do you have a response? OCFO is now asking as they are trying to wrap up all of these questions for the record.

Thanks,

Greg

Greg Spraul

Acting Associate Director
Resource Management Staff

Office of Water

U.S. Environmental Protection Agency

Email: spraul.greg@epa.gov
Direct:(202) 564-0255

From: Gorke, Roger
Sent: Thursday, April 02, 2015 1:16 PM
To: Spraul, Greg
Subject: RE: QFR's from the House Energy and Commerce hearing

I am free most of the afternoon.

Roger Gorke

Senior Policy Advisor

Office of Water

U.S. Environmental Protection Agency

PH: 202-564-0470

FAX: 202-564-0500

gorke.roger@epa.gov

From: Spraul, Greg
Sent: Thursday, April 02, 2015 8:59 AM
To: Gorke, Roger
Subject: RE: QFR's from the House Energy and Commerce hearing

I left you a voicemail. Feel free to call or we can schedule a brief time to talk this afternoon. I am available.

Greg Spraul

Acting Associate Director
Resource Management Staff

Office of Water

U.S. Environmental Protection Agency

Email: spraul.greg@epa.gov
Direct:(202) 564-0255

From: Gorke, Roger
Sent: Wednesday, April 01, 2015 12:44 PM
To: Spraul, Greg
Cc: Fontaine, Tim; Woods, Terry; Orvin, Chris; Shih, Melissa; Reyes, Venus; Spear, Kimisha
Subject: Re: QFR's from the House Energy and Commerce hearing

I saw that. Let's chat about how best to answer.

Roger Gorke

Office of Water

U. S. Environmental Protection Agency

202-564-0470

On Apr 1, 2015, at 11:45 AM, Spraul, Greg <Spraul.Greg@epa.gov> wrote:

Roger,

I should have asked Kimisha to include this in her email, but we would also like your assistance, working with Region 9, in answering the other question from McNerney on the Bay Delta.

"1. How many staff and how much funding has EPA designated for review of the Bay Delta Conservation Plan?"

Thanks,

Greg

Greg Spraul

Acting Associate Director
Resource Management Staff

Office of Water

U.S. Environmental Protection Agency

Email: spraul.greg@epa.gov
Direct:(202) 564-0255

From: Spear, Kimisha
Sent: Tuesday, March 31, 2015 3:13 PM
To: Gorke, Roger
Cc: Bissonette, Eric; Cooper, Tiffany; Fontaine, Tim; Spraul, Greg; Woods, Terry; Orvin, Chris; Shih, Melissa; Reyes, Venus
Subject: QFR's from the House Energy and Commerce hearing

Good Afternoon,

Attached are the Questions for the Record following the February 25, 2015 House Energy and Commerce Hearing. Please review and prepare a response **no later than COB Tuesday, April 7, 2015**. The formal document is attached for your reference.

Please let us know if you have any questions or need additional support.

The Honorable Jerry McNerney Roger Gorke Response (Referenced from pg. 11)

2. Does EPA currently have a strategic plan for assessing and managing the risks of drought to drinking water

provided by public water systems?

a. If no, would creating a strategic plan be beneficial for use by other federal, state, and local entities?

Kimisha Spear

Program Analyst

EPA • Office of Water • Resource Management Staff

Phone: (202)564-1485

Email: spear.kimisha@epa.gov

To: Reichgott, Christine[Reichgott.Christine@epa.gov]
From: Rader, Cliff
Sent: Fri 9/19/2014 8:48:54 PM
Subject: one more - similar
NEPA Overview Briefing_10-31-13.pptx

Cliff Rader

Director, NEPA Compliance Division

(202) 564-7159

To: Reichgott, Christine[Reichgott.Christine@epa.gov]
From: Rader, Cliff
Sent: Fri 9/19/2014 8:46:34 PM
Subject: presentation
NEPA Overview Briefing - CEH Conf Call.pptx

Cliff Rader

Director, NEPA Compliance Division

(202) 564-7159

To: Cliff Rader (rader.cliff@epa.gov)[rader.cliff@epa.gov]
From: Rader, Cliff
Sent: Fri 9/19/2014 8:43:56 PM
Subject: accomplishments
NEPA Compliance Division accomplishments.docx

Cliff Rader

Director, NEPA Compliance Division

(202) 564-7159

To: Conger, Nick[Conger.Nick@epa.gov]
From: Rader, Cliff
Sent: Wed 9/10/2014 9:05:58 PM
Subject: FW: Sacramento Bee editorial re: BDCP

From: Goforth, Kathleen
Sent: Monday, September 08, 2014 3:09 PM
To: Skophammer, Stephanie; Johnson, Kathleen; Hanf, Lisa; Vendlinski, Tim; Hagler, Tom; Foresman, Erin; Rader, Cliff
Subject: Sacramento Bee editorial re: BDCP

Note the encouraging quotes from Will . . .

Editorial: Brown needs to answer EPA on Delta tunnels

By the Editorial Board

By the Editorial Board

Last modified: 2014-09-06T05:34:19Z

Published: Sunday, Sep. 7, 2014 - 12:00 am

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Some scientists and environmentalists have been contending that water quality would suffer, pollution would increase and aquatic life would be harmed if California goes forward with plans to build twin tunnels in the Delta. Now, the U.S. Environmental Protection Agencyhas strongly reinforced those concerns and called for changes in the multibillion-dollar plan.

Gov. Jerry Brown and other proponents of the twin tunnels need to answer the EPA directly and publicly, and either debunk the agency's claims, or significantly alter the proposal.

As currently envisioned, the 40-foot-wide, 30-mile-long tunnels would draw water from the

Sacramento River and pipe it to the southern part of the Delta. In its review of the Bay Delta Conservation Plan, the EPA said the tunnels "would contribute to increased and persistent violations of water quality standards" under the Clean Water Act.

The federal agency, in a recently released letter, recommended that an alternative plan be developed that would allow for "greater freshwater flows through the Delta." That's an unwelcomed analysis for water agencies south of the Sacramento-San Joaquin Delta that rely on water exports and already have ponied up millions for environmental studies as a prelude to building the tunnels.

Stressing that more water should pass through the Delta – resulting in less water for exports to farms and cities to the south – brings into question whether the $25 billion plan will pencil out for agricultural districts and municipal water agencies that would pay for the project.

The letter to the National Marine Fisheries Service, and submitted to the California Department of Water Resources, enumerated a variety of problems and recommended alternatives. It questioned whether plans to restore Delta habitat would help fish populations recover, and called for more analysis of the impacts upstream from the Delta and downstream to the San Francisco Bay.

"This is not the first time and likely won't be the last time that there is close scrutiny of the project," Richard Stapler, a spokesman for the California Natural Resources Agency, said in an interview. "This is part of the critical process."

Will Stelle, West Coast administrator for the National Marine Fisheries Service, said the letter responding to a draft environmental impact statement "raises genuine issues about water quality, strategy and compliance."

He also was confident about satisfying the EPA's concerns. "We will deal with those issues," he said in an interview. "It may require adjustments in operating terms. … The biggest challenge for this project is getting the details right on operations."

The Bay Delta Conservation Plan calls for tunnels to export water more directly to Central Valley farms and Southern California cities. The goals would be to help restore the Delta's collapsing ecosystem and provide a more reliable supply of fresh water to 25 million Californians and 3 million acres of farmland.

The EPA letter says that while the tunnel diversions would "improve the water quality for agricultural and municipal water agencies that receive water exported from the Delta, water quality could worsen for farmers and municipalities who divert water directly from the Delta."

The letter, signed by EPA regional administrator Jared Blumenfeld, recommended changes in the project to deal with potential increases in concentrations of salinity, chloride, bromide, mercury, pesticides and selenium. Blumenfeld suggested alternatives, such as better "integrated water management, water conservation, levee maintenance and decreased reliance on the Delta."

The California Department of Water Resources has delayed final environmental studies until next year.

In his debate on Thursday with Republican challenger Neel Kashkari, Brown said the tunnel project wasn't fully cooked. That clearly is true.

When Kashkari cited the EPA criticism, and noted it came from President Barack Obama's administration, Brown shot back: "That doesn't make it right, by the way." To satisfy skeptics, Brown will need to provide a far more detailed analysis about the affect on the ecological health of the Delta.

Read more here: http://www.sacbee.com/2014/09/07/6682725/editorial-brown-needs-to-answer.html#storylink=cpy

Kathleen Martyn Goforth, Manager

Environmental Review Section

EPA Region 9 (ENF-4-2)

75 Hawthorne Street

San Francisco, CA 94105

415-972-3521

To: Gorke, Roger[Gorke.Roger@epa.gov]
From: Rader, Cliff
Sent: Wed 8/27/2014 5:08:20 PM
Subject: RE: BDCP

Thanks!

From: Gorke, Roger
Sent: Wednesday, August 27, 2014 12:14 PM
To: Bromm, Susan; Rader, Cliff
Subject: BDCP

It's official!

Roger Gorke

Office of Water

U. S. Environmental Protection Agency

202-564-0470

Begin forwarded message:

From: Bay Delta Conservation Plan <info@BayDeltaConservationPlan.com>
Date: August 27, 2014 at 12:08:11 PM EDT
To: <gorke.roger@epa.gov>
Subject: eNewsletter: Lead Agencies to Publish Partially Recirculated Draft BDCP, EIR/EIS, and Implementing Agreement
Reply-To: Bay Delta Conservation Plan <info@BayDeltaConservationPlan.com>

August 27, 2014

Lead Agencies to Publish Partially Recirculated Draft

BDCP, EIR/EIS, and Implementing Agreement

The Department of Water Resources and the other state and federal agencies leading the Bay Delta Conservation Plan will publish a Recirculated Draft BDCP, Environmental Impact Report/Environmental Impact Statement (EIR/EIS), and Implementing Agreement (IA) in early 2015. The agencies are currently reviewing the comments received through the public comment period that ended on July 29, 2014. The scope of the partially recirculated draft documents will be announced in approximately six to eight weeks. The recirculated documents will include those portions of each document that warrant another public review prior to publication of final documents. The public will also have the opportunity to review the final documents prior to their adoption and any decisions about the proposed actions.

To: Gorke, Roger[Gorke.Roger@epa.gov]
From: Rader, Cliff
Sent: Wed 7/30/2014 12:53:30 AM
Subject: FW: NRDC Comments on the Draft BDCP and DEIS/DEIR
FINAL BDCP comment letter 7-29-14.pdf

Cliff Rader
Director, NEPA Compliance Division
202-564-7159

From: Goforth, Kathleen
Sent: Tuesday, July 29, 2014 8:24 PM
To: Hanf, Lisa; Johnson, Kathleen; Rader, Cliff
Subject: FW: NRDC Comments on the Draft BDCP and DEIS/DEIR

258 pages of comments from NRDC (the table of contents, alone, is 7 pages!).
Highlights from the cover letter:

"□ The DEIS/DEIR and Draft Plan both fail to use the best available science . .

□ The Draft Plan fails to conserve the health of the Bay-Delta estuary and its wildlife and

fisheries, and instead the Draft Plan is likely to cause significant environmental impacts

to the estuary, its wildlife and fisheries, and the people and communities that depend on

its health, including significant water quality impacts to farmers and cities, reduced

survival of salmon migrating through the Delta, and declining populations of salmon and

other native fisheries;

□ The DEIS/DEIR fails to accurately inform the public and decisionmakers of the likely

environmental impacts, fails to consider a reasonable range of alternatives, and fails to

adequately analyze cumulative impacts; and,

□ The Draft Plan fails to reduce reliance on the Delta, fails to ensure that biological

objectives are likely to be achieved, fails to ensure funding for plan implementation, provides unlawful water supply assurances, and otherwise violates the Delta Reform Act of 2009 and other state and federal laws. . .

We respectfully request that state and federal agencies to substantially revise the Draft Plan and DEIS/DEIR consistent with these comments."

-Kathy

From: Skophammer, Stephanie
Sent: Tuesday, July 29, 2014 4:57 PM
To: Goforth, Kathleen
Subject: FW: NRDC Comments on the Draft BDCP and DEIS/DEIR

From: Hagler, Tom
Sent: Tuesday, July 29, 2014 4:48 PM
To: Skophammer, Stephanie; Foresman, Erin; Vendlinski, Tim; Cabrera-Stagno, Valentina
Subject: FW: Comments on the Draft BDCP and DEIS/DEIR

258 pages!

From: Obegi, Doug
Sent: Tuesday, July 29, 2014 4:35 PM
To: 'BDCP.Comments@noaa.gov'
Cc: Poole, Kate; john@goldengatesalmon.org; kdelfino@defenders.org; bobker@bay.org; 'bobker@sbcglobal.net'; Jonathan Alan Rosenfield Ph. D. (rosenfield@bay.org)
Subject: Comments on the Draft BDCP and DEIS/DEIR

Dear Mr. Wulff,

Attached are comments of Defenders of Wildlife, NRDC, The Bay Institute, and Golden Gate Salmon Association regarding the Draft Bay Delta Conservation Plan and associated DEIS/DEIR. We are also sending a hardcopy of these comments, along with a CD with attachments and materials referenced therein, via U.S. Mail. Please let us know if you have any problem opening the attachment, or if you have questions or would like to discuss these comments further with us.

Thank you for consideration of our views.

Sincerely,

Doug

Doug Obegi

Staff Attorney*

Water Program

Natural Resources Defense Council

111 Sutter Street, 20th Floor

San Francisco, CA 94104

415.875.6100 (phone)

415.875.6161 (facsimile)

** Admitted to practice in California*

July 29, 2014

Ryan Wulff
National Marine Fisheries Service
650 Capital Mall, Suite 5-100
Sacramento, CA 95814

Sent via U.S. Mail and via email to BDCP.Comments@noaa.gov

RE: Comments on the Draft Bay Delta Conservation Plan and DEIS/DEIR

Dear Mr. Wulff:

On behalf of Defenders of Wildlife, the Natural Resources Defense Council, and the Bay Institute, and our combined membership and activists, we are writing to submit comments on the draft Bay Delta Conservation Plan ("Draft Plan") and associated Draft Environmental Impact Report and Draft Environmental Impact Statement ("DEIS/DEIR").

As you know, our organizations have dedicated countless hours over the past 8 years working on the Bay Delta Conservation Plan ("BDCP"). Our organizations supported the 2009 Delta Reform Act, which we continue to believe establishes a road map for a successful plan for achieving the co-equal goals of a more reliable water supply and protecting and restoring the health of the Delta ecosystem in a manner that protects and enhances the Delta's unique cultural, agricultural, and other values as an evolving place. And in early 2013, our organizations proposed and requested that the DEIS/DEIR analyze a Portfolio Alternative that included new conveyance in the Delta and new storage south of the Delta, in combination with significant investments in local and regional water supplies.

Unfortunately, as we discuss on the pages that follow, we find that the Draft Plan and DEIS/DEIR fail to meet the standards established in the Delta Reform Act and other applicable state and federal laws. In particular, our review finds that:

- The DEIS/DEIR and Draft Plan both fail to use the best available science, as numerous agency comments demonstrate and independent scientific reviews have concluded;

- The Draft Plan fails to conserve the health of the Bay-Delta estuary and its wildlife and fisheries, and instead the Draft Plan is likely to cause significant environmental impacts to the estuary, its wildlife and fisheries, and the people and communities that depend on its health, including significant water quality impacts to farmers and cities, reduced survival of salmon migrating through the Delta, and declining populations of salmon and other native fisheries;
- The DEIS/DEIR fails to accurately inform the public and decisionmakers of the likely environmental impacts, fails to consider a reasonable range of alternatives, and fails to adequately analyze cumulative impacts; and,
- The Draft Plan fails to reduce reliance on the Delta, fails to ensure that biological objectives are likely to be achieved, fails to ensure funding for plan implementation, provides unlawful water supply assurances, and otherwise violates the Delta Reform Act of 2009 and other state and federal laws.

Our organizations remain committed to working to achieve the co-equal goals and other requirements of the Delta Reform Act. A successful plan for the Delta must be based on the best available science, must reduce reliance on water supply from the Delta and invest in conservation and regional water supply solutions, and must achieve the requirements of state and federal law. We respectfully request that state and federal agencies to substantially revise the Draft Plan and DEIS/DEIR consistent with these comments.

Thank you for consideration of our views. Please feel free to contact us at your convenience if you have any questions regarding these comments.

Sincerely,

Doug Obegi
Natural Resources Defense Council

Kim Delfino
Defenders of Wildlife

Jon Rosenfield, Ph.D.
The Bay Institute

John McManus
Golden Gate Salmon Association

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EPA-HQ-2016-004924 ED_000757_000012359-00004

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I. THE DEIS/DEIR AND DRAFT PLAN FAIL TO MEET MINIMUM LEGAL STANDARDS UNDER THE NCCPA, ESA, CEQA, NEPA, AND RELATED ENVIRONMENTAL LAWS

The Draft Plan and supporting analyses do not meet the stated intent to (1) minimize and mitigate for the effects of the activities proposed in this Plan, (2) provide for the conservation of covered species, or (3) meet the standards of the Delta Reform Act of 2009. Draft Plan at 1-1 to 1-2. Nor do the Draft Plan and DEIS/DEIR use the best available scientific data or otherwise comply with the minimum legal standards of several state and federal laws that it is required to meet, including CEQA and NEPA. The Draft Plan and DEIS/DEIR must be substantially revised and recirculated to meet these minimum requirements.

A. The Draft Plan Violates the Natural Community Conservation Planning Act

As NRDC, Defenders, and TBI explained in a letter to DFW Director Bonham on July 10, 2013 (and incorporated here by reference),[1] the Natural Community Conservation Planning Act ("NCCPA") provides the foundational elements for a successful BDCP. As Director Bonham explained in an op-ed, the NCCPA (Cal. Fish & Game Code § 2800 *et seq.*) is a "cutting edge" law that sets a high bar for species protection, and that requires the BDCP to "provid[e] for the conservation and management of . . . 57 species." Charlton H. Bonham, Op-Ed., Plan could help fisheries, water supply, *S.F. Chron.*, June 6, 2013. Unfortunately, the Draft Plan does not meet this laudable standard.

Fundamentally, the Draft Plan fails to comply with the NCCPA by: (1) failing to include conservation measures that are likely to be adequate to conserve covered species in the Plan Area; (2) failing to establish biological objectives that are consistent with the NCCPA standard;[2] (3) providing regulatory assurances that are not "commensurate with long term conservation assurances," preclude effective adaptive management, and are otherwise inconsistent with the NCCPA;[3] and, (4) failing to ensure adequate funding needed to implement the Draft Plan.

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[1] A copy of this letter as well as many of our organizations' prior comment letters and memorandums, as well as the scientific studies, modeling analyses, independent scientific peer reviews, and other documents relied on and incorporated by reference in these comments are included on a CD submitted with the hardcopy of these comments.

[2] *See infra* for the discussion of the adequacy of biological objections in sections III and IV of these comments.

[3] *See infra* for the discussion of regulatory assurances in section I(C) of these comments.

1. The Draft Plan Fails to Provide Measures Necessary to Achieve Conservation (Recovery) in the Plan Area, as Required by the NCCPA

To comply with the NCCPA, a natural community conservation plan must provide for measures necessary to recover covered species within the Plan Area. This is evident from the definition of "natural community conservation plan" in the statute, which requires that a plan "shall identify and provide for those measures necessary to conserve and manage natural biological diversity within the plan area while allowing compatible and appropriate economic development, growth, and other human uses." Cal. Fish & Game Code § 2805(h). The NCCPA defines the terms "conserve," "conserving," and "conservation" as "the use of, methods and procedures within the plan area that are necessary *to bring any covered species to the point at which the measures provided pursuant to [the California Endangered Species Act ("CESA")] are not necessary*, and for covered species that are not listed pursuant to [CESA], to maintain or enhance the condition of a species so that listing pursuant to [CESA] will not become necessary." *Id.* at § 2805(d) (emphasis added).[4] Thus, for species listed as endangered or threatened under the CESA, an NCCP must, within the Plan Area, identify and provide for those measures necessary to recover the species to the point where it is no longer considered endangered or threatened and no longer needs to be on the endangered species list. For unlisted species, the Draft Plan must provide measures, within the Plan Area, that keep the species from declining to the point at which it would need to be listed under CESA.

The Draft Plan fails to "provide for those measures necessary to conserve" listed species within the Plan Area. First, for a species that exists exclusively within the BDCP plan area, the BDCP must provide for all of the measures necessary for the species' recovery within the Plan Area. Such species include endangered delta smelt and longfin smelt. Merely contributing to these species' recovery is inadequate when the species occurs entirely within the Plan Area. This requirement is clear from several statutory provisions that require the Department to make specific findings regarding whether the Plan contains specific measures to "conserve" the

[4] In addition to the arguments raised in our 2013 letter, this conclusion regarding the recovery standard is further supported by the text and legislative history of the 2009 Delta Reform Act. First, provisions of the Delta Reform Act require BDCP to include "operational requirements and flows **necessary for recovering the Delta ecosystem and restoring fisheries** under a reasonable range of hydrologic conditions." Cal. Water Code § 85320(b)(2)(A) (emphasis added). Second, the November 4, 2009 Assembly Floor analysis of the Delta Reform Act 2009, which states that with respect to the NCCPA standard, "While some agencies have asserted that BDCP would be an NCCP, the December 2006 planning agreement specifically provided that the signatories were not committed to achieving **the higher ecosystem recovery standard for an NCCP. This bill sets the higher NCCP standard ("the gold standard")** as the threshold for state funding of the public benefits of BDCP activities, while relying on existing law." Nov. 4, 2009 Assembly Floor Analysis of SB 1 X7 (Simitian and Steinberg), available online at: http://leginfo.ca.gov/pub/09-10/bill/sen/sb_0001-0050/sbx7_1_cfa_20091104_035148_asm_floor.html (emphasis added).

covered species within the Plan Area. *See* Cal. Fish & Game Code § 2805(h) (Plan "shall identify and provide for those measures necessary to conserve . . . within the plan area); *id.* at § 2805(d) (defining conservation as recovery); *id.* at § 2820(a)(4) (requiring Plan to contain "measures in the plan areas . . . as needed for the conservation of species"); *id.* at § 2820(a)(6) (requiring plan to contain "specific conservation measures that meet the biological needs of covered species"); *id.* at § 2835 (authorizing the Department to issue a take permit for a covered species if they find that the covered species' "conservation and management is provided for in a [Plan]"). As discussed below, the Draft Plan fails to provide for those measures necessary to conserve delta smelt and longfin smelt, and instead predicts significant declines in the abundance of these species as a result of BDCP, CVP/SWP operations, and other cumulative impacts (including climate change) in the Plan Area.

Second, the Draft Plan unlawfully limits the magnitude of the Plan's required contribution to a species' recovery by the extent of the Plan's impacts on that species. The NCCPA does not permit this artificially truncated contribution to recovery. Rather, the NCCPA takes a far more expansive view of conservation measures, which includes, but is not limited to, taking into account the impacts of covered activities on the covered species. *See* Fish and Game Code § 2820(a)(6) ("The plan contains specific conservation measures that meet the biological needs of covered species **and** are based on the best available information regarding the status of the species and the impacts of permitted activities on those species.") (emphasis added). But the Draft Plan indicates that the BDCP will not provide for sufficient measures to achieve recovery in the Plan Area if a species is imperiled by non-Plan impacts. BDCP Draft at 3.A-19 (explaining that BDCP did not strive to meet species' recovery plan goals, and noting that BDCP's goal-setting "process did not assume that BDCP would be solely responsible for recovery of [covered] species"). For species that exist solely in the Plan Area, this approach is not legally defensible because it ignores the NCCPA's focus on what is necessary to recover a species as opposed to simply addressing the impacts of covered activities. This approach also attempts to excuse the proponents from responsibility for multiple indirect effects of the Draft Plan. If plan developers ignore threats within a plan area that undermine the achievement of recovery of a covered species, the NCCPA's goal of delisting species would be impossible to achieve in most cases. As explained below, the Draft Plan fails to require measures necessary for the conservation of covered species within the Plan Area, in part, because it fails to address impacts beyond those directly caused by the proposed permitted activities. That approach is unlawful.

Third, the manner in which the BDCP's proposed "contribution to recovery" standard is linked to species' geographic range is also inconsistent with the NCCPA. The Draft Plan limits the magnitude of the Plan's contribution to recovery for species with a range that extends beyond the BDCP's plan area. Draft Plan at 3.A-18 ("For species that have a substantial portion of their range outside the Plan Area, the BDCP's potential contribution to recovery is necessarily limited."); BDCP Planning Agreement at 8 (magnitude of contribution to recovery determined,

in part, by "the scope of the BDCP Planning Area in relation to the geographic range of the Covered Species."). While it is clear that the NCCPA does not intend for a plan's conservation measures to occur in a species' range *outside* of the Plan Area,[5] the conservation measures within the Plan Area must be adequate to support recovery within that area. The Draft Plan fails to meet this requirement.

The latter flaw is especially relevant to covered salmonids, which spend a portion of their life-cycle within the Plan Area and a portion in other areas. There are a variety of approaches possible when developing a conservation plan for salmonids:

> (1) Providing for measures within the Plan Area sufficient to recover the population;
> (2) Providing for all of the measures within the Plan Area necessary for and consistent with a recovery plan or strategy that encompasses the entirety of the species or range;
> (3) Providing for measures within the Plan Area that contribute to the recovery of population that spends part of its life cycle within the Plan Area in a manner proportional to the portion of the population's life cycle that is spent within the Plan Area.

Of these approaches, only the second application of the NCCPA's conservation standard is legally defensible. The first approach, which requires the Plan to provide for all of the measures necessary for the recovery of any covered species that enters the Plan Area, is unrealistic. If animals are subject to take outside of the Plan Area, there may be little that plan participants could agree to do within the Plan Area to recover the species. In contrast, the third option is inadequate to meet the statutory standard because the amount of time spent in a geographic area is not reflective of the importance of the area. To the extent the Draft Plan limits its contribution to recovery so that the contribution is proportional to the *time* an anadromous fish spends in the Plan Area versus outside of the Plan Area, or to the *size* of the Plan Area compared to the other areas the fish spends its life, the BDCP is adopting the third standard, which fails because it is insufficiently protective.

Finally, as we discuss below, the proposed upstream operations of the CVP and SWP, which are integrally linked to and driven in large part by proposed operations in the Plan Area under the Draft Plan, in combination with climate change, are likely to result in potential extirpation and extinction of several salmon runs. *See, e.g.,* National Marine Fisheries Service 2013, NMFS

[5] It is important to note that other legal requirements apply to the draft BDCP's impact on species outside of the Plan Area. For example, CVP/SWP operations proposed under the Draft Plan will have a significant impact on the operation of upstream reservoirs of the CVP and SWP. Those reservoir operations, in turn, may have a significant and adverse impact on the survival and recovery and listed fisheries below the reservoirs, including salmonids. Those impacts must be addressed, avoided and mitigated under a myriad of requirements, including section 7 of the Endangered Species Act, CEQA, NEPA, the Central Valley Project Improvement Act, and other state and federal laws.

Progress Assessment and Remaining Issues Regarding the Administrative Draft BDCP Document, 4/4/13 ("NMFS 2013 Progress Assessment") at 12-13. This outcome is the opposite of the NCCPA's goal of recovery, and appears likely to result in a jeopardy opinion under section 7 of the Endangered Species Act. Ultimately, the operations and CVP and SWP must adapt to climate change, not only for ecosystem protection, but also to manage water supply. The water projects cannot take the approach that there is no duty to adjust operations to account for climate change. It is difficult to imagine how the agencies could even consider approving a conservation plan under either the NCCPA or the ESA that predicts the likely extinction of several listed salmon runs.

2. The Draft Plan Fails to Ensure Adequate Funding for Implementation of the Plan, as Required by the NCCPA

Like the federal ESA, the NCCPA requires that the plan "ensure" adequate funding. *See* Cal. Water Code §§ 2820(a)(10), (b)(8). The Draft Plan and associated documents fail to meet this requirement. *See* discussion *infra* regarding the similar standard to ensure funding under the ESA.

In discussing the ESA and NCCPA standards, the Delta Stewardship Council, which has review authority over DFW's review of BDCP's compliance with the NCCPA, recently noted that,

> Although there are no cases interpreting the 'ensured funding' requirement under the NCCPA, there are a number of federal cases, and one state case, interpreting the very similar 'ensured funding' requirements for issuance of incidental take permits under the federal Endangered Species Act and the California Endangered Species Act. In general, these cases conclude that meeting this requirement cannot rely on speculative future actions by other parties, but requires the applicant's guarantee of adequate funds to carry out the plan.

Delta Stewardship Council, October 24, 2013 staff report, Agenda Item 9, page 2, available online at http://deltacouncil.ca.gov/sites/default/files/documents/files/Item_9_8.pdf. The Draft Plan proposes to rely on speculative future funding actions, and fails to provide such guaranteed funding.

B. The Draft Plan Violates the Endangered Species Act

The federal Endangered Species Act ("ESA," 16 U.S.C. § 1531 *et seq.*) provides another foundational set of requirements on the adequacy of the Draft Plan, which is intended to act as a Habitat Conservation Plan ("HCP") under section 10 of the ESA. As described in the Draft Plan, the BDCP must satisfy at least the following criteria to qualify as an HCP:

- The applicant will ensure that adequate funding for the Plan will be provided;
- The applicant will, to the maximum extent practicable, minimize and mitigate the impacts of any taking that is incidental to an otherwise lawful activity;
- The taking will not appreciably reduce the likelihood of the survival and recovery of the species in the wild.

Draft Plan at 1-8; 16 U.S.C. § 1539(a)(2)(B). As we discuss below, the Draft Plan and accompanying documents fail to meet these requirements. Equally important, as we discuss extensively in sections III and IV of these comments, the Draft Plan fails to use the best available science as required by the ESA. *See* 16 U.S.C. § 1536(a)(2). In addition, as we discuss in section I(C) of these comments, the Draft Plan and Draft Implementation Agreement propose to provide regulatory assurances that violate the requirements of the ESA, including the 5 Point Policy.

1. The Draft Plan and Draft IA Fail to Ensure Adequate Funding for Plan Implementation

As currently drafted, the Draft Plan and draft Implementation Agreement fail to comply with the funding provisions of the NCCPA and ESA. The Endangered Species Act is clear that the plan must "ensure" funding over the lifetime of the permit. 16 USC § 1539(a)(2)(B)(iii); HCP Handbook at 3-33 to 3-34; *National Wildlife Federation v. Babbitt*, 128 F.Supp.2d 1274, 1294-95 (E.D. Cal., 2000); *Southwest Center for Biological Diversity v. Bartel*, 470 F.Supp.2d 1118, 1155 (S.D. Cal., 2006). Of particular note, the HCP Handbook is explicit that a HCP cannot rely on unappropriated federal funding to "ensure" funding of the plan in light of the "Anti-Deficiency Act and the availability of appropriated funds." HCP Handbook at 3-33 to 3-34. In addition, a HCP must provide "remedies for failure to meet funding obligations by signatory measures." *National Wildlife Federation*, 128 F.Supp.2d at 1294-95. And it is black letter law that a HCP "cannot rely on speculative future actions of others" for funding, and that the HCP effectively must be backed by a guarantee by the applicant to ensure funding for all plan elements. *Bartel*, 470 F.Supp.2d at 1155. The *Bartel* case is directly on point regarding the possibility of relying on funding from a future bond requiring voter approval, and in that case the Court noted that "the uncertainty of these ideas is readily apparent," that such funding is speculative in light of future voter approval requirements, and that relying on future bonds does not meet the requirement to ensure funding of an HCP under the ESA. *Id.* The HCP Handbook also emphasizes that,

> Whatever the proposed funding mechanism is, failure to demonstrate the requisite level of funding prior to permit approval or to meet funding obligations after the

> permit is issued are grounds for denying a permit application or revoking or suspending an existing permit, respectively.

HCP Handbook at 3-35 (emphasis in original).

In contrast to these requirements, Chapter 8 of the Draft Plan explicitly states that it does not provide a financing plan and instead only provides estimates of potential funding sources:

> It is important to note that this chapter is not a financing plan for the state or federal water contractors or any other party. Separate financing plans, funding agreements, legislative authority, and other documents will be needed to enable the use of certain funding sources. This chapter provides an overview of potential funding sources to support the implementation of the BDCP as well as the level of past financial support at the state and federal level for similar Delta activities.

Draft Plan at 8-64. Despite this language, Chapter 8 also claims that these "potential funding sources" demonstrate that "adequate funding to implement BDCP has been assured." Draft Plan at 8-120. This conclusion is unlawful and unsupported by the text of Chapter 8.

First, the text of chapter 8 assumes that funding from future water bonds would be used for BDCP. *See* Draft Plan at 8-64 to 8-65, 8-84 to 8-85. Although it is true that one or more future water bonds could fund BDCP, it is unlawful to assume that future water bonds provide assured funding for BDCP. *Bartel*, 470 F.Supp.2d at 1155.

Second, the text of Chapter 8 assumes that billions of dollars in future federal funding could be dedicated to BDCP. *See* Draft Plan at 8-99 to 8-118. However, none of these federal funding sources are dedicated to BDCP, and all are subject to future appropriations by Congress. As such, these funds cannot be relied upon to ensure funding for BDCP. HCP Handbook at 3-33 to 3-34.

Third, Chapter 8 fails to provide adequate remedies to ensure funding if there is a shortfall of initial funding sources for plan implementation. The only remedy identified in the document appears to be reduction in habitat restoration or other conservation measures required under the Draft Plan. Draft Plan at 8-122. This is unlawful; as the court concluded in *National Wildlife Federation v. Babbitt*,

> It is not clear that a funding mechanism that is not backed by the applicant's guarantee could ever satisfy the requirement of § 1539(a)(2)(B)(iii) that the applicant "ensure" funding for the Plan. Assuming, however, that a cost shifting mechanism "ensures" funding within the meaning of § 1539(a)(2)(B)(iii), in these

> circumstances, where the adequacy of funding depends on whether third parties decide to participate in the Plan, the statute requires the applicant's guarantee…
>
> In the face of the City's refusal to "ensure" funding, the Secretary's (B)(iii) finding with respect to the City's ITP is either at odds with the evidence in the record or is based on the City's untenable reading of the statute. In either case, while the Service's (B)(iii) finding is not arbitrary with respect to the Plan as a whole, it is arbitrary and capricious with respect to the City's Permit

128 F.Supp.2d at 1294-95. That court specifically rejected the argument that permit revocation was an adequate remedy to ensure funding. *Id.* The same is true here; BDCP must have some financial backstop or guarantee to ensure that the plan is fully implemented.

The draft Implementation Agreement ("Draft IA") includes similarly unlawful statements and conclusions regarding the assurance of funding under the Draft Plan. *See* Draft IA at 11, 16, 45-48. For instance, the Draft IA states that, "The Parties acknowledge that such assurances do not require that all necessary funds be secured at the time of permit issuance, but rather establish that such funding is reasonably certain to occur during the course of Plan implementation." Draft IA at 45. This is wholly inconsistent with the requirement to "ensure" funding for the plan. *See Bartell*, 470 F.Supp.2d at 1155; *Babbitt*, 128 F.Supp.2d at 1294-95. In addition, the document states that, "Furthermore, as described in Chapter 8 of the Plan, the State and federal governments have committed to provide additional funding to implement the plan." Draft IA at 45. This is contradicted both by the text of Chapter 8 of the Draft Plan, which disclaims any firm commitment of funding by state or federal sources, and by the text on page 46. *See* Draft IA at 46 ("While the United States has been engaged in the development of this draft Agreement, there is no federal position as of this time regarding potential funding obligations of the United States.").

Finally, we note that the Draft Plan improperly proposes that the public pay for restoration of the Yolo Bypass (CM2), despite the fact that restoration of the Yolo Bypass is required under existing permits as a mitigation measure. *See* Draft Plan at 8-74 (excluding CM2 from list of measures for which the contractors will pay any portion of costs). It is unclear how the allocation of costs was made in Chapter 8 between the public (state and federal taxpayers) and USBR/DWR (and their ratepayers), but in light of the fact that the draft plan fails to achieve the standards of the NCCPA, the conclusion that these measures are in excess of mitigation requirements of the project proponents and should be borne by the public appears unsupportable.

2. The Draft Plan Fails to Minimize and Mitigate Takings to the Maximum Extent Practicable

The ESA requires that an HCP minimize the take of covered species to the "maximum extent practicable." 16 U.S.C. § 1539(a)(2)(B)(ii). State law provides even more protection to species listed under CESA. Under CESA, the take must be "minimized and fully mitigated," and under both CESA and the NCCPA, the measures required to minimize take must be roughly proportional to the amount of take. Fish & Game Code §§ 2081(b)(2), 2820(b)(3)(b), (b)(9); 14 Cal. Code Regs. § 783.4. There is no question that the CVP and SWP are significant sources of harm (which is encompassed within the definition of take) and mortality for most of the fish species covered by the Draft Plan. *See, e.g.*, *NRDC v. Kempthorne*, 506 F.Supp.2d 322 (E.D. Cal., 2007). Project-related take occurs not just through entrainment and salvage at export pumps, but throughout the integrated operation of the Projects as a whole, including, for example, by failing to provide adequate coldwater habitat for fish below terminus dams, failing to provide sufficient attraction flows to prevent straying into dead-end sloughs and channels, and by creating channel blockages or altering flows in a manner that increases covered species' exposure to predation, invasive species, and toxics. *See, e.g., San Luis & Delta-Mendota Water Authority v. Jewell,* 747 F.3d 581, 627 (9th Cir. 2014) ("CVP/SWP operations 'have … played an indirect role in the delta smelt's decline by creating an altered environment in the Delta that has fostered the establishment of nonindigenous species and exacerbates these and other stressors that are adversely impacting delta smelt.'"); *id.* at 628-29 (discussing Projects' indirect effects on limiting food supply); *id.* at 629-30 (discussing Projects' role in exacerbating water pollution); *id.* at 630-34 (noting Projects' role in promoting the exposure of native species to harmful predators and the expansion of exotic species in the Delta). The extent of take associated with these activities is directly related to Project operations, including those proposed as part of the Draft Plan.

The Draft Plan fails to minimize and mitigate takings anticipated under the Plan to the maximum extent practicable, as required by the ESA. First, the Plan fails to minimize and mitigate takings associated with the Draft Plan's proposed operations that occur upstream of the Delta, instead claiming that the Projects do not have to modify their upstream operations to adjust to projected temperature increases because the Projects do not control water temperatures. This is incorrect. Those foreseeable effects must be addressed and minimized and mitigated. Second, where the Plan proposes mitigation, it is so uncertain as to be unreliable, and fails to meet the requirements of the ESA.

As we discuss in sections III and IV of these comments, the Draft Plan anticipates that the populations of several covered species – particularly, salmon, sturgeon, and steelhead stocks – will *decline* over the life of the Draft Plan, potentially to the point of extirpation, because of proposed operations and water temperatures below Project-operated dams will be too warm to

sustain spawning and rearing. These adverse effects have been confirmed in numerous independent reviews. *See, e.g.,* NMFS 4/4/13 comments at 1.17 ("the cumulative effects of the project when combined with effects of climate change and other baseline conditions is showing the potential extirpation of mainstem Sacramento River populations of winter-run and spring-run chinook salmon over the term of the permit"); *id.* at 2.8 ("Keswick release strategies between the ESO and EBC will result in increased egg mortality upstream. Lower flows in key summer and fall months increase egg mortality for winter-run and spring-run Chinook salmon and potentially other runs. SacEFT habitat results show significant impacts on spawning and rearing habitat for winter-run that are above and beyond effects of climate change…. The analysis shows that ESO criteria could result in riskier operations relating to stranding risk for juveniles (over two times more low risk years under EBC."); *id.* at 2.9 ("While the high spring-time Feather River flows modeled in HOS could attract sturgeon into the Feather River from the Sacramento River, summertime releases are decreased compared to EBC2 to provide for end-of-September storage requirements. The decreased summertime river flows increase water temperatures in the high-flow channel; the resulting temperatures reported in the effects analysis would be lethal to sturgeon eggs and embryos.") The Plan declines to mitigate for this take, even though the Projects could be re-operated to improve the extent and duration of cold-water habitat for these species. But the Draft Plan declines to address this take or propose measures to mitigate it, claiming that the increasing water temperature is not an effect of the Plan, but primarily a result of externally-induced climate change. That is incorrect; operations of these dams and reservoirs strongly affect downstream water temperatures and are driven by water delivery demands, including operations in the Delta.

The Projects have the ability to expand the cold-water pools in Project-controlled reservoirs; adjust reservoir releases to match the temperature and timing needs of cold-water species; construct, repair or maintain lower outlets to better access cold water behind dams (particularly relevant to Oroville Dam); and install other measures such as temperature control curtains to control downstream temperatures to protect cold water habitat in response to these changes. *See, e.g.,* DWR, "Reconnaissance Study of Potential Future Facilities Modifications," Oroville Facilities Settlement Agreement Implementation FERC Project No. 2100 (Dec. 2006) (acknowledging improved ability to meet cold-water species temperature requirements with improvements to the Oroville Dam River Valve) (incorporated herein by reference). Moreover, the Projects have the obligation to do so – there is nothing in the law that excuses the agencies from their obligations to avoid jeopardy and to protect and restore salmon and other cold-water fish simply because external factors contributed to the problem, particularly in a plan that purports to conserve and recover covered species.

Here, the Draft Plan essentially ducks the problem by attempting to claim the Projects are powerless to mitigate for increasing water temperatures. That is simply false. "Normally, an agency rule would be arbitrary and capricious if the agency has ... entirely failed to consider an

important aspect of the problem." *Motor Vehicle Manufs. Ass'n v. State Farm Automobile Ins. Co.,* 463 U.S. 29, 43 (1983). Here, the Draft Plan fails to consider the many feasible ways in which it could mitigate for the increased upstream take resulting from proposed Project operations in light of increasing water temperatures. As stated in the Service's HCP Handbook:

> [P]articularly where adequacy of mitigation is a close call, the record must contain some basis to conclude that the proposed program is the maximum that can be reasonably required by that applicant. This may require weighing the benefits and costs of implementing additional mitigation, the amount of mitigation provided by other applicants in similar situations, and the abilities of that particular applicant.

The Draft Plan's approach also violates the requirement that proponents must address the impacts of the *whole of the action* in analyzing impacts and associated mitigation. *See, e.g., Connor v. Burford,* 848 F.2d 1441, 1457–58 (9th Cir.1988).[6] As explained by the Ninth Circuit in *Southwest Ctr. for Biological Diversity v. Bartel:*

> The ESA "does not permit the incremental-step approach" of consultation because "biological opinions must be coextensive with the agency action." *Conner*, 848 F.2d at 1457–58; accord *Center for Biological Diversity v. Rumsfeld*, 198 F.Supp.2d 1139, 1155 (D.Ariz.2002); *Greenpeace v. National Marine Fisheries Serv.*, 80 F.Supp.2d 1137, 1143–45 (W.D.Wash.2000). "[T]he ESA requires that all impacts of agency action—both

[6] It is no excuse to claim that Project operations upstream of the Delta are driven by considerations beyond those contemplated in the Draft Plan. Even if it were possible to segregate Project operations in this manner (which it is not), the Draft Plan must be accompanied by a system-wide ESA consultation to obtain necessary take permits. For example, the Draft Plan explains that it is intended "to support the issuance of a joint BiOp under Section 7 by USFWS and NMFS authorizing the incidental take associated with BDCP actions undertaken by Reclamation and CVP contractors within the Plan Area. That joint BiOp will also address the decision by USFWS and NMFS to issue Section 10 permits to the Authorized Entities." Draft Plan at 1-8. In addition, the coordinated operations of the CVP and SWP and its infrastructure (including any modifications proposed by BDCP) must undergo a section 7 consultation under the ESA. *See* 74 Fed. Reg. 7257, 7258 ("in a parallel yet separate process, Reclamation will be required to reinitiate Section 7 consultation on the long-term operation of the CVP, as coordinated with the SWP, to the extent that such coordinated operations may be modified to effectively be integrated with any operational or facility improvements that may occur from implementation of the BDCP."). That consultation must consider the coordinated operations of the projects as a whole, not merely any changes proposed by BDCP, and the consultation must consider all federal, state, private and other actions that may affect listed species, including nondiscretionary actions, to ensure that the proposed project will not cause jeopardy to the survival and recovery of the species or adversely modify its critical habitat. *NWF v. NMFS,* 524 F.3d 917, 928-931 (9th Cir. 2008).

> present and future effects on species—be addressed in the consultation's jeopardy analysis." *American Rivers v. United States ACOE*, 271 F.Supp.2d 230, 255 (D.D.C.2003). This rule ensures that the ESA is enforced in an effective manner because "impermissible segmentation would allow agencies to engage in a series of limited consultations without ever undertaking a comprehensive assessment of the impacts of their overall activity on protected species." *Id.* (emphasis added).
>
> The lesson of *Conner* applies to this case because the ESA's policy of "institutionalized caution," *Tennessee Valley*, 437 U.S. at 194, 98 S.Ct. 2279, "can only be exercised if the agency takes a look at all the possible ramifications of the agency action." *Conner*, 848 F.2d at 1453 (quotation and citation omitted). Though FWS chose not to evaluate the cumulative impact of the implementation of the MSCP and Subarea Plan on the vernal pool species, it fixed the ameliorative measures for the fifty-year life of the ITP to those contemplated in 1997. Ironically, this structure diminishes the value of one of the primary strengths of regional conservation planning—enabling jurisdictions to plan and implement protections for an entire ecosystem. E.g., AR 6780–82, 23189–90, 28100–01, 39463. By the time FWS undertakes its incremental site-specific consultations it may have lost the opportunity to protect the vernal pool species from extinction. Conner, 848 F.2d at 1454–58 (requiring comprehensive information and review "to avoid piecemeal chipping away of habitat"). The flaw is fatal in the context of this case because all vernal pool habitat outside of the San Diego region has been destroyed. E.g., AR 26236 ("The loss of vernal pool habitat is nearly total in Los Angeles, Riverside, and Orange counties"); 63 Fed.Reg. at 54983–84; 58 Fed.Reg. at 41387 (otay mesa mint). The vernal pool species have narrow and strict habitat requirements. E.g., 58 Fed.Reg. at 41388 (Riverside fairy shrimp); 62 Fed.Reg. at 4929 (San Diego fairy shrimp). The remaining habitat is found within the area covered by the MSCP (and lands controlled by the military). Because the MSCP controls the fate of the remaining vernal pool habitat throughout all of its range, it is particularly important to comply with the purpose and spirit of the ESA to seek to prevent the extinction of these species.

470 F. Supp. 2d 1118, 1142-43 (S.D. Cal. 2006). Here, the Draft Plan puts on blinders and pretends that Project operations proposed under the 50-year Plan have no effect on water temperatures or habitat or species viability below Project dams, when it undeniably does. The fact that climate change is an exacerbating factor is not an excuse for the proponents to avoid grappling with this aspect of Project operations. As explained by CDFW in the attached Memorandum dated October 15, 2009 insisting that Caltrans mitigate for impacts related to sea level rise and climate change:

> Based upon … climate change and SLR [sea level rise] data and the project's size, location, design life, and reasonable foreseeable adaptation strategy, there is a fair

> argument this project could have [significant] …impacts on the Humboldt Bay ecosystem.
>
> …
>
> [T]he project's … facilities should provide adequate channel or flow capacity based upon calculations using current SLR and climate change projections.
>
> …
>
> DFG recommends this project's Final EIR evaluate how this project will adapt to SLR. While adaption options are reasonably foreseeable, they need not be undertaken in the current project. However, given that potentially significant indirect environmental impacts from such adaptations are reasonably foreseeable, they should be evaluated during the current environmental review for this project.

Comments of CDFG to CA Dept. of Transp. re: Eureka-Arcata Corridor Improvement Project, Draft EIR/EIS SCH #200192035, October 15, 2009, at 8, 11-12. The Draft Plan must be revised to evaluate impacts from reasonably foreseeable adaptation changes to Project operations and facilities during the life of the Project required to maintain adequate cold water temperatures for species viability, address this critical aspect of the "whole of the action," and identify mitigation measures to minimize and avoid, where possible, associated take.

Under the ESA, mitigation measures must be "reasonably specific, certain to occur, and capable of implementation; they must be subject to deadlines or otherwise-enforceable obligations; and most important, they must address the threats to the species in a way that satisfies the jeopardy and adverse modification standards." *Ctr. for Biological Diversity v. Rumsfeld,* 198 F.Supp.2d 1139, 1152 (D.Ariz.2002) (citing *Sierra Club v. Marsh,* 816 F.2d 1376 (9th Cir.1987)); *see also NWF v. NMFS,* 481 F.3d 1224 at *12 & n. 16 ("Although the record does reflect a general desire to install structural improvements [to benefit fish] where feasible, it does not show a clear, definite commitment of resources for future improvements."). While adaptive management tied to clearly enforceable biological objectives and actions may fit within this paradigm, "overly flexible adaptive management may be incompatible with the requirements of the ESA." *NRDC v. Kempthorne*, 506 F. Supp. 2d at 352. "[A]t a minimum, a mitigation strategy must have some form of measurable goals, action measures, and a certain implementation schedule; i.e., that mitigation measures must incorporate *some* definite and certain requirements that ensure needed mitigation measures will be implemented." *Id.* at 355 (citing *Rumsfield*, 198 F.Supp.2d 1139 (D. Az. 2002)). Many of the Draft Plan's proposed conservation and mitigation measures fall into the latter category, requiring only process rather than a slate of specific, certain and feasible measures to protect species and their habitat.

Several critical aspects of the Draft Plan are not reasonably certain to occur and cannot be relied on under the ESA. First, as we discuss in section II of these comments, the flows required under the High Outflow Scenario are not likely to occur in a significant percentage of years because of

arbitrary operational limitations. Second, as we discuss in section II of these comments, modeled operations that are more protective than the operational rules are not reasonably likely to occur. Third, reliance on adaptive management generally and on the biological objectives specifically is not reasonably likely to occur, because: (a) the Draft Plan proposes that implementation of the conservation measures, not achievement of the biological objectives, is the measure of the plan; and, (b) the adaptive management structure, including the regulatory assurances, eliminate effective adaptive management that would require additional water. Fourth, the Draft Plan cannot lawfully rely on purchases of water to meet minimum instream flows, *see, e.g.*, Draft Plan at 3.4-356, but must ensure that in the absence of adequate funding or lack of available water transfers the minimum flows will be implemented.[7]

3. The Draft Plan Fails to Demonstrate that Taking will not Appreciably Reduce the Likelihood of Survival in the Wild

Finally, as explained above and more extensively in sections III and IV of these comments, the Project operations proposed by the Draft Plan will lead to increased take of covered species. The Draft Plan and DEIS/DEIR demonstrate that this increased take will appreciably reduce the likelihood of survival of listed species in the wild and in combination with other reasonably foreseeable factors, will jeopardize the continued existence and recovery of several listed species, anticipating the potential extirpation and substantial decline in abundance of longfin smelt and several stocks of salmon and steelhead. This result is prohibited under section 10 of the ESA, and prevents the Plan from satisfying the minimum requirements of an HCP or NCCPA.

C. The Regulatory Assurances Proposed in the Draft Plan and Draft Implementation Agreement Violate the NCCPA and ESA

In the following key respects, the regulatory assurances identified in the Draft Plan and Draft Implementation Agreement (Draft IA) violate the ESA, NCCPA, Delta Reform Act, and other state and federal laws:

1) The Draft Plan and Draft IA provide assurances that are inconsistent with the best available science and effective adaptive management, particularly in light of the State's

[7] Although the Draft Plan briefly mentions this concept, it is not a covered activity under the Draft Plan, the effects of such a program are not analyzed in the Draft Plan or the DEIS/DEIR, and there is no funding provided to implement such a program. Prior effects to acquire environmental flows, such as the EWA, have been abject failures, and it is not clear how such a program would ensure that public funds were not being used to pay for private mitigation obligations (such as meeting minimum flow requirements), which would likely constitute an unlawful gift of public funds.

admission of scientific uncertainty and the evidence showing that the Draft Plan is unlikely to achieve key biological goals and objectives;

2) The Draft Plan and Draft IA provide assurances that are not commensurate with conservation assurances as required by the NCCPA, and otherwise violate state law;
3) The Draft Plan's provisions regarding changed circumstances are unlawful;
4) The Draft Plan and Draft IA provide assurances that are inconsistent with the requirements of the ESA, including the Services' 5 point policy;
5) The Draft Plan and Draft IA cannot provide assurances any regarding upstream operations of the CVP and SWP; and,
6) The Draft Plan and Draft IA provide assurances to CVP contractors and to USBR in violation of the No Surprises Rule, which prohibits providing No Surprises assurances to federal agencies.
7) CVP and SWP Contractors are Not Qualified as Permittees, and Thus Cannot Obtain Regulatory Assurances

Each of these points is discussed in turn.

1. Proposed Assurances are Inconsistent with the Best Available Scientific Information and Effective Adaptive Management

The scope of regulatory assurances and how they impact effective adaptive management has been a key issue throughout the development of BDCP. In our 2008 scoping comments, we stated that,

> As both the ESA and NCCPA recognize, adaptive management is a necessary element of an ecologically sustainable HCP/NCCP. Fish & Game Code § 2820(a)(2), (8), (b)(5), (f)(1)(G); HCP Handbook at 3-24; *see* 50 C.F.R. § 17.22(b)(2)(C), (b)(5).… The NCCPA requires that the level of assurances provided by a NCCP be "commensurate with long-term conservation assurances and associated implementation measures pursuant to the approved plan." Fish & Game Code § 2820(f). A critical component in determining the level of assurances is "[t]he degree to which a thorough range of foreseeable circumstances are considered and provided for under the adaptive management program." *Id.* § 2820(f)(1)(8); *see also* 50 C.F.R. §§ 17.22(b)(5), 222.307(g) (regulatory assurances with respect to changed and unforeseen circumstances under the ESA). In addition, we note that California law requires suspension or revocation of the NCCP if take of the species under the plan will jeopardize the continued existence of the species. *See* Fish & Game Code § 2823. Thus all parties have an incentive in ensuring that the HCP/NCCP achieves its goals and avoids jeopardy to any listed species.… As such, the flexibility required for the

> BDCP to succeed precludes any inflexible guarantees or complete regulatory assurances regarding water supplies and exports…. Instead, the BDCP must retain sufficient flexibility to respond to changed conditions and continue to conserve and restore listed species and the health of the Delta ecosystem.

See Scoping comments at 4-5. Unfortunately, the proposed assurances (including the provisions of "water supply neutral" adaptive management) eliminate the necessary flexibility for the Draft Plan to be likely to achieve the Plan's biological goals and objectives, are inconsistent with the NCCPA's statutory criteria for assurances, and fail to adequately address changed circumstances.

First, the Draft IA makes clear that the BDCP biological objectives are not enforceable, and that implementation of the conservation measures – not achievement of the biological objectives – is the only obligation of the plan proponents and permittees:

> Through the implementation of the Plan, including adjustments made through the adaptive management process, Permittees will satisfy their obligation to achieve the biological goals and objectives. Unless otherwise specified in the Plan or this Agreement, failure to achieve a biological goal(s) and/or objective(s) shall not be a basis for a determination by the Fish and Wildlife Agencies of non-compliance with the Plan or for suspension or revocation of the Permits, provided the Permittees are properly implementing BDCP and are in compliance with this Agreement and the terms and conditions of the Permit.

Draft IA at 24 (Section 10.1) The Draft IA also makes clear, consistent with language in the Draft Plan, that adaptive management must be 'water supply neutral,' stating that, "The Parties agree that any potential adaptive management change to the Conservation Measures, either individually or cumulatively, shall not require the commitment of resources, including land, water or money, in excess of those specifically provided for under these strategies, including the Supplemental Adaptive Management Fund, or alter the financial commitments of Plan Participants, as set out in Chapter 8." Draft IA at 36; *see* Draft Plan at 3.4-354 to -357.

However, contrary to statements in the Draft IA, the Draft Plan fails to demonstrate that it is likely to achieve many of the biological objectives, many of the objectives are not consistent with the requirements of the NCCPA, ESA, and other laws, and the Draft Plan is unlikely to achieve many of these critical biological objectives. The Draft IA asserts that, "The Conservation Measures are expected to be sufficient to achieve the biological goals and objectives of the Plan during the 50-year timeframe for Plan implementation." Draft IA at 24 (section 10.2). This statement is not supported by the Draft Plan or the independent scientific and agency reviews. As discussed in sections III and IV of our comments, although the Draft Plan and DEIS/DEIR fail to analyze consistency with most of the biological objectives, the best

available scientific evidence shows that the Draft Plan is unlikely to achieve the Plan's biological objectives and that the objectives are not legally adequate, including:

- Salmon survival objective: The Draft Plan is likely to reduce survival of salmon migrating through the Delta and there is no scientific evidence that the survival objectives are likely to be achieved. NMFS has admitted that, "A rough examination of this issue in the current draft indicates that it may be difficult to meet the through-delta survival objectives for salmonids under the proposed operational criteria." NMFS 2013 Progress Assessment at 22. The salmon survival objectives also fail to meet the requirements of the NCCPA and other laws.
- Delta Smelt entrainment objective: The Draft Plan and DEIS/DEIR demonstrates that entrainment under the Draft Plan is likely to exceed this objective, and the objective is not consistent with the existing incidental take statement required under the ESA.
- Longfin Smelt abundance and productivity objectives: The Draft Plan and DEIS/DEIR demonstrate that longfin smelt abundance is predicted to significantly decline under the Draft Plan, that the objectives are not likely to be achieved, and that the objectives are not consistent with ESA and NCCPA requirements.
- Upstream water temperature objectives: the Draft Plan and DEIS/DEIR demonstrate that operations will not be consistent with this objective, nor will operations comply with existing temperature requirements under the ESA. Modeling in the DEIS/DEIR and Draft Plan indicate that abundance of numerous salmon and steelhead runs will decline, and several may go extinct.

As we discuss extensively in our comments, numerous independent scientific reviews and agency reviews have identified failures to use the best available science in the Draft Plan, and they have emphasized the need for an effective adaptive management program in BDCP because of scientific uncertainty.

However, providing assurances that restrict adaptive management to being "water supply neutral" is not consistent with the best available science regarding the effectiveness of the proposed conservation measures in achieving these biological objectives. [8] Such assurances make it substantially less likely that the Draft Plan will achieve the biological objectives, as they

[8] In addition, the Draft IA and Draft Plan establish additional measures that reduce the effectiveness of adaptive management. For instance, the Draft IA appears to allow the implementation Office to change conservation measures through adaptive management without the approval and concurrence of the fishery agencies, even if such measures reduce protections for covered fish and wildlife species. Draft IA at 32. The Draft IA also impedes adoption of adaptive management measures that affect water supply, *id.* at 35, and create procedural roadblocks to effective adaptive management through the dispute resolution process, *id.* at 36.

prevent BDCP from requiring measures to improve flow conditions and address some of the most important stressors on these populations.

2. The Proposed Assurances are not Commensurate with Conservation Assurances as Required by the NCCPA, and Otherwise Violate State Law

Under the NCCPA, regulatory assurances are required to be "commensurate with long-term conservation assurances and associated implementation measures." Cal. Fish and Game Code § 2820(f). The NCCPA requires the Department to consider certain criteria in determining the "level of assurances" to be provided, including: the level of knowledge of the status of species; the adequacy of the analysis of the impact of take on covered species; the use of the best available science and the reliability of mitigation strategies; the range of foreseeable circumstances provided for under the adaptive management program; and the duration of the plan. *Id.*

Unfortunately, the assurances proposed in the Draft Plan and Draft IA are not commensurate with long-term conservation assurances, nor are they adequate in light of the existing scientific information regarding the likelihood that the proposed conservation measures will not achieve the biological objectives, the failure to use the best available science, the lack of meaningful adaptive management responses to changed circumstances, and the 50 year duration of the Draft Plan. For instance, there effectively are no "long-term conservation assurances," as the Draft Plan and Draft IA make clear that the biological objectives are not enforceable and that a failure to achieve these objectives will not result in additional restrictions on water supply, despite the available scientific evidence about the likelihood that proposed conservation measures will not achieve the Draft Plan's biological objectives. Similarly, numerous independent and agency scientific reviews have concluded that the Draft Plan and DEIS/DEIR fail to use the best available science, contrary to the requirements of section 2820(f). The available scientific information demonstrates that the Draft Plan is unlikely to achieve many of the biological objectives as currently designed, and that several salmon runs and other covered species may in fact go extinct during the duration of the Draft Plan. The extensive length of the draft permits (proposed for 50 years, with the possibility of extension) strongly indicates that assurances should be more limited. And as discussed below, the Draft Plan's provisions regarding foreseeable circumstances, particularly climate change, are significantly flawed and inconsistent with legal requirements. As a result, the proposed assurances are not consistent with the NCCPA.

In addition, the proposed assurances, particularly to the extent that they prevent adaptive management and real time operations from achieving biological objectives, also violate the Delta Reform Act. *See* Water Code § 85321 ("The BDCP shall include a transparent, real-time operational decisionmaking process in which fishery agencies ensure that applicable biological

performance measures are achieved in a timely manner with respect to water system operations.").

3. The Draft Plan's Provisions Regarding Changed Circumstances, Particularly Foreseeable Circumstances such as Climate Change, are Unlawful

Both the NCCPA and ESA generally require the Draft Plan to address changed circumstances, including foreseeable circumstances. *See* Cal. Fish and Game Code §§ 2805(c), 2820(g); 50 C.F.R. §§ 17.22(b)(5), 222.307(g); HCP Handbook at 3-28. The Draft Plan identifies a number of clearly foreseeable circumstances, such as levee failures, climate change, drought,[9] and nonnative species. Draft Plan at 6-32. However, the Draft Plan generally proposes no additional measures to address these foreseeable circumstances, and precludes any measures to adapt to these changed circumstances that would require additional commitments of water or funding from the water contractors. *See* Draft Plan at 6-30.

These proposed provisions are not compatible with the requirements of state and federal law, particularly regarding the effects of climate change. Climate change is a foreseeable circumstance, and is likely to result in substantial adverse effects on aquatic and terrestrial ecosystems and species in combination with CVP/SWP operations (including BDCP) absent additional changes beyond those proposed in BDCP, including reductions in Delta inflows and outflows, increased air and water temperatures.[10] Yet the Draft Plan proposes that "no additional actions will be required to remediate climate change effects on covered species and natural communities in the reserve system." Draft Plan at 6-43. This is legally inadequate.

Despite acknowledging significant effects of climate change in the Draft Plan and DEIS/DEIR, the Draft Plan repeatedly disclaims any responsibility to address the adverse effects of climate change, repeatedly distinguishing adverse effects as the result of climate change (rather than the effect of the Draft Plan). *See, e.g.*, Draft Plan at 5.5-3, 5.5-11, 5.3-20, 5.5.3-45 to -47. The Draft

[9] The Draft Plan states, however, that drought is only a foreseeable circumstance with respect to the terrestrial reserve system, and that "the expected effects of droughts on the aquatic natural communities are not considered a changed circumstance." Draft Plan at 6-37. This is inappropriate; the scope of a future drought could certainly exceed that modeled in the Draft Plan, and in such circumstances, additional measures will be needed to protect fish and wildlife. If drought conditions truly are addressed in the Draft Plan and no additional measures will be required,, then the Draft Plan must also prohibit any regulatory changes to respond to drought that weaken operational protections for fish and wildlife, such as Temporary Urgency Changes that reduce Delta outflow requirements under D-1641 or relaxation of ESA protections.

[10] BDCP modeling projects little change in inflows on the Sacramento River, *see* Draft Plan at 5.A.2-101, increased Delta salinity, *id.* at 5.A.2-107, and increased extinction risks and reduced habitat for numerous covered species, *id.* at 5.A.2-101-107.

Plan and DEIS project substantial population declines, and possible extinction, as a result of BDCP and climate change. Yet the Draft Plan makes no provisions to mitigate the impacts of CVP/SWP operations in light of climate change, particularly in terms of upstream operations. As we discuss above, the Draft Plan must be revised to evaluate impacts from reasonably foreseeable adaptation changes to Project operations and facilities during the life of the Project required to maintain adequate cold water temperatures for species viability, address this critical aspect of the "whole of the action," and identify mitigation measures to minimize and avoid, where possible, associated take.

Federal agencies have previously concluded that "the range of adaptive responses available to address those changed circumstances is far too narrow and limiting." NMFS 2013 Progress Assessment at 22; USFWS 2013, U.S. Fish and Wildlife Service Staff BDCP Progress Assessment, April 3, 2013 ("USFWS 2013 Progress Assessment") at 29. We strongly concur. The Draft Plan must be revised to incorporate additional measures to address the impacts of CVP/SWP operations in light changed circumstances, particularly climate change, including operations upstream.

4. The Proposed Assurances are Inconsistent with the ESA, Including the Services' Five Point Policy

NMFS and USFWS adopted an addendum to the HCP Handbook in 2000, which is referred to as the Five Point Policy. *See* 65 Fed. Reg. 35242 (June 1, 2000). In 2010, the Federal agencies issued a white paper on application of the Five Point Policy to BDCP. It states in pertinent part that,

> The BDCP is a complex, landscape scale, long-term HCP with a high degree of uncertainty as to how close the initial conservation measures will come to achieving the plan's biological goals and objectives. It falls into the category of plans that will be a mixture of the two strategies, with initial prescriptions associated with adaptive management, and specific biological outcomes defining the ultimate success of the plan. This type of plan will allow management flexibility so the permittee may institute actions necessary to achieve the plan's goals while providing boundaries for future expectations and commitments. In addition, a results-based plan will address uncertainty in the ecosystem and provide the conservation assurances required by the Act. The Services will be challenged to make the findings required for permit issuance if the plan does not include clearly defined and scientifically supported biological goals and objectives, an adaptive management plan that tests alternative strategies for meeting those biological goals and objectives, and a framework for adjusting future conservation actions, if necessary, based on what is learned.

Federal Agencies White Paper on Application of the 5-point Policy to the Bay Delta Conservation Plan, April 29, 2010 at 1 ("BDCP 5-Point Policy Memo"), available online at: http://baydeltaconservationplan.com/Libraries/Dynamic_Document_Library_-_Archived/5_20_10_BDCP_SC_HO_5_pt_policy_BDCP_white_paper.sflb.ashx. This memo also states that, "An agreement to simply implement specific actions is not sufficient to support the finding unless the analysis demonstrates at the outset a reasonable likelihood that the actions will be successful." *Id.* at 1.

Both NMFS and USFWS have reaffirmed these principles more recently. For instance, NMFS' April 4, 2013 Progress Assessment concludes that,

> Implementation of the conservation measures as initially described in the plan does not constitute the extent of the responsibilities of the Authorized Entities. Achieving the outcomes described in the objectives is the primary responsibility of those implementing the plan.

NMFS 2013 Progress Assessment at 20. That document also states that, "Continuing to achieve objectives is necessary for progress toward recovery of covered species and in many cases will be required for compliance with the terms of the BDCP permit." *Id.* at 19. The U.S. Fish and Wildlife Service provided similar comments in its 2013 Progress Assessment, reaffirming the 2010 memo and stating that,

> In an outcome-based plan, biological objectives provide targets that conservation measures are expected to reach, thereby contributing to the conservation outcomes required by the permit. If the objectives have been appropriately crafted, their achievement assures that a project is doing what it can to contribute to the accomplishment of the ultimate biological goals of the plan. If the CMs fail to achieve the biological objectives around which they are designed, then the plan must provide the means (adaptive management) to change the conservation measures to achieve the outcomes.
>
> We are concerned about the ability of the draft BDCP to successfully facilitate adaptive management.

USFWS 2013 Progress Assessment at 25-26. In addition, the document states that, "the plan needs to clearly articulate that achieving biological objectives is the whole basis of the conservation plan. Achieving and continuing to achieve objectives will be necessary for progress toward the biological goals and recovery of covered species, and may be required for compliance with the HCP permit." *Id.* at 25.

In virtually every respect, the proposed assurances violate the 5 Point Policy and these conclusions of the federal fishery agencies. The Draft IA proposes that the implementation of conservation measures – rather than achievement of biological objectives – shall be the only obligation of the plan proponents and Permittees. *Compare* Draft IA at 24 *with* BDCP 5-Point Policy Memo at 1; *see* NMFS 2013 Progress Assessment at 19, 20. As discussed extensively in sections III and IV of these comments, while BDCP has developed draft biological goals and objectives, the Draft Plan and Draft IA are unlikely to achieve these biological objectives. By establishing a wholly action based HCP, despite the fishery agencies' conclusions regarding scientific uncertainty of conservation measures and the likelihood that the Draft Plan fails to achieve key biological objectives, the proposed assurances violate the ESA.

5. The Draft Plan and Draft IA Cannot Provide any Assurances Regarding Upstream Operations of the CVP and SWP

Even though the CVP/SWP are operated as an integrated unit from upstream reservoirs to operations in the Delta, BDCP proposes to limit the geographic scope of the Draft Plan largely to the legal Delta, excluding upstream operations from covered activities. In our initial scoping comments, we strongly recommended that BDCP revise the geographic scope to include upstream operations, to no avail. Given the adverse impacts of climate change and CVP/SWP operations, particularly upstream reservoir operations, upstream operations of CVP/SWP facilities will have to be substantially changed from that modeled in BDCP in order to avoid causing jeopardy to listed species (either in the near term, or in the future). Because BDCP does not include upstream operations in the proposed project as a covered activity, the Draft Plan and Draft IA cannot legally provide any assurances regarding upstream reservoir operations, even if changes to upstream operations substantially reduce Delta exports in the future. The Draft Plan and Draft IA must be revised to specifically recognize that there are no assurances under the ESA or NCCPA provided regarding upstream operations of the CVP and SWP, and that changes to upstream CVP/SWP operations may result in substantial reductions in water supply under BDCP as compared to that modeled in the Draft Plan.

6. The Draft Plan and Draft IA Provide Assurances to CVP Contractors and to USBR in Violation of the No Surprises Rule, which Prohibits Providing No Surprises Assurances to Federal Agencies

As we previously discussed in our March 2011 memorandum to the state and federal agencies, the ESA prohibits providing "No Surprises" assurances to the Bureau of Reclamation:

> Critically, 50 CFR Sec. 17.22(b)(5), which codifies HCP regulation, states expressly that No Surprises assurances "**cannot be provided to Federal**

> **agencies**." (Emphasis added.) When promulgated, the federal government stated that it was issuing the revised rules in part to clarify that No Surprises assurances "do not apply to Federal agencies who have a continuing obligation to contribute to the conservation of threatened and endangered species under section 7(a)(1) of the ESA." 63 Fed. Reg. 8867 (Feb. 23, 1998). In addition, the notion that the FWS and/or NMFS would be precluded from imposing on a federal agency additional terms and conditions designed to minimize or mitigate excessive take conflicts with the obligation to reinitiate consultation under Section 7(a). Thus, the law expressly prohibits Reclamation and federal water contractors from obtaining Section 10 "No Surprises" assurances and prohibits the FWS/NMFS from approving permits that are structured to undermine the agencies' Section 7 obligations.

Memorandum from EDF, Defenders of Wildlife, and NRDC to the Resources Agency and U.S. Department of the Interior regarding Permittee Status for Water Contractors in BDCP, March 23, 2011 ("2011 Permittee Memo"), at 3; 50 C.F.R. § 17.22(b)(5). However, despite this explicit prohibition under the "No Surprises" rule, the Draft IA attempts to provide regulatory assurances to Reclamation:

> In light of Reclamation's integral role in the BDCP, it is appropriate to provide to Reclamation a degree of certainty regarding its obligation to fund Conservation Measures, and to provide durability and reliability regarding BDCP implementation. In that regard, USFWS and NMFS agree that once the Integrated Biological Opinion has been issued: (1) to the maximum extent allowed by law, Reclamation's ongoing responsibilities for Associated Federal Actions under Section 7(a)(2) of the ESA will be fulfilled through Reclamation's participation in the BDCP, including through the obligations it has assumed under the adaptive management and the Changed Circumstances provisions of the Plan; and (2) USFWS and NMFS agree that Reclamation will not be required to provide additional commitments or measures for Associated Federal Actions beyond those set forth in the BDCP without first attempting to resolve issues through the review process in Section 15.8, if invoked by an Authorized Entity, and exhausting processes set forth in Section 22.5 of this Agreement.

Draft IA at 50-51. This is wholly inconsistent with section 7(a)(1) of the ESA and the "No Surprises" rule, and is unlawful. In order to fulfill its continuing obligations under the ESA, Reclamation must have the ability to provide additional water or money to meet the conservation needs of covered species.

Equally important, the Draft Plan and Draft IA unlawfully propose to extend No Surprises assurances to Federal water contractors, in violation of the No Surprises Rule. Such assurances would not only limit the resources Federal water contractors will be required to contribute to the Draft Plan, but such assurances would effectively limit the water and other resources the Bureau of Reclamation could contribute to the Draft Plan. That is inconsistent with section 7(a)(1) of the ESA and the No Surprises rule, as we made clear in our November 2011 comments on the draft first amendment to the BDCP Memorandum of Agreement.

Under the ESA, Federal agencies operate under Section 7, which does not contain any assurances similar to Section 10. The distinction between private landowners and Federal agencies reflects the latter's legal duty under section 7(a)(1) of the ESA, which provides that Federal agencies are under a "continual obligation to contribute to the conservation of threatened and endangered species." 63 Fed. Reg. 8859, 8867 (Feb. 23, 1998). Providing Federal CVP water contractors with Section 10 assurances contravenes the same continuing obligation placed on Federal agencies because it limits the water and other resources Reclamation will be expected to provide to the Plan. The Draft Plan and Draft IA fail to explain how Reclamation can comply with its continuing obligations under section 7(a)(1) of the ESA, particularly the continuing duty (if needed) to provide additional water to meet environmental needs of listed species, if BDCP provides assurances to CVP contractors that there will be no additional impacts to CVP water supply: it is the same water, and the rights to that water are held by Reclamation. As such, the Draft Plan and Draft IA must be revised to avoid providing regulatory assurances to Reclamation and/or CVP contractors.

7. CVP and SWP Contractors are Not Qualified as Permittees, and Thus Cannot Obtain Regulatory Assurances

In addition to violating the No Surprises Rule, neither SWP nor CVP contractors are appropriate permittees who could obtain Section 10 assurances. *See* Permittee Memo. In addition, according to the HCP Handbook, "[t]he permittee must therefore be capable of overseeing HCP implementation and have the authority to regulate the activities covered by the permit." HCP Handbook at 3-2. Similarly, as part of the USFWS ITP application, applicants are required to sign a notice which certifies that they

> own the lands indicated in this application, or have sufficient authority or rights over these lands to implement the measures of the Habitat Conservation Plan (and Implementing Agreement if applicable) covered by the Incidental Take permit. Further, upon receipt of the Incidental Take permit, [the signatories] agree to conduct the activities as specified in the Habitat Conservation Plan (and Implementing Agreement if applicable) according to the terms and conditions of the Incidental Take permit and its supporting documents.

Department of the Interior: U.S. Fish and Wildlife Service, Incidental Take Permit Associated with a Habitat Conservation Plan Application Form (Rev. October 2013) at 12, available online at http://www.fws.gov/forms/3-200-56.pdf. This provision ensures that permittees will have sufficient authority to implement the HCP's conservation measures.

However, the state and federal water contractors lack sufficient authority over either the land or operations of the CVP and SWP to qualify as a permittee under the ESA. *See* Permittee Memo. The existing CVP and SWP facilities are owned by the State and Federal Governments, and any new water conveyance infrastructure will be owned and operated by the Department of Water Resources (DWR). *See* Draft Plan at 8-70. Furthermore, the water rights associated with the BDCP, SWP, and CVP will not be held by the water contractors, and are instead held by DWR and USBR. *See, e.g.,* Water Rights Decision 1641 (December 29, 1999) at 146-149. And state and federal agencies, not the water contractors, control operations of diversion facilities, consistent with existing law. *See, e.g., id.* at 132 ("Only the DWR and the USBR can implement the objectives for operational constraints in the 1995 Bay-Delta Plan. The objectives for export pumping rates are the responsibility of each of the two projects at their respective facilities. The objectives for Delta Cross Channel operation are the sole responsibility of its owner, the USBR."); Permittee Memo at 4-5.

Because the state and federal water contractors do not have adequate authority to implement the Draft Plan, including lacking any authority to implement conservation measures relating to CVP/SWP operations and/or affecting CVP/SWP water rights as well as lacking any authority over lands in the Delta, they do not qualify as permittees and they cannot therefore obtain No Surprises assurances.[11]

D. The Draft Plan Fails to Comply with the Central Valley Project Improvement Act, Bay Delta Water Quality Control Plan, and Provisions of the Fish and Game Code Regarding Salmon Doubling

Despite the fact that our organizations have reiterated for years that any lawful BDCP must meet salmon doubling requirements in state and federal law, the Draft Plan fails to acknowledge the applicability of these requirements. *See, e.g.,* Letter to Lori Rinek, USFWS, from NRDC, TBI, Defenders of Wildlife, EDF (May 14, 2009) (incorporated herein by reference). The Draft Plan's omission indicates a failure to meet these requirements, but does not lessen the requirement that the Plan provide for salmon doubling. *Cf.* Draft Plan at 1-6 to 1-20.

[11] The same logic extends to permits and assurances provided under the NCCPA.

The federal Central Valley Project Improvement Act imposes an anadromous fish doubling goal on operations of the CVP that is long overdue.[12] The CVPIA directs DOI to develop and implement a program that makes "all reasonable efforts" to ensure and sustain on a long-term basis a doubling of the number of naturally produced anadromous fish in Central Valley rivers and streams, using the average levels attained during the period of 1967-1991 as the baseline. P.L. 102-575, § 3406(b)(1). The plan was due by 1995, and the doubling goal was supposed to have been met by 2002. It has not been met. *See, e.g.,* CVPIA Independent Fisheries Review Panel 2008, "Listen to the River: An Independent Review of the CVPIA Fisheries Program," ("CVPIA Fisheries Review 2008") available online at http://www.usbr.gov/mp/cvpia/docs_reports/indep_review/FisheriesReport12_12_08.pdf, incorporated by this reference.

As the CVPIA Independent Science Panel noted, DOI has yet to take on its environmental mission with the same "zeal" that it brings to its water supply responsibilities. The CVPIA Fisheries Review 2008 states that "After 16 years of implementation the CVPIA anadromous fish program is not close to its stated doubling goal, nor has it solved the problems that led to the listing of several species of salmon and steelhead under the ESA." The report concludes that DOI:

- Has not developed a proper conceptual foundation and framework for the program;
- Has organized and managed the program in a compartmentalized way rather than an integrated, systematic and scientific way;
- Has not addressed key fisheries problems at the systems level;
- Has failed to prioritize and address effectively the problems in the Delta;
- Has substantially underutilized CVPIA authorities, especially with regard to water management and the issues in the Delta.

The Panel was particularly severe in discussing DOI's reticence to use its Section 3406(b)(2) authority to make more water available for salmon:

> An excellent example of the agencies' constrained approach to their authorities is how the agencies have implemented Section 3406(b)(2)....When viewed in combination with the broad directive in Section 3406(b)(1)(B) to "modify Central Valley Project operations

[12] In addition, the Draft Plan fails to incorporate Level 4 water deliveries to the wildlife refuges, despite the requirements of the CVPIA. *See* P.L. 102-575, § 3406(d). As discussed infra, the DEIS/DEIR and Draft Plan also omit Level 4 refuge water supply from the environmental baseline.

> to provide flows of suitable quality, quantity, and timing to protect all life stages of anadromous fish," for which the 800 kaf is one explicit tool, the panel expected to find that implementation of 3406(b)(2) had occurred in this way: The agencies identify 800 kaf of dedicated storage in the system – essentially, a water volume budget – and then consistent with an identified system-wide flow regime to improve conditions for anadromous fish, Reclamation would release this stored water in requested amounts at the call of the fish managers and then protect that amount of altered flow through the rivers, through the Delta, and into the bay.
>
> We were flabbergasted to learn this is not how the agencies implement this provision. The agencies have not identified a system-wide flow regime and set of system flow objectives. Worse, Reclamation does not dedicate and manage 800 kaf of water from headwaters storage through the Delta. Instead, Reclamation releases approximately *400* kaf from CVP storage each year, aimed at supporting the needs of particular life stages at particular locations. These augmented amounts are then *diverted out of the system* at a later point. The 800 kaf accounting then includes approximately 400 kaf realized in pump restrictions in the Delta. **This approach seems fundamentally at odds with the intent and language of the legislation.**

Id. (emphasis in original). The Ninth Circuit Court of Appeals has similarly and repeatedly made clear that DOI has failed to implement this mandate, which it is required to meet by law, holding in *San Luis & Delta Mendota Water Authority v U.S.*, 672 F.3d 676 (9th Cir. 2012) that:

- The CVPIA establishes its own "restoration mandate" distinct from the environmental protections provided for in other statutes.
- The concept of primary purpose cannot be "untethered" from CVPIA's restoration mandate.
- The CVPIA distinguishes between the "primary restorative purpose (on the one hand) and those of water quality protection and meeting other legal obligations such as the ESA (on the other)." This distinction: "clearly demonstrates that an action taken to meet water quality criteria and/or ESA requirements does not, by itself, fall within the category of a (b)(2) primary purpose."
- It is improper for DOI to relegate "water needed for implementation of the Improvement Act's restoration mandate" to a secondary role.
- Crediting of ESA/WQCP releases to the (b)(2) account is only appropriate when such releases "predominantly" overlap with actions taken for the primary (b)(2) purpose.
- DOI's December 2003 Guidance is invalid in its characterization of the 1995 WQCP.
- Not every measure taken to protect some species of fish and wildlife automatically becomes a primary purpose under (b)(2). Thus, merely because a water quality release is

made for some environmental purpose does not mean that it qualifies as a (b)(2) primary purpose action: "primary purpose is narrower than the 2003 Guidance Memo suggests. It consists… only of those restoration measures which are specifically enumerated in Section 3406(b)(2) of the CVPIA."

- DOI could have limited confusion and controversy by implementing a more coherent set of accounting procedures after it became aware of the Jan. 2004 9th Circuit Decision.

The Bay-Delta Water Quality Control Plan likewise imposes a water quality objective requiring that,

> Water quality conditions shall be maintained, together with other measures in the watershed, sufficient to achieve a doubling of natural production of chinook salmon from the average production of 1967-1991, consistent with the provisions of State and federal law.

See State Water Resources Control Board, Final Water Quality Control Plan for the San Francisco Bay San Joaquin River Delta, December 13, 2006, at 14, available online at: http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/wq_control_plans/2006wqcp/docs/2006_plan_final.pdf (and hereby incorporated by reference). The State Water Resources Control Board's review of BDCP must demonstrate that the Draft Plan is consistent with achievement of this objective. *See also* Water Code §§ 13050(j)(3), 13242(a); *In re State Water Resources Control Board Cases*, 136 Cal.App.4th 674, 775 (2006). Likewise, Salmon doubling is also a stand-alone requirement of State law. Section 6902 of the Fish and Game Code establishes as State policy that the State shall "double the current natural production of salmon and steelhead trout resources" and that existing salmon and steelhead habitat shall not be further diminished. Similarly, section 5937 of the Fish and Game Code is a long-standing provision of State law that requires the operator of any dam, including state and federal governments, to provide sufficient water at all times to pass over or around the dam to restore and maintain naturally-producing populations of native fish in good condition. *See, e.g., Natural Resources Defense Council v. Patterson*, 333 F.Supp.2d 906 (E.D. Cal. 2004).

The Draft Plan can and must be revised to address these long-overdue requirements, include salmon doubling as an achievable biological objective, and address how DOI and DWR will meet their salmon doubling obligations in the context of BDCP.

E. The Draft Plan Fails to Comply with Water Quality and Water Rights Requirements Under State Law

The Draft Plan acknowledges that the State Water Resources Control Board has extensive independent authority to determine legal obligations that directly affect BDCP. These include the SWRCB's ongoing (and long overdue) update of the Bay Delta Water Quality Control Plan, including flow standards necessary to protect the fish, aquatic, and wildlife resources, and agricultural and domestic supply in the Delta; and review and permitting of the Plan's proposed change in point of diversion, which may not cause injury to any legal user of the water involved, including fish and wildlife. Draft Plan at 1-19 to 1-20. The Draft Plan asserts that the "State Water Board's participation in the development of the BDCP and in the environmental review process is intended to ensure consistency between the actions described in the BDCP and those required by the State Water Board." Draft Plan at 1-20. Despite this assertion, the Draft Plan utterly fails to address or account for anticipated changes under an updated water quality control plan and change in point of diversion review. This is most apparent in the Plan's failure to adequately incorporate and address the Board's recognition of the need for significantly increased flows into and through the Delta, as indicated by its 2010 public trust flows report and numerous comments provided during BDCP development. *See* Water Code § 85086(b) and (c) (public trust flow criteria should inform the BDCP and related Delta planning decisions); State Water Resources Control Board, Final Report, Development of Flow Criteria for the Sacramento-San Joaquin Delta Ecosystem, August 3, 2010 ("SWRCB 2010 Flow Report"), available online at: http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/deltaflow/docs/final_rpt080310.pdf. Instead of acknowledging this input and providing for increased flows at critical times of the year for imperiled fish, the Draft Plan asserts without adequate justification that exports cannot be reduced to a level sufficient to protect and restore fish and wildlife. But the Plan bases this false conclusion on its failure to adequately consider alternative sources of water supply available to exporters, which would enable diversions from the Delta to be significantly reduced while maintaining a reliable and adequate water supply.[13]

The Draft Plan must be revised to assess the proposed project's ability to meet the significantly increased flows necessary to protect and restore covered species in light of the abundant and

[13] The Draft Plan's failure to consider alternative water supply and demand reduction measures in export areas violates several other legal requirements, as well, including the failure to consider an adequate range of alternatives, failure to comply with requirements of the Delta Reform Act of 2009, and failure to consider alternatives to take, to name just a few. This failure is especially egregious in light of the fact that the Draft Plan proposes these very same alternative water supply and demand reduction measures for in-Delta diverters as a proposed form of mitigation for imposing degraded water quality conditions on those water users. DEIS/DEIR Appendix 3B at 3B-43.

affordable alternative water supply sources available to exporters. *See, e.g.,* NRDC and the Pacific Institute, "The Untapped Potential of California's Water Supply: Efficiency, Reuse, and Stormwater," June 2014, available online at http://www.nrdc.org/water/ca-water-supply-solutions.asp (incorporated herein by reference); 2013 update to bulletin 160 at http://www.waterplan.water.ca.gov/previous/b160-98/TOC.cfm (incorporated herein by reference); USBR, CVP Integrated Resource Plan (2014) at http://www.usbr.gov/mp/SSJBasinStudy/documents/cvp_integrated_resource_plan_summv2.pdf (incorporated herein by reference).

Even if it is beyond the scope of the Draft Plan to analyze these alternative water supply options in detail, the Plan may not simply pretend that these planned future investments and options do not exist and fail to consider them, especially in light of the state policy to reduce reliance on Delta water exports by investing in efficiency, recycling, advanced water technologies, local and regional water supply projects. *See* Water Code § 85021. Indeed, the Draft Plan itself proposes to reduce adverse water supply impacts for in-Delta water users imposed by the Plan's adverse water quality impacts by:

> **Develop[ing] demand management and/or conservation/recycling projects to extend available water supplies (municipal uses).** Facilitation and development of additional demand management, water conservation, and wastewater recycling projects would help reduce use of Delta diversion facilities when water quality is poor allowing for more efficient use of other existing water supplies.

DEIS/DEIR Appendix 3B at 3B-43. Of course, these measures would also "help reduce use of Delta diversion facilities" by export water users to enable reduced diversions from the Delta to meet ecosystem and species protection needs. Moreover, DWR and DOI have already acknowledged that they can choose to include and analyze the impact of measures taken outside of the Delta in this BDCP analysis. 74 Fed. Reg. 7257 (Feb. 13, 2009) ("it may be necessary for the BDCP to include conservation actions outside of the Statutory Delta that advance the goals and objectives of the BDCP within the Delta.... The EIS/EIR project area for which impacts are evaluated may be different than the BDCP geographic scope."); DWR NOP (Feb. 13, 2009) ("The EIR/EIS project area for which impacts are evaluated may be different that the BDCP geographic scope."). There is no reasonable excuse to artificially limit the scope of the analysis in the manner chosen by the Draft Plan.

Further, as noted in the attached analysis by the University of Southern California, "Water Supply Scarcity in Southern California: Assessing Water District Level Strategies," the expensive price tag of the currently proposed BDCP is likely to negatively affect the ability of local water districts and others to invest in efficiency, recycling, advanced water technologies, and other local and regional water supply projects. University of Southern California Center for

Sustainable Cities, Water Supply Scarcity in Southern California: Assessing Water District Level Strategies, 2012, available online at http://sustainablecities.usc.edu/research/publications.html (incorporated by reference). That report finds that "[w]ith a projected costs of $23.7 Billion to be paid by user fees, this project could foreclose other water supply options for Southern California." *Id.* at page x. Without a financing plan that explains how users will finance the proposed project, the Draft Plan does not and cannot accurately assess the impact of the proposed project on user fees in the future or the effect of that increase on other needed investments to meet state policy. This omission is significant, since "[t]he increasing price of imported water is [already] a major factor in local water agency efforts to conserve water and to invest in new water supply sources." *Id.* at page xi. As the report concludes, "Some investments, such as SWP proposed tunnels will preclude others due to financial constraints. Trade-off analysis and full-accounting … should be included in such analyses." *Id.* at pages xxvi-xxvii.

In addition, as we discuss in section II, the Draft Plan proposes to violate existing water quality standards protecting fish and wildlife, and the Draft Plan identifies significant degradation in water quality for other users, including agricultural and municipal and industrial uses, and fails to propose adequate mitigation for such degradation, *see* DEIS/DEIR at ES-63 to ES-65 and Chapter 8 (identifying significant and unavoidable impacts to water quality from methylmercury, bromide, chloride, electrical conductivity, organic carbon, pesticides, and selenium). Many other commentators have identified significant flaws with the DEIS/DEIR's modeling of water quality impacts. The DEIS/DEIR and Draft Plan must propose operational changes and other feasible mitigation measures to address these significant impacts.

As currently drafted, the analysis fails to provide information or analysis sufficient to support the State Board's change in point of diversion permit or to address the reasonably foreseeable impact of strengthened flow standards under an updated Bay-Delta water quality control plan.

F. <u>The Draft Plan Violates the State's Obligations under the Public Trust Doctrine</u>

The Draft Plan fails to adequately consider and protect against the Plan's adverse impacts on public trust resources, as it must. As discussed above, the Draft Plan does an insufficient job of addressing and incorporating the public trust flow criteria developed by the State Board in 2010, despite the fact that the Legislature specifically called for these flow criteria to be developed to inform the BDCP, any change in point of diversion permit, and other Delta planning decisions. Water Code § 85086(b) and (c). This renders the Plan's analysis insufficient to support the State Board's subsequent issuance of a change in point of diversion permit. However, the failure to adequately consider and protect public trust resources is also a violation of DWR's independent obligation to do so as a trustee state agency. "The State can no more abdicate its trust over property in which the whole people are interested … than it can abdicate its police powers."

Illinois Central Railroad Co. v. Illinois, 146 U.S. 387, 452 (1882). Indeed, DWR and other state agencies have "an affirmative duty to take the public trust into account … and to protect public trust uses whenever feasible." *Nat'l Audubon Soc'y v. Superior Court,* 33 Cal. 3d 419, 446 (1983)

The State holds title as trustee of the public trust for the benefit of the People of California. *Colberg, Inc. v. State*, 67 Cal.2d 408, 416 (1967). The State also has a duty to supervise and administer the trust so that the public may continue to use navigable waterways, like the Delta, for public trust purposes. While the obligation extends to preserving public trust uses where feasible, the failure to adequately assess alternative water supply options means that the Plan utterly fails to assess the feasibility of significantly reducing exports from the Delta over the next 70 years (50-year plan duration plus approximate permitting and construction period). The Draft Plan violates DWR's and other state agencies' public trust obligations and must be modified to incorporate feasible protections sufficient to protect and restore native fish and other public trust resources.

G. <u>The Draft Plan Fails to Comply with the Delta Reform Act</u>

The 2009 Delta Reform Act established several requirements that BDCP fails to comply with. First, the Act prohibits any public funding for BDCP unless it complies with the NCCPA, CEQA, and specific provisions of the Act. Cal. Water Code § 85320(b). However, because the Draft Plan violates the NCCPA, *see supra*, and violates CEQA, *see infra*, approval of the Draft Plan and provision of any public funding would violate the Delta Reform Act. Second, as discussed extensively in these comments, BDCP fails to identify the "operational criteria and flows necessary for recovering the Delta ecosystem and restoring fisheries under a reasonable range of hydrologic conditions, which will identify the remaining water available for export and other beneficial uses." Water Code § 85320(b)(2)(A). Third, BDCP fails to comply with the Delta Reform Act's requirement to reduce reliance on the Delta:

> The policy of the State of California is to reduce reliance on the Delta in meeting California's future water supply needs through a statewide strategy of investing in improved regional supplies, conservation, and water use efficiency. Each region that depends on water from the Delta watershed shall improve its regional self-reliance for water through investment in water use efficiency, water recycling, advanced water technologies, local and regional water supply projects, and improved regional coordination of local and regional water supply efforts.

Cal. Water Code § 85021. Appendix 3I of the DEIS/DEIR, which addresses BDCP compliance with the Delta Reform Act, wholly omits any discussion of section 85021 of the Delta Reform

Act. At a minimum, the Draft Plan and DEIS/DEIR fail to demonstrate how BDCP complies with this mandate.

Fourth, as discussed above, the Draft Plan and Draft IA do not require achievement of the Draft Plan's biological objectives, instead only requiring implementation of the conservation measures. This is inconsistent with the requirements of the Delta Reform Act, which requires that the fishery agencies "ensure" that biological performance measures "are achieved." *See* Water Code § 85321 ("The BDCP shall include a transparent, real-time operational decisionmaking process in which fishery agencies ensure that applicable biological performance measures are achieved in a timely manner with respect to water system operations.").

H. <u>The DEIS/DEIR Violate CEQA and NEPA</u>

The fundamental purpose of CEQA and NEPA is to ensure that agencies consider, mitigate, and disclose to the public potentially significant adverse impacts on the environment before approving or implementing a project. Their requirements are not mere hoops to jump through, but are intended "to afford the fullest possible protection to the environment within the reasonable scope of the statutory language." *Friends of Mammoth v. Board of Supervisors*, 8 Cal.3d 247, 259 (1972). As articulated by the legislature, CEQA is designed to prevent public agencies from approving projects if "feasible" alternatives or mitigation measures would substantially lessen the significant environmental effects." Pub. Res. Code § 21002. Another key goal is to inform decisionmakers and the public about the potentially significant environmental effects of proposed projects. *See, e.g.,* 14 Cal. Code Regs. §15002. Finally, CEQA and NEPA both require consideration of a reasonable range of alternative actions that might achieve similar goals with less environmental impact. *See, e.g.,* 40 C.F.R. §1502.14. In several key respects, the DEIS/DEIR violate fundamental provisions of CEQA and NEPA. First, the DEIS/DEIR uses flawed environmental baselines which understate the environmental impacts of the Draft Plan and Alternatives and fail to inform the public and decisionmakers of the actual impacts. Second, the DEIS/DEIR fail to include a reasonable range of alternatives, and rely on unreasonably narrow purpose and need statement to exclude reasonable alternatives. Third, the DEIS/DEIR fails to adequately analyze cumulative impacts. Fourth, the geographic scope of the DEIS/DEIR violates CEQA by excluding analysis of impacts to San Francisco Bay. Finally, as we discuss extensively in sections II, III and IV of these comments, the DEIS/DEIR fails to use sound science and provide accurate information to the public and decisionmakers regarding potential impacts of the State's proposed plan (Alternative 4), and the DEIS/DEIR's conclusions regarding several impacts are not supported by substantial evidence and understate the true environmental impacts. Because feasible mitigation measures are available, including changes to CVP/SWP operations and investments in local and regional water supplies that reduce reliance on the Delta, the DEIS/DEIR must be revised to incorporate such mitigation measures.

1. The DEIS/DEIR Use an Illegal Baseline that Understates the Likely Adverse Environmental Impacts of the Draft Plan and Alternatives

Both NEPA and CEQA require that the Project be analyzed against the existing environmental conditions (the "environmental baseline"), in order that the Project's environmental impacts can be meaningfully analyzed and compared to alternatives. 40 C.F.R. § 1502.15; CEQA Guidelines § 15125(a); *see County of Amador v. El Dorado County Water Agency*, 76 Cal.App.4th 931, 952 (1999); *Neighbors for Smart Rail v. LA County Metropolitan Transit Authority*, 57 Cal. 4th 310, 315 (2013). Under CEQA, the DEIR must "delineate environmental conditions prevailing absent the project, defining a 'baseline' against which predicated effects can be described and quantified." *Neighbors for Smart Rail*, 57 Cal.4th 439, 447 (2013) (*citing Communities for a Better Environment v. South Coast Air Quality Dist.*, 48 Cal.4th 310, 315 (2010)). The purpose is to provide a "realistic baseline that will give the public and decision makers the most accurate picture practically possible of the project's likely effects." *Neighbors for Smart Rail*, 57 Cal.4th at 449 (*citing Communities for a Better Environment*, 48 Cal. 4th at 322, 325, 328).

In three distinct ways, the environmental baseline used in the draft BDCP and DEIS/DEIR fails to accurately assess the impacts of the proposed project, misleading decisionmakers and the public of the potential environmental impacts of the proposed project and alternatives in violation of NEPA and CEQA. First, the environmental baseline in the DEIS/DEIR omits implementation of floodplain habitat restoration in the Yolo Bypass and associated changes to weirs and infrastructure, despite existing permit requirements to implement these actions by 2020 as a mitigation measure for existing CVP/SWP operations. These habitat restoration projects will be implemented if no action is taken on BDCP, yet they are not included in the no action alternative. As a result, the DEIS/DEIR overstates the environmental benefits of the proposed project as compared to no action, and it substantially understates the environmental impacts of the proposed project as compared to no action. Second, the environmental baseline in the DEIR (but not the DEIS) omits implementation of the "Fall X2" action required under the 2009 Delta smelt biological opinion. This creates further confusion by creating two separate environmental baselines under NEPA and CEQA, and it results in the DEIR overstating the environmental benefits of the proposed project as compared to the no action alternative, and understating the environmental impacts of the proposed project as compared to the no action alternative. Third, the draft BDCP uses a completely manufactured environmental baseline for Chapter 9 of the draft plan, which causes further confusion and is inconsistent with the baselines used in the DEIS/DEIR.[14] Taken together, these flaws confuse the reader, undermining the

[14] In addition, the Draft Plan and DEIS/DEIR use an improper baseline for water deliveries to CVPIA wildlife refuges, failing to incorporate any Level 4 deliveries in the baseline. *See* DEIS/DEIR Appendix 3D at 3D-6.

intent of NEPA and CEQA, and result in the DEIS/DEIR overstating the environmental benefits and understating the environmental impacts of the proposed project.

i. The DEIS/DEIR and Draft Plan Provide Misleading Information Because they Fail to Include Required Habitat Restoration, Including Yolo Bypass Restoration, in the Environmental Baseline

First, the document violates NEPA and CEQA by failing to include required habitat restoration projects, including floodplain habitat restoration in the Yolo Bypass, in the environmental baseline in the DEIS/DEIR. These habitat restoration measures are required by the existing permits for SWP and CVP operations as a mitigation obligation, and they are required to be implemented regardless of whether BDCP moves forward. *See, e.g.*, 2009 NMFS Biological Opinion; 2008 USFWS Biological Opinion; Draft Yolo Bypass Salmonid Habitat Restoration and Fish Passage Implementation Plan, September 2012;[15] Notice of Intent, Draft Environmental Impact Statement / Environmental Impact Report for Yolo Bypass Salmonid Habitat Restoration and Fish Passage, California, 78 Fed. Reg. 14117 (March 4, 2013). The 2009 NMFS biological opinion includes specific criteria that must be achieved with respect to modifications to Freemont and Lisbon weirs, the amount of acreage that must be inundated as a result of restoration, and specific timelines for implementation. NMFS 2009 Biological Opinion at 607-611.

Despite these existing legal requirements, the DEIS/DEIR does not include these measures in the no action alternative or in the environmental baseline for BDCP. *See* DEIS/DEIR at 3-44 to 3-45; Draft Plan at 5.2-6 to 5.2-8. Yet the document also identifies significant environmental benefits from the Yolo Bypass restoration action, benefits that do not appear in the no action alternative despite the fact that these habitat restoration measures are required to be implemented regardless of the outcome of BDCP. *See, e.g.*, DEIS/DEIR at 11-19, 11-278 to 11-281, 11-343, 11-345, 11-487 to 11-488; Draft BDCP Plan at 5.5.3-2 to 5.5.3-7, 5.5.3-41 to 5.5.3-47 (effects analysis of proposed project on winter-run Chinook salmon, concluding in particular that Yolo Bypass restoration under BDCP is highly beneficial for salmon).[16] For instance, the draft plan

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[15] The draft plan and associated letters between the Bureau of Reclamation and National Marine Fisheries Service are available online at: http://www.usbr.gov/mp/BayDeltaOffice/Documents/yolo.html. These documents are incorporated by reference.

[16] Confusingly, and without any analysis, the DEIS/DEIR claims that the Yolo Bypass restoration measures proposed under BDCP "go beyond those in the 2008 NMFS BiOp actions." DEIS/DEIR at 3-45. In contrast, Chapter 9 of the Draft Plan states that, "There is significant overlap in Yolo Bypass improvements between the NMFS 2009 BiOp and the USFWS 2008 BiOp and CM2. The CM2 estimate was reduced to 75% to account for this overlap." Draft Plan at 9-42. It appears that the Draft Plan includes the costs of implementing these habitat restoration requirements in the different baseline used in Chapter 9, even though they were not included in the baseline in the DEIS/DEIR or in other chapters of

concludes that, "The BDCP will provide improved adult and juvenile salmonid passage at Fremont Weir, increase the inundation period of the bypass, and enhance habitat conditions across the bypass itself." Draft Plan at 5.5.3-42. However, the 2009 NMFS biological opinion requires each of these actions on a shorter time frame than BDCP. As a result, the exclusion of Yolo Bypass restoration from the environmental baseline is highly misleading and fails to accurately assess the environmental impacts of the proposed project and alternatives, including the no action alternative.

For purposes of NEPA, the no action alternative in the BDCP DEIS/DEIR provides the environmental baseline, and "The No Action Alternative, sometimes referred to as the future no action condition, considers No Action to include continuation of operations of the SWP and CVP as described in the 2008 USFWS and 2009 NMFS BiOps and RPAs and other relevant plans and projects that would likely occur in the absence of BDCP actions." DEIS/DEIR at 4-5. Yet despite the fact that Yolo Bypass and other habitat restoration requirements of the 2008 USFWS biological opinion and 2009 NMFS biological opinion will "likely occur in the absence of BDCP actions," inexplicably, the DEIS/DEIR does not include the Yolo Bypass and other habitat restoration requirements of the biological opinions in the no action alternative. By failing to include the Yolo Bypass and other habitat restoration requirements in the No Action alternative, the DEIS overstates any environmental benefits of BDCP and understates the environmental impacts of BDCP. This fundamentally violates NEPA's purpose of informing the public and decisionmakers of the environmental consequences of a proposal and its alternatives. In order to comply with NEPA, the DEIR should be revised to include the Yolo Bypass and related requirements of the 2009 NMFS biological opinion and the habitat restoration requirements of the 2008 USFWS biological opinion in the no action alternative.

For purposes of CEQA, the environmental baseline generally is the existing conditions at the time of the NOP. 14 Cal. Code Regs. § 15125. However, the state Supreme Court's decision in *Neighbors for Smart Rail v. Exposition Metro Line* explains that this rule is not absolute, and "A departure from this norm can be justified by substantial evidence that an analysis based on existing conditions would tend to be misleading or without informational value to EIR users." 57 Cal. 4th 439, 457 (2013). The fundamental goal is to ensure that, "CEQA analysis employ a realistic baseline that will give the public and decision makers the most accurate picture practically possible of the project's likely impacts." *Id.* at 449. Footnote 5 of the court's opinion

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the draft plan. By omitting the Yolo Bypass restoration requirements of the 2009 NMFS biological opinion from the No Action Alternative, the DEIS/DEIR fails to provide the public and decisionmakers with the analysis to show the potential environmental consequences of CM2 versus the 2009 NMFS biological opinion requirements and to accurately demonstrate the environmental impacts of the proposed project and alternatives. In addition, as noted above, it appears that BDCP proposes to have the public pay for CM2 (Yolo Bypass restoration), despite the fact that this is a mitigation obligation of the CVP and SWP under existing biological opinions.

cited an example where use of the existing conditions as the environmental baseline could be misleading:

> Amicus curiae South Coast Air Quality Management District provides a hypothetical example of factual conditions in which use of an existing conditions baseline would arguably mask potentially significant project impacts that would be revealed by using a future conditions baseline. In this illustration, an existing industrial facility currently emits an air pollutant in the amount of 1,000 pounds per day. By the year 2020, if no new project is undertaken at the facility, emissions of the pollutant are projected to fall to 500 pounds per day due to enforcement of regulations already adopted and to turnover in the facility's vehicle fleet. The operator proposes to use the facility for a new project that will emit 750 pounds per day of the pollutant upon implementation and through at least 2020. An analysis comparing the project's emissions to existing emissions would conclude the project would reduce pollution and thus have no significant adverse impact, while an analysis using a baseline of projected year 2020 conditions would show the project is likely to increase emissions by 250 pounds per day, a (presumably significant) 50 percent increase over baseline conditions.

Id. at 453, fn. 5.

As in this example from the court's opinion, in the draft BDCP exclusion of the requirement to restore floodplains in the Yolo Bypass from the environmental baseline misleads the public of the potential environmental effects. By omitting these existing mitigation requirements, an analysis comparing the project to existing habitat conditions in the Yolo Bypass would show significant increases in habitat, whereas using a baseline that includes the 2009 NMFS biological opinion requirements relating to the Yolo Bypass would presumably show there would be little change from the baseline. This is critically important, as the DEIR claims that Yolo Bypass actions would have significant benefits for fish that may offset some of the impacts of other elements of BDCP (CM1); because Yolo Bypass restoration would necessarily occur with or without BDCP, this measure cannot offset impacts from CM1.[17] The environmental baseline in

[17] As an example of how this misleads the public, at least one independent review of the Draft Plan and DEIS/DEIR have identified Yolo Bypass restoration as a mitigation measure to offset the impacts to salmon and other native fisheries, whereas a clear presentation of the Yolo Bypass restoration as part of the environmental baseline would not have mislead reviewers. Jeffrey Mount, William Fleenor, Brian Gray, Bruce Herbold, Wim Kimmerer. September 2013, Panel Review of the Draft Bay Delta Conservation Plan: Prepared for The Nature Conservancy and American Rivers ("Mount and Saracino et al. 2013"), at 2, 38-41, available online at: https://watershed.ucdavis.edu/files/biblio/FINAL-BDCP-REVIEW-for-TNC-and-AR-Sept-2013.pdf (noting that their review of the BDCP documents shows that BDCP will increase the frequency of inundation of the bypass and that the duration of inundation in the bypass would not change under the No Action Alternative). While we agree with many of the modeling

the DEIR should be revised to include the requirements of the 2009 NMFS biological opinion relating to the Yolo Bypass (RPA Actions I.6.1 and I.7) and habitat restoration requirements of the 2008 USFWS biological opinion.

ii. The DEIR Provides Misleading Information because it Fails to Include Fall X2 Requirements in the Environmental Baseline

Second, the DEIR improperly justifies the exclusion of the Fall X2 action of the 2008 USFWS biological opinion from the environmental baseline in light of the state Supreme Court's decision in *Neighbors for Smart Rail v. Exposition Metro Line*. DEIS/DEIR at 4-4 to 4-5. Because the NEPA baseline appropriately includes the Fall X2 action from the 2008 USFWS biological opinion, the document unnecessarily confuses the public and decisionmakers with two separate baselines for comparison. Equally important, just as in the prior discussion of excluding the habitat restoration requirements of the biological opinions from the environmental analysis, this too is a case where excluding the Fall X2 action from the baseline leads to highly misleading analysis. At the time of the NOP (as well as today), the Fall X2 requirement of the 2008 USFWS biological opinion was required to be implemented in every wet and above normal water year type by allowing greater outflow during the fall months than was previously required, in order to mitigate impacts of the CVP and SWP operations on Delta smelt. Yet by omitting the Fall X2 action from the DEIR, the document makes it appear that BDCP results in the same or higher outflow in the fall months than under the status quo, and makes it appear that alternatives that do not include the Fall X2 action are similar to the status quo (rather than causing significantly increased environmental impacts, given the environmental benefits of the Fall X2 action). *See, e.g.*, DEIS/DEIR at 11-1295 to 11-1298 (discussing different findings of the effects of Alternative 4 on delta smelt rearing habitat under NEPA and CEQA, concluding that, "The NEPA analysis is a better approach for isolating the effect of the alternative from the effects of sea level rise, climate change, future water demands, and implementation of required actions such as the Fall X2 requirement."). As with exclusion of the habitat restoration requirements of the two biological opinions, exclusion of the Fall X2 action from the CEQA baseline in the DEIR is misleading and confusing to the public and decisionmakers, and the DEIR should be revised to include the Fall X2 action in the CEQA baseline.

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and biological critiques in this report, we disagree in particular with the flawed legal analysis in Chapter 2 of that review.

iii. The Draft Plan Provides Misleading Information because it Includes a Wholly Unjustified Baseline for Economic Impacts and Benefits

Third, Chapter 9 of the Draft Plan includes two new, wholly invented baselines for comparison of economic impacts and benefits. *See* Draft Plan at 9.A-1 to 9.A-4; Draft Plan at 9-40 to 9-42. This is problematic both because it provides a grossly misleading assessment of the potential economic benefits of the proposed project and because it creates significant confusion for the public and decisionmakers about BDCP's effects more generally.

The baselines used in Chapter 9 of the Draft Plan are called the "Existing Conveyance High Outflow Scenario" and the "Existing Conveyance Low Outflow Scenario," and they are only used in Chapter 9 and related appendices. *See id.* These two alternatives result in very substantial reductions in Delta exports as compared to other alternatives, including the No Action Alternative (despite the fact that the Draft Plan does not, in fact, compare them to the No Action Alternative). *See id.* The Draft Plan provides no justification for using a radically different baseline for the economics analysis (Chapter 9) from the rest of the draft plan.

The baseline used in Chapter 9 of the Draft Plan is wholly misleading and without foundation. There is no justification for providing a separate baseline for the economic analysis from that used for the environmental analysis; the document should use a consistent baseline. By using this imaginary baseline that significantly reduces water exports, Chapter 9 estimates significant economic benefits relating to water supply that presumably would not occur when compared to an accurate baseline. *Compare* Draft Plan at 9.A-44 (Table 9.A-7, showing expected water supply benefits) with Draft Plan at 9.A-4 (Table 9.A-2, showing net benefits and costs).[18] Chapter 9 should be revised to be consistent with the baseline recommended in these comments In these three distinct ways, the Draft Plan and DEIS/DEIR use flawed environmental baselines that provide materially misleading information to the public and decisionmakers about the economic and environmental costs and benefits of the BDCP and alternatives. The documents must be revised to provide a consistent, legally adequate baseline in order to fulfill CEQA and

[18] In addition to the flawed baseline, Chapter 9 includes many other substantial flaws, including: calculating economic costs and benefits out to 2075, even though proposed permits only run to 2065, *see* Draft Plan at 9.A-4; calculating water supply based on Early Late Term (2025) export levels, rather than the lower export levels resulting in the Late Long Term (2060), *see* Draft Plan at 9-16; failing to assign the cost of Yolo Bypass restoration to the water contractors as a mitigation measure, and unreasonably assigning the vast majority of costs associated with CM 2-21 to the public, *see* discussion *supra*; and by using inflated estimates of water demand in Southern California and inflated costs of alternative water supplies, as other commentators have argued. Each of these flaws tends to overstate the economic benefits of the proposed project, providing decision-makers and the public with misleading information. Accurately assessing economic costs and benefits are also important with respect to determining what alternatives are feasible. *See* 14 Cal. Code Regs. § 15126.6(f)(1).

NEPA's fundamental purpose of informing the public and decisionmakers of the likely environmental consequences of BDCP and its alternatives.

2. The DEIS/DEIR Fails to Analyze a Reasonable Range of Alternatives

CEQA and NEPA both require that a reasonable range of alternatives to the proposed project be considered in the environmental review process, including a no project alternative. Cal. Pub. Res. Code §§ 21002, 21061, 21100; tit. 14, Cal. Code Regs. ("CEQA Guidelines") § 15126.6; 42 U.S.C. § 4332; 40 C.F.R. §§ 1502.14, 1508.25(b). Unfortunately, the DEIS/DEIR fails to include a reasonable range of alternatives, particularly because it (a) fails to include a range of alternatives that achieve the standards of the ESA, NCCPA, and other environmental laws, consistent with BDCP objectives, and (b) includes no alternatives that include investments in water conservation, recycling, and other local supplies to improve water supply reliability and reduce reliance on the Delta. An alternative that includes both improved flows and investments in local water supplies is likely to result in substantial environmental benefits and improved water supply reliability, consistent with the overarching goals of BDCP, and the failure to include such an alternative violates CEQA. *See Citizens of Goleta Valley v. Board of Supervisors,* 52 Cal.3d 553, 566 (1990) (EIR must consider a reasonable range of alternatives that offer substantial environmental benefits and may feasibly be accomplished).

Indeed, as discussed elsewhere in these comments, the proposed project fails to meet the standards of the ESA, NCCPA, and other environmental laws. This is a fundamental objective of BDCP. *See* DEIS/DEIR at 2-2 to 2-3. Because the Draft Plan and most alternatives fail to achieve these standards, the range of alternatives must include more alternatives that reduce exports from the Delta in order to provide the improved flows needed to comply with these standards. The State Supreme Court's 2008 decision reviewing the CALFED EIR is instructive:

> As the CALFED PEIS/R itself recognizes, Bay–Delta ecosystem restoration to protect endangered species is mandated by both state and federal endangered species laws, and for this reason water exports from the Bay–Delta ultimately must be subordinated to environmental considerations. The CALFED Program is premised on the theory, as yet unproven, that it is possible to restore the Bay–Delta's ecological health while maintaining and perhaps increasing Bay–Delta water exports through the CVP and SWP. If practical experience demonstrates that the theory is unsound, Bay–Delta water exports may need to be capped or reduced. At this relatively early stage of program design, however, we conclude that CALFED properly applied the rule of reason when it decided to consider in the PEIS/R only alternatives that have the potential to both achieve ecosystem restoration goals and meet current and projected water export demands, and that

> will provide balanced progress in all four of the program areas. Failure to include a reduced exports alternative thus was not an abuse of discretion.

In re Bay-Delta Programmatic Environmental Impact Report Coordinated Proceedings, 43 Cal.4th 1143, 1168 (2008). Unlike in 2008, practical experience (e.g., numerous court orders, new biological opinions and other permits, independent and agency scientific reviews, and the SWRCB 2010 Flow Report) has demonstrated that Bay-Delta water exports need to be reduced in order to achieve the ecosystem recovery requirements of the NCCPA and other state and federal laws.

Similarly, the DEIS/DEIR excludes consideration of the fishery agencies' more protective operational proposal for BDCP known as CS5. *See* Resources Agency, Background on Proposed Project and Operational Rules, March 14, 2013, at 4, available online at: http://baydeltaconservationplan.com/Libraries/Dynamic_Document_Library/Background_on_BDCP_Proposed_Project_and_Operational_Rules_3-14-13.sflb.ashx (explaining that CS5 was not incorporated into the Draft Plan or DEIS/DEIR "given the geographic scope of BDCP (limited to the Delta itself)."). CS5 operations provided substantially increased Delta outflow as compared to the Draft Plan and most of the alternatives analyzed in the DEIS/DEIR, resulting in reduced environmental impacts, yet it was excluded from analysis. The DEIS/DEIR should be revised to include alternative operational proposals, such as the operational proposal developed by state and federal fishery agencies in 2013 (known as "CS5"), that provide improved flows (particularly winter/spring Delta outflow) and achieve the requirements of the NCCPA, ESA, and other environmental laws.

Second, in our 2008 scoping comments, we requested that the draft environmental documents include alternatives that improve Delta outflow and reduce water exports from the Delta, while also including investments in water conservation, recycling, and other local supplies to improve water supply reliability. In January 2013, our organizations identified a so-called "Portfolio Alternative," which includes a new conveyance in the Delta, a single tunnel, investments in levee stability and new storage, and significant investments in water conservation, recycling, stormwater capture, and other local water supplies, and requested that it be analyzed in the DEIS/DEIR. *See* attachment.[19] More than 30 members of the State legislature, more than 10 members of Congress, several water districts, other local governments, and numerous newspaper editorial boards all requested or recommended that this alternative be analyzed in the DEIS/DEIR. *Id.* DWR performed some CALSIM modeling of the operational rules proposed in this alternative, including with various conveyance sizes. *Id.* However, the agencies refused to

[19] Information relating to the Portfolio Alternative is included on the attached CD.

analyze the Portfolio Alternative, or any other alternative that includes investments in local water supplies, in the DEIS/DEIR.[20]

To the extent that the State argues that the purpose and need for the project exclude alternatives with water supply elements outside of the Delta, the purpose and need statement is inconsistent with California law[21] because it ignores the mandate of State policy to reduce reliance on the Delta and invest in regional and local water supplies, including water conservation, recycling, and similar projects, in order to improve water supply reliability. *See* Water Code § 85021. Although Chapter 2 of the DEIS/DEIR discusses the Delta Reform Act, it wholly omits discussion of this mandate of the Act.[22] It is irrational to exclude all alternatives that include investments in water conservation, water recycling, and other local and regional water supplies to improve water supply reliability. These water supply tools can provide substantial new sources of water for CVP and SWP contractors, and in combination with reduced exports from the Bay-Delta in order to improve flows and environmental outcomes, such an alternative can provide greater water supply reliability and improved environmental outcomes. Development of local water supplies is consistent with the additional project objectives under CEQA and NEPA. DEIS/DEIR at 2-3 ("To develop projects that restore and protect water supply and ecosystem health and reduce 36 other stressors on the ecological functions of the Delta in a manner that creates a stable 37 regulatory framework under the ESA and NCCPA.").

In addition, we note that the CALFED Bay-Delta program (which was approved as a Natural Community Conservation Plan) included significant investments in water conservation and other supplies in all of the alternatives, including the adopted alternative. *See* CALFED Record of Decision at 12, 19-20, 59-63; CALFED Bay-Delta Program Natural Community Conservation

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[20] While the state included a 3,000 cfs conveyance alternative in the DEIS/DEIR and in Chapter 9 of the draft plan, neither are consistent with the Portfolio Alternative because: (1) the 3,000 cfs alternative in the DEIS/DEIR fails to use the operational rules proposed in the Portfolio Alternative, which increased Delta outflow and reduced exports; (2) the 3,000 cfs alternative in Chapter 9 assumes two tunnels under the Delta, dramatically increasing the cost by nearly $6B, as compared to a single tunnel alternative, as the State has previously admitted, *see* http://baydeltaconservationplan.com/news/blog/13-11-12/Revised_Capital_Cost_for_3_000_cfs_Single_Bore_Tunnel.aspx; and (3) the 3,000 cfs alternative in Chapter 9 does not include analysis of additional investments in local and regional water supplies, an essential element of the Portfolio Alternative.

[21] The purpose and need statement and objectives are also inconsistent with the requirements of the NCCPA because they wholly misstate that conservation standard of that Act, as discussed in section I(A)(1) of these comments. In addition, the purpose and need statement is unlawfully narrow by attempting to limit the geographic scope of BDCP to the Delta, as we discuss. In addition, to the extent that the reference to water supply goals and "full contract amounts" in the purpose and need statement screen out alternatives that reduce water exports, this would be unlawful.

[22] The Draft Plan omits any mention of section 85021 in its discussion of the Delta Reform Act, and fails to demonstrate whether and how BDCP is consistent with this section of the Act. *See* Draft Plan at Chapter 2, Appendix 3I. As currently drafted, the State's proposed project is fundamentally inconsistent with this section of the Delta Reform Act.

Plan Determinations at 9-10, 22-25, 52. In the context of BDCP, such investments can be analyzed at the program level, with established criteria identifying potential water supply costs and yields, without proscribing how particular water contractors achieve these targets. This is similar to the approach taken for most of the conservation measures in the Draft Plan and DEIS/DEIR, which are analyzed at the program, not project, level. Doing so would not require that the State actually take over implementation of these projects, but instead provides a framework for ensuring that the targets and criteria are achieved. To the extent that the State argues that these sources are not cost-effective, the way to demonstrate that is through analysis in the DEIS/DEIR, not through unsupported conclusory statements.

Third, the proposed project and other alternatives analyzed in the DEIS/DEIR will result in significant environmental impacts, including significant impacts to native fisheries and water quality, as well as cumulatively significant impacts. However, alternatives such as the Portfolio Alternative are likely to be feasible alternatives that would result in lower environmental impacts. The failure to meaningfully consider such alternatives precludes the agencies from adopting an alternative that results in significant environmental impacts. *See* Cal. Pub. Res. Code § 21081; *California Clean Energy Committee v. City of Woodland*, 225 Cal.App.4th 173, 203 (2014).

As currently drafted, the DEIS/DEIR fails to include a reasonable range of alternatives, and the documents should be revised to include analysis of the Portfolio Alternative and/or one or more other alternatives that achieve the standards of the NCCPA and other environmental laws as well as increasing investments in regional and local water supplies.

3. The DEIS/DEIR Fails to Adequately Analyze Cumulative Impacts

In several respects, the DEIS/DEIR's analysis of cumulative impacts is significantly flawed, understating the potential environmental impacts of BDCP in combination with other state and federal projects and programs.

First, the DEIS/DEIR fails to include several CALFED reservoir storage projects in its cumulative impacts analysis, despite the fact that notices of preparation, and in some cases, NEPA/CEQA documents, have been released for these projects. These include the Shasta Lake Water Resources Investigation,[23] North of Delta Offstream Storage Investigation,[24] and Upper

[23] *See, e.g.*, Shasta Lake Water Resources Investigation Draft Environmental Impact Statement, June 2013, available online at: http://www.usbr.gov/mp/nepa/nepa_projdetails.cfm?Project_ID=1915. Notice of the DEIS for this project was published in the Federal Register on July 1, 2013. *See* 78 Fed. Reg. 39315 (July 1, 2013). Prior to that, the draft feasibility report was released in 2012, and the Notice of Intent was published in the Federal Register in 2005. 70 Fed. Reg. 58744 (October 7, 2005). BDCP is

San Joaquin River Basin Storage Investigation.[25] The DEIS/DEIR mentions the Shasta Lake Water Resources Investigation and Upper San Joaquin River Basin Storage Investigation, but does not include either of these potential new reservoirs in the cumulative impacts analysis. DEIS/DEIR at Appendix 3D-90, 3D-92. The DEIS/DEIR claims that the North of Delta Offstream Storage Investigation is included in the cumulative impacts analysis, DEIS/DEIR at Appendix 3D-91, but it appears that all of the cumulative impact analysis is qualitative and fails to include the potential reservoir projects in CALSIM modeling, despite the CALSIM modeling available for these projects. *See, e.g.*, DEIS/DEIR at 11-3006 ("This analysis [Cumulative Effects on Fish and Aquatic Resources] is qualitative in nature.").

In combination with BDCP, these storage projects have the potential to significantly reduce Delta outflow and increase Delta exports, particularly as compared to modeled conditions in the DEIS/DEIR, which would be likely to cause cumulatively significant environmental impacts. The failure to analyze these and other storage projects (such as expansion of San Luis Reservoir or further expansion of Los Vaqueros Reservoir, both of which are being analyzed by the federal government) results in the DEIS/DEIR underestimating the cumulative environmental impacts. These projects also will cause cumulative impacts on water supply. *See* DEIS/DEIR at 5-153 to 5-154 (excluding these reservoir projects from the cumulative impacts analysis).[26]

For instance, with additional storage south of the Delta, operations in the Delta could result in greater water exports, which could increase entrainment, increase negative Old & Middle River (OMR) flows, or reduce outflow, particularly as compared to modeled conditions.[27] Appendix

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included in the cumulative impacts analysis in the DEIS. *See, e.g.,* Shasta Lake Water Resources Investigation Draft Environmental Impact Statement at 3-13, 3-27 to 3-28.

[24] *See, e.g.*, North-of-the-Delta Offstream Storage Investigation, 2013 Progress Report, available online at: http://www.usbr.gov/mp/nodos/docs/NODOS_Progress_Report_12.26.2013.pdf.

[25] The Upper San Joaquin River Basin Storage Investigation draft feasibility report was released in January 2014, and is available online at: http://www.usbr.gov/mp/sccao/storage/docs/index.html. The Notice of Intent to prepare an EIS was published in the Federal Register in 2004. *See* 69 Fed. Reg. 5184 (February 3, 2004). The Upper San Joaquin River Basin Storage Investigation draft feasibility report includes a discussion of BDCP (see esp. pages 6-31 to 6-32), and it states that, "Increasing surface water storage in the upper San Joaquin River Basin could allow for increased system flexibility and further use of new Delta conveyance facilities, providing for even greater increases in water supply reliability." Draft feasibility report at 1-37; *see id.* at 6-6 (stating that water supply benefits are expected to increase in combination with BDCP). That report also concludes that modeling studies will be updated to account for BDCP. *Id.* at 3-8.

[26] The DEIS/DEIR also fail to adequately explain and justify the increase of 443TAF in upstream diversions, which reduce export water supply. *See* DEIS/DEIR at 5-67.

[27] As an example, the CALSIM modeling relied on in the DEIS/DEIR assumes that OMR will be less negative than required by the proposed operational rules. However, providing additional storage could result in increased inflows to the Delta and increased export pumping that could increase negative OMR as compared to the CALSIM modeling, increasing environmental impacts as compared to that in the

1B of the DEIS/DEIR admits that preliminary BDCP modeling shows that increased South of Delta storage could increase water exports under BDCP by approximately 150TAF per year, with the majority of pumping increases in wet years. DEIS/DEIR at 1B-12. Inexplicably, this preliminary modeling and analysis is not included in the cumulative impacts analysis, only this conclusory statement.

Appendix 1B claims that all of these potential surface storage projects are neither "a probable future project" nor a "reasonably foreseeable future action." DEIS/DEIR at 1B-1. This conclusion is wholly inconsistent with the existing draft feasibility studies, notices of preparation, and draft NEPA / CEQA documents referenced herein. Further demonstrating that additional storage is a reasonably foreseeable future project under NEPA, in 2013 the State wrote that, "And [BDCP] is about establishing the improved conditions to set the stage for additional future storage improvements north and south of the Delta." *See* www.baydeltaconservationplan.com/news/blog/13-05-16/Making_Storage_Work.aspx. Likewise, the National Marine Fisheries Service has concluded that, "There is a high likelihood that south-of-delta storage capabilities will be increased over the 50-year term of this permit. There is also the potential for such an increase in storage capacity to result in water operation parameters (pumping rates/timing, OMR flows, I/E ratios, etc.) that differ from those modeled in the current analysis." NMFS 2013 Progress Assessment at 18. And the Delta Stewardship Council, in their June 24, 2014 comment letter on BDCP, stated that new storage should be included in the cumulative impacts analysis. In light of the availability of CALSIM modeling for many of these proposed reservoir projects, the likelihood that new storage projects (particularly South of the Delta) will occur, the existing NEPA/CEQA documents and draft feasibility studies for CALFED storage projects, and the State's statement that BDCP "set the stage" for new surface storage, the failure to include these projects in the modeling and analysis of cumulative impacts violates CEQA and NEPA.

Second, the DEIS/DEIR fails to include Phase I and Phase II of the State Water Resources Control Board's (SWRCB) update of the Bay Delta Water Quality Control Plan. *See* Attachment 3D-A (not listing either Phase I or Phase II in the description of projects and programs included in the cumulative impacts). The SWRCB has publicly noticed both phases of these proceedings,[28] and in late 2012 the SWRCB issued a draft Substitute Environmental Document

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DEIS/DEIR. Such differences between modeled conditions and actual operations have occurred frequently in recent years, including under CALFED and under prior biological opinions.

[28] The Notice of Preparation for Phase I was issued on February 13, 2009, and is available online at: http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/bay_delta_plan/environmental_review/docs/nop2009feb13.pdf. The supplemental Notice of Preparation related to Phase II was issued on January 24, 2012, and is available online at: http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/bay_delta_plan/environmental_review/docs/notice_baydeltaplancompreview.pdf.

for Phase I (lower San Joaquin flows).[29] The potential increase in flows from the San Joaquin River in Phase I of these proceedings would significantly affect operations of the CVP and SWP under BDCP, and could potentially result in increased export pumping, entrainment, outflow, residence time, and other changes in water quality in the Delta. At a minimum, the DEIS/DEIR should include modeling of SWRCB alternatives in its analysis of cumulative impacts. These proceedings began in 2009.

Third, the DEIS/DEIR fails to include planned investments in local water supply development and water conservation, particularly in Southern California. *See* Attachment 3D-A. New water conservation, water recycling, stormwater capture, and similar projects to increase regional water supplies can reduce the need for water exports from the Delta, and help increase water supply reliability. For instance, in late 2012 the San Diego County Water Authority identified more than 1.2 million acre feet in planned conservation and other water supply projects in Southern California (in addition to "650,000 AF of planned and state-mandated conservation"), the vast majority of which were not included in the 2010 Urban Water Management Plan prepared by the Metropolitan Water District of Southern California. *See, e.g.,* http://www.sdcwa.org/sites/default/files/files/board/2013_agendas/2013_01_13_FormalBoardPacket.pdf (*see* pages 161-285). While some of these projects were analyzed in Chapter 9 of the BDCP,[30] they were not analyzed in the DEIS/DEIR.

Finally, the analysis in DEIR under CEQA fails to adequately account for the impacts of climate change, in contrast to the NEPA analysis. *See* DEIS/DEIR at 4-6. At a minimum, the effects of climate change in combination with BDCP and other probable future projects must be analyzed as cumulative impacts under CEQA.

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[29] The 2012 draft SED for Phase I is available online at: http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/bay_delta_plan/water_quality_control_planning/2012_sed/. The SWRCB is currently revising the SED in response to comments, and plans to release a revised draft SED later this year.

[30] According to text in Chapter 9A, BDCP relied on MWD's IRPSIM model in calculating local water supplies and conservation available to retail agencies. *See* Draft Plan at 9.A-6 and FN 1. As such, it would have failed to include many of these planned projects in Southern California, thus substantially overstating demand for water from the Delta and potential water shortages. For instance, Chapter 9A estimates that recycled water increases by only 100TAF/year by 2035, *see* Draft Plan at 9.A-7, whereas SDCWA's review of existing UWMPs has identified more than 248,000 acre feet of new water supply from water recycling by 2035. *See* http://www.sdcwa.org/sites/default/files/files/board/2013_agendas/2013_01_13_FormalBoardPacket.pdf (page 283). In addition, although Chapter 9A assumes shortages in water supplies in dry years in urban areas, MWD's 2010 UWMP identified surpluses in 2035, under both single critically dry year (1977) and multiple dry year (1990-1992) hydrology. *See id.* (reproducing tables from MWD's 2010 UWMP).

4. The Geographic Scope of the DEIS/DEIR is Unlawful

CEQA requires that an EIR's analysis of significant environmental effects describe all significant direct and indirect changes in the physical environment caused by the proposed project over time. *See, e.g.,* 14 Cal. Code Regs. § 15126. An artificially truncated project description does not excuse the failure to analyze the full scope of impacts, but instead reflects a flawed project description and a flawed impact analysis. *See, e.g., Santiago County Water Dist. v. County of Orange*, 118 Cal. App. 3d 818 (1981); *San Joaquin Raptor Rescue Ctr. v. County of Merced*, 149 Cal. App. 4th 645 (2007).

Here, the draft EIS/EIR excludes analysis of potentially significant adverse impacts of the proposed project on the environment downstream of Chipps Island and in San Francisco Bay. The EIS/EIR must be revised to address these impacts.

The BDCP Plan Area's downstream boundary is at Chipps Island, excluding Suisun Bay, Suisun Marsh, and San Francisco Bay. But that does not mean that the Plan's impacts cease at that boundary. Indeed, independent analyses have identified significant impacts downstream of the Plan's boundaries that are not assessed in the draft EIS/EIR. *Cf.* National Research Council, A Review of the use of Science and Adaptive Management in California's Draft Bay Delta Conservation Plan, 2011 ("NRC Review 2011"), at 2-3, 17.

There has been no analysis of BDCP's flow, sediment, food, temperature, and DO effects on water bodies downstream of Suisun Marsh. However, the Plan reveals that "the greatest difference in the mean DO value for any day of the year was 0.95 mg/L in Suisun Marsh during March." Draft Plan at 5.3-23. With no analysis of impacts farther downstream, potentially significant impacts to San Francisco Bay remain undisclosed. The March 2014 Delta Science Program Independent Review Panel agreed: "The current Effects Analysis does not consider the influence of shifting timing of withdrawals on San Francisco Bay circulation patterns and ecology. This is a significant omission with ecologically important implications." Delta Science Program Independent Review Panel Report, BDCP Effects Analysis, Phase 3, March 2014, available online at: http://deltacouncil.ca.gov/sites/default/files/documents/files/Delta-Science-Independent-Review-Panel-Report-PHASE-3-FINAL-SUBMISSION-03132014_0.pdf ("DSP Independent Science Review Panel Report 2014") at 14 (incorporated by reference).

The State Water Resources Control Board has also expressed concern that the projected increase in Suisun Marsh salinity will degrade conditions for fish and wildlife. SWRCB, Comments on the Second Administrative Draft Environmental Impact Report/Environmental Impact Statement for the Bay Delta Conservation Plan, July 5, 2013 ("SWRCB 7/5/13 BDCP Comments") at 13. The DEIS/DEIR summarily states that BDCP will contribute to "measurable long term degradation," DEIS/DEIR at 8-426, and "would contribute substantially to the adverse water

quality effects," *id.* at 8-428. But the effect of these adverse impacts on the downstream ecosystem, including San Francisco Bay, are not analyzed or disclosed in the draft EIS/EIR. In addition to potentially significant salinity impacts downstream of the BDCP Plan Area, the draft EIS/EIR fails to assess impacts on turbidity and sediment supply to the Bay. The March 2014 Delta Science Program Independent Review Panel Report states:

> …this isn't a conservation plan, but rather a conservation menu that generally fails to describe how major uncertainties will be resolved. For instance, while the Effects Analysis recognizes that suspended sediment has been declining in the Sacramento River and that the new diversions would remove an additional 8-9%, all analyses used a high and constant amount with no mention of downstream sediment effects on either Suisun or San Francisco Bay.

DSP Independent Science Review Panel Report 2014 at 13. The Delta Stewardship Council and other reviewers have also noted this flaw in the geographic scope of the effects analysis and DEIS/DEIR. *See* Delta Stewardship Council, Comments on the Bay Delta Conservation Plan Draft Environmental Impact Statement/Environmental Impact Report, June 24, 2014, at 12, available online at:
http://deltacouncil.ca.gov/sites/default/files/documents/files/BDCP%20Comments%20Cover%20Letter%20and%20Final%20BDCP%20EIR-S%20Comments.pdf ("DSC BDCP Comments June 2014").

The Draft Plan also admits that there may not be sufficient sediment for marsh restoration, or even maintenance of existing tidal marsh, but it fails to analyze such impacts on tidal marsh habitats in Suisun Marsh and other areas downstream of the Plan Area. *See, e.g.*, Draft Plan at 5.3-24 to -25 ("The initial effect of tidal restoration is to decrease sediment supply downstream of the Plan Area…"). It states that BDCP's in-Delta ROAs "could also lead to greater water clarity in downstream areas such as Suisun Bay," and that there is "potential for lower water clarity in the LLT under the BDCP in portions of the Suisun Bay and West Delta subregions." *Id.* These short-term reductions and uncertain long-term sediment conditions, when combined with long-term sea level inundation of existing and restored marsh areas, could result in significant losses of marsh habitat in and downstream of the Delta. Yet the BDCP fails to analyze these potential impacts, and it proposes no mitigation measures to address such impacts. DEIS/DEIR figure 8-49 shows low turbidity in 2006 downstream of the major dams on the Sacramento River and Feather River. Missing from the DEIS/DEIR are turbidity values upstream of these dams or on tributaries that have a less-impaired sediment flow to the valley floor. Clearer water in San Francisco Bay as a result of BDCP could allow sunlight to penetrate the water column further. This could change the Bay's response to nutrient input, causing increased algal blooms and degraded water quality. *See* Delta Independent Science Board, Review of the draft EIS/EIR for the Bay Delta Conservation Plan May 15, 2014 ("Delta ISB 2014"), at B-12,

available online at: http://deltacouncil.ca.gov/sites/default/files/documents/files/Attachment-1-Final-BDCP-comments.pdf. Yet as the Delta ISB and other reviewers have noted, the Draft Plan and DEIS/DEIR fail to analyze and disclose the nature and extent of these likely environmental impacts.

I. The Draft Plan Fails to Adequately Define the Elements of Governance and Adaptive Management Associated with Plan Implementation and Fails to Meet Applicable Legal Standards

The governance structure and the Adaptive Management Plan are critical components of the BDCP. Governance sets forth who will implement the Draft Plan and how, providing assurances to plan participants as well as the public that the Draft Plan will be implemented fairly, transparently, and consistent with existing statutory and regulatory requirements. Adaptive management is widely recognized as a necessary element of an ecologically sustainable HCP/NCCP. Fish & Game Code § 2820(a)(2), (8), (b)(5), (f)(1)(G); HCP Handbook at 3-24; *see* 50 C.F.R. § 17.22(b)(2)(C), (b)(5). In the Services' Five Point Policy Guidance, the Service states that "[a]daptive management is an integrated method for addressing uncertainty in natural resources management." 65 Fed. Reg. at 35252.

As discussed below, the current version of the governance chapter and Adaptive Management Plan in the Plan and Draft IA has numerous problems.

1. The Adaptive Management Plan Lacks the Necessary Details to Support the Required Findings for Permit Issuance

Given the broad complexities of the BDCP, the Adaptive Management Program is an essential and critical part of this plan. Indeed, the Services acknowledged this in a white paper on the application of the Five Point Policy to the BDCP, in which they stated that,

> [t]here is substantial uncertainty regarding the effects on listed species of a new water conveyance system and of water withdrawal, combined with effects of other human activities and natural phenomena that are reasonably certain to occur, over a time period as long as 50 years. This uncertainty is compounded by both the complexity of the Delta ecosystem and the predicted future increases in temperature and climate variability.

BDCP 5-Point Policy Memo at 1.

In order for the Adaptive Management Program to work and for the Services to be able to make their required findings for permit issuance, the Draft Plan must include "an adaptive management

plan that tests alternative strategies for meeting those biological goals and objectives, and a framework for adjusting future conservation actions, if necessary, based on what is learned." *Id.* at 2; *see also* HCP Handbook; 65 Fed. Reg. at 35252.

Despite the fact that there are entire sections of the BDCP devoted to the discussion of Adaptive Management, the Plan lacks a great deal of details on how the Adaptive Management Plan will be designed. In its review of the Draft BDCP, the Delta Independent Science Board commented that the "adaptive management process is not fully developed" and is "left to a future Adaptive Management Team." Delta ISB 2014 at 3, 8-9, 11; *see id.*, Appendix A at A-13 to A-23. This lack of detail led the Delta ISB to conclude that they "have *substantial misgivings* about how well the proposed adaptive management process, as proposed, will actually function as a key component of BDCP." *Id.* at 9 (emphasis added).

i. There is no Basis to Conclude that the Adaptive Management Plan will Result in the Achievement of the Plan's Biological Goals and Objectives

As discussed supra in section I(C), the Plan and Draft IA makes clear that the BDCP biological goals and objectives are not enforceable and not a part of the permit requirements. This lack of enforcement undermines the credibility of the BDCP's Adaptive Management Plan. According to the Federal Agency White Paper, the BDCP is intended to be a "results-based" HCP, which means that the permittees will be given flexibility in managing the plan "as long as [the permittees] achieve the intended result (i.e., the biological goals and objectives)." BDCP 5-Point Policy Memo at 1; *see also* 65 Fed. Reg. at 35351. However, if the BDCP's biological goals and objectives are not enforceable, there is no guarantee that the Draft Plan, through the implementation of the Adaptive Management Program, will result in the achievement of these goals and objectives. In order to cure this problem, the BDCP biological goals and objectives should be made a part of the permit requirements, guaranteeing that they are reasonably certain to occur through the Adaptive Management Program.

ii. The Plan Fails to Adequately Describe how Operations or other Actions will be Modified Based on new Information as part of the Adaptive Management Plan.

The Adaptive Management Plan is lacking a large number of details, including how the Draft Plan will modify operations in light of new information. For example, the Delta ISB commented that the Draft BDCP lacked "measures needed to evaluate actions and make adjustments," including a failure to identify "'trigger points' at which adaptive management procedures would be initiated." Delta ISB 2014 at 8. Indeed, the Delta ISB commented in its letter that it agreed with the Delta Science Program's Independent Panel's review of Chapter 5 (Effects Analysis),

which, among other things, criticized the BDCP for "[c]haracteriz[ing] adaptive management as the default solution to unresolved issues and uncertainties, without clear description of how adaptive management will actually be implemented or tied to monitoring." *Id.* at 10.

At the heart of the Adaptive Management Plan is the need to make changes to the Draft Plan's implementation, including operations, if new information indicates that changes are necessary to continue to achieve the Draft Plan's biological goals and objectives. Currently, the Decision Tree is at odds with effective adaptive management as it creates brackets that inappropriately limit the potential range of operations to preclude necessary improvements in outflows, fails to identify how the agencies would decide which of the Decision Tree operational alternative should be used, and fails to explain default or starting operations under the Decision Tree. *See* Draft Plan at 3.4-24 to -26. Many scientific reviewers have criticized the adaptive management framework for these and other reasons. Delta ISB 2014 at 3, 8-9, 11; *see id.*, Appendix A at A-13 to A-23; Mount and Saracino et al. 2013 at 3, 83-84, 86-87, 99-105; DSP Independent Science Review Panel Report 2014 at 8-9, 15-16, 18, 20, 41-44. This bracketing creates limits in how adaptive management will be used to achieve biological goals and objectives. If the BDCP is committed to using best available science and adaptive management, the Draft Plan must not set artificial boundaries that limit operations where those operational limits are unlikely to result in the Draft Plan achieving its biological objectives, as demonstrated *infra*.

2. The AMP Lacks Scientific Independence

The Adaptive Management Team (AMT) is chaired by the BDCP Science Manager and has primary responsibility for the administration of the Adaptive Management Program. The AMT consists of representatives from DWR, Reclamation, federal water contractors, state water contractors, DFW, USFWS, and NMFS, all of which are voting members. The IEP Lead Scientist, the Delta Program lead scientist, and the Director of the NOAA Southwest Fisheries Science Center will serve as non-voting members of the AMT. In addition, the Science Manager is hired by the Program Manager, who is directed by the Authorized Entity Group (AEG), which is comprised of federal and state water contractors, DWR and Reclamation.

The current make-up and structure of the AMT blurs the distinction between regulated entities, scientists and regulators. Moreover, the Adaptive Management Program could be perceived as essentially run by the regulated entities since the Science Manager is hired by the Program Manager, who is overseen by the AEG.

Further, there is nothing in the Draft Plan demonstrating any kind of independent oversight of the BDCP Adaptive Management Program. There is some mention of coordinating with the Delta Science Program, but as noted by the Delta Science Program's Independent Panel, the Draft Plan lacks any clarity about the coordination with the Delta Science Program. Delta ISB 2014 at A-

20. It is absolutely critical that the BDCP Science Program and Adaptive Management Program contain a clear structure for independent science oversight.

Finally, it appears that the AMT may be allowed to operate almost entirely outside of public view. There is no requirement for AMT meetings to be open to the public in any meaningful way. Instead, the Draft IA states that the AMT shall open its meetings to the public "[o]n a periodic basis." Draft IA at 30. In order to foster transparency and credibility with the public, the AMT and its discussions must be more open to the public.

3. The Draft Plan's Governance Structures and Rules, Including those Governing the Adaptive Management Program, Violate State and Federal Law, and are Likely to Result in Paralysis

The Draft Plan and Draft IA detail a complex set of rules and structures for the implementation of the Plan, including the Adaptive Management Program. The Authorized Entity Group, the Permit Oversight Group, the Program Manager, the Science Manager, the Adaptive Management Team, and the Real Time Operations Team are at the core of the governance structure. The Plan details conflict resolution processes for each of these groups or teams as it pertains to specific types of decisions.

The Authorized Entity Group (AEG) will include four members: A representative from the state water contractors, a representative from the federal water contractors, the Director of DWR, and the Regional Director for Reclamation. The state and federal water contractors are likely to be members of the AEG as the Draft Plan and Draft IA anticipate making them permittees. There are no fish and wildlife agencies on the AEG. The AEG has numerous duties and responsibilities, including hiring the Program Manager, implementation and administration of the program, implementation and oversight of the implementation of the conservation measures (except for water operations), compliance monitoring and reporting, the production and approval of the Annual Work Plan, the production of the Annual Program Report, Annual Water Operations Report, and Five Year Comprehensive Review. The AEG also is involved in the selection of the Science Manager and heavily engaged in the decision-making of all aspects of the Adaptive Management Program. *See* Draft Plan Chapters 6 and 7.

The Permit Oversight Group (POG) will be comprised of the Regional Director of the USFWS, the Regional Administrator of NMFS, and the Director of DFW. The POG is involved in a variety of implementation and oversight duties involving the Program Manager, AEG and the Adaptive Management Plan. Of particular importance, the POG has input into the Annual Delta Water Operations Plan, but does not have any ability to require changes to that plan. *Id.*

The Program Manager will be hired by the AEG and essentially manages the implementation of the BDCP Program except for water operations. The Science Manager is hired by the Program Manager and chairs the Adaptive Management Team.

Finally, the Real Time Operations Team is in charge of real time operation of Conservation Measure 1. The Real Time Operations Team is comprised of one representative each from USFWS, NMFS, CDFW, Reclamation and DWR. The team will also include a representative each from the state and federal water contractors, but those two representatives will be non-voting members of the team.

As discussed below, the lines of authority and final decision-making are complicated and, for some decisions and groups, contradictory to current law or standards of transparent and effective decision-making.

i. The Governance Structure and Adaptive Management Program Violate the Delta Reform Act Requirement that the Fish Agencies Ensure the Achievement of the Biological Performance Measures with Respect to Water System Operations.

The Delta Reform Act requires that the fish agencies must be in a position to ensure that the biological performance measures in the BDCP's water operations are achieved.[31] However, under the Plan the fish agencies (as the POG) do not have approval rights for some of the key plans and decisions that would affect biological performance of the BDCP as it pertains to water operations. First, in the case of the Real Time Operations Team, it is not clear that the fish agencies have final decision-making authority if there is a dispute. According to the Plan, the Regional Director of the relevant fish agency may only have final decision-making authority if "the Director of the project agency concurs that the change is within their authority." Draft Plan at 3.4-27. If the Director of the project agency disputes that the fish agencies have authority to make the change, there does not seem to be any recourse other than the status quo. This approach does not meet the Delta Reform Act standard.

Second, the fish agencies are not in a position to ensure that biological performance measures in the BDCP's water operation will be achieved with respect to the Annual Water Operations Plan. Practically speaking, DWR and Reclamation have final authority and approval over those plans. While it appears that the POG may find that the Annual Water Operations Plan is unacceptable, it is in DWR and the Bureau's discretion to make changes to that plan and even after the dispute

[31] The Delta Reform Act provides that, "[t]he BDCP shall include a transparent, real-time operational decision-making process in which fishery agencies ensure that applicable biological performance measures are achieved in a timely manner with respect to water system operations." Cal. Water Code § 85321.

resolution process, DWR and the Bureau have final decision-making authority. Draft IA at 72. This approach does not meet the Delta Reform Act standard.

Third, the fish agencies do not have approval rights over the Annual Work Plans or Budgets other than providing written concurrence that the "draft adequately sets forth and makes adequate provision for the implementation of the applicable joint decisions of the Authorized Entity Group and Permit Oversight Group or decisions of the agency within the Permit Oversight Group with authority over the matter." Draft Plan at 7-12; Draft IA at 71. This language is a departure from the finding that the POG is supposed to make regarding the Annual Water Operations Plan. For that plan, the POG must ensure that it is consistent with the BDCP, Implementing Agreement, and regulatory requirements. Draft Plan at 6-23; Draft IA at 71. At a minimum, the POG should be required to make a similar finding for the Annual Work Plan. The lack of the fish agencies' ability to affect changes to the Annual Water Operation Plan is troubling since that plan is likely to include funding and staffing decisions and action that could affect biological performance measures with respect to water system operations.

Finally, the Plan currently shifts responsibility for a key part of adaptive management to the Adaptive Management Team with no decision-making authority by the fish agencies under the guise of "routine or administrative matters." Draft IA at 30-32. The IA defines "routine and administrative matters" as "reassessment of and modification to problem statement sand conceptual models." *Id.* at 30-31. However, a change to a problem statement or conceptual model is hardly a "routine or administrative" matter. At the beginning of the Plan's Adaptive Management chapter, conceptual models are listed as a key part of adaptive management. Draft Plan at 3.6-2, 3.6-15. Conceptual models link the biological objectives to proposed actions. By allowing the AMT to make changes to conceptual models and problem statements, the Plan removes the fish agencies from effectively ensuring that biological performance measures will be achieved. This is not only in violation of the Delta Reform Act, but it undermines the credibility of the Adaptive Management Program in its entirety.

ii. The Governance Structure and Adaptive Management Program Appear to Improperly Delegate Operation of the CVP

Numerous state and federal laws, such as the Central Valley Project Improvement Act (CVPIA), require that the SWP and CVP be operated by the state and federal governments, respectively. *See* Permittee Memo. Federal law prohibits delegating the Secretary's policymaking role and authority. *Id.* (citing *National Park and Conservation Association v. Stanton*, 54 F. Supp. 2d 7 (D.D.C. 1999)).

While the Plan appears to attempt to disentangle DWR and Reclamation from the state and federal water contractors for purposes of CVP and SWP operations, as detailed above, the very

structure of the AEG (in which two of the four voting members are water contractors), with the presence of federal and state water contractors in the Real Time Operation Team as well as on the Adaptive Management Team creates a situation in which the water contractors will have special and undue influence in CVP and SWP water operations decision-making on a day-to-day basis and for the 50 year length of the permits.

In addition, there is some confusing language in Chapter 7 in which the Implementation Office structure is described as "contemplate[ing] that DWR and Reclamation will maintain their historical roles as operators of the SWP and CVP, but provides flexibility for changing those roles if so directed by Congress, the California Legislature, or through administrative process." Draft Plan at 7-22. While it is clear that Congress and the California Legislature may change the laws regarding who can operation the CVP and SWP, respectively, it is unclear what "administrative process" would allow for such a delegation of authority.

Finally, as discussed supra in section I(C), the state and federal contractors are legally unqualified to serve as permittees, and such status would inevitably influence the operation of the CVP and SWP. Permittees have an entirely different legal relationship to the BDCP than non-permittees.

iii. The Adaptive Management Team's Requirement of Consensus is Unworkable and a Barrier to Effective Adaptive Management

The AMT is required to operate by consensus, which means that if any one member of the group objects to a decision, there is no consensus of the team. Lack of consensus triggers a drawn-out process detailed in Chapter 7.1.6. This AMT structure is unwieldy and may result in delay. Delta ISB 2014 at 8 ("the organization structure may delay rather than expedite needed adjustments"); *id.* at A-19 ("Overall, this decision-making arrangement does not seem to bring enough authority and resources for adaptive management to be implemented decisively and in a timely way. With this structure, each cycle of adaptive management would probably occur very slowly, if at all.").

iv. The Dispute Resolution Process is Unclear and could lead to Decision-Making Paralysis or Purposeful Delay Tactics

The Governance Chapter and Draft IA detail a dispute resolution process that is vague and time-consuming. Draft Plan at 7-17; Draft IA at 66-67. First, in reviewing the details of this process, it appears that the process could take as little as six weeks or may have no end in sight. While the process details various 14 day deadlines, there does not appear to be any specified deadline in which the parties submit written positions to the panel and the panel is convened. In addition, since the decisions of the panel are non-binding, the real heart of this process is determining which entity has decision-making authority over which decision. While Table 7-1 provides some

details for some of the bigger decision-making points/plans, this dispute process could be triggered on any number of other decision points. At a minimum, this process needs to be detailed and clarified.

In addition, there is some question as to the utility of the dispute resolution process including the process-laden panel. A positive view of this process is that it provides an additional forum to air differences. A negative view is that this could result in abuse by certain parties in an attempt to delay decisions and actions. In any event, this process could become a costly and time-consuming process if appropriate sideboards are not included in this section.

II. SIGNIFICANT MODELING FLAWS IN BDCP UNDERSTATE LIKELY ENVIRONMETNAL IMPACTS AND MUST BE CORRECTED TO PROVIDE ACCURATE IMPACT ASSESSMENTS

A. The Water Operations and Delta Hydrodynamics Modeling for BDCP Contains Errors and Faulty Assumptions, Which are Used as Input Data for Other Analyses, Resulting in Flawed Conclusions in the DEIS/DEIR.

The flawed use of the CALSIM II and DSM2 models for BDCP understates environmental impacts. The BDCP DEIS/DEIR warns: "Given the relatively generalized representation of the RPAs assumed for CALSIM II modeling, much caution is required when interpreting outputs from the model." DEIS/DEIR at 5A-B199. The CALSIM II model results are not just used for water operations, but are the basis for many other analyses, including Delta hydrodynamics, water temperature, fisheries (habitat, production, and survival), terrestrial habitat, economics, power generation and use, and recreation. There is often no disclosure of how much caution was used when CALSIM II input was used in these analyses. The BDCP Independent Scientific Review Panel also expressed concern over a "lack of consideration of propagation of errors or sensitivity analysis in linked models," and suggested a methodology for assessing uncertainty in linked models. DSP Independent Review Panel Report 2014 at 40-41.[32]

These CALSIM II model results that require "much caution" to interpret, *see* DEIS/DEIR at 5A-B199, are presented and used in other analyses at a level of specificity that is not cautious, propagates errors, and overstates certainty. According to DWR,

> CALSIM II provides a reasonable planning level simulation of existing project operations, recognizing that the operating environment and regulatory

[32] The report is available online at: http://deltacouncil.ca.gov/sites/default/files/documents/files/Delta-Science-Independent-Review-Panel-Report-PHASE-3-FINAL-SUBMISSION-03132014_0.pdf and is included with the supplementary and supporting materials we have included on a CD with our written comments.

> requirements for the projects are in a constant state of transition and change. Since CALSIM II is not a detailed operations model, it does not capture many of the complexities of forecasted and actual operations of project facilities.

See California Department of Water Resources website at: http://baydeltaoffice.water.ca.gov/modeling/hydrology/CalSim/Downloads/CalSimDownloads/CalSim-IIStudies/Benchmark/index.cfm. These limitations of the CALSIM II modeling of the BDCP means that the Draft Plan and DEIS/DEIR are not capable of reproducing actual historic operations or likely future operations at the timescale and accuracy required to adequately analyze the environmental effects of the project.

The BDCP DEIS/DEIR states "The CALSIM II model is most appropriately applied for comparing one alternative to another and drawing comparisons between the results. This is the method in which CALSIM II is applied for the BDCP." DEIR/DEIS at 5A-A15. If the value of the modeling results is relative, with unknown or undisclosed relation to actual outcomes, then the BDCP DEIS/DEIR cannot accurately assess whether biologically relevant thresholds of significance are likely to be achieved, or how projected outcomes can be related to goals and objectives. With only relative modeling results presented in a way that fails to disclose context and uncertainty, it is difficult to assess the accuracy of the evaluation of whether the BDCP alternatives are likely to achieve the BDCP's biological objectives.

In numerous locations the CALSIM II and other physical model results are presented as if they were likely to be actual, not relative, results. Conclusions are commonly drawn without regard to the warnings cited above and they are not qualified with confidence intervals or reference to the level of uncertainty inherent in model outputs. This makes it hard to trust any of the modeling output. Examples of this lack of disclosure of uncertainty include:

- Relative to the NAA, average annual Delta exports under Alternative 4 Scenario H4 (HOS) are expected to decrease by 27 TAF. DEIS/DEIR at 11-52. This is equivalent to just 0.6% of the average annual export. There is no context provided for interpreting whether such a tiny deviation will actually materialize. There is no discussion of what the margin of error is for the modeled results—an important piece of information, given all the cautionary statements about use of model results. It is thus not possible to distinguish this extremely small projected decrease in exports under the HOS from a potentially substantial 18% increase in exports under the LOS.
- At times, multiple hydrodynamic models were compared, each generating unique results. Yet these differing results are often described in vague terms, with just a few selected examples. For example, DSM2 models ROAs (Restoration Opportunity Areas) as channels or reservoirs. It does not allow dry channels or reservoirs, *see* DEIS/DEIR Appendix 5A

Section D Attachment 4 at 6, and sets the depth of all ROAs to -10.1 feet to prevent drying. This extra volume has the potential for increased dilution of salinity and other constituents in ROAs. Despite adjusting channel roughness in DSM2 to match the tidal and flow range in the RMA model, *see* DEIS/DEIR Appendix 5A Section D Attachment 4 at 10, there is not good agreement between the models at Prisoners Point and there is a "slight" underprediction of flows toward the Sacramento River in DSM2 at Three Mile Slough. *Id.* at 11. Differences due to the ROAs are "considered to be within acceptable limits for the purpose of this analysis," *id.*, however the acceptable limits are not disclosed, and without peer review, this statement lacks both specificity and credibility.

- UnTRIM-model-predicted salinity at Jersey Point was 20% below observed values and DSM2 was about 20% higher than observed. UnTRIM underpredicts salinity in central and south Delta while DSM2 did "well," so UnTRIM was used here only to corroborate trend with sea level rise. DEIS/DEIR Appendix 5A Section D Attachment 4 at 13. No information is given why UnTRIM underpredicted salinity in these areas, and whether the flaw affecting salinity might also affect sea level rise predictions. The reason why the 2002-2003 period was chosen for corroboration was not explained—was there adequate variation during this period representative of the variation predicted with the project, including potential ROA configurations and sea level rise?
- The range of outcomes from TRIM/RMA versus DSM2 and CALSIM II is limited to only one potential set of Restoration Opportunity Area (ROA) configurations. *See* DSP Independent Science Review Panel Report 2014 at 41. The ROA configuration significantly influences hydrodynamics in the Delta, *id.*, yet details of the ROA configuration are not provided, nor is a sensitivity analysis to other potential ROA configurations. The result is poor model agreement when the Delta Cross Channel is open, and more uncertainty in the results of all related analyses, including salinity distribution and attainment of water quality standards.

If modeling studies are to characterize that multiple environmental objectives of the BDCP can be met, modeling assumptions must adhere to the same principles as the operating criteria. This is not the case with the physical models used by BDCP, where many unjustified or incorrect assumptions have been made. Unrealistic modeling assumptions (we expand upon these below) include:

- Generalized representation of RPAs (in CALSIM II) resulting in unreliability of model output used for other analyses;
- Use of X2 estimates from CALSIM II that are unusable for comparison with actual historic operations and conditions , resulting in a lack of disclosure of the likely pattern of water management or the ability to attain other objectives;

- The BDCP version of CALSIM II underestimates north Delta exports, overestimates south Delta exports, overestimates net Delta outflow, and underestimates total exports, resulting in flawed input to every analysis that uses CALSIM II flows and exports in the Delta.
- Use of physically unjustified dispersion coefficients in DSM2-QUAL resulting in inconsistent model performance and unreliable results spatially and temporally;
- Failure to account for full residence time of particles diverted and returned to Delta waterways by agricultural diversions (in DSM2) resulting in a lack of disclosure of likely longer residence times and associated water quality impacts;
- Incorrect assumption that components in the particle tracking model (DSM2-PTM) act in a conservative manner throughout the system resulting in the failure to properly characterize the transport and residence time of water quality constituents;
- No changes in upstream reservoir management in CALSIM II based on downstream river temperatures, resulting in a lack of disclosure of likely reservoir operations and releases or ability to attain water quality and other objectives;
- Failure to properly modify operations enough to eliminate or reduce EC exceedances, resulting in a lack of disclosure of the water management required to achieve compliance or ability to attain water quality and other objectives;
- Failure to account for reasonably foreseeable water supplies and conservation opportunities, resulting in unrealistic operations.

In addition to the inability to convert modeling results into likely real-world impacts (their "relative nature") and the false precision accorded to some, but not all, of these outputs, the results of the BDCP modeling analyses are at times simply incorrect. For example, the X2 results in CALSIM II are not consistent with other studies, rendering them unusable for comparison. The ANN model approximates DSM2 model-generated salinity, and is used in CALSIM II to calculate X2. DEIS/DEIR at 5A-A7. But X2 calculated by CALSIM II using the ANN model differs substantially from that determined by the relationship with Delta outflow as calculated by Jassby et. al. 1995. *See* Mount and Saracino et al. 2013 at 48. The Jassby equation has been used by previous studies of X2-fish relationships, is used by DWR in the DAYFLOW program, and is the equation recommended by the Interagency Ecological Program. *See* Delta Science Program, Panel Report, Workshop on Delta Outflows and Related Stressors, May 2014 ("DSP Outflows Review Panel Report 2014"), at 8, available online at http://deltacouncil.ca.gov/sites/default/files/documents/files/Delta-Outflows-Report-Final-2014-05-05.pdf.[33] No explanation is given why the BDCP analysis fails to provide a calibration of the CALSIM II methods with the Jassby methodology or with actual X2. As presented, the X2 results in the DEIS/DEIR cannot be compared to numerous other studies that have documented Delta outflow needed to produce specific benefits in this ecosystem. As a consequence, the

[33] This review also found substantial discrepancies between modeled and actual X2 locations, particularly when X2 is seaward of 56 km or landward of 81 km. *Id.* at 12.

DEIS/DEIR presents contextually confusing X2 results that make it difficult for the public and decision-makers to adequately evaluate the DEIS/DEIR's outcomes and conclusions. This information is then used to arrive at a potentially erroneous and inadequate assessment of the environmental consequences of BDCP. A proper approach would be to calibrate the two X2 models with observed data and reveal in the EIR-EIS how the models differ and the implications of those differences for different analyses that depend upon CALSIM II X2 output.

Another example of incorrect results from the CALSIM II modeling is due to a flaw that was not fixed in the BDCP-modified CALSIM II model. An independent effort found that the BDCP version of the CALSIM II model underestimates the north Delta diversions by 700,000 acre-feet per year, and overestimates the south Delta diversions by 500,000 acre-feet per year. *See* MBK Engineers 2014.[34] Their review concluded that BDCP would result in 34% less Delta outflow and 41% more export than is disclosed in the BDCP DEIS/DEIR. This 200,000 acre-foot overestimate of net Delta outflow in the BDCP version of the model results in an unrealistically rosy picture of Delta outflow in the DEIS/DEIR, and thus the DEIS/DEIR understates the environmental impacts on species dependent on Delta outflow. *See also* Mount and Saracino et al. 2013 at 48, 64-66. At times the expected Delta outflow won't actually materialize under BDCP because the water can be exported or stored upstream. The incorrect proportion of exports between north and south in the BDCP model is also a problem because it results in flawed conclusions about changes in residence time, Old and Middle River flows (OMR) and entrainment, Sacramento River flows (and salmonid survival rates), and other effects of the north Delta diversions. Residence time in the south Delta will be much greater than BDCP discloses, and the effects of the north Delta diversions (on flow, entrainment, sediment, etc.) will be much greater than disclosed. These errors also affect the water supply analysis in the DEIS/DEIR, since the timing of diversions will differ from the timing derived from BDCP modeling. This has cascading effects on all of the other analyses that depend on CALSIM II, including the analysis of upstream reservoir operations and of export timing and magnitude, as well as Delta hydrodynamics and fisheries impacts. BDCP must revise the CALSIM modeling to correct this significant error, which propagates through virtually all of the environmental analyses. Without such revisions to the models, the entire BDCP Effects Analysis fails to accurately assess likely environmental impacts and is inadequate.

In addition, the lack of adequate validation and calibration of the DSM2 model leads to it overestimating salinity in the summer and fall and underestimating salinity in the winter and spring, which has significant environmental impacts that are not identified in the document. We

[34] Walter Bourez of MBK Engineers gave an initial presentation of their modeling results to the Delta Stewardship Council's Independent Science Board on January 17, 2014. That presentation is available online at: http://deltacouncil.ca.gov/get-document/7219. We understand that a more detailed review will be submitted as formal comments to BDCP.

have previously noted the failure to properly validate and peer review the BDCP-altered CALSIM II and DSM2 models. *See* TBI, EDF, CCWD 12/21/11 letter at 10-11. In their efforts to update the DSM2-QUAL model, BDCP modelers failed to calibrate and validate the model appropriately for prediction of EC. This results in spatial and temporal unreliability, under and overestimates of the amount of certain types of habitats, the false attainment or non-attainment of water quality standards, and incorrect estimates of the amount of freshwater flow needed to attain those targets.

DSM2 consists of three linked models: HYDRO, QUAL, and PTM. The DSM2-HYDRO model predicts hydrodynamics in the Delta. The BDCP-modified DSM2-QUAL model predicts EC (a measure of salinity, which is a key attribute of environmental conditions for most aquatic organisms) and other water quality parameters in the Delta under the BDCP alternatives. DSM2-QUAL was last calibrated in 2000 prior to the BDCP calibration. To calibrate the model, channel dispersion factors (increased dispersion causes greater salinity transport) were changed. In contrast to the much better performance (i.e. model output more closely matches observed data) of DSM2-HYDRO (hydrodynamics) compared to the 2000 calibration, changes in DSM2-QUAL model performance (EC) are inconsistent, and "the EC results indicate slightly worse performance compared to the previous calibration." DEIS/DEIR Appendix 5A, Section D, Attachment 1 at 6-2, 6-4. Problems with the EC calibration include:

- Dispersion coefficients were changed in an ad hoc manner to get better performance (model matches to the observed data) at Emmaton (a compliance point), however this resulted in worse performance at Old River at Holland Cut, South Delta export locations, and Rio Vista compared to the 2000 calibration. This also resulted in a low point in dispersion coefficients at Rio Vista, which according to the DEIS/DEIR "may not be justifiable from a physics standpoint and should be addressed in subsequent analyses." DEIS/DEIR Appendix 5A, Section D, Attachment 1 at 6-2. No subsequent analysis was performed for the DEIS/DEIR. DEIS/DEIR Appendix 5A Section D Attachment 1 Table 6-1 shows the dispersion factors that were changed—but it does not disclose which changes are physically justifiable in the real world. Using unjustifiable dispersion coefficients means that water quality results and conclusions drawn from DSM2-QUAL outputs for individual stations are suspect and may not be representative of the likely conditions under BDCP. Given these flaws, the DEIS/DEIR states that the lower Sacramento River stations should be viewed as a group. DEIS/DEIR Appendix 5A, Section D, Attachment 1, Table 6-3. However the results are not presented as a group, and instead BDCP inappropriately focuses on results at individual stations, such as the Emmaton compliance point.
- BDCP modelers failed to use a different validation period than the calibration period. Use of a separate validation period is a standard modeling practice that ensures the model calibrations are relevant to other time periods. Using the same calibration and validation

periods is flawed because model assumptions may not be correct during different periods of time. This calibration used the eight years 2001-2008 based on a discussion with DWR staff that concluded there was a need for a long period with dry years. Unfortunately, the decision to use this long calibration period resulted in an invalid validation, since development of a separate validation period (a standard practice) did not occur due to lack of EC data outside of that period. DEIS/DEIR Appendix 5A, Section D, Attachment 1, Section 6. Without validating the model against another time period, the unjustified calibrations discussed above enable the model to match the 8-year calibration period chosen but their relevance to other time periods is unknown. As a probable consequence, DSM2-QUAL overestimates salinity in summer-fall and underestimates salinity in winter-spring. DEIS/DEIR Appendix 5A Section D Attachment 1 at 6-2, 6-3. It also performs worse outside of dry and critical years. DEIS/DEIR Appendix 5A, Section D, Attachment 1 at 7-1.

- EC boundary conditions at the upstream and downstream edges of the modeled area were not verified, but flow and stage verified with 2001-2004 data, and mismatches were corrected to use observed flows. DEIS/DEIR Appendix 5A, Section D, Attachment 1 at 2-4. The need for flow and stage corrections during the 2001-2004 verification period indicates that mismatches outside of that period should have been corrected as well, yet no verification outside that period occurred. No explanation for the differences is given, leaving the impression there is a lack of understanding of why the model differs so much from reality during the verification period: Mokelumne River 9% of the time, Calaveras River 2% of the time, Sacramento River 1% of the time. Presumably mismatches occur outside the verification period at the same rate. The implications of the mismatches on model accuracy and the lack of corrections outside the verification period cast doubt on modeled results and on the quality of the analysis of the environmental impacts of BDCP.

The DEIS/DEIR concludes that, "the channel dispersion factors were modified to simulate EC accurately." DEIS/DEIR Appendix 5A, Section D, Attachment 1, Section 7-1. Yet this is not the case since performance is often worse, and the changes were not justified, and the validation failed to use a different period than the calibration period.[35]

Despite the improved ability of the BDCP version of the DSM2-HYDRO model to predict hydrodynamics, the BDCP DEIS/DEIR identifies problems noted a decade and a half ago that remain unfixed in the hydrodynamics modeling. The DSM2-HYDRO model could have a datum problem at Rio Vista, where tidally-averaged stage is .7 feet lower than the observed water

[35] Calibration and validation have been defined by the American Society of Testing and Materials, as follows (ASTM, 1984. Standard Practice for Evaluating Environmental Fate Models of Chemicals. Designation E978-84. American Society of Testing Materials. Philadelphia, PA. 8 p.): Calibration - a test of the model with known input and output information that is used to adjust or estimate factors for which data are not available. Validation - comparison of model results with numerical data independently derived from experiments or observations of the environment.

levels. This is similar to the error observed during the 2000 calibration effort. No additional investigation appears to have occurred and there is no mention of the feasibility of fixing this error. Due to this error, "tidally-averaged metrics were not used as the key metric in assessing the stage calibration." DEIS/DEIR Appendix 5A, Section D, Attachment 1 at 4-5. However the implications of the lack of access to a reliable tidally-averaged metric are not explained. The possible relationship of this error in DSM2-HYDRO to the physically unjustified low point in dispersion coefficients at the same location in DSM2-QUAL is also not discussed. These seem likely to be related, and perhaps a simple resurvey of the datum used at Rio Vista would solve both errors. This is important because an error in the DSM2 model known for over a decade was not fixed when it was potentially feasible to do so, there was no disclosure of the steps needed to fix the error, and that error is in a location that has an important influence on tidal flows, salinity, and freshwater outflow. Failure to fix a basic error propagates that error in all the scenarios modeled. In a system with so much uncertainty, and so many important resources at stake, BDCP modelers must attempt to fix errors where they are identified, and identify why it is infeasible to fix errors when it is difficult to do so. The presence of such an error, even if limited in scope and significance, is an example of how BDCP's flawed modeling approaches have resulted in other errors we have discussed here. These compounded errors and faulty assumptions make the BDCP modeling an unreliable foundation for all the analyses discussed in the DEIS/DEIR.

The particle tracking model, DSM2-PTM, as used in the DEIS/DEIR Chapter 8 water quality analysis (and described in DEIS/DEIR 5A-A54) likely underestimates residence time, resulting in an underestimate of BDCP's impacts on water quality. Particles are removed from the system when they are diverted by agricultural intakes within the Delta, reducing residence time. Many constituents are not consumed by agriculture, so when the water is discharged back to Delta channels, the constituents return to Delta channels, concentrated by consumptive use. We stated previously, *see* 12/21/11 TBI, EDF, CCWD letter, at 13-14, that the analysis should be modified to properly account for the true residence time in the system. NMFS agreed that the DEIS/DEIR Chapter 8 water quality analysis is flawed. In a July 5, 2013 letter, NMFS stated:

> CALSIM and DSM2 were used for all constituents (with additional organism tissue models for selenium and mercury). However, DSM2 only directly models electrical conductivity (EC) and dissolved organic carbon (DOC). Other constituents were modeled as relationships to EC or using mass-balance calculations and outputs from CALSIM and DSM2 with the assumption that the constituents act in a conservative manner throughout the system, which is not universally applicable and could lead to inaccurate results. This method also results in a hybrid analysis which produces numerical output (seemingly quantitative) that is actually intended to be considered "qualitative" for several very important parameters such as DO, nitrogen, phosphorus and turbidity [see

> Table 8-61]. This approach also does not take into account the likely interaction of constituents, such as that between DO and DOC, or DO and temperature.

NMFS 2013, "Big Picture" Issues for the 2013 Admin Draft BDCP EIR/EIS, at 6, available online at:
http://baydeltaconservationplan.com/Libraries/Dynamic_Document_Library/Federal_Agency_Comments_on_Consultant_Administrative_Draft_EIR-EIS_7-18-13.sflb.ashx.

The DEIS/DEIR acknowledges problems with DSM2-QUAL as well, cautioning that, "[s]ignificant uncertainty exists in flow and EC input data related to in-Delta agriculture, which leads to uncertainty in the simulated EC values. Caution needs to be exercised when using EC outputs on a sub-monthly scale." DEIS/DEIR Appendix 5A, Section D, Attachment 1 at 7-2. Yet elsewhere the DEIS/DEIR incautiously claims that DSM2 can show daily or less time steps, "which can help understand how salinity moves within the system with more accuracy than CalSim." DEIS/DEIR Appendix 5A, Section D at 5A-208. The limited sub-daily accuracy of the model, when combined with the flawed water quality analysis, casts doubt on the value of the results. A proper approach would be, as suggested by NMFS, to explore additional analytical methods that can better characterize anticipated water quality conditions in the system, or to use smaller-scale models that focus on particular areas of concern.

TBI and others have discovered the modeling flaws cited above. It is entirely possible that there are additional unknown flaws and errors in the CALSIM II and DSM2 modeling. We and others have commented before that the models, including the recent modifications, need to be fully documented and properly validated and should undergo a peer review. 12/21/11 TBI, EDF, CCWD letter, at 10-11; *see also* "Comments on CALSIM II" from the Environmental Defense Fund, September 14, 2001. The modeling tools (described in DEIS/DEIR Appendix 5A) that simulate statewide operational changes for the SWP and CVP (CALSIM II) and hydrodynamics and transport within the Delta (DSM2) have known limitations in forecasting water supply and water quality conditions in the current configuration of the Delta. These same model tools have undergone numerous changes by the BDCP project team to implement the new OCAP BiOps under current conditions and to forecast conditions in a radically altered Delta. Although long overdue, the additional documentation provided in the public draft is welcome. However, proper validation and peer review are still missing.

B. Certain Water Quality Modeling Assumptions are Inconsistently Applied between Alternatives, Fail to Comply with D-1641 Requirements, and Fail to Reflect Likely Management during Droughts

In addition to some of the salinity problems identified above, the DEIS/DEIR and Draft Plan also contain additional modeling problems and assumptions regarding compliance with existing water quality standards.

First, D-1641 water quality standards require salinity compliance at Emmaton. BDCP proposes to move this compliance location to Three Mile Slough. The document also uses an inconsistent EC compliance point—Emmaton for Existing Conditions and the No Action Alternative, and Three Mile Slough for the proposed project. Due to this inconsistency, BDCP fails to adequately disclose the effects of moving the compliance point, since they aren't presented separately from the effects of BDCP's proposed water management and restoration. This proposal would reduce Delta outflow and harm fish and wildlife. Yet all of the alternatives—including the No Action Alternative--result in modeled exceedances at both locations, meaning all of the alternatives generate estimates that D-1641 standards will not be met, during some year types, for some of the required durations. DEIS/DEIR Appendix 8H, at Tables EC-1 through EC-20. The document claims that "many" of these are model anomalies, *see* DEIS/DEIR Appendix 8H, at 8H-1, but as a result of these repeated anomalies in the data, a meaningful evaluation is impossible.

BDCP not only proposes (without any scientific justification) to eliminate the Emmaton EC compliance point, but it conflates this location with Three Mile Slough. The presentation of Emmaton EC and Three Mile Slough EC as equivalent in the BDCP DEIS/DEIR is misleading. DEIS/DEIR Appendix 8H tables EC-1 through EC-20 show exceedances of Water Quality Control Plan objectives for each alternative. The State Water Board previously recommended using Emmaton as the compliance location in the modeling for all of the alternatives, SWRCB 7/5/13 BDCP Comments at 21-22, yet the BDCP DEIS/DEIR fails to do this: the first row of each table (except EC-11) compares the effects on EC at Three Mile Slough under the alternatives to EC at Emmaton under Existing Conditions and the No Action Alternative. This juxtaposition of the two locations implies they are equivalent, however the second row of each table shows that EC exceedances at Emmaton are expected to occur a much greater percentage of the time than at Three Mile Slough under all scenarios evaluated. This comparison reveals that it is incorrect and misleading to say that EC at Three Mile Slough is the same as EC at Emmaton under any alternative, including No Action and Existing Conditions, and the first row of each table conflating the two locations should be deleted or modified. Since the model appears to be capable of estimating the difference in EC between the two locations under each alternative,[36]

[36] As stated above, the EC analysis is substantially flawed. The DEIS/DEIR admits that water quality results and conclusions drawn from DSM2-QUAL outputs for individual stations are suspect and may not

the table should be modified with actual model output for the Existing Conditions and No Action alternatives at Three Mile Slough. The DEIS/DEIR cannot conflate results for Emmaton and Three Mile Slough. The tables beginning at EC-12 show color-coded results from analyses that were performed on the erroneous comparison—in addition to deleting this top row, any results and conclusions from it that were used elsewhere should be deleted as well.

The actions of DWR and USBR this year demonstrate that the EC differences between Emmaton and Three Mile Slough are real and that results for the two sites should not be conflated. For instance, the April 9, 2014 Temporary Urgency Change request to the Water Board proposed that while emergency drought barriers are in place, "The compliance location for the D-1641 Agricultural Western Delta Salinity Standard at Emmaton (14-day running average of 2.78 millimhos per) is moved to Three Mile Slough on the Sacramento River." DWR and USBR, April 9, 2014, request for Temporary Urgency Change, at 5, available online at: http://www.swrcb.ca.gov/waterrights/water_issues/programs/drought/docs/tucp/031814order_urgchg_swcv/20140409_petitioners_request.pdf (incorporated by reference). DWR and USBR further explained:

> These two forecasts show a gain of 149,000 AF in cumulative end of September carryover storage between all reservoirs as a result of implementing the emergency drought barriers. However, as described below, this savings in storage would only be achieved if the D-1641 Agricultural Western Delta Salinity Standard at Emmaton is set aside while the emergency drought barriers are in place. If hydrologic conditions warrant that sufficient water is available in upstream reservoirs to maintain this Emmaton standard, or a modification of the standard that would move the compliance point to Three Mile Slough on the Sacramento River, emergency drought barriers would not provide any savings in Delta outflow needs or end of September carryover storage in upstream reservoirs.

Id.[37] The models are "trained" to modify operations to meet the EC standard, although the training is never perfect and generally a few exceedances are found in planning model runs.

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be representative of the likely conditions under BDCP, and therefore the lower Sacramento River stations should be viewed as a group. DEIS/DEIR Appendix 5A, Section D, Attachment 1, Table 6-3. Given that the numbers in the tables are incorrect, our discussion here focuses on the misleading presentation of the results, and not the likely erroneous results themselves.

[37] This and other elements of the 2014 Temporary Urgency Change Petitions and Orders raise additional concerns regarding future compliance with water quality and other regulatory standards during dry and drought conditions. BDCP provides no information regarding how often TUCs like this one would be requested, and does not analyze the impacts of such requests. This is yet another undisclosed impact of BDCP. DEIS/DEIR Appendix 8H-1 is misleading where it states that "DWR and USBR have every

However, the BDCP runs show far more frequent and extreme exceedances than has been commonly observed in previous planning studies. Tables EC-1 through EC-20 show greatly varying exceedances at Emmaton and Three Mile Slough for each alternative. The DEIS/DEIR Appendix 8H-1 (additional descriptions of the model limitations related to the water quality modeling results are found in Appendix 5A) states that "many" exceedances of D-1641 standards are model anomalies, and "DWR and USBR have every intention of operating SWP and CVP facilities by fine tuning reservoir storage and exports in real time to meet D-1641 standards, and any changes to D-1641 as adopted by the SWRCB." DEIS/DEIR Appendix 8H at 8H-1. This statement, when combined with the prevalence of exceedances in the model results, raises many unanswered questions:

- What proportion of the exceedances are anomalous? Which of the EC exceedances are model anomalies, and which are expected to occur under BDCP?
- Is the ability to meet water quality standards more achievable under some alternatives than others?
- If the intent is that each alternative will result in exceedances 0% of the time, and all cases of exceedance are model anomalies: 1) why is there so much variance in the anomalies; 2) what is the purpose of presenting the anomalies without more context, such as error bars; 3) how were these results used in the analysis; 4) what evidence is there to show that there will be no exceedances under any alternative; and 5) under what conditions would exceedances be unavoidable and how often would this situation occur?
- If the intent is that exceedances will be minimized, but real differences in EC compliance exist between the alternatives, then the anomalies should be better-characterized so that only the real differences between the alternatives are presented. The way the results are presented combined with the disclaimer, the analysis is not useful, and does not enable a decision maker or the public to answer any of the questions posed above.

The DEIS/DEIR states that, "If necessary, comparisons of model results against threshold or standard values should be limited to comparisons based on cumulative probability distributions." DEIS/DEIR Appendix 5A, Section C, at C6. Yet the exceedance of a standard should result in probabilities close to zero, and the lack of such output indicates that the models are inaccurate.

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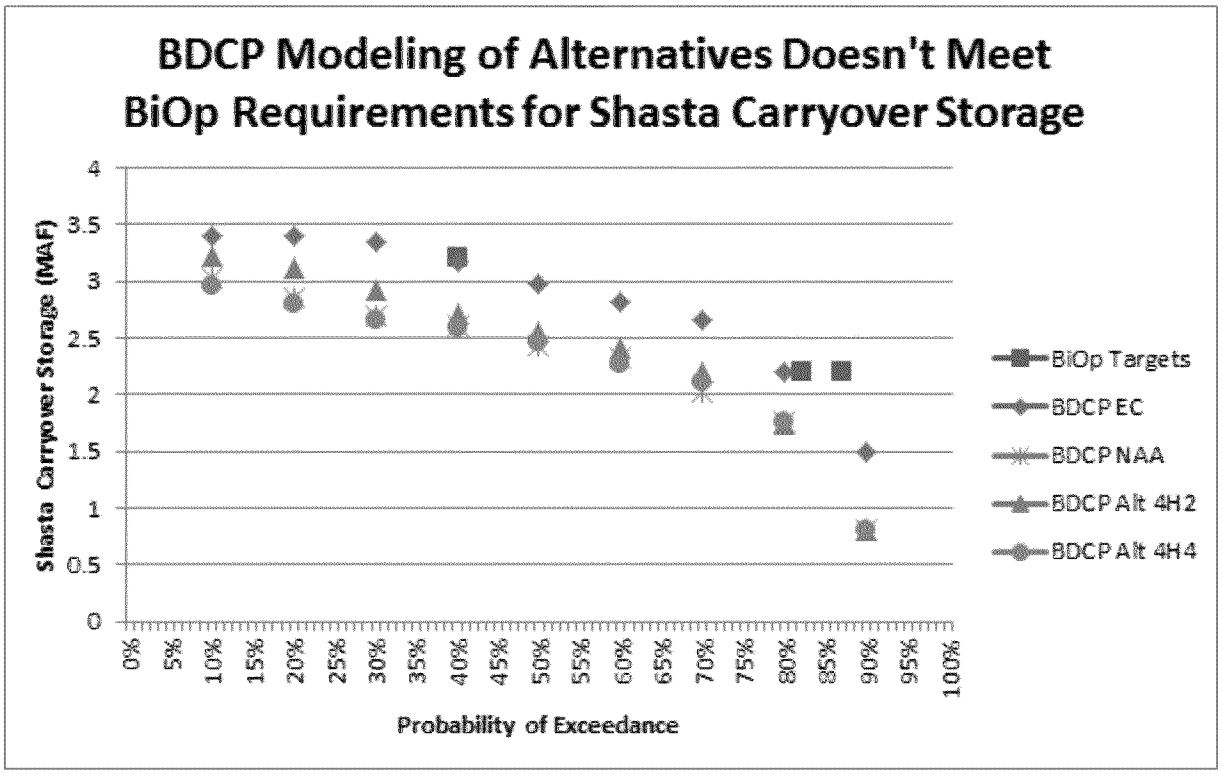
intention" of meeting D-1641 standards. This does not seem to be the case in certain dry years such as 2013 and 2014, and the effects of similar relaxations of water quality standards and other environmental requirements in the future are not analyzed or disclosed in the DEIS/DEIR, despite the fact that such changes are reasonably foreseeable. According to the 2014 independent panel review of delta outflow and other stressors, "The average measured Delta outflow during fall 2013 was approximately 2,000 cfs, which failed to meet the Board's minimum outflow requirement of 3,000 to 3,500 cfs for fall months of a critically dry year." DSP Outflows Review Panel Report 2014 at 15. Likely future waivers and relaxations of standards modeled in BDCP are yet another example of how the modeling of BDCP fails to accurately assess likely environmental impacts.

Second, D-1641 sets limits on south Delta exports based on Delta inflow, known as the export:inflow ratio (E/I ratio), during certain months of the year. The inconsistent application of the allowable E/I ratio to the different alternatives and scenarios, *see* DEIS/DEIR at ES34-ES35, is a long-standing problem with the BDCP modeling. BDCP defines the D-1641-E/I ratio—except in scenarios H2 and H4—to ignore both the inflow to the Delta being exported by the proposed north Delta intakes and those exports, thus exempting the north Delta intakes from compliance with the D-1641 export/inflow requirement. In contrast, the intent of the D-1641 E/I ratio is to limit pumping by the CVP/SWP to a fraction of Delta inflow, regardless of where the CVP/SWP intakes are located. The sensitivity analysis memo (DEIS/DEIR at 5A-D148) characterizes the approach taken in H2 and H4—the NMFS approach—as minimally different from the BDCP approach, and if this is the case, then it is unclear why a single approach was not universally followed for clarity and simplicity. Using an inconsistent E/I ratio introduces complexity, confusion, and obfuscation where there is no need for it, hampering the transparent and concise disclosure of impacts to decision makers and the public.

C. The DEIS/DEIR Fails to Incorporate CVP/SWP Legal Constraints on Upstream Water Temperature in its CALSIM II Modeling, Resulting in a Failure to Adequately and Accurately Assess the Effects of Current and Proposed Operations Both Upstream and in the Delta

The BDCP CALSIM II modeling fails to accurately model how reservoirs would be operated to adapt and minimize the effects of climate change and project operations on listed species and water supply, leading to inaccurate modeling results that likely underestimate environmental impacts of BDCP in the Delta. Once again, the documents offer yet another modeling disclaimer, noting that the model results may be unlikely to actually occur: "…the BDCP does not change Shasta Reservoir and upper Sacramento River operating criteria, so that changes in upstream areas derived from modeling, be they positive or negative, may not be fully reflective of the nature of actual changes that could occur." Draft Plan at 5.5.3-45. The modeling appendix shows markedly decreased end-of-year storage in Shasta Reservoir under the proposed project late long-term scenario (and even under the No Action Alternative). DEIS/DEIR 5A-C42 to 5A-C45. BDCP CALSIM II model projections for carryover storage at Shasta Reservoir do not attain those required by the NMFS 2009 Biological Opinion (RPA Action 1.2.1 at 592). In particular, as the graphic below shows (based on information in the DEIS/DEIR), the that the carryover storage targets of 2.2 MAF in 82% and 87% of years and 3.2 MAF in 40% of years in the 2009 biological opinion are not attained.[38]

[38] The DEIS/DEIR fails to demonstrate whether operations will achieve the 2009 NMFS biological opinion's performance measures for temperature compliance points on the Sacramento River, but it would



The NMFS RPA prescribed these carryover storage targets as the minimum necessary to protect winter-run Chinook salmon (and other listed salmonids) spawning in the Sacramento River. They also provide ancillary protection to fall run Chinook salmon spawning in the same rivers. Modeled operations for all BDCP alternatives lead to significantly worse operational effects upstream on salmon than the minimum required under existing biological opinions.

In contrast, modeling of existing conditions comes close to achieving the NMFS carryover storage targets for Shasta, and the independent effort by MBK Engineers appears to have used CALSIM II to correctly model BDCP with the required NMFS 2009 Biological Opinion exceedances. Modeling in BDCP needs to be revised to achieve these carryover storage requirements of the 2009 biological opinion, as these other efforts demonstrate that such modeling is feasible and has already been prepared.[39]

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appear unlikely given the failure to achieve carryover storage targets. 2009 NMFS Biological Opinion at 592.

[39] In addition, modeling BDCP operations that fail to achieve the carryover storage requirements of the 2009 NMFS biological opinion is not consistent with the objectives of the Draft Plan. *See, e.g.*, Objective WRCS3.1 for winter-run Chinook salmon, which states that the BDCP will, "Implement covered activities so as to not result in a reduction of the primary constituent elements of designated critical habitat for winter-run Chinook salmon upstream of the Plan Area).

Unrealistic reservoir management (even under the No Action Alternative) is another significant modeling flaw that makes analyses of downstream operations and environmental impacts inaccurate and unreliable. In order to meet existing reservoir carryover storage targets, BDCP likely will have to reduce reservoir releases as compared to modeled operations, which will have cascading impacts on downstream operations (e.g., Delta outflow, Delta inflow, and exports) and on environmental impacts to fish and wildlife.

In addition, these same flawed modeling assumptions also result in additional drawdowns of Trinity Reservoir, *see* DEIS/DEIR Appendix 5A at C10, which would affect that river's Coho and Chinook salmon populations at well as its steelhead. As with the Shasta Reservoir modeling, these drawdowns occur even under the No Action Alternative. These impacts should not and are unlikely to be allowed to occur. As a result, the modeling is unrealistic and misrepresents likely water management and likely environmental impacts under BDCP.

D. Modeling of Operations Relating to the High Outflow Scenario are Flawed, and Demonstrate that the High Outflow Scenario is Not Reasonably Certain to Occur in Many Years

BDCP's assumption that outflows sufficient to meet the High Outflow Scenario (HOS) will occur when needed is flawed, and the current approach to achieving the HOS does not appear reasonably certain to occur. BDCP plans to release the enhanced spring outflow in the Alternative 4 High Outflow Scenario from Oroville Reservoir in order to avoid impacting storage in other reservoirs. However if end-of-May Oroville storage is projected to be less than 2 MAF, additional flow is not released, nor is flow released above the 17,000 cfs power house capacity. In drier years, only export curtailment is used to achieve the HOS spring outflow, unless exports would be less than 1500 cfs. The DEIS/DEIR does not clearly document how often these combined limits are expected to prevent the HOS spring outflow from occurring. The end-of-May storage offramp is expected to occur 30% of the time, *see* DEIS/DEIR, Appendix 5A, at C73, and the 1,500 cfs export offramp is expected to occur as much as 40% of the time, *see* DEIS/DEIR, Appendix5A, at C320. As such, it appears that the BDCP HOS will not be achieved a significant portion of the time, contrary to the assumptions in the environmental analyses.[40]

In addition, the proposed reoperation of Oroville Reservoir to achieve the High Outflow Scenario should be peer reviewed. NMFS has commented in the past that:

[40] The 2014 review of BDCP modeling by MBK Engineers also found significant flaws in the modeling of the High Outflow Scenario.

> the potential temperature compliance point included in the Dec 2012 Settlement Agreement for Licensing of the Oroville Facilities… would require compliance to 64° F from May-September in the high flow channel, and the Robinson Riffle criteria for protection of spring-run Chinook in the low flow channel, which could be affected as a result of changes in end of May storage and resulting diminishment of the cold water pool. Because of the potential biological importance of re-operation of Oroville, we recommend that the entire set of decisions and effects analysis be submitted for independent peer review to further assist in predicting these effects.

NMFS 2013 Progress Assessment at 21. In addition to the failure to properly model the reoperation of Oroville Reservoir or the temperature constraints downstream of it and other reservoirs, the way the temperature model output is presented renders the analysis invalid. One of the appendices states:

> There would be small to moderate reductions in May storage and small to moderate increases in September storage under the HOS relative to the ESO. Despite these changes, year-round water temperatures in the Feather River would not substantially [sic] changed by HOS or LOS scenarios, because mean monthly water temperatures would not differ by more than 4% from those under ESO regardless of month or water-year type (Table 5C.5.2-154 through Table 5C.5.2-157).

Draft Plan, Appendix 5C, at 5C.5.2-292. This temperature analysis is fundamentally flawed and will likely result in significantly greater environmental impacts than identified in the documents, because:

First, a percentage change in temperature is meaningless and an invalid means of determining impacts or comparing alternatives; instead, the focus should be whether the changes exceed biologically important thresholds. Thresholds are biologically more important than absolute differences (or percentage differences). An increase in temperature that crosses a biological threshold is more significant than a larger increase that stays below the threshold. The 3.5% maximum increase predicted for September of Below Normal years under HOS, *see* Draft Plan, Appendix C, at Table 5C.5.2-156, appears to be based on a 2.1 degree Fahrenheit increase over a temperature of 61 degrees, *see* Draft Plan, Appendix C, at Table 5C.5.2-154.[41] This same increase when measured on the Celsius scale is 7.5%. Regardless of each percentage increase being correct and misleading without additional context, a 2.1 degree F increase in water

[41] This does not match the other table, even when rounding is considered.

temperature can have significant lethal and negative sub-lethal effects on salmonid and non-salmonid species.

Second, mean monthly water temperatures are a poor indicator of biological conditions – salmon and other native fish and wildlife respond immediately and dramatically to actual temperature conditions, and lethal and sub-lethal temperature thresholds are frequently measured as daily, 3-day, or 7-day averages. However, a monthly average temperature will frequently be exceeded on a weekly or daily basis – the frequency and magnitude of the exceedances are inversely related to the length of the relevant timestep. Summertime peaks, daily fluctuation, and exceedance curves for important biological thresholds would provide more accurate assessment of environmental impacts.

E. The DEIS/DEIR Fails to Adequately Analyze Environmental Impacts in the Early Long Term (ELT)

The DEIS/DEIR generally only provides modeling results for the Late Long Term (LLT – 60 years from now), and it states that, "For the purpose of BDCP EIR/EIS impacts evaluation, Alternatives' modeling results at LLT phase are considered." DEIS/DEIR Appendix 5A at A-4. The lack of modeling and analysis of operations and environmental impacts in the Early Long Term (ELT, which includes climate change effects in 2025) prevents a meaningful analysis. ELT results are needed to help distinguish the effects of climate change from project operations and to demonstrate the impacts during the first several decades of operations. There are significant changes in operations, flows, and environmental impacts between the ELT and LLT; for instance, this table below shows changes in exports between the ELT and LLT.

Average Annual Exports	ELT	LLT
Alternative 4 HOS	4,705 cfs	4,413 cfs (-6%)
Alternative 4 LOS	5,591 cfs	5,255 cfs (-6%)

Source: Draft Plan, Chapter 5, at Tables 5.3.2 – 5.3.3. HOS is the High Outflow Scenario and LOS is the Low Outflow Scenario.

The DEIS/DEIR Appendix 5A Section C (CALSIM II and DSM2 Modeling Results) presents LLT modeling results only. We echo the comment previously made by the Delta Stewardship Council that BDCP needs to provide modeling results for ELT, not just LLT, in the DEIS/DEIR. Delta Stewardship Council, Responsible Agency Comments, 2013 Administrative Draft, Bay Delta Conservation Plan Environmental Impact Report/Environmental Impact Statement, July 11, 2013 ("DSC 2013 BDCP Comments"), at 17, available online at: http://deltacouncil.ca.gov/sites/default/files/documents/files/DSC_Letter_on_BDCP_Review.pdf (incorporated by reference).

F. The Presentation of Average Results (Including Flows and Temperatures) Obscures and Understates Likely Environmental Impacts

As the DEIS/DEIR repeatedly warns, model output for a single point in time is not necessarily reliable, and therefore proper use of results requires "much caution" and is limited to a general comparison of relative averages and exceedances on a monthly basis. *See* DEIS/DEIR Appendix 5 at 5A-A15, 5A-B199, 5A-C5, and 5A-C6. Although some sub-monthly modeling was conducted for the north Delta intakes, and some hydrodynamic modeling used sub-daily flows, BDCP generally used monthly average flows in its hydrologic modeling. At times, annual or year-type averages are presented in the Draft DEIS/DEIR. While use of averages can at times be helpful, it is not always the proper tool for use in assessing impacts, and without proper context, it can obscure potential impacts, especially in biological systems where outcomes are often determined by threshold and extreme values, more than by average conditions. Average results from physical models were presented in the BDCP DEIS/DEIR in the following ways that obscure potential impacts:

- In the in the DEIS/DEIR Appendix 5A Section C, BDCP exports are shown as year-type averages. There can be significant year-to-year variability in exports. Averaging fails to convey that variability and the associated variability in export-related impacts. For example, conditions that produce the highest entrainment values may control outcomes in future years, more than the average, long-term condition (an extreme example would be that an extinction or near-extinction event in one year will not be mitigated by improved conditions in subsequent years). More information than just the average needs to be presented.
- The averaging period proposed for OMR flows is undisclosed in the Alternative 4 Decision Tree Scenarios. Table B-13 from the DEIS/DEIR, Appendix 5A, Section B lists monthly average flows, yet states that USFWS and NMFS OMR criteria would be met, which require compliance on a 14 day average basis. Without presenting the most-negative flows, the DEIS/DEIR fails to disclose the full impacts to the Delta ecosystem and fails to demonstrate that operations would comply with the biological opinions.[42]
- The averaging period proposed for Sacramento River bypass flows is undisclosed in the Alternative 4 Decision Tree Scenarios. Table B-13 from the DEIS/DEIR, Appendix 5A, Section B does not state if it is a daily average or an instantaneous flow. The SWRCB has expressed concern that reverse flows at Freeport would become more common July-

[42] In addition, neither Table B-13 or any other information in the DEIS/DEIR or Draft Plan explains how OMR rules based on water year type will actually be implemented (given the inability to precisely forecast water year type, particularly early in the year), what method of forecasting will be used, and how that may differ from modeled operations and thus modeled environmental impacts. The same is true for other operational parameters that are based on water year type.

November if BDCP fails to apply the bypass flow on an instantaneous basis. SWRCB 7/5/13 BDCP Comments at 13. The impacts of the proposed averaging period on biological resources must be disclosed.

- The DEIS/DEIR appendices do not appear to analyze the effect of changed residence time but rather draw a conclusion based on the average change in residence time over all time periods. DEIS/DEIR Appendix 5C. Residence time is presented for a limited number of time periods of the model simulation period to represent a variety of hydrologic conditions. Residence time in the Delta changes dramatically in response to hydrology and operations. *See* DSP Independent Science Review Panel Report 2014 at 65. Changes in residence time would be expected to alter primary productivity, pH, and temperature, and thus alter transformations of constituents, with longer residence times likely to negatively impact water quality and ecosystem function. However, average change is not relevant to any processes and thus not important to any covered species. This analysis should be expanded and the results should be integrated into other areas of Appendices C and D.
- ESO flows could be as much as 6500 cfs less than EBC2 flows (in November) when months are evaluated individually, and not grouped by month and water year type.[43]

In a comment letter on the administrative draft Plan and DEIS/DEIR, NMFS stated:

> The results of these models signal a need for further investigation to determine why they are not what are "expected". It seems that upstream releases between ESO and EBC2 do not match as well as thought, as seen in Plan Table C.A-47 and EIR-EIS Tables C-15-5,6,7,8.[44] Some summertime and fall months in drier years are very different, which may be what is causing the biological models to show a negative egg survival response. The table below shows the results of month-to-month comparisons of flows out of Keswick for LLT. It indicates that the ESO flows could be as much as 6500 cfs less than EBC2 flows (November) when months are evaluated individually, and not grouped by month and water year type.

NMFS 2013 Progress Assessment at 12.

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[43] In addition, BDCP modeling shows delta outflow in October of many years in excess of BDCP's proposed operational requirements. *See* Mount and Saracino et al. 2013 at 48, 52, 64-66. They concluded that these modeled outflows, which would substantially benefit delta smelt, are unlikely to occur. *Id.*
[44] This reference is to Table C.5.2-2 in the Administrative Draft Plan, entitled "Difference and Percent Difference in Flows in the Sacramento River at Keswick, Year-Round." For reasons that are not explained, this Table has been removed from the public draft documents, and the Draft Plan and DEIS/DEIR fail to explain whether and how this discrepancy was resolved.

The Plan and DEIS/DEIR often analyze averages when averages are not the proper tool for assessing impacts, however the inverse problem occurs with the use of physical model results in other models. If BDCP were to heed its own warnings about the proper use of these results, then it would only use averages and statistical representations of the model output as input to other models. Since averages are often not the proper tool for assessing impacts, this approach would leave biological models lacking input data. But the public BDCP documents appear to be scrubbed of non-averaged data, yet those detailed data were still used in biological models inappropriately. This results in documents that hide potential impacts from the public, and present overly-confident biological model results. A proper, more consistent and informative approach would be to allow use of detailed physical model results—both in other models and the public documents—on a case by case basis based on a detailed understanding of model accuracy and errors, and to prohibit use of potentially erroneous results on a case by case basis as well. This would maximize the value of the modeling and minimize the propagation of errors.

III. BDCP FAILS TO USE A SCIENTIFICALLY SOUND APPROACH TO SETTING BIOLOGICAL OBJECTIVES, IDENTIFYING AND EVALUATING STRESSORS, AND DESIGNING CONSERVATION MEASURES

Our organizations have been involved with the planning of BDCP's conservation strategy (Conservation Strategy) for several years. Throughout that time, we have emphasized the need for a planning and evaluation process and a project description that clearly articulate the project's goals and its specific biological outcomes (objectives) and that clearly links those targets to the factors that impair the ecosystem and covered species in the Delta today (stressors). The Draft Plan should then describe extent that stressors must be ameliorated (stressor reduction targets) in order to achieve its objectives; this description of the problem sets the context for designing actions (conservation measures) that the Draft Plan will undertake to alleviate stressors. Finally, the intended outcomes (projected effects) of the individual conservation measures should be tabulated and explicitly compared to the Draft Plan's stressor reduction targets and, ultimately, its objectives, so that the public can clearly understand the need for and relationship among various Plan elements as well as the adequacy of and logic behind the Conservation Strategy. In numerous letters, memoranda, and meetings with all BDCP parties, we described the structure of this "Logic Chain" and the importance of such a transparent explanation of the Conservation Strategy both for (a) evaluation of the project proposal in the permitting phase (i.e. is the Plan sufficient to accomplish the needed ecosystem improvements?), and (b) the post-implementation, adaptive management phase (i.e. have Plan components produced the anticipated benefits or is there a need to adjust the suite of measures or their implementation?).[45]

[45] *See, e.g.*, Letter from TBI, EDF, and DOW to BDCP Steering Committee, December 20, 2009; Letter from American Rivers et al. to BDCP Steering Committee, November 3, 2010; Memorandum to J. Meral and D. Nawi from J. Cain et al. re: Necessary analytical steps for completing a successful BDCP

We have persistently encouraged BDCP to utilize criteria for viable populations (McElhany et al. 2000; Lindley et al. 2007) to identify and address important conservation needs and opportunities of the covered species. *See, e.g.,* Letter from TBI, EDF, and DOW to BDCP Steering Committee December 20, 2009. This approach emphasizes that viable populations simultaneously display adequate levels of four key attributes of viability: abundance, productivity, spatial distribution, and life-history or genetic diversity. The essential nature of these attributes of viability is generally accepted throughout the conservation science literature. Meffe and Carrol 1994. We review the Draft Plan and DEIS/DEIR through this lens because, even though the attributes influence each other, actions in the Plan may impact species viability by altering one or more of these attributes, independent of effects on other attributes. The assessment of Plan impacts on covered species should address positive and negative effects to each attribute of viability. We briefly review the meaning of each of these attributes of viability here.

Abundance: The number of organisms in a population is a common and obvious species conservation metric. For instance, endangered species recovery plans (USFWS 1996; NMFS 2014) and conservation programs such as the Anadromous Fish Restoration Program (AFRP) generally identify abundance targets against which conservation success may be measured. Populations or species with low abundance are less viable and at higher risk of extinction than large populations for reasons that include environmental variation, demographic stochasticity, genetic processes, and ecological interactions. Abundance is also correlated with and contributes to other viability characteristics including spatial extent, diversity, and productivity. In itself, however, simply increasing abundance of organisms (or any other single viability characteristic) is not sufficient to guarantee viability into the future.

Productivity: The ability of populations to grow when conditions are suitable is essential to conservation success. Species or populations that display persistent negative population growth, as well as populations with limited ability to respond positively to favorable environmental conditions, are less viable and at higher risk of extinction. As we use them here, productivity parameters are expressed as rates (such as survival rate, offspring per adult female, etc.) and, refer to the ability of organisms to survive to reproduction and their reproductive success in the absence of density-dependent factors. Desirable population growth rates are commonly determined by identifying an abundance target and a date in the future by which that abundance should be attained; the population growth rate is then calculated as the minimum population

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Environmental Effects Analysis (EA) and NEPA/CEQA document, July 11, 2011; Memorandum to J. Meral et al. from TBI, EDF, and Contra Costa Water District re: Review of Appendices C and D, December 21, 2011; Memorandum to J. Meral from J. Rosenfield re: "Review of BDCP Effects Analysis Appendix G" December 22, 2011; Memorandum to J. Meral et al. from J. Rosenfield re: "Preliminary Review of BDCP Effects Analysis Appendix F", February 9, 2012.

growth needed to achieve the desired abundance in the available time frame. This approach does not always provide adequate productivity as it may result in population growth rates representing impaired productivity for a given species (for instance, if the abundance target could be achieved in less time by a more "healthy" population). While population growth rates vary, depending on environmental conditions, demographic conditions, and how abundance relates to local carrying capacity, species are often characterized as having "intrinsic" population growth rates that reflect their life history and demographic characteristics (age at first reproduction, fecundity, survival, and sex ratio). The reproductive success rates and life-stage specific survival rates observed under good conditions in the field, and in the absence of density-dependent limitations, are valid reference points for determining adequate productivity of managed populations.

Spatial Distribution: Maintaining or restoring spatial distribution of fish and wildlife species is a critical component of protecting these species and maintaining the public trust. The notion that spatial distribution is inversely proportional to extinction risk is axiomatic to modern conservation biology. MacArthur and Wilson 1967; Meffe and Carrol 1994; Laurance et al. 2002. Populations or species with limited or less varied geographic distributions are more vulnerable to catastrophic events, such as an episode of lethally elevated water temperature, disease, a toxic spill, drought, or other localized disturbances. The effect of geographic distribution on extinction risk is also apparent in the geographic attributes of extant freshwater fish species. Rosenfield 2002. Increased spatial distribution reduces susceptibility to localized catastrophes, predator aggregations, and disease outbreaks while simultaneously increasing the probability that at least some dispersing individuals will encounter habitat patches with favorable environmental conditions. The need to maintain adequate spatial distribution is regularly acknowledged in regulatory planning and decision-making regarding the Delta and its environs. *See, e.g.,* NMFS 2014.

Life-History and Genetic Diversity: Natural diversity needs to be protected both within populations of specific public trust species and within the ecosystem as a whole. Natural diversity (life history patterns) allows organisms to adapt to and benefit from environmental variability. In addition, variability among individuals in a population increases the likelihood that at least some members of the population will survive and reproduce regardless of natural variability in the environment. Diversity across a population is especially important in highly variable ecosystems such as the Delta. Although only genetically based traits are subject to evolution and not all diversity is genetically-based, it is a trait itself (genetically based or not) that confers the ability to survive and reproduce in different environments. Thus, in a conservation sense, both genetically-based diversity and phenotypic diversity that is a response to the environment (eco-phenotypic diversity) are important and must be conserved. Many of the native fish species in the San Francisco Estuary demonstrate high levels of life-history diversity that is believed to reflect the evolutionary history of success in environments that changed, unpredictably from year-to-year. Bennett 2005; Williams 2010; Rosenfield 2010; Miller et al.

2010. Thus, differential impacts to particular life history types (e.g. early migrants, late-spawning individuals, slow growing individuals, etc.) should be avoided to maintain viability of covered species.

In the logic chain planning framework, species-specific objectives are always expressed in terms of desired levels of these attributes of viability – objectives define the parameters that reflect viability for each species concerned. Lower levels of the logic chain (e.g., stressors, stressor reduction targets, conservation measures) articulate hypotheses regarding how the conservation strategy may attain these desired levels of abundance, productivity, spatial distribution, and diversity. Even though the Draft Plan provides a description of the attributes of viability as applied to the covered species, Draft Plan at 5.2-26, it frequently confounds these basic metrics of desired outcome with "habitat" conditions it believes will produce improved viability. In so doing, it improperly substitutes a hypothetical means of achieving success (such as "habitat restoration") for a definition of success for conserving species in the Plan Area (SMART targets for each attribute of viability) and that substitution changes the definition of success from conserving viable populations to providing specified quantities and qualities of "habitat." Furthermore, the Draft Plan generally fails to identify SMART objectives for covered species related to each of the four attributes of viability; when it does identify objectives reflecting the attributes of viability, the Draft Plan and the DEIS/DEIR fail to analyze the conservation strategy and operational alternatives in terms of their ability to attain these foundational targets.

As currently drafted, the BDCP repeatedly fails to adequately articulate or identify in a logical, transparent, and consistent manner the connection between its goals, objectives, stressors, stressor reduction targets, and conservation measures; in many cases, the explanation of one level of the Plan's logic chain contradicts the rationale provided for the level above or below it (e.g. conservation measures do not address presumed stressors, or stressor reduction targets are clearly inadequate to attain the Plan's stated objectives). Adequately described Plan objectives (those that would be useful in evaluating the draft Plan and in adaptively managing implementation of a final Plan) must be specific, measureable, achievable, relevant to a particular goal, and time-bound; most of the draft Plan's objectives do not include all of these essential elements. To the extent that objectives are adequately described, many of them are clearly inadequate to attain species-specific goals or the larger goal of ecosystem restoration. The DEIS/DEIR fails to rigorously evaluate many intended outcomes of the Conservation Strategy in even a qualitative fashion and many of the outcomes that are evaluated are not compared to the desired outcomes described in the biological goals and objectives or stressor reduction targets. Furthermore, the Plan overstates the benefits arising from the Conservation Strategy; the outcomes described in the DEIS/DEIR do not match those the Plan needs to attain, as described by its own biological goals and objectives (*see* Chapter 3 Conservation Strategy). Finally, numerous inadequacies and potential biases in the analyses of conservation measure outcomes are addressed below.

The importance of, and functions served by, well-defined desired biological outcomes of the Plan (biological goals and objectives) are adequately described at the outset of the Conservation Strategy, which states:

> Biological goals and objectives are the foundation of the Conservation Strategy and are intended to provide the following functions.
>
> - Describe the desired biological outcomes of the conservation strategy and how those outcomes will contribute to the long-term conservation of covered species and their habitats.
> - Provide, where feasible, quantitative targets and timeframes for achieving the desired outcomes.
> - Serve as benchmarks by which to measure progress in achieving those outcomes across multiple temporal and spatial scales.
> - Provide metrics for the monitoring program that will evaluate the effectiveness of the conservation measures and, if necessary, provide a basis to adjust the conservation measures to achieve the desired outcomes.

Draft Plan at 3.1-3. In order for objectives to provide adequate guidance to project planners, decision-makers, and the public and, in order to realize the functions the Plan identifies for them, BDCP's objectives must be specific, measureable, attainable, relevant to the goal they describe, and time-bound ("SMART"). The requirements for SMART objectives are well-developed in the business planning literature, and BDCP purports to provide SMART objectives. *See* Draft Plan at 3.3-3. However, as we discuss, most of the objectives in the Plan do not meet the SMART criteria.

The Conservation Strategy describes numerous biological goals and objectives (a welcome advance over previous versions of the Plan that we have reviewed); however most of the objectives fail to satisfy the intended functions of Biological objectives described above. Many of the goals and objectives are not adequate to produce the level of benefits to ecosystem processes and covered-species that are required by an HCP/NCCP and most of the objectives are not adequately defined. Of equal concern, the Plan's approach (its Conservation Strategy) for attaining objectives largely or completely ignores certain key stressors that are believed to inhibit the ecosystem today and the conservation measures do not match with the stressors that are identified as driving ecological decline/preventing ecological restoration in the Project Area. Finally, analysis of outcomes anticipated to result from the Conservation Strategy (in both the Plan and DEIS/DEIR) are either not compared to the stated objectives and/or stressor reduction Targets or demonstrate that the Plan will not attain its objectives and stressor reduction Targets.

A. Many of the Biological Goals and Objectives are not Legally Adequate

Numerous objectives in the BDCP Conservation Strategy merely codify the status quo; in some cases they allow for further deterioration of covered species' populations and ecosystem elements. As we have previously emphasized and discuss elsewhere in these comments, because the BDCP is intended to serve as the basis for regulatory compliance with the NCCPA, the Draft Plan must provide for the conservation and management of Covered Species within the Planning Area. For species that exist exclusively within the BDCP Plan Area, the BDCP must provide the measures necessary for the species' conservation (recovery). For species that migrate through the BDCP Plan Area, BDCP must provide measures necessary for the species' conservation in the Plan Area. *See* Letter from Defenders of Wildlife, TBI, and NRDC to Chuck Bonham dated July 10, 2013; *see* discussion *supra* in section I(A). Beyond simply mitigating impacts of the Plan, conservation measures must be drafted to deal with both covered activities' impacts and to achieve conservation of the covered species in the Plan Area. Because the NCCPA defines conservation with respect to species' status and biological needs, as opposed to simply analyzing and mitigating for the Plan's impacts on the covered species, a Plan's conservation measures must be designed to be consistent with what is necessary to "conserve" or recover a covered species and only activities "compatible" with conservation are permitted.

1. The Biological Objective for Longfin Smelt Productivity is Inadequate

One of the BDCP's objectives for longfin smelt (Objective LFSM1.1) states that BDCP will "Achieve longfin smelt population growth", such that "Future indices of annual recruitment [...] are equal or exceed expected levels based on the 1980–2011 trend in recruitment relative to winter-spring flow conditions." Draft Plan at 3.3-120. The Conservation Strategy provides a specific definition of annual recruitment and explains that the objective will be met: "...if, after year 10, 50% (5 of each 10 consecutive years) or more of future indices... " reflect higher abundance than would be predicted based on the 1980-2011 relationship of longfin smelt abundance with Delta outflow. Draft Plan at 3.3-124.

This objective is specific, measureable, and time-bound, however, the objective falls short of the biological outcome necessary to meet BDCP's legal requirements to restore longfin smelt; thus, it is not adequate to the goal of restoring this species.

i. The Objective Improperly Assumes that the Plan will do little to Restore the Species and Predicts Continued Decline of Longfin Smelt

The "Global goal" for productivity of this species (i.e. the target that the Plan suggests would represent full recovery of species productivity) is defined as:

> Achieve productivity (abundance indices) equal to or greater than predicted for 5 of 10 years based upon a regression of **1967 to 1987** abundance on December through May mean outflow (or X2).

Draft Plan at 3.3-119 (emphasis added). The Draft Plan's target of matching productivity to 1980-2011 period is much less than the global productivity goal as longfin smelt productivity per unit flow is well-known to have declined (probably more than once) during the 1980-2011 period. Kimmerer 2002; Rosenfield and Baxter 2007; Thomson et al. 2010. The productivity objective will not achieve the goal for this species; the USFWS Draft Recovery Plan target for longfin smelt recovery called for restoration of population dynamics (i.e. the mean and variance associated with both abundance and productivity) typical of the 1967-1984 period. USFWS 1996. This productivity objective for longfin smelt is, in fact, a codification of an inadequate and undesirable status quo for this species. In the period from 1980-2011, the longfin smelt population index should have exceeded its average (on a flow-corrected basis) in approximately 50% of years and it should have dropped below its average in approximately 50% of years-- that is the nature of a mathematical average; thus, all the Draft Plan's longfin smelt productivity objective requires is to match productivity that has occurred recently, not the much higher productivities that occurred earlier in the historical data series. The Draft Plan's objective for longfin smelt productivity improperly defines success as maintaining the level of productivity that occurred after this species' productivity was severely compromised. Therefore, this objective does not satisfy one of the primary functions of defining biological objectives: to describe how the desired biological outcome of the conservation strategy will achieve the long-term conservation of covered species.

ii. The Biological Objective Ignores the Importance of Longfin Smelt Overall Abundance to Conserving this Population; Setting a Productivity Objective that is "Flow Corrected" Effectively Eliminates What the Best Available Science Indicates is a Strong Relationship between Delta Outflow and Longfin Smelt Abundance

The Plan must develop objectives for each attribute of viability, *see* McElhany et al. 2000, for each covered species and measure projected outcomes against these desired outcomes. The Draft Plan has no specific objective for longfin smelt *abundance*. Productivity is an important metric of viability, *see id.*, but even an objective that defined an adequate level of productivity cannot substitute for other important attributes of viability, such as abundance. The attributes of viability are inter-related (e.g., sustained high productivity will produce higher abundance) but they are not redundant of each other. So although it is important that the Estuary's productivity is restored with respect to production of longfin smelt per unit of flow, that is a different measure from the (equally important) total abundance of longfin smelt.

Though no abundance objective for longfin smelt is set by the Draft Plan, it does suggest an intent to maintain longfin smelt abundance at index levels that were common between 1990 and 2000. *See* Draft Plan at 3.3-124. This is clearly inadequate; longfin smelt abundance indices during this period were low enough to prompt filing of a petition to list longfin smelt as a federally endangered species (in 1993), and the species was ultimately listed under CESA in 2009 and the U.S. Fish and Wildlife Service determined in 2012 (responding to a petition filed in 2007) that listing of the species under the ESA was warranted but precluded. The average longfin smelt index in the first three years of the Draft Plan's target period (1990-1992 average: 151) was less than one fifth of the average in the three years leading up to filing of the successful ESA petition for this population in 2007 (2004-2006 average: 756.3). Given that population abundance indices of longfin smelt reached lows during the 1990-2000 period that were a fraction of the levels observed when the population was eventually listed as a threatened species, the 1990-2000 period cannot represent a "recovery" for longfin smelt. The average longfin smelt index (as measured by CDFW's Fall Midwater Trawl) for the 1987-2011 time frame was 4,920 or approximately 30.4% of the 1967-1987 average (16,210) anticipated under the USFWS 1996 Draft Recovery Plan for this population.

Implicit in the Draft Plan's wording of its productivity objective is that longfin smelt abundance in a given year is largely a function of ecological conditions related to freshwater flow rates (or X2 position) in the winter and spring. For decades, researchers have detected statistically significant relationships between freshwater flow and longfin smelt abundance; these relationships hold over orders in magnitude in both flow and indices of longfin smelt abundance. Stevens and Miller 1983; Jassby et al. 1995; Kimmerer 2002; Rosenfield and Baxter 2007; Kimmerer et al. 2009; Mac Nally et al. 2010; Thomson et al. 2010. In addition, there are well-known relationships between various other stressors on the population and freshwater Delta outflow. *See* Rosenfield 2010 (e.g., pelagic food web productivity, entrainment, etc.). The productivity objective defines the expectation for abundance *with respect to flow*; by "correcting" longfin smelt abundance for Delta outflow, this objective does not account for total abundance as a factor contributing to longfin smelt viability – the objective focuses on changes in abundance due to anything *except* flow.

iii. Delta Outflow is Significantly Affected and Reduced by CVP/SWP Operations in Many Years

In addition to its inadequate productivity objective, failure to set an abundance objective, and tepid expectations for abundance, the Draft Plan's longfin smelt productivity objective is also flawed because it ignores the effects of CVP/SWP operations on Delta outflow. Given that Delta outflow explains an extraordinarily large fraction of long-term variability in the longfin smelt population index and water management operations under the BDCP will differ from operations

under the status quo (i.e., operations under BDCP affect actual Delta outflow relative to available runoff), the metric associated with this objective should be scaled to some measure of annual hydrology (e.g., unimpaired runoff) not to a measure of hydrology that will be modified by the operations in the Plan. As the Conservation Strategy notes, the CVP and SWP have a major effect on *actual* Delta outflow because those two projects control releases of water into the Delta and exports of water from the Delta. Therefore, because the metric employed by this productivity objective calibrates annual longfin smelt abundance to reflect whether it is above or below a value based on *actual* Delta outflow, BDCP operations that result in lower actual Delta outflow also simultaneously reduce the target value for longfin smelt abundance. As a result of setting a productivity objective that measures performance after removing the effect of flow, it is possible that if (when) the BDCP results in reduced Delta outflows (i.e. X2 moves upstream), then the productivity metric could be satisfied even as total abundance declines. Such an outcome is clearly at odds with restoring longfin smelt viability, yet the Plan clearly anticipates reductions in freshwater outflow during the December-May period (particularly over the longer term).

The Draft Plan's intent in choosing an objective of flow-corrected productivity is to remove the climatically driven part of the freshwater flow effect on longfin smelt recruitment:

> The primary purpose of [the longfin smelt productivity] metric is to remove the <u>climatically driven</u> part of the freshwater flow effect on longfin smelt recruitment. This effect is best reflected in winter flows, because <u>outflow during other seasons is more strongly influenced by the SWP/CVP</u> operations. As described above, the correlation of the composite index with spring flow is nearly as strong as the correlation with winter flow, so the conceptual preference for basing the subobjective metric on the winter outflow regression equation is to some extent academic.

Draft Plan at 3.3-123 (emphasis added). The choice to measure productivity against *actual* outflow (which is a product of human management and which will be influenced by the BDCP itself) rather than some measure of annual precipitation (e.g. full natural flow; runoff into the rim station reservoirs) wholly ignores the effect of SWP/CVP operations on Delta outflow. If BDCP results in greater exports of water during some years (an outcome that is expected), then actual Delta outflows will be lower than they are currently under analogous hydrological conditions; this would effectively "lower the bar" needed to satisfy the longfin smelt productivity objective because *actual* outflow forms the denominator of the metric envisioned in this objective. As currently constructed, the longfin smelt productivity metric would be informative about the efficacy of non-flow related conservation measures in restoring longfin smelt populations (because the influence of *actual* flow is effectively "removed" by the flow correction). But a metric that incorporates unmodified hydrology (e.g., full natural or unimpaired flow) during a given year is necessary to allow an apples-to-apples comparison among BDCP alternatives and performance of longfin smelt under the current water management regime because it would

retain the very important effect of water operations under human control on longfin smelt abundance.

iv. The Objective Improperly Assumes Only a Small Fraction of the Responsibility for Restoring Longfin Smelt Productivity

The Plan's objectives must be based on the biological outcomes that are consistent with its legal requirements. By contrast, the Conservation Strategy explains that its rationale for benchmarking this longfin smelt objective to the 1987-2011 period was "…because this is the entire period for which all three individual survey indices [used in the metric for this objective] are currently available." Draft Plan at 3.3-120. It is impermissible to define Plan objectives by an arbitrary decision regarding data availability (i.e. adding in information from two shorter data series that are less suitable to understanding progress towards the objective). By allowing data availability (in this case, availability of less desirable data) to dictate the desired biological conditions that reflect recovery of longfin smelt, the Conservation Strategy sets on its head the logical progression from goals to objectives to stressor reduction targets to conservation measures to Metrics used to evaluate efficacy and adaptively manage implementation of the Conservation Strategy.

Similarly, the Plan fails to justify why the BDCP does not take full responsibility for improvements needed to attain the global objectives for longfin smelt. Although some longfin smelt live outside of the Plan Area for at least part of their life cycle, Rosenfield and Baxter 2007, the Draft Plan's rationale for relying on the unknown and perhaps non-existent potential for restoration actions outside the Plan Area to restore longfin smelt is unjustified by the current scientific information-base for longfin smelt. By assuming only a small fraction of responsibility for the total improvement in longfin smelt productivity (and by failing to set an adequate abundance objective) that will be required to restore longfin smelt (e.g., to levels described by the USFWS 1996 Draft Recovery Plan for Delta fishes), the BDCP Conservation Strategy implicitly assumes that additional substantial restoration is possible (and will occur) for this species outside the Plan Area. By contrast, for Chinook salmon and steelhead, the Conservation Strategy is very specific in its allocation of conservation responsibility within the Delta (BDCP's responsibility) and outside of the Delta, *see* Draft Plan at 3.3-140 and Appendix 3.G; the Plan assumes that 50% of the needed improvement in Central Valley salmonid productivity will be occur within the Delta, by BDCP. Yet, the biological objective for improving longfin smelt productivity is far less than half of what is needed to restore this species, despite the facts that longfin smelt:

- Delta outflow (and X2) is persistently correlated with the vast amount of variation in longfin smelt abundance over the past 45 years of sampling. Jassby et al. 1995; Kimmerer

2002; Rosenfield and Baxter 2007; Kimmerer et al. 2009; Thomson et al. 2010; Mac Nally et al. 2010; Rosenfield 2010; and,

- Some fraction of the population may spend its entire life within the Plan Area and most or all of the population spends most of its life cycle in areas where ecological conditions are strongly affected by Delta outflow. Rosenfield and Baxter 2007; Rosenfield 2010.

v. The Plan Anticipates Long Term Declines in Longfin Smelt Abundance and Productivity Relative to the Status Quo and Offers no Description or Expectation of Additional Restoration Activities Inside or Outside the Plan Area that Would Lead to Restoration of the Species' Abundance or Productivity

Because the conservation standard implied by the longfin smelt productivity objective and the Draft Plan's expectations of future abundance are inappropriately low, the Conservation Strategy fails to incorporate conservation measures that are necessary (in either number or magnitude of effect) to adequately enhance the species' population. For example, longfin smelt populations are projected to decline from unacceptably low levels on average and under most of year types in alternatives 1-7 as evaluated in the DEIS/DEIR. *See, e.g.,* DEIS/DEIR at Tables 11-1A-8, 11-2A-7, 11-3-7, 11-4-8, 11-5-8. It is difficult to imagine actions outside of the Plan Area that are available to federal and state trustee agencies, that could accomplish restoration of longfin smelt, much less the majority of the necessary restoration (the gap between the Plan's flow-corrected productivity standard and the flow-corrected productivity global objective or the gap between recent abundances and historical abundances that represent a healthy population) that the Plan apparently assumes will occur. The failure to identify actions inside or outside the Plan Area with a reasonable likelihood of significantly improving longfin smelt productivity or abundance is more egregious given that most of the water management scenarios considered in the DEIS/DEIR reduce winter-spring Delta outflows compared with the current baseline – a Delta outflow baseline that state water and fish and wildlife management agencies consider to be inadequate for this species. *See, e.g.,* CDFG (2010) at 94 ("Recent Delta flows are insufficient to support native Delta fishes in habitats that now exist in the Delta"); SWRCB 2010 Flow Report at 5 ("Recent Delta flows are insufficient to support native Delta fishes in today's habitats").

To the extent that the BDCP does rely on undescribed future actions when it assumes only a small fraction of the responsibility for restoration of longfin smelt, the Plan highlights additional problems with its description of this objective. This objective does not satisfy the Plan's need for objectives to serve as a "… benchmark […] by which to measure progress in achieving […] outcomes across multiple temporal and spatial scales"; nor does it provide a "… metric […] for the monitoring program that will evaluate the effectiveness of the conservation measures and, if necessary, provide a basis to adjust the conservation measures to achieve the desired outcomes."

See Draft Plan at 3.1-3. There is no way of differentiating the effects of BDCP actions from recovery actions taken outside the BDCP on longfin smelt's flow-corrected productivity (i.e. no way to distinguish progress towards the 1980-2011 productivity pattern from progress towards the higher global objective (population dynamics similar to those in the 1967-1984 period; USFWS 1995) for this species.

vi. The Plan Sets an Unacceptably Long Timeline for Attaining its own Inadequate Targets for Longfin Smelt Productivity

Finally, the time frame set for achieving the BDCP's productivity objective (20 years after implementation begins) is unacceptably long. Here, the timeline for attaining biological outcomes seems to be a product of the timeline for conservation measures identified in the Conservation Strategy. This is contrary to the purpose and function of setting Biological objectives; the timeline for conservation measures (and the mix of Conservation Strategy itself) should be designed to produce the desired biological outcome within a timeframe that is appropriate for conservation needs. Even assuming the specified level of productivity for longfin smelt were acceptable (and it is not), it is indefensible to wait twenty years to produce this "improvement" in productivity, especially for a species that has declined as dramatically as longfin smelt. Waiting 20 years (10 generations of longfin smelt) before this sub-par level of productivity will be achieved condemns this species to linger indefinitely at population levels that merited its listing as an endangered species.

2. Biological Objectives for Delta Smelt are Inadequate

i. The Entrainment Objective is Inadequate

One objective for Delta smelt (objective DTSM1.2) states the Plan's intention to:

> Limit entrainment mortality associated with operations of water facilities (i.e., CVP and SWP) in the south delta to ≤5% of the delta smelt population, calculated as a 5-year running average of entrainment for subadults and adults in the fall and winter and their progeny in the spring and summer.

Draft Plan at 3.3-108. Because the Delta smelt geographic range is completely contained within the Plan Area, BDCP has responsibility for attaining global and BDCP objectives for this species – the two types of goals and objectives are one and the same for this species. The Global objective for this species regarding entrainment (Global objective 1.2) is to: "Maintain a cumulative entrainment of equal to or less than 5% per year across all life stages." Draft Plan at 3.3-107. By calculating the proportional entrainment of Delta smelt as a 5-year running average, the Plan allows potentially devastating impacts to the population in any one year. This objective

could be satisfied if 25% of the population were entrained in any one year, as long as entrainment was not detected in previous years. Thus the BDCP objective is not consistent with the Global objective for this species. By expressing the Objective only as a 5-yr running average (without also specifying annual limits), the objective is significantly weaker than the existing incidental take limit for this species, which prohibits take of adult Delta smelt that would exceed 5% of the population in any year. *See* USFWS 2008 Biological Opinion at 387.

ii. Delta Smelt Objectives are not Adequately Described to Inform Plan Development or Adaptive Management

Many of the Conservation Strategy's biological objectives are inadequately defined and, as a result, they cannot be of use in design of conservation measures, assessment of the Conservation Strategy as whole, or post-implementation performance evaluation of the Plan. Most of the objectives in the Plan do not meet the SMART criteria. For example, no time-frame is given for attainment of the Delta Smelt entrainment objective, so this objective is not clearly defined and thus neither it, nor the actions designed to attain it, can be fairly evaluated. Another BDCP objective for Delta smelt (objective DTSM1.1) is also inadequately defined to be of much use. The objective states:

> Increase fecundity of delta smelt over baseline conditions as measured through field investigations and laboratory studies conducted through year 10 and refined through adaptive management.

Draft Plan at 3.3-108. Although the intent here is laudable, there is no indication of what it means to "increase" fecundity (how much is enough?). Also, the objective does not indicate by when the (undefined) target will be met (in other words, it is not time bound; we assume that the phrase "through year 10" refers to the period during which the baseline will be defined). As a result, this objective does not adequately describe the conservation standard for Delta smelt, nor can it be used to assess whether the Plan's conservation measures are adequate to achieve that conservation standard. In essence, this statement regarding the Plan's intent to increase delta smelt fecundity is equivalent to having no intent to increase Delta smelt fecundity.

The final part of objective DTSM1.2 ("Assure that the proportional entrainment risk [to delta smelt] is evenly distributed over the adult migration and larval-juvenile rearing time periods") is ill-defined. There is no definition of "evenly distributed" entrainment risk and no indication of when this objective will be attained. These are crucial omissions as the objective's intent (to protect life history diversity of delta smelt by preventing repeated and disproportionate impacts to certain segments of the species' temporal distribution) is essential for conservation and restoration of this species. *See* Bennett 2005. As a result, this objective cannot be used to assess the adequacy of conservation measures (pre-implementation) or to measure the Plan's efficacy in

restoring endangered species (post-implementation). This is a common problem for the objectives in the Draft Plan as the Effects Analysis (Draft Plan Chapter 5) acknowledges that this and similar (and equally important) BDCP objectives are not adequately described; for instance, in describing why the Plan's likelihood of attainment is not evaluated for objectives intended to protect life history diversity (timing of migration) within Chinook salmon runs (WRCS3.2, SRCS3.2, FRCS3.2, STHD3.2), the Effects Analysis states: "The biological objective requires further refinement in order to establish the metrics by which it could be assessed." Draft Plan at 5.2.-41.[46]

It is possible for the Draft Plan to describe these important objectives to limit life history impacts in measureable terms. For example, BDCP could set limits on Delta smelt entrainment and salmonid mortality during migration that occur on a smaller time-step, within the limits already described in other objectives, so that all of the allowable entrainment/mortality does not impact one particular life history variant (early vs late spawners/migrants, smaller vs. larger spawners/migrants, etc.) disproportionately. Attaining the clear intentions of Delta smelt objective DTSM1.2 (to reduce total entrainment mortality and to reduce the entrainment impact in any given time period) would require a set of objectives that are tiered over different time scales. Setting an annual limit (not averaged over 5 years) on entrainment at 5% of the Delta smelt population makes sense; if entrainment is approaching 5% within any given year, corrective actions (that should be specified in the Plan), would be required. But, protection of life-history diversity within the Delta smelt population calls for a limit on entrainment at shorter time steps. Delta smelt salvage is generally recorded within the 6 month (26 week) period from mid-December through mid-June; thus, allowing for a maximum of 0.5% of the population to be entrained in any two-week period would complement the annual limit, while also providing protection for temporally, defined segments of the population within a year. Similarly, a time-step greater than 1 year could be applied to prevent repeated occurrence of maximum annual entrainment limits – 5% entrainment every year is not desirable and may lead to jeopardy for Delta smelt. For example, a threshold of 3% entrainment as a 5-year running average would be consistent with the other temporally-defined entrainment objectives described here, while increasing protection for the species.

[46] Notwithstanding these limitations, as we discuss below, available scientific information indicates that the Draft Plan is unlikely to achieve many of the draft biological objectives.

3. Biological Objectives for Sturgeon are Inadequate

i. Objectives are Not Adequately Described to Inform Plan Development or Adaptive Management

Similarly, objectives for green and white sturgeon are too poorly defined to provide guidance regarding necessary or effective management actions or regarding the success or failure of any actions that are taken under the BDCP. For example, one green sturgeon objective (GRST1.1) is to:

> Increase juvenile green sturgeon survival (as a proxy for juvenile abundance and population productivity) throughout the BDCP permit term and increase adult green sturgeon survival (as a proxy for adult abundance and productivity) by year 15.

Draft Plan at 3.3-190. An analogous objective exists for white sturgeon. We agree that juvenile survival of green sturgeon must be improved to conserve these two Central Valley fish species. Israel and Klimley 2008; Israel et al. 2008. However, the BDCP objective is not specific enough to be actionable or enforceable: What does "increase" mean? How much improvement is enough? At what level of survival should the Plan's efforts be declared a success? The Effects Analysis acknowledges:

> Current spawning-to-adult abundance is unknown, so evaluating an increase as a result of the BDCP is not currently feasible. The capacity to meet this objective will be a topic of the adaptive management program.

Draft Plan at 5.2-46. NMFS previously commented on the inadequacy of Draft Plan objectives for sturgeon species, writing: "The biological objectives for sturgeon abundance and productivity (under GRST1) are vague and rely too much on "documenting the current distribution" and future studies." NMFS 2013 Progress Assessment at 15.

There are numerous ways to set meaningful conservation objectives for sturgeon survival despite a perceived lack of desired information. If current survival rates for these two species in the Central Valley are unknown, the Plan could set objectives that are tied to survival estimates in river systems where sturgeon populations are relatively stable or increasing. Alternatively, the Plan could have set survival objectives for sturgeon that are consistent with population growth, given survival estimates from other stages of these species' life cycles (as it does for salmonid survival objectives). If that information is not available or adequate, the Plan could have set an objective regarding biological parameters that are closely related to survival rates (e.g. growth rate, condition factor, hatching success, etc.). By establishing an objective as an unspecified

improvement over an unknown value, the BDCP limits its ability to develop a Conservation Strategy that is adequate to produce desired biological outcomes or to evaluate that strategy (e.g. in the Effects Analysis). Moreover, the Draft Plan's claim that this will be a topic of Adaptive Management discussions is feeble. Adaptive management is an approach that allows managers to adjust the strategy for attaining desired outcomes (for example, under what circumstances would the Plan allocate more or less effort to certain conservation measures to adaptively manage towards an objective?); adaptive management is not a technique that allows one to determine what the desired outcome is for the Plan. The Draft Plan habitually an incorrectly relegates to "adaptive management" any decision that is inconvenient to make now – these are simply failure to plan that will lead to paralysis of adaptive management in the future.

As currently developed, the BDCP does not set a target for sturgeon survival that is consistent with conservation of these species. By failing to identify any measure of current sturgeon survival against which an improvement can be measured, the Plan calls into question whether it has an adequate grasp of the conservation challenges facing these or other species. It is not acceptable to permit a Plan with objectives for covered species survival rates that only lead to extinction at a slightly later date than without the Plan.

4. Biological Objectives for Through-Delta Salmon Survival are Inadequate

The Plan describes through-Delta survival objectives for Central Valley steelhead and each temporally-defined run of Central Valley Chinook salmon and separate objectives for fall-run Chinook originating from the San Joaquin River Valley and those originating from the Sacramento River Valley. These targets were calculated by estimating the total increase in survival, throughout each population's life-cycle, necessary to attain certain Cohort Replacement Rates (CRR: the quotient of a given generations abundance divided by the abundance of the generation that produced it) that are assumed to contribute significantly to recovery. Half (50%) of the total needed improvement in survival was allocated to improvements in through-Delta survival that would be entirely the responsibility of the BDCP; the other half of the improvement in steelhead and Chinook salmon survival would be accomplished by non-BDCP actions that occur outside of the Plan Area.

i. The Objectives are Inadequate as the Timeframes for Achieving the Biological Objectives are Arbitrary and Too Long to Generate any Reasonable Expectation of Recovery

Although we applaud the transparency and detail of the methodology presented in the technical appendix, Draft Plan Appendix 3G (Proposed Interim Salmonid Delta Survival objectives), some of the assumptions embedded in this approach lead to through-Delta survival targets that are insufficient to support recovery of these salmon populations. For example, the technical

appendix describes its approach to incremental improvement in steelhead and Chinook salmon CRRs and survival as follows:

> Using average fish generations (3-years) as the unit of time, we identified intermediate time steps at BDCP Year-19 (three generations past dual conveyance) and a CRR target of 1.2; another intermediate time step at Year-28 (another three generations) and a CRR target of 1.3; and a final time step at Year-40 (four more generations) and a CRR target of 1.4, for spring-run, fall-run, and late fall-run Chinook salmon and steelhead. CRR targets of 1.3, 1.4, and 1.5 at the same respective time steps were used for winter-run Chinook salmon based on recognition of their endangered status. These CRR targets were selected to put the covered salmonids on a population growth trajectory to achieve the previously published BDCP Global goals (BDCP 2012) identified in Table 4.

Draft Plan, Appendix 3G at 7. Table 4 in this Appendix reveals that the desired CRR's were chosen in order to attain global goals of population abundance sometime in the 40-50 year, post-implementation time frame. *Id.* at 21. The global goals used here for population abundance are lower than those expected under the Anadromous Fish Restoration Program (AFRP) of the Central Valley Improvement Act (CVPIA) in some cases (such as winter-run Chinook salmon). Attainment of the AFRP's targets for salmonid abundance is already long overdue pursuant to both state and federal law. *See* P.L. 102-575, § 3406(b)(1); Cal. Fish and Game Code § 6902. There is no justification for planning to not attain the AFRP targets or to attain them only after waiting for an additional 40 years or more, given the ability to make additional efforts to achieve these targets.

The NMFS targets for CRRs (and the Delta survival estimates they derive from these CRR's) are abnormally low for a recovering Chinook salmon population. In fact Table 4 of the technical appendix shows that populations of <u>all</u> salmonids are expected to drop initially from current levels, because current survival rates are so low, and remain below these starting levels for over 20 years. As modeled in the Appendix, the Draft Plan anticipates extirpation of all San Joaquin salmonid populations (fall-run Chinook salmon, spring-run Chinook salmon, and steelhead) within the first 10 years of the BDCP (though they are artificially resurrected in year 10 to allow continued modeling). Application of the methodology provided in Appendix 3.G for calculating salmonid survival objectives will lead the BDCP to accept worse conditions for San Joaquin River fall-run Chinook, spring-run Chinook, and steelhead – including possible extinction in the next decade. Even if conditions do improve in the future under BDCP, allowing a prolonged decline in populations of covered species in the "short term" greatly increases their risk of extirpation and is inconsistent with the BDCP's purposes and authorizing legislation.

Although such low population growth rates might be acceptable as an average over a long time-period, there is no justification for targeting recovery of Central Valley salmonids over 40 years, or 13 generations, in the future. Normal Chinook salmon and steelhead populations have the intrinsic (and demonstrated) potential to grow from current levels to the desired abundance targets (the overarching goals for abundance in the Central Valley, identified in Table 4 of the Appendix) in less than 4 generations.[47]

The assumption that a species' recovery timeline is tied to the expected implementation of a particular conservation measure is improper and arbitrary. Whereas, objectives must be attainable (the "A" in a SMART objective) this does not mean that the timing of that particular conservation measure should drive the timing of the desired outcome. Such an approach represents a failure to consider conservation actions not included in the Conservation Strategy or expediting timelines for conservation actions that are included in the Conservation Strategy in a way that would lead to attainment of biological outcomes in a desirable time-frame. Again, objectives (and the time bounds for attaining these desired outcomes) should drive development of the Draft Plan, not the other way around. The Draft Plan's failure to first determine conservation needs of covered species, and then design a Conservation Strategy to meet those needs leads to troubling outcomes. For example, the first target for improvement in salmonid survival is at year 19 of the Plan; this interval was chosen because it is ~3 Chinook salmon generations after the expected implementation of the dual conveyance in year 10. Draft Plan, Appendix 3G at 10. Thus, the Draft Plan uses the conservation measure to set the objective, rather than setting an objective and devising a Conservation Strategy to attain that objective. In tying the objectives' time frame to completion of the new conveyance, the Plan exposes each of the 5 covered salmonid populations to grave risk if completion of the dual conveyance is delayed. Indeed, the Plan and technical appendix assume that Central Valley salmonids will continue to decline in the first 10 years of the Plan. *Id.* at 20.

Accelerating the improvement in attainment of desired salmonid survival rates would not require a potentially infeasible construction schedule for the dual conveyance element of the BDCP (Conservation Measure 1). There are other measures available (e.g., increased Delta through-flow, reduced export pumping in the South Delta, Yolo Bypass restoration) for which there is strong scientific evidence that they are likely to improve salmonid survival through the Delta,

[47] From a biological perspective, Cohort Replacement Rates (CRR) of 1.2 to 1.4 represent anemic growth in populations of Pacific salmon. If we assume that males are as abundant as females in a spawning cohort, we can use Quinn's (2005) findings from numerous populations to estimate Cohort Replacement Rates of Chinook salmon. This procedure produces CRR's that range from ~>3-9 for Chinook salmon and from ~4.6-13.0 for steelhead. We have clarified with that author that the freshwater and ocean survival rates used to calculate the CRR's were derived from a numerous populations of each species and none of those populations would be considered "pristine" or unimpacted by human activity. Quinn 2014 personal communication. Other authors studying multiple Chinook salmon populations have found similarly high freshwater survival rates. Healey 1991; Bradford 1995.

and other actions that the Plan asserts can improve survival (such as targeted predator removal) that could be implemented more aggressively until the dual conveyance is operational. Also, the technical appendix does not explain why it would take 9 years (approximately 3 Chinook salmon generations) to attain desired interim survival levels *after* dual conveyance operations begin. Survival through the Delta in one year is not in any way affected by survival in previous years – it is not a cumulative effect. If the dual conveyance is, as the Technical Appendix assumes, the key to improved through-Delta survival for Central Valley salmonids, then the benefits of such a conveyance ought to accrue immediately upon completion and operation of the new diversion facility (e.g. year 10).

ii. The Survival Objectives for San Joaquin Basin Salmonids are Flawed Because the Methodology for Determining Survival Objectives Produces Inconsistent Targets for Chinook Salmon Entering the Delta from the San Joaquin and Sacramento Rivers at the Same Time of Year

Although the methodology for calculating necessary improvements for salmonid through-Delta survival is the same for all populations considered, the methodology produces inconsistent outcomes that reflect an inadequate Conservation Strategy. For example, because overall survival rates differ between Sacramento and San Joaquin populations of fall-run Chinook salmon (San Joaquin survival being much lower), the methodology for calculating necessary improvement in through-Delta survival produces lower future survival for San Joaquin fall-run Chinook salmon than it does for fall-run emanating from the Sacramento River. The objective states:

> Objective FRCS1.1: For fall-run Chinook salmon originating in the San Joaquin River and its tributaries, achieve a 5-year geometric mean interim through-Delta survival objective of <u>27% by year 19</u> (from an estimated 5%), <u>29% by year 28,</u> and <u>31% by year</u> <u>40</u>, measured between Mossdale and Chipps Island. For fall-run Chinook salmon originating in the Sacramento River and its tributaries, achieve a 5-year geometric mean interim through-Delta survival objective of <u>42% by year 19</u> (from an estimated 40%), <u>44% by year 28</u>, and <u>46% by year 40</u>, measured between Knights Landing and Chipps Island. …

Draft Plan at 3.3-158 (emphasis added).

The Draft Plan simply adopts these two different targets without offering any rationale as to why juveniles of the same sub-species, that enter the Delta at approximately the same size and in the same season, would experience such radically different survival rates. While BDCP is required to achieve conservation in the Plan Area for salmon (not recovery *per se*, but measures in the

Delta that are sufficient to achieve recovery in combination with actions outside of the Plan Area) the proposed objectives lock in the current disparity between north and south delta habitat suitability (which results in lower survival for salmon and other species) for which CVP/SWP operations play a major role. This outcome is inconsistent with global and BDCP objectives that seek to increase spatial distribution of covered species by restoring populations that spawn or rear in the southern Delta and San Joaquin Valley. Objectives for San Joaquin salmon survival need to be strengthened and revised to ensure they are compatible with existing legal obligations.

5. Objectives for Community and Ecosystem Conservation are Inadequate

The Conservation Strategy identifies numerous landscape scale objectives (related to a reserve system, ecological process, increased fish and wildlife movement, and increased habitat suitability for covered species) as well as well as for numerous natural communities (e.g. tidal mudflat, tidal brackish emergent, tidal perennial aquatic, vernal pool complex, etc.). Inclusion and attainment of such broad scale objectives for the Draft Plan are essential to ensure that the Draft Plan achieves the requirements of the NCCPA. *See* Fish and Game Code §§ 2820(a)(3), (4).

i. Objectives are not Adequately Described to Inform Plan Development or Adaptive Management

Unfortunately, none of the community and ecosystem conservation objectives identified are sufficiently well-defined to serve the functions of SMART objectives. Without this level of specificity, it is impossible to know whether the objectives are sufficient to the larger goals and legal requirements of an HCP/NCCP and it is not possible to judge whether the actions specified in the conservation strategy will produce the necessary level of benefit. For example, while goal L.1 is an excellent aspiration for the BDCP, there is no way to know whether the associated objectives will allow the Draft Plan to attain it. Goal L1 reads:

> A reserve system with representative natural and seminatural landscapes consisting of a mosaic of natural communities that is adaptable to changing conditions to sustain populations of covered species and maintain or increase native biodiversity.

Draft Plan at 3.3-35. None of the objectives associated with this goal are time-bound – there is no way to tell whether the goal will be satisfied early or late in the Plan's permit term (if at all). While the objectives are somewhat specific regarding acreage to be restored, there is little specificity regarding the desired final condition or location of these acres. For example, objective L1.6 ("Increase the size and connectivity of the reserve system by acquiring lands adjacent to and between existing conservation lands") does not define what is meant by "increased size" and

"connectivity" – how will we know when or if this target is attained? Also, this objective's call for increased biological connectivity is simplistic, as not all connectivity is desirable; in this particular ecosystem, "connectivity" has resulted in the damaging spread of invasive predators and competitors and ecosystem architects such as clams and *Egeria*. Clearly, objectives like L1.4 ("Include a variety of environmental gradients (e.g., hydrology, elevation, soils, slope, and aspect) within and across a diversity of protected and restored natural communities") are far too vague to meet the Plan's stated purpose for objectives, which are to serve as "the foundation of the conservation strategy" and to provide descriptions of: desired biological outcomes; how those outcomes will contribute to the long-term conservation of covered species and their habitats; benchmarks by which to measure progress in achieving those outcomes across multiple temporal and spatial scales; metrics for the monitoring program that will evaluate the effectiveness of the conservation measures. Draft Plan at 3.1-3. There is no imaginable circumstance where such a general statement could provide a basis to adjust the conservation measures to achieve the desired outcomes.

Similarly, the objectives associated with goal L.2 ("Ecological processes and conditions that sustain and reestablish natural communities and native species," Draft Plan at 3.3-40) do not provide guidance on critical questions like "how much?", "where?" and "by when?" – the answers to these questions are essential for objectives to perform the functions identified for them by the Plan; as a result, these objectives are merely sweeping statements that do not allow planners, permit-granting agencies, or the general public to understand the intent of the Draft Plan or analyze whether the conservation strategy is likely to accomplish these ends (and by when).

6. Conclusion: Draft Biological Objectives are Inadequate

In summary, although we applaud the effort to include biological goals and objectives into the Draft Plan, we find that most of the objectives identified:

- Do not meet the standards required by the NCCPA or ESA; and/or,
- Are not articulated to the degree that they can guide development of either the Plan's Conservation Strategy or its Adaptive Management plan.

The Draft Plan's objectives are inadequate to attain the conservation standard in the Plan Area for most species. Recovery of species means that they display sufficient levels of all attributes of viability, including abundance, productivity, spatial distribution, and diversity, *see* McElhany et al. 2000; the Draft Plan does not include objectives for each of these attributes for any of the covered species. As described above for longfin smelt, the failure to identify specific desired outcomes for each of these attributes of viability (e.g. "abundance" for longfin smelt) means that

implementation and adaptive management of the BDCP will not respond to continued degradation of those characteristics of covered species.

The inadequacy or absence of key biological objectives becomes apparent immediately as the Conservation Strategy moves down the logic chain to identify stressors that impede attainment of those objectives (stressors are described in more detail below). Although numerous stressors are mentioned or implied throughout the various documents, there is only spotty and disjointed analysis of the relative or absolute importance of different stressors on different organisms (or life history stages) and what analysis is presented is often internally inconsistent. As a result, in many cases, the Conservation Strategy is not designed to ameliorate the stressors that are most important for attaining the desired biological outcomes (objectives) necessary for restoration of covered species' populations. Projected benefits of the Conservation Strategy will not emerge if the stressors the Plan addresses are not those that actually limit species' viability. Furthermore, the failure to link conservation measures to the most important stressors means that some claims that conservation measures will benefit a species do not reflect the Plan's biological objectives – unless the Plan's intended benefits to species are captured by its stated objectives, there is no way to evaluate the Plan's projections of benefits to covered species (prior to adoption of the Plan), or to evaluate the success or failure of conservation measures, or to manage the Conservation Strategy adaptively (post-implementation).

B. <u>The Draft Plan and DEIS/DEIR Fail to Evaluate Biological Outcomes Against Biological Goals and Objectives</u>

The Draft Plan and DEIR/DEIS fails in most cases to measure projected outcomes of the Conservation Strategy and water operations against the desired biological outcomes described in the objectives. The first recommendation of the Delta Science Program Independent Review Panel (2014) was that the "Analysis of biological effects needs more consistency and specificity." DSP Independent Science Review Panel Report 2014 at 12. Commenting on the Draft Plan's own evaluation of its ability to evaluate the Conservation Strategy's biological objectives that review panel wrote:

> Approximately 72% of the objectives for covered fish could not be fully evaluated at this time due to insufficient information. The overall net effects conclusion for each species seemed to be based on the judgment of the authors, rather than a systematic ranking of attribute importance, change in response to the BDCP, and uncertainty in the rankings … A systematic approach for synthesizing the net effect on each Covered Species was not used even though a ranking system was described that could have been used as a semi-quantitative scoring approach. Instead, professional judgment was used to assess the overall net effect.

DSP Independent Science Review Panel Report 2014 at 22.

The failure to generate expected outcomes in terms that would be comparable to the objectives is not solely due to technical challenges or lack of modeling capacity. For example, the expected outcomes for Delta smelt entrainment under different alternatives (*see* Figures 11-1A-1, 11-1A-2, 11-2A-1, 11-2A-2, 11-3-1, 11-3-2, 11-4-1, 11-4-2, 11-5-1, 11-5-2, 11-7-1, 11-7-2, 11-8-1, 11-8-2) are reported in the same terms as objective DTSM1.2 (e.g. the mean proportion of the adult and larval/juvenile population, respectively, lost to entrainment-related mortality each year). These analyses clearly demonstrate that alternatives 1 through 5, at least, are not projected to attain the relevant biological objective for Delta smelt in most year types (making it extremely unlikely that any of these alternatives would meet the 5 year running average target). Despite having produced the relevant analysis, the DEIS/DEIR fails to connect the dots between the biological objectives that were supposed to have driven development and review of alternatives and operations, and the projected outcomes of those alternatives and operations so that readers could understand which of the alternatives studied offered the best chance of meeting the stated objective.

This same failure to compare projected outcomes to desired outcomes occurs throughout the DEIS/DEIR. For each Alternative studied, Chapter 11 provides a table entitled, "Estimated Differences Between Scenarios for Longfin Smelt Relative Abundance in the Fall Midwater Trawl or Bay Otter Trawl." *See, e.g.,* DEIS/DEIR at 11-2492 (Table 11-8-7). These tables clearly display that longfin smelt populations are expected to decline as compared to current conditions in most year types of each Alternative studied, except for Alternative 8. *Id.* Objective LFSM1.1 declares that the Plan's intention is to *increase* population productivity (relative to freshwater flow) compared to current conditions. The comparison between expected and desired outcomes show that most (and perhaps all) of the alternatives studies are inadequate to achieve the Plan's own conservation standards.

The failure to compare expected outcomes in the DEIS/DEIR to the biological objectives set in the Plan's Conservation Strategy undermines the purposes for setting biological objectives in the first place (as described in the Draft Plan at 3.1-3). Development of the Conservation Strategy must be guided by specific, measureable, achievable, relevant, and time bound targets to allow evaluation of the relative benefits of conservation measures and suites of conservation measures in achieving those targets. Because the Effects Analysis does not describe expected outcomes that can be compared to the Plan's objectives, there is no way to know whether the Conservation Strategy is adequate and there is no way to compare the relative merits of different alternative Conservation Strategies and their interactions with different operational regimes.

C. The Draft Plan and DEIS/DEIR Fail to Accurately Identify, Prioritize, or Analyze Key Stressors that will be Addressed to Assure Attainment of Desired Outcomes (Objectives), and as a Result the Draft Plan and DEIS/DEIR Overemphasizes the Benefits of Certain Actions and Underestimates the Adverse Impacts

In order for the BDCP to realize the objectives and goals it defines (much less those that are required to actually accomplish its legal responsibilities), it is vital for the Plan to accurately characterize what forces prevent attainment of desired biological outcomes currently ("stressors") and the level of stressor reduction needed to promote attainment of the objectives. Obviously, focusing on unimportant or less important stressors will lead to inefficient, slow, and perhaps incomplete attainment of biological objectives. Development and prioritization of specific conservation actions is premature until there is adequate description of the Plan's objectives and a science-based assessment and ranking of the key stressors that prohibit attainment of the objectives.

The Plan's description of stressors is ad-hoc, incomplete, internally inconsistent, and its justification of stressor reduction lacks scientific rigor. For example, Appendix 5F (Biological stressors on Covered Fish) opens by declaring: "Biological stresses can result from competition, herbivory, predation, parasitism, toxins, and disease." Draft Plan, Appendix 5F at 5.F-i. Stressors such as habitat loss or direct export-related mortality (salvage) by SWP and CVP export operations receive almost no attention in this Appendix – curious given that the Conservation Strategy's focuses on restoring habitat and attempting to significantly reduce export-related mortality. Furthermore, this Appendix pays no attention to the driving effect of reductions in freshwater flow into, through, and out of the Delta on most of the stressors affecting covered fish species dynamics; this is a major and grave omission because freshwater flow reductions are widely acknowledged to be one of the most important stressors for numerous native species in this ecosystem. *See, e.g.*, SWRCB 2010 Flow Report; CDFW 2010. Ineffective and inefficient migration of aquatic species is one of the many effects of altered/reduced freshwater flows; although the Plan identifies these effects as key stressors for certain covered species, they are not analyzed or compared to other stressors in this Appendix on the biological stressors to covered fishes. Instead, the Appendix focuses exclusively on four "key biological stressors:" invasive aquatic vegetation, predation, invasive mollusks, and *Microcystis*. Draft Plan, Appendix 5F at 5.F-i.

D. The Draft Plan Uses Inconsistent and Scientifically Unsupported Estimations of the Relative Importance of Stressors

Both the Draft Plan and DEIS/DEIR are internally inconsistent regarding the estimation of the relative or absolute importance of stressors. The documents frequently fail to provide any

support for their assertion that certain stressors are actually limiting population viability or ecosystem productivity. In many cases, the Draft Plan and DEIS/DEIR documents ignore evidence of stressor importance, even when those documents acknowledge the existence of the stressor.

1. The Draft Plan and DEIS/DEIR are Internally Inconsistent and Fail to Use the Best Available Science Regarding the Importance of Entrainment as a Stressor

The problem is particularly vexing with regard to known stressors such as entrainment. Despite the best available science demonstrating that entrainment-related mortality can be a significant stressor on many covered species, both the Draft Plan and the DEIR/DEIS fail to accurately acknowledge this. Instead, they maintain that current entrainment rates have only minor effects on covered species. In part, this erroneous conclusion stems from a persistent focus on "average" (mean) entrainment across years in the Draft Plan and DEIS/DEIR. The mean is an inappropriate and misleading metric because (a) covered species do not experience persistent "average" conditions, they experience individual years with either high entrainment of low entrainment, and (b) the impact of entrainment mortality is believed to vary substantially with different annual (or seasonal) environmental conditions; thus, entrainment impacts (and many other kinds of negative impacts) to covered species are periodically (not continually) severe. *See, e.g.*, Kimerrer 2008; Kimmerer 2011; Rosenfield 2010. Both the Draft Plan and DEIS/DEIR repeatedly underplay the importance of current entrainment levels. But the Draft Plan identifies entrainment-related mortality as a stress for each of the aquatic covered species and both the Draft Plan and DEIS/DEIR commit considerable space to analysis of both the reduction of this stressor that will presumably arise from moving the point of water diversion (Conservation Measure #1; CM1) and the "operational flexibility" that will be gained from CM1. By emphasizing that current entrainment rates are not a significant stressor on covered species, the Draft Plan demonstrates that construction and operation of its primary conservation measure (adding an additional point of diversion; CM1) will have minimal environmental benefits and that the environmental impacts from operation of CM1 are likely to worsen conditions for salmon and other covered species.

Entrainment-related mortality has been studied more intensively than most, if not all, of these other stressors. While the precise impact of this stressor, in terms of its incremental contribution to extinction risk, is unknown (and perhaps, unknowable), species-specific, and varies with regard to year-type and population status; the relative impact of this stressor on covered fish species and ecosystem productivity is well established. For example, Kimmerer 2008 found direct entrainment-related mortality of winter-run Chinook salmon to be approximately 10% of the juvenile winter-run population, on average, at the highest export flows recorded and that

these were "higher than expected based on management targets for the Delta"; he further cautioned that indirect, entrainment-related mortality could be high as well and he concluded:

> From a population maintenance standpoint, the calculated loss rate at the export facilities would be a significant component of direct anthropogenic mortality.

Kimmerer 2008 at 24.

With regard to Delta smelt, numerous studies that have estimated the relative effect of putative stressors on this population found that entrainment-related mortality was one of the more important stressors. Kimmerer 2008, 2011; Mac Nally 2010; Thomson 2010; Maunder and Deriso 2011; Rose et al. 2013a,b.[48]

It is simply not credible for the Plan and DEIS/DEIR to suggest that the impacts of south Delta export operations on the BDCP's covered aquatic species might be small. In addition to the quantitative analyses of entrainment-related mortality described above, the California Department of Fish and Wildlife's life history conceptual models for Chinook salmon (Williams 2010), Delta smelt (Nobriga and Herbold 2009), white sturgeon (Israel et. al. 2009), and longfin smelt (Rosenfield 2010) conclude that mortality arising from CVP and SWP water export operations in the south Delta are one of the more important stressors on covered species. In addition to these syntheses of scientific information on entrainment-related impacts to covered species, the USFWS 2008 and NMFS 2009 biological opinions identify entrainment as an important stressor and attempt to minimize that impact so as to avoid jeopardy to Delta smelt and endangered anadromous species; entrainment-related mortality is also the primary stressor addressed by the SWP's incidental take permit for longfin smelt. CDFG 2009.

For both Delta smelt and winter-run Chinook salmon, the Draft Plan and DEIS/DEIR repeatedly overstate the uncertainty surrounding the level of impact caused by entrainment and the threat posed by this stressor despite the:

- wealth of recent, detailed studies of the importance of entrainment to many covered species
- strong conceptual support for addressing entrainment as a priority stressor, and
- the Draft Plan's own emphasis on reducing entrainment through its primary conservation measure (creation of a new point of water diversion)

[48] The Plan and DEIS/DEIR documents incorrectly assert that Maunder and Deriso 2011 did not find evidence of adult entrainment impacts on the Delta smelt population. Maunder and Deriso's results clearly identify adult Delta smelt entrainment as an important impact to Delta smelt abundance, though their interpretation of this result downplays its importance for reasons that are not clear. In fact, Rose et al. (2013b) recently argued that Maunder and Deriso's interpretation of their own analyses improperly downplayed the magnitude of the entrainment-related mortality impact.

For example, regarding Delta smelt entrainment, the Plan states:

> Changing the primary point of diversion to the north Delta will contribute to further reducing the already low levels of entrainment of delta smelt (averaged across all water-year types) currently required under the USFWS (2008) BiOp. The entrainment levels required under the BiOp, which are much lower than historical levels, will be met or further reduced under the BDCP, depending on the water-year type.

Draft Plan at 3.3-100 (emphasis added). Similarly, the DEIS/DEIR declares:

> Despite the number of delta smelt that have been entrained by the State Water Project (SWP) and Central Valley Project (CVP) export facilities … the direct effects of water diversions on the overall population dynamics of delta smelt are not well understood and there is disagreement among experts about the magnitude of these effects (Bennett 2005; Kimmerer 2008; Kimmerer 2011; Miller 2011).

DEIS/DEIR at 11A-11. Similarly, the Draft Plan lists entrainment as an "important" threat and stressor for the winter-run Chinook salmon population, but then immediately downplays this determination, declaring:

> These facilities [including the SWP and CVP water export pumping facilities] also change the hydrodynamics in Delta channels and directly or indirectly increase vulnerability to entrainment at unscreened diversions. However, the effects of entrainment mortality on the population dynamics and overall adult abundance of winter-run Chinook salmon are not well understood.

Draft Plan at 3.3-128. And, after identifying entrainment-related mortality as an "important threat and stressor" to winter-run Chinook salmon, the DEIS/DEIR concludes:

> No quantitative estimates have been developed to assess the potential magnitude of entrainment losses for juveniles migrating through the rivers and Delta, or the effects of these losses on the overall population abundance of returning adult Chinook salmon. The effect of entrainment mortality on the population dynamics and overall adult abundance of winter-run Chinook salmon is not well understood.

DEIS/DEIR at 11A-56. Finally, we note that the Draft Plan and DEIS/DEIR do not discuss the "uncertainties" regarding impacts of other stressors to nearly the same extent as they focus on what is unknown about entrainment-related mortality. The Delta Independent Science Board

emphasized this uneven treatment of uncertainties as a major problem with the current Draft Plan and DEIS/DEIR, finding:

> Uncertainties are inconsistently and incompletely addressed … Uncertainties accompany every action and consequence discussed in the DEIR/DEIS, ranging from the designations of habitats for individual species, to projections of entrainment, to modeling results used in the analyses. When combined, these uncertainties will be compounded and propagate. Although the Draft BDCP discusses some of these uncertainties, they are treated inconsistently in the DEIR/DEIS and are largely ignored in the Executive Summary … If the outcomes of an action are considered too uncertain or speculative, it is sometimes argued in the documents that this uncertainty is sufficient reason not to address the issue of uncertainty at all.

Delta ISB 2014 at 5.

2. Example: Spawning Habitat Limited by SAV

i. Stressors that do not relate to species' objectives

Often times, the Draft Plan's identification of stressors appears to be a post-hoc justification of proposed conservation measures rather than an effort to alleviate barriers to attainment of desired outcomes (objectives). For example, Appendix 5F claims that: "Removal of invasive SAV is expected to increase the availability of freshwater spawning habitat for longfin smelt in the Delta." Draft Plan Appendix 5F at 5.F-iii. As described above, the Draft Plan inappropriately fails to identify improvements in longfin smelt abundance or longfin smelt spatial distribution as desired biological outcomes (objectives) of the BDCP; the Plan also fails to identify spatial distribution or abundance objectives for Delta smelt. Thus, the Conservation Strategy must anticipate that increased availability of spawning habitat will improve longfin smelt and Delta smelt productivity, which are identified objectives of the Draft Plan. However, the specific micro-habitats that longfin fish use for spawning are unknown, *see* Rosenfield 2010, so there is little or no support for the claim that SAV removal will increase availability of spawning habitat for longfin smelt. Similarly, the Appendix states that: "There is no indication … that the delta smelt population is limited by the amount of suitable spawning habitat area because they spawn throughout the Delta in different years." Yet despite this acknowledgement, and the acknowledgment that "[s]pawning habitat for Delta smelt in the wild is unknown," the Conservation Strategy and the incredibly confusing summary of Delta smelt conceptual models located in the Effects Analysis nevertheless asserts that the extent of tidal marsh habitat is of

"moderate" importance for the success of Delta smelt egg deposition.[49] Draft Plan at 3.3-100; Draft Plan at 5.5.1-7. Despite the statement cited above from Appendix 5F, the DEIS/DEIR claims that one of the main purposes of BDCP's tidal marsh restoration (CM4) is to increase suitable spawning habitat for Delta smelt, DEIS/DEIR at 11-278, and the DEIS/DEIR claims benefits to Delta smelt spawning from removal of submerged aquatic vegetation, DEIS/DEIR at 11-283. So, the Plan, its technical appendices, and the DEIS/DEIR are ultimately confused and inconsistent with regard to the limitations imposed on smelt species' abundances by spawning habitat limitations.

Ironically, while neither the benefits of increasing total spawning habitat acreage nor the efficacy of the proposed mechanism to accomplish that (SAV removal[50]) are obvious, it is very clear that both smelt species are jeopardized by the increasingly narrow spatial distribution of available spawning habitat. The loss of access to spawning habitat, particularly along the San Joaquin River and in the Central Delta, confines Delta smelt and longfin smelt spawning to a very small area and this represents a significant risk to both species' viability. *See* Rosenfield 2002; Rosenfield 2010. This stressor (limited spatial distribution of spawning habitat) is not identified in the Draft Plan. This is yet another example of how the BDCP's failure to identify the most important stressors results from its failure to thoroughly and adequately describe biological objectives for each attribute of viability. If the Draft Plan had identified an objective for the "spatial distribution" attribute of viability for Delta smelt and/or longfin smelt, that desired outcome would naturally have led to a focus on the stress presented by limited spatial distribution of available spawning habitat (as distinct from total acreage of spawning habitat) and the Draft Plan might then have targeted the relevant stressor with appropriate conservation measures.

3. The Draft Plan Fails to Document the Impact of the Presumed Illegal Harvest Stressor

In another example of failure to adequately evaluate stressors, the Plan's emphasizes "Illegal Harvest" as a stressor on numerous covered fish species. Although the Plan expresses great faith that it will reduce the illegal harvest stressor for all the covered salmonid and sturgeon species, there is a big difference between reducing a presumed stressor and that progress leading to attainment of a desired (or required) outcome – if the stressor is not that important in limiting population viability, reducing the it will not lead to improved population viability. The problem statement for CM17 provides no assessment of the extent of illegal harvest, citing only one reference to published literature (a paper dealing with green sturgeon) and reference to the memo that describes CM17. We do not dispute that increasing staffing at CDFW's anti-poaching units

[49] The DEIS/DEIR notes that agency opinion is that this attribute is of "low" importance.
[50] However, it is important to note that removal of SAV may have other benefits for covered species.

may lead to a reduction in sturgeon poaching and it is possible that reduced poaching of adult sturgeon will help attain productivity targets for these two species. But neither the Effects Analysis nor the Conservation Strategy explains their ranking of the impact of this stressor relative to other stressors affecting sturgeon species.

The Conservation Strategy provides absolutely no basis for its expectation of benefits to salmonids from reduction in the illegal harvest of juvenile salmon, and the suggestion that reductions in the illegal harvest of juvenile salmon will have a favorable impact on salmon populations is inexplicable. Illegal harvest (or "poaching") of juvenile salmon is not mentioned as a significant stressor to these populations in the DRERIP conceptual life history model for salmonids. Williams 2010. Illegal harvest of these fish may occur; but does it actually affect abundance or productivity of Central Valley salmonids? And if so, is it a threat on the same level as other stressors to these populations? The Conservation Strategy is strangely unambiguous about the need to reduce the illegal harvest stressor, stating "any reduction in illegal harvest of covered fish species, whether inside or outside the Plan Area, is expected to contribute to the achievement of the biological goals and objectives for the covered fish species." Draft Plan at 3.4-319. This strong statement is in stark contrast to the Plan's equivocality and uneven treatment of entrainment-related mortality as a priority stressor discussed above, even though entrainment (in terms of salvage and expanded salvage) is a somewhat quantifiable impact for each of the covered species and poaching of juveniles is not. Though illegal harvest is unquantified in all cases and the numbers of juvenile salmon that are taken in illegal harvest almost certainly pales before the tens of thousands of Chinook salmon that appear in salvage (a small fraction of the number that are entrained in the SWP and CVP south Delta diversion infrastructure; *see* TBI 2012, the Plan strongly implies that illegal harvest of salmon juveniles is a more important stressor on salmonids than other potential stressors, including entrainment-related mortality. This implication is not credible.

Even if poaching of adults is a significant problem for some salmonid populations, the degree of the problem is likely to vary across the different salmon populations based on factors that affect their susceptibility to poaching (i.e. the duration and timing of their presence in the Central Valley and the size of the waterways in which they are found). In his 398-page tome on Central Valley salmonids, Williams mentions "poaching" or "illegal harvest" of adult salmon twice (an indication of the relative importance of this stressor). Williams 2006. He acknowledges that though is difficult to quantify illegal harvest impacts, there are "some indications that it may be significant" for spring-run Chinook salmon. *Id.* at 248. However, no similar statement is made with regard to winter-run, Sacramento or San Joaquin fall-run or late-fall run Chinook salmon, or Central Valley steelhead. Both the Draft Plan and Williams 2006 suggest that spring-run Chinook salmon populations may be relatively more susceptible than other populations to poaching because they hold in small streams for weeks or months during the summer before spawning. Draft Plan at 3.4-322. However, this is immaterial to the Draft Plan's illegal harvest

stressor reduction target for spring-run Chinook salmon (and all other populations), which specifies that poaching will be reduced "in the Plan Area," Draft Plan at 3.3-151-152, which is not in the habitat (upstream) where spring-run are believed to be more susceptible to illegal harvest. Furthermore, susceptibility to poaching is not an evaluation of the impact of illegal harvest in absolute or relative terms. The Effects Analysis (Chapter 5) inexplicably asserts that winter-run Chinook salmon are also susceptible to poaching, Draft Plan at 5.5.3-37, even though these fish hold in fresh water for a much shorter period than spring-run Chinook salmon and exhibit this behavior in a much bigger river that is much more easily patrolled than the high mountain streams used by spring-run.

In sum, the Conservation Strategy and Effects Analysis assert, without analysis or supporting data, that illegal harvest "in the Plan Area" on adult sturgeon and both juveniles and adults of all Central Valley salmonid populations and that any reduction in that stressor will translate to meaningful progress towards attainment of related species-specific objectives. There is simply no support for these assumptions and many, particularly those regarding covered salmonid populations, are not likely to be true.

4. The Draft Plan Fails to Adequately Describe, Evaluate and Address Delta Outflow and Other Known Flow Stressors

The Conservation Strategy fails to identify entrainment-related mortality or Delta outflow rates as stressors to longfin smelt despite the fact that two longfin smelt-specific objectives specifically incorporate these stressors. For example, one longfin smelt productivity objective uses flow-corrected abundance as its measure (LFSM1.1) and the other productivity objective sets a limit on entrainment-related mortality rates at the CVP and SWP (LFSM1.2). However, in the same tables that identify these desired biological outcomes, only "lack of food resources" is identified as a stressor for longfin smelt. As described in our critique of objective LFSM1.1, there is overwhelming evidence that Delta outflow is strongly correlated with stressors on longfin smelt populations in this Estuary. Jassby et al. 1995; Kimmerer et al. 2002; Rosenfield and Baxter 2007; CDFG 2009; Kimmerer et al. 2009; Mac Nally et al. 2010; Rosenfield 2010; CDFG 2010; Thomson et al. 2010. Delta outflow may be a direct stressor on both population abundance and distribution, as it affects larval transport and subsequent spatial distribution. Kimmerer 2002b; Dege and Brown 2004; Rosenfield 2010. The Department of Fish and Wildlife's life history conceptual model for longfin smelt describes "Delta outflow" and "salinity" (which is directly related to Delta outflow) as "important" stressors with "medium" to "high" certainty of impact and it explicitly links another important stressor, entrainment-related mortality, to Delta outflow rates. Rosenfield 2010 at 30. The Plan's failure to identify these two factors as major stressors on longfin smelt populations is inexplicable, especially since both freshwater flow and CVP/SWP operations also affect the "lack of food resources" that the

Conservation Strategy identifies as the sole stressor it will attempt to address. Jassby et al. 1995; Kimmerer 2002; Rosenfield 2010.

In contrast to stressors like "lack of food resources" or "predation" or "illegal harvest", the reduction of which are consistently identified by the Plan as means for attaining numerous biological objectives, significant reductions and alterations to the timing of freshwater flow into, through, and out of the Delta are inconsistently identified as stressors. However, numerous state and federal agencies concur that reduced or otherwise altered patterns of flow into, through, and out of the Delta are among the most important stressors to native organisms and communities in the Delta. We have described this major shortcoming of the BDCP approach in numerous previous letters and communications; for example, regarding an appendix to a previous version of the Draft Plan, we wrote:

- ..a panel of experts convened by the SWRCB for its flow hearings (SWRCB 2010) found "[F]low modification is one of the few immediate actions available to improve conditions to benefit native species";
- the State Board (2010) itself specifically addressed the BDCP stating: "…this [Public Trust Flow] report highlight[s] the need for the BDCP to develop an integrated set of solutions, to address ecosystem flow needs, including flow and non-flow measures. …One cannot substitute for the other; both flow improvements and habitat restoration are essential to protecting public trust resources";
- the DRERIP conceptual life-history models for Delta smelt, longfin smelt, and salmonids (for instance) each clearly identify water exports and fresh water flow (or the position of X2) as important drivers of population response;
- the Final Recovery Plan for Central Valley salmonids (NMFS 2014) repeatedly emphasizes the need to improve fresh water flow conditions in the Delta and to reduce entrainment at water exports;
- the Delta Science Council's Independent Science Board (DSC 2011) found that both "Changed hydrograph; reduced inflow and outflow" and "Entrainment at pumps & other diversions" were key stressors in the Delta (the former was listed in three different stressor categories)…"

Memorandum to J. Meral from J. Rosenfield re: Review of BDCP Effects Analysis Appendix G December 22, 2011 (emphasis added).

Even though they are not explicitly identified as key stressors, the Draft Plan and DEIS/DEIR strongly imply that decreased and altered flow patterns are a major force affecting many of the

covered aquatic species. For instance, increased flows are a key difference between the "High Outflow" and "Low Outflow" scenarios of Alternative 4 and, the High Outflow scenario performs better than many other Alternative 4 scenarios (though still inadequately) with regard to several of the biological objectives for aquatic species (such as OBAN escapement predictions for winter-run Chinook salmon, *see* Draft Plan Appendix 5G at Table 5.G-19). But, because the Draft Plan's treatment of freshwater flow as a stressor that impedes attainment of numerous biological objectives is inconsistent, the Conservation Strategy fails to consider flow augmentations as a specific conservation measure that would reduce these stressors. Even Alternative 4 produces no flow-related effects that are considered "beneficial" under both a NEPA and CEQA standard, *see* DEIS/DEIR at 11-55 (Table 11-4-SUM1) because flow levels under this alternative do not constitute a substantial improvement over the status quo.[51]

Specific examples abound of the Draft Plan's failure to treat flow as an important stressor that can and should be addressed by the BDCP. The Draft Plan states that "altered migration flows" are a stressor for each of the covered salmonid populations, but, when it sets stressor reduction targets for these species, the Conservation Strategy seeks only to prevent further degradation to these migration flows. For instance, for winter-run Chinook salmon, the migration flow stressor target is: "Ensure that north Delta intake operations do not increase the incidence of reverse flows in the Sacramento River at the Georgiana Slough junction." Draft Plan at 3.3-139; *see also* Draft Plan at 3.3.151; 3.3.159, 3.3.169 (stressor reduction targets for spring-run Chinook, fall-run Chinook, and steelhead respectively). In other words, even where it does identify flow impairment as a major stressor to several species, the Conservation Strategy seeks only to maintain the status quo, rather than seeking to reduce this stressor directly compared to current conditions.

Given such strong indication of the importance of flow modifications to sturgeon, it is indefensible that "altered flows" are not identified in the "assumed stressors" associated with biological objectives for either of the sturgeon species (perhaps more alarming, none of the stressor reduction targets identified for sturgeon species are specific, measureable, or time-bound, so it is not clear what, if anything, BDCP will do to actually address species-specific stressors). The National Marine Fisheries Service, commenting on an earlier version of the Draft Plan's biological objectives, requested greater emphasis on the need for adult attraction flow for sturgeon species. NMFS 2013 Progress Assessment at 15. Indeed, the Conservation Strategy

[51] One exception to the Draft Plan's failure to improve freshwater flow conditions is its provision of flows through Fremont Weir and the Yolo Bypass, both of which result from physical modifications to the landscape, rather than alterations in flow volumes. However, as we discuss elsewhere in these comments, both of these "improvements" are actually an example of BDCP's flawed baselines as both of these actions are already required under the NMFS 2009 biological opinion, even if BDCP is not approved and implemented.

identifies "Flow Operations" as an important "threat and stressor" to both white sturgeon and green sturgeon populations, stating:

> River flows influence white sturgeon spawning, habitat availability, and prey resources, and have been shown to be related to YOY abundance. Modifications of flow rates have the potential to provide an unnatural cue for spawning, which could result in lowered reproductive success. The dispersal of larval white sturgeon is dependent on high spring river flows, which optimally consist of multiple large flow pulses. Reduced seasonal flows or flows mismatched ecologically with sensitive early life stages may reduce dispersal of these life stages when they are most vulnerable to native and nonnative predation. Flow reductions may serve to reduce or eliminate YOY survival even if spawning was successful. Outflow influences YOY, juvenile, and adult white sturgeon bay and delta habitats by influencing salinity. Tagging data demonstrate white sturgeon move upstream when saline waters encroach eastward in dry years, while white sturgeon expand use of bay habitat when brackish water is pushed westward in wet years (Israel et al. 2009).

Draft Plan at 3.3-197; *see also id.* at 3.3-183 (green sturgeon).

Thus, the Plan clearly identifies the negative and important effects of altered freshwater flows and then either refuses to identify them as important stressors or fails to set targets for alleviating the stress caused by freshwater flow alterations, or both. This is a major inadequacy of the Draft Plan that defeats the point of clearly:

- linking species-specific biological outcomes (objectives) to forces that currently prevent the attainment of those objectives (stressors);
- describing reductions in those stressors to a degree (stressor reduction targets) that will facilitate attainment of the objectives;
- and then, designing conservation measures of appropriate type and magnitude to produce the specific desired effects.

E. The Draft Plan Fails to Describe how Proposed Conservation Measures Match, in Either Type or Scope, the Stressors it Identifies and the DEIS/DEIR Fails to Analyze how Outcomes of these Conservation Measures Address the Draft Plan's Desired Outcomes (Stressor Reduction Targets and Biological Objectives). As a Result the DEIS/DEIR and Draft Plan Fail to Adequately Evaluate the Adequacy or Efficacy of the Conservation Strategy

The National Research Council criticized a previous version of the Bay Delta Conservation Plan as "…a post-hoc rationalization of the water supply elements contained in the BDCP" and "a list but not a synthesized plan for the restoration activities." NRC 2010. Unfortunately, this remains an apt description of the Draft Plan in many respects. The conservation measures presented in the BDCP do not appear to be designed achieve specific reductions in stressors that are necessary in order to achieve desired outcomes (SMART biological objectives); instead, they are incompletely described actions whose benefits are assumed to provide benefits. There is no evaluation of how different levels of investment in a particular conservation measure might provide different levels of benefit; neither is there an evaluation of how different conservation measures interact with each other to produce positive or negative synergies. Very often, the Plan, EA, and DEIS/DEIR simply assume that the conservation measures work perfectly as described, with no analysis given to how outcomes might differ if the conservation measures are less than 100% successful. The Delta Independent Science Board identified this as the first of its "major concerns" with the Draft Plan, stating:

> Expectations for the effectiveness of conservation actions are too optimistic.—Throughout the DEIR/DEIS, the BDCP actions, as supplemented by Avoidance and Minimization Measures and Mitigation Measures, are assumed to produce the anticipated benefits when they are needed to offset any impacts of BDCP actions. In essence, it is often argued that Conservation Measures (CM) 2–22 will have sufficient positive benefits for covered species to counterbalance any negative impacts of water diversions and changes in flow caused by proposed alternatives (CM1). This is an implausible standard of perfection for such a complex problem and plan…. It would be better to begin with more realistic expectations that include contingency or back-up plans.

Delta ISB 2014 at 5; *see also* DSP Independent Science Review Panel Report 2014 at 45, 57.

1. The Draft Plan makes Unfounded and Unanalyzed Assertions Regarding the Efficacy of the Illegal Harvest Reduction Measure (CM17) and Fails to Evaluate Whether the Conservation Measure is Appropriately Scaled to the Magnitude of the Problem they are Intended to Address.

The Conservation Strategy offers conservation measure 17 (CM17 – additional investment in anti-poaching law enforcement teams) as a response to the Illegal Harvest stressor. Both the green sturgeon and white sturgeon DRERIP conceptual life history models, Israel and Klimley 2008; Israel et al. 2009, which are not referenced, mention illegal harvest of these species as an important (though unquantifiable) stressor, and we do not dispute that reducing illegal harvest of sturgeon in the Delta is worthwhile pursuit. However, the Plan's analysis of the problem and rationale for its proposed solution (CM17) appears limited to the following statement: "California has a population of approximately 37 million people (U.S. Census Bureau 2012), but has fewer than 200 field wardens. This is the lowest game warden-to-population ratio of any state in the nation." Draft Plan at 3.4-318.

Despite an acknowledged lack of information on the extent of the problem, the Draft Plan vastly overstates claims regarding the likely impact of illegal harvest for salmonids and the likelihood that CM17 will solve those problems. The Effects Analysis simply asserts, "The BDCP will help reduce illegal harvest of adult winter-run Chinook salmon." Draft Plan at 5.5.3-22. Again, this confuses efficacy of the conservation measure with importance of the stressor. In this case, the Effects Analysis assumes that illegal harvest is of moderate importance to the population and that there is moderate certainty of that effect. Draft Plan at 5.5.3-22. In fact, there is no certainty at all of the effect of poaching on the winter-run Chinook salmon population or any salmonid population, *see* Williams 2006, Williams 2010, and it is unlikely that poaching is a large impact on most of these populations. Nonetheless, the Effects Analysis claims: "… with high certainty that there will be a high positive change to the illegal harvest attribute for adult winter-run Chinook salmon, as well as for foraging and migrating juveniles." Draft Plan at 5.5.3.23.

Similar conclusions are drawn for spring-run Chinook salmon. The conclusions of high impact are over-inflated and neither the Conservation Strategy, Effects Analysis, nor the DEIS/DEIR offers supporting evidence to support this "high" level of certainty. This finding is attributed to the opinion of one agency biologist who wrote the memorandum describing the conservation measure and its costs – this hardly represents a rigorous or independent review of conservation measure effects and reveals no effort to compare the relative merits of different conservation measures.

Conclusions regarding illegal harvest reductions of steelhead are also overstated and are not supported by the available scientific information. The Effects Analysis states:

> "… it was assumed with <u>low certainty (based on relatively little information)</u> that illegal harvest of steelhead juveniles and adults is an attribute of <u>low importance</u>. It is concluded that there will be a <u>high positive change to the illegal harvest attribute for steelhead under the BDCP, with high certainty</u> based on the analysis

> presented by Roberts and Laughlin (2013) that is discussed further in the winter-run Chinook salmon analysis."

Draft Plan at 5.5.6-10.

However, the memorandum by Roberts and Laughlin presents no analysis whatsoever regarding the extent of illegal harvest of steelhead or winter-run Chinook salmon. There is no information in Roberts and Laughlin's memo that justifies a high certainty of high positive change resulting from reductions in steelhead poaching; there is also no information presented that can square these high expectations with the *low importance* of the stressor to begin with.

Because there is not even a qualitative estimate of the scope of the illegal harvest problem, the Conservation Strategy provides no way to evaluate whether CM17's proposed increase in enforcement staffing is adequate, too much of an investment, or too little. Also, the Draft Plan fails to evaluate whether this conservation measure's efficacy will be reduced by effectiveness of other conservation measures, such as the effort to reduce migration delays at the Fremont Weir (CM2). The Conservation Strategy relies heavily on a memo from CDFW regarding the cost for this action, but that memo provides no estimate of the benefits anticipated from CM17 or whether more benefits could be expected from an even larger effort. Roberts and Laughlin 2013.

The Draft Plan states that, "increased enforcement as part of CM17 will be focused on the Bay-Delta area and its waterways; however, increased enforcement outside of the Plan Area may occur as part of CM17." Draft Plan at 3.4-319. But the Draft Plan then states: "spring-run Chinook salmon are expected to experience the greatest benefit, because their over-summer holding and ease of locating may make them more susceptible to poaching than other runs." *Id.* at 3.4-322. Most current spring-run Chinook salmon holding habitat is far from the Delta in streams that drain the slopes of Mt. Lassen; staff time allocated to enforcing anti-poaching regulations for over-summering spring-run Chinook salmon will clearly not be available for in-Delta enforcement efforts. Similarly, the Effects Analysis suggests that reduced winter-run Chinook salmon poaching will occur due to enforcement efforts upstream on the Sacramento River holding grounds of this species. Draft Plan at 5.2-40. This holding habitat is approximately 2.5 hours or more from Fremont Weir; thus, staff that conduct anti-poaching efforts in winter-run holding habitat are not available for in-Delta efforts at that time. Also, winter-run Chinook salmon hold in the mainstem of the Sacramento River where they are less susceptible to poaching than, for example, spring-run Chinook salmon, *see* Williams 2006, and where anti-poaching efforts may be more challenging than in areas with fewer river access-egress options. Furthermore, the Effects Analysis suggests that anti-poaching efforts from CM17 will extend into the San Joaquin River drainage. Draft Plan at 5.5.5-54. Neither the Plan not the DEIS/DEIR describe how all of these divergent presumed benefits from the conservation measure (and the Plan describes others, not mentioned here) will be realized.

2. The Draft Plan Makes Unfounded and Scientifically Inaccurate Assertions Regarding the Efficacy of Tidal Marsh Restoration (CM4; Presumed Food Web Benefits)

The BDCP Conservation Strategy focuses heavily on restoration of food web productivity in the Plan Area. Indeed, increases in the availability of prey is identified as a stressor reduction target for longfin smelt (Draft Plan at 3.3-120), and salmonids, splittail, delta smelt, and sturgeon (Draft Plan at 5.E-149 (Table 5.E.4-39)). The main proposal for addressing limited food web productivity is to restore thousands of acres of tidal and shallow sub-tidal habitat (CM4). The plan describes two principal purposes of this action: (1) to provide habitat for covered species, and (2) "To enhance the ecological functions and services of the Delta especially in regard to the Delta foodweb that supports many covered fish species." Draft Plan Appendix 5E at 5.E-ii.

As we have stated repeatedly, our organizations generally support tidal and shallow sub-tidal habitat restoration in the Bay-Delta as a means of improving the quantity and quality of habitat for numerous wildlife species (especially, migratory waterfowl) and fishes that use these habitats extensively (e.g., Sacramento sucker), but, the BDCP must provide benefits to the fish and wildlife species that are covered by the Plan; ancillary benefits to other native species are welcome, but they cannot be the basis for permitting and implementing an HCP or NCCP. *See, e.g.,* EDF, NRDC, TBI, and DOW "BDCP: Performance Assessment from the Conservation Perspective" September 2011; Memorandum to J. Meral et al. From J. Rosenfield re: "Preliminary Review of BDCP Effects Analysis Appendix F" February 9, 2012. Contrary to the Draft Plan's assumptions and assertions in the DEIS/DEIR, there is little scientific evidence indicating that that restoration of the type and extent discussed in BDCP is likely to stimulate food production that will substantially benefit most of the covered species; there is no evidence that any increase in food availability will extend far beyond the immediate vicinity of the restoration projects to benefit life stages of covered species that do not frequent the restored habitat (*see below*).

i. The Draft Plan Misrepresents Cited Scientific Literature with Regard to the Potential Efficacy of Proposed Tidal Marsh Restorations to Covered Species

In comments on earlier versions of the BDCP, we documented the misrepresentation of scientific literature in BDCP documents regarding the likely effects of tidal marsh restoration. *See* "Partial Review of 2011 Draft of the BDCP Effects Analysis, April 4, 2011; Memorandum to J. Meral et al. from J. Rosenfield re: "Preliminary Review of BDCP Effects Analysis Appendix F" February 9, 2012. These mischaracterizations have not been corrected in the Draft Plan and thus the claims

that specific benefits from proposed tidal marsh restorations are likely to accrue to covered species remain misleading and/or overstated.

The large uncertainties and potential negative effects to numerous fish species of restoring tidal marshes in the San Francisco Estuary were well-articulated by Brown (2003); he summarized the situation as follows: "… there is a high degree of uncertainty regarding the benefits of tidal wetland restoration for native fishes, including special status species such as delta smelt (*Hypomesus transpacificus*), chinook salmon (*Oncorhynchus tshawytscha*), steelhead rainbow trout (*O. mykiss*) and splittail (*Pogonichthys macrolepidotus*). Brown 2003 at 3. However, the Draft Plan cites Brown 2003 repeatedly as evidence that tidal marsh restoration will be good for a variety of covered fish species, *see, e.g.,* Draft Plan at 3.4-119, even though there is nothing in Brown 2003 that would support that conclusion as the paper focuses on the rather large uncertainties and potential pitfalls of that position.[52]

The Draft Plan cites the 2009 DRERIP Evaluation conducted for BDCP (Essex Partnership 2009) in a way that implies that these reviews supported the notion that restoration in the Cache Slough ROA would "Increase rearing habitat area for Chinook salmon (Sacramento River runs), splittail, and sturgeon." Draft Plan at 3.4-121. However, that preliminary DRERIP review rated potential benefits to sturgeon and most Sacramento River Chinook salmon runs as "low" (at best) with low to minimal certainty (fall-run Chinook salmon were seen as possibly experiencing "moderate" benefits from this restoration, but again certainty was rated "low" for this potential outcome); on the other hand, potential negative outcomes from this restoration effort were judged to be of "medium" magnitude (at worst) for all the covered species. Essex Partnership 2009 (2009 DRERIP Evaluation).

As we stated in our review of earlier BDCP efforts to justify the Draft Plan's tidal marsh restoration proposal, references to "Healy 1991" and "Kjelson 1982" are misleading; Healy (1991) is a 20+-year old book chapter that describes Chinook salmon behavior across the coast throughout their life cycle – it provides no support for the notion that BDCP's proposed restoration of Suisun Marsh habitats will benefit Chinook salmon. Kjelson et al. 1982 (also the source of most of the information about salmon in this system in Healy 1991) provides no support for the notion that BDCP's proposed restoration of Suisun Marsh habitats will benefit Chinook salmon.

[52] Similarly, the Draft Plan cites "Siegel (2007)" as supporting claims regarding the benefits of tidal marsh restoration for numerous covered species, Draft Plan at 3.4-121, but this document is a "first draft" that clearly states that it is: "incomplete and not fully vetted" and that "…the very short time frame for development of this first draft means it is neither complete nor subjected to adequate scrutiny as a complete package." Seigel 2007 at 5.

Similarly, Hobbs et al. 2006 is referenced as supporting the notion that Suisun Marsh restoration will benefit longfin smelt and delta smelt, but this paper does not reference the potential effect of marsh restoration on either of these covered smelt species – in fact, the words "marsh", "Suisun Marsh", "wetlands", and "restoration" do not occur at all in that paper, whereas the importance of the low salinity zone for rearing of both species is repeatedly emphasized. The Draft Plan cites "Moyle 2008" and "Fresh 2006" in support of a claim of benefits to covered species from proposed restoration of tidal marsh in the Suisun Marsh and Cache Slough ROAs. Draft Plan at 3.4-121. However, because these papers are not listed in the literature cited section of this document, it is not possible to review their relevance to the claims made in the Draft Plan.

ii. The Draft Plan fails to match conservation measures to the presumed drivers of ecosystem stress they are intended to address

Approaches to ameliorate limited food web productivity should either address the causes of food supply limitations (i.e., produce stressor reduction) or circumvent those forces that currently result in reduced food supplies. The point of clearly identifying and characterizing stressors is to ensure that conservation measures are designed specifically to attack these problems. Thus, it is surprising that the stressors the Plan and DEIS/DEIR identify as limiting food supplies for covered species are <u>not</u> those that would be ameliorated by increased tidal marsh restoration. The Plan argues variously that invasive clam species (which graze on phytoplankton) and altered estuarine chemistry (both nutrients and toxins), and other stressors are the likely forces that drive the decline in this estuary's food web productivity. For example, in its rationale for setting the food web stressor reduction target relevant to its longfin smelt objective, the Conservation Strategy explains:

> Researchers have hypothesized that a major factor in the decline of longfin smelt abundance is related to invasion by *Potamocorbula* and its subsequent disruption of the foodweb (Carlton et al. 1990; Alpine and Cloern 1992; Orsi and Mechum 1996; Kimmerer 2002a; Baxter et al. 2008:36). There is evidence that the disruption of the foodweb is the most significant change in the estuary's carrying capacity for other fishes (e.g., Kimmerer et al. 2000; Kimmerer 2006).
> …
> Total ammonia levels may be another factor affecting covered fish species by inhibiting primary productivity (Ballard et al. 2009; Dugdale et al. 2007; Dugdale et al. 2012 in Parker et al. 2012; Glibert 2010; Glibert et al. 2011; Parker et al. 2012; Wilkerson et al. 2006), altering the phytoplankton species assemblage (Baxter et al. 2010; Glibert 2010), or altering the role of invasive species (Ballard et al. 2009). The primary source of total ammonia in the Delta is effluent discharged from wastewater treatment plants, and the primary contributing facility is the Sacramento Regional Wastewater Treatment Plant. The frequency, severity,

> and distribution of effects from total ammonia levels are the subject of ongoing research, but current science indicates a high likelihood that decreasing loading of total ammonia from the Sacramento Regional Wastewater Treatment Plant would have beneficial consequences for phytoplankton productivity and thus the productivity of the pelagic foodweb in and downstream of the Sacramento River in the Plan Area. Section 3.5.1, Ammonia Load reduction, describes the analysis underlying this conclusion.

Draft Plan at 3.3-126. Assuming that these food supplies are currently limited by stressors such as invasive clams, altered aquatic nutrient ratios, *Microcystis*, or contaminants, then any food supply benefit of the BDCP's habitat restoration will be substantially reduced by these very same problems.

Despite the Plan's focus on non-habitat related stressors as the drivers of decline in foodweb productivity, the Conservation Strategy does not identify measures to directly combat these stressors. Instead, the Conservation Strategy focuses on inundation of low-lying habitats under the expectation that these will generate food for covered species. The Plan does not describe why it believes that food produced by these "restored" wetlands and floodplains would not be subject to the same negative impacts (clam grazing and/or altered water chemistry) that it contends drive the current limits on food web productivity. Indeed, the Conservation Strategy at times acknowledges that its description of benefits likely to arise from tidal marsh and floodplain inundation are highly uncertain because of the risk that food produced on the restored areas will be consumed by invasive clams. The Effects Analysis states:

> Translation of the potential production implied by the prod-acre index into food for covered fish species is complicated by biological and physical conditions… In particular in shallow areas <u>grazing rates of clams can exceed phytoplankton production rates resulting in no augmentation of zooplankton or other food sources for covered fish species</u> (Lucas et al. 2012). Hydrodynamics can affect water residence time and the movement of food from sources to potential fish feeding areas. Because clam grazing rates and hydrodynamics vary across the Delta, the potential of primary production changes in Table 5.E.4-39 and Figure 5.E.4-86 to effectively convert to food for covered fish species will likely vary significantly among and within subregions and will depend greatly on local conditions and by large scale drivers of conditions such as flow, salinity and temperature."

Draft Plan, Appendix 5.E, at 5.E-147. The Plan does not seem to acknowledge that, if estuarine chemistry is limiting productivity (as the Conservation Strategy suggests), then restoration of shallow water habitats will do nothing to address that limitation.

In its confusing, and ultimately unresolved, portrayal of some of the stressors that may affect estuarine food supplies for covered species, the Effects Analysis states:

> In a precursor to the broader work by Glibert et al. (2011), Glibert (2010:229) concluded the following.
>
> > *"[A] clear management strategy* [for managing food web impairments] *is the regulation of effluent N discharge through nitrification and denitrification. Until such reductions occur, other measures, including regulation of water pumping or manipulations of salinity, as has been the current strategy, will likely show little beneficial effect."*
>
> This suggests recognition that other attributes (stressors) such as entrainment may also be of importance, albeit secondary importance [to estuarine stoichiochemistry], according to Glibert (2010).

Draft Plan at 5.5.1-4 (emphasis added).

We and many other independent scientific reviews are skeptical of the analyses and nutrient management approach to foodweb stimulation promoted by Glibert (2010; Glibert et al. 2011). *See, e.g.,* Cloern and Jassby 2012; Cloern et al. 2014; DSP Outflows Review Panel Report 2014. However, we agree that management actions should respond to (or at least not be blind to) the root causes of the problems they are intended to address.[53] Ironically, though the Effects Analysis cites this argument, it does not acknowledge that restoration of tidal marsh and sub-tidal habitat do not respond to, and would be impaired by, the stressors the Draft Plan cites as driving food web productivity declines.

Meanwhile, the BDCP Plan and DEIS/DEIR documents do not analyze the documented effects of:

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[53] This paper was the subject of a scathing re-analysis by Cloern et al. 2012 which showed that:

> …CUSUM-transformed variables often have an apparent statistically significant correlation even if none exists between the original untransformed series. Moreover, even if a statistically significant relationship could be established between CUSUM-transformed variables, there is no proven basis for inferring relationships between the original variables. … As a real example, Glibert (2010) inferred a strong negative association between delta smelt abundance and wastewater ammonium from regression of CUSUM- transformed time series. However, the Pearson correlation ($r = -0.096$) between the time series … is not significant, even under the naive IID assumptions ($p = 0.68$). In short, correlations between CUSUM-transformed variables should not be used as a substitute for analysis of the original untransformed variables.

Cloern et al.2012.

- Increased freshwater flow rates (and the related position of the salinity field, "X2") on production of zooplankton species that covered fish species eat. Jassby et al. 1995; Kimmerer 2002;
- Increased freshwater flow rates on the alleged food web effects arising from unbalanced nutrient concentrations. Dugdale et al. 2007, 2012, 2013;
- Reduced south Delta exports (and associated hydrodynamic modifications) on food web productivity. Jassby et al. 2002; Cloern and Jassby 2012; and
- Freshwater flow management on the susceptibility of this ecosystem to invasion by disruptive, non-native species. Winder et al. 2011.

iii. The Draft Plan's Analysis of CM4 Fails to Use the Best Available Science and is Inconsistent with Numerous Peer Reviews

Many of the purported benefits of CM4 are unsupported by the BDCP Effects Analysis and/or they are contradicted by previous analyses and published literature. Although at times the document acknowledges uncertainty, by and large the Effects Analysis reiterates assertions made throughout the document regarding the presumed benefits of BDCP's tidal marsh restoration efforts, stating:

> Restored tidal marshes are expected to provide increased phytoplankton production, which will benefit zooplankton such as copepods that are an important prey item for listed fish (e.g., delta smelt, longfin smelt, and splittail), other estuarine fish, and other aquatic organisms. Substrates in restoration areas will provide habitat for macroinvertebrates which will also result in beneficial food web effects.

Draft Plan at 5.4-11. The Effects Analysis fails to support this claim with a specific analysis relating its conservation measures to the attainment of stressor reduction targets. For example, the Conservation Strategy identifies the following stressor reduction target for longfin smelt:

> Increase the average late-winter and early-spring (late February to April) density of zooplankton (target of 7,000/m3 of calanoid copepods) in the Cache Slough ROA, West Delta ROA, and Suisun Marsh ROA and/or supply adequate transport flows (sustained or pulse flows) to move longfin smelt larvae to areas with adequate food resources (target of 7,000/m3 of calanoid copepods). Achieve this target by year 15. Increasing food abundance will contribute to increased longfin smelt juvenile survival immediately following yolk-sac absorption by providing food resources suitable for juvenile longfin smelt within the Plan Area.

Draft Plan at 3.3-120.

We approve of the specificity of this stressor reduction target (though we do not comment here on its adequacy), but the point of providing such targets is to guide the Effects Analysis and DEIS/DEIR to evaluate whether such targets will be met by the Conservation Strategy, as proposed. Neither the Effects Analysis not the DEIS/DEIR delivers an analysis of food web effects that are comparable to the target above.

The presumption that tidal marsh restoration will substantially improve food production for most or all of the covered fish species ignores the weight of scientific and agency opinion which indicates that the expectation of food exports are highly uncertain and too small to significantly benefit pelagic fish species even if the amount of food web stimulation that the Plan anticipates actually occurs. For example, in 2012 the U.S. Fish and Wildlife Service stated that, "The plan's ultimate conclusions regarding the outcome of creating such large new areas of tidal marsh remain more positive and certain than the literature and scientific authorities suggest they should be. U.S. Fish and Wildlife Service, FWS BDCP Effects Analysis red flags for March, 2012 ("USFWS Red Flags 2012") at 8-9. In its 2013 comments on proposed habitat restoration under the BDCP, the Delta Stewardship Council noted that, "[s]ome suggest enhanced flow may also provide more reliable benefits to the ecosystem than marsh restoration, the benefits of which are less certain and not yet well documented." DSC 2013 BDCP Comments. Similarly, in its review of the Effects Analysis' estimation of food web impacts resulting from physical habitat restoration under the BDCP, the Delta Science Program's Independent Review Panel wrote "…the BDCP analyses are ambiguous and conclusions and estimates of net effects overestimate the net positive impacts of conservation measures. DSP Independent Science Review Panel 2014 at 59. Regarding habitat restoration in particular, they wrote

> Restoration of tidal wetlands (and other communities) is highly uncertain and at least an extremely long process. <u>The Effects Analysis does not adequately justify the critical assumption of the benefit of tidal wetland restoration as a food web subsidy for covered pelagic fish given the uncertainties of tidal wetland restoration itself</u>. A critical issue is the implicit expectation that restoration activities will result in increases in abundance of lower trophic levels, but it is uncertain whether the resulting increased production will result in food web pathways supporting covered species. The presentation of phytoplankton-based and tidal wetland macrophyte detritus-based food webs as alternative ecosystem processes, rather than as an integrated system, also significantly complicates the interpretation of the potential benefit of BDCP restoration. For foraging salmonids, the Effects Analysis did not evaluate the reduced extent to which salmonids would have access to rehabilitated habitat when the north Delta intakes are operating and flows are reduced.

Id. at 7-8. In addition, they wrote that,

> …there is great uncertainty associated with the restoration of the wide range of ecosystems slated for restoration. Many of these systems have a poor record of achieving restoration, especially in short-to-moderate time periods. This range of ecosystems also varies considerably in the degree of difficulty of restoring functions. Nonetheless, the outcomes for conservation measures and their interaction and effectiveness are glossed over and uncertainties are not apparent in conclusions and summary discussions.

Id. at 37. Furthermore, that panel found that the Draft Plan and DEIS/DEIR frequently failed to assess the potential negative impacts of conservation measures, such as habitat restoration, stating:

> With respect to food webs, wetland and aquatic systems restoration are assumed to be effectively restored and functional immediately or in a short time frame and meet the biological objectives of the BDCP. This result is based on a number of additional assumptions, all of which contain considerable uncertainty. Similarly, while potentially negative impacts on the success of restoration are considered in passing, e.g., invasive bivalves, none of their potential effects are incorporated into their analyses or conclusions. The simplest effects perspective of the BDCP is that it edits out all potential outcomes except for the most favorable one.

Id. at 57. A separate review by a different assemblage of independent experts concluded that many of the BDCP's assessments of impacts "… hinge on overly optimistic expectations about the feasibility, effectiveness, or timing of the proposed conservation actions, especially habitat restoration." Delta ISB 2014 at 3.

Another review of BDCP conducted by experts in ecosystem processes and aquatic ecology of the Bay-Delta ecosystem (this one commissioned by The Nature Conservancy and American Rivers) reached a similar conclusion, noting that "The BDCP is overly optimistic about the likely benefits of tidal marsh restoration to the smelt species, particularly the extent of food production." Mount and Saracino et al. 2013 at 70-71 (emphasis added). They conclude:

> The BDCP is overly optimistic about the potential benefits to delta and longfin smelt of physical habitat restoration. Longfin smelt do not appear to use marshes as habitat to any great extent. Delta smelt are also considered pelagic but their persistent abundance in the Cache Slough complex, and greater abundance in shallow rather than deep water, suggests some potential benefit to their population

> of expanded marsh in that area. The magnitude of this benefit is impossible to predict, as is the degree to which marsh and floodplain restoration might cause an increase, or reverse the decline, in the delta smelt population. Under these conditions it is premature to assert that the restoration activity will have such an effect, until studies including pilot projects and even some smaller full-scale restoration projects can show whether an effect is to be expected.
>
> The idea that restored marsh and floodplain will export substantial amounts of zooplankton to the open waters of the estuary is not tenable. The ecology of shallow waters suggests that shallow areas are more likely to be sinks for zooplankton. Even if they were sources, simple mass-balance considerations indicate that the resulting export would produce at most a small enhancement of extant zooplankton of the open waters. This idea should be dropped from discussions of BDCP.

Mount and Saracino et al. 2013 at 82. In general, scientific reviews of the potential for large-scale tidal marsh restoration to produce significant benefits to pelagic fish species in the Bay Delta (e.g. via enhanced food web productivity) have concluded that such effects are speculative and unlikely to be realized to the extent expected by the BDCP Effects Analysis. For example, the National Research Council in 2010 concluded that, with respect to the USFWS 2008 biological opinion's habitat restoration action in the RPA,

> The tidal habitat management action in the RPA requires creation or restoration of 8,000 acres of intertidal and subtidal habitat in the delta and in Suisun Marsh. This action has not been controversial because it does not affect other water users. The committee finds that the conceptual foundation for this action (Action 6) is weak <u>because the relationship between tidal habitats and food availability for smelt is poorly understood</u>. … The committee recommends that this action be implemented in phases, with the first phase to include the development of an implementation and adaptive management plan (similar to the approach used for the floodplain habitat action in the NMFS biological opinion), but also to explicitly consider the sustainability of the resulting habitats, especially those dependent on emergent vegetation, in the face of expected sea-level rise. In addition, there should be consideration of the types and amounts of tidal habitats necessary to produce the expected outcomes and how they can be achieved and sustained in the long term. The committee supports the monitoring program referred to in Action 6, and appropriate adaptive management triggers and actions.

NRC 2010 at 6.

A recent review by nine authors with vast experience in fisheries and shallow sub/inter-tidal habitats of the Bay-Delta (Herbold et al. 2014) concluded:

> Movement of plankton from a tidal marsh (beyond the immediate area of tidal exchange) is likely to be limited and to decrease strongly with distance. Even under ideal circumstances, plankton in water discharged from tidal marsh cannot greatly affect the standing crop of plankton in large, deep channels. Feeding by clams and other introduced species can further reduce contributions of marsh plankton to open-water foodwebs.

Herbold et al. 2014 at 1-2 (emphasis added). These authors also found that, "In the modern San Francisco estuary, tidal wetlands can be important habitats for many fishes, but likely will have little effect on the export of food available to fish at any significant distance." *Id.* at 3. And they state:

> Restored tidal wetlands are unlikely to have much effect on food webs in the upper estuary's open waters. The shallow depth and small volume of water on tidal wetlands compared to the vast volume of open water in the Delta channels and Suisun Bay means that the flux of wetland phytoplankton and zooplankton would be inconsequential to pelagic food webs. We are unaware of reports from the worldwide literature in which substantial quantities of zooplankton are exported from marshes to open waters, whereas several studies show net import of zooplankton to fish consumption on site.

Id. at 4.[54]

These conclusions echo findings of BDCP's own earlier review of six tidal marsh restoration measures considered in the BDCP; for the most part, these tidal marsh restoration measures have been retained in the current BDCP Conservation Strategy. In our review of this earlier effects analysis (the 2009 DRERIP evaluation, *see* Essex Partnership 2009), which considered a variety of conservation measures in addition to tidal marsh restoration proposals (but no alternative water management regimes), we found that "… covered species are expected to receive only "Minimal" or "Low" benefits from most of the proposed conservation measures" and "…a substantial portion of the positive results are characterized by "Low" to "Minimal" certainty.

[54] While publication of this paper occurred after publication of the BDCP documents and the DEIS/DEIR, each of the authors has been available to the BDCP planning team and several of the authors have been engaged in the planning and technical analyses of BDCP components. Their conclusions are not new results, but represent longstanding perspectives of experts in the Bay-Delta ecosystem's aquatic foodwebs.

Thus, the actual outcome of many of these actions is likely to be significantly less than projected, based on magnitude scores alone. TBI letter to BDCP Steering Committee, August 17, 2009 at 3-4.

iv. The Draft Plan and DEIS/DEIR assume benefits accrue to species that are unlikely to benefit from the Conservation Measure, even when the presumed benefit is not related to a previously identified stressor.

The Draft Plan and DEIS/DEIR tend to claim that projected benefits from conservation measures will benefit numerous species even when the presumed benefit does not alleviate an identified stressor on the species' population. For example, with regard to habitat restoration, the Effects Analysis claims repeatedly that species such as steelhead may benefit from the anticipated increase in potential rearing habitat associated with tidal marsh restorations; this expectation is contradicted by the Habitat Restoration Appendix's acknowledgement that "steelhead are generally thought to move quickly through estuarine habitats because of their larger size at outmigration." Draft Plan, Appendix 5E, at 5.E-116. Similarly, the conceptual model for Central Valley salmonids concludes "Spring Chinook, or at least the Butte Creek population, pass quickly through the Delta, so habitat restoration there seems unlikely to do much for them. The same is probably true for late fall Chinook, and for steelhead." Williams 2010 at 41.

In fact, an expert panel convened by the BDCP planning process (the 2009 DRERIP evaluation) to review the potential benefits of tidal marsh measures found that, with the exception of effects to Sacramento splittail (a species that does well in marsh habitats), five of the six tidal marsh measures evaluated were expected to generate "minimal" to "low" benefits, at best, for the covered fish species and the likelihood of these small benefits was "minimal" to low" in most cases. By contrast, each of the six regional tidal marsh restoration efforts studied in detail by the expert panel was expected to generate negative effects of "moderate" to "high" magnitude (with "medium" to "low" certainty) for covered species. These negative impacts included the potential for restored wetlands to harbor or facilitate impacts from invasive competitor and predator species. For both positive and negative impacts, the magnitude of effects generated by tidal marsh restoration was acknowledged to depend on site-specific considerations among other uncertainties. Essex Partnership 2009. In their more recent review, the Delta Science Program Independent Review Panel emphasized similar concerns, stating:

> Migrant life histories are less likely to benefit from habitat restoration activities, which are a key focus of the BDCP conservation measures. This implies that spring Chinook and steelhead may experience less benefit from BDCP actions than other salmonid species, or they may even experience a negative net effect in response to reduced spring flows. The key question, which deserves more

> attention in the BDCP, is whether the migrant life history will sufficiently benefit from conservation measures to offset moderate negative impacts related to reduced spring flows.

DSP Independent Science Review Panel Report 2014 at 30; *see id.* at 57-58.

v. The Draft Plan makes the unfounded assumption that all planned restorations will occur when and to the extent planned and will be 100% successful.

In addition to the lack of scientific evidence that the Bay-Delta food web is likely to be substantially improved by restoring tidal marsh habitats, there is great uncertainty regarding the assumed effectiveness of marsh restoration measures – that is, even if tidal marsh restoration supports the Bay-Delta food web in the manner anticipated by the Draft Plan, there is no certainty that each individual restoration will be maximally effective in producing these results. If some of the restoration actions are less effective at producing food for covered species (or more effective at supporting invasive competitor or predator species) than the Plan assumes, then the overall benefit of this measure will be reduced. The State Water Resources Control Board identified this general concern, in its July 5, 2013 comment letter, which states "The fishery and aquatic resources impact analysis does not appear to analyze scenarios in which conservation measures are not 100% successful." SWRCB 7/5/13 BDCP Comments at 32.

Similarly, there are growing concerns that physical and economic limitations (including the lack of willing sellers) may prevent BDCP from achieving the overall restoration acreage. Reviews from NMFS (2013), USFWS (2013), SWRCB (2013) and the Delta Science Program Independent Review Panel (2014) have raised the concern that the physical characteristics of the Estuary cannot support the tidal marsh restoration. For instance, the State Water Resources Control Board, commenting on the 2013 Administrative Draft of the BDCP, wrote:

> The BDCP relies on habitat restoration to provide adequate ecosystem conditions to achieve the biological goals and objectives of the project. Available tidal energy, and the associated tidal exchange, might be attenuated as restoration projects begin to be constructed and put into operation. The reduction in tidal exchange might reduce the export of phytoplankton and reduce turbidity. Both of these effects might reduce the effectiveness of existing and future restoration areas.

SWRCB 7/5/13 BDCP Comments at 5. The Board also expressed concern that the Administrative Draft of the BDCP did not "appear to analyze the effects of changes in tidal energy exchange that may result after construction and implementation of habitat restoration

projects, and how those changes in tidal energy might affect transport of food and turbidity to locations where pelagic species are present." *Id.* The current public draft of the BDCP still fails to analyze the effects of habitat restoration on tidal energy and vice versa.

The Delta Science Program Independent Review Panel points to another potential physical limitation on the BDCP's ability to effectively restore tidal marsh habitats:

> *The issue is sediment supply for these restorations. The BDCP assumes a constant* sediment concentration for the time period of the plan (Appendix 5.E, pp. 43-44: turbidity held constant in models and interpretations), yet they indicate that sediment concentration has been declining over the past 50 years (p. 109) and that the BDCP conservation measures will further reduce the sediment supply by an additional 8-9%. <u>While in their discussion of sediment supply, they also conclude that declining sediment concentration and the impact of CM1 will mean much lower sediment supply, these issues have no impact on the BDCP analysis and inference</u>. Yet the loss of sediment supply creates great uncertainties in the rate and potential for restoration of these habitats, while <u>only the most optimal circumstances are modeled or estimated</u>.

DSP Independent Science Review Panel Report 2014 at 58 (emphasis added).

In a related problem, any benefits of tidal marsh habitat restoration can only materialize *after* the restoration projects are implemented. The implementation schedule for CM4 indicates that less than half of the total "tidal wetland restoration will be completed by year 15 (the end of the so-called "Early Long-term" period). Draft Plan at 6-5. Thus, most of the presumed benefits provided by tidal marsh restoration actions (assuming there are net benefits) to covered species will only become apparent decades into the BDCP permit term, and the full benefits described in the Plan cannot materialize until after the permit-term is completed, assuming that the schedule is accurate and restorations are not significantly delayed. The Effects Analysis and DEIS/DEIR also tend to assume that benefits of tidal marsh restoration materialize as soon as the restoration occurs, despite the scientific consensus that such restorations evolve over long time periods. DSP Independent Science Review Panel Report 2014; Herbold et al. 2014; Delta ISB 2014. The DEIR/DEIS offers no alternative strategy for conserving and restoring covered species (such as accelerated or more aggressive implementation of other conservation measures or temporary improvements to freshwater flow regimes) during the long implementation horizon for CM4. The long delay in the Plan's effort to provide benefits to covered species is asymmetrical to the timing of actions intended to provide water supply reliability benefits. *See* Draft Plan at 6-3 (North Delta conveyance operations could begin as early as year 11). This asymmetric approach is inconsistent with the NCCPA's requirement for conservation and mitigation measures to be

implemented roughly proportional in time and extent" to the impacts under the Draft Plan. *See* Cal. Fish and Game Code § 2820(b)(3)(B).

The Delta Science Program Independent Review Panel's Phase 3 review of BDCP summarizes many of our concerns with the DEIS/DEIR's analysis of food web impacts arising from the BDCP:

> An overarching assumption is that conservation measures have rapid and positive impacts. With respect to food webs, wetland and aquatic systems restoration are assumed to be effectively restored and functional immediately or in a short time frame and meet the biological objectives of the BDCP. This result is based on a number of additional assumptions, all of which contain considerable uncertainty. Similarly, while potentially negative impacts on the success of restoration are considered in passing, e.g., invasive bivalves, none of their potential effects are incorporated into their analyses or conclusions. The simplest effects perspective of the BDCP is that it edits out all potential outcomes except for the most favorable one.

DSP Independent Science Review Panel 2014 at 57 (emphasis added).

IV. THE DRAFT PLAN AND DEIS/DEIR FAIL TO USE THE BEST AVAILABLE SCIENCE IN ASSESSING THE EFFECTS OF PROPOSED ACTIONS

Given the failure to identify legally adequate restoration outcomes for BDCP, the logical shortcomings of the Conservation Strategy's design, the failure to apply the best available science to analysis of ecological stressors and problems in the Bay-Delta ecosystem, and the failure to explain or justify many of the conservation measures in terms of their contribution to success, it is not surprising that the DEIS/DEIR and Draft Plan predict that the biological outcomes anticipated from implementation will not achieve the biological goals and objectives, let alone achieve legally adequate outcomes. In addition, the Draft Plan's Effects Analysis inappropriately overlooks, de-emphasizes, or underestimates potential negative impacts to the covered species and the ecosystem attributes resulting from Plan implementation. The Draft Plan and DEIS/DEIR frequently identify high "uncertainty" surrounding projected outcomes or model predictions, but, despite this acknowledgement, they proceed to draw conclusions that are usually favorable to the BDCP – we interpret the large uncertainties as a lack of credible evidence that the hypothetical positive results of the Draft Plan are likely to arise and/or that potentially severe negative outcomes will be avoided. Furthermore, the Plan's estimation of ecosystem and species-specific benefits are routinely biased in a way that is overly optimistic about the magnitude and certainty of likely impacts. Even when scientific information demonstrates the biological objectives are unlikely to be achieved or that species or ecosystem

attributes of viability will continue to decline (even to the point of potential extinction during the duration of the BDCP) the Draft Plan concludes that the BDCP will successfully contribute to the recovery of covered species.[55] Finally, the methods and results applied towards analyzing likely plan impacts are inadequate and frequently biased in a way that favors permitting of the Plan.

This is not the first time we have raised our serious concerns with the analysis or interpretation of the Plan's likely effects, and numerous independent scientific reviews have repeatedly emphasized serious deficiencies in the analysis and interpretation of Plan impacts. For instance, the Delta Science Program's Independent Review Panel found that the BDCP Effects Analysis "tends to overreach conclusions of positive benefits for covered fish species, given the inability to quantify the over-all net effects and the realization of high uncertainty," DSP Independent Science Review Panel Report at 25, and that it:

> … does not adequately acknowledge the extensive uncertainty associated with the BDCP's assumptions and predictions. In its current form, at the level of detail conveyed, in the models used, and in the verbal assessments and conclusions, the level of uncertainty is often downplayed. Within appendices sometimes more explicit discussion of uncertainties can be found, but there is a disconnect between the summary pages with the conclusions drawn in Chapter 5. In situations in which an array of outcomes may be possible, only the more beneficial outcomes are used in conclusions about the BDCP. Communication of uncertainty would be improved by consideration of a range of potential outcome values in models."

Id. at 8 (emphasis added). The Delta Independent Science Board concurred with the Independent Review Panel's conclusions regarding the Effects Analysis and had a similarly harsh critique of the DEIS/DEIR, concluding that, "We find, however, that the science in this BDCP effort falls short of what the project requires," Delta ISB 2014 at 1, and they also find that, "the DEIS/DEIR currently falls short of meeting this 'good enough' scientific standard" of the best available science," Delta ISB 2014 at 3. In particular, they concluded that:

> 1. Many of the impact assessments hinge on overly optimistic expectations about the feasibility, effectiveness, or timing of the proposed conservation actions, especially habitat restoration.
> 2. The project is encumbered by uncertainties that are considered inconsistently and incompletely; modeling has not been used effectively to bracket a range of uncertainties or to explore how uncertainties may propagate.

[55] As we emphasize elsewhere, this is not the correct legal standard under the NCCPA.

> 3. The potential effects of climate change and sea-level rise on the implementation and outcomes of BDCP actions are not adequately evaluated.
> 4. Insufficient attention is given to linkages and interactions among species, landscapes, and the proposed actions themselves.
> 5. The analyses largely neglect the influences of downstream effects on San Francisco Bay, levee failures, and environmental effects of increased water availability for agriculture and its environmental impacts in the San Joaquin Valley and downstream.
> 6. Details of how adaptive management will be implemented are left to a future management team without explicit prior consideration of (a) situations where adaptive management may be inappropriate or impossible to use, (b) contingency plans in case things do not work as planned, or (c) specific thresholds for action.
> 7. Available tools of risk assessment and decision support have not been used to assess the individual and combined risks associated with BDCP actions.
> 8. The presentation … makes it difficult to compare alternatives and evaluate the critical underlying assumptions.

Id. at 3. We concur with and reiterate these conclusions of both the Delta Independent Science Board and the Independent Science Review Panel's assessments of the Draft Plan and DEIS/DEIR. In addition, we find that both documents repeatedly fail at the analytical level, in multiple other ways, including:

- Failing to analyze impacts with regard to each attribute of viability (i.e. abundance, productivity (survival), spatial extent of spawning habitat, and life history diversity; McElhany et al. 2000 *and described above*) for each covered species;
- Selectively presenting positive results of analyses when the same analyses also reveal negative outcomes;
- Dismissing modeling results (or entire models) that indicate the Draft Plan and operational alternatives are likely to have negative outcomes relative to baseline conditions (as modeled in the future under the assumption of climate change);
- Selectively applying "uncertainty" as an excuse to dismiss modeling outcomes that reflect negatively on the Draft Plan and operational Alternatives, but ignoring model variance wherever modeling results are deemed to reflect positively on the Draft Plan and Operational Alternatives;
- Incorrectly measuring uncertainty (when it is addressed at all) to reach conclusions of "no difference" between Alternatives and the appropriate baseline, when a valid comparison of results would likely reveal significant differences between Alternatives and NAA;

- Failing to demonstrate that the Draft Plan is likely to achieve its biological objectives, and that the modeling and other analyses show that the Draft Plan is unlikely to achieve these goals and objectives;
- Failing to demonstrate that the Draft Plan would improve upon or even maintain current conditions for covered species, many of which are designated as threatened or endangered;
- Using average values (and, worse "mean" values) across all years to reflect likely effects of modeled alternatives rather than analyzing the range (maximum and minimum) and median of effects modeled within different year-types – the modeling outputs results are far more reflective of the conditions that will affect conservation and restoration outcomes (i.e. the "mean" condition will not occur uniformly, rather different year-type conditions will occur in unpredictable sequences);
- Dismissing the importance of a negative impact by applying arbitrary, capricious, and opaque standards regarding the threshold magnitude at which an effect would be considered important (often the Draft Plan accepts a positive result as having a beneficial "effect" while dismissing as unimportant, or "small", an analogous negative result of greater magnitude);
- Dismissing entire stressors (including those identified by the Draft Plan and/or in agency management documents and those managed in current regulations) as unimportant whenever analyses show that the Draft Plan and operational alternatives will cause and increase in this stressor;
- Discounting its own modeling of inputs (e.g. flows, temperatures, reservoir storage) and outputs (population responses to modeled changes in condition) such that it is impossible to tell which, if any, analyses in the Draft Plan and DEIS/DEIR the reader is expected to believe.

Below, we illustrate the Draft Plan's shortcomings on a species-by-species and ecosystem-as-a-whole basis. To standardize and streamline our synthesis of inadequacies in the Draft Plan and DEIS/DEIR, we describe how deficiencies in the logic chain for each species, and the ecosystem-as-a-whole lead to inadequate protections for biological resources and also identify where the analysis and interpretation of BDCP outcomes found in the Effects Analysis and/or DEIS/DEIR are deficient, fail to incorporate the best available science, or are internally inconsistent with the modeling prepared for these documents. Some of this material will be covered with reference to examples given above; such redundancy is necessary in order to describe systematic problems with the Draft Plan and DEIR/DEIS (above) and their consequences for specific ecological resources (below).

A. Longfin smelt

1. Draft Plan Objectives for Longfin Smelt are Inadequate to Attain the NCCPA (and ESA) Standard for this Species

The Draft Plan's Biological objectives for longfin smelt as outlined in the Conservation Strategy are inadequate. The Draft Plan offers no targets for improvement (objectives) or actions to alleviate the threat this population experiences from human activities that lead to reduced spatial distribution, curtailment of life history diversity, or reduced absolute abundance, all of which are major concerns for this species (Rosenfield 2010). And, as described above, The Draft Plan's targets for longfin smelt productivity plainly do not guide the BDCP towards recovery of this species. One objective for longfin smelt productivity (LFSM1.1) assumes, without a specific rationale, that only a small fraction of the global goal and objective for longfin smelt will be attained via BDCP actions, even though the bulk of this population spends most of its life cycle in areas that are affected by freshwater flow through and out of the Plan Area and the species population displays long-term, statistically significant, high magnitude positive correlation with Delta outflow, which the BDCP will alter. The other objective for longfin smelt productivity –a proposed limit on entrainment mortality (LFSM1.2) -- is inadequate as it permits potentially catastrophic rates of entrainment mortality in any one year and does not specify how entrainment impacts to life history diversity in this species will be limited.

2. The Draft Plan Fails to Accurately Identify and Address the Correct Stressors on this Species

The Draft Plan is ultimately confused and inconsistent as to its strategy for restoring longfin smelt productivity and abundance as revealed by its inconsistent and inaccurate identification of stressors that currently affect this population. The Draft Plan claims that "The conservation strategy for longfin smelt focuses on the same three primary stressors discussed for delta smelt (food, predators, and entrainment)." Draft Plan at 3.3-115. But, "lack of food resources" is the only stressor listed in the table describing species-specific objectives and stressor reduction targets for longfin smelt. *Id.* at 3.3-120. Commenting on a stressor (limited spawning habitat) that was identified in an earlier version of the Draft Plan, USFWS recommended that the BDCP "…provide a plausible prediction of marginal longfin smelt benefits that will be realized by enhancing extent of spawning habitat or delete the corresponding stressor reduction target. USFWS 2013 Progress Assessment at 10. Apparently, that advice was accepted as there is no mention of a spawning habitat limitation for longfin smelt in the current draft Conservation Strategy (Chapter 3) and the Draft Plan's Effects Analysis tersely and accurately states that: "spawning habitat for longfin smelt in the Delta is unknown." Draft Plan at 5.5.2-8. It is therefore surprising that the Draft Plan's Effects Analysis proceeds to analyze potential benefits to longfin smelt spawning anticipated to arise from the construction of new tidal habitats. The

Effects Analysis presents results of a "Habitat Suitability Index", despite its admission that there is no information on longfin smelt spawning micro-habitat requirements. The Effects Analysis claims that there would be "considerably more" tidal habitat available for longfin smelt egg deposition (10% more in the Late Long Term) and that tidal marsh habitat restoration will be of "high" benefit to longfin smelt. Given the lack of knowledge about the extent of spawning habitat, the lack of evidence that longfin smelt spawning habitat limits population abundance or productivity (*see* Rosenfield 2010; USFWS 2013 Progress Assessment), and the Draft Plan's own statements, the finding of benefit from the estimate of BDCP's creation of "new" spawning habitat simply lacks scientific support. Even if that projected increase in spawning habitat were somehow correct, it likely would have little or no impact on the population since there is no reason to believe (and the Draft Plan does not contend) that spawning habitat limitation limits the population currently.

In contrast, the Conservation Strategy does not identify as a stressor on longfin smelt either "altered migration flows" (as it does for each covered salmonid species) or "flow operations" (as it does for sturgeon species. *See* Draft Plan at 3.3-183, 3.3-197. The failure to identify Delta outflow as a significant stressor on longfin smelt abundance is inexplicable given the fact that the relationship between longfin smelt abundance and freshwater outflow from the Delta has been strong, statistically significant, and durable over the past four decades of fish community sampling in this ecosystem. Jassby et al. 1995; Kimmerer 2002; Rosenfield and Baxter 2007; Sommer et al. 2007; Kimmerer et al. 2009; Rosenfield 2010; Thomson et al. 2010; Mac Nally et al. 2010. Through Delta flow and Delta outflow are also believed to drive longfin smelt distribution, Dege and Brown 2004, in ways that affect longfin smelt entrainment, Grimaldo et al. 2009; Rosenfield 2010, and to stimulate production of key longfin smelt food items, *see* Jassby et al. 1995; Kimmerer 2002; Rosenfield 2010. Elsewhere in its Effects Analysis, the Draft Plan appears to agree that freshwater flows are important to this species, stating that, "Current science indicates that the decline in longfin smelt relative abundance observed from monitoring has been a result of foodweb changes, and that longfin smelt relative abundance is strongly correlated with winter-spring outflow from the Delta." Draft Plan at 5.5.2-7. Indeed, the method used by both the Draft Plan and the DEIS/DEIR to estimate changes in longfin smelt populations in the future relies entirely on changes in the position of X2 (an indicator of freshwater flows). It is therefore inexplicable that the Draft Plan does not identify the driving effect of low freshwater flows on longfin smelt and take direct action to ameliorate this important stressor to this species and the ecosystem as a whole.

Similarly, the Plan does not identify entrainment-related impacts as a known stressor for longfin smelt despite the facts that (a) the Conservation Strategy identifies an entrainment reduction objective for longfin smelt, (b) the CDFW conceptual model of longfin smelt life history (Rosenfield 2010) identifies entrainment as a stressor to this population (in certain year types), and (c) the California Department of Fish and Wildlife has issued an incidental take permit to the

State Water Project (CDFW 2009) with terms that are intended to limit entrainment mortality for this species.

These statements and omissions are inconsistent with the best available science. As described above, the Conservation Strategy, Effects Analysis, and DEIS/DEIR are inconsistent in their evaluation and weighting of stressors, stating that certain stressors are important in one place, but then reaching a different conclusion regarding the importance of the same stressors elsewhere. Thus, despite the overwhelming wealth of scientific evidence regarding the impact of freshwater flows on the productivity of longfin smelt, the Effects Analysis says there is uncertainty regarding the role of outflow. *See, e.g.*, Draft Plan at 5.5.2-29. And, disregarding the fact that the Conservation Strategy sets a target intended to limit entrainment-related mortality, the Effects Analysis claims: "… entrainment of adult longfin smelt is no longer considered to be an attribute of importance as a constraint to the longfin smelt population." Draft Plan at 5.5.2-19. This failure to identify and evaluate two of the most important stressors on the longfin smelt leads to the Plan's failure to design adequate conservation measures for this species and the failure to properly interpret clear impacts to the longfin smelt population that will arise from implementation of the Draft Plan.

3. Conservation Measures do not Adequately Address Known Stressors for this Species and/or their Impacts are Overstated

i. The Failure to Provide for Adequate Winter-Spring Freshwater Flows in the Conservation Strategy for Longfin Smelt is Unacceptable and Leads to the DEIS/DEIR's Projection of Declining Longfin Smelt Populations Under the Draft Plan and the Inability to Attain Necessary Conservation Targets

We have repeatedly emphasized the need for the BDCP to consider operational alternatives that result in increased Delta outflows in the winter and spring months as a means to improve the abundance and productivity of longfin smelt. *See, e.g.,* Letter from five conservation NGOs to John Laird and David Hayes, September 30, 2011; Memorandum to Jerry Meral from The Bay Institute, Environmental Defense Fund and Contra Costa Water District, December 21, 2011, RE: "Review of Appendices C and D"; Letter from six conservation NGOs to Gerald Meral, March 1, 2012, RE: "BDCP Draft Effects Analysis"; Memorandum to J. Meral et al. from J. Rosenfield re: "Preliminary Review of BDCP Effects Analysis Appendix F," February 9, 2012. Despite the extremely strong and long-lasting correlations between longfin smelt abundance and winter-spring freshwater outflow from the Delta (a relationship that the Draft Plan and DEIR/DEIS repeatedly acknowledge implicitly), the Draft Plan does not contemplate increases to freshwater flow as a conservation measure for longfin smelt or other species and most of the operational alternatives considered in the DEIS/DEIR actually reduce Delta outflows below

current, unacceptably low levels. The SWRCB criticized a previous version of the DEIS/DEIR for its failure to consider alternatives that resulted in increased Delta outflows, stating:

> Compared to the no-project alternative … it appears that all of these operational scenarios decrease total Delta outflow (see Attachment 1: State Water Board analysis) in the late-long term. The justification for this limited range of Delta outflow scenarios is not clear given that there is strong information on the possible need for more Delta outflow for the protection of aquatic resources and the uncertainty that other conservation measures will be effective in reducing the need for flow. Specifically, recent research indicates that restoration of tidal marsh may not be feasible, possible, or effective. Accordingly, it appears appropriate to include a broader range of Delta outflows under the decision tree process.

SWRCB 7/5/13 BDCP Comments at 5. Similarly, the USFWS recommended that the previous version of the BDCP "… acknowledge that spring Delta outflow is a well-established driver of longfin smelt abundance, and formulate a stressor reduction target that provides spring Delta outflow in accordance with the Service's standing recommendation." USFWS 2013 Progress Assessment at 10. Despite these powerful and direct recommendations that the BDCP provide improved Delta outflows for covered species like longfin smelt and for improved estuarine functions, the problem remains unaddressed in the current Draft Plan.[56]

Speaking to the utility of increasing Delta freshwater flows rates to protect estuarine fish (like longfin smelt), fish habitat, and other ecosystem processes, a recent independent science review panel wrote:

> There is <u>very strong (even unequivocal) evidence that specifying outflow requirements and objectives specific to seasons (specific months) is a rational and scientifically justified approach</u>. As summarized in SWRCB (2010 – Development of Flow Criteria), <u>there is solid evidence that high outflows during various combinations of winter-spring months benefit a variety of species</u>. … High winter-spring flows into the Bay-Delta (low X2) have been shown or argued to act as cues for fish spawning migrations, to improve reproductive success, and to increase survival of juvenile anadromous species migrating seaward. <u>High</u>

[56] Alternative 8 in the DEIS/DEIR does provide an increase in winter/spring Delta outflow as recommended by the SWRCB, but the State's proposed project fails to provide increased winter/spring Delta outflow, despite the comments from the SWRCB and other agencies. The so called "high outflow scenario" (HOS) largely maintains the status quo of winter/spring outflow, and the both the Draft Plan and DEIS/DEIR fails to analyze the "CS5" operations developed by the fishery agencies in 2012 to provide increased outflow and improve other flow conditions for fish and wildlife.

> winter-spring outflows also benefit a variety of species through early-life-stage dispersal, access to floodplain habitat, and reduced entrainment.

DSP Outflows Review Panel Report 2014 at 62 (emphasis added).

ii. The Draft Plan and DEIS/DEIR's Expectation of Large Benefits to the Longfin Smelt Population Resulting from the Restoration of Shallow Sub-Tidal Habitats is Scientifically Unsupported, as Numerous Independent Scientific Reviews have Found

Rather than take action to address the primary documented stressor (and driver of other stressors) with known, high-order effects on longfin smelt (Delta fresh water outflows), for which scientifically credible and feasible measures exist to address the stressor (improve outflows during winter/spring months) the Draft Plan proposes to reduce (or maintain currently inadequate) Delta outflows during key seasons and year-types,[57] and relies on completely speculative habitat restoration measures under the theory that these will bolster food supplies for longfin smelt and that improved food supplies can counter the negative effects of reduced Delta outflows. Although many reviews refer to the potential benefits of habitat restoration in general as "highly uncertain", with regard to their potential to bolster longfin smelt abundance or productivity, these measures are actual quite certain to produce negligible benefits to longfin smelt. The Conservation Strategy and DEIS/DEIR repeatedly assert BDCP benefits to longfin smelt from increased prey production that is supposed to occur as a result of habitat restoration. *See, e.g.,* DEIS/DEIR at 11-34; Draft Plan at 5.5.2-25, -29. In the BDCP's own 2009 review of tidal marsh restoration proposals (which are quite similar to the proposals in the Draft Plan), a team of experts on local fish ecology and estuarine dynamics rated the potential for these measures to benefit longfin smelt as "low" to "marginal" (at best), with "low" to "marginal" certainty (at best), in every case but one. For all but one proposed tidal marsh restoration area, at least one foreseeable negative impact to this species was rated "high", with "low" to "medium" certainty; for example, shallow sub-tidal habitat restoration in the West Delta ROA was judged to run the risk of "establishment of undesirable species" (such as Centrarchid bass (predators) or *Corbula* clam (competitors), which would be a "high" negative impact. Essex Partnership 2009 (2009 DRERIP Evaluation, Appendix D). The recent Delta Science Program Independent Review Panel identified the same two potential negative outcomes of habitat restoration measures and suggested that they were relatively certain to arise, questioning only whether they could be controlled when they did arise. DSP Independent Science Review Panel Report 2014. On page 11-20, the DEIS/DEIR mentions the potential for invasion by *Corbula* clams of habitats restored under CM4 as a potential negative impact to Delta smelt (but not to longfin smelt), but

[57] *See* Draft Plan, Appendix 5C at 5C.5.3-348 (Table 5C.5.3-189); *id.* at 5C.5.3-350 (Table 5C.5.3-190). This is also true with respect to the cumulative impacts of BDCP and climate change.

does not mention the potential for invasion/foraging by invasive piscivorous fish (e.g., Centrarchids). Similarly, the Draft Plan's appendix on habitat restoration (Appendix 5E) barely acknowledges the potential risks associated with colonization of restored habitats by non-native species, including predatory fish, simply declaring that "Marsh channels and levee breaches will be designed to maintain flow velocities that minimize conditions favorable to the establishment of nonnative submerged aquatic vegetation (SAV) and floating aquatic vegetation (FAV) and habitat for nonnative predatory fish." Draft Plan, Appendix 5E at 5.E-47 (emphasis added). The Draft Plan's appendix on fish stressors (5F) does identify the risk of predation on covered species in the restored habitats described by the Draft Plan, but it is similarly non-specific regarding control or prevention of this problem (relying on vaguely-described removal of invasive aquatic vegetation, which would not guarantee elimination of the problem) and non-committal regarding the likely outcome of this response. Draft Plan Appendix 5F at 5.F-iv.

Since the publication of the 2009 DRERIP Review, additional independent reviews have assessed the potential for habitat restorations to benefit pelagic fish species, like longfin smelt, in the manner anticipated by the Draft Plan. As described in detail above, the overwhelming consensus of independent scientists is that BDCP's assumption of benefits are vastly overstated and unlikely to materialize. DSP Independent Science Review Panel Report 2014; Delta ISB 2014; Herbold et al. 2014; Mount and Saracino et al. 2013; NRC 2010. The assumption that restored habitats will enhance prey production, to the extent necessary to support species' global biological objectives is particularly poorly supported for longfin smelt. This is because longfin smelt occupy pelagic environments, typically in or near deep-water channels. Rosenfield and Baxter 2007; Rosenfield 2010. These habitats are furthest from the location of proposed shallow water habitat restoration meaning the benefit of any food web export from restoration sites will be attenuated (via dispersal and consumption by other species) before it can reach longfin smelt. Reviewing the specific question ("Is the analysis of food web benefits to longfin smelt from habitat restoration appropriate?"), the Delta Science Program's Independent Review Panel concluded that both the mechanism and magnitude described for increased production of longfin smelt prey resulting from habitat restoration was "highly uncertain" and that the contribution to increased plankton abundance available for longfin smelt was "basically hypothetical because of the uncertainties of primary consumption within the restoring ecosystems, especially by non-indigenous clams, and whether these systems would be sources or sinks for any increased production." DSP Independent Science Review Report 2014 at 60-61.

Despite the consensus of the scientific community that this effect is tenuous and extremely small at best,[58] Figure 5.5.2-5 reveals that the Draft Plan assumes "moderate" benefit (with low

[58] However, as we have noted repeatedly, there are likely to be benefits to some other species and ecosystem processes from tidal marsh habitat restoration projects, and we encourage implementation of restoration projects in an adaptive management process. *See also* footnote 80, *infra*.

certainty) from enhanced zooplankton production for juvenile longfin smelt. The figure is contradicted by the Draft Plan's accompanying text, which indicates a "low" benefit of enhanced zooplankton production from its restoration projects. Draft Plan at 5.5.2-13. There is very little, if any, empirical support for a finding of even "low" benefit. And, even if the benefits of habitat restoration for longfin smelt were as "low" or "moderate" as the Draft Plan alternately claims, there is no way for such benefits to materialize until well into the Plan's Late Long Term (LLT) because most restoration activity will not be complete until that time and benefits of marsh restoration typically require substantial time to evolve post-restoration. *See, e.g.*, Herbold et al. 2014.

iii. The Conservation Hatchery Proposal is Unacceptable as part of a Conservation Strategy for Longfin Smelt under an HCP/NCCP

Certain conservation measures described in the Plan and DEIS/DEIR as beneficial to longfin smelt are inadequate and/or irrelevant to the conservation standard for this species. For example, a hatchery's function is to increase the number of larvae that survive per female spawner. Providing a hatchery for longfin smelt would not address the problems the Draft Plan or other sources identify as stressors for longfin smelt. Food limitations, inadequate transport flows, etc. all arise *after* the egg incubation/early larval stage – producing and releasing more small longfin smelt into an environment that is not expected to support them does not address or circumvent the problems facing longfin smelt and is not likely to achieve conservation of this species in the Plan Area. Furthermore, the Draft Plan does not identify or address any of the myriad known problems with hatchery production of other fish species (e.g. salmon) as a conservation method. We have raised this issues numerous times. *See* Letter from TBI, EDF, DOW to BDCP Steering Committee December 20, 2009; J. Rosenfield letter to Meral et al. dated February 9, 2012. Conservation hatcheries for smelt (CM18) do not address the primary stressors on longfin smelt. The Fish and Wildlife Service has commented that "CM18 is linked to wild population goals and objectives for delta and longfin smelts. This is inappropriate and contrary to the Service's present policy for these species." USFWS 2013 Progress Assessment at 10.

Also, as described above, removal of invasive submerged aquatic vegetation to "increase the availability of freshwater spawning habitat for longfin smelt in the Delta," *see* Draft Plan Appendix 5F at 5.F-iii, does not address threats to longfin smelt abundance because (a) there is no indication that the abundance of longfin smelt spawning habitat limits abundance or productivity of this species (though it may be limiting a different attribute of longfin smelt viability: spatial distribution) and (b) there is no indication that longfin smelt will spawn in areas where SAV has been removed – very little is known about longfin smelt preferred micro-habitats for spawning. Rosenfield 2010.

4. The Draft Plan and DEIS/DEIR's Assessment of Effects on Longfin Smelt are Inaccurate and do not Attain the Conservation Standard for this Species. In addition, Presentation of these Results is Biased, Internally Inconsistent, and Confusing

Despite the Draft Plan's claims that it would contribute to recovery of longfin smelt and would have beneficial effects on the species, and the Draft Plan's objectives that (though inadequate) attempt to define improved biological outcomes, the Draft Plan and DEIR/DEIS both demonstrate that BDCP is likely to result in large declines in longfin smelt abundance, is unlikely to achieve the biological objectives for the species, and that the proposed project would cause additional negative impacts on the species. These declines are due, in large part, to the projected declines in the winter-spring Delta outflows under the BDCP as compared to the environmental baseline, shown in Table 11-4-7 and Table 11-4-9, that tend to drive longfin smelt population abundance. The Draft Plan and DEIS/DEIR portray these large declines as benefits because their modeling suggests that populations under BDCP will be slightly larger than without BDCP (though the magnitude of modeled change is likely not statistically significant and therefore unlikely to materialize). As we discuss elsewhere the DEIS/DEIR uses the wrong baseline and the significant reduction in outflow under the Draft Plan as a result of BDCP and other projects and effects cumulatively (including the effects of climate change) will cause significant environmental impacts, including cumulative impacts.

i. Draft Plan and DEIS/DEIR Misuse and Misinterpret Models to Project Longfin Smelt Abundance and Fail to use the Best Available Scientific Information

Despite the Draft Plan's claim of "uncertainty" that Delta freshwater outflows drive longfin smelt abundance (*see, e.g.,* Draft Plan at 5.5.2-29), the DEIS/DEIR project future longfin smelt abundance based solely on a model derived from the well-documented relationship between X2 (an indicator of Delta fresh water outflow rates) and longfin smelt abundance indices (i.e., Kimmerer et al. 2009). The fact that no other quantitative tools are used to provide a robust estimate of the effect of BDCP on longfin smelt population size reveals the differential strength of evidence underlying the Draft Plan's two conceptual models for longfin smelt: one that attributes population size to levels of Delta freshwater flow (as identified in numerous peer reviewed papers and quantitative models, including that used in the DEIS/DEIR) and the second that attributes population size to unidentified levels of prey abundance.

As discussed elsewhere, the relationship between Delta outflows (or X2) and longfin smelt abundance is among the best-documented, durable, statistically significant ecological relationships in this Estuary. *See, e.g.*, SWRCB 2010 Flow Report; DSP Outflows Review Panel Report 2014. Kimmerer et al. 2009, like numerous other research papers, clearly demonstrates

that freshwater flows (as represented by X2) remain strongly and significantly correlated with longfin smelt abundance. However, additional, more recent models should be used for projecting longfin smelt populations in futures with and without BDCP, because:

1) The model used by BDCP does not incorporate any effect of previous population size; thus, any given X2 value always predicts the same longfin smelt abundance index, regardless of whether the previous (parental) generation had high abundance or low abundances. Models that incorporate historical longfin smelt population size (or "stock") have been developed. TBI/NRDC 2010 Exhibit 2; USFWS Progress Assessment April 3, 2013. These models show a significant effect of historical population size on current population size (i.e., models with both Delta outflow and recent population size predict current population size better than models with flow alone). Indeed, the Draft Plan claims to analyze BDCP effects on longfin smelt abundance using a model that incorporates stock, *see* Draft Plan at 5.C.0-5, but such a model is not present in the Effects Analysis or the DEIS/DEIR. The DEIS/DEIR should utilize one of the recent models that incorporates both flow and prior-abundance to estimate future abundance of longfin smelt. As a result of applying the very simple Kimmerer et al. (2009) relationships without accounting for the effect of current population sizes that are close to their historic lows, the DEIS/DEIR likely overestimates the size of future longfin smelt populations;
2) The model will only predict population extinction when X2 is such that the equation solves for "y" (longfin smelt index value) = 0. Any X2 that is marginally below (better than) this critical threshold will predict retention of the population and, even if the critical value of X2 is reached in one generation, the equation will predict a "resurrection" of the population the next time X2 is better than the critical value (*see* issue #1 above). This is a critical flaw in a model that is being used to evaluate the conservation status of a population in the future as it is quite blind to the risk of persistently low populations and the fact that, if the longfin smelt population is locally extirpated, it will be very difficult or impossible to restore;
3) The Kimmerer et al. 2009 relationship accounts for two different flow-abundance relationships corresponding to periods pre- and post-1987; it is not clear which time period the analyses uses to project longfin smelt abundance into the future. However, there is evidence to indicate that a second decline in the flow-abundance relationship may have occurred, creating a third relationship from the early-2000's to the present. Thomson et al. 2010. Thus, the relationship between flow and abundance used in the DEIR/DEIS likely overstates the longfin smelt abundances that will result from Delta outflows under the BDCP.

In addition, the way the Draft Plan and DEIS/DEIR apply modeled Delta outflow results as inputs to the longfin smelt abundance-X2 relationship is inappropriate. The numerous inadequacies with the flow modeling employed by the Draft Plan and DEIS/DEIR are documented elsewhere in this comment letter. All of the biases and uncertainty associated with the Draft Plan and DEIR/DEIS flow model outputs are relevant here and many are magnified in the longfin smelt analysis by the addition of uncertainties and biases inherent in the approach to modeling longfin smelt impacts. And as discussed in our comments on the flow modeling, it is not clear that the HOS flows are likely to actually occur.[59]

Furthermore, it is not clear that the analyses reflect accurately the Kimmerer et al. 2009 methodology or that the analyses reflect the Draft Plan's own conceptual model relating Delta outflows (and/or X2) on longfin smelt abundance. The Kimmerer et al. 2009 model uses X2 values averaged over the January-June period. But the Draft Plan states its belief that flows in the March-May period affect longfin smelt abundance. Draft Plan at 5.5.2-8. But then the DEIS/DEIR states, "Relationships between December through May X2 position and log longfin smelt abundance … were used to determine how the changes in winter-spring X2 position described above might influence longfin smelt abundance the following fall." DEIS/DEIR at 11-1305. There is no explanation for the mismatch of months used in the analysis and those used by Kimmerer et al. 2009 or those assumed to be important in the BDCP conceptual model.

Using the average X2 position from December through May means that the analysis ignores variations within that 6-month period as they are eliminated by averaging. In 2013 USFWS stated that, "The effects analysis did not use the best available longfin smelt statistical models to support its net effects conclusion." USFWS 2013 Progress Assessment at 18. It then quotes the USFWS 2012 Red Flags as follows:

> The older regression models that were used in the effects analysis are published, but can easily be shown not to perform as well as the newer models. The older models also average the flow influence on longfin smelt across half a calendar year, which likely affects conclusions about the reduction in springtime outflow seen in modeling outputs for the Preliminary Proposal.

Id. Kimmerer et al. 2009 averaged X2 values over winter-spring because that is generally when longfin smelt are spawning and rearing in or near the Delta; they had no *a priori* or statistical reason to consider smaller time periods for X2, and they were not trying to model differential

[59] In addition, the Projects' frequent practice of requesting and receiving Temporary Urgency Changes to Delta outflow requirements under Dry and Critically Dry conditions (such as those that were requested and granted in WY 2014) strongly suggests that flow conditions projected in the Draft Plan and DEIS/DEIR for Dry and Critically Dry years overestimate the actual amount of flow that will occur in some of those years and that the analysis thus overestimates the indices of longfin smelt during drier years.

impacts to longfin smelt resulting from alterations to the historical hydrological relationships among months in the winter and spring (flows in those months are strongly correlated). However, for many of the potential mechanisms by which X2 might control longfin smelt productivity (population growth or decline; *see* Kimmerer 2002b), changes in X2 or flow within the winter-spring period would be as or more important than the "average" value for the whole period.

Kimmerer et al. 2009 do not suggest and certainly do not demonstrate that mean X2 position for the 6-month winter-spring period is the best indicator of flow related effects on longfin smelt abundance – their results could also mean that a critical flow related effects occur in a shorter time window within the January-June time frame or that minimum or maximum flows in that period controlled the population response. For example, the Draft Plan suggests that March-May may represent the critical period for flows – so why not study flows and X2 in the March-May period? Even within that smaller time window, the analyses should focus on the potential for extreme flows (high or low) and corresponding X2's to drive outcomes for longfin smelt rather than the mean flow. It is at least as likely that the largest or smallest value of X2 in the winter-spring drives the population response of longfin smelt as it is that the mean value of X2 controls population levels.

It is also possible that flows (or X2) in a narrower time window than January-June have the greatest influence on the population, as more recent models suggest. Just because Kimmerer 2009 uses a six month average does not mean that average flows over that entire period are driving the effect. Flows in a narrower window, or maximum or minimum flows during that period, are likely to be the variable that longfin smelt populations respond to. The Draft Plan and DEIS/DEIR should be aware of these possibilities (we and others have made this comment before) and should present, in addition to effects based on mean winter-spring flow, estimates of effect on the longfin smelt population if flows in a narrower window or maximum or minimum flows during winter-spring actually drive the population. If mean X2 is not the most relevant flow variable for predicting longfin smelt population (as opposed to a maximum or minimum) or the most important time frame for X2 position is a subset of the months used in the Kimmerer et al. 2009 relationship, then the usefulness of the Kimmerer et al. 2009 relationship for predicting longfin smelt populations in the future would be reduced in a situation where the timing of flows across months is different than it has been historically (as would occur under BDCP and climate change). Since extreme values (high or low X2) may be what actually controls the overall pattern described by Kimmerer et al. 2009 and, because the BDCP will change the relative distribution of those flows in months within the Jan-June period (*see* DEIS/DEIR at Table 11-4-7, Table 11-4-9), the Kimmerer et al. 2009 relationship may not be the most sensitive to the real effects on longfin smelt populations represented by the altered hydrograph anticipated under the Draft Plan and DEIS/DEIR. This is not the first time we have warned that BDCP draft documents: "…presents the flow-abundance relationships for the longfin smelt population in this Estuary in a

way that will tend to lead to underestimation of potential impacts to this species." Memorandum to J. Meral from TBI, EDF, and Contra Costa Water District re: Review of Appendices C and D December 21, 2011. Fortunately, having calculated X2 for January-June and, using the Kimmerer et al. relationship, the associated longfin smelt abundance index for each year in the record, the Effects Analysis and the DEIS/DEIR must have the data necessary to calculate the alternate outputs we suggest (i.e. maximum and minimum longfin smelt estimates based on max and min X2 for any month in the January-June period). We have requested this analytical approach before. The Bay Institute, 2013 comments on Administrative Draft Appendices C and D, at 7-8.

ii. Even with the Flawed Modeling Biased Towards more Positive Outcomes, the DEIS/DEIR Projects Substantial Declines in the Abundance of Longfin Smelt from Recent Unacceptably low Levels under most Alternatives

Relative to longfin smelt abundances seen in recent years (abundances that are lower than those that warranted listing under the California and federal Endangered Species Acts), the Draft Plan and DEIS/DEIR project significant declines in longfin smelt abundance in the future. The alleged benefits to longfin smelt abundance claimed in the Draft Plan (*see* Table 5.5.2-2) and DEIS/DEIR (*see* Table 11-4-8.) are meager and result reflect only a comparison to a modeled future baseline in which spring outflows (and longfin smelt) decline significantly.

With respect to longfin smelt abundance, the relevant question is: "Will the longfin smelt population increase (display higher abundance indices) from current levels to levels that are consistent with conservation of this species in the Plan Area?" The Draft Plan Technical Appendix 5C addresses these questions in tables such as 5C.5.4-39 where it compares EBC2 modelled in the present day ("EBC2") to conditions under the BDCP in the late long term (ESO_LLT). This comparison shows that longfin smelt populations are expected to decline 22%-33% from current levels (as predicted by the Draft Plan's modification of the Kimmerer et al. 2009 relationship). *See* Draft Plan Appendix 5C at Table 5C.5.4-39. Table 5C.5.4-41 and Table 5C.5.4-43 provide a similar comparison, for two different sampling programs, and they show slightly larger declines. Thus, the BDCP's Technical Appendix anticipates very significant proportional declines in longfin smelt abundance over the BDCP permit term. The CEQA/NEPA conclusions in AQUA-23 and AQUA-24 that there will not be significant impacts are not supported by the substantial evidence, and the modeling shows that Alternative 4 and other alternatives will cause significant impacts and cumulatively significant impacts.

The DEIS/DEIR (Table 11-4-8) and Draft Plan (Table 5.5.2-2) rely on a misleading and erroneous comparisons to claim that BDCP will improve longfin smelt abundance. In addition to showing the large relative and absolute declines in longfin smelt abundance projected to arise

under the Draft Plan, these tables present a comparison of ESO_LLT to EBC2_LLT, which suggests that conditions under the BDCP will be marginally better than under current operations applied to modeled future conditions. It is unclear whether any of the reported differences are statistically significant because the error bounds of the Draft Plan or DEIS/DEIR estimates (i.e., the variance associated with the Kimmerer et al. 2009 model combined with those related to modeled Delta outflow) are not reported. This comparison is misleading because it assumes that operations do not adapt to climate change. However, given that these assumptions regarding changing environmental conditions lead to projections of very significant declines in longfin smelt abundance, the Draft Plan should not assume that either current operating rules or those envisioned in the BDCP alternative will be permissible. So, while the modeling seems to indicate some very small benefits to longfin smelt abundance of BDCP operations compared to status quo operations, there is no reason to expect that either operation will result in conservation or restoration of longfin smelt.

There are feasible measures to address anticipated baseline freshwater flow rates that are under control of the Projects, in order to avoid or reduce the negative impacts that threaten the continued existence of covered species. We – and many other agency and independent scientific reviewers – have repeatedly recommended substantial increases in Delta outflow to avoid these predicted outcomes. For instance, Alternative 8 in the DEIS/DEIR includes increases in spring outflow as recommended by the SWRCB.

With regard to its own productivity objectives, which are inadequate (*see* above), the relevant question for evaluating the Draft Plan's progress towards attaining the co-equal goals is: "Will abundance relative to winter-spring hydrology (i.e., flow corrected abundance, or "productivity") increase to levels consistent with conservation and restoration of the species?" The DEIS/DEIR does not compare outcomes projected under the Plan to those targeted by its productivity objectives. And, because the productivity objectives are "flow corrected," the DEIS/DEIR has not developed information that would allow evaluation of whether non-flow related activities (such as CM4, CM6, etc.) will produce improvements in flow corrected abundance. However, it is abundantly clear from the results in the Draft Plan's Technical Appendix and Effects Analysis that the BDCP is not likely to "restore" flow corrected abundance to 1980-2011 levels (the Conservation Strategy's inadequate target) or 1967-1984 levels (the USFWS 1995 Draft Recovery Plan target) because absolute abundances are predicted to decline substantially from current levels (which are already below those implied by the productivity objective) in each water-year type category. Thus, even the flawed and biased analyses in the DEIS/DEIR and Draft Plan demonstrate that BDCP likely will not attain critical conservation targets for this covered species.

iii. Draft Plan and DEIS/DEIR Rely on "Average" Results for Longfin Smelt Populations in Different Year Types, Which Understates Likely Environmental Impacts to the Species

Similarly, the DEIS/DEIR rely on "average" projected flow conditions (and changes in flow conditions) to predict longfin smelt outcomes in the future. The analysis does incorporate reasonably foreseeable changes in the frequency of year-types experienced by the longfin smelt or magnitude of flows in different year types, in the future. The use of average flows is particularly inappropriate for analyses of semelparous organisms with discrete generations; longfin smelt will respond to actual conditions within a given year, not to the long-term average, so if several low outflow years occur in sequence, then population will decline and may be extirpated. The use of the long-term average conditions to gauge longfin smelt response is also misleading because the average depends on the frequency distribution of different hydrological year types (and conditions in each year type) and this distribution is likely to change (i.e. due to normal or human induced climate changes).

Like Delta smelt, longfin smelt are believed to be semelparous (die soon after spawning the first time) and have largely distinct spawning classes. This means that the population response to any set of annual conditions is not tempered by overlapping generations or the capacity for mature fish to delay spawning in bad years. Thus, for the BDCP analysis, conditions in individual years and the frequency of good and bad conditions are more important than are "average" conditions over many years. The Draft Plan and DEIS/DEIR's presentation of "average" change in the population (depicted under the heading "All") is deceptive and confusing in a way that paints an inappropriately optimistic view of aggregate effects on longfin smelt populations. For example, if conditions in a particular year were such that a population experienced a 100% decline ("extinction"), it would not matter what the "average" condition was in a given year type or across all year types. The Draft Plan and DEIS/DEIR should present results and comparisons between scenarios that anticipate a series of years with poor environmental conditions in a row (as in the 1987-1994 drought or the 2012-current drought) because those are conditions that the covered species actually experience; at a minimum, the Draft Plan and DEIS/DEIR should compare the worst case conditions in each year-type between modeled scenarios – differences in the worse-case conditions will better reflect the likelihood of conserving the population in the Plan Area. As a result of modeling "average" conditions, the Draft Plan likely understates the potential environmental impacts to the species, and overstates likely abundance.

The Draft Plan misrepresents its likely impact on freshwater flow rates in a manner similar to those made in its presentation of longfin smelt population impacts. In addition to the fact that "average" conditions are not as relevant to conservation efforts as the frequency and magnitude of extreme conditions (*see* above), presenting flows in the "average" year assumes some distribution of water year types (here, flow conditions) affecting the population which may or

may not occur – if the future brings a long series of "dry" years, all that will matter is how the fish populations perform under BDCP during "dry" years compared to how they would perform in "dry" years without a BDCP. With regard to Delta outflow, the Plan assumes that Wet, Above Normal, Below Normal, Dry, and Critical years types occur in 32%, 15%, 17%, 22%, and 15% of years respectively. Draft Plan at 5.2-16. If these conditions do not hold in the future, then the "average" result of that hydrological distribution will not occur either. This could occur under climate change, *see* Null and Viers 2013, and would also occur when/if human water management changes the frequency or "wetness", as experienced by the Bay-Delta ecosystem, of different year types. For example, as we discuss with respect to cumulative impacts, if water users develop greater water storage capacity (e.g., greater reservoir capacity, on or off-river, or greater groundwater storage) then humans will capture more of the available runoff in wetter year types. This will make the wetter year types less frequent and likely make all year types less wet from the perspective of organisms and processes that rely on Delta outflow.

The Draft Plan and operational alternatives modeled in the DEIS/DEIR clearly produce low flows in many years. Even under the "High Outflow Scenario", outflows lower than the status quo are expected in drier years. These are years when the longfin smelt population is particularly vulnerable. *See* Rosenfield 2010. According to our calculations, the "low outflow scenario" (LOS) will result in Delta outflows during March through May that are lower than recent historic (1970-2003) outflows in approximately 70% of years. The "high outflow scenario" (HOS) will only generate Delta outflows that are higher than recent historic flows (between Jan and June) during the Below Normal Year-type in the late long term. All other year-type average display a 0.4% to 1.8% decrease in NDO compared to the No Action Alternative. As a result of these projected declines (or minor increases) in Delta outflow, longfin smelt abundances are projected to decline significantly in the early and late-long term of the BDCP compared to current conditions.

iv. The Draft Plan's Presentation of Projected Outcomes for Longfin Smelt Abundance and Productivity is Confusing and Prevents the Average Reader from Comprehending the Impact of BDCP

The Draft Plan creates unnecessary confusion by presenting model outcomes based on input of three different longfin smelt sampling programs. The Effects Analysis technical appendix alone presents at least 11 different tables showing projected changes in longfin smelt abundance. The Draft Plan's technical appendix (Appendix 5.C.) demonstrates that each of the three longfin smelt sampling programs it employs to model projected outcomes produces nearly the same results. The most relevant sampling program for projecting the relationship between longfin smelt abundance and X2 is the Fall Midwater Trawl (FMWT) sampling program as (a) that is data set used by Kimmerer et al. 2009 to develop the model the Draft Plan relies on for forecasting longfin smelt populations; (b) the FMWT program samples intensively in the areas

most immediately affected by BDCP, whereas the other sampling programs sample the entire Bay Estuary diffusely; and (c) the FMWT sampling program data series is substantially longer than the record for the other sampling programs. Kimmerer et al. 2009 and Rosenfield and Baxter 2007 both found substantial concurrence among the different data sets of longfin smelt sampling that are used in the Draft Plan and DEIS/DEIR analyses. Thus, while presentation of separate results for three different sampling programs compounds the confusion for readers, it is not clear that any additional information is gained by presenting separate analysis of the data from three different longfin smelt sampling programs.

Furthermore, the projected outcomes of BDCP on longfin smelt abundance presented in the DEIS/DEIR do not match those found in the Draft Plan's technical appendix. The DEIS/DEIR summary is inconsistent with the Draft Plan's associated technical appendix. *Compare* DEIS/DEIR at 11-1308 (Table 11-4-8) *with* Draft Plan at 5C.5.4-104 to –109. Many of the results presented in the DEIS/DEIR are not displayed in the technical appendix, and the DEIS/DEIR does not reveal how it arrived at estimates that differ from those found in the technical appendix; thus, it is challenging to review and compare the two documents and to evaluate the DEIS/DEIR.

v. The Draft Plan is Unlikely to Achieve the Entrainment Objective for Longfin Smelt, and Entrainment will Continue to Harm the Species. The Presentation of Results is Confusing, Biased Towards Positive Outcomes, and Internally Inconsistent

The presentation of entrainment impacts on longfin smelt within and across the Draft Plan's Effects Analysis, Entrainment Appendix (Appendix 5B), DEIS/DEIR, and the DEIS/DEIR Summary of Effects are confused and contradictory, and the conclusion of no significant impacts (AQUA-21) is not scientifically justified. As described above, the Draft Plan clearly identifies an objective intended to reduce entrainment of longfin smelt (though it is not written in a manner that will necessarily accomplish such a reduction) and to distribute entrainment evenly across the winter-spring in order to eliminate differential impacts to longfin smelt life history variants (though, again, it is inadequate to affect that intent). Contrary to the intent of the entrainment-related objective for longfin smelt, entrainment of longfin smelt is projected to remain unchanged or even increase during dry years, when most longfin smelt entrainment occurs. For example, during Dry and Critically Dry water year types, entrainment of juvenile longfin smelt is expected to increase or remain unchanged during the early and late long term in April. Draft Plan at Table 5.B.6-163 and Table 5.B.6-164. The Draft Plan acknowledges that during Dry water year types, when most entrainment of juvenile longfin smelt would occur, entrainment loss under evaluated starting operations (ESO) compared to current conditions would increase by 4% in the early long term. Draft Plan at 5.B-231.

Despite the Effects Analysis' findings that juvenile longfin smelt entrainment will increase from current levels in drier years (years when the population already suffers poor recruitment) during the early long-term, it concludes that the BDCP will generate a "low" *positive* effect on juvenile longfin smelt entrainment and "very low" positive effects on larval longfin smelt. Draft Plan at Figure 5.5.2-5. The DEIS/DEIR does not convey changes in entrainment rates in the early long term, *see, e.g.,* DEIS/DEIR at Table 11-4-5, but increased entrainment in drier years is a negative effect in the early long term. Given the precarious state of the longfin smelt population, this may translate to a long-term effect that impacts any anticipated benefit in the late long term. Again, we note that average changes in entrainment rates modeled over many years are immaterial to fish that are semelparous (have only one chance to reproduce) and live for only two years – multiple generations of longfin smelt may experience only the higher entrainment expected under drier years and an extended period (i.e. a drought) of such high entrainment could do significant and possibly irreparable damage to the population.

The Draft Plan does not directly compare the predicted changes in longfin smelt entrainment to the Draft Plan objective of limiting longfin smelt entrainment. However, neither the Effects Analysis nor the DEIS/DEIR indicate that longfin smelt entrainment will be reduced to levels less than 5% of the population per year, as required by objective LFSM1.2. Entrainment rates for each life stage of longfin smelt vary substantially based on water-year type; it is well-known that entrainment rates for this species increase dramatically in drier year types and can be negligible in wetter year types. Sommer 2007; CDFW 2009; Grimaldo et al. 2009; Rosenfield 2010. Entrainment rates also vary based on the assumed distribution of longfin smelt spawning (when more longfin spawn closer to the pumps, more of the subsequent larval population is entrained). For example, the Effects Analysis projects that in drier year types, if 15% of longfin smelt spawn in the South Delta, then up to 19.1% of the larval longfin smelt population may be entrained under BDCP operations. Under these conditions, projected entrainment of larval longfin smelt exceeds the 5% *total* entrainment maximum set in objective LFSM1.2 in more than one quarter of the years analyzed in the Early Long Term period. Draft Plan at Table 5.B.6-151. This analysis does not account for cumulative effects of entraining other life history stages (juvenile or adult).[60]

These findings reveal that:

[60] Modeling of the entrainment risk for longfin smelt and other species is highly reliant on the modeling of Delta flows and in-Delta hydrodynamics and is thus subject to the quality of the assumptions used to perform that modeling and the uncertainty inherent in such modeling. Flaws and high uncertainties associated with the BDCP's hydrological and hydrodynamic modeling are described, at length, in our comments. Here, it is important that the reader understand that the modeled entrainment risks are extremely uncertain and may be higher than modeled in some cases and that the modeling itself lends itself to an underestimation of entrainment risks.

- entrainment of juvenile longfin smelt is expected to be quite high now under certain conditions (the BDCP cannot achieve large reductions in longfin smelt entrainment if entrainment is not high to begin with)
- entrainment is expected to increase in certain year types under BDCP operations in the early long term; and,
- the risk of entrainment will not be "evenly distributed over the adult migration and larval-juvenile rearing periods" as required by objective LFSM1.2.

The DEIS/DEIR treatment of entrainment as a stressor to longfin smelt is inconsistent and internally contradictory. For example, in reporting higher entrainment levels that would be expected under Alternative 1A, the DEIS/DEIR declares:

> The salvage density approach for March-June entrainment suggested that overall entrainment loss would be similar or slightly increased (by up to 25%) under Alternative 1A. Although there were considerable increases in entrainment rate (over 100% in some cases) under Alternative 1A in below-normal years, the actual number of fish involved were very low… Higher numbers of entrained fish were estimated in dry water years. In these years, entrainment under alternative 1A was 14-44% higher than NAA. In critical years, there were modest decreases of 5-20% in entrainment under Alternative 1A relative to NAA"

DEIS/DEIR at 11-200.

The DEIS/DER does not explain why an increase of "up to 25%" in longfin smelt entrainment would be considered a "slight" increase, or why, in the same paragraph a smaller decrease in entrainment of 5-20% would be considered a "modest" improvement (which implies an impact that is greater than "slight"). It is also not clear how the 25% increase in entrainment statement squares with those that follow, predicting increases in entrainment of "over 100%" or "14-44%" in some cases. Rather than acknowledge and address the failure of Alternative 1 operations to reduce entrainment as the Draft Plan intends, the DEIS/DEIR undermines the rationale for declaring that objective at all, stating: "Entrainment at the SWP and CVP facilities is not believed to be an important stressor influencing survival of longfin smelt larvae, as they are generally encountered in substantial numbers at the south Delta facilities only in dry years (approximately one-third of all water years). Consequently the population-level impact of this stressor on longfin smelt larvae is believed to be low." DEIS/DEIR at 11-200.[61] The DEIS/DEIR

[61] It is entirely unclear how the DEIS/DEIR can downplay the importance of entrainment as an impact based on the frequency of encountering "substantial numbers" of larval longfin smelt at the south Delta facilities since larval smelt were not identified (much less enumerated) at the salvage facilities prior to 2008. CDFW 2009 Incidental Take Permit for the SWP at 6.

goes on to state that, "Based on the limited potential for a population-level effect on longfin smelt and the minor to moderate change in the entrainment expected under Alternative 1A, the effect of entrainment would not substantially change for juvenile longfin smelt." DEIS/DEIR at 11-200 (emphasis added). This analysis of potential negative effects for one set of BDCP operations (Alternative 1) stands in contrast to its interpretation of alleged positive effects for another operational alternative 4. Although the proportional magnitude of positive effects are similar, the positive effects anticipated under Alternative 4 operations are judged to be "substantial," DEIS/DEIR at 11-1304, while the negative effects under Alternative 1 are termed "low." The DEIS/DEIR rationale for downplaying negative effects to longfin smelt entrainment under Alternative 1 exemplifies its flawed approach to evaluating impacts. The DEIS/DEIR argues that the anticipated negative entrainment effects to longfin smelt are minor because such impacts "only" occur in about 1 of every 3 years. This is scientifically unjustified. As we have described before, longfin smelt are short-lived (~2 years) and semelparous; as a result the longfin smelt population is very sensitive to conditions that occur in individual years and less sensitive to "average" conditions. Thus, an action that increases a known impact to the population by 14-100% (the range of increases identified in the DEIS/DEIR) should be modified, even if the effect occurs "only" in a fraction of years. Moreover, the impact of high entrainment rates on longfin smelt in drier years is important because longfin smelt experience lower recruitment in dry years; to quote the CDFW's incidental take permit for the SWP, "the mortality associated with entrainment would be highest when the population already faces adverse recruitment conditions attributable to low outflow." CDFW 2009 at 7.

In general, the Draft Plan and DEIS/DEIR take the inaccurate position that the impact of entrainment on longfin smelt have been reduced in recent years, though the Entrainment Appendix acknowledges that longfin smelt salvage has been high "in some years." Draft Plan at 5.B-1. The Draft Plan and DEIS/DEIR presumably refer to implementation of SWP/CVP export controls under the biological opinion for Delta Smelt as reducing salvage of longfin smelt. Yet, entrainment is a known stressor on, and threat to the Bay-Delta's longfin smelt population. Rosenfield 2010; CDFW 2009. In addition, the documents' assumption regarding recent reductions in this impact are not supported by recent entrainment levels; relative to the measured index of longfin smelt abundance, entrainment rates of longfin smelt have been higher since the species' 2009 listing under the state Endangered Species Act than they were before the listing. The Bay Institute and Center for Biological Diversity letter to C. Bonham, CDFW April 27, 2012; *see* The Bay Institute, Center for Biological Diversity, NRDC, and Defenders of Wildlife letter to C. Bonham, CDFW July 10, 2013.

vi. The Draft Plan Fails to Adequately Model Likely Entrainment Rates, Underestimating Likely Entrainment

The Effects Analysis obscures the impact of entrainment on longfin smelt by reporting longfin smelt entrainment rates separately for different life stages: larval, juvenile, and adult. Even if data availability requires different modeling approaches for different life stages, there is only one longfin smelt population and thus, the effects of stressors on multiple life stages must be summarized into a single cumulative impact. A summation of this type would be aided by a numerical life cycle model for the species, but such a model is not required to accurately report the relative impacts of entrainment (or other stressors) on the population as a whole. Also, in a population that is not limited by density-dependent interactions, the proportional loss of any life stage would be directly translated to subsequent life stages and eventual egg production.

Here again, the DEIS/DEIR applies a different standard of impact when results appear to favor the BDCP alternative. When the DEIS/DEIR asserts net benefits of reduced adult entrainment, it no longer questions whether entrainment is a meaningful stressor on the population. *See* DEIS/DEIR at 11-201.

The Draft Plan entrainment index and DEIS/DEIR fail to use known relationships between OMR flow rates and longfin smelt entrainment. Entrainment rates of longfin smelt and other pelagic fish species are known to correlate with impaired hydrodynamic patterns in the South Delta caused by the relationship between Delta export rates and Delta outflows. CDFW 2009; Rosenfield 2010. In particular, entrainment of longfin smelt and other species is significantly and negatively correlated with flow rates in the Old River and Middle River distributaries of the San Joaquin River; entrainment rates accelerate rapidly as Old and Middle River (OMR) flows become increasingly negative (flow towards the South Delta export facilities on a tidally averaged basis). Grimaldo et al. 2009. The Draft Plan fails to use OMR as an indicator of entrainment risk despite this known relationship. *See* Draft Plan at Table 5B.5-2. The Draft Plan's analysis of OMR flow rates under the BDCP indicate that they will be nearly unchanged or more negative in all year-types during April and May in both the Early Long Term, *see* Draft Plan at Figures 5B.4-15 to 4-19, and Late Long Term, *see* Draft Plan at Figures 5B.4-20 to 4-24. These are the months in which longfin smelt are most susceptible to entrainment. Rosenfield 2010. As a result, the Draft Plan fails to accurately analyze a potentially significant impact and/or the ability or failure of the BDCP to alleviate a known, periodic stressor on the longfin smelt population.

B. Chinook Salmon

1. Draft Plan Objectives for Chinook Salmon and Steelhead Populations are Inadequate

i. The Proposed Objectives are Not Consistent with the CVPIA/AFRP, ESA, and Other Laws

Unfortunately, the Draft Plan's objectives for Chinook salmon and steelhead productivity are inadequate. The Draft Plan sets thresholds for Chinook salmon and steelhead survival based on population growth rates necessary to attain Chinook salmon and steelhead abundance targets within 40-50 years after BDCP is adopted. Draft Plan Appendix 3G. There are at least two problems with setting survival rate objectives as proposed in the technical appendix. First, there is no scientific justification or rationale for survival rates that produce such anemic growth rates for Chinook salmon; Chinook salmon typically display much higher freshwater survival rates than are described in the Appendix, particularly in the first half of the BDCP permit term. Quinn 2005; Healy 1995; Bradford 1995. Thus, setting the date for attaining abundance targets 40-50 year in the future is arbitrary and inadequate.

Second, the abundance targets the Draft Plan uses to set growth rate (and thus, through-Delta survival) are not those specified by the CVPIA Anadromous Fish Restoration Program (AFRP) or the NMFS 2014 Final Recovery Plan for Central Valley salmonids (or for that matter, in the 2009 Draft Recovery Plan). For example, the BDCP Draft Plan identifies a global goal (a target to be attained by restoration efforts throughout this fish's life cycle, including upstream spawning areas, the BDCP Plan Area, and the ocean) for winter-run Chinook salmon escapement of 23,800 fish. However, this is a small fraction of the AFRP target for this species (110,000 2-yr+ fish in the ocean). AFRP 2001, Appendix B at B-1.[62] Setting survival rates based on the growth rates needed to attain an inadequate and arbitrary abundance target over an inadequate and arbitrarily long timeframe is unacceptable. Similarly, the Draft Plan's target for Sacramento River steelhead abundance is less than that specified in the AFRP. *See* AFRP 2001, Table 1. There is no explanation of the abundance target for Central Valley steelhead returning to the San Joaquin basin (1,700 per year), though this number is clearly less than that required to meet the draft recovery standards for steelhead in the San Joaquin basin. The NMFS 2014 Final Recovery Plan requires two populations in the Southern Sierra diversity group (the San Joaquin drainage basin) to be maintained at low risk of extinction and multiple "Core 2" populations maintained at

[62] Although escapement (the BDCP metric) is always lower than production (the AFRP metric) because fish die of natural causes and human fishing post-"production," the discrepancy either assumes an unreasonably high harvest rate (the California commercial fishing season is currently timed to minimize and avoid fishing-related mortality to winter-run Chinook salmon) or non-attainment of the AFRP target for winter-run Chinook salmon.

"moderate risk of extinction" or better. NMFS 2014 Final Recovery Plan at 98. The Recovery Plan defines populations at "low risk" as displaying, among other criteria, a census population abundance of 2,500 fish (or ~833 returning spawners per year). *Id.* at 97. Two such populations with 833 returning steelhead/year would be a minimum of 1,666 returning steelhead each year. The Recovery Plan defines populations at moderate risk to constitute returns of no less than 250 fish (or ~83 spawning steelhead per year). *Id.* Three such populations would be a minimum of 249 spawning steelhead. Thus to achieve recovery targets for steelhead in the San Joaquin Basin, it appears that the Delta must provide survival rates that can support the return of no less than 1,916 steelhead each year (two populations at low risk of extinction with at least 833 returning spawners per year, plus three populations at moderate risk of extinction or better, with at least 83 spawners per year) – this target is more than 12% higher than that used in the Draft Plan's technical appendix.

Finally, even with faulty abundance assumptions and unacceptably protracted period assumed for attainment of its abundance targets for the Central Valley salmonids, the Draft Plan's technical appendix reveals that its survival rate targets are likely insufficient to achieve those abundance targets. Specifically, neither spring-run or fall-run Chinook salmon from the San Joaquin basin are projected to reach the abundance targets that the Draft Plan relies on to set Delta survival targets, indicating that these through-Delta survival targets are insufficient to meet salmonid abundance targets for the San Joaquin Valley. In the case of fall-run Chinook salmon, the projected survivals are insufficient to support populations consistent with the CVPIA/AFRP and analogous state law (Cal. Fish and Game Code § 6902) for the San Joaquin River's tributaries. Draft Plan Appendix 3G at 20-21 (Table 4).

Furthermore, the Draft Plan assumes maintenance of status quo through Delta survival rates for the first 10 years of a BDCP followed by a very slow incremental improvement in survival rates for various Chinook salmon and steelhead populations. The resulting survival targets would lead to substantial declines in all Central Valley salmonid populations and steelhead, including extirpation of all San Joaquin salmonids in the first 10 years and near eradication of the endangered winter-run Chinook salmon population. Draft Plan Appendix 3G at 20-21 (Table 4).[63] This is a clearly unacceptable outcome and significant impact, and there are feasible alternatives and mitigation measures to reduce or eliminate this impact.

The Draft Plan identifies the need to conserve the life-history attribute of salmonid viability. *See, e.g.,* Draft Plan at 3.3-140 (Objective WRCS3.2); *id.* at 3.3-148 (SRCS3.2); *id.* at 3.3-156 (FRCS3.2). However, the stated objectives ("Operate water facilities to support a wide range of

[63] Also, it is not clear why the winter run population mysteriously increases from a predicted low of 565 fish in year 10 to 709 fish in year 11 of the BDCP. If this increase is an error as it seems, it will produce erroneous results that overstate the final estimated populations.

life history strategies … without favoring any one life history strategy or trait over another") is inadequately defined, so it is not possible to tell whether the objective is sufficient, whether the Draft Plan will attain the target (prior to adoption of the BDCP), or under what circumstances adaptive management actions will be triggered to attain the objective (post-implementation). As with similarly ill-defined objectives (such as those described above for longfin smelt and Delta smelt), the Draft Plan identifies export operations and associated fish entrainment as a potential stressor on salmonid life history, but the Conservation Strategy offers no guidance as to what constitutes acceptable homogeneity in entrainment risk and how to address it. As described for other species, one approach to quantifying this objective would be to identify entrainment limits on short time steps (e.g., weekly) to assure that no particular temporal component of a migrating cohort of juvenile salmon is disproportionately affected by entrainment; these weekly entrainment limits can be combined with annual and multi-year average entrainment rates in a way that allows for management flexibility and increased protection for covered fish species. Furthermore, the Draft Plan fails to identify targets and actions to limit life-history impacts due to high temperatures or low flows upstream as these impacts tend to be asymmetrical in time (i.e., affecting early or late ends of the diversity spectrum) and are largely under the control of Project operators.

ii. The Draft Plan Fails to Identify any Objective for Key Attributes of Viability that are Necessary to Achieve Conservation and Recovery of Central Valley Salmonid Species

The Draft Plan fails to establish objectives for other key attributes of viability that are necessary for recovery, such as spatial diversity. As discussed above, the Draft Plan sets survival objectives for both spring-run and fall-run Chinook salmon and Central Valley steelhead that: (a) likely lead to their extirpation of in the San Joaquin Basin during the first 10 years of the BDCP; (b) provide for no population growth and low abundance for years 10-19; and, (c) never support the abundance target identified as the global goals for the Chinook salmon populations. Draft Plan Appendix 3G at 20-21 (Table 4). If the Draft Plan established an adequate objective for spatial diversity for spring-run and fall-run Chinook salmon and steelhead then it would have focused on identifying stressors (e.g., high through-Delta mortality) and conservation measures (including but not limited to improved flow regimes) that would support conservation and recovery of these covered populations. But because it fails to set adequate objectives, the Draft Plan seems oblivious to the extirpation of existing salmon populations.

2. The Draft Plan Fails to Identify and Address the Correct Stressors on these Species

i. The Draft Plan and DEIS/DEIR Mischaracterize and Understate the Impact of Reservoir Operations on Chinook Salmon and Steelhead

The Draft Plan and DEIS/DEIR's presentation of stressors on Central Valley Chinook salmon ignores the proverbial elephant in the room – poor water quality, temperatures, and freshwater flow conditions related to CVP and SWP reservoir operations. Although the Draft Plan correctly acknowledges the historical role of dams in restricting Chinook salmon access to high elevation spawning habitats, *see* Draft Plan at 3.3-122, it ignores or downplays the impact of current dam operations on available spawning habitat, rearing, and migration habitat. Because the geographic range of Chinook salmon and steelhead spawning in the Central Valley is constrained by the presence of impassable dams (*see* Yoshiyama et al. 2001; Lindley et al. 2004), conditions below those dams have tremendous influence on the viability of these populations, including their abundance (total carrying capacity), productivity (survival rates), life history diversity (e.g. size and condition of juveniles, timing of upstream and downstream migration), and geographic range (extent of available spawning habitat). High temperatures have multiple deleterious effects on Chinook salmon, the type, severity and frequency of which vary with population spawning time and location. Quinn 2005; Myrick and Cech 2004, 2005; Richter and Kolmes 2005; NMFS 2014 Final Recovery Plan. Central Valley dams and reservoir operations exert great control on water temperature conditions in Chinook salmon spawning and rearing habitat. Nickel et al. 2004; NMFS 2009 Biological Opinion. However, the Draft Plan mentions reservoir operations only tangentially in its discussion of water temperature as a stressor on Chinook salmon. In describing the impact of temperatures, the Draft Plan credits a temperature control device (TCD) on Shasta Dam and "improved reservoir management" as "important factors contributing to the increase in adult winter-run Chinook salmon abundance in recent years." Draft Plan at 3.3-123. Yet the biological opinion indicates that upstream water temperatures have exceeded requirements in recent years, despite the TCD. *See* NMFS 2009 Biological Opinion at 263.

In addition to temperature impacts caused by operations of the Project reservoirs, flows below those dams severely constrain the abundance, productivity, spatial distribution, and life history diversity of numerous Central Valley salmonid populations. For example, following the end of the winter-run Chinook salmon incubation season releases from Shasta/Keswick are often reduced, often resulting in dewatering of fall-run Chinook salmon redds on the Sacramento River, even in recent years. SRTTG 2013; CDFW 2013. Dewatering of early spawning fall-run Chinook salmon on the Sacramento River reduces the life history diversity of this population (by eliminating the fraction that spawn, hatch, and migrate early) as well as its productivity (average survival rate) and overall abundance (carrying capacity). Redd dewatering presents similar

problem for steelhead on the American River. NMFS 2009 Biological Opinion at 279 (Table 6-18). Negative impacts resulting from variations in reservoir release have been known to impact steelhead and Chinook salmon on other Sacramento River tributaries as well. *See, e.g.,* Williams 2006 (citing Kurth 2003); DWR 2003.

The Draft Plan does appear to acknowledge the potential for water project operations on temperatures and flow conditions upstream as it sets objectives that require that the BDCP will not reduce the primary constituent elements of winter-run Chinook salmon critical habitat upstream. Draft Plan at 3.3-139 (Objective WRCS3.1). However, this target is misidentified as an objective. Objectives are statements of desired biological outcomes (e.g., a covered species' spawning extent), not drivers of those outcomes (e.g., habitat availability). The point of identifying desired outcomes separately from stressors that will be addressed to achieve those outcomes is to make transparent the Draft Plan's assessment of factors that currently impede attainment of its goals and objectives; such transparency allows reviewers to understand and evaluate the rationale for various elements of the Conservation Strategy. In any case, by setting an "objective" that is already a requirement of the status quo, the Draft Plan ignores potential feasible operational actions that would *improve* the Projects' ability to provide adequate upstream habitat for covered salmonids. *See, e.g.*, Nickel et al. 2004.

The Draft Plan is inconsistent and incomplete in its treatment of the impact of flow modification as a stressor on different runs of Chinook salmon. Flow modifications resulting from CVP and SWP operations are widely understood to affect survival (productivity), abundance (carrying capacity), spatial distribution, and life history diversity of all Central Valley Chinook salmon populations. Moyle 2002; Williams 2006; Williams 2010; NMFS 2009 Biological Opinion; NMFS 2014 Final Recovery Plan. Furthermore, several recent papers have improved our understanding of the relationship between freshwater flow rates, migratory corridor selection within the Delta, and Delta survival rates. *See* Perry et al. 2010; Michele et al. 2012. Even where the Draft Plan acknowledges the need for adequate freshwater flow rates, it largely fails to identify specific flow targets in different locations (in terms of volume, timing, duration, and frequency) that are needed to conserve and restore the different populations of Chinook salmon from the San Joaquin or Sacramento sides of the Central Valley. For example, in the same table where it sets forth the species-specific objectives for Chinook salmon, the Draft Plan lists "altered migration flows" as a stressor to Chinook salmon. Draft Plan at 3.3-134. However, its target for this stressor is only to "ensure that north Delta intake operations do not increase the incidence of upstream flows in the Sacramento River at the Georgiana Slough junction." *Id.* This target mistakes ameliorating current stressors on the population with preventing further harm from implementation of one of the Plan's own "conservation measures." In so doing, the Draft Plan ignores the fact that current flow levels are inadequate upstream, into the Delta, through the Delta, and out of the Delta into Suisun Bay. *See, e.g.*, NMFS 2009 Biological Opinion; NMFS 2014 Final Recovery Plan; SWRCB 2010 Flow Report; CDFW 2013 Letter to

the SWRCB. In addition, one of the landscape level objectives for Chinook salmon that speaks to the need for adequate transport flows for larval and juvenile fish. Draft Plan at 3.3-127 (Objective L3.3). However, this objective is not specific with regard to the magnitude, seasonal timing, or duration of flows (how much water? at what time of year? for how long?), the locations where such flows play an important role (and should be measured), or the percentage of years (frequency) in which they should occur, nor does the Draft Plan identify a time-bound for when these necessary flows will occur under the BDCP. The objective is deficient and unacceptable.

The Draft Plan and DEIS/DEIR analyze the effect of in-Delta flows on Chinook salmon and steelhead survival almost exclusively in terms of how OMR flows drive salmon entrainment. The Draft Plan and DEIS/DEIR ignore the effect of changes in freshwater flows into, through, and out of the Delta on other stressors the BDCP attempts to address and on improved survival rates of salmonids in this system. Kjelson et al. 1982; Stevens and Miller 1983; Kjelson and Brandes 1989; Brandes and McLain 2001; Newman and Rice 2002; NMFS 2009 Biological Opinion; NMFS 2010 Exhibit 7; NMFS 2014 Final Recovery Plan. For example, in the presentation and evaluation of CM14 (Aeration of the Stockton Deep Water Ship Channel to prevent violations of the dissolved oxygen standard), there is no analysis of the beneficial effect of freshwater flow rates in the lower San Joaquin River on dissolved oxygen rates, despite the fact that this effect is well-studied. Jassby and Van Nieuwenhuyse 2005.

Also, neither the Draft Plan nor the DEIS/DEIR alternatives consider provision of increased flow rates from CVP facilities on the San Joaquin River into the Delta as a means of transporting juveniles of covered fish species, attracting adults during spawning migrations, reducing negative OMR rates, alleviating dissolved oxygen problems, or increasing estuary-wide productivity. Increased flow rates also have been shown to decrease predatory efficiency on salmonids. DOI 2011 at 35 -36; USFWS Comments to SWRCB 2012; Cavallo et al. 2012. Decreased flow rates combined with increased Delta export pumping may facilitate high predator abundance in the Delta. *See* Moyle 2002, Moyle and Bennett 2008. Yet the Draft Plan and DEIS/DEIR do not consider the potential benefits of reducing predation pressure via increased flow rates into, through, and out of the Delta. Also, there is no analysis of the relationship between Delta outflow conditions and salmonid survival, distribution, and travel rates, though there is strong conceptual support for such an effect.

ii. The Draft Plan Overstates the Magnitude and/or Certainty of Stressors on Chinook Salmon Population and Incorrectly Treats these Stressors as if they have the same Impact on all Chinook Salmon Populations

In contrast to its uneven, weak, and/or missing treatment of critical flow-related stressors on Central Valley salmonid populations, the Draft Plan is overconfident about the magnitude of other stressors on Chinook salmon and steelhead. The Draft Plan frequently accepts any suggestion of a negative outcome for one salmonid population as solid evidence that (a) the factor is a stressor (as opposed to an outcome of other stressors) and (b) that the stressor effects other salmonid populations to the same degree. For example, the Draft Plan confidently states that predation is an important threat to each Chinook salmon population. *See, e.g.*, Draft Plan at 3.3-147 (spring-run); id. at 3.3-154 (fall-run and late fall-run). However, the Draft Plan only cites to a modeling study of predation on winter-run Chinook salmon to support this assertion. *Id.* at 3.3-122. Juvenile Chinook salmon and steelhead are certainly eaten in the Delta, and always have been; merely demonstrating that predation occurs, or even that predation rates are high relative to other sources of mortality is not evidence that predation is a "problem." Williams 2010 at 53. Furthermore, evidence of predation does not indicate that predation is a "stressor" per se, because any struggling fish is vulnerable to predation (whether it is undernourished, sick, suffering from toxic exposure, struggling with high temperatures, disoriented by poor flow conditions, etc.) – in other words, even high predation rates may be a only a symptom, rather than a cause, of salmon decline. Grossman et al. 2013. To support its assertion that predation rates may affect productivity of winter-run Chinook salmon, the Draft Plan relies on a modeling exercise, which showed that artificial stocking of predators could impact the recovery prospects of winter-run Chinook salmon. Lindley and Mohr 2003. The Draft Plan fails to address how stressors it identifies (lack of cover, toxins, temperatures) and those it does not (i.e., flow rates) affect predation rates and so fails to establish that controlling predation rates (by controlling predators directly) will actually alleviate impediments to salmonid recovery.

In addition, the modeling paper that the Draft Plan relies on (Lindley and Mohr 2003) to suggest that predation is a problem for winter-run Chinook salmon did not assess potential impacts of predators on other Central Valley salmonid populations and the Draft Plan provides no evidence that predation is an important outcome (much less, a stressor) on these other salmonid populations. Any population-level effect of predation is likely to differ across salmonid populations because these different fish enter the Delta at different times, from different locations, and at different sizes (i.e., they have different exposure and susceptibility to predation). For example, there are far more fall-run Chinook salmon juveniles than winter-run Chinook salmon migrants entering the Delta each year and they co-migrate with spring-run Chinook salmon juveniles, thus the proportional impact of predation on these populations is likely to differ from the impact on winter-run Chinook salmon. Juvenile late fall-run Chinook

salmon (which the Draft Plan erroneously treats as equivalent to fall-run Chinook salmon) are larger and thus less susceptible to predation than winter-run juveniles when they enter the Delta. Similarly, the Draft Plan suggests that steelhead migrants are significantly affected by predation in the Delta, *see* Draft Plan at 3.3-158, but this seems highly unlikely as steelhead spend a relatively short amount of time in the Delta, are usually several times larger (and thus less susceptible to predation) than migrating Chinook salmon fry, and are, in fact, aggressive predators in their own right.

By contrast, the Plan selectively ignores evidence of Project-related stressors to Chinook salmon and/or fails to consider how evidence of such impacts on one Chinook salmon population may indicate negative effects on other runs. For example, the Draft Plan's description of the entrainment stressor suggests that this effect is "not well understood." Draft Plan at 3.3-123. The document makes no mention of numerous detailed studies of this stressor. *See, e.g.,* Kjelson and Brandes 1989; Kimmerer 2008; Kimmerer and Nobriga 2008; NMFS 2009 Biological Opinion. The life history conceptual model for Central Valley Chinook salmon, in its coarse assessment of stressors to all salmonid populations in the Delta, rates "project diversions" and the Delta's "modified hydrograph" as equal to or more important *and* better understood than "predation by introduced fishes." Williams 2010 at 57 (Table 8). Similarly, the Final Recovery Plan for Central Valley salmonids states:

> The primary factors causing mortality of winter-run Chinook salmon in the Delta are considered to be the diversion of juveniles from the mainstem Sacramento River into the central and southern Delta where environmental conditions are poor and reverse flow conditions exist which may move them into the lower San Joaquin River and into the south Delta waterways (NMFS 1997). Survival through central Delta migratory routes is substantially lower than through northern routes. The numbers of juveniles arriving at the export pumps is lower as river flows increase, pumping decreases, and the Delta Cross Channel gates are closed (Cramer et al. 2003).

NMFS Final Recovery Plan 2014, Appendix B at 2-31.

The Final Recovery Plan indicates that spring-run Chinook salmon probably experience the same negative impact of entrainment into the Central Delta as identified for winter-run. *Id.*, Appendix B at 3-24 to 3-25. The Final Recovery Plan's stressor matrices for winter-run Chinook salmon, steelhead, and spring-run Chinook salmon (Attachments A, B, and C to Appendix B) list both entrainment at the Projects' current diversion facilities and predation in the Delta as stressors of "Very High" magnitude. It is not credible to imply, as the Draft Plan and DEIS/DEIR repeatedly do, that predation is better understood and more important as a population level stressor on Chinook salmon and/or steelhead than the entrainment stressor.

iii. The Draft Plan Provides no Rationale or Analysis Supporting the Adequacy of its Stressor Reduction Targets.

The Draft Plan does not analyze stressor reduction targets for Central Valley salmonids in a rigorous manner and, as a result, the targets are poorly defined and/or inadequate to attain desired biological outcomes (objectives) for salmonids. The point of identifying stressors that limit attainment of the Draft Plan's biological objectives is to force clear analysis of the scale of problems facing the covered species and to ensure that meaningful reductions in stressors occur within the time bounds identified by the objectives. Stressor reduction targets thus identify the degree to which threats must be reduced and the timeframe for producing the desired reduction in stress in order to serve attainment of biological objectives.

In many cases, the Draft Plan fails to identify even a rough target for reducing stressors. The stressor reduction target for "spatial structure" specifies that it must be attained by year 15, but the description of this target provides no detail regarding how to measure "spatial structure" or how much will be enough. In the end, this target sounds as though it is simply a partial explanation of the rationale for the "lack of rearing habitat" stressor reduction target. In another example of ill-defined stressor reduction targets, "illegal harvest" of steelhead and all runs of Chinook salmon is to be reduced in both the Sacramento and San Joaquin drainages "within the Plan Area" by year 15 (*see, e.g.*, Draft Plan 3.3-169 (steelhead)), but there is no indication of how much reduction in salmon or steelhead poaching the Draft Plan is expected or how much will need to occur in order to attain biological objectives for this species.[64] Above, we describe numerous inadequacies with the Draft Plan or DEIS/DEIR's description and evaluation of the illegal harvest stressor and its related conservation measures.

The Draft Plan sets objectives for improved through-Delta survival rates of juvenile San Joaquin fall-run Chinook salmon and steelhead and survival rates for spring-run Chinook salmon that are, or will be, reestablished in the San Joaquin Basin – above, we describe why those objectives are inadequate. Stressor reduction targets for San Joaquin population are related to entrainment, predation, and rearing habitat for fall-run Chinook salmon, Draft Plan at 3.3-159, spring-run Chinook salmon, *id.* at 3.3-151, and steelhead, *id.* at 3.3-168. The stressor reduction targets for predation are specific to predation rates in the export facility infrastructure and are thus redundant of the stressor reduction target related to "survival rates at south Delta export facilities" – it too calls for reduced predation within the canals and bays of the export infrastructure). The latter stressor reduction target is not SMART as there are no specifics regarding how much or when entrainment related mortality will be reduced; thus, there is no way

[64] It is also not clear how reduction in poaching of adult fish is relevant to the biological objectives set for salmonids, as there is no productivity or abundance objective for adult salmon

of telling how reduction of this stressor will contribute to improved Delta survival rates specified in the objectives for salmonids.

The "lack of rearing habitat" stressor is specific and time-bound, but the Draft Plan's description of these attributes demonstrates how little BDCP plans to reduce this stressor, particularly as compared to the needed survival improvements in the south Delta. The Draft Plan calls for restoring migrating juvenile salmonids access to at least "1000 acres of inundated floodplain habitat, primarily within the south Delta." Draft Plan at 3.3-169. This is one seventh of the floodplain acreage the Draft Plan intends to provide in the north Delta, on the Yolo Bypass, for salmonids of the Sacramento Basin, yet there is no explanation as to why migratory fishes of the San Joaquin basin require so much less floodplain habitat than Sacramento River fish. The Draft Plan calls for this new San Joaquin floodplain habitat to be inundated for a minimum of 1 week, while similar habitat on the Sacramento River is to be inundated for at least 30 days. Again, there is no explanation of why the same fish (i.e., fall-run Chinook salmon) using the same kind of habitat (inundated floodplains) would require different amounts (extent or duration) of that habitat, though the Draft Plan acknowledges that inundation periods of less than 30 days are expected to result in a lesser benefit to juvenile growth compared to inundation that extends longer than 30 days. Draft Plan at 3.4-41. Furthermore, the stressor reduction target specifies that, "On average, 50 acres of floodplain will be inundated a minimum of every other year, 500 acres will be inundated a minimum of every 5 years, and all 1000 acres will be inundated a minimum of once every 10 years." *Id.* In other words, a negligible amount of floodplain habitat will be available in only about half of years and a tiny amount will be available at a frequency of approximately once every five years. Central Valley Chinook salmon have a generation length of approximately 3 years (Moyle 2002; Williams 2006), so it is possible that two generations of migrants out of three would not experience even 500 acres of inundated habitat. Similarly, many Chinook salmon generations could migrate down the San Joaquin River without experiencing the relatively small maximum amount of floodplain habitat expected to occur in 1 year out of 10.

Though inadequate, the Draft Plan's objectives for survival through-Delta survival rates of San Joaquin salmonids are many times the current, miserably poor, survival rates. But the stressor-reduction targets the Draft Plan identifies are simply inadequate to affect such improvements, much less to attain objectives that would actually be adequate to restore San Joaquin salmonids. The floodplain habitat stressor reduction target is expected to occur by year 15 of the Plan, therefore, even if the stressor reduction target had any meaningful effect on San Joaquin survival, it would not contribute in any way to preventing extinction of all San Joaquin Valley salmonids that the Appendix 3G of the Draft Plan expects will occur within the first 10 years of the BDCP. Had the BDCP planning process followed a logical and science-based planning process, the disconnect between the timing of biological outcomes and the stressor reduction targets and conservation measures necessary to achieve desired outcomes would have been transparent; this

would have necessitated design and evaluation of actions that were appropriately scaled and timed to attain the adequate conservation and restoration objectives.

No target is identified for the "Migration Flows" stressor San Joaquin basin salmonids. This is problematic and unjustifiable given (a) the extremely impaired flows of the San Joaquin as it enters the Delta (*see, e.g.,* NMFS 2009 Biological Opinion; NMFS 2014 Final Draft Recovery Plan; SWRCB 2010 Flow Report; VAMP Panel Report 2010; NMFS March 28, 2013 Comment Letter on SWRCB 2012, Phase 1 WQCP SED), (b) the Draft Plan sets a "Migration Flow" stressor reduction target (though inadequate and ill-defined) for the Sacramento River, which has much higher spring flows (both absolute and proportional to the Basin's full-natural flow) than the San Joaquin River now and under the Draft Plan, and (c) the State Water Resources Control Board is currently contemplating water quality standards that would improve flow conditions in the lower San Joaquin. Improved flows in the lower San Joaquin are necessary to conserve and restore salmonid populations and other public trust values in that drainage and in the southern Delta. SWRCB 2010 at 119; USDOI Comments to the SWRCB 2013 at 31; NMFS 2013 Letter to the SWRCB at 1 and Enclosure 1 at 1; CDFW testimony to the SWRCB 2010b; CDFW Letter to the SWRCB 2013 at 5-6. Improved flows are also a foreseeable outcome of the State Board's update of the applicable Water Quality Control Plan, as we discuss in section I of these comments.[65]

For each Chinook salmon population and for steelhead, the Draft Plan sets a goal of reducing passage delays for adults migrating through the Delta at human-made impediments. *See, e.g.,* Draft Plan at 3.3-171 (Goal STHD2). In each case, the objective for this goal is to limit adult passage delays to less than 36 hours by year 15 of the BDCP. There is no indication of why it would not possible and desirable to remove human-made impediments to adult passage in less than 15 years or why it is not possible to restore relatively unfettered passage in less time. A key part of restoring passage for salmonids (and sturgeon and lamprey species) migrating through the Sacramento River is to modify the barriers formed by the Fremont, Lisbon, and Sacramento Weirs. Most or all of these actions are required under the 2009 NMFS biological opinion. Specifically, RPA Action I.6 and I.7 identify most of the same passage improvements described in the Draft Plan's CM2. NMFS 2009 Biological Opinion at 608-611.

The Draft Plan indicates that the passage barrier modifications will all occur within Phase 1 (years 1-5 of the BDCP) or Phase 2 (years 6-10). However, the biological opinion specifies that one half of the habitat restoration target of 17,000 to 20,000 acres of floodplain habitat must be restored by 2016. NMFS 2009 Biological Opinion at 609. There is no reason why the Draft Plan's stressor reduction objective for adult passage of salmonids, and the component projects

[65] We note that CVP facilities in the San Joaquin Basin affect the San Joaquin River inflow to the South Delta.

related to improving adult fish passage through the Yolo Bypass, should not be fully implemented in less than 15 years following adoption of BDCP. If, in fact, it is not possible to eliminate human-made barriers to fish passage in less than 15 years using the approaches described in CM2, then the Draft Plan ought to identify measures that *can produce the desired biological outcome* in less time. Again, we emphasize that the Draft Plan's own technical appendix (Appendix 3G) demonstrates that juvenile survival rates in the Delta will contribute to population declines (and perhaps extirpation for certain runs) for *all* central Valley salmonids for at least 10 years into the BDCP – the imperative to increase survival rates for salmonids (of any life stage) migrating through the Delta could not be more urgent.

3. Conservation Measures do not Adequately Address Known Stressors for this Species and/or their Impacts are Inaccurately Portrayed

i. Conservation Measures Identified in the Draft Plan are Deficient in Comparison with Similar Measures that are Already Required

In some cases, actions described by the Draft Plan are similar to those identified by the NMFS Biological Opinion RPA as necessary to prevent jeopardy to listed salmon species; however, the Draft Plan proposes a longer time period for implementation and/or a reduction in the magnitude of these actions as compared to what is specified in the RPA. For example, "CM2 Yolo Bypass Fisheries Enhancement" includes many of the same actions that are required by the 2009 NMFS biological opinion. The Draft Plan acknowledges the relationship between the RPA specified actions and those described in CM 2 (at 3.4-40), but the "fisheries enhancements" (largely floodplain restoration and removal of passage barriers) expected under the Draft Plan's CM2 are less than those specified by the RPA and BDCP implementation lags behind that required in the RPA.

Action I.6.1 of the RPA requires that an "initial performance objective" of 17,000-20,000 acres of inundated floodplain habitat (excluding acres under tidal influence) be restored in the Yolo Bypass, and it specifies that, "[i]n the event that less than one half of the total acreage identified in the plan's performance goal is implemented by 2016, then Reclamation and DWR shall re-initiate consultation." NMFS 2009 Biological Opinion at 608-609. In contrast, the Draft Plan targets restoration of only 7,000 acres of inundated floodplain habitat on Yolo Bypass, less than half of that required by the RPA. *See* Draft Plan at 3.3-159 (fall-run Chinook salmon); id. at 3.3-179 (Sacramento splittail). And it will not restore even this amount of habitat by 2016 as many of the "component projects" of CM2 are not scheduled to *begin* until the BDCP has been in effect for more than 5 years (i.e., Phases 2-4). The Draft Plan never identifies restoration of 17,000-20,000 acres of floodplain habitat on Yolo Bypass, as required by the RPA, as a stressor reduction target; thus, the BDCP's conservation measure for Yolo bypass fishery enhancements is less than what was required under the 2009 NMFS Biological Opinion as part of a suite of

actions necessary to prevent jeopardy to the listed winter-run Chinook salmon, spring-run Chinook salmon, or steelhead.[66]

ii. Some Conservation Measures Identified for Central Valley Salmonids are Speculative and the Likelihood and Magnitude of Benefits is Unspecified, Undocumented, and Likely to be very low

As with other species, the Draft Plan's expectations of benefits to many of the covered salmonids arising from restoration of tidal wetlands are speculative and overstated. The Draft Plan asserts that juvenile salmonids migrating through the freshwater and brackish water estuary will benefit from the addition of tidal rearing habitat and increased availability of food that is assumed will result from these restoration efforts. Draft Plan at 3.4-119. The assumption that Chinook salmon will rear in newly created tidal wetlands habitats is based on work from ecosystems in the Pacific Northwest where salmon rear in the estuarine environment. *See* Simenstad et al. 1982; Healy 1982.

However, recent research from the San Francisco Bay-Delta ecosystem indicates that the assumed benefits to Central Valley salmonids of tidal marsh restorations are uncertain and may not materialize. The life history conceptual model for Central Valley salmonids states, "Spring Chinook, or at least the Butte Creek population, pass quickly through the Delta, so habitat restoration there seems unlikely to do much for them. The same is probably true for late-fall Chinook, and for steelhead." Williams 2010 at 41. Also, recent, extensive research on the growth, survival, and migration rates of fall-run Chinook salmon through the San Francisco Estuary and in the nearshore ocean demonstrates that Central Valley Chinook salmon transit the brackish portion of the estuary quickly and gain little or no weight in the process; salmon smolts from the Central Valley grow more than ten times faster in the nearshore ocean than they do in the saline portion of the San Francisco Estuary. MacFarlane and Norton 2002; MacFarlane 2010. Although this may reflect the lack of suitable and highly productive estuarine rearing habitat in the current San Francisco Estuary (which has lost the vast majority of its tidal wetlands), it is also possible that low estuarine growth rates, coupled with high growth rates in the nearshore ocean has always been the case for Central Valley salmonids, as it is in many other river-estuary systems. *See* MacFarlane 2010 (providing examples). If this is the case, then restoration of complex "rearing" habitats in the Delta may serve to trap or delay small Chinook salmon migrants (exposing them to predators and potentially high Delta temperatures) more than they serve to increase growth and survival of these fish.

[66] In addition, other reviewers have emphasized the need for Yolo Bypass restoration to be completed prior to initial operations of the north Delta intakes, because of the additional impacts to migrating salmon from operation of new intakes. Mount & Saracino et al.2013. This further demonstrates the need to exceed the requirements of the 2009 biological opinion.

Second, as described above, actions to reduce illegal harvest of salmon are not sufficiently described to determine their potential to benefit adults of any of the migrating Central Valley salmonid populations. It seems very unlikely that the improved enforcement of fishing regulations would be sufficient to contribute meaningfully to restoration of all salmonid populations in both the Sacramento and San Joaquin River watersheds. Our skepticism regarding the efficacy of the Illegal Harvest Reduction conservation measure (CM17) for salmonids stems from the fact illegal harvest is not likely to be a major conservation threat to all salmonid populations of the Central Valley, not likely to be equally distributed across the Sacramento and San Joaquin basins, and not likely to be best addressed in the Delta (as specified in the stressor reduction measure). Thus, the increased enforcement identified in this conservation measures seems completely inadequate to the task of limiting illegal harvest of the number of species (two sturgeon species, five Sacramento River salmonid populations and three San Joaquin River salmonid populations) and in the geographic area covered by this action.

4. Projected Outcomes for Chinook Salmon do not Attain the Conservation Standard for these Species. In addition, the Presentation of these Results is Inaccurate, Biased, and Unacceptably Confusing.

The Draft Plan and DEIR/DEIS both demonstrate that BDCP, alone as well as in combination with climate change and other cumulative impacts, is likely to result in negative outcomes for the abundance, productivity (survival), life history diversity, and spatial distribution of several Chinook salmon and steelhead populations. The best available science demonstrates that: the three ESA-listed salmonids will experience reduced survival through the Delta, reduced abundance, and increased risk of extinction; the commercially valuable fall-run will decline substantially; and, none of the populations are likely to attain even the inadequate objectives described in the Draft Plan. Each of the species is discussed separately on the pages that follow.

C. Winter-Run Chinook Salmon

1. The Draft Plan and DEIS/DEIR Predict Severe Impairment of Winter-Run Chinook Salmon Population Viability; Significant Impacts are Overlooked or Obfuscated by Inaccurate and Irrelevant Comparisons

i. The Modeling Analysis Demonstrates that the Draft Plan will Result in Substantial Decreases in Abundance, Productivity, and Life History Diversity

The DEIS/DEIR inaccurately claims no beneficial or negative flow-related effect for winter-run Chinook salmon from Alternative 4. DEIS/DEIR at 11-55. However, this reporting ignores several large negative effects reported in the Draft Plan's effects analysis and those that are

likely to arise from large changes in flow and temperature reported in the DEIS/DEIR. The Draft Plan's Effects Analysis employs two life cycle models to evaluate the BDCP's likely effects on winter-run Chinook salmon. Draft Plan Appendix 5G. These models project that conditions in the future will be worse for winter-run Chinook salmon assuming current operations required under the Biological Opinion and other environmental standards and climate change as modeled in the BDCP (EBC2_ELT and EBC2_LLT).

Comparing outcomes of the Draft Plan to the status quo under assumed conditions in the future, the results indicate an impermissible negative impact to this endangered salmon population. In reviewing results of the OBAN modeling framework, the Draft Plan's technical appendix states: "The median of median escapement for ESO_ELT was 28% lower than the median for EBC2_ELT, and the median of median escapement for ESO_LLT was 13% lower than the median for EBC2_LLT (Table 5.G-9)." Draft Plan Appendix G at 5.G-51.[67] These results indicate that changes in CVP/SWP operations will be needed to sustain salmonids and achieve long term population abundance targets, particularly in light of climate change and other stressors.

The other model used to assess changes in winter-run Chinook salmon survival into and through the Delta (IOS) indicates that fry survival (Draft Plan at Table 5.G-20) and smolt survival (Draft Plan Table 5.G-21 to 5.G-23) will decline substantially under the Draft Plan BDCP in both the early and late-long term. This model projects a median decline in winter-run Chinook salmon escapement under the high outflow scenario of 27% relative to the EBC2_ELT (the comparison that incorporates climate change assumptions in the early long term for both scenarios); the low outflow scenario shows even more dramatic declines in winter-run Chinook salmon escapement, 66% lower escapement under the BDCP in the median case. Draft Plan at Table 5.G-25. Thus, the model provides no support (and clearly contradicts) the NEPA/CEQA finding that BDCP will not result in significant impacts to salmon migration (AQUA-42). Comparing future conditions under the BDCP Alternative 4/H3 (ESO) to modeled current conditions (without

[67] Because organisms experience conditions in particular years, not in the "mean" year, comparisons of the frequency distribution of results are more valuable than simply comparing averages. However, if a quick comparison is to be informative, median results (an indicator of the frequency distribution) are far more relevant than comparison of "mean" results; the latter are almost useless when, as the Draft Plan is at pains to emphasize, model results are not believed to reflect actual values, but are for comparative purposes only. The mathematical mean and variance of a set of values is irrelevant and likely to be misleading if the individual values are not believed to be accurate. When the purpose of analysis is to compare relative outcomes of scenarios, a variety of non-parametric statistical analyses are available (e.g., Chi-Square tests for differences in distribution, Wilxocon Ranked Signs Test, etc.). The technical appendix states: "The BDCP effects analysis uses life cycle models to provide relative comparisons among the effects of alternatives (e.g., direction and relative magnitude of anticipated population response). These results should therefore not be interpreted as predictions of changes in population abundance." Draft Plan Appendix 5G at 5.G-3. The Draft Plan inappropriately presents mean values and parametric error bounds of modeled scenarios despite this warning.

climate change) reveals that IOS predicts a decline in winter-run abundance of 53% in the early long term and 80% in the late long term. Draft Plan at Table 5.G-25 and 5.G-26.

As elsewhere, the DEIS/DEIR focus on changes in "mean" values understates the magnitude of the impacts that will be expected in years that are worse than average – impacts in "below average" years may damage the population irreparably (including, but not limited to, extinction). Understanding the conservation consequences to imperiled species requires assessment of the entire range of potential differences - the DEIS/DEIR should report both the median of differences (not the difference between the medians) and the range of differences between paired predictions arising from different scenarios. These reported declines under equivalent assumptions of climate change represent either the proportional difference between the median cases of both scenarios or the median of differences across years in the comparison (it is not clear which, though the latter would be more informative) but, in either case, it is clear that these declines do not represent the largest declines anticipated from implementation of the BDCP alternative. The technical appendix also presents these results in terms of mean declines and as the projected absolute difference in number of fish returning to spawn, despite the repeated warning in the technical appendix that these model results are for comparison purposes only.

Although both OBAN and IOS use different assumptions and analytical approaches to estimate Chinook salmon population response to different scenarios, both models project declines in winter-run Chinook salmon escapement under the BDCP, as described in the Draft Plan, when compared with current operations and infrastructure (assuming the same effect of climate change for both proposed BDCP and No Action scenarios). In both cases, the negative results were attributed to low reservoir storage and low river flow conditions arising from the BDCP. For example, the technical appendix describes the results for OBAN as follows:

> The lower escapement of winter-run Chinook under ESO compared with EBC2, even though through-Delta survival was higher under ESO, is the result of differences in modeled conditions in the Sacramento River above the Delta. In the Sacramento River spawning reaches, modeled water temperatures at Bend Bridge were higher (Figure 5.G-3) and minimum flow rate were lower (Figure 5.G-4) under the ESO compared to EBC2 scenarios, particularly during the ELT. These differences in Sacramento River conditions cause lower survival in ESO scenarios relative to EBC2 scenarios in the alevin and fry stages and are ultimately reflected in lower escapement under ESO.

Draft Plan Appendix G at 5.G-54.

The Draft Plan Technical Appendix explains its IOS modeling results as follows: "The lower BDCP scenario survival rates were the result of increased flow-related mortality in specific

model reaches in the Delta," Draft Plan Appendix 5G at 5.G-68, and "Modeled differences in egg and through Delta survival accounted for the largest differences in escapement between scenarios after the effects of climate change are considered," *Id.* at 5.G-72. Using two through-Delta survival models, different than the ones applied by the Draft Plan, NMFS projected decreased through-Delta survival for winter-run Chinook salmon juveniles under Alternative 4/H3 as compared to EBC2 in the late-long term. NMFS 2013 Evaluation of Flow Effects at 4. Projected survivals for winter-run and steelhead were also lower under HOS and LOS than under EBC2 in all years. *Id.* NMFS' estimates of through-Delta survival for spring-run Chinook salmon under H4 were lower than that projected for EBC2 in a substantial fraction of years in the late-long term. *Id.* Survival under HOS was generally substantially higher than under LOS for spring-run, steelhead, and fall-run. *Id.*

The finding that flow rates and temperature conditions would be negatively impacted during the winter-run incubation, rearing, and migration period reveals that the Draft Plan will not achieve many of its major goals for winter-run Chinook salmon and is not likely to achieve the Draft Plan's biological objectives, will cause significant environmental impacts (contrary to conclusion AQUA-42 that Alternative 4 and several other alternatives would cause less than significant impacts for migrating winter-run salmon), and may result in operations that jeopardize winter-run Chinook salmon. Goal WRCS3 calls for "No degradation of aquatic habitat conditions upstream of the water facilities." Draft Plan at 3.3-145. The related objective (WRCS3.1) states that this species' critical habitat will not be impacted. *Id.* Clearly, if mortality increases because of increased temperature and reduced flow rates upstream, then "aquatic habitat conditions upstream of the water facilities" have been degraded. These projected outcomes represent not simply a failure to meet an important restoration goal of the Draft Plan, but a likely degradation of winter-run critical habitat. *See* 50 CFR § 226.204. These findings also contradict the Draft Plan's repeated claim that BDCP will not affect how cold water pool and flows in the upper Sacramento River are managed. *See, e.g.*, Draft Plan Appendix 5G at 5.G-60; *see also* discussion in section II of these comments regarding modeling flaws. Furthermore, population declines are inconsistent with requirements of the ESA and NCCPA as they increase the risk of extinction and move the population away from recovery.

ii. The Draft Plan Improperly Ignores the Results of its own Modeling Regarding Severe Negative Impacts to Winter-Run Chinook Salmon

The Draft Plan's technical appendix uses spurious arguments and metrics in an attempt to dismiss the OBAN and IOS model results that reveal the Draft Plan will likely lead to significant impacts to viability and degraded conditions for winter-run Chinook salmon upstream and in the Delta. For example, the technical appendix points to the variance in OBAN and IOS model predictions to suggest that there may actually be no difference in model outputs between the

BDCP and baseline conditions in the future. Figures such as 5.G-21, 5.G-23, 5.G-24, and 5.G-26 imply a spurious comparison of within-scenario means relative to their total variance (error bars) when the relevant comparison between scenarios would involve analysis of the differences in outcomes within years (a paired analysis) – as stated above, any analysis that relies on mean values and calculated variances is inappropriate. Although we appreciate the recognition that variance in model predictions must be accounted for when interpreting model outputs, we note that:

- The Draft Plan and DEIS/DEIR do not present error bounds whenever doing so might discount findings that these documents suggest reflect positively on the BDCP. For example, the Draft Technical Appendix's analysis of OBAN model predictions of through-Delta survival for winter-run Chinook salmon claims improvement under BDCP operations (*see, e.g.,* Draft Plan Appendix 5G at 5G-48) and the DEIS/DEIR compares these "positive" results to negative outcomes of the IOS model to suggest that the models conflict and therefore there is uncertainty about the effect of Alternative 4 on winter-run Chinook salmon juvenile survival in the Delta (*see, e.g.,* DEIR/DEIS at 1333). However, neither document reveals that the purported improvement in through-Delta survival rates detected by OBAN are nearly undetectable. Draft Plan at Figure 5.G-13 and 5.G-14. It would be extremely surprising if the maximum survival differences in through Delta survival projected under different scenarios (~0.15%), not to mention the median differences (0.09%; *see* Draft Plan at Table 5.G-7), reflected an actual improvement (i.e., were outside the error bounds for the OBAN model's survival estimation routine). That error estimate is not presented. Thus, any "contradiction" between OBAN and IOS in their estimate of through-Delta survival has likely been overstated: IOS projects substantial declines in Chinook salmon through-Delta survival rates (productivity) and OBAN finds no improvement; both models project declines in survival upstream of the Delta. Even if the differences OBAN detects in through-Delta survival rates for different scenarios were real (in terms of the model's inherent error), it is clear that the extremely tiny alleged increases in through-Delta survival will not lead to the sizeable (though still inadequate) improvements in through-Delta survival specified in the BDCP objective (WRCS1.1) for winter-run Chinook salmon. Thus, there is no scientific evidence that the draft plan is likely to achieve the Draft Plan's biological objectives for salmon survival through the delta.
- The implied statistical comparison of upstream survival rates between scenarios is statistically inappropriate because it confounds variance *among* years surrounding the mean modeled outputs with variance in the *difference* between modeled outputs *within* years. The appropriate statistical approach is a comparison of pairs of "observations" (model outputs for different scenarios) that occur in the same year; in

other words, a statistical comparison (if one were valid) would analyze *the mean and variance of the differences*, not the difference between means relative to total variance in the modeled time series. Simply looking at the comparison of OBAN escapement estimates for EBC2_ELT and ESO_ELT (upper panel of Figure 5.G-15) suggests that the difference between modeled escapement frequently favors EBC2-ELT; OBAN's detection of abundance declines is likely to be statistically significant, whereas the statistical comparison implied by Figure 5.G-17 (which shows overlapping among-year error bounds for each scenario) are completely irrelevant and entirely misleading.

- The use of quantitative comparison of means and variance estimates is inappropriate given the technical appendix's repeated warning that its modeling outputs are for relative comparisons of between scenarios and that the results should not be compared to absolute survival or escapement targets. Comparing differences in the frequency distribution of outcomes are far more appropriate here as the frequency of high and (particularly) low abundances are of greater interest than are the mean population estimates over time – there are tests for differences between frequency distributions (e.g. Chi-square) and non-parametric analyses appropriate for relative comparisons (e.g. Wicloxon Ranked Signs test) that the technical appendix and DEIS/DEIR should have employed.

The Draft Plan also improperly interprets results of a "sensitivity analysis" to undermine the projections from its models. The comparison of "high outflow" and "low outflow" scenarios with EBC2 conditions modeled by OBAN clearly demonstrates that both of these scenarios will produce substantial declines in the median outcome across the early and late long term. Draft Plan at Table 5.G-13. All alternatives where OBAN modeling is presented (including Table 5.G-13) indicate a decline in winter-run Chinook salmon escapement compared to the NAA.

As with the OBAN model, the technical appendix presents results of a "sensitivity analysis" for the IOS model and uses those outputs to cast doubt upon the clear implications of the IOS model results described above; once again, the argument is not credible. When different assumptions are made regarding either winter-run migration paths (e.g., due to implementation of non-physical barriers, CM16) or mortality at the new North Delta diversion facility, IOS model outputs change. From this, the technical appendix derives the elementary conclusion that if different model assumptions and inputs are made, then the model will produce different outputs. But in no case do BDCP operational variants produce higher through-Delta survival than environmental baseline conditions. Draft Plan at Figure 5.G-27 and Figure 5.G-28. There is no rationale for the technical appendix's conclusion that, because the IOS model is "sensitive" to assumptions about conditions in the Delta (which it terms a "limitation"), "IOS results alone do not provide a sufficient basis for drawing conclusions about the overall effect of the BDCP on winter-run Chinook salmon." Draft Plan Appendix 5G at 5.G-78. This statement is problematic

because: (1) all models ought to be sensitive to model inputs and assumptions (that is the advantage and disadvantage of quantitative modeling exercises); (2) if the Draft Plan concludes that a model is not appropriate for evaluating future scenarios, it should not dedicate a large fraction of a lengthy technical appendix to describing and presenting model outputs; (3) the conclusion derived from review of the technical appendix's modeling efforts is not based on "IOS alone"; the IOS modeling results are consistent with OBAN modeling results in projecting very serious negative outcomes for winter-run Chinook salmon; and (4) the technical appendix presents no scenario in which BDCP operations result in higher median modeled escapements than those projected under environmental baseline conditions in the Early Late Term, and most scenarios result in lower median modeled escapements in the LLT (*see* Draft Plan at Figure 5.G-27 and Figure 5.G-28) and certainly none that demonstrate attainment of the Draft Plan's own inadequate biological objectives for this species. The Draft Plan's dismissal of the OBAN and IOS modeling results (simply because the model is sensitive to assumptions about modeling inputs) is one of many examples of the Draft Plan and DEIS/DEIR's biased presentations of the BDCP's likely effects.

The results of these modeling runs indicate that changes to flows and temperatures described in the DEIS/DEIR and the Draft Plan will not lead to improved survival of winter-run Chinook salmon in fresh water. As such, the proposed project as described in the Draft Plan and most of the DEIS/DEIR alternatives are not likely: (a) to attain the survival targets set in the BDCP objective for this species (as the ESO estimates clearly underperform the current baseline ("EBC2"); or (b) to increase abundance of winter-run Chinook salmon. Current survival rates in freshwater (through-Delta and upstream) are inadequate to attain any of these targets (and even the BDCP survival objective WRCS 1.1 is not adequate to attain the CVPIA/AFRP targets within the lifespan of the project, *see above*); thus, survival rates lower than the current level cannot be adequate or acceptable.

Whichever approach is used to estimate the significance of differences in winter-run Chinook salmon abundance among scenarios, the Draft Plan and DEIS/DEIR should have acknowledged that, under ESO assumptions, OBAN predicts near-extinction of winter-run Chinook salmon in all but a few years of the 23 year model run depicted in Figure 5.G-15. IOS estimates similarly disastrous results. Reviews of previous versions of the Draft Plan have remarked that, having chosen OBAN and IOS to model projected outcomes of different BDCP operational scenarios, the results of these models should not be "… discounted because they do not show what was "expected." Since these methods were deemed acceptable, the results need to be fully acknowledged." NMFS 2013 Progress Assessment at 12. It is clear that the NCCPA/ESA conclusions in the draft plan, and the CEQA/NEPA findings of less than significant impacts, are not supported by substantial evidence.

iii. The DEIS/DEIR Fails to Report Potentially Significant Negative Impacts to Winter-Run Chinook Salmon Arising from the Project by Improperly Attributing Negative Impacts and by Ignoring its own Analysis

The DEIS/DEIR is inconsistent and internally contradictory in its presentation of temperature and flow impacts to winter-run Chinook and other salmonids in the Sacramento River. Important impacts are overlooked, dismissed without sufficient analysis or obscured with inappropriate comparisons. Its findings of "Not Adverse" and "Less than Significant" flow-related impacts to winter-run Chinook salmon are unsubstantiated and not scientifically credible. DEIS/DEIR at 11-55 (Table 11-4-SUM1).

Temperature Impacts

High temperatures below Shasta and Keswick dams during the winter-run incubation period are a well-known impact on winter-run Chinook salmon. The NMFS 2009 biological opinion notes that "the annual change in TCP has degraded the conservation value of spawning habitat" for winter-run. NMFS 2009 Biological Opinion at 91. Thus, high temperatures in the Sacramento River downstream of Shasta-Keswick have been problematic even when direct impacts of high temperatures (egg or juvenile mortality) have been minimized through real-time management of cold water pool resources. The prior history of Keswick/Shasta operations strongly suggests that the model results overestimate benefits and underestimate the likely environmental impacts of upstream temperature impacts from CVP operations, particularly in light of real time operations to allow greater water deliveries.

As a consequence of operations under Alternative 4 of BDCP, the Bureau of Reclamation winter-run egg mortality model projects much higher mortality rates under Evaluated Starting Operations (H3, "ESO") than under the No Action Alternative (NEPA comparison) during "below normal" and "dry" year types (relative differences in mortality are 76% and 11% higher, respectively, under ESO). DEIS/DEIR at Table 11-4-17. The DEIS/DEIR seeks to minimize those differences by arguing that they "only" happen in two year-types and that the absolute difference in egg mortality is "only" about 1% of the egg population. *Id.* Both arguments are spurious. Egg mortality is generally a large problem for winter-run Chinook salmon in drier year-types because freshwater flows during those years are typically low and reservoir storages are insufficient to provide for sufficient storage of cold water. Lack of projected impact to temperatures affecting winter-run Chinook salmon productivity in wetter years is not surprising or particularly positive news, but the revelation of higher egg mortality in drier year types (representing ~40% of all years) is a major negative outcome for BDCP.

The additional loss of 1% of the total cohort at the egg stage cannot be dismissed as insignificant, especially for a critically endangered population that already suffers high egg-mortality during

drier year types. First, the impact assessment ignores sub-lethal negative effects of temperature, which are known to be large at the high end of the Chinook salmon thermal tolerance range. *See* NMFS 2009 Biological Opinion. Second, the increase in egg mortality, as noted by the DEIS/DEIR, is very large in relative terms; to accept the DEIS/DEIR's lack of concern about increased egg mortality, one would have to conclude that current egg mortality is not a problem. Yet egg mortality and other sub-lethal negative effects of high temperatures are currently considered to be a substantial problem for winter-run Chinook salmon in some year types. Moyle 2002; Williams 2006; NMFS 2009 Biological Opinion at 235. A large increase in a stressor that is already considered to be a problem is, itself, a large problem. Similarly, the SacEFT habitat model projects substantial impacts to various life stages of winter-run Chinook salmon dwelling in the upper Sacramento River, which the DEIS/DEIR seeks to minimize (suggesting, for example, that absolute losses in spawning habitat of ~9% would be "small"). DEIS/DEIR at Table 11-4-18.

In another example of its selective emphasis of results that reflect positively on the project alternatives, the DEIS/DEIR reports that, on average, degree-days decrease by up to 5% during August (a good thing in terms of Sacramento winter-run Chinook salmon egg survival and larval development). DEIS/DEIR at 11-1322. However, the results also reveal *increases* of more than 5% in degree days (in most cases, a bad thing for winter-run Chinook salmon eggs and larvae) during June (of Dry and Critical years), July (Above Normal, Below Normal, and Dry), and September (of Below Normal years). Temperatures above a certain threshold can produce negative results whenever critical values are exceeded during the winter-run incubation period; reduced temperatures in some months of a given year and even reduced "average" temperatures throughout a year are meaningless if mortality or sub-lethal negative effects occur during the incubation period. As usual, when the Draft Plan and DEIS/DEIR focus on average results across all years, they overlook important impacts that occur in particular year types (each of which occurs a significant fraction of the time).

The DEIS/DEIR's analysis that categorizes degree-day violations into color-coded "levels of concern" is scientifically unjustified. *See, e.g.,* DEIS/DEIR at Tables 11.4.14 and 11.4.15. Table 11.4.14 defines as "no effect" temperatures that exceed the known limit of winter-run Chinook salmon egg tolerance (56°F) by 1 degree for up to 9 consecutive days and by 2 degrees for up to 4 days; the DEIS/DEIR is only marginally concerned about temperatures 3 degrees higher than the limit that persist for up to 4 days. The biological significance of the 56°F temperature limit for winter-run Chinook salmon is well documented in the NMFS 2009 Biological Opinion, and this threshold has abundant support in the literature. *Id.*; Richter and Kolmes 2005. Optimum temperatures for incubation are somewhat lower than 56°F. McCullough et al. 2001; Myrick and Cech 2004. Furthermore, this method of assessing temperature impacts to winter-run Chinook salmon eggs underestimates temperature problems caused by BDCP operations because it compares scenarios based on the number of days a temperature standard is exceeded at Bend

Bridge. Bend Bridge is not the regulatory standard for temperature compliance (the actual TCP in any given year is a point generated in collaboration among federal agencies that must be approved by the SWRCB). Comparisons of relative performance between BDCP alternatives in the DEIS/DEIR and modeled baseline conditions at Bend Bridge do not necessarily reflect the actual magnitude or spatial extent of problems experienced by incubating eggs upstream. As a result of these and other issues, Tables like 11-4-15 in the DEIS/DEIR fail to provide accurate information on environmental impacts.

In the end, the DEIS/DEIR fails to make a NEPA determination regarding temperature impacts of the Alternative 4 high outflow scenario, claiming:

> "Available analytical tools show conflicting results regarding the temperature effects of relatively small changes in predicted summer and fall flows. Several models (CALSIM, SRWQM, and Reclamation Egg Mortality Model) generally show no change in upstream conditions as a result of Alternative 4. However, one model, SacEFT, shows adverse effects under some conditions. … In conclusion, Alternative 4 modeling results support a finding that effects are uncertain. Alternative 4 does not propose any changes to Shasta operating criteria, but modeled results are mixed and operations that match the CALSIM modeling are not assured. Model results will be submitted to independent peer review to confirm that adverse effects are not reasonably anticipated to occur."

DEIS/DEIR at 1322.

These claims are inaccurate, and the data demonstrates that operations will cause a significant impact under NEPA. First, the DEIS/DEIR does not present results of the Reclamation Egg Mortality Model for the high outflow scenario (H4) of Alternative 4, however, its mischaracterization of serious egg mortality outcomes for H3 suggests that similarly significant results may occur under Alternative 4 operations. Large flow reductions versus NAA are projected during September and October in some year types for Alternative 4/H3 and in October under Alternative 4/H4. DEIS/DEIR Appendix 11C at 11.C.226-227. Water temperatures are affected by reductions in flow as temperature gain during the summer and early fall generally is inversely correlated with flow volume. Thus we would expect higher egg mortality under H4 than was previously reported (and inappropriately downplayed) for H3. Second, temperatures (and thus winter-run egg mortality) were expected to increase under Alternative 4/H4 as compared to H3 between July-September (*see* DEIS/DEIR at 1324) and from August through October (*id.* at 1328). Although it is not valid to measure temperature changes in percentage terms as the DEIS/DEIR does, the temperature increase described would appear to be substantial with potentially significant implications for winter-run Chinook salmon egg viability and juvenile rearing success. Third, the statement suggests that three independent models (CALSIM,

SRWQM, and Bureau Egg Mortality) show "no change" in upstream conditions; however, these models are integrally linked, and the SRWQM (and the Reclamation Temperature Model) use CALSIM II inputs to predict temperatures in the upper Sacramento River. DEIS/DEIR Appendix 5A at 5A-A26 and Table A-2. The Draft Plan's Effects Analysis describes the Bureau of Reclamation Salmon (egg) Mortality Model as follows:

> Limited to effects of water temperature on eggs only; daily time step requires linear interpolation between monthly temperatures to compute daily temperatures; third in a sequence of models (CALSIM and Reclamation Water Temperature Model), so limitations of previous models are compounded.

Draft Plan at 5.2-19. Furthermore, the SRWQM, that develops inputs for the egg mortality model, is known to have an error rate that is high relative to the tolerances of Chinook salmon eggs for temperatures above 56°F and the model is known to underestimate temperatures and thus underestimate the impacts to winter-run Chinook salmon eggs. Quoting from the calibration and validation documentation for the model (RMA 2003), the August 2008 OCAP biological assessment reports: "Computed temperatures are generally within 3° F or less of average observed data at each of the locations plotted. Computed temperatures tend to be slightly cooler than observed." 2008 Biological Assessment Appendix H at H-9. We also note that the chain of modelling that connects CALSIM model outputs to winter-run Chinook salmon egg mortality has failed to predict the Bureau's inability to maintain adequate temperatures for winter-run Chinook salmon incubation. Temperature thresholds for migrating, incubating, and rearing winter-run Chinook salmon are already frequently exceeded, even after the annual revision of TCP to accommodate inadequate storage conditions at Shasta Lake. NMFS 2009 Biological Opinion at 234-236.

There is adequate information to reach a conclusion, and the DEIS/DEIR's claim that information regarding temperature impacts is "incomplete or unavailable" is unjustified. Therefore, it is impermissible to fail to reach a NEPA determination of significant impacts of increased temperatures on winter-run Chinook salmon based on results of both of the temperature-egg mortality analyses conducted. *See* 40 CFR § 1502.22.

The Draft Plan and DEIS/DEIR demonstrate that, relative to the NEPA No Action Alternative (which incorporates climate change), both Alternative 4 EOS (H3) and "High Outflow Scenario" (H4) will cause substantial temperature impacts to winter-run Chinook salmon upstream. The SacEFT model reveals significant effects that the DEIS/DEIR inappropriately downplays. *See* DEIS/DEIR at 11-1319 (Table 11-4-18). Similarly, two models employed by the Draft Plan's technical appendix 5G find negative temperature effects on winter-run Chinook salmon arising from BDCP operations under Alternative 4. Failing to acknowledge the consistent finding of negative outcomes related to temperature by four very different modeling frameworks is not a

credible interpretation of the results. The dramatic nature of the egg mortality impact is made even clearer when operations under the modeled Alternative are compared to modeled current conditions (i.e. prior to climate change). The DEIS/DEIR describes these severe impacts as follows:

> Egg mortality (according to the Reclamation egg mortality model) in drier water years, during which winter-run Chinook salmon would already be stressed due to reduced flows and increased temperatures, would be up to 42% greater under Alternative 4, including climate change, compared to the CEQA baseline (Table 11-4-17). Egg incubation conditions according to the SacEFT model are predicted to be 26% lower under H3, including climate change, than under the CEQA baseline. Further, the extent of spawning habitat predicted by SacEFT would be 60% lower under H3, including climate change, compared to the CEQA baseline (Table 11-4-18), which represents substantial reduction in spawning habitat and, therefore, in adult spawner and redd carrying capacity. Exceedances above NMFS temperature thresholds would be substantially greater under Alternative 4 relative to the CEQA baseline.

DEIS/DEIR at 11-1325.

Winter-run Chinook salmon are severely imperiled and already suffer from Project operations that lead to temperatures beyond this species well-documented tolerance levels. Moyle 2002; Williams 2006; Williams 2010; NMFS 2009 Biological Opinion, NMFS 2014 Final Recovery Plan. Increases in the magnitude, duration, and frequency of temperature impacts are a significant impact to this imperiled species and likely would violate numerous legal requirements including the ESA. The DEIS/DEIR's attribution of all temperature impacts to the anticipated effects of regional climate change is inaccurate, as evidenced by the scenario comparisons that incorporate climate changes. It is also misleading because it incorrectly assumes that (a) water project operations do not contribute to temperature impacts, that (b) water project operations cannot be changed to ameliorate the effect of current or future temperature impacts to winter-run Chinook salmon, and (c) that climate change and BDCP operations are not cumulative impacts.

In fact, water project infrastructure significantly contributes to temperature impacts to winter-run Chinook salmon because water warms behind the Project dams before it is released into current winter-run spawning habitat, and because reservoir releases that are, in some years, lower than natural flow levels gain temperature more quickly than if full reservoir inflows were provided in those years. Moyle 2002; Williams 2006; Williams 2010; NMFS 2009 Biological Opinion, NMFS 2014 Final Recovery Plan. Equally important, feasible mitigation measures, including infrastructure changes (TCD, cold water curtains) and reoperation of Central Valley Project reservoirs are capable of reducing or ameliorating these problems now and in the future. *See,*

e.g., Nickel et al. 2004; NMFS 2009 Biological Opinion. It is unacceptable that the DEIS/DEIR fail to consider feasible mitigation measures and alternatives to reservoir operations that would reduce or avoid temperature impacts to winter-run Chinook salmon. The claims that there are no feasible mitigation measures (AQUA-40 and AQUA-41) are not supported by substantial evidence and are not scientifically credible.

Any temperature-related impacts will, of course, depend on actual reservoir storages and flow release rates. However, BDCP modeling outputs reveal that the modeled operations will violate flow and/or storage (temperature) conditions required in the NMFS 2009 Biological Opinion. *See* section II(C), *infra*. While acknowledging that the four outcomes of the Alternative 4 outflow decision tree, "…have the potential to cause differences in upstream conditions or in-Delta flows in other seasons as well (i.e., summer and winter)," DEIS/DEIR at 11-51, the DEIS/DEIR also maintains that, "Alternative 4 does not propose any changes in Shasta Reservoir operating criteria, and CALSIM results show that Reclamation could operate Shasta in such a manner that it does not affect upstream storage or flows substantially as compared to the NAA." DEIS/DEIR at 11-1322. These two statements are irreconcilable with the BDCP's projections. *See also* MBK Engineers 2014. To meet the storage requirements and temperature conditions required under the biological opinion, reservoir release patterns will be need to change from what has been modeled in the Draft Plan and DEIS/DEIR such that more water is stored upstream in certain years – that will obviously influence flow conditions into and through the Delta in ways that have not been analyzed (it will also likely affect SWP/CVP Project deliveries in ways that have not been modeled). Thus, either the DEIS/DEIR and Draft Plan outputs and analysis are totally invalid, or the negative flow and temperature impacts to winter-run Chinook salmon described in the Draft Plan and DEIS/DEIR are likely, in which case the impacts are significant from a NEPA/CEQA point of view and impermissible from the ESA/NCCPA perspectives. Given the availability of modeling data, it is wholly inadequate to fail to provide accurate information about the likely impacts and to fail to identify whether significant impacts are likely to occur.

<u>Flow impacts on winter-run spawning and downstream migration</u>
Negative impacts to the extent of inundated spawning and incubation habitat for winter-run Chinook salmon should be anticipated as a result of flow reductions projected under the DEIS/DEIR alternatives. Winter-run spawning begins in late-April and lasts through early-August; incubation begins with the onset of spawning and lasts through October, for some fraction of the population. Moyle 2002. Reductions in flow on their spawning habitat during this period represent the potential loss of spawning habitat and/or the dewatering of eggs that have already been deposited. Both should be considered negative effects to this endangered population that suffers both from reduced productivity (low survival rates) and extremely limited spatial distribution. Compared to the No Action Alternative (NEPA), the DEIR/DEIS project substantial flow reductions upstream of Red Bluff Diversion Dam under Alternative 4 operations

for some year types in the July-October period for operational variants H3 (ESO) and H4 (HOS). These range from flows that are 5.3% lower than NAA in July of Dry years under the H4 variant to flows that are 14% lower in Dry years during August of the H3 variant. DEIS/DEIR Appendix 11C at 11.C.-225 to -227. Thus, winter-run Chinook salmon that spawn in July or early August will have less available spawning habitat. Far from mitigating for low flows in the summer period, the higher flows expected during some water year types in May for both H3 and H4 would likely exacerbate the problem of low flows that are expected later. This is because fish that spawn in May will be attracted to deposit their eggs in areas that would be unavailable under the NAA but which are not likely to remain inundated when flows decline in the later incubation period (e.g. after July), some eggs that are deposited based on spawning habitat available in May are likely to be dewatered as a result of temporally asymmetric changes in flow projected in the DEIS/DEIR. Thus, losses to winter-run spawning and incubation habitat projected under Alternative 4 should be listed as a significant impact to productivity, spatial distribution (because the drivers of these impacts (temperature and flow) reduce spawning habitat in a non-random, spatially-explicit manner and spatial extent of winter-run Chinook salmon is already severely constrained), and life history diversity.

The SacEFT model projects large decline in the number of years with desirable spawning conditions for winter-run Chinook salmon. DEIS/DEIR at 1319 (Table 11-4-18). The DEIS/DEIR's lack of concern with the very large reduction in years considered to have "good" conditions for spawning or for juvenile migration demonstrates a poor understanding of both the behavioral ecology and conservation biology of Chinook salmon as well as for the requirement to protect critical habitat for this species. It is not true, as the DEIS/DEIR contends, that these negative impacts to winter-run productivity are only of concern "if the number of spawners is limited by spawning habitat quantity." DEIS/DEIR at 11-1319. Adverse impacts to spawning habitat may violate ESA protections for winter-run Chinook salmon critical habitat, regardless of the number of Chinook salmon spawners.

Negative impacts to migrating juvenile winter-run Chinook salmon are also expected to arise from flow reductions anticipated under the DEIS/DEIR alternatives. Migration flows in the Sacramento River are a known stressor on winter-run Chinook salmon populations. NMFS 2009 Biological Opinion; NMFS 2014 Final Recovery Plan; Williams 2010. The Draft Plan acknowledges this at some points. Draft Plan at 3.3-139. Migration flow rates are also a key input into the modeling tools the Draft Plan relies on to calculate winter-run Chinook salmon juvenile migration success (IOS and OBAN). Draft Plan Appendix 5G. Under analogous climate conditions, migration flows under Evaluated Starting Operations (Alternative 4, H3) would be lower than projected under current operations by 5-18% during November. DEIS/DEIR at 11-1329. The DEIS/DEIR states that migration flows for winter-run Chinook under Alternative 4 will be greater than or equal to flows under the NAA alternative, but again, this is contradicted by the modeling reported in the DEIS/DEIR flows appendix (Appendix 11C). Flows reported for

Wilkins Slough in the "High Outflow Scenario" (H4) of Alternative 4 result in lower flows than the NAA in July (Dry years: flows up to 10.5% lower under Alternative 4 H4), August (Dry years: flows 5.4% lower) October (Below Normal years: flows 11.7% lower), and November (all year types: flows 8.5-15.6% lower). DEIS/DEIR Appendix 11C at 11C-230 to -232 (Table 6). Similar outcomes are projected at Verona, which is closer to the Delta. DEIS/DEIR Appendix 11C at 11C-233 to 11C-237 (Tables 7 and 8). Thus, flow reductions of the magnitude expected under Alternative 3 and 4 represent a significant impact Chinook salmon productivity (survival rates as specified by the Draft Plan in Objective WRCS1.1), and the asymmetrical timing of the flow reductions (unevenly distributed throughout the migration period) is a negative impact to life history diversity in this species arising from operations, contrary to the Draft Plan's objectives for winter-run (WRCS3.2).

<u>Impacts to juvenile winter-run Chinook salmon through-delta migration</u>
The DEIR/DEIS acknowledges that in-Delta flows that affect winter-run Chinook salmon migration success are expected to be reduced by 11-23%, on average, under the BDCP after the new North Delta Diversions come on-line. DEIS/DEIR at 11-1330. However, this fails to accurately assess the problem. A review of the relevant analysis in the DEIS/DEIR flow appendix reveals that:

- With very few exceptions, flows are projected to be reduced in every month from November-April in every year type, under every operational variant (H1-H4) of Alternative 4.
- The average flow reduction for any given month is exceeded (in about half of years) and the true impact on winter-run Chinook salmon populations is likely to be reflected by the maximum flow reductions more than it is by the "average" flow reduction; the maximum flow reduction is 28% in April for Above Normal water year types (and this is still only an average of like years; impacts in individual years of this type will exceed this average).
- The average flows in the "High Outflow Scenario" (H4) are between 10-24% less than projected under the No Action Alternative and, in certain year types, the outflow reductions are greater (e.g. >26% in November of Above Normal and Below Normal years).

See DEIS/DEIR Appendix 11C at 11C-284 to 285 (Table 28). Given the importance of freshwater flows in the Delta to Chinook salmon survival in the Delta, it is unimaginable that such large-scale, pervasive reductions in Sacramento River flow could be anything but a moderate to major negative impact to winter-run Chinook salmon survival and to the species' continued existence. The scientific consensus is that river flow rates have a major impact on salmon survival rates through the Delta. *See, e.g.,* Kjelson and Brandes 1989; Brandes and MacLain 2001; SWRCB 2010; Williams 2010; NMFS, Final Salmon Recovery Plan 2014 at 63, 127; NMFS 2013 Evaluation of Flow Effects. For example, Williams 2010 ranked the

"Hydrograph Modification" in the Delta as among the highest stressors in the Delta for Chinook salmon generally. The NMFS 2014 Final Recovery Plan Stressor matrix for winter-run Chinook salmon rates "changes in delta hydrology" as a "very high" stressor. NMFS 2014 Final Recovery Plan, Appendix B Attachment A. And the Recovery Plan recommends as a high priority action "Develop, implement, and enforce new Delta flow objectives that mimic historic natural flow characteristics, including increased freshwater flows (from both the Sacramento and San Joaquin rivers) into and through the Delta and more natural seasonal and interannual variability." NMFS 2014 Final Recovery Plan at 127; *see also* NMFS 2009 Biological Opinion. The DEIS/DEIR itself states: "Plan Area flows have considerable importance for downstream migrating juvenile salmonids and would be affected by the north Delta diversions, as discussed above for winter-run Chinook." DEIS/DEIR at 11-1330. And the Draft Plan states:

> For this effects analysis, it was assumed with high certainty that Plan Area flows have critical importance for migrating juvenile winter-run Chinook salmon. Agency biologist opinion during the August 2013 workshops generally thought high importance to be warranted.

Draft Plan at 5.5.3-24. NMFS' 2013 evaluation of flow effects on survival indicates that survival under the HOS and LOS are likely to substantially reduce survival (by 10% or more in some years) of migrating winter-run Chinook salmon. NMFS 2013 Evaluation of Flow Effects. So it is not scientifically credible that the substantial reductions in freshwater flow projected by the DEIS/DEIR are likely to result in only a 1% decline (a 3% relative decrease) in juvenile winter-run survival under H3 compared to the NAA. DEIS/DEIR at 1331 (referencing Table 11-4-23). The claim in the text misstates the impact revealed in the accompanying table, which indicates a decline in survival of 4-5% in "drier" years. Such a disproportionately low decline in survival resulting from such large changes in freshwater flow rates argues that the DEIS/DEIR modeling approach understates the effect. Indeed, the Draft Plan's Effects Analysis indicates that agency biologists who participated in August 2013 workshop on Draft Plan effects were of the opinion that reduced Delta flows anticipated under the Draft Plan were more likely to be a "moderate negative change," contrary to the Draft Plan's conclusions that this is impact is a "low" magnitude negative effect. Draft Plan at 5.5.3-26

The DEIS/DEIR analysis of through-Delta survival rates under the different alternatives is yet another example of its biased presentation and interpretation of results that overstates potential benefits and understates potential environmental impacts. Even if we accept that the absolute increase in loss of winter-run Chinook salmon juvenile migrants is as small as 1.4% (the value reported for dry years in Table 11-4-23), despite much larger decreases in freshwater flow rates, further declines in the survival rate of a species that has already declined to the point of being listed as endangered and which continues to decline today is a significant impact and declining winter-run Chinook survival is at odds with the Draft Plan's stated objective (WRCS1.1) of

substantially increasing Chinook salmon survival in the short and long-term. To put in context the DEIS/DEIR's interpretation of the increased losses to juvenile salmon migrating through the Delta, we look to the same document's interpretation of reductions in entrainment of winter-run Chinook salmon at the existing south Delta export facilities and reductions in survival during the incubation phase upstream.[68] The DEIS/DEIR estimate that entrainment of winter-run Chinook salmon at the existing south Delta export facilities under Alternative 4 (H3) will decline from 1.4% of the total population to 0.6%, an "improvement" amounting to less than 1% of the population, and less than the projected increase in overall through-Delta mortality described in Table 11-4-23. DEIS/DEIR at 11-1313. The DEIS/DEIR does not conclude that winter-run entrainment reductions will be "small" or "only 0.8% of the total population," but instead it avoids the apparently small absolute effect of Alternative 4 operations (which result from its significant underestimate of current entrainment rates as a proportion of the population) and presents its results in terms of the proportional reduction in entrainment between Alternative 4 and the NAA. Table 11-4-10 purports to show that entrainment under Alternative 4 will decline between 18-70% as compared to the NAA; the maximum reduction (for wet years) is less than the maximum estimated increase in winter-run Chinook salmon egg mortality (76%, Table 11-4-17), but the DEIS/DEIR dismisses the latter effect as unimportant (*see* above).

Turbidity Impacts on through-Delta survival

The Draft Plan and DEIS/DEIR fail to adequately acknowledge and assess the impact of reduced turbidity as a result of CM1 on Chinook salmon survival through the Delta. Predation on Chinook salmon is known to increase under low turbidity conditions. Gregory 1993; Gregory and Levings 1998. Operation of CM1 and evolution of tidal marsh sites targeted by the Draft Plan (CM4) are both expected to reduce turbidity levels throughout the Delta, particularly downstream of the north Delta diversion. As described in our assessment of impacts to Delta smelt, the Draft Plan and DEIS/DEIR both:

- underestimate the reduction of turbidity anticipated under the BDCP (particularly at the high end of the variation in this effect;
- improperly credit actions that are expected to partially ameliorate this effect to the BDCP, even though these actions are properly part of the environmental baseline, and
- incorrectly minimize the negative impact of turbidity reductions that they do report.

BDCP did not adequately model the effects of reduced turbidity on salmon survival, despite BDCP's estimate of significant reductions in downstream sediment as a result of CM1 operations. Draft Plan Appendix 5C at 5C.4-64; DSP Independent Science Review Panel Report

[68] We do not agree that the DEIS/DEIR's calculation or interpretation of winter-run entrainment rates or the proportional impact of entrainment are valid; our presentation of those claims here is solely to illustrate the inconsistent standard the DEIS/DEIR applies to weighting negative impacts as compared to impacts that are perceived as benefits of the BDCP.

2014 at 58; *see also* DSC BDCP Comments June 2014 at 10. As a result, the DEIS/DEIR and Draft Plan likely overestimate salmon survival through the Delta and underestimate the adverse impacts of BDCP on winter-run chinook salmon survival.

Impacts on Upstream Adult Migration

The Draft Plan and DEIS/DEIR fail to accurately assess impacts to upstream adult migration of winter-run Chinook salmon resulting from reduced flows below the new intakes. The DEIS/DEIR shows greater than 10% flow reductions (the DEIS/DEIR standard for impact to this variable) during March-May, during the peak months of winter-run migration. *See* DEIS/DEIR at 11-1332 (Table 11-4-24). This is a significant impact that is not accurately reported in the DEIS/DEIR. The impact would likely be reduced under the HOS of Alternative 4. *See* DEIS/DEIR Appendix 11C at 11C-288 (Table 30). In addition, by reporting the "average" reduction in the percentage of Sac River flow, the DEIS/DEIR understates the problems that will likely occur for Chinook migrants in certain months and year types. See id. (Showing that the maximum flow reductions at Rio Vista under H3 are in Below Normal years in March, and Above Normal and Wet years in April

D. Spring-Run Chinook Salmon

1. The Draft Plan and DEIS/DEIR Fail to Adequately Analyze Likely Impacts to Spring-Run Chinook Salmon, the Analysis that is Available Predicts Severe Impairment of Spring-Run Chinook Salmon Population Viability, and the Documents Understate or Ignore Significant Environmental Impacts

The Draft Plan and DEIS/DEIR fail to adequately analyze potential environmental impacts to spring-run Chinook salmon. In the absence of results from a life cycle model, [69] the documents fail to summarize/synthesize the impacts to various life stages of spring-run Chinook salmon into a single assessment of project effects to this species for each of the attributes of species' viability: abundance, spatial distribution, life history diversity, and productivity. *See* McElhany et al. 2000. Piecemeal analysis and conclusions regarding separate life stages, without a qualitative (or quantitative) framework for synthesizing the effects to attributes of viability across life stages leads to results that are unnecessarily fragmented and without proper context – simply, they fail to address the important questions: "What will happen to this population of

[69] Although the Draft Plan indicates that at least one existing life cycle model (OBAN) has been developed for spring-run, *see* Draft Plan at 5.G-10, the DEIS/DEIR and Draft Plan fail to use the OBAN model to analyze impacts. The reasons for doing so are unclear. We and other reviewers have identified significant limitations and concerns with some of the existing modeling tools. *See, e.g.*, Memorandum to J. Meral from J. Rosenfield, re: "Review of BDCP Effects Analysis Appendix G: December 22, 2011; Delta Science Program Salmonid Model Workshop 2011 at 18.

Chinook salmon under the Plan?" and "How do expected outcomes of the Plan compare with modeled baseline conditions, with and without consideration of cumulative effects such as climate change?" The DEIS/DEIR and Draft Plan should have relied on the DRERIP review process to assess impacts qualitatively (based on well-supported, peer-reviewed conceptual models) and to synthesize results, especially where quantitative models were unavailable or deemed inappropriate. *See, e.g.*, Essex Partnership 2009; TBI letter to BDCP Steering Committee August 2009. Instead, the document largely ignores these reviews and instead reaches conclusions that are not supported by the available scientific information.

i. The Draft Plan and DEIS/DEIR Fail to Report Potentially Significant Negative Impacts to Spring-Run Chinook Salmon Arising from the Project by Improperly Attributing Negative Impacts and by Ignoring its own Analysis

Both the Draft Plan Effects Analysis and DEIS/DEIR downplay or ignore significant impacts to spring-run Chinook salmon identified in their own modeling and overstate the potential benefit of BDCP Alternatives to this state and federally ESA-listed species.

<u>Impacts to Spring-Run Chinook Salmon Upstream -- Egg Mortality and Spawning Conditions</u>
As it does for winter-run Chinook salmon, the DEIS/DEIR projects increased egg mortality for spring-run Chinook salmon as a result of Alternative 4 operations. Both the SacEFT model and Bureau of Reclamation Egg Mortality model suggest very large declines in the frequency of good conditions for spring-run Chinook salmon egg incubation on the Upper Sacramento River. SacEFT projects a 35% decrease in years with "good incubation conditions" for spring-run Chinook under Alternative 4/H3 operations. The DEIS/DEIR describes increased egg mortality projected by the Bureau of Reclamation egg mortality model under BDCP Alternative 4/H3 this way:

> The Reclamation egg mortality model predicts that spring-run Chinook salmon egg mortality in the Sacramento River under H3 would be similar to mortality under NAA in dry and critical years, less in dry years, but greater in wet, above normal, and below normal (11% to 29% greater) water years (Table 11-4-30). Relative increases of 11% mortality of the spring-run population under wet and above normal water years would be negligible to the overall population, particularly because this represents a 3% to 4% increase on an absolute scale. However, the 29% relative increase in mortality in below normal years would have an effect on the spring-run population. Combining all water years, there would be no effect of H3 on egg mortality (3% absolute change).

DEIS/DEIR at 1345. As with analogous impacts to winter-run incubation success, the DEIS/DEIR again seeks to minimize the importance of this negative impact. By referring to what

it erroneously believes is a small absolute rather than obviously large relative increase in impact between operational alternatives, the DEIS/DEIR obscures the results to argue that this does not constitute a significant impact. Temperature impacts to egg viability are currently considered a significant problem for spring-run Chinook salmon. *See*, e.g., NMFS 2009 Biological Opinion at 259-260 and Figure 6-16; NMFS 2014 Final Recovery Plan, Appendix B Attachment B at B-36. Increasing that problem by 11-29% in 64% of years (the sum of wet, above normal, and below normal year-type frequencies, *see* Draft Plan at 5.2-16) exacerbates this existing problem and constitutes a significant impact.

Furthermore, the DEIS/DEIR misrepresents its own findings regarding temperature increases in the mainstem Sacramento under Alternative 4/H4 during the holding and spawning periods for spring-run Chinook salmon. The document declares that, "[a]t Bend Bridge, total degree-days under H4 would be up to 5% lower than under NAA during August and similar during other months (Table 11-4-21)." DEIS/DEIR at 11-1355. However, that same table displays increases in degree-days of greater than 5% in the Sacramento River during most years in June and July and during below normal years in September. The text is not supported by the results in this table, and the table shows significant increases in temperature impacts.

Similarly, the DEIS/DEIR summary of Table 11-4-35 focuses exclusively on perceived temperature "benefits" that it (erroneously) expects to occur under Alternative 4/H1, but it ignores that temperatures in the Feather River would be higher in most years during September under Alternative 4/H3, *see* DEIS/DEIR at Table 11-4-35.

Projected temperature increases, relative to NAA, would negatively impact spring-run Chinook salmon egg survival rates (a productivity impact) and disproportionately affect early-spawning salmon that would be exposed to the higher temperatures (a life history impact) – such losses also strongly suggest a reduction in carrying capacity of the Feather River for spring-run Chinook salmon (an impact to abundance). *See* DEIS/DEIR at Table 11-4-41.

The comparison of project alternatives to the NAA removes the effect of climate change from the estimate of temperature impacts caused by operation of the state and federal projects; for example, temperatures in the Feather River under project alternatives are much, much higher than those that are expected under current climate conditions with current operations (Existing Conditions vs. either H1 or H4; Table 11-4-40). These dramatic increases in *actual temperature* conditions experienced by spring-run Chinook salmon spawning and incubating in the Feather River are likely to: (a) extirpate this population if they were not ameliorated or mitigated, for instance by re-operating the reservoir and/or providing passage beyond current dams to cooler habitats at higher elevations, and (b) result in significant changes to reservoir operations analyzed in the DEIS/DEIR and Draft Plan, which do not make any provision to adapt to climate change.

Despite these rather large predicted increases in temperatures experienced by holding, spawning, and incubating spring-run Chinook salmon in the Sacramento River and the resulting decrease in frequency of years with suitable holding or incubation conditions, the DEIS/DEIR finds that its own analytical tools present conflicting results on temperature and egg mortality in the Sacramento River. The DEIS fails to reach a NEPA finding on this effect and instead promise that model results will be submitted to independent scientific review. By contrast, the DEIR concludes that there will be no significant impact to egg incubation success of spring-run Chinook salmon on the Feather River, but it acknowledges that operations under H4 "could affect the cold water pool and fall temperatures" in spring-run spawning habitat and so it promises to submit these modeling results to independent scientific peer review as well. Both of these conclusions are improper; existing information shows that operations in combination with climate change will cause significant adverse impacts under both CEQA and NEPA. Reservoir reoperation will be required to adapt to climate change, yet the Draft Plan and DEIS/DEIR fail to examine changes to upstream reservoir operations to avoid or mitigate these impacts.

The DEIS/DEIR concludes that, under NEPA, there will be no significant effects to spring-run Chinook salmon upstream as a result of the Draft Plan and Alternative 4 operations. This finding is contradicted by the comparisons referenced above and others. The CEQA analysis of Alternative 4 impacts to spring-run Chinook salmon upstream is starkly different from the result of the NEPA analysis:

> Collectively, the results of the Impact AQUA-59 CEQA analysis indicate that the difference between the CEQA baseline and Alternative 4 could be significant because, under the CEQA baseline, the alternative could substantially reduce the amount of suitable habitat, contrary to the NEPA conclusion set forth above. There would be small to moderate flow-related effects of Alternative 4 on spring-run Chinook salmon in the Sacramento and Feather rivers and temperature-related effects in the Feather River. Both SacEFT and SALMOD predict reduced habitat conditions for spring-run Chinook salmon in the Sacramento River. Exceedances above NMFS temperature thresholds would be higher under Alternative 4 relative to Existing Conditions. Results would be similar among model scenarios.

DEIS/DEIR at 11-1374. At a minimum, the CEQA analysis reveals that the Draft Plan cannot achieve its stated objectives of not modifying critical habitat for spring-run Chinook salmon. SRCS3.1; Draft Plan at 3.3-153 ("Implement covered activities so as to not result in a reduction in the primary constituent elements of designated critical habitat for spring-run Chinook salmon upstream of the Plan Area"). Clearly, the DEIS/DEIR analysis that the Draft Plan will fail utterly to achieve that objective or even alleviate the degrading effect of modeled changes to the regional climate.

Impacts on Spring-Run Holding, Rearing, and Juvenile Migration: Upstream

Temperature impacts to spring-run Chinook salmon juveniles rearing in the Feather River and those preparing to spawn (holding) and may be severe. Under Alternative 4/H3 operations, the DEIS/DEIR reports substantial increases in the number of years when August temperatures will be 4°F (8% increase) and 5°F (19% increase) above the relevant temperature threshold (63°F) for rearing juveniles. DEIS/DEIR at Table 11-4-43. Marine and Cech (2004) documented increased sub-lethal negative effects of on Central Valley Chinook salmon juveniles reared in temperatures above 17°C, and Richter and Kolmes (2005) reference numerous studies that found that optimal temperatures for Chinook salmon juveniles are ≤17°C. Furthermore, although the impact of water temperatures on developing embryos is not well-understood, it is believed that developing reproductive tissues exposed to high temperatures may be less viable than those that are formed under cooler temperatures. Berman 1990 (a Master's thesis cited in US EPA 1999) found that offspring of adult Chinook salmon that had been held for two weeks at temperatures between 17.5-19°C had higher pre-hatch mortality and developmental abnormality rates and lower weight than a control group held at lower temperatures. NMFS Final Recovery Plan lists high water temperatures as a stressor of "high" importance for adult spring-run Chinook salmon holding on the Feather River. NMFS 2014 Final Recovery Plan, Appendix B Attachment 2 at B-10. Thus, the anticipated increase in the number of years in which August temperatures will exceed 17°C could have large impacts on spawning success of Feather River spring-run Chinook salmon.

Migration and rearing flows would be reduced during critical months of some years under Alternative 4/H3 Operations. For example, the DEIS/DEIR projects reduced flows in the Feather River during December of Above Normal years and during January and March of Below Normal years. DEIS/DEIR at 11-1376 (Table 11-4-48). Reductions of flow in these months, with the frequency projected by the DEIS/DEIR suggests a significant impact to migration flows for spring-run Chinook salmon. The projected increase in Feather River flows during April and May under H4, *see* DEIS/DEIR at 11-1379, may benefit spring-run migration during those months, in some years; however, the improvement during two months combined with degraded conditions in earlier months of the spring-run migration period represents a large asymmetry in effects to different part of the life history spectrum represented by different migration timing; this is in stark contrast to the Draft Plan's stated objective (SRCS3.2) to, "Operate water facilities to support a wide range of life-history strategies for spring-run Chinook salmon without favoring any one life-history strategy or trait over another." Draft Plan at 3.3-153.

Rearing flows would be reduced in the high flow channel of the Feather River during June by up to 39% (DEIS/DEIR at 1369) under Alternative 4/H3. According to the DEIS/DEIR, June is the end of the spring-run rearing period and, as a result, the DEIS/DEIR does not consider this very large reduction in river flows to be biologically significant. This conclusion is erroneous as spring-run juveniles that follow a yearling life history strategy rear in the river through the

summer months; dramatic reductions in flow represent a potentially serious loss of rearing habitat for these fish. The Delta Science Program Independent Review Panel expressed similar concerns regarding the Draft Plan's unsubstantiated assertion that this change in flows would not affect rearing Feather River spring-run or steelhead. DSP Independent Review Panel Report 2014 at 50. In addition, adult spring-run Chinook salmon hold in the river throughout the summer before spawning in the fall – the loss of almost 40% of river flows expected from Alternative 4/H3 operations likely represents a serious impairment to this run-defining behavior. The DEIS/DEIR fails to acknowledge this very important impact to life history diversity of spring-run Chinook salmon; this contradicts the Draft Plan's stated objective of operating to avoid differential impacts to components of the spring-run life history distribution, *see* Draft Plan at 3.3-153 (Objective SRCS3.2), and the Draft Plan's aim to reduce stressors such as "predation, spatial structure, lack of rearing habitat, … and altered migration flows." Draft Plan at 3.3-151.

<u>Entrainment and Predation Impacts on Spring-Run Juvenile Migration: Downstream</u>
The DEIS/DEIR finds that reduced entrainment of spring-run Chinook salmon in the Delta will be a CEQA net benefit to this unique population under Alternative 4/H3 operations (Table 11-4-SUM1). This finding is not likely to be correct and lacks scientific support. As with all runs of migratory fishes, the DEIS/DEIR and Draft Plan net findings emphasize the benefits of potential reduced entrainment in the south Delta and they assume that there will be little or no entrainment or predation-related mortality at the North Delta facilities. *See, e.g.*, DEIS/DEIR at 11-1341. Regarding entrainment, the Draft Plan and DEIS/DEIR simply assume the efficacy of these screens will be perfect or nearly so under all conditions throughout the life of the north Delta diversion. There is no certainty that entrainment related mortality at the North Delta Facilities will start or remain low. In fact, the Draft Plan's Appendix 5B found that it was not possible to be certain about the level of impact these screens will have on either Chinook salmon or steelhead. Draft Plan, Appendix 5B at 5B-304. This contradicts the Draft Plan's effects analysis, which asserts that there is a moderate level of certainty that the effect will be low. Draft Plan at 5.5.4-23. The DEIS/DEIR should have considered what would happen if this assumption was incorrect, even periodically (i.e. what if damage to, imperfect maintenance, or malfunction of the screens occurs with "x" frequency and results in "y" entrainment rate for a duration of "z" weeks).

With regard to predation at the north Delta diversion, the DEIR/DEIS ignores analyses that show negative impacts, In addition to a bioenergetics model, on which it bases its findings, the Draft Plan (Appendix 5F) also applies a fixed predation model, based on observed entrainment rates at the Glenn-Colusa Irrigation District screens which are somewhat similar to those proposed for BDCP. These two models provide strikingly different predictions of predation on Chinook salmon; the bioenergetics model indicates predation rates at the NDD will be <1% for all Chinook populations, whereas the fixed predation model estimates ~12-13% loss of juvenile migrants at the NDD for each population of Chinook salmon. Both models cannot be correct and

the Draft Plan and DEIS largely ignore the result showing significant predation at the north Delta diversion. *See, e.g.,* Draft Plan, Appendix 5F at 5.F-77. In reporting only the results that are more favorable to the BDCP, the Draft Plan and DEIS/DEIR miss the opportunity to learn from the different outputs of the two models. As the Delta Independent Science Review Panel noted, the high mortality of Chinook salmon at the GCID screening facility indicates that predators may aggregate at high densities near that structure; this suggests the same risk exists for the NDD. DSP Independent Science Review Panel Report 2014 at 52. Thus, the difference in projected predation rates between the two modeling approaches applied by the Draft Plan could reveal that its inputs to the bioenergetics model, including the range of predator densities at the GCID facility or their metabolism, were unrealistically low. The bioenergetics model methodology used to calculate potential predation rates arising from the presence of the North Delta diversion would not, apparently, predict existing mortality rates at the GCID screening facility; thus, a larger range of predator densities should have been modeled. Instead, the DEIS/DEIR and Draft Plan simply assume that one model (the fixed predation model) was completely wrong (despite the fact that it's based on a relevant, recent, local observation) and the other model is completely correct. This choice was not scientifically justified.

With regard to changes in South Delta entrainment, the methodology applied is not as precise as the outputs in the DEIS/DEIR suggest accuracy to the nearest single fish, as is implied in Table 11-4-25. *See* Draft Plan, Appendix 5B (modeling appendix showing the 95% Cis, which are not displayed in the DEIS/DEIR). The Delta Science Program Independent Review Panel commented that the normalization procedure used by the Draft Plant to estimate South Delta entrainment effects across years tends to mask some of the variation and uncertainty related to different operational alternatives and the Panel found that the "variance calculations for salvage abundance and entrainment index are being calculated incorrectly." DSP Independent Science Review Panel Report at 54. We concur with these critiques and with the recommended method of calculating variance and the appropriate use of the normalized values (i.e., for qualitative purposes but not for modeling). The Delta Independent Science Board also recommended estimation of entrainment/predation impacts under different assumptions about diversion rates between north and south Delta diversion facilities that would reflect the difficulties and inherent inaccuracies associated with using monthly CalSIM outputs to reflect daily export management decisions. Delta ISB 2014 at B-40.

This brings us to the DEIS/DEIR estimate of the actual effect of reduced entrainment on spring-run Chinook salmon. With respect to the finding that effect of entrainment reduction resulting from CM1 operation under Alternative 4 will be a net benefit to spring-run Chinook salmon, the DEIS/DEIR again applies an opaque and inconsistent standard to evaluating impacts. The DEIS/DEIR states that entrainment of spring-run Chinook salmon will be reduced under Alternative 4/H3 from 5.3% on average across all years (as elsewhere, we find the "average across all years" metric to be misleading and without value) to 3.2% on average – an absolute

difference of 2.1% of the population. The NEPA conclusion states that this will be a "small" benefit, because it claims current predation losses are low; but for CEQA, it claims the entrainment reduction would be "substantial." DEIS/DEIR at 1341. By contrast, when the DEIS/DEIR found increased temperature-related mortality to spring-run incubating in the Sacramento River it concluded: "Relative increases of 11% mortality of the spring-run population under wet and above normal water years would be negligible to the overall population, particularly because this represents a 3% to 4% increase on an absolute scale." DEIS/DEIR at 1345 (emphasis added). So, when negative impacts occur, the DEIS/DEIR insists that absolute losses to the spring-run Chinook salmon of less than 5% are "negligible" or at least "not adverse" (*see also* DEIS/DEIR at 11-1341 (predation rates at the North Delta diversion), but when a perceived positive effect occurs (such as reduced south Delta entrainment) it is termed "substantial" even if it's absolute effect is 2.1%. This fluctuating, dual standard for evaluating the impact of positive versus negative effects is uninformative, misleading, and unacceptable.

Through-Delta Survival Summation

The Draft Plan applies a modification of Newman's (2003) methodology to estimate spring-run smolt survival through-Delta under different Alt 4 scenarios. EBC2_LLT outperforms both ESO and HOS in the early and late long term in this modeling (Table 5C.5.3-111, 5C.5.3-112, Table 5C.5.3-113, 5C.5.3-114 respectively), though it is not clear that any of these results is statistically significant. The Draft Plan should analyze these results using statistical techniques appropriate for paired-observations. If the results are significant, then it should conclude that EBC2 is superior to Alternative 4 variants with respect to spring-run smolt survival; if the results are not significant, then it should conclude that there is no detectable difference (using this modeling approach) between spring-run smolt through Delta survivals among alternative operations compared. In either case, the results indicate that spring-run survival through the Delta will not increase under BDCP operations, in contrast to the Draft Plan's objectives for spring-run (objective SRCS1.1), which include much higher survival rates than are currently observed. Application of the Delta Passage Model confirms that through-Delta survival of spring-run Chinook salmon juveniles is expected to decline as compared to current conditions under the LOS Alternative 4/H3. Draft Plan at 5.5.4-17 to -18. The Draft Plan estimates that survival through the Plan Area will be similar to or slightly higher than the environmental baseline under the HOS using the same methods. *Id.* The DEIS/DEIR attributes slight (but not likely meaningful) improvements in survival under H4, especially in wet years, to high river flows.

The NEPA conclusion for spring-run Chinook salmon relies on outcomes of the Delta Passage Model, and finds that:

> … through-Delta survival under Scenario H3 by juvenile spring-run Chinook salmon Alternative 4 averaged 29% across all years, ranging from about 24% in

> drier years to 38% in wetter years (Table 11-4-51). Scenario H3 survival was similar to NAA in both drier years (0.5% less survival, or 2% less in relative difference) and wetter years (2.5% reduced survival, or 6% less in relative difference) (Table 11-4-51). … Average survival under Scenario H4 (high outflow) was 30.7%, compared to … 30.3% for NAA.

DEIS/DEIR at 11-1382.[70] These results do not appear consistent with the conclusions previously drawn by NMFS, which indicate substantially lower survival of spring- run Chinook salmon under ESO LLT than under either EBC2 LLT or HOS LLT, with survival generally reduced under the HOS LLT as compared to EBC2 LLT as well. NMFS 2013, Evaluation of Flow Effects on Survival in Vicinity of Proposed North Delta Diversions. Furthermore, we note that foraging spring-run Chinook salmon should be expected to experience higher through-Delta mortality than migrant strategy fish because (a) they are smaller, (b) they spend a longer time in the Delta, (c) foraging exposes fish to additional risk of predation compared with migratory behavior. Thus, the DEIS/DEIR's reliance on DPM outputs to draw NEPA conclusions regarding spring-run Chinook salmon survival through the Delta is not supported scientifically and it probably understates mortality impacts to spring-run Chinook salmon from implementation of the BDCP. Finally, neither the DPM nor Newman (2003) methodologies would account for the substantial decline in turbidity throughout the Delta that is expected to arise from operation of the north Delta diversion and/or restoration of tidal marshes (CM4) or the decline in river stage (corresponding to reduced flow volumes) that should be expected immediately downstream of the new diversion. Both reduced turbidity and reduced river stage will translate to greater light penetration and exposure of migrating Chinook salmon to predation pressures. Existing models of Chinook salmon survival through the Delta do not account for the increased susceptibility to predation that will arise from diversion of water and sediment at the new diversion facility; therefore, existing survival models are likely to overestimate survival under BDCP conditions relative to a NAA – this would tend to make comparisons of through-Delta survival less favorable to BDCP operational alternatives.

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[70] We and other reviewers have previously emphasized that the Delta Passage Model is not an appropriate tool for evaluating cumulative changes in survival for wild, spring-run Chinook salmon because a substantial fraction of this population migrate to the Delta as fry or parr-sized fish. Williams 2006; Williams 2010. DPM is based on the relative success of migrant-strategy, hatchery-produced salmonids (such as late-fall run Chinook salmon) and thus cannot be used to understand fry and parr mortality in the Delta. *See* Draft Plan at 5.C.5.3-65. Even applying DPM to large spring-run (or fall-run) smolt is inappropriate as these fish migrate through the Delta in a different season than do late-fall run or steelhead smolt; there is no reason to expect that survival rates (and even relative survival rates) in Delta channels remain unchanged across seasons as numerous influences on predator efficiency (temperature, light penetration, SAV coverage, etc.) may all change seasonally. Memorandum to J. Meral from J. Rosenfield December 21, 2011; NMFS 2013 Progress Assessment at 8; DSP Independent Science Review Panel Report 2014 at 30.

Several things are apparent from the DEIS/DEIR summary of through-delta survival net effects. First, the DEIS/DEIR project lower survival under Alternative 4/H3 operations compared to the NAA; this contradicts the documents finding that the proposed project will have no significant effect, especially if one factors in other negative effects upstream (*see above*) that the impacts assessment inappropriately ignores. Second, restoration of floodplain habitat in the Yolo Bypass that may benefit downstream rearing and migration success is inappropriately excluded from the baseline in the Draft Plan and the DEIS/DEIR, as described above. Third, none of the survival models indicate a likelihood that survival rates will significantly increase as compared to the status quo, which would be necessary to achieve the Draft Plan's through-Delta survival objective. Thus, the document fails to provide substantial evidence that the Draft Plan is likely to achieve its objectives for spring-run Chinook salmon survival.

Impacts to spring-run Chinook salmon juveniles – roll-up:
The DEIS/DEIR largely estimate decreases in through Delta survival. Because the DEIS/DEIR finds that Alternative 4 operations produce only one result that is not "less than significant" for through-Delta survival (reduced entrainment), and that effect is a "benefit" to the species, one would expect to find a meaningful increase in predicted spring-run Chinook salmon through-Delta survival under Alternative 4 – but that is not the case.

Indeed, it is unlikely that spring-run Chinook salmon will benefit from operations described under Alternative 4/H3, even when combined with habitat restoration actions that were not modeled. The Delta Science Program Independent Review Panel (2014) found:

> The negative impact of reduced plan area flows should have been greater on Sacramento River species such as spring Chinook and steelhead that are dominated by migrant life histories.
>
> Migrant life histories are less likely to benefit from habitat restoration activities, which are a key focus of the BDCP conservation measures. This implies that spring Chinook and steelhead may experience less benefit from BDCP actions than other salmonid species, or they may even experience a negative net effect in response to reduced spring flows. The key question, which deserves more attention in the BDCP, is whether the migrant life history will sufficiently benefit from conservation measures to offset moderate negative impacts related to reduced spring flows. This question is key for spring Chinook and steelhead that are composed mostly of migrant life histories.

DSP Independent Science Review Panel Report 2014 at 30.

The Draft Plan also identifies an objective of improving survival of spring-run Chinook salmon juveniles emigrating from the San Joaquin basin (objective SRCS1.1). The Draft Plan suggests that several of its conservation measures will affect better survival for Chinook salmon emigrating from the San Joaquin River basin (including, CM1 operations, efforts to reduce illegal harvest, improvement of water quality conditions in the Stockton Deep Water Ship Channel, floodplain creation in the lower San Joaquin River, etc.). Yet the Draft Plan and the DEIS/DEIR wholly fail to evaluate potential effects of the BDCP on the migration success of juvenile spring-run Chinook salmon entering the Delta from the San Joaquin River. Thus, both the Draft Plan and DEIS/DEIR fail to analyze whether the BDCP will attain its stated objectives. This is a major omission and failure to provide information readers will need to evaluate BDCP benefits to spring-run Chinook salmon abundance, productivity and spatial distribution.

Impacts to upstream migration of adult spring-run

Adult spring-run Chinook salmon may begin their upstream migrations as early as late-March and as late as September, with peak migrations occurring in May and June. Yoshiyama et al. 1998; Moyle 2002. Adult salmon use olfactory cues to home to their natal rivers and streams. Healy 1991; Moyle 2002; Quinn 2005; Williams 2006. Thus, reduction of flows into and through the Delta from spawning tributaries, and the diversion of those flows, can result in confusion, delayed migration, straying, and failure to spawn. For instance, current operations of the CVP/SWP and reduced inflows from the San Joaquin River cause significant impacts on adult migration of fall-run Chinook salmon of the San Joaquin River. Marston et al. 2012. The Draft Plan describes the potential for reduced Sacramento River flows below the new North Delta Diversion to cause orientation problems for spring-run Chinook salmon adults as follows:

> … the difference in Sacramento River flow at Rio Vista in April–May was more than 20% less in wet and above-normal years and similar in other water-year types under the ESO; as described for winter- run Chinook salmon, flows in March–May were similar or greater under HOS_LLT compared to EBC2_LLT (Table 5.C.5.3-235, Mean Monthly Flows (cfs) in Sacramento River at Rio Vista for EBC2, HOS, and LOS Scenarios, and Table 5.C.5.3-236, Differences between EBC2 Scenarios and HOS and LOS Scenarios in Mean Monthly Flows (cfs) in Sacramento River at Rio Vista, in Appendix 5.C). The importance of these changes to the homing ability of spring-run Chinook is unknown. In considering the results of the DSM2 fingerprinting results and the CALSIM flow analyses, it is concluded with low certainty that there will be a low negative change to adult migration Plan Area flows under the BDCP for upstream migrating adult spring-run Chinook salmon. The low certainty in these conclusions would be informed by monitoring and targeted research under the BDCP (e.g., examining migration success of tagged adult Chinook salmon under different flow regimes), with any adverse effects being addressed by adaptive management.

Draft Plan at 5.5.4-19

However, the impacts to spring-run adult migrations from flow reductions in the lower Sacramento River will be higher than estimated in the Draft Plan, as this summary avoids impacts to flows in the peak migration month of June and misstates the predicted flow modifications it does present. According to the referenced table (Table 5.C.5.3-236), average Sacramento River flows at Rio Vista (indicative of the flows that migrating Chinook salmon might use to orient) are expected to decline on average in every month of the spring and early summer in both the High Outflow and Low Outflow Scenarios, in both the early and late long term, when equivalent climate change assumptions are applied. The proportional declines vary by scenario and year-type. In May (the beginning of peak spring-run migrations) flows under the HOS decline relative to EBC2 (factoring in climate change) by more than 10% in critical years during the ELT and by more than 9% in Wet years of the LLT; under the LOS, flow declines of greater than 10% are expected to occur in Below Normal, Above Normal, and Wet years. In June (also a peak migration month), reductions in flow exceeding 30% occur frequently (Wet and Above Normal year types of the HOS_ELT and HOS_LLT, and Wet years in the LOS_ELT). Flows in July, the shoulder of spring-run migration timing, shows even greater reductions (>30% on average across all year-types in both HOS_ELT and HOS_LLT, Critical years in LOS_ELT and LOS_LLT). DEIS/DEIR Appendix 11C at 11.C-288 to -290. The DEIS/DEIR presents expectations of flow reductions at Rio Vista under each of the Alternative 4 operational scenarios (Table 30, DEIS/DEIR Appendix 11C at 11.C-288 to -290); the results show even greater declines than those described in the Draft Plan especially when flows are compared to baseline conditions – under each operational variant, the Sacramento River's flow will be over 40% lower (up to 56% lower) in at least one year type during June. The loss of more than one-third and, in some cases, more than one-half of a River's flow is a large impact for Chinook salmon attempting to find and navigate to their natal streams. If the Draft Plan found low impact under the expectation of a 20% reduction in flow, we would expect that the magnitude and certainty of the impact would be higher when flow reductions of more than 30%, 40%, and 50% are projected. There is no credible scientific evidence that would support a finding of "low" potential impact under these conditions.

Similarly, the DEIS/DEIR analyzes flow reductions on the Feather River during the spring-run adult migration period and finds that under H3 during this period, flow reductions of up to 53% would represent changes "of moderate to large magnitude"; yet the DEIS/DEIR also concludes that the effect would "would not affect spring-run Chinook salmon in a biologically meaningful way." DEIS/DEIR at 11-1375. Once more, there appears to be no scientifically credible evidence to support a conclusion of low or "less than significant" impacts to migrating spring-run Chinook salmon adults.

Finally, with respect to efforts to control illegal harvest (poaching) of spring-run Chinook salmon, the Draft Plan overstates the importance of the stressor in the Plan Area and the likely impact of the proposed conservation measure, CM17. For adult spring-run Chinook salmon, the Draft Plan assumes with "moderate certainty" that illegal harvest is an "attribute of moderate importance for spring-run Chinook salmon adults. Draft Plan at 5.5.4-14. As described above, spring-run Chinook salmon may be the most susceptible of the salmonid species to poaching because, during the summer, *they hold in small streams, away from population centers*. *See* Moyle 2002; Williams 2006; Williams 2010. However, the "Illegal Harvest" conservation measure (CM17) is designed to increase enforcement of anti-poaching laws *within the Plan Area*. Draft Plan at 3.3-151 to -152; DEIS/DEIR at 11-233. Thus, while there could be some moderate (though uncertain and un-measureable) benefit to spring-run Chinook salmon of anti-poaching efforts upstream, where they are most vulnerable, the impact of poaching efforts "in the Plan Area" is unknown (highly uncertain) and likely quite small. Furthermore, the Draft Plan provides no evidence to support its claim that anti-poaching effort will produce measureable benefits (to say nothing of "high" effects) on the survival of spring-run juvenile salmon migrating through the Plan Area. Thus, there is no support for the Draft Plan's conclusion that its efforts to reduce illegal harvest will "...be a high positive change (i.e., decrease) in the illegal harvest attribute for spring-run Chinook salmon juvenile foragers, juvenile migrants, and adults due to CM17" or the implication that this stressor is of more than low (probably very low) importance *in the Plan Area* where the conservation measure is to occur. Furthermore, in the Plan Area, the magnitude of the stressor and the ability of warden's to reduce it is likely to decline as passage improvements described in the Draft Plan are completed. The same arguments hold for other runs of Chinook salmon and steelhead, all of which are less susceptible to poaching overall than spring-run.

Neither the Draft Plan nor the DEIS/DEIR address potential effects of the BDCP on the migration of spring-run Chinook salmon into the San Joaquin River where it enters the Delta. This is known to be a current problem affecting fall-run Chinook salmon of the San Joaquin basin. Marston et al. 2012. Thus, both the Draft Plan and DEIS/DEIR fails to analyze the potential impacts to the Draft Plan's stated objectives. Draft Plan at 3.3-53 (Objective L.2.4) and Draft Plan at 3.3-133 (objective L3.4). Objective L.2.4 is intended to "provide flows that support the movement of adult life stages of native fish species to natal spawning habitats." The DEIS/DEIR also fails to analyze potentially important effects on spring-run Chinook salmon of the San Joaquin Basin of conservation measures intended to address low dissolved oxygen in the Stockton Deepwater Ship Channel (CM14). These are major oversights given that the Draft Plan states an intention to benefit spring-run Chinook salmon in the San Joaquin Basin when spawning populations there have been reintroduced.

E. Central Valley Steelhead

1. The Draft Plan and DEIS/DEIR Fail to Adequately Analyze Impacts to Central Valley Steelhead, but the Available Analyses Demonstrate that the Draft Plan is not Likely to Achieve Plan Objectives and is Likely to Result in Significant Adverse Impacts to the Species

As with many other species, the Draft Plan fails to assess whether the BDCP will attain many of the conservation strategy's objective for steelhead. Draft Plan at 5.2-8. The failure to evaluate whether the Draft Plan is likely to achieve the through-delta survival objective is not scientifically justified. The Draft Plan's claim that it would have needed life-cycle models for steelhead that are unavailable is not accurate; because objective STHD1.1 concerns through-Delta survival only, there are existing modeling tools and analytical approaches that should have been used, albeit with caveats. Although the Draft Plan inappropriately applied DPM to interpret survival of spring, fall, and winter-run Chinook salmon (which migrate at smaller size than the fish whose movements and success were used to construct the DPM), it did not apply this model to projection of differential success rates for steelhead migrating through the Delta. Of course, caution in interpreting these results would still have been warranted for steelhead. *See, e.g.,* Memorandum to J. Meral from J. Rosenfield re: Comments on Appendix G, December 2012.

The DEIS/DEIR relies on its improper use of DPM for Chinook salmon to conclude that, "…steelhead survival would not be expected to change more than 1% under Alternative 4." DEIS/DEIR at 11-1531.[71] Late fall-run Chinook salmon migrate at similar size and in similar season to steelhead suggesting potentially similar impacts. Yet this statement neglects to mention that the DEIS/DEIR anticipates decreased through Delta survival of late fall-run Chinook salmon under H1 as compared to the NAA and in all Alternative 4 operational variants during wetter year types compared to current conditions. DEIS/DEIR at 11-1458 (Table 11-4-76).

Similarly, the DEIS/DEIR concludes that "Alternative 4 would have no effect on steelhead migration success through the Delta" for San Joaquin steelhead." DEIS/DEIR at 11-1532. Its conclusion that steelhead survival would not change seems to indicate that adverse effects of BDCP on through-Delta flows offset any benefits from reduced steelhead entrainment at the south Delta export facilities, *see* DEIS/DEIR at 11-1476 (Table 11-4-77).

In general, both the Draft Plan and DEIS/DEIR fail to use existing scientific information to evaluate the effects of CM1 on steelhead migratory survival, completely ignoring key scientific information including the 2013 NMFS Evaluation of Flow Effects on Survival in Vicinity of Proposed North Delta Diversions. *See* DEIS/DEIR at 11-1531 to -1532. In addition, Appendix

[71] The change referred to is likely to be a decrease in through-Delta survival. Draft Plan at 11-1551.

3G to the Draft Plan projects that steelhead populations will decline substantially for both Sacramento and San Joaquin basin fishes in the first 10 years of the BDCP (to extinction, in the latter case). Draft Plan, Appendix 3G at Table 4. This result is consistent with that described in NMFS testimony to the State Water Resources Control Board regarding necessary flow improvements on the lower San Joaquin River. NMFS Comments on the Phase I WQCP Update Phase 1, March 2013.

Regardless of the methodology used, these analyses (and others, like NMFS Evaluation of Flow Effects on Survival in Vicinity of Proposed North Delta Diversions 2013, which the Draft Plan and DEIS/DEIR fail to utilize in their analysis) all demonstrate the Draft Plan is unlikely to achieve the increases in steelhead survival identified in the Draft Plan's biological objective (STHD1.1). As such, the DEIS/DEIR and Draft Plan lack any scientific evidence to conclude that the Draft Plan is likely to achieve its steelhead survival objective.

Furthermore, the Draft Plan and DEIS/DEIR overstate the potential value of conservation measures to steelhead juveniles migrating through the Delta and underestimates the potential negative effects on steelhead survival through the Delta. Specifically, flow is understood to be a key driver to the success of salmonids that are primarily attempting to migrate through the Delta; salmonids that are primarily focused on foraging, by contrast, may benefit differentially from increased food and rearing habitat in the Delta. The Draft Plan assumes that 95% of steelhead juveniles in the Delta are following a migrant strategy. Draft Plan at 5.5.6-3. We concur with the Delta Science Program Independent Review Panel finding that:

> The effect of each attribute on migrant versus forager salmonids was examined in Chapter 5, but summary Figure 5.5.3-2 did not capture differences in the assumed relative abundances of these life histories among the species. Plan area flows were typically ranked as a moderate negative effect on migrant salmonids in the Sacramento River and a low negative effect on foragers. However, this attribute was ranked the same for each salmonid species regardless of the proportion migrants versus foragers assumed in the population. The negative impact of reduced plan area flows should have been greater on Sacramento River species such as spring Chinook and steelhead that are dominated by migrant life histories.
>
> Migrant life histories are less likely to benefit from habitat restoration activities, which are a key focus of the BDCP conservation measures. This implies that spring Chinook and steelhead may experience less benefit from BDCP actions than other salmonid species, or they may even experience a negative net effect in response to reduced spring flows.

DSP Independent Science Review Panel 2014 at 30; *see also* Williams 2010; NMFS 2013 Progress Assessment at 4. The findings in the Draft Plan and DEIS/DEIR regarding foodweb benefits to steelhead in the Plan Area are not scientifically supported because the vast majority of steelhead are not foraging in this location.

Similarly, the Draft Plan and DEIS/DEIR's failure to emphasize the important negative impact of flow reductions (and even status quo flows) to the 95% of steelhead that are primarily seeking to migrate through the Delta quickly is not supported by the best available science. For example, in describing the need for improved Delta inflows from the San Joaquin River to the Delta, NMFS stated:

> Flow is undisputedly a key driver for [salmon and steelhead] survival…San Joaquin River flows must be augmented significantly from current levels in order to reverse the present trend of salmonid population declines in the basin. Survival rates in the San Joaquin River were only slightly greater than one percent in 2003 and 2004 and 12 percent in 2006, which was a very high flow year… We note that these survival rates are unlikely to support a viable salmonid population.

NMFS Comments on the Phase I WQCP Update Phase 1, March 2013 (emphasis added). NMFS' comments also emphasize that habitat fixes generally cannot replace the need for increased flows in the lower San Joaquin River (but should supplement needed improvements in flows). *Id.* BDCP fails to consider any changes in upstream CVP reservoir operations in the San Joaquin Basin that could improve flow conditions.

Meanwhile, the DEIS/DEIR and Draft Plan assume, without justification, that the BDCP will provide benefits to steelhead that are unlikely to occur. For example, the Draft Plan assumes with low certainty that reduced illegal harvest of steelhead will produce a low benefit to steelhead even though the stressor itself is likely to be of low importance (and even that is a low certainty conclusion). Draft Plan at 5.5.6-9. Another way of stating this outcome is that it is unlikely to produce any measurable effect to the steelhead population. Indeed, steelhead adults migrate through the Delta during winter months when river flows are typically high and these fish are relatively difficult to detect. Williams 2010. Thus, it is very unlikely that reduction of poaching in the Plan Area (as the Conservation Strategy specifies) is likely to have much of measureable effect on steelhead populations.

Also, the Draft Plan fails to support its claims regarding the effect of predation mortality on steelhead. Draft Plan at 5.5.6-8. To the extent that their aggressive behavior and relatively large size limits predation on steelhead in the Delta (steelhead are typically ~250cm when they reach the Delta), predation mortality in the Delta is not likely to be a direct limit on steelhead populations currently, so perceived low-level benefits from measures to control predation are

unlikely to yield population-level benefits. Although steelhead that are lost, malnourished, entrained in diversion infrastructure, or otherwise stressed from poor migration conditions may be eaten by opportunistic predators, these are secondary effects; steelhead are relatively large fish when they migrate through the Delta and they are capable swimmers and are more aggressive than Chinook salmon. Moyle 2002; Quinn 2005; Williams 2006. Although predation in the Delta is probably not a major stressor for steelhead currently, ecosystem alterations anticipated under BDCP could increase steelhead exposure and susceptibility to predators in the future. For instance, the Draft Plan claims that tidal marsh restoration would provide "more shallow water habitat with less predators." Draft Plan at 5.5.6-9. However, this ignores the fact that (a) steelhead are not expected to make great use of these habitats because 95% of them are migrating quickly towards the Bay and ocean and (b) there is little evidence and no guarantee that these restored habitats will be low predation environments. Even if the promised invasive vegetation removal succeeds, predation rates may be accelerated in these environments because not all predators rely on submerged aquatic vegetation, such as avian predators or striped bass. In contrast to the statement in the Draft Plan, the DRERIP review concluded that the potential for increased predation associated with habitat restoration planned for the West Delta ROA and elsewhere was a potentially high magnitude negative impact. Essex Partnership 2009 at Appendix D. In addition, the DEIS/DEIR and Draft Plan fail to address the potential impact of reductions in turbidity increasing predation risk. *See* our discussion of impacts of reduced turbidity for Delta smelt and both sturgeon species.

For steelhead, as for most of the covered fish species, the Draft Plan largely ignores the weight of scientific evidence that improved flows are needed with respect to steelhead, in combination with other measures. *See, e.g.*, NMFS, Comments on the Draft Technical Report on the Scientific Basis for Alternative San Joaquin River Flow and Salinity Objectives (Report), February 4, 2011;[72] CDFW 2010 Flow Criteria.

2. <u>The Draft Plan and DEIS/DEIR fail to acknowledge significant negative impacts to steelhead arising from the project upstream of the Plan Area</u>

Both the Draft Plan Effects Analysis and DEIS/DEIR downplay or ignore significant upstream impacts to steelhead that result from BDCP operational alternatives, particularly regarding egg mortality and spawning conditions. The DEIS/DEIR claims that Alternative 4 will have "negligible" impacts to spawning and egg incubation habitat for steelhead, but this conclusion is not supported by the analysis. For instance, it reports a relative decline of 10% in the weighted usable area for steelhead spawning on the Sacramento River. DEIS/DEIR at 11-1478 (Table 11-

[72] These comments are available online at: http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/bay_delta_plan/water_quality_control_planning/cmmnts020811/010411dpowell.pdf and are incorporated by this reference.

4-78). Also, under Alternative 4/H4, Sacramento River flows are expected to decline substantially during the spawning and egg-incubation seasons during May in Below Normal and Wet years (9% and 18.3%, respectively); the DEIS/DEIR improperly concludes that these effects will be "small" and have no meaningful biological effect on steelhead spawning or rearing. DEIS/DEIR at 11-1507. There is no scientific basis for such conclusions; such substantial declines in flow are likely to have a significant biological effect that the DEIS/DEIR simply ignores. On Clear Creek, the DEIS/DEIR reports no change between Alternative 4/H3 and NAA but it does indicate that flow declines in Wet years relative to current conditions are expected to be as high as 38%. DEIS/DEIR at 11-1478. Similar degradation of flows and temperatures as compared to existing conditions are expected on: the Feather River, *see* DEIS/DEIR at 11-1480 to -82, -89 (Tables 11-4-80, 4-82, and 4-83; the American River, DEIS/DEIR at 11-1490 to -91 ; and the Stanislaus River, DEIS/DEIR at 1491. The net effects in the Draft Plan and conclusions in the DEIS/DEIR fail to adequately account for these increases in upstream temperatures and their likely impacts to steelhead productivity, abundance, and spatial distribution in the future. They also reveal the Draft Plan is unlikely to achieve two of its stated objectives (STHD3.1 and STHD3.2, which indicate that the Draft Plan will be implemented so as not to negatively impact critical habitat or life history diversity of steelhead, respectively). As with other salmonids, it is clear that changes in reservoir operations will be needed to adapt to climate change and other cumulative impacts.

Juvenile steelhead rearing conditions on the mainstem Sacramento River would decline substantially under Alternative 4/H3 relative to the NAA. DEIS/DEIR at Table 11-4-78 (SacEFT projects an absolute decline in frequency of years with "good" conditions of 10 percentage points and a relative decline of 22%). The DEIS/DEIR suggests that the impact would be counterbalanced by a 2% absolute (10% relative) reduction in the incidence of juvenile stranding resulting from flow fluctuations. The DEIS/DEIR concludes that more frequent degradation of steelhead juvenile rearing conditions would cause negligible effects, *see* DEIS/DEIR at 11-1498, is not supported by a scientific analysis and is contrary to the available biological evidence. For example, any countervailing effect of reduced juvenile stranding presumes that the years in which this improvement occurs are not the same years in which juveniles are expected to experience diminished quantity and quality of rearing habitat – "saving" fish from stranding is not a benefit if the fish later die in a river that is too hot or has too little flow. Even were there no overlaps between years with reduced stranding and years in which the DEIS/DEIR anticipates impacts to steelhead rearing conditions, the number of years in which the latter (negative) impact are expected outnumber the years where reduced stranding is expected. Loss of "good" rearing conditions in more than an additional 2 years out of ten (22%) under Alternative 4 operations is a bad outcome for Sacramento River steelhead.

Large reductions in flow (up to 50%) are projected during the juvenile steelhead rearing period (specifically, July through September) in the "high flow" channel of the Feather River, *see*

DEIS/DEIR at 11-1499 and on the American River (August-September) under Alternative 4/H3. As reported for spring-run Chinook salmon, the frequency of temperature exceedances on the Feather River is expected to increase during July and August of most years. Similarly large increases in temperature are reported for the American River under Alternative 4 operations and the method of reporting such exceedances on both rivers vastly underestimates the likely negative effects. Temperature exceedances on the Feather and American Rivers are reported in the DEIS/DEIR as "degree-months" or the number of months in which the *average* temperature exceeds a certain threshold, but temperature thresholds reported for salmonids and steelhead are generally daily or multi-day temperature maxima. When temperatures exceed these short-duration thresholds on a monthly basis, it means that fish are exposed to deleterious conditions for at least a large plurality of days during that month. Thus, the DEIS/DEIR's depiction of increased frequency in temperature exceedances that are greater than 5 degrees higher than the 63°F temperature threshold (Table 11-4-43, Table 11-4-85) reveal that steelhead will experience temperatures greater than 68°F (a temperature associated with negative effects to rearing steelhead; Reese and Harvey 2002) for most of those months. The table does not capture the number of months/years in which temperatures will exceed steelhead thresholds for many days (when the monthly average temperature remains below the threshold), even though severe negative impacts to rearing steelhead juveniles will occur in these months. As a result, the DEIS/DEIR dramatically understates the likely adverse temperature impacts on steelhead. We note that predicted reductions in the frequency of temperature exceedances during June under Alternative 4 versus NAA (Table 11-4-43, Table 11-4-85) do not mitigate for the high temperature impacts that are projected to occur later in the spring or summer, especially because actual temperatures are predicted to exceed critical steelhead temperature thresholds much more frequently in June relative to current conditions.

The DEIS/DEIR is inconsistent and contradictory regarding its assessment of the impact of flow reductions on steelhead migration upstream of the Plan Area. Flow reductions on major steelhead spawning rivers during the steelhead migration season represent potentially serious impacts to migration and adult survival. For example, the DEIS/DEIR appropriately finds that under Alternative 4/H3 operations on the Feather River, "The substantial reductions in flows during drier water years would have biologically meaningful effects on migration conditions during September through March." DEIS/DEIR at 11-1536. In contrast, the DEIS/DEIR concludes that under Alternative 4/H1 the significant flow reductions would have no effect "…because they occur in only one of seven months." DEIS/DEIR 11-1525. This rationalization ignores the potential survival and life history impacts to steelhead on the Feather River that can occur from unsuitable adult migration and contradicts the Draft Plan's objective to implement operations in a way that does not differentially impact particular parts of the life history range of steelhead. There is also no scientific support for the DEIS/DEIR claims that November flow reductions under Alternative 4/H3 (and other operational variants) on the Sacramento River above Red Bluff in all water year types (declines from 7.9%-16.3%, *see* DEIS/DEIR Appendix 11C (Table

4)) are "isolated" and will not have meaningful biological effect, *see* DEIS/DEIR 11-1520. The reluctance of the DEIS/DEIR to acknowledge impacts to steelhead migration resulting from reduced fall flows is not scientifically supported.

3. Conclusion

The DEIS/DEIR analysis of impacts to steelhead fails to adequately and accurately assess the overall effects of the Draft Plan to this species. The DEIS/DEIR projects no increase in through-Delta survival rate arising from Alternative 4 operational variants; in fact, it allows for and projects a decrease in through-Delta survival rates below unacceptable status-quo conditions. Projected levels of through-Delta survival are inadequate to maintain populations from either the San Joaquin Basin or Sacramento Basin, and NMFS' appendix describing through Delta survival objectives indicates that abundance will go to zero quickly at such low levels of through Delta survival. Given these outcomes, the draft documents indicate the extirpation of Central Valley steelhead in the San Joaquin Basin and substantial reductions in abundance of populations in the Sacramento Basin within the first half of the BDCP's proposed permit terms. In addition, the DEIS/DEIR reveals substantial impacts to steelhead spawning, rearing, and migration upstream of the Delta (in both the San Joaquin drainage and the Sacramento drainage). These significant adverse impacts are likely to result in the loss of one or more steelhead populations during the course of BDCP permit term, and these adverse impacts biologically outweigh and overwhelm any potential benefits from other BDCP conservation measures.

F. Green and White Sturgeon

1. The Draft Plan Fails to Define Adequate Objectives for Viability of Both Sturgeon Species

The southern distinct population segment (DPS) of green sturgeon is a federally-listed threatened species. In the Central Valley, its current spawning, egg incubation, and early rearing range falls entirely in the area downstream of Anderson, CA on the Sacramento River to and through the Plan Area. Israel and Klimley 2008; NMFS 2009 Biological Opinion at 125. White sturgeon spawning is currently believed to occur in the Sacramento River only from Colusa to the gauge at Verona, though spawning has been detected on the San Joaquin River, with rearing occurring throughout the Plan Area. Israel et al. 2009 . Both species are expected to have occurred on other larger rivers in the Central Valley, though there are no recent records from these other waterways. Both species are anadromous, meaning they spend some portion of their post-juvenile life history in marine environments. Thus, spawning, larval, and juvenile life stages of both of these covered species occur within the Plan Area or reaches of the Sacramento River where flow and water quality are significantly affected or controlled by operations of the SWP and CVP.

The Draft Plan's presentation of global goals and objectives for green sturgeon is confused, conflicting, and not specific. For instance, whereas the global goal for endangered species such as Delta smelt is to remove them from the endangered species list through restoration of their abundance and distribution, *see* Draft Plan 3.3-107, the Draft Plan identifies a global goal for green sturgeon that is to ensure that they use habitats they currently use and to maintain a stable population size and age structure. Draft Plan at 3.3-190. Clearly, this is an inadequate goal for a federally-threatened species that is at risk of extinction because of low abundance and a greatly restricted geographic range. *See, e.g.,* NMFS 2009 Biological Opinion. Fortunately, this erroneous global target is contradicted by global objectives that call for increased abundance, productivity, spatial distribution, and life history and genetic diversity, but, none of these global objectives are SMART, so they fail to set the context for what the BDCP will do to serve these larger conservation aspirations. The description of global goals and objectives for white sturgeon is identical to what is described for green sturgeon and similarly flawed

As described above, the green sturgeon productivity objective GRST1.1 is too vague to understand or to use in evaluating the adequacy of conservation measures or to assess the efficacy of the BDCP as it is implemented (i.e. for adaptive management). *See also* NMFS 2013 Progress Assessment at 15. Another objective related to green sturgeon productivity (GRST1.2; to eliminate stranding in migration corridors of the Yolo Bypass, *see* Draft Plan at 3.3-193) is actually a stressor reduction target (as it refers to a particular stress on adult survival) but it is at least close to being SMART. Unfortunately, the Draft Plan has no objectives for improved spatial distribution or life history and genetic diversity for this species – issues that are identified as important in the preceding statements of global objectives and in the existing biological opinion. NMFS 2009 Biological Opinion at 558. Again, the descriptions of white sturgeon BDCP objectives are identical to those provided for green sturgeon in the Draft Plan and they are inadequate for the same reasons.

2. <u>The Draft Plan and DEIS/DEIR Ignore Several Effects of the BDCP that are Each Likely to Cause Significant Negative Impacts on Survival of Sturgeon Juveniles in the Plan Area and Upstream. Operation of the New North Delta Diversion (CM1) Likely Will Cause Significant Impacts to Both Species that are not Reported in the DEIS/DEIR, and the Draft Plan and DEIS/DEIR Ignore the Cumulative Impacts on these Two Species.</u>

Because the Draft Plan's objectives for the sturgeon species are unacceptably vague, it is not possible to evaluate whether the Draft Plan is likely to achieve such objectives. Still, the DEIS/DEIR indicate that BDCP will cause significant environmental impacts to both sturgeon species and prevent attainment of conservation objectives. Alone and cumulatively, these impacts represent potentially devastating impacts to both sturgeon species.

Sturgeon larval and juvenile life stages are most susceptible to major stressors such as entrainment, low migration/dispersal flows, and predation. Young-of-the-year green sturgeon are present in the middle and lower Sacramento River from April-October (larvae) and from August through March (juvenile). All stages of white sturgeon are present in the lower Sacramento River, with larvae present from February-May and the smallest juveniles present from April-June. Israel *et al.* 2009. Larval and young-of-the-year juvenile sturgeon are expected to be most abundant following spawning seasons characterized by high river flows. Kolhorst 1991; Moyle 2002; Israel *et al.* 2009. The spawning cues for green sturgeon are not known, but they are believed to be analogous to those for white sturgeon, with spawning being triggered by high river flows. NMFS 2009 Biological Opinion at 127.

i. Larval and Juvenile Sturgeon Migration – Flows Downstream of North Delta Diversion

Migration and dispersal of juvenile and larval white sturgeon will likely be significantly and adversely affected by reduced flows below the north Delta diversion. The DRERIP life history conceptual model for green sturgeon indicates that the volume of flow in the middle and lower Sacramento River is a stressor that can limit transport and dispersal of larval and juvenile green sturgeon. Israel and Klimley 2008 at 32; the white sturgeon conceptual model indicates the same potential stressors for that species, Israel et al. 2009 at 36, and rates "flow operations" as the stressors with the highest possible importance and understanding for this species, *id.* at 43. Compared to EBC2 LLT, flows below the new diversion would be substantially lower under both the low and high outflow scenarios; under the LOS, flows will be reduced between 11.7%-20.4% on average, and under the HOS, flows will be reduced between 5%-18.9% on average. Draft Plan at 5.5.8-21 to 5.5.8-23 (Table 5.5.8-9). Worse, the flow reductions are greatest during above normal and wet years (up to 28% in the HOS and 28.5% in the LOS, *see id.*), the very years in which sturgeon species are likely to spawn. Anticipated average flow decline in the August-March period, when green sturgeon juveniles would be in the lower river, are dramatically lower under BDCP Alternative 4 than under the environmental baseline in the late-long term, and the reductions are greater than those identified above affecting white sturgeon juveniles. For example, flows in September under the low outflow scenario would be 49% less than under the baseline on average across all year types, and 57.4% and 70% lower in the vital above normal and wet years, respectively. *See id.* Substantially lower flows downstream of the new north Delta diversion are expected in nearly every year type of every month under Alternative 4/H3 ("evaluated starting operations"). *See also* DEIS/DEIR Appendix 11C at 11C-284 (Table 28). These significant reductions in flow are likely to result in significant adverse impacts on juvenile survival of both sturgeon species that is contrary to the Draft Plan's conservation objectives. *See* Draft Plan at 3.3-190 (GRST1.1); id. at 3.3-198 (WTST1.1).

Despite these significant reductions in flows and the prior acknowledgement of their importance, the Draft Plan disregards its own findings about the importance of river flows in the lower Sacramento River and about the large changes anticipated under Alternative 4. It identifies rearing habitat has a major stressor on both green and white sturgeon, Draft Plan at 3.3-190, 3.3-198, and it acknowledges that flow management may affect larval and juvenile rearing habitat "upstream of the Plan Area." Draft Plan at 3.3-191. The Draft Plan even concludes with "moderate" certainty that the BDCP will: "… result in a moderate negative change to migration flows for green sturgeon larvae and a low negative change for juvenile green sturgeon in the Feather River, and a low negative change for white sturgeon juveniles in the Feather River." Draft Plan at 5.5.8-19. Despite this, the Draft Plan does not regard the projected huge changes in flow downstream of the north Delta diversion as problematic. Rather, it states:

> Given that most green and white sturgeon occupying the Plan Area are likely to be from the Sacramento River region, it is concluded with moderate certainty that there would be a low negative change to Plan Area flows because of diversions at the north Delta intakes, for juvenile and adult green sturgeon; and for larval, juvenile, and adult white sturgeon … flows on the Sacramento River below the north Delta intakes, the main migratory pathway … would be lower; therefore it is felt that a low negative change is warranted.

Draft Plan at 5.5.8-24 (emphasis added). The conclusion that flow reductions represent a "low" impact change for either sturgeon species is not supported by the best available science, particularly because it impacts "most green and white sturgeon occupying the Plan Area" as they migrate through their "main migratory pathway". In fact, commenting on a previous version of the Draft Plan, the California Department of Fish and Game stated:

> River flows are important to sturgeon production in the Sacramento River system and Delta, and [proposed project] operations are predicted to result in significant occurrences of river flow reduction during the sturgeon spawning and early rearing periods. Reductions are most pronounced in the mainstem Sacramento River downstream of the Fremont Weir and the proposed northern delta intakes, but occurrences of substantial flow reductions are also predicted in more upstream river reaches.
>
> … the [proposed project] is predicted to expose green sturgeon larvae to substantial reductions in July-September Feather River flows in most years.
>
> The collective predicted negative river flow effects of the [proposed project] create the risk of a depressive effect on sturgeon production that may not be overcome by more favorable [proposed project] aspects (e.g. reduced entrainment,

> increased food production supply). This suggests the need to modify the [proposed project] to reduce the magnitude and frequency of river flow reduction occurrences, in both upstream and downstream areas.

CDFW Red Flags 2012 at 2. The Bureau of Reclamation made an analogous observation in its comments on the same earlier draft of BDCP. USBR Red Flags 2012 at 4. These problems have not been resolved in the current Draft Plan or DEIS/DEIR.

The negative effect of reduced flows is likely to extend to areas downstream of the north Delta diversion. The best available science indicates that Delta outflows likely correlate positively with sturgeon rearing success in this estuary. Israel et al. 2009 (citing Kolhorst et al. 1991); USFWS 1995;[73] AFRP 2001 Final Plan; NMFS 2010 Testimony to the SWRCB, Exhibit 9; Fish Agencies 2012 "Scenario 5 Modeling." Consistent with this scientific information, CDFW noted in 2012 that:

> The EA seems to suggest that a reduction in entrainment of juvenile sturgeon at the south Delta offsets (justifies) the effects of reduction in winter-spring outflows. While the statement that "Entrainment of juvenile sturgeon at the south Delta pumping facilities, however, is considered an important stressor for this life stage." may be true, it is not considered to be a more important stressor on sturgeon than reduced winter-spring outflow. Entrainment of juvenile white sturgeon at the south Delta pumping facilities is not a significant stressor, when compared to the loss of winter-spring outflow. Although entrainment of green sturgeon is a somewhat different matter, reducing it in exchange for reducing winter-spring outflow is still not preferred.

CDFW Red Flags 2012 at 1. As noted elsewhere in our comments (*see, e.g.,* discussion *supra* regarding longfin smelt and Delta outflows), operations under all Alternative 4 variants reduce Delta outflows, in some cases severely. Given that the best available science indicates that current levels of Delta outflow are inadequate to maintain or restore many native fish species in the Delta including sturgeon, *see* SWRCB 2010; CDFW 2010; DSP Outflows Review Panel Report 2014, the failure to increase winter-spring Delta outflows from present levels (let alone to decrease them) will perpetuate and likely exacerbate negative impacts to green and white sturgeon.

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[73] U.S. Fish and Wildlife Service, 1995. Working paper on restoration needs: habitat restoration actions to double natural production of anadromous fish in the Central Valley of California. Volume 3. May 9, 1995. Prepared for the U.S. Fish and Wildlife Service under the direction of the Anadromous Fish Restoration Program Core Group. Stockton, California.

As with other strong, well-documented relationships between flow and fish species' abundance, the Draft Plan attempts to cast doubt on the effect by pointing to a general lack of consensus regarding the mechanism underlying the effect. Yet this does not justify ignoring the best available science that clearly identifies strong relationships between freshwater flow rates and positive population-level responses among numerous aquatic species in this estuary; one does not need to understand the mechanism of an effect to be certain that a relationship exists and is likely to persist into the future. With regard to the Draft Plan's statement that: "… there is appreciable uncertainty in the mechanisms involved in Plan Area (and other) flows for migration and movement, which would be investigated during BDCP implementation monitoring and research," CDFW previously commented that:

> The assessment effects seems to turn the notion of uncertainty upside down. In general, the Plan reduces winter-spring outflow, and in some regards Sacramento River Flow. There is a strong historical association between flow conditions and sturgeon production, which the EA seems to dismiss, citing a lack of understanding of the mechanisms underlying the association.

CDFW Red Flags 2012 at 1. The best available science indicates with high certainty that green and white sturgeon spawning, larval and juvenile rearing and transport success is positively correlated with the rate of freshwater flows into, through, and out of the Delta. There is no justification for the Draft Plan or DEIS/DEIR to ignore the potential effect of reduced flows in the lower Sacramento River, Delta through-flow, and Delta outflow on these two species. Both the DEIS/DEIR and Draft Plan fail to use the best available science regarding the effects of flow reductions on green and white sturgeon. In particular, the DEIS/DEIR conclusions regarding effects on migration conditions for green sturgeon (AQUA-132),[74] including the conclusion in AQUA-130 that Alternative 4 would not cause adverse impacts on migration conditions and that there are not feasible mitigation measures to reduce impacts under other alternatives are both incorrect; the former ignores the weight of scientific evidence, and the latter ignores changes to operational rules that reduce impacts on Delta inflows, bypass flows, and outflows.

ii. Predation Risk

The DRERIP life history conceptual models for the sturgeon species both indicate that predation may be a concern to the youngest/smallest life stages, when they are in the riverine environment. Israel and Klimley 2008 at 32; Israel et al. 2009 at 36. Reduced turbidity below the north Delta intakes would exacerbate this problem as increased water clarity increases predator efficiency on sturgeon. Gadomski and Parsley 2005a,b,c. The Draft Plan inappropriately assumes that

[74] The DEIS/DEIR's conclusions regarding white sturgeon (AQUA-149 and AQUA-150) lack substantial evidence for the same reasons.

predation rates are not important to either white or green sturgeon larvae or juveniles in the Plan Area (though it is not clear why the location of these life stages in the Plan Area would reduce their susceptibility to predation); nevertheless, it assumes that the BDCP could produce a beneficial reduction in predation throughout the Plan Area. Draft Plan at 5.5.8-14. In fact, the Draft Plan and DEIS/DEIR analytical outputs indicate a substantial risk of increased predation on early life stages of both sturgeon species; this increased risk arises from both the reduced flows (*discussed above*), reduced turbidity, the interaction between the two, and the increased density of predators expected to aggregate close to the CM1 facility, *see* Draft Plan at 5.5.8-14. The US Bureau of Reclamation, commenting on an earlier version of the Draft Plan, specifically requested a more thorough evaluation of the claim that predation of green sturgeon would be a minor effect. USBR Red Flags 2012 at 5. The DEIS/DEIR and Draft Plan do not do so, as we discuss below.

iii. Reduced Turbidity and Predation Risk

Projected diversion of sediment and other suspended particles from the Sacramento River at the north Delta diversion facility are expected to increase water clarity and reduce turbidity throughout the Delta on average. DEIS/DEIR at 11-267. The effect is actually larger than the DEIS/DEIR acknowledges as operations under ESO_LLT are expected to remove well over 20% of the Sacramento River's sediment load in most months April-October. Draft Plan Appendix 5.C, Attachment 5C.D at 5C.D-24 (Figure 5.C.D-11). This is the period when this stretch of river would normally be occupied by larval and juvenile white and green sturgeon. Thus, the reduced turbidity expected under the BDCP in the primary migration corridor for white and green sturgeon juveniles will likely lead to increased predation on young-of-the-year white and green sturgeon, and this adverse impact is inappropriately dismissed in the Draft Plan (*see* Draft Plan at 5.5.8-32) and is not considered or analyzed at all in the DEIS/DEIR.

iv. Predation Risk: Combined Effects

Reduced flows and reduced turbidity below the new north Delta diversion facility (CM1) each represent separate independent threats to white and green sturgeon that the DEIS/DEIR improperly discount or ignore, and the combination of these two effects is expected to exacerbate the increased predation rates that might arise from either of the individual impacts. When river flow rates fall substantially, as they will below the new North Delta diversion, the reduction in volume concentrates predators and prey into a smaller area. In addition, the decline in river volume will also cause a drop in river depth (stage) that will allow sunlight to penetrate through more of the water column, to depths that represent prime sturgeon habitat in many places. Furthermore, diversions at the north Delta facility would be expected to reduce the Sacramento River's velocity and, therefore, its competence to transport suspended sediments that have not been diverted. Thus, diversion of water and suspended sediment by CM1 will increase water

clarity, increase light levels in near-bottom environments frequented by both sturgeon, and concentrate predators in a smaller area – it is highly likely that this will increase predation rates on both green and white sturgeon juveniles and larvae; this is likely to represent a severe impact on both species. *See, e.g.*, Gadomski and Parsley 2005 a,b,c. The proportional and absolute reduction in fresh water flows and turbidity downstream of the north Delta diversion are expected to be greatest during Wet and Above Normal type water years, the very years in which the most white and green sturgeon young-of-year would be exposed to predation risks. In addition, we note that this combined impact would apply to all species that use the Sacramento River as a primary migration corridor (e.g. all the covered salmonid species).

v. Entrainment/Impingement and Indirect Effects (Predation) at North Delta Diversions

The Draft Plan and DEIS/DEIR fail to adequately analyze the potential effect of a range of entrainment and impingement rates at the new North Delta diversion on green and white sturgeon larval-juvenile survival rates. Entrainment at existing agricultural diversions like that of the Glenn-Colusa Irrigation District is believed to be a stressor of high importance for green sturgeon feeding larvae. Israel and Klimley 2008. White sturgeon spawn downstream of the GCID diversion, so this stressor is not regarded as high currently, Israel *et al.* 2009, but the addition of a new diversion facility in the heart of this species' juvenile rearing grounds is cause for concern. Entrainment rates of juvenile green and white sturgeon at the new North Delta Diversion are unknown; however, the Draft Plan's unsubstantiated dismissal of this potential effect is unsupported by science.

The bypass flow conditions for the new screens (which are unprecedented in the length of river they will cover) were designed to protect migrating Chinook salmon juveniles and Delta smelt. These fish live in the middle and/or upper part of the water column, unlike sturgeon, which are bottom-dwellers. As indicated by green sturgeon's much greater susceptibility to entrainment in unscreened small agricultural diversions, *see* Mussen *et al.* 2014, sturgeon behavior and ability to avoid entrainment and impingement at the CM1 screens are unknown and not analogous to those of salmonid species. Furthermore, as predators are likely to aggregate near the new diversion facility, *see* Draft Plan at 5.5.8-14, the DEIS/DEIR and Draft Plan fail to adequately analyze the effects of increased predation, which is likely to be as much or higher than that affecting salmonids as described above. *See* Draft Plan, Appendix 5.F, Section 5.F.6.3.1.4). The Draft Plan and DEIS/DEIR fail to adequately analyze these impacts, and both documents need to be revised to analyze the effect of greater entrainment, impingement, and predation as a result of the operation of CM1, consistent with the scientific information provided above.

vi. Entrainment at South Delta Diversions:

The DEIS/DEIR overstates the likelihood of positive impacts from reduced entrainment of sturgeon at the south Delta export facilities. Confidence intervals on estimated entrainment at south Delta diversion suggest there are may be no differences among modeled alternatives, particularly for wet years. Draft Plan Appendix 5B at 5.B-270 (Table 5.B.6-206). Thus, reported proportional declines in sturgeon entrainment DEIR/DEIS are misleading, as they represent actual differences amounting to just a few fish and there is little confidence that these effects are real, given error bounds around the estimates. NMFS identifies entrainment as a problem for this species; thus, if there is no real change in entrainment rates under modeled alternatives, then entrainment may continue at unacceptably high rates. It is possible that entrainment at the south Delta facilities will decline in dry years at the CVP, but again the differences are not as great as the raw percentages might suggest.

vii. Temperature and Flow – Upstream Effects

Both the Draft Plan and DEIS/DEIR suggest that temperature and flow impacts to green sturgeon may occur upstream, particularly on the Feather River. We have indicated our concern with elevated temperatures and reduced flows in our discussion of potential impacts of the BDCP to salmonid populations, and there are similar concerns with regard to the potential impacts to green and white sturgeon. In particular, the DEIS/DEIR indicates that temperatures will exceed the 64°F threshold at Gridley (on the Feather River) with much greater frequency during the July-September period and that this negative effect will be most common in the Above Normal and Wet years when rearing sturgeon larvae and juveniles are expected to be most abundant. DEIS/DEIR at 11-1576. Similarly, exceedances of the temperature threshold identified for rearing green sturgeon larvae and juveniles would increase under Alternative 4/H3 on the Sacramento River at Bend Bridge in July-September. DEIS/DEIR at 11-1578 (Table 11-4-104). This table contradicts the DEIS/DEIR claim that there would be no difference in mean monthly temperatures at Bend Bridge in any month or water year type and therefore no impact to green sturgeon rearing habitat. DEIS/DEIR at 11-1588. The temperature appendix reveals that temperatures during the green sturgeon rearing period are expected to increase compared to those currently experienced. DEIS/DEIR, Appendix 11D at 11D-268 to -269 (Table 2). In other words, there will be a significant impact of elevated temperatures in the Sacramento River to rearing green sturgeon juveniles.

The DEIS/DEIR inappropriately dismisses these temperature exceedances and ignores scientific evidence indicating this is a stressor of "medium" importance and certainty to green sturgeon. *See* Israel and Klimley 2008; NMFS 2009 Biological Opinion at 712. In discussing the impacts of temperature changes driven by proposed BDCP operations, the DEIS/DEIR fails to look at

cumulative impacts and implies that perceived positive effects to green sturgeon eggs and early larvae will offset the negative effects to later life stages of the same fish; it states:

> Water temperature-related effects of H3 on green sturgeon rearing habitat in the Feather River were also evaluated by determining the total degree-months exceeding the 64°F temperature threshold at Gridley (Table 11-4-102). Combining water years, total degree-months exceeding the threshold under H3 would be 8% to 31% lower relative to NAA during May and June and 13% to 126% higher during July through September. These results indicate that there would be both beneficial and negative temperature-related effects to green sturgeon rearing in the Feather River.

DEIS/DEIR at 11-1587. Increasing survival of green sturgeon eggs (as the DEIS/DEIR asserts will occur), cannot be reported as a positive effect if, as the analysis reveals, high temperatures will impair or kill the resulting larval and juvenile life stages of these fish. Thus, the DEIS/DEIR's statement that Alternative 4 operations will not impact juvenile rearing habitat for green sturgeon is without scientific support. DEIS/DEIR at 11-1586. As a result, the DEIS/DEIR's conclusions regarding effects on rearing habitat for green sturgeon (AQUA-131) and white sturgeon (AQUA-149) lack substantial evidence and are contrary to the best available science.

viii. Conclusion

As discussed above, the Draft Plan and DEIS/DEIR fail to use the best available science and fail to adequately analyze likely impacts on green and white sturgeon. Contrary to findings and conclusions in the DEIS/DEIR, the project is likely to cause significant adverse impacts to green and white sturgeon spawning, rearing habitat, migration success, and abundance. Projected benefits associated with modeled reductions in entrainment at the existing south Delta diversion facilities are overstated. The DEIS/DEIR must be revised, and the Draft Plan and DEIS/DEIR must propose mitigation measures and operational changes to increase flows and otherwise reduce or avoid such impacts.

G. <u>Fall-Run and Late Fall-Run Chinook Salmon</u>

Fall-run Chinook salmon and late fall-run Chinook salmon merit conservation as independent and distinctive lineages. Smith et al. 1995; Moyle 2002. Thus, regardless of the population designation, it is clear that at a minimum, late fall-run warrant conservation efforts that maintain their distinctiveness from other Central Valley fall-run Chinook as an important life history variant. *See also* NMFS 2009 Biological Opinion at 181 (showing differences in life history timing between the different runs in the Central Valley). In particular, late fall-run Chinook

salmon are mostly "stream-type" Chinook salmon as opposed to fall-run Chinook salmon which are typically "ocean-type" Chinook salmon. Moyle 2002. This is a basal life-history distinction within Chinook salmon, Healy 1991, which indicates, among other differences, that late fall-run Chinook salmon juveniles tend to rear in freshwater for many months (up to one year) whereas fall-run Chinook salmon migrate to the ocean quickly, usually in less than half a year. Moyle 2002 at 255. Thus, when late fall-run Chinook salmon reach the Delta, they generally follow a "migrant" strategy (meaning they do not rear much or for long in the Delta) and fall-run Chinook salmon juveniles are much more likely to forage or rear in the Delta.

The difference in these two strategies has implications for the distribution of positive and negative effects among late fall-run and fall-run juveniles. For example, late fall-run juveniles are unlikely to benefit much from efforts to improve prey productivity in the Delta. Williams 2010. In contrast, fall-run Chinook juveniles are among the salmonids most likely to benefit from improved rearing conditions in the Delta because they actually tend to rear in downstream environments. On the other hand, fall-run Chinook salmon juveniles migrate to the Delta at smaller sizes than late fall-run juveniles and they are thus more likely to suffer from increased predation pressure and altered delta hydrodynamics that would lead to entrainment or other sources of mortality following diversion from an optimal migratory path. Clearly, the different adult migration timing of these fish exposes them to different flow rates and temperatures during their adult migration, spawning, and egg incubation phases – juveniles also migrate at different times with late fall-run arriving in the Delta in the late fall-winter while fall-run Chinook salmon juveniles enter the Delta primarily between March and June. Moyle 2002; Williams 2006.

The Draft Plan appropriately sets different through-Delta survival objectives for fall-run and late fall-run Chinook salmon. However, two other objectives regarding the maintenance of spawning and rearing conditions upstream of the new water facilities (FRCS3.1 and FRCS3.2, *see* Draft Plan at 3.3-162), treat the late fall-run and fall-run Chinook salmon life history variants cumulatively. In keeping with the genetic and eco-phenotypic differences between these two runs, the Draft Plan appropriately provides separate analyses of effects for late-fall and fall-run Chinook salmon. However, despite the separate analyses, the Draft Plan and DEIS/DEIR tend to interpret different results for the two runs as though they were the same result. More importantly, we see no indication that the Draft Plan will accomplish the objective of benefiting both life history types equally. As with most other objectives, the DEIS/DEIR does not compare projected outcomes to those described by the conservation strategy objectives.

1. The Draft Plan and DEIS/DEIR Overstate Potential Benefits Within the Plan Area and Underestimate Environmental Impacts, the Available Scientific Information Demonstrates that the Draft Plan is Unlikely to Achieve its Biological Objectives, and the Analyses Predict that the BDCP will Fail to Conserve Both Runs in the Plan Area

i. Upstream Adult Migration

The Draft Plan finds that olfactory cures for migrating adult salmon will be changed differentially for fall-run and late-fall run Chinook salmon. Specifically, the strength of olfactory cues to migrate towards the Sacramento River (i.e., the proportion of water in key Delta channels that emanates from the Sacramento River) declines under ESO operations by 10% for fall-run Chinook salmon and 50% for late-fall run Chinook salmon. Draft Plan at 5.5.5-25. Given these reductions, the Draft Plan concludes with low certainty that there will be a low magnitude negative impact for both fall-run and late-fall run adult migrants trying to orient towards the Sacramento River. The Draft Plan provides no rationale as to why both runs would experience low magnitude and low certainty negative effects given the vast difference in proportional impact to flows experienced by the two runs; it seems that the late-fall run should experience a greater impact, with greater certainty, than for fall-run given the larger projected decline (50%) in the indicator of olfactory cues for late-fall run Chinook salmon. In fact, the DEIS/DEIR implies a threshold for effect on adult salmon migration of proportional declines in flow that are 10%, but, contrary to the Draft Plan, it finds that the proportion of Sacramento River flow in the Delta will only be 10%. DEIS/DEIR at 1458. The difference between Draft Plan and DEIS/DEIR predictions of Sacramento River proportional flow reduction must be resolved in order to allow evaluation of impacts on late-fall run Chinook salmon adult migrants.

ii. Spawning, Incubation, and Rearing (Upstream)

The Draft Plan and DEIS/DEIR understate and downplay negative impacts to fall and late-fall run Chinook salmon upstream of the Delta that are related to project operations under Alternative 4. The DEIS/DEIR reports an increase in years with adequate available spawning area for fall-run Chinook salmon on the Sacramento River under Alternative 4, but also report an increased frequency of years where dewatering of redds will be a problem for Chinook salmon (particularly in November). DEIS/DEIR Appendix 11c at 11C-225. Dewatering of fall-run Chinook eggs is already a problem for Sacramento River fall-run, *e.g.* SRTTG 2013, and, it is important to note that flow levels in this spawning area that cause redd dewatering are almost completely under the control of the CVP at this time of year. The DEIS/DEIR estimate a 7% increase in years when redd dewatering will be problematic; this is a significant impact, regardless of the perceived increase in frequency of "good" availability of spawning habitats –

fish that spawn in habitats that will eventually be dewatered obviously do not benefit from any increase in spawning habitat availability.

In addition, the projected increase in available spawning habitat ignores the anticipated increase in water temperature downstream of Keswick Dam during September and October in almost every year type under Alternative 4/H3 as compared to the NAA. *See, e.g.*, DEIS/DEIR at 11D-257. Though small in relative terms, these projected increases in temperature would be expected to negatively affect available fall-run spawning habitat and egg incubation success. Temperatures are already at or near threshold for Sacramento River fall-run Chinook salmon in many years and, judging from the comparison of temperatures under existing conditions and those under Alternative 4/H3, temperatures problems will increase in the future; thus, even small (proportional) increases in temperature under H3 relative to NAA likely represent large impacts to incubating fall-run Chinook salmon eggs. In fact, the DEIS/DEIR reports increases in egg mortality of 5% or more in most years under Alternative 4/H3 relative to the NAA. The magnitude and frequency of egg mortality increases for fall-run Chinook salmon eggs is of great concern. The DEIS/DEIR reports that "Total degree-days exceeding 56°F … under H4 would be 10% higher than those under NAA during March and similar during remaining months (Table 11-4-68)." DEIS/DEIR at 11-1412. Temperature exceedances during March are likely to result in extra mortality to fall-run Chinook salmon eggs and juveniles rearing on the upper Sacramento River, an impact to run productivity; in addition, the asymmetrical impact to those fall-run Chinook salmon that incubate towards the end of this run's incubation period represents a negative impact to fall-run Chinook salmon life history diversity.

Similarly, SacEFT projects a 5% decrease in years when juvenile rearing conditions will be considered "good" for fall-run juveniles on the Sacramento River upstream under Alternative 4/H3 operations. DEIS/DEIR at 11-1393 (Table 11-4-56). The net impact of increasingly frequent occurrence of years that are "not good" for fall-run Chinook salmon redds or rearing juveniles cannot be good for fall-run Chinook salmon; but, the magnitude of the impact depends largely on how "bad" conditions become and whether bad conditions for redds overlap years with bad conditions for juveniles.

Temperatures exceeding fall-run Chinook egg tolerances are expected to increase in some year types, during either October or November, under Alternative 4/H3 on the Feather River. DEIS/DEIR at 11-1397 (Table 11-4-61). Increased temperature exceedances are also expected during September in most years under H1. DEIS/DEIR at 11-1354 (Table 11-4-41). Furthermore, comparison to current conditions indicate that temperatures on the Feather River will exceed egg incubation thresholds much more frequently in the future than under current conditions; this indicates that the BDCP will not be implemented in a way that would mitigate for expected temperature effects related to climate change. As a result, Feather River fall-run Chinook salmon spawning will be substantially impacted in a future with BDCP.

The frequency of years with "good" rearing habitat conditions for late-fall run Chinook salmon in the upper Sacramento River are projected to decline by 33% in Alternative 4/H3 as compared to the No Action Alternative. DEIS/DEIR Table 11-4-58 at 11-1394. Furthermore, the frequency of years with increased risk of juvenile stranding would increase by 9% between the two scenarios. Finally, the projected 10% increase in temperature exceedances in late-fall run Chinook salmon incubation habitat on the upper Sacramento River during March (referenced above) will likely lead to increased egg mortality for this run under Alternative 4/H4.

The DEIS/DEIR finds that "collectively" there will be no adverse impact of the BDCP to egg incubation conditions for fall-run Chinook salmon on the Sacramento River. DEIS/DEIR at 11-1415. This finding is not supported by the DEIS/DEIR analyses which reveal negative impacts to abundance, productivity, and life history diversity of fall-run Chinook salmon resulting from increased occurrence of high temperatures and red dewatering. The DEIS/DEIR concludes that Alternative 4 operations will not result in significant impacts to juvenile rearing conditions for fall or late-fall run Chinook salmon upstream on the Sacramento River; however, its rationale is confused, as it states:

> Changes in flow rates and water temperatures are generally small and infrequent under Alternative 4 relative to the NAA. Therefore, there would be no biologically meaningful effects to fall- or late fall-run Chinook salmon, <u>except for a moderate reduction in juvenile rearing habitat for late fall-run Chinook salmon</u> as predicted by SacEFT. Because this effect is isolated, it would not cause the impact to be adverse, particularly in combination with modeled flow outputs indicating that flows, which drive rearing habitat availability, would increase during the rearing period.

DEIS/DEIR at 11-1435 (emphasis added). This statement is inaccurate and the DEIS/DEIR fails to demonstrate how the reduction in surviving juveniles as a result of increased redd dewatering is somehow outweighed by improved conditions later in the year (obviously, eggs in dewatered redds will die rapidly and they will not be resurrected by subsequent flows). In addition, the DEIS/DEIR points to increased frequency of other relatively severe outcomes, such as egg incubation temperature exceedances, and large increases in the frequency of sub-optimal rearing conditions for fall-run and particularly for late-fall run Chinook salmon.

In summary, the DEIS/DEIR's projections of degraded upstream egg incubation, rearing and juvenile rearing conditions represents a significant impact to fall-run and late-fall run Chinook salmon. Impacts of Alternative 4 to late-fall run Chinook salmon are severe in the only remaining river that supports this life history; declines in the abundance and productivity of this run represent a significant loss to valuable life history diversity for the Central Valley fall-run

ESU overall. Furthermore, the DEIS/DEIR demonstrate large negative impacts to fall-run Chinook salmon incubation and juvenile rearing in the Sacramento River drainage. The available scientific information demonstrates that Alternative 4 will cause negative impacts upstream to the fall-run/late-fall run Chinook salmon ESU.

iii. North Delta Diversion Survival

The Draft Plan and DEIS/DEIR simply assume that screens on the new north Delta diversion will function perfectly and consistently throughout the life of the BDCP. The Draft Plan's Effects Analysis asserts that there is a "moderate" level of certainty that the effect will be "low." Draft Plan at 5.5.4-23. But this is contradicted by the Draft Plan's Appendix 5B, which declares that it was not possible to be certain about the level of impact these screens will have on either Chinook salmon or steelhead. Draft Plan, Appendix 5B at 5B-304. The DEIS/DEIR should have considered what would happen if the assumption of negligible entrainment was incorrect, even periodically (i.e. what if damage to, imperfect maintenance, or malfunction of the screens occurs with "x" frequency and results in "y" entrainment rate for a duration of "z" weeks?).

The DEIR/DEIS ignores analyses that show negative impacts of additional predation at the north Delta diversion facility. In addition to the bioenergetics model results presented in the DEIS/DEIR, the Draft Plan (Appendix 5F) also applies a fixed predation model, based on observed entrainment rates at the Glenn-Colusa Irrigation District diversion screens. These screens are somewhat similar to those proposed for the NDD. The two estimates of potential predation at the new facility provide strikingly different predictions of predation on Chinook salmon; the bioenergetics model indicates predation rates at the NDD will be <1% for all Chinook populations, whereas the fixed predation model estimates ~12-13% loss of juvenile migrants at the NDD for each population of Chinook salmon. Both models cannot be correct and the Draft Plan and DEIS simply ignore the result showing significant predation at the north Delta diversion. *See, e.g.*, Draft Plan Appendix 5F at 5.F-77. In reporting only the results that are more favorable to the BDCP, the Draft Plan and DEIS/DEIR miss the opportunity to learn from the different outputs of the two models and fail to inform decisionmakers and the public of the potential that these impacts may be more significant than reported in the documents. As the Delta Independent Science Review Panel noted, the high mortality of Chinook salmon at the GCID screening facility indicates that predators may aggregate near that structure, suggesting this risk exists for the NDD. DSP Independent Science Review Panel Report 2014 at 52. Thus, the difference between the two modeling approaches applied by the Draft Plan's appendix could reveal that the range of predator densities at the GCID facility or their metabolism is greater than those that were input to the bioenergetics model. The bioenergetics model methodology used to calculate potential predation rates arising from the presence of the North Delta diversion apparently would not predict existing mortality rates at the GCID screening facility; thus, a larger range of predator densities should have been modeled. Instead, the DEIS/DEIR and Draft

Plan simply assume that the high predation predicted by the fixed predation model was completely wrong (despite the fact that it's based on a relevant, recent, local observation). This assumption is not scientifically justified.

iv. Through-Delta Survival of Late Fall-Run

The effects analysis provides no compelling evidence that late-fall run Chinook salmon through-Delta survival success will improve under ESO conditions as compared to the environmental baseline (with equivalent assumptions regarding climate change). For example, the Delta Passage Model (DPM; which may actually be applicable to late-fall run Chinook salmon, though it is not appropriate for modeling other runs) finds very small differences in the early or late long-term between Alternative 4/H3 operations and current operations. Draft Plan at 5C.5.3-98 (Table 5C.5.3-49); DEIS/DEIR at 11-1458 (Table 11-4-76).

The DPM results are likely to underestimate negative effects of BDCP on through-Delta survival of late-fall run Chinook migrants because of reduced flows, decreased turbidity, and the potential for increased predator exposure. The reductions in flow and other changes below the new intakes are likely very different from the conditions that were used to generate DPM. Operation of CM1 will lead to significant reductions in flow rates downstream of the facility and will cause an increase in water clarity (due to diversion of sediment and loss of river velocity needed to support sediments that remain) and increase in the river's width-to-depth ratio (WDR; i.e., a drop in river stage). Flow rates and turbidity are strongly and positively correlated with late-fall run Chinook salmon survival through the Delta and WDR is strongly and negatively correlated with late-fall run survival. Michel 2010; Michel et al. 2012; *see* Perry et al. 2010. Thus, the changes anticipated under operation of CM1 are beyond the range used to create the relationships in the DPM model and all strongly indicate that late-fall run Chinook salmon are likely to suffer significant impacts in the lower Sacramento River. Furthermore, even the relative success of late-fall run migrants through different Delta channels is likely to change under CM1 operations as predator distribution and success rate may change as flows, turbidity, and depth in the mainstem Sacramento River drop, following operation of the new north Delta diversion.

As the Draft Plan notes, DPM does not account for "growth benefits related to floodplain and tidal wetland restoration," Draft Plan Appendix 5C at 5.C.5.3-65, but even if marsh restoration is successful, (a) late-fall run Chinook salmon juveniles generally follow a migrant strategy, *see* Michel 2010; Williams 2006; Williams 2010, and are thus not likely to use or benefit from those habitats, and (b) salmon rearing in tidal marsh habitats should be expected to experience *additional* mortality in the Delta (though potentially better post-Delta survival) because predation exposure will increase as time in the Delta increases and as foraging behavior

increases. Helfman et al. 1997.[75] Furthermore, DPM does not account for increased in-Delta mortality to migrating late-fall Chinook salmon that is likely to result from decreased turbidity under the BDCP (e.g. as a result of CM1 operation, sediment loss in restoring wetlands, CM4, etc.). Thus, DPM outputs are expected to overstate survival of late-fall run Chinook salmon through the Delta. In addition, the analysis provides no basis for concluding that the Draft Plan is likely to achieve the applicable through Delta survival objective and instead demonstrates that the Draft Plan is unlikely to achieve that biological objective for this species.

v. Through-Delta Survival of Fall-Run

It is well established that fall-run Chinook salmon experience greater survival through the Delta when river flows increase. Kjelson and Brandes 1989; Newman and Rice 2002. In-Delta flows in the Sacramento River channel are projected to decrease substantially once the new North Delta diversion (CM1) begins operations. Thus, the DEIS/DEIR and Draft Plan should anticipate that survival of fall-run Chinook salmon migrating through the Delta in the Sacramento River will decline substantially. Instead, the DEIR/DEIS and Draft Plan fail to adequately analyze survival rates of fry and parr fall-run Chinook salmon in the Delta, despite the fact that this represents most fall-run Chinook salmon migrating into the Delta.

DPM is not an appropriate tool for modeling cumulative fall-run Chinook salmon through-Delta survival rates because most fall-run Chinook salmon enter the Delta as fry or parr (foraging fish). Moyle 2002; Williams 2006. DPM is based on the relative success of migrant-strategy, hatchery-produced salmonids (such as late-fall run Chinook salmon) and thus cannot be used to understand fry and parr mortality in the Delta. Draft Plan at 5.C.5.3-65). We note that foraging fall-run Chinook salmon should be expected to experience higher through-Delta mortality than migrant strategy fish because (a) they are smaller, (b) they spend a longer time in the Delta, (c) foraging exposes fish to additional risk of predation compared with migratory behavior. Even applying DPM to large fall-run (or spring-run) smolt is subject to significant caveats as these fish migrate through the Delta in a different season than do late-fall run salmon; there is no reason to expect that survival rates (and even relative survival rates) in Delta channels remain unchanged across seasons as numerous influences on predator efficiency (temperature, light penetration, SAV coverage, etc.) may all change seasonally.

The Effects Analysis applies a modification of Newman's (2003) methodology to estimate survival of fall-run smolt survival through-Delta under different Alternative 4 scenarios. Again, smolts are expected to be a small fraction of fall-run entering the Delta. EBC2_LLT outperforms both ESO and HOS in the early long term, meaning that fall-run survival through the Delta is

[75] The Draft Plan and DEIS/DEIR ignore the likely positive relationship between increased in-Delta rearing time and total in-Delta mortality in their discussion of all salmonids.

lower under the Draft Plan than under the status quo. Draft Plan Appendix 5C at Tables 5C.5.3-115 and 5C.5.3-117. In the late long term, through Delta survival is higher under the baseline (EBC2_LLT) than under ESO. *See* Draft Plan at 5C.5.3-238 (Table 5C.5.3-116). Under HOS in the late long term, through Delta survival is similar to and may slightly exceed the baseline. Draft Plan at Table 5C.5.3-117. It is not clear that any of these results is statistically significant, and the Draft Plan should analyze these results using statistical techniques appropriate for paired model observations. Whatever the outcome, it is apparent that differences in through-Delta survival (if there are any) as estimated by this modification of the Newman (2003) methodology will be slight – not enough to claim any benefit to fall-run Chinook salmon smolt survival through the Delta and certainly not enough to achieve the Draft Plan's objectives for through Delta survival (FRCS1.1).

The DEIS/DEIR projects no overall change in through Delta survival for fall-run Chinook salmon migrating through the Delta from the San Joaquin River; decreases in through-Delta survival of ~3% in wet year survival are expected to be balanced by improvements in survival of ~1% during dry years. DEIS/DEIR at 11-1459. Setting aside the fact that the small projected changes in through-Delta survival are not equal (and would only "balance" if dry years were more frequent than wet years), the analysis demonstrates that the Draft Plan is likely unable to improve through-Delta survival rates of fall-run Chinook as specified in the biological objective for this species (objective FRCS1.1). Moreover, current rates of through-Delta survival are expected to lead to extirpation of fall-run Chinook emigrating from the San Joaquin basin in the very near future. Draft Plan Appendix 3G; NMFS Comments on the Phase I WQCP Update. We note that benefits to San Joaquin River fall-run Chinook salmon that are assumed to arise from measures in the conservation strategy (e.g. as described at 3.3.-158 through 159) cannot offset the impacts if fall-run Chinook salmon continue to suffer with status quo levels of through-Delta survival.

H. Delta Smelt

1. Draft Plan Objectives for Delta Smelt are Inadequate to Attain the NCCPA Standard for this Species

The Delta smelt geographic range for spawning, egg incubation, and early rearing fall is almost entirely contained within the Plan Area. *See, e.g.*, Moyle 2002; Bennett 2005; Nobriga and Herbold 2009; DEIS/DEIR at 11-1300. Thus, as discussed above, under the NCCPA the BDCP must provide conservation measures sufficient to achieve conservation (recovery) of this species.

The Draft Plan identifies a global goal for Delta smelt to "Remove delta smelt from the state and federal lists of endangered species through restoration of its abundance and distribution" Draft Plan at 3.3-107. The Draft Plan lists three global objectives that it believes, if attained, will lead

to attainment of the global goal (objectives define goals in SMART terms). The objectives relate to increased abundance, reduced entrainment, and increased spatial distribution of this species. However, the Draft Plan completely ignores the need to maintain or restore the historical range of life history variation of Delta smelt that is so important to its future viability. *See* Bennett 2005; Nobriga and Herbold 2009.

The Draft Plan appears to adopt the USFWS 1996 Draft Recovery Plan's global objective for spatial distribution of Delta smelt. Draft Plan at 3.3-107. This global objective is inadequate as it disregards the large portion of Delta smelt's historic range and historic spawning habitat (including the Central Delta and San Joaquin River, *see* Wang 2007). USFWS 1996 Draft Recovery Plan at 16. The USFWS correctly identifies the need to restore Delta smelt to its historic (1967-1981) distribution prior to de-listing. USFWS 1996 Draft Recovery Plan at 21. But its specific description of that range is inappropriately narrow. Also, as written, the Draft Recovery Plan's objective (and thus the BDCP's global objective) for spatial distribution allows for the species to be detected in just one sampling locality in 40% of years – for a species that is critically imperiled because of its limited geographic range, such an outcome cannot represent success of a conservation plan. The Draft Plan includes several measures that it claims will benefit Delta smelt in the south Delta, including reducing exports from the south Delta pumping facilities (CM1) and restoring shallow sub-tidal habitats in the south Delta ROA, e.g. Draft Plan at 3.3-112; thus, the Draft Plan should acknowledge its intent to restore Delta smelt to their historic range, including in the south Delta.

The BDCP-specific set of these objectives calls for (1) improving fecundity, (2) limiting entrainment, and (3) achieving target abundance. Draft Plan at 3.3-108. The first two of these objectives are related to the productivity attribute of viability while the third objective is related to the abundance viability attribute. *See* McElhany et al. 2000. The first two of these "abundance" objectives actually relate to "productivity", as they address biological rates, not threshold values of abundance or ecosystem capacity to maintain abundance levels. The first (DTSM1.1) calls for increases in Delta smelt fecundity – this is a laudable target, but the statement has none of the specificity required of SMART objectives. What does it mean to "increase" fecundity? How much? And by when must this increase occur? DTSM1.1 does not provide answers to these questions; thus, it is not useful in guiding development or evaluation of restoration actions in the Draft Plan or in guiding adaptive management of the BDCP following implementation. Without more specificity, it is not possible to know how actions described by this or other Plans will contribute towards attainment of this biological outcome.

The second of the Delta smelt targets related to productivity calls for limiting entrainment of Delta smelt. As described for longfin smelt (the parallel objectives are nearly identical), DTSM1.2 is inadequate to conserve or restore Delta smelt. First, there is no time-bound for this objective. Second, the objective is less protective of Delta smelt than protections already offered

by the USFWS 2008 Biological Opinion; for instance, because the target is constructed as a 5-year running average, extremely high rates of entrainment (i.e. up to 25%) can occur in a single year without triggering a response from BDCP's implementing agency and adaptive management process. USFWS 2008 at 387; *see* discussion *supra.* Such a result could be devastating to the population. *See* Kimmerer 2011. Also, as the Draft Plan notes, entrainment rates are highly variable due to environmental conditions in any year, and measuring entrainment as a 5-year running average obscures the impact of measures identified in the Draft Plan that are intended to reduce entrainment as these effects are conflated with "natural" variance in entrainment and entrainment-related risk.

Again, we note that the second component of the DTSM1.2 (assure that entrainment risk is evenly distributed over the adult migration and larval-juvenile life stages) is not adequately described to allow us to understand what this target will accomplish or how it will be implemented. As with the similar longfin smelt entrainment objective, this component of the "entrainment objective" could easily be made into its own "life history diversity" sub-objective or stressor reduction target and defined as a limit on entrainment on a short, within year time step (e.g. a maximum entrainment of x% in any one or two week period). Such an objective would limit disproportionate entrainment impacts on any one temporal segment of the critical life stages of this species. Combined with a single-year limit (e.g. ≤5%) and a 5-year running average (e.g. ≤3%), a within-year time step would provide protection against entrainment impacts to life history diversity, productivity, and abundance.

Furthermore, this Delta smelt "objective" is actually a stressor reduction target, as is the parallel target for longfin smelt. Although entrainment rates are an important source of Delta smelt mortality that the BDCP must reduce, they are not the only factor related to Delta smelt productivity (population growth rate potential).[76] The Draft Plan should have an objective for Delta smelt survival rates (productivity) of larval, juvenile, and sub-adult Delta smelt that complement its stated (though non-specific) objective for increased fecundity. Both of these productivity objectives should be consistent with the goal of delisting the species as quickly as possible; SMART targets for reducing particular stressors (e.g. entrainment) to levels that will allow attainment of the required survival objective should be clearly articulated as stressor reduction targets. However, substituting biological outcomes (productivity expressed as survival and/or fecundity rates) for particular strategies chosen to achieve those outcomes (e.g. reduction in entrainment) inappropriately narrows the options available to achieve desired biological

[76] This omission is partially (though inadequately) resolved in the BDCP-specific objectives for Delta smelt which identify a target for fecundity (another driver of population growth potential) and in the conservation measures for this species which seek to address other sources of mortality for this species. The scattering of components of species' productivity across the Draft Plan's conservation strategy for Delta smelt represents its general confusion about attributes of species' viability and the function of different levels of the logic chain framework for conservation planning.

conditions. In other words, even were entrainment rates reduced more than is called for in the Draft Plan target, desired productivity (population growth rates) for Delta smelt might not be achieved if other forces (water quality, predation) limited survival rates; attainment of the Draft Plan's targets ("success") while failing to produce desired levels for each attribute of species viability does not represent success.

Similarly, another objective for Delta smelt sets targets to "increase the extent of suitable habitats…" Draft Plan at 3.3-111. This objective in the Draft Plan inappropriately changes from a spatial distribution objective that defines a desired biological outcome (expressed in the parallel global objective as detecting Delta smelt in various areas throughout the Plan Area, *see* Draft Plan at 3.3-107) to creating "habitat" – the two are not the same. The current BDCP objective DTSM2.1 is actually a stressor reduction target and, as defined, is more related to providing the habitat capacity the Draft Plan believes to be necessary to support Delta smelt abundance. The term "habitat" can encompass everything from physical characteristics to biotic interactions (and the Draft Plan does describe these to a certain extent) and, in choosing so vague a term as "habitat" to supplement the very specific desired outcome (repeated detection of Delta smelt successful use of various areas), the Draft Plan immediately loses focus on what needs to happen to restore this species to a geographic range that will represent a viable Delta smelt population. For example, whereas the inadequate global objective at least specified the frequency with which Delta smelt must be detected in certain areas, the BDCP-specific objective states only "Suitable habitat for delta smelt should also be distributed geographically within the Plan Area to provide a diversity of habitat locations for delta smelt." Draft Plan at 3.3-112; this is not a SMART objective and thus obscures the Plan's intentions and limits the ability to rectify inadequate performance, because adequate performance has not been defined.

Thus, the Draft Plan has no adequate SMART target for improving and conserving the spatial extent of Delta smelt. The erosion of the Delta smelt's geographic range is a major concern for this species' conservation and restoration as they have an extremely small spawning range, that is much-reduced from historical conditions. USFWS 1996; Bennett 2005; Nobriga and Herbold 2009. Restricted geographic ranges (i.e., the area encompassed by successful spawning at the population-level) are well-correlated with extinction risk among freshwater fishes. Rosenfield 2002. The same is true for other species. *See* Macarthur and Wilson 1967; Meffe and Carrol 1994; Laurance et al. 2002. In fact, the Draft Plan identifies a "limited geographic range" as a threat to this species, *see* Draft Plan at 3.3-98, and it defines restoration of spatial distribution as global goal and objective for restoration of Delta smelt, *see* Draft Plan at 3.3-104. It also claims that the conservation measures will improve spatial distribution of juveniles and pre-spawning adults. *Id.* at 3.3-99. But neither the global objective nor BDCP-specific objective will ensure an adequate *spawning range* for this species, which is increasingly confined to the northwest corner of the Delta. The Draft Plan objective (and stressor reduction targets and conservation measures that flow from them) must provide for increased distribution of spawning among Delta smelt into

the central Delta and lower San Joaquin River. Delta smelt spawning, larval, and post-larval distribution is closely tied to Delta outflow and salinity. *See, e.g.,* Dege and Brown 2004; Bennett 2005; Nobriga and Herbold 2009. Both Delta outflow and salinity would be heavily influenced by water project operations and restoration actions under the Draft Plan. The failure to adequately define necessary spatial distribution targets for this species (which arguably experiences immediate risk from its severely constrained geographic range that is equal to or greater than the risk it experiences from its extremely low abundance), and to design measures to alleviate this risk, is a serious shortcoming of the Draft Plan's strategy to conserve and restore Delta smelt.

As noted above, the Draft Plan identifies no target to conserve and restore life history diversity among Delta smelt. Differential impacts to certain life history variants has been identified in Delta smelt and it is believed that diversity in spawning timing, growth rates, repeat spawning, and fecundity play a critical role in the Delta smelt population. Bennett 2005; Nobriga and Herbold 2009. The Draft Plan's entrainment objective for Delta smelt (DTSM1.2) actually suggests the benefit of protecting life history diversity in this species, as it states that entrainment should, "Assure that proportional entrainment risk is evenly distribution over the adult migration and larval-juvenile rearing time periods." Draft Plan at 3.3-104. This clause is not defined adequately (not SMART) to allow for evaluation of its effects or implementation through conservation actions. Also, the Draft Plan states as a "landscape objective" for Delta smelt the extremely general intent to "Maintain or increase the diversity of spawning, rearing, and migration conditions for native fish species in support of life history diversity," Draft Plan at 3.3-99, but it contradicts that intention stating that "maintaining or increasing life-history diversity is not as applicable to delta smelt [because] delta smelt do not have the range of life-history strategies…that species such as Chinook salmon have," Draft plan at 3.3-100. This statement is simply false. For instance, otolith studies have shown significant variation in life history strategies and differential survival rates depending upon the timing and location of spawning and rearing. *See, e.g.*, Hobbs et al. 2007; USFWS 2011 at 173 (draft biological opinion). As elsewhere, the Draft Plan's failure to identify objectives that represent desired outcomes for each attribute of species viability (as opposed to targets for reduction of stressors the Draft Plan *believes* will produce those desired outcomes) impedes its ability to develop specific, measureable targets that can be used to (1) evaluate the Draft Plan prior to implementation, (2) determine its progress towards these targets and adjust, as necessary, following implementation, (3) identify stressors that impede attainment of the targets, and (4) design conservation measures that provide the right level of benefit to the species. In this case, the failure to develop specific metrics for measuring the maintenance or restoration of life history diversity among the Delta smelt population is a key failing of the Draft Plan; Delta smelt are threatened by human-induced loss of critical life history diversity, *see* Bennett 2005, and this threat will be allowed to persist (and may be increased) under the Draft Plan.

Even the objectives that the Draft Plan does specify are inadequate to conserve the species in the Plan Area. The Draft Plan's biological objective for abundance (objective DTSM1.3, *see* Draft Plan at 3.3-108) is inadequate. The objective, while specific, measureable, achievable, and relevant to its associated goal, is not time-bound. There is no indication of *when* the Draft Plan intends to achieve this target. Without a specific time-bound, no trigger exists to force an evaluation of progress towards the target – without a specific trigger, adaptive management is unlikely to occur. Moreover, this objective only requires that its targets, to achieve a Recovery Index ≥ 239 for at least two years of *any* consecutive 5-year period, are achieved once; as written, the Delta smelt population can decline swiftly after attaining this target one time. Even the "floor" of the objective (limiting any two consecutive years to a mean Recovery Index of 84) can result in extinction without violating the objective; for instance, if the Delta smelt Recovery Index in one year is 169, then extinction (Recovery Index of 0) could occur the next year without causing the 2-yr average to drop below 84. The abundance objectives for Delta smelt must be rewritten to prevent extinction (e.g., establishing minimum values for any 1 year) and to require a high level of performance after attaining intermediate targets (e.g., after hitting 239 on the Recovery Index).

As currently drafted, these objectives for Delta smelt are inadequate, and the objectives in the Draft Plan should be revised consistent with these comments.

2. <u>The Draft Plan Fails to Identify and Address the Correct Stressors on this Species</u>

The Draft Plan presents a scattered and unbalanced description of stressors on the Delta smelt population, ignoring some stressors entirely and focusing myopically on others. In tables identifying the Draft Plan's objectives, stressors, and stressor reduction targets, it identifies as stressors only "food" and "habitat" (which is partially determined by the availability of "food"). As with longfin smelt, the Draft Plan does not specifically identify entrainment rates at the south Delta export facilities as a stressor, even though it sets an objective for reducing entrainment rates. Draft Plan at 3.3-108. Entrainment is a well-studied and well-documented stressor on the Delta smelt population that has population level effects. Kimmerer 2008, 2011; Kimmerer and Nobriga 2008; Mac Nally 2010; Thomson 2010; Maunder and Deriso 2011; Rose et al. 2013a,b; *see discussion above*. The failure to clearly identify this stressor is a major omission and is inconsistent with the best available science.

The Draft Plan is also inconsistent in its description of the type of habitat that Delta smelt need. There is no evidence that Delta smelt *abundance* suffers from lack of spawning habitat (i.e. that there is not sufficient habitat for Delta smelt to spawn in), but there is ample evidence that the spatial extent of Delta smelt spawning habitat is increasingly limited to an extremely small

fraction of its historic range. Nobriga and Herbold 2009. As we describe above, the Draft Plan acknowledges these facts in some places but then claims benefits from what it believes will be an increased abundance of Delta smelt spawning habitat (which is not well-described in the literature) while ignoring the need for increased spatial extent of that habitat.

The Draft Plan's description of stressors also fails to acknowledge the importance of reduced flows and an altered Delta hydrograph as important stressors that affect "habitat" for this species (including suitable salinity conditions). As a result of failing to acknowledge the importance of the flow stressor to this species, the Draft Plan is equivocal about the need for flows and assumes that it can provide adequate low salinity habitat for Delta smelt simply by constructing new habitats. The effect of outflows on the extent, availability, and quality of Delta smelt habitat in the spring, summer, and fall months is well-documented. Dege and Brown 2004; Bennett 2005; Nobriga et al. 2008; Nobriga and Herbold 2009; Kimmerer et al. 2009; Feyrer et al. 2007, 2010. In particular, several studies have related the long-term decline in flows to limited habitat extent during the fall months and to fluctuations in Delta smelt abundance indices. Feyrer et al. 2007; Feyrer et al. 2010; USFWS 2008 Biological Opinion; USFWS 2011 (draft biological opinion). The 2008 biological opinion requires implementation of a "Fall X2" action. USFWS 2008.

Thus, the Draft Plan fails to adopt the best available science, which confirms the role of freshwater flow in affecting the habitat area available to this species. As a result, the Draft Plan's description of its "decision tree" process to determine optimal outflows for covered species is inaccurate because it does not "initially use operating criteria based on the best information available," Draft Plan at 3.3-113, and this strategy for determining outflow requirements (as described in CM1 Water Facilities and Operation) is inadequate – if the Draft Plan ignores the best available science that is currently available, there is no assurance that it will utilize additional science as it becomes available in the future.

3. Conservation Measures do not Adequately Address Known Stressors for this Species and/or Their Impacts are Overstated

As elsewhere in the Draft Plan, the rationale behind different conservation measures intended to benefit Delta smelt contradicts the Draft Plan's explanation of why this species has declined. Some of the Draft Plan's conservation measures do not address the identified stressors (even conceptually) and, in some cases, will aggravate those stressors. For example conservation measures that the Draft Plan and DEIS/DEIR expect will generate large quantities of important food items for Delta smelt (e.g. CM2 and CM4) ignore the Draft Plan's favored causes of food declines (invasive clams and/or nutrient ratio limitations on prey productivity). These and other logical disconnects between the Draft Plan's description and prioritization of stressors on Delta smelt and the actions it proposes to conserve species in the Plan area are further described in our discussion of longfin smelt.

In addition, we note that the operation of a new North Delta diversion (CM1) is not consistent with ameliorating an important stressor on Delta smelt: low turbidity. Delta smelt are strongly associated with higher turbidity waters within their range and recent reductions in turbidity are among the stressors believed to affect this species' predation-related mortality and productivity overall. Feyrer et al. 2007; Feyrer et al. 2011; Herbold and Nobriga 2009. The Draft Plan acknowledges the need to raise turbidity levels within the Delta smelt range, and identifies lower turbidity as a stressor. Draft Plan at 3.3-100; Draft Plan, Appendix F, Attachment 5C.D; Draft Plan, Appendix 5.F at 5.F-ii. The Draft Plan includes turbidity as part of numerous objectives. *See* Objectives L2.2 and L2.11, Draft Plan at 3.3-103; Objective TPANC2.1, Draft Plan at 3.3-105; Objective DTSM2.1, Draft Plan at 3.3-111. And the Draft Plan designs specific conservation measures (CM 13) to address the problem locally. The Draft Plan states: "For this effects analysis, it was assumed with <u>very high certainty that water clarity is an attribute of critical importance</u> to delta smelt larvae, juveniles, and adults." Draft Plan at 5.5.1-30 (emphasis added). The Draft Plan also identifies low turbidity as a stressor on longfin smelt, Draft Plan at 3.3-114, Sacramento splittail, Draft Plan at 3.3-174, green sturgeon, Draft Plan at 3.3-183, white sturgeon, Draft Plan at 3.3-196, and water quality in the Delta generally, Draft Plan at 3.2-6. In addition, the Draft Plan should have identified low turbidity conditions as a stressor on Delta smelt as decreased turbidity is associated with higher predation-related mortality for many native species. *See* Gregory 1993; Gregory and Levings 1998.

When CM1 operations begin, water and the turbidity it carries will be removed from the lower Sacramento River and the north Delta – the very areas the Draft Plan targets for Delta smelt "restoration." The U.S. Fish and Wildlife Service previously expressed concern with the effect of CM1 operations on turbidity on Delta smelt and longfin smelt as follows:

> The effects analysis acknowledges that a portion of the Sacramento River sediment supply will be diverted at the North Delta intakes, and that that diversion might be detrimental to native fishes, estimating the average effect to be minus 8-9% of sediment. It is hard to draw definitive conclusions about the ultimate effect of this change, but an average loss of 8-9% of the sediment supply that would ordinarily pass into the Delta and Suisun Bay likely implies higher average water clarity throughout the year. Besides potentially negative effects on delta smelt and longfin smelt and their habitat, which benefit from turbid water, clearer water would encourage growth of exotic aquatic plants and related effects in many areas of the North and West Delta.
>
> …
>
> [Diversion of turbidity at a north Delta intake] …remains an important issue, because we are concerned that an average loss of 8-9% of sediment will have greater negative effects on delta smelt and longfin smelt and their habitats

> downstream of the diversions than are acknowledged in the effects analysis and net effects, and will likely encourage the growth of exotic aquatic plants in the lower Sacramento River and in off-channel tidal marsh areas.

USFWS 2013 Progress Assessment at 16; *see id.* at 8. Both USFWS and CDFW raised similar concerns in earlier analyses. USFWS Red Flags 2012; CDFW Red Flags 2012. The Delta Independent Science Board also raised similar concerns. Delta ISB 2014 at B-24. Unfortunately, as discussed below, the DEIS/DEIR improperly understate the negative effects of BDCP on delta smelt, including the negative effects of CM1 operations on turbidity levels throughout the Delta and those impacts to Delta smelt and other species.

4. Projected Outcomes for Delta Smelt are Inaccurate, and/or do not Attain the Conservation Standard for this Species. In addition, Presentation of these Results is Incoherent, Biased, and Unacceptably Confusing

The Draft Plan and DEIR/DEIS both demonstrate that BDCP is likely to result in substantial negative impacts to Delta smelt and is unlikely to achieve the biological objectives for the species. This is clear even though both documents fail to synthesize the expected outcomes of BDCP conservation measures and operations to Delta smelt. There are numerous life cycle models and statistical models that the documents can and should have used and/or modified by the Draft Plan effects analysis and the DEIS/DEIR to assess the impacts to Delta smelt of the Draft Plan and operational alternatives. Statistical approaches to understanding cumulative effects of changes in multiple environmental variables have been developed and demonstrated, for example by Thomson et al. 2010, Mac Nally et al. 2010. Life cycle models described by Rose et al. (2013a,b) should also have been applied to understand the combined effects of changes to environmental conditions that would result from BDCP. Failure to provide such analyses represents an unacceptable omission from the DEIS/DEIR. Numerous peer reviews have also expressed concern that the Draft Plan and DEIS/DEIR inappropriately excluded some of these life cycle models. DSP Independent Science Review Panel Report 2014 at 14, 21, 31-32 (expressing concern that some models were inappropriately dismissed, and stating on pages 31-32 that, "Appendix 5G excluded delta smelt life cycle models in the Effects Analysis without adequate justification."); Delta ISB 2014 at B-43, B-45.

i. Entrainment Rates for Adult and Larval-Juvenile Delta Smelt are Likely to Exceed Targets set by Draft Plan Objectives and Claims of Modest CM1 Benefits are Likely Overstated

The Draft Plan's claim of reduced entrainment resulting from the BDCP is confused, internally inconsistent, and unsubstantiated. The Effects Analysis and DEIS/DEIR confuse the issue by discussing separately the results of its analyses of larval-juvenile and adult Delta smelt; the

outcome that matters is the proportional entrainment to the Delta smelt population as a whole (i.e. the Draft Plan's objective and overall impacts to productivity must be assessed by the additive effect of entrainment to the two life history stages). The Draft Plan claims relative reductions of ~20% in both adult and larval entrainment under BDCP, but these results translate to an average reduction in entrainment of only 1.5% or 2% respectively. The DEIS/DEIR analysis reveals only tiny differences in entrainment rates between Alternative 3 operations and the NAA. Draft Plan at Figures 11-3-1, 11-3-2 (which is actually the same figure as the previous, though labeled differently)). The DEIS/DEIR identify similarly small differences in entrainment among Alternative 4 operational variants H1, H3, and H4. Draft Plan at Figures 11-4-1 and 11-4-2. Although, in most years, absolute entrainment rates for each of the Alternative 4 variants, are projected to be well above the 5% target of identified in the conservation strategy, all of the *differences* between BDCP operations and NAA are less than 5% in absolute terms. These "differences" in modeled outcomes are unlikely to represent any change at all in actual entrainment rates within year-type comparisons; however, if it can be shown that the projected differences are significant within the error of the modeling technique, then it must also be concluded that Alternative 4/H3 has higher entrainment rates than NAA in most years and that all Alternative 4 variants have higher entrainment rates than NAA in Critically Dry years. DEIS/DEIR at Figure 11-4-1.

The Draft Plan's entrainment appendix (5B) provides estimates of entrainment impacts for the population as a whole (both age classes considered together) and demonstrates that all Alternative 4 operational variants would have total entrainment rates that are much higher than the 5% annual total average entrainment called for by objective DTSM1.2 (Figure 5.B.6-22 at 5.B-215).[77] This strongly implies that the BDCP will fail to meet its own entrainment objective for Delta smelt and that it will violate the existing incidental take limit of 5% of the adult population in any year. USFWS 2008 Biological Opinion at 387. Nonetheless, the Draft Plan concludes that BDCP will produce a "moderate" positive change for adult Delta smelt and a "low" positive change for larval and juvenile Delta smelt and (at 5.5.1-28) – the Draft Plan does not explain the difference in the two ratings given that projected reductions in entrainment of adult and larval-juvenile Delta smelt are both less than 5% in absolute terms and the difference between the two outcomes is less than 0.5%. In contrast to the findings in the Draft Plan, agency biologists who participated in August 2013 workshops "suggested that <u>zero</u> or low positive change [for larval-juvenile entrainment] would be warranted on the basis of the high-outflow scenario" and "<u>low</u> to moderate change" would be warranted for adult Delta smelt. Draft Plan at 5.5.1-28 (emphasis added). The Draft Plan does not explain why it chose the high end of agency biologist position in each case, but we note that the sum of a "low" and a "moderate" change is qualitatively different than the sum of a "zero" and "low" change – the Draft Plan's optimism biases the overall projected result.

[77] Only Wet water year types have average entrainment rates close to 5%.

The claim of "high certainty" about the projected benefits of reductions in Delta smelt entrainment, Draft Plan at 5.5.1-28, is unwarranted and unsupported by science and by the Draft Plan's own statements. The small differences in projected entrainment rates among variants of the Alternative 4 do not suggest a significant difference (i.e. greater than the intrinsic error rate of the entrainment modeling method).[78] In fact, the Draft Plan contradicts its own statements of certainty in the same paragraph where those statements are offered, as it acknowledges that "modeling of entrainment of larval-juvenile delta smelt—and indeed other species—has uncertainty because of real-time management decisions that could occur and alter export rates from those modeled here … Such decisions cannot be modeled accurately; accordingly, the results of the entrainment analyses should be viewed with some caution" and "the extent of positive change under the BDCP in light of existing and future real-time management cannot be predicted with very high certainty." Draft Plan at 5.5.1-28. Thus, the Draft Plan overrates the certainty of its supposed entrainment benefits to Delta smelt entrainment.

The BDCP can attain lower entrainment rates than those projected under Alternative 4 operations. The entrainment rates under Alternative 4 operations are, at best, only slightly better (if at all) from those under baseline operations, but, there appear to be substantial changes in entrainment across year-types, with wetter years showing lower (though still high) entrainment rates. This demonstrates that human management activities in the Delta can have meaningful impacts on Delta smelt entrainment. Differences in Delta conditions among year-types are largely a result of human management decisions, although there are certainly exceptions (such as wet years that follow wet years, when flood control releases occur, or after several drier conditions in a row, when management options regarding Delta flow conditions are severely limited). Differences in year-type conditions in the Delta that are under the control of human export and reservoir release decisions appear to produce measureable differences in Delta smelt entrainment. As the documents acknowledge, "[h]igher outflows under HOS_LLT could result in lower proportional entrainment loss of larval-juvenile delta smelt than under EBC2_LLT." Draft Plan at 5.5.1-28. In contrast to these smaller changes, the data presented in the Draft Plan and DEIS/DEIR demonstrate that Alternative 7 and Alternative 8 operations project substantial declines in both juvenile and adult Delta smelt entrainment. DEIS/DEIR at Figures 11-7-1, 11-7-2 and 11-8-1, 11-8-2. Thus, it is possible for operational decisions to produce larger reductions in Delta smelt entrainment that appear capable, with some refinement, of satisfying the BDCP Delta smelt entrainment objective (DTSM1.2) and of producing a substantial benefit to the species relative to the NAA.

[78] As discussed in section 2 of these comments, modeled results are unlikely to occur.

ii. The DEIS/DEIR and Draft Plan Understate and Improperly Downplay Negative Impacts to Delta turbidity Caused by BDCP, and this will Cause Significant Impacts to the Species

The concerns with impacts to turbidity found in previous versions of the Draft Plan (*see above*) were not addressed in the current Draft Plan and DEIS/DEIR; the DEIS/DEIR acknowledges the potential for an 8 or 9% decline in turbidity on average (under ESO_LLT or HOS_LLT scenarios, respectively as compared to NAA). DEIS/DEIR at 11-267. The effect is actually larger than the DEIS/DEIR acknowledges as operations under ESO_LLT are expected to remove well over 20% of the Sacramento River's sediment load in most months April-October. Draft Plan at Figure 5C.D-11. Both sets of results are for "average" conditions, meaning the actual loss of turbidity is likely to be greater in some years (probably in wet years, when the north Delta diversions would divert a greater amount of flow). Finally, the DEIS/DEIR and Draft Plan's estimate of average effects on turbidity levels throughout the Delta incorporates anticipated additions of suspended sediment from floodplain inundation on the Yolo Bypass, but the increased acreages and frequency of floodplain inundation anticipated by the Draft Plan were improperly excluded from the baseline as restoration of even greater acreages are required under NMFS 2009 Biological Opinion.[79] Thus, the Draft Plan and DEIR/DEIS improperly report lower levels of turbidity impact under BDCP than would occur under an accurate accounting of baseline conditions.

Even given their underreporting of anticipated declines in turbidity under the BDCP, the Draft Plan and DEIS/DEIR downplay the effect of reduced turbidity as a result of CM1 operations. The DEIS/DEIR does not adequately explain or analyze its interpretation of projected reduced turbidity throughout the Delta, despite the DEIS/DEIR's claim that, for its physical modeling, "A 'difference' was defined as a >5% difference between the pair of model scenarios in at least one water year type in at least 1 month." DEIS/DEIR at 11-202. The Draft Plan declares with "very high certainty" that reduced turbidity is a stressor of "critical importance," found a large proportional negative change in the stressor under BDCP operations, and then concluded that the impacts of such a change are "low" or nonexistent with "low" certainty. Draft Plan at 5.5.1-31. This conclusion is unwarranted and not supported by the scientific information that is available. The average loss of turbidity of 8-9% (and, more likely, over 20% in some months) is a significant impact. Thus, in addition to concerns about the impact of reduced flows below the north Delta diversion and its effects on through-Delta flows and Delta outflow (addressed elsewhere), it is clear that CM1 aggravates rather than alleviates important stressors like low turbidity that affect most, if not all, of the covered species. The magnitude of CM1 operations reduction of turbidity suggests that it will have a significant negative impact on productivity (for

[79] This is another example of how the improper baselines lead to flawed analysis of potential impacts. *See* discussion *supra* regarding improper baselines for analysis.

instance through increased predation and decreased foraging success) of Delta smelt, longfin smelt, Chinook salmon, and Sacramento splittail. We note that low river flows below the north Delta diversion may cause additional reductions in turbidity (slower river velocities can result in deposition of additional sediments, beyond those that are diverted directly at CM1) and that there are synergistic interactions between reduced river velocities, stage, and turbidity that would lead to increased predation of Delta smelt and other small fishes in the riverine environment below the north Delta diversion. In addition, the loss of turbidity may further reduce the geographic range and carrying capacity of the Delta for endemic species like Delta smelt, *see* Nobriga and Herbold 2009 at 14, and Sacramento splittail.

5. The Draft Plan and DEIS/DEIR Fail to use the Best Available Science Regarding the Impacts of Tidal Marsh Habitat Restoration, Dramatically Overstating the Likely Benefits to Delta Smelt and Understating Likely Negative Impacts to the Species Under the Draft Plan and some Alternatives

There is no indication that Delta smelt populations are limited by the availability of shallow sub-tidal or inter-tidal habitats, except as access is limited by unsuitable salinity or temperature conditions. *See, e.g.*, Nobriga and Herbold 2009. For example, the Draft Plan acknowledges that spawning habitat is not believed to be limiting to the population. Draft Plan, Appendix 5F at 5.F-63. So, it is not clear why the Draft Plan concludes with "moderate certainty" that there would be an "very high positive change in the intertidal habitat attribute for occupancy by delta smelt eggs and larvae as a result of restoration actions under CM4 Tidal Natural Communities Restoration" and that there would be a "moderate" positive change in egg and larval habitat from addition of subtidal habitat. Draft Plan at 5.5.1-9. These statements obviously overstate the potential for any benefit to Delta smelt spawning habitat (if, indeed, such habitat is limited by the existence of shallow water, and not by the existence of appropriate salinity and flow conditions in existing shallow water habitats). In particular, they assume that all restored wetland acreages, and both inter-tidal and sub-tidal habitats, will benefit Delta smelt eggs and larvae when, in fact, inter-tidal habitats are unlikely to provide any direct benefit to either larvae or eggs. Bennett 2005; Nobriga and Herbold 2009. Shallow sub-tidal habitats may be locations of egg deposition (though this is unknown; Nobriga and Herbold 2009) but, upon hatching, larval Delta smelt are believed to migrate quickly away from nearshore habitats towards the Delta's low salinity zone. Dege and Brown 2004; Nobriga and Herbold 2009 at 5, 9. It is thus highly unlikely that larval Delta smelt experience benefits substantial benefit from shallow sub-tidal habitats of the type targeted for restoration by the BDCP.[80]

[80] Again, we emphasize, as we have many times before, that we are not opposed to restoring tidal and sub-tidal wetlands in the Plan Area as a potential measure that may benefit numerous species and ecosystem processes in the Delta and northern San Francisco Estuary. However, the Draft Plan's heavy

Numerous reviewers have reached similar conclusions. In their 2013 comments on a previous version of the Draft Plan, the USFWS recommended that future versions: "…either (1) show through modeling what subset of "tidal habitat restoration" will have sandy beaches with a turbid, active overlying water column, or (2) avoid the speculation that habitat restoration will create spawning habitat and the speculation that spawning habitat is limiting delta smelt recruitment"; analogous recommendations were made for longfin smelt. USFWS 2013 Progress Assessment at 9.Although some studies have found benefit of "shallow" environments for Delta smelt, these almost always refer to the shallow pelagic environments like those in Suisun Bay (Bennett 2005; Hobbs et al. 2006; Nobriga and Herbold 2009), not, as the Draft Plan assumes, those immediately adjacent (within one to several dozen meters) of historic or restored wetlands. Furthermore, the Draft Plan overstates the acreages of "restored" wetlands that are likely to benefit Delta smelt (if those benefits even occur); the USFWS stated in 2013 that:

> Because delta and longfin smelts are generally pelagic fish, they are not expected to extensively rear in many restored tidal habitats except under very specific circumstances where there is somewhat deep (> 1, but < 4 meters), cool, and very turbid open water (examples: Liberty Island, Suisun Bay, Sherman Lake). These conditions cannot be created everywhere. Current scientific understanding suggests that some regions of the Plan Area are unlikely to be good places for delta and longfin smelt – especially if the only practical option is to flood subsided Delta islands; existing examples include the interiors of Franks Tract and Mildred Island.

USFWS, 2013 Progress Assessment at 14-15. Even if Delta smelt receive little (or short-lived) direct benefit (related only to spawning and egg incubation) from some fraction of the shallow sub-tidal, nearshore habitats targeted for restoration under the BDCP, the Draft Plan's claims of increased suitable habitat during fall (non-spawning) months (Fall X2 habitat) are overstated and inaccurate. Draft Plan, Table 5.5.1-6; DEIS/DEIR, Table 11-4-3. As the DEIS/DEIR states, with regard to its projections for fall habitat for Delta smelt:

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reliance on these measures to address all manner of problems for all covered fish species lack scientific support and fails to adequately consider well-known risks of such restoration projects. We, and others, have recommended before that these marsh restoration actions should be implemented as targeted research projects so that uncertainties regarding their potential beneficial and negative impacts can be reduced and so that agencies responsible for BDCP implementation can learn whether there are design or implementation strategies that maximize benefits and minimize risks of these restorations. If the Draft Plan's expectations of benefits from the proposed tidal marsh restoration actions are demonstrated, then an effective adaptive management program can adjust the overall strategy accordingly. *See also* National Research Council 2010; USFWS 2013 Progress Assessment at 8; Mount and Saracino et al. 2013 at 109.

> The benefits of restored habitat for this species will depend on the success of restoration in creating physical habitat for smelt and in fostering ecological conditions that favor good feeding conditions and production of food upon which smelt can feed. The magnitude of restored habitat benefits is uncertain.

DEIS/DEIR at 11-1298; *see* discussion *infra*. Furthermore, the Draft Plan's assumption that Delta smelt may benefit from spawning in shallow sub-tidal habitats fails to consider that such habitats may also be occupied by invasive predators, such as inland silverside, Nobriga and Herbold 2009, and that restoration of these habitats may support predators as well, Grimaldo et al. 2012. Indeed, the potential for restored areas to be colonized organisms that compete with Delta smelt for food or prey on different life stages of Delta smelt were chief concerns of the earlier expert review of a prior draft of the BDCP. Essex Partnership 2009 (2009 DRERIP reviews). However, these scientific concerns are not addressed at all with regard to habitat restoration in the DEIS/DEIR and are only mentioned in passing in the Draft Plan.

The Draft Plan argues that, "The certainty level reflects some uncertainty regarding selection of habitat types by delta smelt." Draft Plan at 5.5.1-10. This is an understatement as, even though spawning microhabitat utilization of Delta smelt are unknown, Bennett 2005, they are not believed to include inter-tidal habitats, *see* Nobriga and Herbold 2009. As the Draft Plan admits, agency biologists polled at an August 2013 workshop concluded that, "… the function of the restored intertidal habitat for delta smelt may have less to do with direct occupation as opposed to other functions." Draft Plan at 5.5.1-10. Additional uncertainty must be attributed to any benefit to Delta smelt because, as the Draft Plan notes, "Use of restored areas by delta smelt will depend on the habitat characteristics within these areas (e.g., the extent of tidal excursion and velocity, temperature, and turbidity)," factors that have not been described or modeled for the BDCP's wetland and sub-tidal restoration areas.

Equally important, as described at length above, there is little to no scientific support for the notion that the Draft Plan's habitat restoration conservation measures (e.g. CM2, CM4) will export substantial amounts of Delta smelt food items to the pelagic habitats these fish inhabit. Numerous agencies and independent expert reports have found unlikely or, at best, highly uncertain the Draft Plan's proposed linkage between tidal marsh restorations and meaningful benefits to the Delta smelt prey base (i.e. the kind of food Delta smelt consume in the areas and at the times where food is believed to limit their populations), including:

- Brown 2003;
- National Research Council 2010;
- USFWS Red Flags 2012;
- USFWS Progress Assessment 2013;
- DSC 2013 BDCP Comments;

- DSP Independent Science Review Panel Report 2014;
- Delta ISB 2014;
- Mount and Saracino et al. 2013;
- Herbold et al.2014; and
- BDCP's own review process involving outside scientific experts (DRERIP Reviews, Essex Partnership 2009)

Each of these reports is described in detail elsewhere in this comment letter.

Thus, there is no scientific support for the Draft Plan's conclusions that tidal and sub-tidal habitat restoration will produce: "…a moderate positive change … on zooplankton abundance for juvenile delta smelt". As noted above, and elsewhere, the Draft Plan's reference to literature it believes supports its alleged benefits to the Delta smelt food web are inaccurate and biased. For instance, the Mount and Saracino et al. 2013 review of the Draft Plan's alleged benefits to the Delta smelt food web finds that the methodology applies in the Draft Plan habitat restoration appendix (5E) is flawed in that it:

> …uses "prodQacres" to index the expected productivity of phytoplankton in the restored areas. However, this index is conceptually flawed in two ways. First, it uses an estimate of growth rate rather than production of phytoplankton, which is the product of growth rate and biomass. Second, it assumes implicitly that all phytoplankton growth is available as food for the zooplankton consumed by the smelt species, but analyses published on the San Francisco Estuary and elsewhere show that most of the production is consumed by benthos and by microzooplankton such as ciliates (e.g., Lopez et al. 2006, Lucas and Thompson 2012, Kimmerer and Thompson submitted).

Mount and Saracino et al. 2013 at 71.

The "low certainty" attributed to this outcome is not solely due to the potential for restored sites to be colonized by invasive clams, as the Draft Plan suggests. There is simply not much evidence that restored habitats will generate a regular supply of food (on any time step) to the surrounding environment and even less evidence or indication that any measureable quantity of exported food will be transported far downstream to the areas where pelagic species (like Delta smelt and longfin smelt) rear. Mount and Saracino et al. 2013 at 78. Even the reference the Draft Plan cites regarding export of food from existing shallow sub-tidal habitats makes the point that these habitats are (at best) periodically sinks for primary productivity, Lehman et al. 2010, not a surprising result as tidal marsh areas are characterized by accretion of materials. Invasion of restored sites by invasive clams could actually change the effect of habitat restoration to a

negative effect as habitats created under CM4 would then become a sink for primary productivity generated elsewhere in the Delta. Essex Partnership 2009 (DRERIP Reviews 2009). The independent peer review panel report from Mount and Saracino et al. 2013 concluded:

> Thus, marshes may act either as net sources or sinks for plankton in the adjacent waters, depending on the availability of habitat for small fish and the degree of colonization by benthic grazers such as clams. The exact details of the exchange processes depend on the physical configuration of the marsh including permanence of inundation (Brucet et al. 2005), residence time of the water (Lucas and Thompson 2012), and the biological composition, i.e., the kinds and abundance of producers and consumers within the marsh including transient organisms (Kneib 1997).

Mount and Saracino et al. 2013 at 71; *see also* Lucas and Thompson 2012. Indeed, an accurate reporting of uncertainty regarding the food web effect of CM4 for Delta smelt would be that there is "low" certainty of any positive effect at all, "moderate certainty" of no effect (especially for ROA's that are not immediately adjacent to Delta smelt and longfin smelt habitat), and, a "moderate-high" certainty of negative effects to Delta smelt if the restored habitats become colonized by invasive clams or invasive Delta smelt predators. BDCP's DRERIP reviews made exactly these points in their ratings of most tidal marsh ROA's. Essex Partnership 2009 at 9 and appendices.

In addition, any benefits from shallow water habitat restoration could not arise until the habitat restoration occurred, and potentially many years after active restoration ceased. In most cases, the planned restoration will not occur for several decades, meaning there cannot possibly be a food benefit to the covered species for many of these species' generations. In addition, the Draft Plan's assertion of benefits to Delta smelt from habitat restoration incorrectly assumes that no habitat restoration occurs under the environmental baseline. In fact, as we have discussed elsewhere, restoration of 8,000 acres of tidal marsh and shallow sub-tidal habitat is already called for in the USFWS 2008 Biological Opinion, and under the NMFS 2009 Biological Opinion a much larger expanse of floodplain habitat is targeted for restoration, at an earlier date, than what is expected under the Draft Plan. Thus the DEIR/DEIS improperly credits to the BDCP all of its expected benefits to Delta smelt from tidal marsh restoration and Yolo Bypass floodplain restoration because of the flawed baseline used for comparison.

In summary, the Draft Plan and DEIS/DEIR claims that operations under the proposed project will benefit Delta smelt by reducing entrainment are not supported scientifically. In fact, operations of the new north Delta diversion are likely to have a negative effect on Delta smelt as a result of the diversion of turbidity that both the Draft Plan and DEIS/DEIR report will occur there (though both underestimate the overall reduction in turbidity and its likely effects). If

restored habitats are not utilized by Delta smelt to the degree expected or if habitat restorations are delayed, any scenario of BDCP operations that does not include provision of fall outflows will result in a marked decrease in fall habitat for Delta smelt. DEIS/DEIR at 11-1298. The best available science demonstrates that the Fall X2 action is necessary to meet minimum protections for delta smelt. The Draft Plan and DEIS/DEIR overstate the value of habitat restoration measures in both their estimate of the direct utility of these habitats to Delta smelt and in their claims that these habitats will export significant amounts of food to environments where Delta smelt are common. Benefits to the species rely completely on habitat restoration measures, which are unlikely to produce intended benefits and which cannot produce those benefits until they are actually restored, decades from now. Furthermore, the Draft Plan and DEIS/DEIR inappropriately ignore or downplay the risk that restored habitats will be colonized by species that compete with Delta smelt for food or prey directly on Delta smelt eggs, larvae, juveniles, or adults or that restoring marsh habitats will become sinks for turbidity or Delta smelt prey items. The risks posed by shallow water habitat restorations to Delta smelt have not been adequately evaluated.

6. The Draft Plan and DEIS/DEIR Fail to use the Best Available Science to Analyze Environmental Effects on the Effects of Fall X2, and the Documents Understate the Likely Negative Impacts to the Species

Finally, the DEIS/DEIR and Draft Plan fail adequately analyze the effect of fall Delta outflows on delta smelt abundance and productivity. First, the documents fail to discuss the results of scientific studies on the higher fall outflow provided in 2011, when delta smelt abundance increased by a factor of approximately 10, consistent with the predicted outcomes in the adaptive management plan for Fall X2. The California Department of Fish and Game in 2011 stated that, "Delta smelt abundance in 2011 is greater than it has been since 2001 but remains a small fraction of historical abundance, state biologists say. The improvement is likely due in large part to higher than usual Delta outflow which resulted in more and better habitat." California Department of Fish and Wildlife, press release, Endangered Delta Smelt Population Improves, December 22, 2011, available online at: http://cdfgnews.wordpress.com/2011/12/22/endangered-delta-smelt-population-improves-2/.

Increased Delta outflow in the fall of 2011 appeared to result in higher growth rates, reduced effects of invasive clams on productivity and prey abundance, and increased food production. *See, e.g.*, Brown et al. 2012; Thompson et al. 2012; Teh 2012; Baxter and Slater 2012. The DEIS/DEIR and Draft Plan likewise make no reference to the MAST report or other Fall X2 studies conducted in 2011 and recent years. *See* Baxter et al. 2013. The documents need to be revised to incorporate this existing scientific information.

Second, the documents fail to use existing statistical methods to quantify and analyze the effects of fall outflow on delta smelt abundance. Kimmerer, as part of an independent peer review of BDCP, developed an alternative model that analyzed the effects of fall outflow on subsequent summer abundance as measured by the townet survey. Mount and Saracino et al. 2013 at 64-66, 68. That peer review concludes that the model "was appropriate for the data," and found that "the predicted ratio of townet index for LOS:NAA was about the same as that for HOS:NAA about half the time, and the other half of the time it was much lower, with large confidence intervals related to the uncertainty in the prediction from the model." *Id.* at 65. The peer review concludes that "projections under LOS showed about half the time a marked reduction in predicted summer abundance index compared to NAA." *Id.* at 68.[81] The Draft Plan and DEIS/DEIR need to be revised to use this existing model to asses effects of fall outflow on delta smelt.

V. THE BDCP FAILS TO ADEQUATELY ANALYZE IMPACTS TO NATURAL COMMUNITIES, TERRESTRIAL SPECIES AND WILDLIFE REFUGE AND THE CONSERVATION STRATEGIES BENEFITTING TERRESTRIAL SPECIES SUFFER FROM MULTIPLE FLAWS.

A. The Conservation Strategies in Chapter 3 for Protection and Restoration of Natural Communities are Uncertain and are Based on Unsupported Assumptions

The Plan assumes that restoration of various natural communities and habitat types will provide sufficient benefits for covered natural communities, plants and wildlife. However, as the Delta ISB pointed out in detail in their assessment of the BDCP, Chapter 3 suffers from a lack of underlying reasoning and evidence to support the conclusion that conservation acreage or restoration goals will provide the contemplated benefits to covered species. *See* Delta ISB 2014. In particular, the Delta ISB commented that the BDCP relies on an assumption that restoration will adequately address the impacts from the project. However, that conclusion is premised on the assumption that restoration would occur in a time-frame relevant to address the impacts. Such a conclusion is flawed as restoration of most habitat types may take years or decades to achieve the level of what had been functioning habitat before it was destroyed or degraded by BDCP activities. *Id.* at B-51. In addition, the BDCP is also based on the assumption that restoration will always be effective and would provide habitat equal or better than the habitat lost. However, such a conclusion is fraught with uncertainties, none of which were acknowledged or addressed in the Plan. *Id.* at B-52. Finally, the extensive use of habitat suitability models, which rely on assumptions about where habitat may or may not be located, results in uncertainty about the location of species and the value of habitat. *Id.* at 50. The Delta

[81] However, as noted above, this review also identified significant modeling flaws with outflow in the fall months that may affect these results.

ISB recommended that the BDCP incorporate extensive monitoring in order to ensure that the extensive uncertainties are addressed. *Id.*

B. The Conservation Strategy relying on Cultivated Lands is confusing and lacks clarity

The BDCP proposes to conserve 48,625 acres of cultivated land for the benefit of wildlife. Draft Plan at 3.4-76 to -88. However, the acreage numbers of cultivated lands do not appear consistent. For example, of the 48,625 acres of cultivated land, the BDCP requires 43,325 acres of cultivated lands for Swainson hawk, leaving 5300 acres for crops that are not of moderate or high value for hawks. However, this acreage breakdown does not fit with the cultivated lands requirement for Sandhill crane, which requires 7300 acres of cultivated land for foraging, of which 5840 must be of high quality (i.e., rice or corn). Since moderate or high value crops for Swainson hawk cannot be rice or corn, the remaining 5300 acres of cropland not needed for Swainson's hawk does not match with the 5840 acres of high value crop needed for cranes. In addition, the Plan fails to provide any details regarding the management of cultivated lands after harvest. For many species, how cultivated lands are managed after harvest is critical for those species. For example, Sandhill crane require specific timing and flooding of fields after harvest. In addition, tillage practices can leave fields either providing food for wildlife or providing no value to wildlife. The final Plan must include specific details about treatment of after-harvest lands.

C. The Plan fails to assess the direct and indirect impacts to wildlife refuges.

As discussed *supra* in section I(h), the DEIR/DEIS failed to include level 4 water supply as part of the baseline conditions, which is a significant oversight by the state and federal agencies as level 4 water supply for wildlife refuges is required under the CVPIA. The Central Valley Joint Venture (CVJV) partners specifically requested that the BDCP assess impacts to refuge water supply and "adopt a goal to contribute to the attainment of the acreage, water, and bird population goals set forth by the CVJV Implementation Plan." Central Valley Joint Venture Letter to BDCP (May 24, 2013). Similarly, it is not clear that the Draft Plan included Level 4 water deliveries. *See supra*, section I(d). As a result, the DEIR/DEIS fails to adequately assess the direct and indirect impacts from BDCP operations on state and federal wildlife refuges. The BDCP must take into account the effects of water operations on the timing and quantity of water deliveries to refuges across water years. Those impacts must be assessed and fully mitigated consistent with the requirements of the CVPIA.

D. The BDCP must improve the analysis and conservation strategies for specific covered terrestrial species.

1. Tricolored Blackbird

Tricolored blackbird population numbers have crashed in the last few years, resulting in DFW proposing to emergency list the blackbird under CESA. *See* Fish and Game Commission Agenda Item 11, "Possible Adoption of Emergency Regulations to add the Tricolored Blackbird (Agelaius tricolor) to the list of Endangered Species (pursuant to Section 2076.5, Fish and Game Code)," available online at http://www.fgc.gov/meetings/2014/aug/080614agd.pdf (incorporated by reference). Given the dire condition of Tricolored blackbirds and the likely imminent listing under CESA, the BDCP must include a robust conservation strategy for this species. Unfortunately, the Plan provides a mere 50 acres and no restoration within the Plan area. This does not meet the NCCP's conservation standard.

2. Sandhill Crane

The BDCP will have a significant impact on Sandhill crane due to the decision to site the tunnel alignment and other associated structures in crane habitat. As noted above, there are substantial concerns about the temporal mismatch between habitat lost and conservation lands protected or restored. This concern applies to the conservation strategy for cranes. Further, there are serious concerns that the siting of powerlines through and near crane habitat will result in a serious impact to cranes. It is appears that the scientific information associated with powerline impact analysis and the minimization of those impacts is outdated. The analysis of the risk to birds from powerlines did not include a 2012 report from the Avian Powerline Interaction Committee (APLIC), "Reducing Avian Collisions with Powerlines: The State of the Art in 2012," Edison Electric Institute and APLIC. Washington, DC, available online at: http://www.aplic.org/uploads/files/11218/Reducing_Avian_Collisions_2012watermarkLR.pdf (incorporated by reference).

3. Giant Garter Snake

The conservation strategy for Giant garter snake appears to be little more than 1:1 mitigation for habitat acres lost, which falls well short of the NCCP conservation standard. Conservation Measure 1 as well as impacts from the conversion of land in the Yolo Bypass will result in the loss of 6,538 acres of Giant garter snake habitat in key areas for garter snake. Draft Plan at 3.3-30 to -31. There is no explanation how a 1:1 mitigation ratio for a critically endangered species with only 13 populations left in California meets the NCCP requirement that the plan "provide for the conservation" of the species in the Plan Area. The conservation strategy for Giant garter snake must be revised to include substantially more habitat for snakes within the Plan Area.

4. California Red-Legged Frog and California Tiger Salamander

The conservation strategy for California red-legged frog and California tiger salamander includes a directive to protect stock ponds on conserved grasslands. Draft Plan at 3.3-31. While such a conservation requirement is important, additional detail should be required, including a requirement that funding shall be directed towards stock pond improvement and maintenance in perpetuity as part of the management of the grasslands. Stock ponds are frequently in need of repair and require on-going management (e.g., cleaning and tulle control) in order to remain of value to these listed species.

5. Valley Elderberry Longhorn Beetle

The conservation objectives for Valley elderberry longhorn beetle (VELB) lacks any specific conservation acreage number. Draft Plan at 3.3-32. It is impossible to tell how much acreage is required in this plan to address VELB impacts and to provide for the conservation of VELB in the plan area. The conservation objective must be revised to be quantifiable.

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Categories
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Description
SCt: Denise Anderson
Ct: Ellen Tarquinio

Invitees:
Ken Ko pocis

Cynthia Giles
Stacy Mitchell
Roger Gorke
Susan Bromm
Cliff Rade r
Jared Blumenfeld (Call into the VTC)

End Date/Time
20140723T180000

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20140716T175436Z

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20140723T173000

Last Modified
20140716T182015Z

Location
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ORGANIZER (CN="Deputy Administrator")
mailto:62Perciasepe.Bob73@epa.gov

Priority
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Sequence Number
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Summary
Bay Delta Conservation Plan Final Steps

Time Transparency
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Cliff Rader
Director, NEPA Compliance Division
202-564-7159

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From: Rader, Cliff
Sent: Mon 7/14/2014 9:12:51 PM
Subject: FW: BDCP cover letter - edits
BDCP DEIS Cover letter to HQ CORRECTED-OFA edits.docx

From: Rader, Cliff
Sent: Monday, July 14, 2014 4:31 PM
To: Bromm, Susan
Subject: BDCP cover letter - edits

Cliff Rader

Director, NEPA Compliance Division

(202) 564-7159

To: Marshall, Tom[marshall.tom@epa.gov]
From: Rader, Cliff
Sent: Thur 7/10/2014 4:46:19 PM
Subject: FW: bay delta
BDCP Briefing paper Westlands7 8 14final.docx

From: Bromm, Susan
Sent: Wednesday, July 09, 2014 8:02 PM
To: Rader, Cliff
Subject: Fw: bay delta

From: Johnson, Kathleen
Sent: Wednesday, July 9, 2014 7:41:07 PM
To: Bromm, Susan
Subject: bay delta

Susan,

I left you a vmail about some going on with the Bay Delta project. I understand the Bob P. meeting is this week and this was the paper that Roger sent to him.

Kathleen H. Johnson

Director, Enforcement Division

U.S. EPA - Region 9

75 Hawthorne Street ENF-1

San Francisco, CA 94015

415/972-3873

johnson.kathleen@epa.gov

To: Gorke, Roger[Gorke.Roger@epa.gov]
From: Rader, Cliff
Sent: Thur 7/10/2014 4:43:28 PM
Subject: FW: bay delta
BDCP Briefing paper Westlands7 8 14final.docx

From: Bromm, Susan
Sent: Wednesday, July 09, 2014 8:02 PM
To: Rader, Cliff
Subject: Fw: bay delta

From: Johnson, Kathleen
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To: Gorke, Roger[Gorke.Roger@epa.gov]
From: Rader, Cliff
Sent: Sat 5/31/2014 1:19:13 PM
Subject: Fw: Briefing Paper: R9's Bay Delta Conservation Plan
Bay Delta Conservation Plan Draft EIS Update for June 3 5_30_14.docx

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From: Martynowicz, Trina
Sent: Friday, May 30, 2014 10:39:49 PM
To: Bromm, Susan; Rader, Cliff; Kopocis, Ken; Giles-AA, Cynthia; Blumenfeld, Jared; Anderson, Denise
Cc: Hagler, Tom; Hanf, Lisa; Johnson, Kathleen; Goforth, Kathleen; Quast, Sylvia; Skophammer, Stephanie; Zito, Kelly; Blumenfeld, Jared; Gaudario, Abigail; Diamond, Jane
Subject: Briefing Paper: R9's Bay Delta Conservation Plan

Please see the briefing paper attached for Bob Perciasepe's meeting this Tuesday, June 3rd with the Deputies from other Federal Agencies on Region 9's Bay Delta Conservation Plan. Please let me know if you have any questions or need anything else. Thank you!

Trina Martynowicz
Special Assistant to the Administrator
Pacific Southwest Region 9
U.S. Environmental Protection Agency
415-972-3474
Martynowicz.Trina@epa.gov

California Natural Resources Agency

May 28, 2014

Contact: Richard Stapler, 916-653-9402
Richard. Stapler@resources.ca.gov

Public Comment Period Extended on Draft Bay Delta Conservation Plan Documents

Key Component of Plan Also Released for Separate Public Review

SACRAMENTO—Lead federal and state agencies on Friday announced they have extended by more than a month the time available for the public to comment on the draft Bay Delta Conservation Plan (BDCP), so that a public comment period that would otherwise end June 13 will run to July 28. Time to comment officially on the BDCP draft Environmental Impact Report/Environmental Impact Statement also has been extended, from June 13 to June 30.

In addition, federal and state water and wildlife agencies released a draft agreement that would govern implementation of the BDCP. Called an "Implementing Agreement," the newly-released document will be available for public review for 60 days, until July 28. The draft agreement details roles and responsibilities of the various agencies under the BDCP.

The twin goals of the BDCP are to stabilize the delivery of water supplies to much of California from the Sacramento-San Joaquin Delta while also contributing to the recovery of threatened and endangered species in the region. Since 2006, BDCP proponents have been working to safeguard the Delta as both an ecosystem and water supply source for 25 million state residents and three million acres of irrigated farmland.

Both the draft BDCP and its corresponding environmental review documents were made available for official public comment on December 13, 2013. The public comment periods on both sets of documents have been extended twice.

The separate Implementing Agreement released today provides expectations, assurances, and protections, and sets forth remedies and recourse should any party to the BDCP fail to perform its obligations. Parties to the draft agreement are the California Department of Water Resources, the California Department of Fish and Wildlife, certain contractors of the Central Valley Project and the State Water Project, the U.S. Fish and Wildlife Service, and the National Marine Fisheries Service.

The draft Implementing Agreement, available here, will be available for public review for 60 days between May 28 and July 28, 2014.

In proposing to reconfigure how water is pumped from the Delta and to return relatively large parcels of the Delta to its original wetlands, the BDCP seeks to protect entire communities of plants and animals in the Delta on a sustained, landscape-wide level. The BDCP was drafted by the California Department of Water Resources (DWR) and the U.S. Bureau of Reclamation (Reclamation) and the public water agencies that buy water pumped from the Delta by DWR's State Water Project and Reclamation's Central Valley Project.

The BDCP seeks permits to cover operation of those water projects in compliance with the U.S. Endangered Species Act and the California Natural Community Conservation Planning Act (NCCPA). In order to issue the 50-year permits sought under the BDCP, the U.S. Fish and Wildlife Service and the National Marine Fisheries Service must determine, among other findings, that the plan will not reduce the likelihood of survival and recovery of federally-protected species including Chinook salmon and Delta smelt. To issue permits under the NCCPA, the California Department of Fish and Wildlife must determine, among other things, that the BDCP adequately provides for the conservation and management of covered species and their habitat.

The NCCPA requires habitat conservation plans such as the BDCP to include an Implementing Agreement. The draft Implementing Agreement released today describes various parties' roles as it relates to implementation of the 22 conservation measures included in the BDCP. It describes how permits may be suspended or revoked by wildlife agencies in the event the water agencies fail to adequately fund or make progress on the implementation of conservation measures. It also describes the assurance that would be granted to the agencies funding the BDCP, were permits issued. Under the draft agreement, the regulatory wildlife agencies would not require additional land, water, or financial contribution beyond what is required by the plan.

The estimated cost of the BDCP is $25 billion. Nearly 70 percent of those costs would be borne by residents of Santa Clara Valley, San Joaquin Valley, and Southern California whose local water districts buy water pumped from the Delta. Potential sources of funding for the remainder of BDCP costs include bonds issued by water districts, bonds issued by DWR, federal agency appropriations, and state and federal grants.

As a federal agency, Reclamation must comply with the U.S. Endangered Species Act through a separate process. Reclamation will enter into a memorandum with the state and federal wildlife agencies to set forth its roles and responsibilities under the BDCP.

There are two main elements to the draft BDCP now under public review: Construction of new intakes on the Sacramento River near Hood to ameliorate the unnatural flows now created by south Delta pumping plants, and protection or restoration of 140,000 acres of habitat, much of it tidal wetlands.

To review and comment on the draft BDCP and its accompanying draft Environmental Impact Report/Statement, go to http://baydeltaconservationplan.com/PublicReview/HowtoComment.aspx.

To comment on the draft Implementing Agreement, email draftIAcomments@baydeltaconservationplan.com. Or mail comments to Bay Delta Conservation Plan, Attn: Draft IA Comments, 901 P Street, 4th Floor, Sacramento, CA 95814.

-30-

BDCP
BAY DELTA CONSERVATION PLAN

Draft Bay Delta Conservation Plan (BDCP) Implementing Agreement Released; Public Review/Comment Period Extended for Draft BDCP and Draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS)

The U.S. Department of the Interior and the California Natural Resources Agency today released the "Draft Implementing Agreement for the Bay Delta Conservation Plan (IA)" for a 60-day public review and comment period. The Draft IA can be found online at: www.baydeltaconservationplan.com.

Lead state and federal agencies have also extended the public comment period for the Draft BDCP by an additional 45 days to allow the public more time to review and comment.

Comments on the Draft BDCP and Draft IA must be received electronically or postmarked on or before July 28, 2014.

In addition, lead state and federal agencies have extended the public comment period for the Draft EIR/EIS by an additional 17 days, for a 197-day review. The comment period began on December 13, 2013 and will conclude on June 30, 2014.

The Draft BDCP and Draft EIR/EIS are being made available to the public in accordance with the California Natural Community Conservation Planning Act (NCCPA), Section 10 of the federal Endangered Species Act (ESA), the California Environmental Quality Act (CEQA,) and the National Environmental Policy Act (NEPA).

SAMPLE

Written comments on all documents may be submitted via:

- Mail or hand delivery to Ryan Wulff, National Marine Fisheries Service, 650 Capitol Mall, Suite 5–100, Sacramento, CA 95814
- Email to BDCP.comments@noaa.gov

No final decisions have been made regarding going forward with the BDCP or in selecting an alternative; those decisions will only occur after completion of the CEQA and NEPA processes.

Copies of the Draft BDCP and Draft EIR/EIS:
Hard copy Draft documents are available at the Department of Water Resources, 3500 Industrial Blvd., Room 117, West Sacramento, CA 95691 and at the National Marine Fisheries Service, 650 Capitol Mall, Suite 5-100, Sacramento, CA 95814, electronically on the project website at www.BayDeltaConservationPlan.com and electronically at libraries throughout the state. Visit www.BayDeltaConservationPlan.com to find a location near you. Copies of the documents referenced in the Draft EIR/EIS will be available at the DWR Office at 3500 Industrial Blvd., Room 117, West Sacramento, CA 95691. If you would like to request a DVD copy of the documents please email a request to BDCP.comments@noaa.gov.

To protect and restore California Rivers by influencing public policy and inspiring citizen action.

FRIENDS OF THE RIVER

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PHONE: 916/442-3155 ● FAX: 916/442-3396
WWW.FRIENDSOFTHERIVER.ORG

May 15, 2014

BDCP.Comments@noaa.gov (via email)

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Will Stelle
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Seattle, WA 98115-0070

Additional Addressees at end of letter

Re: COMMENT LETTER and REQUEST for EXTENSION OF TIME and NEW DRAFT PLAN and DRAFT EIR/EIS for PUBLIC REVIEW because of the Government's Failure to Release a Draft Implementing Agreement, Violating NEPA, ESA, CEQA, and NCCPA

Dear Federal and California Agencies, Officers, and Staff Members Carrying out the BDCP:

Despite releasing of the Draft Bay Delta Conservation Plan (BDCP) and its Draft Environmental Impact Report-Environmental Impact Statement (EIR/EIS) in December, 2013, the government has not released a draft Implementing Agreement (IA). The Natural Community Conservation Planning Act requires each conservation plan to include an IA which contains, among other things, "provisions for establishing the long-term protection of any habitat,"

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"provisions ensuring implementation of the monitoring program and adaptive management program," and "mechanisms to ensure adequate funding to carry out the conservation actions . . . ." Cal. Fish & G. Code § 2820(b).

For purposes of the BDCP, the IA is a commitment from each party under the BDCP specifying its contribution to the cost, construction, and operation of the proposed project. The IA is an integral and indispensable necessity to the development and function of the BDCP. However, the parties to the BDCP, water contractors who expect to benefit from the BDCP, have failed to enter an IA which establishes each party's contribution to the cost, construction, and operation of the BDCP. Without the draft IA, it is not possible for the public to meaningfully review the draft BDCP and EIR/EIS. Accordingly, the absence of the draft IA has resulted in a violation of the National Environmental Policy Act (NEPA), NEPA regulation 40 C.F.R. § 1502.25, Endangered Species Act (ESA) regulations 50 CFR § 17.22(b)(1)(i); § 222.307(b)(4), the California Environmental Quality Act (CEQA), and the Natural Communities Conservation Planning Act (NCCPA).

Critical information is missing from the review process. For example, the BDCP proponents have been been internally admitting the obvious to the State, that "The cost of the BDCP is high, and there is significant concern that it will increase. Recent experience shows that the cost of large public works projects tends to increase during construction. The cost of the BDCP is so high there is no room for any increase in cost." We ***attach*** a copy of the May 13, 2014 letter to BDCP agency directors from the Natural Resources Defense Council, Defenders of Wildlife, American Rivers, The Nature Conservancy, and The Bay Institute requesting a 60 day extension of time for public comments based on several factors including the absence of the draft Implementation Agreement. That letter includes a one-page ***attachment***, the Critical Issues document, edited by J. Maher (January 27, 2014). These examples including the above are taken from the ***attached*** Critical Issues document.

Another example is that the BDCP proponents seek a level of water supply assurances of "water supply reliability of approximately 75% for both SWP and CVP water service contractors." (Critical Issues document). The water contractors also seek "Strong regulatory assurances [to] increase the willingness of local public agencies to fund the BDCP and construction of the new conveyance facilities [tunnels]." (Critical Issues document). Any commitments like those would significantly worsen the already horrendous impacts on

endangered fish species, the Sacramento River, and the San Francisco Bay-Delta resulting from operations of the massive BDCP Water Tunnels.

It is also not possible for the public to meaningfully review the draft BDCP and EIR/EIS because of the failures, violating both the ESA and NEPA, of the federal agencies to have prepared the Biological Assessments and Biological Opinions required by the ESA. These violations have been pointed out to you previously in our comment letters of June 4, August 13, September 25, and November 18, 2013, our comment letters of January 14, and March 6, 2014, and at our meeting with federal agency representatives in Sacramento on November 7, 2013.

This absence of the critical information for public review and review by the decision-makers that would be found in the missing Implementing Agreement, Biological Assessments, and Biological Opinions makes a mockery of the environmentally informed public and decision-maker review provisions and purposes of NEPA, CEQA, and the ESA. In addition, the absence of the essential information that would be furnished by the draft Implementing Agreement, Biological Assessments, and Biological Opinions unlawfully segments and postpones the review of those documents from the current review of the Draft BDCP Plan and Draft EIR/EIS.

Violation of NEPA

Under NEPA, each EIS must contain a discussion of the "environmental impacts of the proposed action . . . ." 42 U.S.C. § 4332(C)(i). An EIS "shall provide full and fair discussion of significant environmental impacts and shall inform decision-makers and the public of the reasonable alternatives which would avoid or minimize adverse impacts . . . ." 40 C.F.R. § 1502.1.

The Draft BDCP Chapters 6, 7, and 8 frequently refer to the IA as a regulatory force of the BDCP operations, ensuring that the project will operate in accordance with law. Nowhere does the Draft BDCP or EIR/EIS list the terms or specific provisions that the IA will contain. Thus, the IA's terms and requirements are not available for the public or decision makers to review. Because the IA will contain information concerning impacts and mitigation, it is a critically important component of the environmental review mandated by NEPA. Without the IA, it is impossible for the EIS to provide a "full and fair discussion" of the impacts and mitigation measures. Consequently, the EIS is incomplete and insufficient to provide meaningful public review of BDCP impacts and mitigation measures.

Violation of NEPA Regulation 40 C.F.R. § 1502.25

Under NEPA regulations, "To the fullest extent possible, agencies shall prepare draft environmental impact statements concurrently with and integrated with environmental impact analyses and related surveys and studies required by the . . . Endangered Species Act . . . ." 40 C.F.R. § 1502.25. Thus, agencies must prepare environmental impact review documents concurrently.

Because the BDCP is expected to result in the take of endangered and threatened species, the parties must acquire an incidental take permit (ITP) before implementing the BDCP. 16 U.S.C. § 1539(a)(1). A party applying for an ITP must submit a conservation plan that specifies, among other things, "what steps the applicant will take to *minimize and mitigate such impacts*, and the *funding that will be available to implement such steps* . . . ." 16 U.S.C. § 1539(a)(2)(A)(ii) (emphasis added). The Draft BDCP and EIR/EIS lack this information and suggest that it will appear in the IA.

Accordingly, the BDCP is incomplete without the IA because the BDCP does not specify any commitments the parties have made to fund and promote mitigation measures. As an impact analysis, the IA was required to have been prepared concurrently with the EIS. Nevertheless, the parties to the BDCP have failed to produce even a draft IA specifying their individual commitments to ensuring the integrity of the project. This has resulted in the staggered or piecemeal environmental review that NEPA Regulation 40 C.F.R. § 1502.25 prohibits.

Violation of ESA Regulations

The BDCP is the heart of an application for an ITP. All applications for ITPs must include a "complete description of the activity sought to be authorized. . . ." 50 C.F.R. § 17.22(b)(1)(i). Further, all conservation plans must include "steps . . . that will be taken to monitor, minimize, and mitigate [the] impacts, and the funding available to implement such measures . . . ." 50 C.F.R. § 222.307(b)(5)(iii). Before approving a conservation plan, the government must provide notice of the application and an opportunity for the public to review the application. 16 U.S.C. § 1539(c).

The Draft BDCP fails to provide a complete description of the project because it does not specify the steps that will be taken to mitigate impacts and fund such mitigation. Instead, it insists that the IA will clarify details concerning mitigation measures and funding. Consequently,

the Draft BDCP and EIR/EIS lack critical information concerning how the conservation plan will address mitigation and funding requirements, rendering the review period inadequate under ESA Regulations.

Violation of CEQA

Under CEQA, California agencies must make draft EIRs available for public review and comment. 14 CCR § 15087. An EIR "shall include a detailed statement setting forth . . . [a]ll significant effects on the environment of the proposed project" and "[m]itigation measures proposed to minimize significant effects of the environment . . . ." Cal. Pub. Res. Code § 21100(b). Regulations define *project* to mean "the *whole of an action*, which has a potential for resulting in either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment . . . ." 14 CCR § 15378(a) (italics added). Before approving a proposed project, the "lead agency shall determine whether a project may have a significant effect on the environment based on *substantial evidence* in light of the whole record." Cal. Pub. Res. Code § 21082.2(a) (italics added). *Substantial evidence* does not include "speculation" or "unsubstantiated opinion"; on the contrary, *substantial evidence* includes "facts, reasonable assumptions predicated upon facts, and expert opinion supported by facts." Cal. Pub. Res. Code § 21082.2(c). Courts applying CEQA have held over and over that:

> An accurate, stable and finite project description is the sine qua non [absolutely indispensable requirement] of an informative and legally sufficient EIR. [Citation]. However, a curtailed, and enigmatic or unstable project description draws a red herring across the path of public input. [citation] Only through an accurate view of the project may the public and interested parties balance the proposed project's benefits against its environmental cost, consider appropriate mitigation measures, assess the advantages of terminating the proposal and properly weigh other alternatives.

San Joaquin Raptor Rescue Center v. County of Merced, 149 Cal.App.4th 645, 672 (2007) (internal citations omitted).

The IA is part of the project but has not even been placed before the public for review during the Draft EIR/EIS public review period. Because the IA will contain critical project information that is not in the Draft EIR/EIS, the Draft EIR-EIS does not describe the *whole of the action*. Consequently, the EIR-EIS fails to provide an "accurate view of the project" and the public is incapable of understanding how the proposed project will operate. Further, this missing information demonstrates that the incomplete EIR/EIS fails to support its conclusions as to the

impacts of the project. Whereas CEQA requires environmentally informed agency decisions, the absence of the IA prevents the agencies from forming valid decisions. Instead, the agencies rely on speculation as to what the terms of the IA might include.

Violation of NCCPA

The NCCPA requires that any draft documents associated with an NCCP are made available for public review and comment. Cal. Fish & G. Code § 2815. As mentioned above, the NCCPA requires the NCCP to include an IA. Cal. Fish & G. Code § 2820(b). The Act further imposes a "requirement to make available in a *reasonable and timely manner* . . . planning documents associated with a natural community conservation plan that are subject to public review." Cal. Fish & G. Code § 2815 (italics added).

Because the impact and mitigation analyses in the EIR/EIS rely on the IA, the government agencies needed to make the draft IA available at the same time as the draft EIR/EIS in order to meet the *reasonable and timely manner* requirement. Releasing the draft IA months after the Draft EIR/EIS is neither reasonable nor timely because the government could have waited for completion of the draft IA before releasing the draft EIR/EIS.

How to Remedy These Violations

The government's plans to hold a 60-day public comment period for the draft IA after the Draft BDCP and Draft EIR/EIS comment period closes will not cure these defects. Staggering the release and comment periods for BDCP documents deprives the public of adequate review opportunities in two ways. First, once the government releases the Draft IA containing specific details concerning BDCP operation, interested parties' understanding of the project will change. It is likely that new information released in the IA will supersede comments received during the Draft BDCP and EIR/EIS comment period, undermining the integrity of the comment period. To ensure that interested parties have an adequate opportunity to review and comment on the project, all documents relating the BDCP need to be available for comment at the same time.

Second, a 60-day comment period is drastically insufficient to provide interested parties enough time to review the IA and its effects on BDCP operations. Interested parties will need to both review the draft IA and determine how it alters 40,000+ pages of BDCP documents. Accomplishing this type of review in a mere 60 days is impossible. Limiting the draft IA

comment period to 60 days will effectively ensure that interested parties are incapable of meaningfully reviewing the totality of the BDCP.

In order to provide meaningful public review, the BDCP federal and State agencies need to hold a new Draft BDCP comment period with *every* BDCP document -- Implementing Agreement, Biological Assessments and Biological Opinions, and Draft BDCP Plan and Draft BDCP EIR/EIS-- available for public review and comment during the same time period. Additionally, the new comment period must remain open for at least four months. NEPA regulation 40 C.F.R. 1502.7 declares that the text of an EIS for "proposals of unusual scope or complexity shall normally be less than 300 pages." Here, there are already 40,214 pages of released documents which represent 20% more pages than the 32 volumes of the last printed edition of the Encyclopedia Britannica. The government's original four month comment period and subsequent two-month extension tacitly conceded that extended public review periods are necessary for a project as massive as the BDCP.

Conclusion

The absence of the Draft IA during the Draft BDCP and Draft EIR/EIS comment period has violated NEPA, CEQA, ESA, and NCCPA. These violations have rendered the comment period inadequate to support meaningful public review and comments. In order to remedy these violations, the government must release the Draft IA and open a new, four-month Draft BDCP comment period with every BDCP document available for public review and comment. Beyond these violations of law, the government must open a new public comment period to restore any public confidence in the integrity of the BDCP. It is absurd to expect the public to trust the BDCP process without full disclosure of the project's impacts, costs, and who will pay those costs.

For these reasons, Friends of the River urges you to open a new public comment period on all BDCP documents, including the IA when it is released, for at least four months. Please call Robert Wright, Senior Counsel, Friends of the River at (916) 442-3155x 207 with any questions you may have.

Sincerely,

/s/ E. Robert Wright
Senior Counsel
Friends of the River

/s/ Patrick Huber
Legal Counsel
Friends of the River

(Encl. two attachments)

Additional Addressees, all via email:

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Michael Tucker, Fishery Biologist
National Marine Fisheries Service

Ryan Wulff, Senior Policy Advisor
National Marine Fisheries Service

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cc:
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Congresswoman Doris Matsui
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May 16, 2014

Subject: BDCP Public Comments Time Extension Request

We are writing on behalf of the member organizatio ns which are shown with this letter to request an extension for responding to the draft BDCP and draft EIR/EIS for BDCP. We request a minimum extension of 60 days which would extend the deadline into August, 2014. We are requesting this extension primarily so that the Implementation Agreement (IA) can be analyzed and commented on as an integral part of the plan, and coterminous with the EIR/EIS.

The Implementation Agreement is one of the foundat ional elements of this project and should succinctly describe the project's purpose; the project's financing plan; the project's biological goals; the project's operations; and the project's adherence to existing laws. Each of these elements is a mandatory requirement of a permissible project plan. The lack of the Implementation Agreement as an integral component of the project plan and the project's

environmental documents is a clear indication to us of a fundamentally flawed project.

It is the Implementation Agreement that defines ob ligations, provides assurances, ensures adequate funding, specifies responsibility for implementing measures, provides for enforcement and remedies for failure, and establishes the process for changes, among numerous other things. And these details reach into critical sections throughout the documents, from governance to finance to adaptive management to assurances to the very project description.

BDCP is incomplete without the IA because it does not specify any commitments the parties have made to fund and promote mitigation measures. As an impact analysis, the IA is required to be prepared concurrently with the EIS. Nevertheless, the parties to the BDCP have failed to produce even a draft IA specifying their individual commitments to ensuring the integrity of the project. This has resulted in the staggered or piecemeal environmental review that NEPA prohibits.

Finally, the BDCP has been described as the most complex HCP/NCCP permit application ever attempted. The integration of the IA with the EIR/EIS is essential, as is the time extension to adequately review and comment on the combined documents.

Nick Di Croce

Nick Di Croce, Co-Facilitator

ATTACHMENT TO EWC TIME EXTENSION REQUEST

MAY 16, 2014

RESTORE THE DELTA

FRIENDS OF THE RIVER

PLANNING AND CONSERVATION LEAGUE

SIERRA CLUB CALIFORNIA

CALIFORNIA SPORTFISHING PROTECTION ALLIANCE

CSPA

PCFFA

STEWARDS OF THE FISHERIES

california water impact network

CALIFORNIA COASTKEEPER. ALLIANCE

A Statewide Voice for Our Waters

AQUALLIANCE

DEFENDING NORTHERN CALIFORNIA WATERS

Environmental Justice Coalition For Water

GREAT SEAL OF THE KARUK TRIBE

Winnemem Wintu Tribe

Middle River Pebble

SOUTHERN CALIFORNIA WATERSHED ALLIANCE

Foothill Conservancy

Lower Sherman Island Duck Hunters Association

Butte Environmental Council
Protecting Butte County's Land, Air & Water Since 1975

epic
wildcalifornia.org

CA SA□□ O□ □ S□□□A□ S CO□ □ C□□

CALIFORNIA RURAL LEGAL ASSISTANCE FOUNDATION

earth LAW CENTER

Tuolumne River Trust

sacramento river preservation trust

CLEAN WATER ACTION
CALIFORNIA

Institute for Fisheries Resources
Unite. Protect. Restore.

Santa Clarita Organization for Planning and the Environment (SCOPE)

SIERRA NEVADA ALLIANCE

NORTHERN CALIFORNIA COUNCIL
FEDERATION OF FLY FISHERS

food&waterwatch

Desal Response Group

citizens water watch of Northern California

KLAMATH RIVERKEEPER

CALIF. STRIPED BASS ASSOC.

The following Environmental Water Caucus affiliated organizations support the comments and recommendations shown in the attached letter.

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California Coastkeeper

Dan Bacher
Editor
Fish Sniffer

Colin Bailey
Executive Director
Environmental Justice Coalition for Water

Barbara Barrigan-Parrilla
Executive Director
Restore the Delta

Lloyd Carter
President
California Save Our Streams Council

Jennifer Clary
Water Policy Analyst
Clean Water Action

Joan Clayburgh
Executive Director
Sierra Nevada Alliance

Jim Cox
President
California Striped Bass Association

Robyn DiFalco
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Butte Environmental Council

Siobahn Dolan
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Marty Dunlap
Citizens Water Watch

Conner Everts
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Southern California Watershed Alliance

Laurel Firestone
Co-Director & Attorney at Law
Community Water Center

Konrad Fisher
Executive Director
Klamath Riverkeeper

Zeke Grader
President
Pacific Coast Federation of Fisherman's Associations

Diana Jacobs
Chair, Board of Directors
Sacramento River Preservation Trust

Bill Jennings
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Roger Mammon
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Jonas Minton
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Planning and Conservation League

Gary Graham Hughes
Executive Director
Environmental Protection Information Center

Pietro Parravano
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Institute for Fisheries Resources

Lynne Plambeck
Executive Director Santa Clarita for Planning and the Environment

Kathryn Phillips
Director
Sierra Club California

Lowell Ashbaugh
Vice President, Conservation
Northern California Council Federation of Fly Fishers

Adam Scow
California Campaign Director
Food and Water Watch

Linda Sheehan
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Chief Caleen Sisk
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Cecily Smith
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Esmeralda Soria
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California Rural Legal Assistance Foundation

Craig Tucker
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May 13, 2014

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Re: Request for 60-day Extension of DEIS/EIR Comment Deadline

Dear Messrs. Laird, Cowin, Bonham, Murillo, Lohoefener, and Stelle,

We are writing on behalf of the Natural Resources Defense Council, Defenders of Wildlife, American Rivers, The Nature Conservancy, and The Bay Institute and our hundreds of thousands of members and activists in California to request an extension of at least 60 days for submitting comments on the tens of thousands of pages of materials comprising the draft proposed Bay Delta Conservation Plan ("BDCP") and draft EIS/EIR on BDCP. This request would extend the deadline for public comment on those documents from June 13, 2014, to at least August 12, 2014.

This extension is requested and merited for three primary reasons. First, as you know, California is in the midst of an extraordinary drought, causing water management challenges unlike any we have experienced in several decades. These extraordinary conditions have demanded near

constant vigilance and participation in water management decisions this year by many stakeholders in the water community, including our organizations. The State has acknowledged that the work involved in responding to drought has necessarily resulted in the delay of many workplans and schedules. For instance, as the State announced on its BDCP website on May 5, 2014, when explaining that an anticipated draft Implementation Agreement for BDCP was still not available:

> the past weeks have required significant time commitments from key water management and regulatory principals. Understand that this is the worst drought California has faced in nearly 40 years, and operations and regulatory decisions need to be made in real time to address water needs for the rest of 2014.

http://baydeltaconservationplan.com/News/KeyAnnouncements.aspx. Similarly, the California Department of Justice, on behalf of the Department of Water Resources, recently sought an extension of time for a filing deadline in the Ninth Circuit Court of Appeals. The filing by the State Water Contractors, joined by DWR, based that request for delay on the grounds that, among other things:

> Water year 2014 has produced one of the driest years on record in the State of California. Indeed, on January 17, 2014, Governor Edmund G. Brown proclaimed a State of Emergency, directing agency officials to take all necessary actions to prepare for the expected drought conditions. ...The drought conditions in 2014 have exacerbated the already-limited resources of State Contractor Appellees. State Contractor Appellees are consequently involved in managing the water needs of their constituents and stakeholders, and this drought period has required legal and technical resources that might otherwise have been applied to evaluating the panel's decision and determining whether to seek rehearing en banc.

San Luis Delta-Mendota Water Authority v. Salazar, lead case no. 11-15871, Appellees' Unopposed Motion for Extension of Time to Petition for Rehearing En Banc and For Leave to File Oversized Petition (9th Cir., April 15, 2014) (citations omitted).

Agencies affected by the drought include many BDCP responsible agencies that are bound by the current comment deadline, such as the State Water Resources Control Board. The SWRCB recently announced that because of the time and staffing required to respond to drought, they have further delayed the release of the draft Substitute Environmental Document for Phase I of the update of the Bay Delta Water Quality Control Plan.

Of course, non-governmental stakeholders and the public also are deeply affected by the drought and also have committed significant time and effort to tracking and responding to the drought, and attempting to reduce or mitigate the drought's harmful impacts on people and California's environment. The unanticipated demands of the drought have limited the amount of time that we and many other stakeholders and members of the public engaged in water issues have been able to devote to the important task of reviewing and analyzing the draft BDCP and draft EIS/EIR. For instance, the state and federal agencies have filed numerous temporary urgency change petitions to the SWRCB, which have necessitated our review and, where appropriate, filing of

protests and requests for reconsideration. We have also been involved in numerous meetings with the state and federal agencies regarding drought response, allocations, water project operations, and related actions. All stakeholders have had to dedicate significant, unplanned resources to address the drought, and that has impacted our ability to review and comment on BDCP.

Second, key information has not yet been made available to the public that is critical to developing informed comments on the potential impacts of the proposed BDCP. That information includes the draft Implementation Agreement, which is likely to substantially affect the environmental impacts of the proposed project and the adequacy of the analysis in the draft EIS/EIR. For example, a recurring topic in discussions of the Implementation Agreement has been the level of water supply assurances, if any, that will be provided to contractors, and the level of assurances, if any, that biological goals and objectives of the draft BDCP will be met. The attached document prepared by several of BDCP's proponents in January, 2014, seeks "a level of water supply reliability of approximately 75% for both the SWP and CVP water service contractors and the SWP post-construction." *See* attached Critical Issues document, edited by J. Maher (Jan. 27, 2014). Such a commitment, if made in the draft Implementation Agreement, would represent a marked departure from previous commitments by federal and state agencies to not provide water supply assurances and would significantly worsen the impacts associated with the operation of a proposed BDCP as analyzed in the draft EIS/EIR. The public should be made aware of the full range of commitments proposed in the draft Implementation Agreement prior to requiring public comment on the draft EIS/EIR.

The Implementation Agreement will directly affect commitments, responsibilities, implementation roles and financial responsibilities contained in the BDCP. Indeed, the Natural Community Conservation Planning Act requires public review and comment on the draft Plan (including all associated documents like the draft Implementation Agreement), and encourages that the draft Plan and CEQA document be circulated for review and comment at the same time. Cal. Pub. Res. Code § 2815. Because the draft Implementation Agreement is likely to substantially affect the environmental effects of the BDCP, the agencies should extend the comment period on the draft EIS/EIR to be coterminous with the comment period on the draft Implementation Agreement and draft plan.

Finally, as numerous independent reviewers and agency representatives have acknowledged on many occasions, the proposed BDCP and draft EIS/EIR comprise "the most complex HCP/NCCP permit application ever attempted." *See* Saracino and Mount, "Panel Review of the Draft Bay Delta Conservation Plan" (September 2013) at 6, available at https://watershed.ucdavis.edu/files/biblio/FINAL-BDCP-REVIEW-for-TNC-and-AR-Sept-2013.pdf. The proposed project is immensely complicated, the analysis exceedingly lengthy, and the topic vitally important to every Californian. By this request, we seek the time needed to review it carefully and provide thoughtful input.

Thank you for your prompt consideration and response.

Sincerely,

Katherine Poole
Natural Resources Defense Council

Kim Delfino
Defenders of Wildlife

Jonathan Rosenfield
The Bay Institute

Jay Ziegler
The Nature Conservancy

John Cain
American Rivers

Cc: Tom Howard, Executive Director, SWRCB
Jessica Pearson, Delta Stewardship Council
Stephanie Skophammer, U.S. Environmental Protection Agency
Andrew Constantaras, U.S. Army Corps of Engineers

ATTACHMENT 1

Critical Issues
January 27, 2014

Threshold Issues Requiring Attention

- **The current level of federal effort** is jeopardizing ~~does not support~~ **the BDCP.** The engagement of the federal agencies must dramatically improve to ensure that water supplies and species populations improve. The available solutions are limited to direct communication between the governor, S~~s~~enator Feinstein and the White House. The purpose of that communication is to secure a commitment from the federal administration that it will direct its agencies to participate in the BDCP as a full partner with the state and as a project proponent.
- **The BDCP** proposed project **provides insufficient water supplies.** ~~-~~ As currently proposed,~~constructed~~ the BDCP will not result in sufficient water supply benefits to support a decision to continue funding the development of this program. In general terms, the BDCP should result in a level of water supply reliability of approximately 75% for both ~~the~~ SWP and CVP water service contractors~~and the SWP post-construction~~. The available solutions are to increase the yield of the BDCP~~project~~ through changes in default assumptions, to implement~~ing~~ publicly funded programs that help meet environmental water demands, and, given the substantial commitment of water and other resources being made in BDCP, to establish~~ing~~ a minimum water supply below which water will not be taken from SWP and CVP water service contractors for other purposes, including environmental purposes.
- **The cost of the BDCP is high, and there is significant concern that it will increase**. Recent experience shows that the cost of large public works projects tends to increase during construction. The cost of the BDCP is so high there is no room for any increase in cost. To reduce the likelihood of cost increases during construction, all costs need to be controlled by the entities that choose to fund construction of the BDCP. The available solutions are to allow DWR to retain design approval, while delegating all construction-related decisions to the local public agencies that volunteer to pay for the construction of the tunnels.
- **The BDCP's regulatory assurances** to permittees **are weak**. Strong regulatory assurances increase the willingness of local public agencies to fund the BDCP and construction of the new conveyance facilities~~tunnels~~. The assurances currently included in the BDCP are unclear and uncertain. The available solutions include clear delineation in BDCP of permittee commitments of water, financial and other resources so that permittees can rely upon ~~establishing~~ a minimum water supply from~~or~~ the project, and clear commitment ~~certainty~~ that a lack of funding by the state and federal agencies doesn't invalidate the permits for operation of the new conveyance facilities~~BDCP's tunnels~~.

Additional detail on each of these issues and possible solutions were provided to the governor's staff in prior meetings.

To protect and restore California Rivers by influencing public policy and inspiring citizen action.

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May 15, 2014

BDCP.Comments@noaa.gov (via email)

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Additional Addressees at end of letter

Re: COMMENT LETTER and REQUEST for EXTENSION OF TIME and NEW DRAFT PLAN and DRAFT EIR/EIS for PUBLIC REVIEW because of the Government's Failure to Release a Draft Implementing Agreement, Violating NEPA, ESA, CEQA, and NCCPA

Dear Federal and California Agencies, Officers, and Staff Members Carrying out the BDCP:

Despite releasing of the Draft Bay Delta Conservation Plan (BDCP) and its Draft Environmental Impact Report-Environmental Impact Statement (EIR/EIS) in December, 2013, the government has not released a draft Implementing Agreement (IA). The Natural Community Conservation Planning Act requires each conservation plan to include an IA which contains, among other things, "provisions for establishing the long-term protection of any habitat,"

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"provisions ensuring implementation of the monitoring program and adaptive management program," and "mechanisms to ensure adequate funding to carry out the conservation actions . . . ." Cal. Fish & G. Code § 2820(b).

For purposes of the BDCP, the IA is a commitment from each party under the BDCP specifying its contribution to the cost, construction, and operation of the proposed project. The IA is an integral and indispensable necessity to the development and function of the BDCP. However, the parties to the BDCP, water contractors who expect to benefit from the BDCP, have failed to enter an IA which establishes each party's contribution to the cost, construction, and operation of the BDCP. Without the draft IA, it is not possible for the public to meaningfully review the draft BDCP and EIR/EIS. Accordingly, the absence of the draft IA has resulted in a violation of the National Environmental Policy Act (NEPA), NEPA regulation 40 C.F.R. § 1502.25, Endangered Species Act (ESA) regulations 50 CFR § 17.22(b)(1)(i); § 222.307(b)(4), the California Environmental Quality Act (CEQA), and the Natural Communities Conservation Planning Act (NCCPA).

Critical information is missing from the review process. For example, the BDCP proponents have been been internally admitting the obvious to the State, that "The cost of the BDCP is high, and there is significant concern that it will increase. Recent experience shows that the cost of large public works projects tends to increase during construction. The cost of the BDCP is so high there is no room for any increase in cost." We ***attach*** a copy of the May 13, 2014 letter to BDCP agency directors from the Natural Resources Defense Council, Defenders of Wildlife, American Rivers, The Nature Conservancy, and The Bay Institute requesting a 60 day extension of time for public comments based on several factors including the absence of the draft Implementation Agreement. That letter includes a one-page ***attachment***, the Critical Issues document, edited by J. Maher (January 27, 2014). These examples including the above are taken from the ***attached*** Critical Issues document.

Another example is that the BDCP proponents seek a level of water supply assurances of "water supply reliability of approximately 75% for both SWP and CVP water service contractors." (Critical Issues document). The water contractors also seek "Strong regulatory assurances [to] increase the willingness of local public agencies to fund the BDCP and construction of the new conveyance facilities [tunnels]." (Critical Issues document). Any commitments like those would significantly worsen the already horrendous impacts on

endangered fish species, the Sacramento River, and the San Francisco Bay-Delta resulting from operations of the massive BDCP Water Tunnels.

It is also not possible for the public to meaningfully review the draft BDCP and EIR/EIS because of the failures, violating both the ESA and NEPA, of the federal agencies to have prepared the Biological Assessments and Biological Opinions required by the ESA. These violations have been pointed out to you previously in our comment letters of June 4, August 13, September 25, and November 18, 2013, our comment letters of January 14, and March 6, 2014, and at our meeting with federal agency representatives in Sacramento on November 7, 2013.

This absence of the critical information for public review and review by the decision-makers that would be found in the missing Implementing Agreement, Biological Assessments, and Biological Opinions makes a mockery of the environmentally informed public and decision-maker review provisions and purposes of NEPA, CEQA, and the ESA. In addition, the absence of the essential information that would be furnished by the draft Implementing Agreement, Biological Assessments, and Biological Opinions unlawfully segments and postpones the review of those documents from the current review of the Draft BDCP Plan and Draft EIR/EIS.

Violation of NEPA

Under NEPA, each EIS must contain a discussion of the "environmental impacts of the proposed action . . . ." 42 U.S.C. § 4332(C)(i). An EIS "shall provide full and fair discussion of significant environmental impacts and shall inform decision-makers and the public of the reasonable alternatives which would avoid or minimize adverse impacts . . . ." 40 C.F.R. § 1502.1.

The Draft BDCP Chapters 6, 7, and 8 frequently refer to the IA as a regulatory force of the BDCP operations, ensuring that the project will operate in accordance with law. Nowhere does the Draft BDCP or EIR/EIS list the terms or specific provisions that the IA will contain. Thus, the IA's terms and requirements are not available for the public or decision makers to review. Because the IA will contain information concerning impacts and mitigation, it is a critically important component of the environmental review mandated by NEPA. Without the IA, it is impossible for the EIS to provide a "full and fair discussion" of the impacts and mitigation measures. Consequently, the EIS is incomplete and insufficient to provide meaningful public review of BDCP impacts and mitigation measures.

Violation of NEPA Regulation 40 C.F.R. § 1502.25

Under NEPA regulations, "To the fullest extent possible, agencies shall prepare draft environmental impact statements concurrently with and integrated with environmental impact analyses and related surveys and studies required by the . . . Endangered Species Act . . . ." 40 C.F.R. § 1502.25. Thus, agencies must prepare environmental impact review documents concurrently.

Because the BDCP is expected to result in the take of endangered and threatened species, the parties must acquire an incidental take permit (ITP) before implementing the BDCP. 16 U.S.C. § 1539(a)(1). A party applying for an ITP must submit a conservation plan that specifies, among other things, "what steps the applicant will take to *minimize and mitigate such impacts*, and the *funding that will be available to implement such steps* . . . ." 16 U.S.C. § 1539(a)(2)(A)(ii) (emphasis added). The Draft BDCP and EIR/EIS lack this information and suggest that it will appear in the IA.

Accordingly, the BDCP is incomplete without the IA because the BDCP does not specify any commitments the parties have made to fund and promote mitigation measures. As an impact analysis, the IA was required to have been prepared concurrently with the EIS. Nevertheless, the parties to the BDCP have failed to produce even a draft IA specifying their individual commitments to ensuring the integrity of the project. This has resulted in the staggered or piecemeal environmental review that NEPA Regulation 40 C.F.R. § 1502.25 prohibits.

Violation of ESA Regulations

The BDCP is the heart of an application for an ITP. All applications for ITPs must include a "complete description of the activity sought to be authorized. . . ." 50 C.F.R. § 17.22(b)(1)(i). Further, all conservation plans must include "steps . . . that will be taken to monitor, minimize, and mitigate [the] impacts, and the funding available to implement such measures . . . ." 50 C.F.R. § 222.307(b)(5)(iii). Before approving a conservation plan, the government must provide notice of the application and an opportunity for the public to review the application. 16 U.S.C. § 1539(c).

The Draft BDCP fails to provide a complete description of the project because it does not specify the steps that will be taken to mitigate impacts and fund such mitigation. Instead, it insists that the IA will clarify details concerning mitigation measures and funding. Consequently,

the Draft BDCP and EIR/EIS lack critical information concerning how the conservation plan will address mitigation and funding requirements, rendering the review period inadequate under ESA Regulations.

Violation of CEQA

Under CEQA, California agencies must make draft EIRs available for public review and comment. 14 CCR § 15087. An EIR "shall include a detailed statement setting forth . . . [a]ll significant effects on the environment of the proposed project" and "[m]itigation measures proposed to minimize significant effects of the environment . . . ." Cal. Pub. Res. Code § 21100(b). Regulations define *project* to mean "the *whole of an action*, which has a potential for resulting in either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment . . . ." 14 CCR § 15378(a) (italics added). Before approving a proposed project, the "lead agency shall determine whether a project may have a significant effect on the environment based on *substantial evidence* in light of the whole record." Cal. Pub. Res. Code § 21082.2(a) (italics added). *Substantial evidence* does not include "speculation" or "unsubstantiated opinion"; on the contrary, *substantial evidence* includes "facts, reasonable assumptions predicated upon facts, and expert opinion supported by facts." Cal. Pub. Res. Code § 21082.2(c). Courts applying CEQA have held over and over that:

> An accurate, stable and finite project description is the sine qua non [absolutely indispensable requirement] of an informative and legally sufficient EIR. [Citation]. However, a curtailed, and enigmatic or unstable project description draws a red herring across the path of public input. [citation] Only through an accurate view of the project may the public and interested parties balance the proposed project's benefits against its environmental cost, consider appropriate mitigation measures, assess the advantages of terminating the proposal and properly weigh other alternatives.

San Joaquin Raptor Rescue Center v. County of Merced, 149 Cal.App.4th 645, 672 (2007) (internal citations omitted).

The IA is part of the project but has not even been placed before the public for review during the Draft EIR/EIS public review period. Because the IA will contain critical project information that is not in the Draft EIR/EIS, the Draft EIR-EIS does not describe the *whole of the action*. Consequently, the EIR-EIS fails to provide an "accurate view of the project" and the public is incapable of understanding how the proposed project will operate. Further, this missing information demonstrates that the incomplete EIR/EIS fails to support its conclusions as to the

impacts of the project. Whereas CEQA requires environmentally informed agency decisions, the absence of the IA prevents the agencies from forming valid decisions. Instead, the agencies rely on speculation as to what the terms of the IA might include.

Violation of NCCPA

The NCCPA requires that any draft documents associated with an NCCP are made available for public review and comment. Cal. Fish & G. Code § 2815. As mentioned above, the NCCPA requires the NCCP to include an IA. Cal. Fish & G. Code § 2820(b). The Act further imposes a "requirement to make available in a *reasonable and timely manner* . . . planning documents associated with a natural community conservation plan that are subject to public review." Cal. Fish & G. Code § 2815 (italics added).

Because the impact and mitigation analyses in the EIR/EIS rely on the IA, the government agencies needed to make the draft IA available at the same time as the draft EIR/EIS in order to meet the *reasonable and timely manner* requirement. Releasing the draft IA months after the Draft EIR/EIS is neither reasonable nor timely because the government could have waited for completion of the draft IA before releasing the draft EIR/EIS.

How to Remedy These Violations

The government's plans to hold a 60-day public comment period for the draft IA after the Draft BDCP and Draft EIR/EIS comment period closes will not cure these defects. Staggering the release and comment periods for BDCP documents deprives the public of adequate review opportunities in two ways. First, once the government releases the Draft IA containing specific details concerning BDCP operation, interested parties' understanding of the project will change. It is likely that new information released in the IA will supersede comments received during the Draft BDCP and EIR/EIS comment period, undermining the integrity of the comment period. To ensure that interested parties have an adequate opportunity to review and comment on the project, all documents relating the BDCP need to be available for comment at the same time.

Second, a 60-day comment period is drastically insufficient to provide interested parties enough time to review the IA and its effects on BDCP operations. Interested parties will need to both review the draft IA and determine how it alters 40,000+ pages of BDCP documents. Accomplishing this type of review in a mere 60 days is impossible. Limiting the draft IA

comment period to 60 days will effectively ensure that interested parties are incapable of meaningfully reviewing the totality of the BDCP.

In order to provide meaningful public review, the BDCP federal and State agencies need to hold a new Draft BDCP comment period with *every* BDCP document -- Implementing Agreement, Biological Assessments and Biological Opinions, and Draft BDCP Plan and Draft BDCP EIR/EIS-- available for public review and comment during the same time period. Additionally, the new comment period must remain open for at least four months. NEPA regulation 40 C.F.R. 1502.7 declares that the text of an EIS for "proposals of unusual scope or complexity shall normally be less than 300 pages." Here, there are already 40,214 pages of released documents which represent 20% more pages than the 32 volumes of the last printed edition of the Encyclopedia Britannica. The government's original four month comment period and subsequent two-month extension tacitly conceded that extended public review periods are necessary for a project as massive as the BDCP.

Conclusion

The absence of the Draft IA during the Draft BDCP and Draft EIR/EIS comment period has violated NEPA, CEQA, ESA, and NCCPA. These violations have rendered the comment period inadequate to support meaningful public review and comments. In order to remedy these violations, the government must release the Draft IA and open a new, four-month Draft BDCP comment period with every BDCP document available for public review and comment. Beyond these violations of law, the government must open a new public comment period to restore any public confidence in the integrity of the BDCP. It is absurd to expect the public to trust the BDCP process without full disclosure of the project's impacts, costs, and who will pay those costs.

For these reasons, Friends of the River urges you to open a new public comment period on all BDCP documents, including the IA when it is released, for at least four months. Please call Robert Wright, Senior Counsel, Friends of the River at (916) 442-3155x 207 with any questions you may have.

Sincerely,

/s/ E. Robert Wright
Senior Counsel
Friends of the River

/s/ Patrick Huber
Legal Counsel
Friends of the River

(Encl. two attachments)

Additional Addressees, all via email:

Maria Rea, Assistant Regional Administrator
National Marine Fisheries Service

Michael Tucker, Fishery Biologist
National Marine Fisheries Service

Ryan Wulff, Senior Policy Advisor
National Marine Fisheries Service

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U.S. Fish and Wildlife Service

Michael Hoover, Assistant Field Supervisor
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U.S. Fish and Wildlife Service

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cc:
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Congresswoman Doris Matsui
Sixth District, California

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May 16, 2014

Subject: BDCP Public Comments Time Extension Request

We are writing on behalf of the member organizatio ns which are shown with this letter to request an extension for responding to the draft BDCP and draft EIR/EIS for BDCP. We request a minimum extension of 60 days which would extend the deadline into August, 2014. We are requesting this extension primarily so that the Implementation Agreement (IA) can be analyzed and commented on as an integral part of the plan, and coterminous with the EIR/EIS.

The Implementation Agreement is one of the foundat ional elements of this project and should succinctly describe the project's purpose; the project's financing plan; the project's biological goals; the project's operations; and the project's adherence to existing laws. Each of these elements is a mandatory requirement of a permissible project plan. The lack of the Implementation Agreement as an integral component of the project plan and the project's

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environmental documents is a clear indication to us of a fundamentally flawed project.

It is the Implementation Agreement that defines ob ligations, provides assurances, ensures adequate funding, specifies responsibility for implementing measures, provides for enforcement and remedies for failure, and establishes the process for changes, among numerous other things. And these details reach into critical sections throughout the documents, from governance to finance to adaptive management to assurances to the very project description.

BDCP is incomplete without the IA because it does not specify any commitments the parties have made to fund and promote mitigation measures. As an impact analysis, the IA is required to be prepared concurrently with the EIS. Nevertheless, the parties to the BDCP have failed to produce even a draft IA specifying their individual commitments to ensuring the integrity of the project. This has resulted in the staggered or piecemeal environmental review that NEPA prohibits.

Finally, the BDCP has been described as the most complex HCP/NCCP permit application ever attempted. The integration of the IA with the EIR/EIS is essential, as is the time extension to adequately review and comment on the combined documents.

Nick Di Croce

Nick Di Croce, Co-Facilitator

ATTACHMENT TO EWC TIME EXTENSION REQUEST

MAY 16, 2014

RESTORE THE DELTA

FRIENDS OF THE RIVER

PLANNING AND CONSERVATION LEAGUE

CALIFORNIA SPORTFISHING PROTECTION ALLIANCE

CSPA

PCFFA

STEWARDS OF THE FISHERIES

SIERRA CLUB CALIFORNIA

california water impact network

AQUALLIANCE

DEFENDING NORTHERN CALIFORNIA WATERS

CALIFORNIA COASTKEEPER. ALLIANCE

A Statewide Voice for Our Waters

Environmental Justice Coalition For Water

GREAT SEAL OF THE KARUK TRIBE

Winnemem Wintu Tribe

Middle River Pebble

SOUTHERN CALIFORNIA WATERSHED ALLIANCE

Foothill Conservancy

Lower Sherman Island Duck Hunters Association

Butte Environmental Council
Protecting Butte County's Land, Air & Water Since 1975

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wildcalifornia.org

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CALIFORNIA RURAL LEGAL ASSISTANCE FOUNDATION

earth LAW CENTER

Tuolumne River Trust

sacramento river preservation trust

CLEAN WATER ACTION
CALIFORNIA

Institute for Fisheries Resources
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Santa Clarita Organization for Planning and the Environment (SCOPE)

SIERRA NEVADA ALLIANCE

NORTHERN CALIFORNIA COUNCIL
FEDERATION OF FLY FISHERS

food&waterwatch

Delta Response Group

citizens water watch of Northern California

KLAMATH RIVERKEEPER

CALIF. STRIPED BASS ASSOC.

The following Environmental Water Caucus affiliated organizations support the comments and recommendations shown in the attached letter.

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Policy Director
California Coastkeeper

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Editor
Fish Sniffer

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Executive Director
Environmental Justice Coalition for Water

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May 13, 2014

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Re: Request for 60-day Extension of DEIS/EIR Comment Deadline

Dear Messrs. Laird, Cowin, Bonham, Murillo, Lohoefener, and Stelle,

We are writing on behalf of the Natural Resources Defense Council, Defenders of Wildlife, American Rivers, The Nature Conservancy, and The Bay Institute and our hundreds of thousands of members and activists in California to request an extension of at least 60 days for submitting comments on the tens of thousands of pages of materials comprising the draft proposed Bay Delta Conservation Plan ("BDCP") and draft EIS/EIR on BDCP. This request would extend the deadline for public comment on those documents from June 13, 2014, to at least August 12, 2014.

This extension is requested and merited for three primary reasons. First, as you know, California is in the midst of an extraordinary drought, causing water management challenges unlike any we have experienced in several decades. These extraordinary conditions have demanded near

constant vigilance and participation in water management decisions this year by many stakeholders in the water community, including our organizations. The State has acknowledged that the work involved in responding to drought has necessarily resulted in the delay of many workplans and schedules. For instance, as the State announced on its BDCP website on May 5, 2014, when explaining that an anticipated draft Implementation Agreement for BDCP was still not available:

> the past weeks have required significant time commitments from key water management and regulatory principals. Understand that this is the worst drought California has faced in nearly 40 years, and operations and regulatory decisions need to be made in real time to address water needs for the rest of 2014.

http://baydeltaconservationplan.com/News/KeyAnnouncements.aspx. Similarly, the California Department of Justice, on behalf of the Department of Water Resources, recently sought an extension of time for a filing deadline in the Ninth Circuit Court of Appeals. The filing by the State Water Contractors, joined by DWR, based that request for delay on the grounds that, among other things:

> Water year 2014 has produced one of the driest years on record in the State of California. Indeed, on January 17, 2014, Governor Edmund G. Brown proclaimed a State of Emergency, directing agency officials to take all necessary actions to prepare for the expected drought conditions. ...The drought conditions in 2014 have exacerbated the already-limited resources of State Contractor Appellees. State Contractor Appellees are consequently involved in managing the water needs of their constituents and stakeholders, and this drought period has required legal and technical resources that might otherwise have been applied to evaluating the panel's decision and determining whether to seek rehearing en banc.

San Luis Delta-Mendota Water Authority v. Salazar, lead case no. 11-15871, Appellees' Unopposed Motion for Extension of Time to Petition for Rehearing En Banc and For Leave to File Oversized Petition (9th Cir., April 15, 2014) (citations omitted).

Agencies affected by the drought include many BDCP responsible agencies that are bound by the current comment deadline, such as the State Water Resources Control Board. The SWRCB recently announced that because of the time and staffing required to respond to drought, they have further delayed the release of the draft Substitute Environmental Document for Phase I of the update of the Bay Delta Water Quality Control Plan.

Of course, non-governmental stakeholders and the public also are deeply affected by the drought and also have committed significant time and effort to tracking and responding to the drought, and attempting to reduce or mitigate the drought's harmful impacts on people and California's environment. The unanticipated demands of the drought have limited the amount of time that we and many other stakeholders and members of the public engaged in water issues have been able to devote to the important task of reviewing and analyzing the draft BDCP and draft EIS/EIR. For instance, the state and federal agencies have filed numerous temporary urgency change petitions to the SWRCB, which have necessitated our review and, where appropriate, filing of

protests and requests for reconsideration. We have also been involved in numerous meetings with the state and federal agencies regarding drought response, allocations, water project operations, and related actions. All stakeholders have had to dedicate significant, unplanned resources to address the drought, and that has impacted our ability to review and comment on BDCP.

Second, key information has not yet been made available to the public that is critical to developing informed comments on the potential impacts of the proposed BDCP. That information includes the draft Implementation Agreement, which is likely to substantially affect the environmental impacts of the proposed project and the adequacy of the analysis in the draft EIS/EIR. For example, a recurring topic in discussions of the Implementation Agreement has been the level of water supply assurances, if any, that will be provided to contractors, and the level of assurances, if any, that biological goals and objectives of the draft BDCP will be met. The attached document prepared by several of BDCP's proponents in January, 2014, seeks "a level of water supply reliability of approximately 75% for both the SWP and CVP water service contractors and the SWP post-construction." *See* attached Critical Issues document, edited by J. Maher (Jan. 27, 2014). Such a commitment, if made in the draft Implementation Agreement, would represent a marked departure from previous commitments by federal and state agencies to not provide water supply assurances and would significantly worsen the impacts associated with the operation of a proposed BDCP as analyzed in the draft EIS/EIR. The public should be made aware of the full range of commitments proposed in the draft Implementation Agreement prior to requiring public comment on the draft EIS/EIR.

The Implementation Agreement will directly affect commitments, responsibilities, implementation roles and financial responsibilities contained in the BDCP. Indeed, the Natural Community Conservation Planning Act requires public review and comment on the draft Plan (including all associated documents like the draft Implementation Agreement), and encourages that the draft Plan and CEQA document be circulated for review and comment at the same time. Cal. Pub. Res. Code § 2815. Because the draft Implementation Agreement is likely to substantially affect the environmental effects of the BDCP, the agencies should extend the comment period on the draft EIS/EIR to be coterminous with the comment period on the draft Implementation Agreement and draft plan.

Finally, as numerous independent reviewers and agency representatives have acknowledged on many occasions, the proposed BDCP and draft EIS/EIR comprise "the most complex HCP/NCCP permit application ever attempted." *See* Saracino and Mount, "Panel Review of the Draft Bay Delta Conservation Plan" (September 2013) at 6, available at https://watershed.ucdavis.edu/files/biblio/FINAL-BDCP-REVIEW-for-TNC-and-AR-Sept-2013.pdf. The proposed project is immensely complicated, the analysis exceedingly lengthy, and the topic vitally important to every Californian. By this request, we seek the time needed to review it carefully and provide thoughtful input.

Thank you for your prompt consideration and response.

Sincerely,

Katherine Poole
Natural Resources Defense Council

Kim Delfino
Defenders of Wildlife

Jonathan Rosenfield
The Bay Institute

Jay Ziegler
The Nature Conservancy

John Cain
American Rivers

Cc: Tom Howard, Executive Director, SWRCB
Jessica Pearson, Delta Stewardship Council
Stephanie Skophammer, U.S. Environmental Protection Agency
Andrew Constantaras, U.S. Army Corps of Engineers

ATTACHMENT 1

Critical Issues
January 27, 2014

Threshold Issues Requiring Attention

- **The current level of federal effort** is jeopardizing ~~does not support~~ **the BDCP.** The engagement of the federal agencies must dramatically improve to ensure that water supplies and species populations improve. The available solutions are limited to direct communication between the governor, S~~s~~enator Feinstein and the White House. The purpose of that communication is to secure a commitment from the federal administration that it will direct its agencies to participate in the BDCP as a full partner with the state and as a project proponent.
- **The BDCP** proposed project **provides insufficient water supplies.** ~~-~~ As currently proposed,~~constructed~~ the BDCP will not result in sufficient water supply benefits to support a decision to continue funding the development of this program. In general terms, the BDCP should result in a level of water supply reliability of approximately 75% for both ~~the~~ SWP and CVP water service contractors~~and the SWP post-construction~~. The available solutions are to increase the yield of the BDCP~~project~~ through changes in default assumptions, to implement~~ing~~ publicly funded programs that help meet environmental water demands, and, given the substantial commitment of water and other resources being made in BDCP, to establish~~ing~~ a minimum water supply below which water will not be taken from SWP and CVP water service contractors for other purposes, including environmental purposes.
- **The cost of the BDCP is high, and there is significant concern that it will increase**. Recent experience shows that the cost of large public works projects tends to increase during construction. The cost of the BDCP is so high there is no room for any increase in cost. To reduce the likelihood of cost increases during construction, all costs need to be controlled by the entities that choose to fund construction of the BDCP. The available solutions are to allow DWR to retain design approval, while delegating all construction-related decisions to the local public agencies that volunteer to pay for the construction of the tunnels.
- **The BDCP's regulatory assurances** to permittees **are weak**. Strong regulatory assurances increase the willingness of local public agencies to fund the BDCP and construction of the new conveyance facilities~~tunnels~~. The assurances currently included in the BDCP are unclear and uncertain. The available solutions include clear delineation in BDCP of permittee commitments of water, financial and other resources so that permittees can rely upon ~~establishing~~ a minimum water supply from~~or~~ the project, and clear commitment ~~certainty~~ that a lack of funding by the state and federal agencies doesn't invalidate the permits for operation of the new conveyance facilities~~BDCP's tunnels~~.

Additional detail on each of these issues and possible solutions were provided to the governor's staff in prior meetings.

To protect and restore California Rivers by influencing public policy and inspiring citizen action.

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May 15, 2014

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Additional Addressees at end of letter

Re: COMMENT LETTER and REQUEST for EXTENSION OF TIME and NEW DRAFT PLAN and DRAFT EIR/EIS for PUBLIC REVIEW because of the Government's Failure to Release a Draft Implementing Agreement, Violating NEPA, ESA, CEQA, and NCCPA

Dear Federal and California Agencies, Officers, and Staff Members Carrying out the BDCP:

Despite releasing of the Draft Bay Delta Conservation Plan (BDCP) and its Draft Environmental Impact Report-Environmental Impact Statement (EIR/EIS) in December, 2013, the government has not released a draft Implementing Agreement (IA). The Natural Community Conservation Planning Act requires each conservation plan to include an IA which contains, among other things, "provisions for establishing the long-term protection of any habitat,"

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"provisions ensuring implementation of the monitoring program and adaptive management program," and "mechanisms to ensure adequate funding to carry out the conservation actions . . . ." Cal. Fish & G. Code § 2820(b).

For purposes of the BDCP, the IA is a commitment from each party under the BDCP specifying its contribution to the cost, construction, and operation of the proposed project. The IA is an integral and indispensable necessity to the development and function of the BDCP. However, the parties to the BDCP, water contractors who expect to benefit from the BDCP, have failed to enter an IA which establishes each party's contribution to the cost, construction, and operation of the BDCP. Without the draft IA, it is not possible for the public to meaningfully review the draft BDCP and EIR/EIS. Accordingly, the absence of the draft IA has resulted in a violation of the National Environmental Policy Act (NEPA), NEPA regulation 40 C.F.R. § 1502.25, Endangered Species Act (ESA) regulations 50 CFR § 17.22(b)(1)(i); § 222.307(b)(4), the California Environmental Quality Act (CEQA), and the Natural Communities Conservation Planning Act (NCCPA).

Critical information is missing from the review process. For example, the BDCP proponents have been been internally admitting the obvious to the State, that "The cost of the BDCP is high, and there is significant concern that it will increase. Recent experience shows that the cost of large public works projects tends to increase during construction. The cost of the BDCP is so high there is no room for any increase in cost." We ***attach*** a copy of the May 13, 2014 letter to BDCP agency directors from the Natural Resources Defense Council, Defenders of Wildlife, American Rivers, The Nature Conservancy, and The Bay Institute requesting a 60 day extension of time for public comments based on several factors including the absence of the draft Implementation Agreement. That letter includes a one-page ***attachment***, the Critical Issues document, edited by J. Maher (January 27, 2014). These examples including the above are taken from the ***attached*** Critical Issues document.

Another example is that the BDCP proponents seek a level of water supply assurances of "water supply reliability of approximately 75% for both SWP and CVP water service contractors." (Critical Issues document). The water contractors also seek "Strong regulatory assurances [to] increase the willingness of local public agencies to fund the BDCP and construction of the new conveyance facilities [tunnels]." (Critical Issues document). Any commitments like those would significantly worsen the already horrendous impacts on

endangered fish species, the Sacramento River, and the San Francisco Bay-Delta resulting from operations of the massive BDCP Water Tunnels.

It is also not possible for the public to meaningfully review the draft BDCP and EIR/EIS because of the failures, violating both the ESA and NEPA, of the federal agencies to have prepared the Biological Assessments and Biological Opinions required by the ESA. These violations have been pointed out to you previously in our comment letters of June 4, August 13, September 25, and November 18, 2013, our comment letters of January 14, and March 6, 2014, and at our meeting with federal agency representatives in Sacramento on November 7, 2013.

This absence of the critical information for public review and review by the decision-makers that would be found in the missing Implementing Agreement, Biological Assessments, and Biological Opinions makes a mockery of the environmentally informed public and decision-maker review provisions and purposes of NEPA, CEQA, and the ESA. In addition, the absence of the essential information that would be furnished by the draft Implementing Agreement, Biological Assessments, and Biological Opinions unlawfully segments and postpones the review of those documents from the current review of the Draft BDCP Plan and Draft EIR/EIS.

Violation of NEPA

Under NEPA, each EIS must contain a discussion of the "environmental impacts of the proposed action . . . ." 42 U.S.C. § 4332(C)(i). An EIS "shall provide full and fair discussion of significant environmental impacts and shall inform decision-makers and the public of the reasonable alternatives which would avoid or minimize adverse impacts . . . ." 40 C.F.R. § 1502.1.

The Draft BDCP Chapters 6, 7, and 8 frequently refer to the IA as a regulatory force of the BDCP operations, ensuring that the project will operate in accordance with law. Nowhere does the Draft BDCP or EIR/EIS list the terms or specific provisions that the IA will contain. Thus, the IA's terms and requirements are not available for the public or decision makers to review. Because the IA will contain information concerning impacts and mitigation, it is a critically important component of the environmental review mandated by NEPA. Without the IA, it is impossible for the EIS to provide a "full and fair discussion" of the impacts and mitigation measures. Consequently, the EIS is incomplete and insufficient to provide meaningful public review of BDCP impacts and mitigation measures.

Violation of NEPA Regulation 40 C.F.R. § 1502.25

Under NEPA regulations, "To the fullest extent possible, agencies shall prepare draft environmental impact statements concurrently with and integrated with environmental impact analyses and related surveys and studies required by the . . . Endangered Species Act . . . ." 40 C.F.R. § 1502.25. Thus, agencies must prepare environmental impact review documents concurrently.

Because the BDCP is expected to result in the take of endangered and threatened species, the parties must acquire an incidental take permit (ITP) before implementing the BDCP. 16 U.S.C. § 1539(a)(1). A party applying for an ITP must submit a conservation plan that specifies, among other things, "what steps the applicant will take to *minimize and mitigate such impacts*, and the *funding that will be available to implement such steps* . . . ." 16 U.S.C. § 1539(a)(2)(A)(ii) (emphasis added). The Draft BDCP and EIR/EIS lack this information and suggest that it will appear in the IA.

Accordingly, the BDCP is incomplete without the IA because the BDCP does not specify any commitments the parties have made to fund and promote mitigation measures. As an impact analysis, the IA was required to have been prepared concurrently with the EIS. Nevertheless, the parties to the BDCP have failed to produce even a draft IA specifying their individual commitments to ensuring the integrity of the project. This has resulted in the staggered or piecemeal environmental review that NEPA Regulation 40 C.F.R. § 1502.25 prohibits.

Violation of ESA Regulations

The BDCP is the heart of an application for an ITP. All applications for ITPs must include a "complete description of the activity sought to be authorized. . . ." 50 C.F.R. § 17.22(b)(1)(i). Further, all conservation plans must include "steps . . . that will be taken to monitor, minimize, and mitigate [the] impacts, and the funding available to implement such measures . . . ." 50 C.F.R. § 222.307(b)(5)(iii). Before approving a conservation plan, the government must provide notice of the application and an opportunity for the public to review the application. 16 U.S.C. § 1539(c).

The Draft BDCP fails to provide a complete description of the project because it does not specify the steps that will be taken to mitigate impacts and fund such mitigation. Instead, it insists that the IA will clarify details concerning mitigation measures and funding. Consequently,

the Draft BDCP and EIR/EIS lack critical information concerning how the conservation plan will address mitigation and funding requirements, rendering the review period inadequate under ESA Regulations.

Violation of CEQA

Under CEQA, California agencies must make draft EIRs available for public review and comment. 14 CCR § 15087. An EIR "shall include a detailed statement setting forth . . . [a]ll significant effects on the environment of the proposed project" and "[m]itigation measures proposed to minimize significant effects of the environment . . . ." Cal. Pub. Res. Code § 21100(b). Regulations define *project* to mean "the *whole of an action*, which has a potential for resulting in either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment . . . ." 14 CCR § 15378(a) (italics added). Before approving a proposed project, the "lead agency shall determine whether a project may have a significant effect on the environment based on *substantial evidence* in light of the whole record." Cal. Pub. Res. Code § 21082.2(a) (italics added). *Substantial evidence* does not include "speculation" or "unsubstantiated opinion"; on the contrary, *substantial evidence* includes "facts, reasonable assumptions predicated upon facts, and expert opinion supported by facts." Cal. Pub. Res. Code § 21082.2(c). Courts applying CEQA have held over and over that:

> An accurate, stable and finite project description is the sine qua non [absolutely indispensable requirement] of an informative and legally sufficient EIR. [Citation]. However, a curtailed, and enigmatic or unstable project description draws a red herring across the path of public input. [citation] Only through an accurate view of the project may the public and interested parties balance the proposed project's benefits against its environmental cost, consider appropriate mitigation measures, assess the advantages of terminating the proposal and properly weigh other alternatives.

San Joaquin Raptor Rescue Center v. County of Merced, 149 Cal.App.4th 645, 672 (2007) (internal citations omitted).

The IA is part of the project but has not even been placed before the public for review during the Draft EIR/EIS public review period. Because the IA will contain critical project information that is not in the Draft EIR/EIS, the Draft EIR-EIS does not describe the *whole of the action*. Consequently, the EIR-EIS fails to provide an "accurate view of the project" and the public is incapable of understanding how the proposed project will operate. Further, this missing information demonstrates that the incomplete EIR/EIS fails to support its conclusions as to the

impacts of the project. Whereas CEQA requires environmentally informed agency decisions, the absence of the IA prevents the agencies from forming valid decisions. Instead, the agencies rely on speculation as to what the terms of the IA might include.

Violation of NCCPA

The NCCPA requires that any draft documents associated with an NCCP are made available for public review and comment. Cal. Fish & G. Code § 2815. As mentioned above, the NCCPA requires the NCCP to include an IA. Cal. Fish & G. Code § 2820(b). The Act further imposes a "requirement to make available in a *reasonable and timely manner* . . . planning documents associated with a natural community conservation plan that are subject to public review." Cal. Fish & G. Code § 2815 (italics added).

Because the impact and mitigation analyses in the EIR/EIS rely on the IA, the government agencies needed to make the draft IA available at the same time as the draft EIR/EIS in order to meet the *reasonable and timely manner* requirement. Releasing the draft IA months after the Draft EIR/EIS is neither reasonable nor timely because the government could have waited for completion of the draft IA before releasing the draft EIR/EIS.

How to Remedy These Violations

The government's plans to hold a 60-day public comment period for the draft IA after the Draft BDCP and Draft EIR/EIS comment period closes will not cure these defects. Staggering the release and comment periods for BDCP documents deprives the public of adequate review opportunities in two ways. First, once the government releases the Draft IA containing specific details concerning BDCP operation, interested parties' understanding of the project will change. It is likely that new information released in the IA will supersede comments received during the Draft BDCP and EIR/EIS comment period, undermining the integrity of the comment period. To ensure that interested parties have an adequate opportunity to review and comment on the project, all documents relating the BDCP need to be available for comment at the same time.

Second, a 60-day comment period is drastically insufficient to provide interested parties enough time to review the IA and its effects on BDCP operations. Interested parties will need to both review the draft IA and determine how it alters 40,000+ pages of BDCP documents. Accomplishing this type of review in a mere 60 days is impossible. Limiting the draft IA

comment period to 60 days will effectively ensure that interested parties are incapable of meaningfully reviewing the totality of the BDCP.

In order to provide meaningful public review, the BDCP federal and State agencies need to hold a new Draft BDCP comment period with *every* BDCP document -- Implementing Agreement, Biological Assessments and Biological Opinions, and Draft BDCP Plan and Draft BDCP EIR/EIS-- available for public review and comment during the same time period. Additionally, the new comment period must remain open for at least four months. NEPA regulation 40 C.F.R. 1502.7 declares that the text of an EIS for "proposals of unusual scope or complexity shall normally be less than 300 pages." Here, there are already 40,214 pages of released documents which represent 20% more pages than the 32 volumes of the last printed edition of the Encyclopedia Britannica. The government's original four month comment period and subsequent two-month extension tacitly conceded that extended public review periods are necessary for a project as massive as the BDCP.

Conclusion

The absence of the Draft IA during the Draft BDCP and Draft EIR/EIS comment period has violated NEPA, CEQA, ESA, and NCCPA. These violations have rendered the comment period inadequate to support meaningful public review and comments. In order to remedy these violations, the government must release the Draft IA and open a new, four-month Draft BDCP comment period with every BDCP document available for public review and comment. Beyond these violations of law, the government must open a new public comment period to restore any public confidence in the integrity of the BDCP. It is absurd to expect the public to trust the BDCP process without full disclosure of the project's impacts, costs, and who will pay those costs.

For these reasons, Friends of the River urges you to open a new public comment period on all BDCP documents, including the IA when it is released, for at least four months. Please call Robert Wright, Senior Counsel, Friends of the River at (916) 442-3155x 207 with any questions you may have.

Sincerely,

/s/ E. Robert Wright
Senior Counsel
Friends of the River

/s/ Patrick Huber
Legal Counsel
Friends of the River

(Encl. two attachments)

Additional Addressees, all via email:

Maria Rea, Assistant Regional Administrator
National Marine Fisheries Service

Michael Tucker, Fishery Biologist
National Marine Fisheries Service

Ryan Wulff, Senior Policy Advisor
National Marine Fisheries Service

Mike Chotkowski, Field Supervisor, S.F. Bay-Delta
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cc:
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Sixth District, California

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May 16, 2014

Subject: BDCP Public Comments Time Extension Request

We are writing on behalf of the member organizatio ns which are shown with this letter to request an extension for responding to the draft BDCP and draft EIR/EIS for BDCP. We request a minimum extension of 60 days which would extend the deadline into August, 2014. We are requesting this extension primarily so that the Implementation Agreement (IA) can be analyzed and commented on as an integral part of the plan, and coterminous with the EIR/EIS.

The Implementation Agreement is one of the foundat ional elements of this project and should succinctly describe the project's purpose; the project's financing plan; the project's biological goals; the project's operations; and the project's adherence to existing laws. Each of these elements is a mandatory requirement of a permissible project plan. The lack of the Implementation Agreement as an integral component of the project plan and the project's

environmental documents is a clear indication to us of a fundamentally flawed project.

It is the Implementation Agreement that defines ob ligations, provides assurances, ensures adequate funding, specifies responsibility for implementing measures, provides for enforcement and remedies for failure, and establishes the process for changes, among numerous other things. And these details reach into critical sections throughout the documents, from governance to finance to adaptive management to assurances to the very project description.

BDCP is incomplete without the IA because it does not specify any commitments the parties have made to fund and promote mitigation measures. As an impact analysis, the IA is required to be prepared concurrently with the EIS. Nevertheless, the parties to the BDCP have failed to produce even a draft IA specifying their individual commitments to ensuring the integrity of the project. This has resulted in the staggered or piecemeal environmental review that NEPA prohibits.

Finally, the BDCP has been described as the most complex HCP/NCCP permit application ever attempted. The integration of the IA with the EIR/EIS is essential, as is the time extension to adequately review and comment on the combined documents.

Nick Di Croce

Nick Di Croce, Co-Facilitator

ATTACHMENT TO EWC TIME EXTENSION REQUEST

MAY 16, 2014

RESTORE THE DELTA

Friends of the River

Planning and Conservation League

California Sportfishing Protection Alliance

Sierra Club California

PCFFA

Stewards of the Fisheries

california water impact network

AquAlliance

Defending Northern California Waters

California Coastkeeper Alliance

A Statewide Voice for Our Waters

Environmental Justice Coalition for Water

Great Seal of the Karuk Tribe

Winnemem Wintu Tribe

Middle River People

Southern California Watershed Alliance

Foothill Conservancy

Lower Sherman Island Duck Hunters Association

Butte Environmental Council
Protecting Butte County's Land, Air & Water Since 1975

epic
wildcalifornia.org

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CALIFORNIA RURAL LEGAL ASSISTANCE FOUNDATION

earth LAW CENTER

Tuolumne River Trust

sacramento river preservation trust

CLEAN WATER ACTION
CALIFORNIA

Institute for Fisheries Resources
Unite. Protect. Restore.

Santa Clarita Organization for Planning and the Environment (SCOPE)

SIERRA NEVADA ALLIANCE

NORTHERN CALIFORNIA COUNCIL
FEDERATION OF FLY FISHERS

food&waterwatch

Delta Response Group

citizens water watch of Northern California

KLAMATH RIVERKEEPER

CALIF. STRIPED BASS ASSOC.

The following Environmental Water Caucus affiliated organizations support the comments and recommendations shown in the attached letter.

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Editor
Fish Sniffer

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May 13, 2014

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Re: Request for 60-day Extension of DEIS/EIR Comment Deadline

Dear Messrs. Laird, Cowin, Bonham, Murillo, Lohoefener, and Stelle,

We are writing on behalf of the Natural Resources Defense Council, Defenders of Wildlife, American Rivers, The Nature Conservancy, and The Bay Institute and our hundreds of thousands of members and activists in California to request an extension of at least 60 days for submitting comments on the tens of thousands of pages of materials comprising the draft proposed Bay Delta Conservation Plan ("BDCP") and draft EIS/EIR on BDCP. This request would extend the deadline for public comment on those documents from June 13, 2014, to at least August 12, 2014.

This extension is requested and merited for three primary reasons. First, as you know, California is in the midst of an extraordinary drought, causing water management challenges unlike any we have experienced in several decades. These extraordinary conditions have demanded near

constant vigilance and participation in water management decisions this year by many stakeholders in the water community, including our organizations. The State has acknowledged that the work involved in responding to drought has necessarily resulted in the delay of many workplans and schedules. For instance, as the State announced on its BDCP website on May 5, 2014, when explaining that an anticipated draft Implementation Agreement for BDCP was still not available:

> the past weeks have required significant time commitments from key water management and regulatory principals. Understand that this is the worst drought California has faced in nearly 40 years, and operations and regulatory decisions need to be made in real time to address water needs for the rest of 2014.

http://baydeltaconservationplan.com/News/KeyAnnouncements.aspx. Similarly, the California Department of Justice, on behalf of the Department of Water Resources, recently sought an extension of time for a filing deadline in the Ninth Circuit Court of Appeals. The filing by the State Water Contractors, joined by DWR, based that request for delay on the grounds that, among other things:

> Water year 2014 has produced one of the driest years on record in the State of California. Indeed, on January 17, 2014, Governor Edmund G. Brown proclaimed a State of Emergency, directing agency officials to take all necessary actions to prepare for the expected drought conditions. ...The drought conditions in 2014 have exacerbated the already-limited resources of State Contractor Appellees. State Contractor Appellees are consequently involved in managing the water needs of their constituents and stakeholders, and this drought period has required legal and technical resources that might otherwise have been applied to evaluating the panel's decision and determining whether to seek rehearing en banc.

San Luis Delta-Mendota Water Authority v. Salazar, lead case no. 11-15871, Appellees' Unopposed Motion for Extension of Time to Petition for Rehearing En Banc and For Leave to File Oversized Petition (9th Cir., April 15, 2014) (citations omitted).

Agencies affected by the drought include many BDCP responsible agencies that are bound by the current comment deadline, such as the State Water Resources Control Board. The SWRCB recently announced that because of the time and staffing required to respond to drought, they have further delayed the release of the draft Substitute Environmental Document for Phase I of the update of the Bay Delta Water Quality Control Plan.

Of course, non-governmental stakeholders and the public also are deeply affected by the drought and also have committed significant time and effort to tracking and responding to the drought, and attempting to reduce or mitigate the drought's harmful impacts on people and California's environment. The unanticipated demands of the drought have limited the amount of time that we and many other stakeholders and members of the public engaged in water issues have been able to devote to the important task of reviewing and analyzing the draft BDCP and draft EIS/EIR. For instance, the state and federal agencies have filed numerous temporary urgency change petitions to the SWRCB, which have necessitated our review and, where appropriate, filing of

protests and requests for reconsideration. We have also been involved in numerous meetings with the state and federal agencies regarding drought response, allocations, water project operations, and related actions. All stakeholders have had to dedicate significant, unplanned resources to address the drought, and that has impacted our ability to review and comment on BDCP.

Second, key information has not yet been made available to the public that is critical to developing informed comments on the potential impacts of the proposed BDCP. That information includes the draft Implementation Agreement, which is likely to substantially affect the environmental impacts of the proposed project and the adequacy of the analysis in the draft EIS/EIR. For example, a recurring topic in discussions of the Implementation Agreement has been the level of water supply assurances, if any, that will be provided to contractors, and the level of assurances, if any, that biological goals and objectives of the draft BDCP will be met. The attached document prepared by several of BDCP's proponents in January, 2014, seeks "a level of water supply reliability of approximately 75% for both the SWP and CVP water service contractors and the SWP post-construction." *See* attached Critical Issues document, edited by J. Maher (Jan. 27, 2014). Such a commitment, if made in the draft Implementation Agreement, would represent a marked departure from previous commitments by federal and state agencies to not provide water supply assurances and would significantly worsen the impacts associated with the operation of a proposed BDCP as analyzed in the draft EIS/EIR. The public should be made aware of the full range of commitments proposed in the draft Implementation Agreement prior to requiring public comment on the draft EIS/EIR.

The Implementation Agreement will directly affect commitments, responsibilities, implementation roles and financial responsibilities contained in the BDCP. Indeed, the Natural Community Conservation Planning Act requires public review and comment on the draft Plan (including all associated documents like the draft Implementation Agreement), and encourages that the draft Plan and CEQA document be circulated for review and comment at the same time. Cal. Pub. Res. Code § 2815. Because the draft Implementation Agreement is likely to substantially affect the environmental effects of the BDCP, the agencies should extend the comment period on the draft EIS/EIR to be coterminous with the comment period on the draft Implementation Agreement and draft plan.

Finally, as numerous independent reviewers and agency representatives have acknowledged on many occasions, the proposed BDCP and draft EIS/EIR comprise "the most complex HCP/NCCP permit application ever attempted." *See* Saracino and Mount, "Panel Review of the Draft Bay Delta Conservation Plan" (September 2013) at 6, available at https://watershed.ucdavis.edu/files/biblio/FINAL-BDCP-REVIEW-for-TNC-and-AR-Sept-2013.pdf. The proposed project is immensely complicated, the analysis exceedingly lengthy, and the topic vitally important to every Californian. By this request, we seek the time needed to review it carefully and provide thoughtful input.

Thank you for your prompt consideration and response.

Sincerely,

Katherine Poole
Natural Resources Defense Council

Kim Delfino
Defenders of Wildlife

Jonathan Rosenfield
The Bay Institute

Jay Ziegler
The Nature Conservancy

John Cain
American Rivers

Cc: Tom Howard, Executive Director, SWRCB
Jessica Pearson, Delta Stewardship Council
Stephanie Skophammer, U.S. Environmental Protection Agency
Andrew Constantaras, U.S. Army Corps of Engineers

ATTACHMENT 1

Critical Issues
January 27, 2014

Threshold Issues Requiring Attention

- **The current level of federal effort** is jeopardizing ~~does not support~~ **the BDCP.** The engagement of the federal agencies must dramatically improve to ensure that water supplies and species populations improve. The available solutions are limited to direct communication between the governor, S~~s~~enator Feinstein and the White House. The purpose of that communication is to secure a commitment from the federal administration that it will direct its agencies to participate in the BDCP as a full partner with the state and as a project proponent.
- **The BDCP** proposed project **provides insufficient water supplies.** ~~-~~ As currently proposed,~~constructed~~ the BDCP will not result in sufficient water supply benefits to support a decision to continue funding the development of this program. In general terms, the BDCP should result in a level of water supply reliability of approximately 75% for both ~~the~~ SWP and CVP water service contractors~~and the SWP post-construction~~. The available solutions are to increase the yield of the BDCP~~project~~ through changes in default assumptions, to implement~~ing~~ publicly funded programs that help meet environmental water demands, and, given the substantial commitment of water and other resources being made in BDCP, to establish~~ing~~ a minimum water supply below which water will not be taken from SWP and CVP water service contractors for other purposes, including environmental purposes.
- **The cost of the BDCP is high, and there is significant concern that it will increase**. Recent experience shows that the cost of large public works projects tends to increase during construction. The cost of the BDCP is so high there is no room for any increase in cost. To reduce the likelihood of cost increases during construction, all costs need to be controlled by the entities that choose to fund construction of the BDCP. The available solutions are to allow DWR to retain design approval, while delegating all construction-related decisions to the local public agencies that volunteer to pay for the construction of the tunnels.
- **The BDCP's regulatory assurances** to permittees **are weak**. Strong regulatory assurances increase the willingness of local public agencies to fund the BDCP and construction of the new conveyance facilities~~tunnels~~. The assurances currently included in the BDCP are unclear and uncertain. The available solutions include clear delineation in BDCP of permittee commitments of water, financial and other resources so that permittees can rely upon ~~establishing~~ a minimum water supply from~~or~~ the project, and clear commitment ~~certainty~~ that a lack of funding by the state and federal agencies doesn't invalidate the permits for operation of the new conveyance facilities~~BDCP's tunnels~~.

Additional detail on each of these issues and possible solutions were provided to the governor's staff in prior meetings.

To: Roemele, Julie[Roemele.Julie@epa.gov]; Wright, Justin[wright.justin@epa.gov]
From: Rader, Cliff
Sent: Wed 5/14/2014 12:04:46 AM
Subject: Fw: Briefing Paper for Thursday's NEPA Bay Delta briefing
BDCP Briefing paper 5 13 14_lbh kmg skop EF final.docx

From: Johnson, Kathleen
Sent: Tuesday, May 13, 2014 6:30:34 PM
To: Giles-AA, Cynthia; Kopocis, Ken; Bromm, Susan; Rader, Cliff
Cc: Goforth, Kathleen; Skophammer, Stephanie; Hanf, Lisa; Quast, Sylvia; Hagler, Tom; Vendlinski, Tim; Diamond, Jane; Foresman, Erin
Subject: Briefing Paper for Thursday's NEPA Bay Delta briefing

All,

Please find attached a briefing paper (revised from previous versions) for the Bay Delta Conservation Plan Draft EIS. We look forward to discussing this project with you on Thursday, 11:00 am Eastern. Let me know if we can provide further information in advance of the briefing.

Thanks.

Kathleen H. Johnson

Director, Enforcement Division

U.S. EPA - Region 9

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From: Rader, Cliff
Sent: Wed 5/14/2014 12:04:14 AM
Subject: Fw: Briefing Paper for Thursday's NEPA Bay Delta briefing
BDCP Briefing paper 5 13 14_lbh kmg skop EF final.docx

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Sent: Tuesday, May 13, 2014 6:30:34 PM
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To: Marshall, Tom[marshall.tom@epa.gov]
From: Rader, Cliff
Sent: Wed 5/14/2014 12:02:47 AM
Subject: Fw: Briefing Paper for Thursday's NEPA Bay Delta briefing
BDCP Briefing paper 5 13 14_lbh kmg skop EF final.docx

From: Johnson, Kathleen
Sent: Tuesday, May 13, 2014 6:30:34 PM
To: Giles-AA, Cynthia; Kopocis, Ken; Bromm, Susan; Rader, Cliff
Cc: Goforth, Kathleen; Skophammer, Stephanie; Hanf, Lisa; Quast, Sylvia; Hagler, Tom; Vendlinski, Tim; Diamond, Jane; Foresman, Erin
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NEPA Effects/Mitigation on Water Quality – Delta Bay

Electrical Conductivity

8-439

***NEPA Effects*:** In summary, the increased frequency of exceedance of EC objectives and increased long-term and drought period average EC levels that would occur at western, interior, and southern Delta compliance locations under Alternative 4, Scenarios H1–H4, relative to the No Action Alternative, would contribute to adverse effects on the agricultural beneficial uses. In addition, the increased frequency of exceedance of the San Joaquin River at Prisoners Point EC objective and long-term and drought period average EC could contribute to adverse effects on fish and wildlife beneficial uses. Given that the western and southern Delta are CWA section 303(d) listed as impaired due to elevated EC, the increase in the incidence of exceedance of EC objectives and long-term average and drought period average EC in this portion of the Delta has the potential to contribute to additional beneficial use impairment. The increases in long-term average EC levels that would occur in Suisun Marsh would further degrade existing EC levels and could contribute additional to adverse effects on the fish and wildlife beneficial uses. Suisun Marsh is CWA section 303(d) listed as impaired due to elevated EC, and the potential increases in long-term average EC levels could contribute to additional beneficial use impairment. These increases in EC constitute an adverse effect on water quality. Mitigation Measure WQ-11 would be available to reduce these effects (implementation of this measure along with a separate, non-environmental commitment as set forth in EIR/EIS Appendix 3B, *Environmental Commitments*, relating to the potential EC-related changes would reduce these effects).

Pg 8-441

Mitigation Measure WQ-11: Avoid, Minimize, or Offset, as Feasible, Reduced Water 10 **Quality Conditions**

It remains to be determined whether, or to what degree, the available and existing salinity response and countermeasure actions of SWP and CVP facilities, municipal water purveyors, or Suisun Marsh salinity control facilities would be capable of offsetting the actual level of changes in EC that may occur from implementation of Alternative 4. Therefore, in order to determine the feasibility of reducing the effects of increased EC levels, and potential adverse effects on beneficial uses associated with CM1 operations (and hydrodynamic effects of tidal restoration under CM4), the proposed mitigation requires a series of phased actions to identify and evaluate existing and possible feasible actions, followed by development and implementation of the actions, if determined to be necessary. The phased actions for reducing EC levels and associated adverse effects on agricultural water supply also could mitigate adverse effects on fish and wildlife life. The emphasis and mitigation actions would be limited to those identified as necessary to avoid, reduce, or offset adverse EC effects at Delta compliance locations and the Suisun Marsh. The development and implementation of any mitigation actions shall be focused on those incremental effects attributable to implementation of Alternative 4 operations only. Development of mitigation actions for the incremental EC effects attributable to climate change/sea level rise are not required because these changed conditions would occur with or without implementation of Alternative 4. The goal of specific actions would be to reduce/avoid additional exceedances of Delta EC objectives and reduce long-term average concentration increases to levels that would not adversely affect beneficial uses within the Delta and Suisun Marsh.

Mitigation Measure WQ-11a: Conduct Additional Evaluation and Modeling of Increased EC Levels Following Initial Operations of CM1

Following commencement of initial operations of CM1, the BDCP proponents will conduct additional evaluations described herein, and develop additional modeling (as necessary), to define the extent to which modified operations could reduce or eliminate the additional exceedances of the Bay-Delta WQCP objectives for EC currently modeled to occur under Alternative 4. The additional evaluations should also consider specifically the changes in Delta hydrodynamic conditions associated with tidal habitat restoration under CM4

(in particular the potential for increased EC concentrations that could result from increased tidal exchange) once the specific restoration locations are identified and designed. If sufficient operational flexibility to offset EC increases is not feasible under Alternative 4 operations, achieving EC reduction pursuant to this mitigation measure would not be feasible under this Alternative

Chloride

Pg 8-428

***NEPA Effects*:** In summary, relative to the No Action Alternative conditions, all of the Alternative 4 H1–H4 Scenarios would result in increased water quality degradation and frequency of exceedance of the 150 mg/L objective at Contra Costa Pumping Plant #1 and Antioch, increased water quality degradation with respect to the 250 mg/L municipal and industrial objective at interior and western Delta locations on a monthly average basis, and measureable water quality degradation relative to the 303(d) impairment in Suisun Marsh (see Mitigation Measure WQ-7 below; implementation of this measure along with a separate, non-environmental commitment relating to the potential increased chloride treatment costs would reduce these effects). The predicted chloride increases constitute an adverse effect on water quality. Additionally, the predicted changes relative to the No Action Alternative conditions indicate that in addition to the effects of climate change/sea level rise, implementation of CM1 and CM4 under the Alternative 4 H1–H4 Scenarios would contribute substantially to the adverse water quality effects.

8-429

Mitigation Measure WQ-7: Conduct Additional Evaluation and Modeling of Increased Chloride Levels and Develop and Implement Phased Mitigation Actions

It is currently unknown whether the effects of increased chloride levels, and potential adverse effects on municipal and industrial water supply and fish and wildlife beneficial uses associated with CM1 operations (and hydrodynamic effects of tidal restoration under CM4), can be mitigated through modifications to initial operations. Specifically, it remains to be determined whether, or to what degree, the available and existing salinity response and countermeasure actions of SWP and CVP facilities, municipal water purveyors, or Suisun Marsh salinity control facilities would be capable of offsetting the actual level of changes in chloride that may occur from implementation of Alternative 4. Therefore, the proposed mitigation measures require a series of actions to identify and evaluate potentially feasible actions, to achieve reduced chloride levels in order to reduce or avoid impacts to beneficial uses.
The development and implementation of any mitigation actions shall be focused on those incremental effects attributable to implementation of Alternative 4 operations only. Development of mitigation actions for the incremental chloride effects attributable to climate change/sea level rise are not required because these changed conditions would occur with or without implementation of Alternative 4.

Mitigation Measure WQ-7a: Conduct Additional Evaluation and Modeling of Increased Chloride Levels Following Initial Operations of CM1

Following commencement of initial operations of CM1, the BDCP proponents will conduct additional evaluations described herein, and develop additional modeling (as necessary), to define the extent to which modified operations could reduce or eliminate the additional exceedances of the 250 mg/L Bay-Delta WQCP objective for chloride currently modeled to occur under Alternative 4. The additional evaluations should also consider specifically the changes in Delta hydrodynamic conditions associated with tidal habitat restoration under CM4 (in particular the potential for increased chloride concentrations that could result from increased tidal exchange) once the specific restoration locations are identified and designed. If sufficient 22 operational flexibility to offset chloride increases is not feasible under Alternative 4 operations, achieving chloride reduction pursuant to this mitigation measure would not be feasible under this alternative.

Bromide

8-420 – 8-421

***NEPA Effects*:** In summary, the operations and maintenance activities under Scenarios H1–H4 of Alternative 4, relative to the No Action Alternative, would result in small increases (i.e., <1%) in long-term average bromide concentrations at Vernalis related to relatively small declines in long-9 term average flow on the San Joaquin River. However, the operations and maintenance activities under Scenarios H1–H4 of Alternative 4 would cause substantial degradation to water quality with respect to bromide at Barker Slough, source of the North Bay Aqueduct. This substantial degradation would be predicted to occur regardless of operational scenario, but would be greatest under Scenario H2. Resultant substantial change in long-term average bromide at Barker Slough could necessitate changes in water treatment plant operations or require treatment plant upgrades in order to maintain DBP compliance, and thus would constitute an adverse effect on water quality. Mitigation Measure WQ-5 is available to reduce these effects (implementation of this measure along with a separate, non-environmental commitment as set forth in EIR/EIS Appendix 3B, *Environmental Commitments*, relating to the potential increased treatment costs associated with bromide-related changes would reduce these effects).

Pg: 8-422

Mitigation Measure WQ-5: Avoid, Minimize, or Offset, as Feasible, Adverse Water Quality Conditions

It remains to be determined whether, or to what degree, the available and existing salinity response and countermeasure actions of SWP and CVP facilities or municipal water purveyors would be capable of offsetting the actual level of changes in bromide that may occur from implementation of Alternative 4. Therefore, in order to determine the feasibility of reducing the effects of increased bromide levels, and potential adverse effects on beneficial uses associated with CM1 operations (and hydrodynamic effects of tidal restoration under CM4), the proposed mitigation requires a series of phased actions to identify and evaluate existing and possible feasible actions, followed by development and implementation of the actions, if determined to be necessary. The development and implementation of any mitigation actions shall be focused on those incremental effects attributable to implementation of Alternative 4 operations only. Development of mitigation actions for the incremental bromide effects attributable to climate change/sea level rise are not required because these changed conditions would occur with or without implementation of Alternative 4. The goal of specific actions would be to reduce/avoid additional degradation of Barker Slough water quality conditions with respect to the CALFED bromide goal. Following commencement of initial operations of CM1, the BDCP proponents will conduct additional evaluations described herein, and develop additional modeling (as necessary), to define the extent to which modified operations could reduce or eliminate the increased bromide concentrations currently modeled to occur under Alternative 4. The additional evaluations should also consider specifically the changes in Delta hydrodynamic conditions associated with tidal habitat restoration under CM4 (in particular the potential for increased bromide concentrations that could result from increased tidal exchange) once the specific restoration locations are identified and designed. If sufficient operational flexibility to offset bromide increases is not practicable/feasible under Alternative 4 operations, achieving bromide reduction pursuant to this mitigation measure would not be feasible under this alternative.

Mercury

8-446

Impact WQ-14: Effects on Mercury Concentrations Resulting from Implementation of CM2–22 3

***NEPA Effects*:** Some habitat restoration activities under Alternative 4 would occur on lands in the Delta

formerly used for irrigated agriculture. Tidal and other restoration proposed under Alternative 4 have the potential to increase water residence times and increase accumulation of organic sediments that are known to enhance methylmercury bioaccumulation in biota in the restored habitat. Therefore, increases in mercury methylation in the habitat restoration areas is possible but uncertain depending on the specific restoration design implemented at a particular Delta location. Models to estimate the potential for methylmercury formation in restored areas are not currently available. However, DSM2 modeling for Alternative 4 operations does incorporate assumptions for certain habitat restoration activities proposed under CM2 and CM4 (see Section 12 8.3.1.3) that result in changes to Delta hydrodynamics compared to the No Action Alternative. These modeled restoration assumptions provide some insight into potential hydrodynamic changes that could be expected related to implementing CM2 and CM4 and are considered in the evaluation of the potential for increased mercury and methylmercury concentrations under Alternative 4.

BDCP Conservation Measure 12 (CM12) addresses the potential for methylmercury bioaccumulation associated with restoration activities and acknowledges the uncertainties associated with mitigating or minimizing this potential effect. CM12 proposes project-specific mercury management plans for restoration actions that will incorporate relevant approaches recommended in Phase 1 Methylmercury TMDL control studies. Specific approaches recommended under CM12 that are intended to minimize or mitigate for potential increases in methylmercury bioaccumulation at future restoration sites include:

- Characterizing mercury, methylmercury, organic carbon, iron, and sulfate concentrations to better inform restoration design,
- Sequestering methylmercury at restoration sites using low intensity chemical dosing techniques,
- Minimizing microbial methylation associated with anoxic conditions by reducing the amount of organic material at a restoration site (this approach could limit the benefit of restoration areas by limiting the amount of carbon supplied by these areas to the Delta as a whole. In some cases, this would run directly counter to the goals and objectives of the BDCP. This approach should not be implemented in such a way that it reduces the benefits to the Delta ecosystem provided by restoration areas),
- Designing restoration sites to enhance photo degeneration that converts methylmercury into a biologically unavailable, inorganic form of mercury,
- Remediating restoration site soils with iron to reduce methylation in sulfide rich soils, and
- Considering capping mercury laden sediments, where feasible, to reduce methylation potential at a site.

Because of the uncertainties associated with site-specific estimates of methylmercury concentrations and the uncertainties in source modeling and tissue modeling, the effectiveness of methylmercury management proposed under CM12 to reduce methylmercury concentrations would need to be evaluated separately for each restoration effort, as part of design and implementation.

Because of this uncertainty and the known potential for methylmercury creation in the Delta this potential effect of implementing CM2–CM22 is considered adverse.

Chloride and Electrical Conductivity Sections

Chloride: pgs: 8-423 – 8-428

Impact WQ-7: Effects on Chloride Concentrations Resulting from Facilities Operations and Maintenance (CM1)

Upstream of the Delta

Under Alternative 4, Scenarios H1–H4, there would be no expected change to the sources of chloride in the Sacramento and eastside tributary watersheds. Chloride loading in these watersheds would remain unchanged and resultant changes in flows from altered system-wide operations would have negligible, if any, effects on the concentration of chloride in the rivers and reservoirs of these watersheds. The modeled long-term annual average flows on the lower San Joaquin River at Vernalis would decrease slightly compared to Existing Conditions (in association with the different operational components of Scenarios H1–H4 for Alternative 4, climate change, and increased water demands) and be similar compared to the No Action Alternative (considering only changes due only to the different operational components of Scenarios H1–H4 under Alternative 4). The reduced flow would result in possible increases in long-term average chloride concentrations of about 2%, relative to the Existing Conditions, which would be nearly identical under each of the H1–H4 scenarios, and no change relative to No Action Alternative (Appendix 8G, Table Cl-62). Consequently, the Alternative 4 H1–H4 Scenarios would not be expected to cause exceedances of chloride objectives/criteria or substantially degrade water quality with respect to chloride, and thus would not adversely affect any beneficial uses of the Sacramento River, the eastside tributaries, associated reservoirs upstream of the Delta, or the San Joaquin River.

Delta

Modeling scenarios included assumptions regarding how certain habitat restoration activities (CM2 42 and CM4) would affect Delta hydrodynamics, To the extent that restoration actions alter hydrodynamics within the Delta region, which affects mixing of source waters, these effects are included in this assessment of operations-related water quality changes (i.e., CM1). Other effects of CM2-22 not attributable to hydrodynamics, for example, additional loading of a constituent to the Delta, are discussed within the impact header for CM2-22. See section 8.3.1.3 for more information.
Relative to Existing Conditions, modeling predicts that the Alternative 4 H1–H4 Scenarios would result in similar or reduced long-term average chloride concentrations for the 16-year period modeled at most of the assessment locations. The mass-balance modeling results indicate similar, but slightly larger increases in chloride concentrations compared to estimates generated using EC- chloride relationships and DSM2 EC output (see Section 8.3.1.3). Increased long-term average chloride concentrations would occur at the North Bay Aqueduct at Barker Slough (i.e., range from up to 33% [H2] to 16% [H3]) and San Joaquin River at Staten Island (i.e., similar increase of 22–23% for all H1–H4 Scenarios) (Appendix 8G, *Chloride*, Tables Cl-25A/25D [mass balance model results] and Tables Cl-26A/26D [EC-chloride relationship results]). Changes in long-term average concentrations in the western Sacramento River at Emmaton would range from an increase for Scenarios H1 and H2 (14 to 16%) to no measureable change for Scenarios H3 and H4 (i.e., -1%). Long-term average chloride concentration would decrease at other assessment locations, with the largest reductions occurring under Scenarios H3 and H4 (i.e., up to -24% at Franks Tract) and less reduction under Scenarios H1 and H2 (i.e., up to -12% at Franks Tract). Additionally, implementation of tidal habitat restoration under CM4 would increase the tidal exchange volume in the Delta, and thus may contribute to increased chloride concentrations in the Bay source water as a result of increased salinity intrusion. More discussion of this phenomenon is included in

Section 8.3.1.3. Consequently, while uncertain, the magnitude of chloride increases may be greater than indicated herein and would affect the western Delta assessment locations the most which are influenced to the greatest extent by the Bay source water. This comparison to Existing Conditions reflects changes in chloride due to both the different operational components of Scenarios H1–H4 for Alternative 4 and climate change/sea level rise.

Relative to the No Action Alternative conditions, the mass balance analysis of modeling results indicated that the Alternative 4 Scenarios H1–H4 would result in similar increases in long-term average chloride concentrations for the 16-year period as described above compared to Existing Conditions: SF Mokelumne River at Staten Island (i.e., up to 25 to 27% for all H1–H4 Scenarios), North Bay Aqueduct at Barker Slough (i.e., range of 20% [H3] up to 37% [H2]), and for the Sacramento River at Emmaton (i.e., ranging from an increase for Scenarios H1-H2 of up to 17% to reduction under Scenarios H3-H4 [-1%]) (Appendix 8G, Table Cl-25A/25D [mass balance model results] and Tables Cl-26A/26D [EC-chloride relationship results]). Relative to the No Action Alternative, the long-term average chloride concentrations based on EC to chloride relationships indicate that most of the other interior and western Delta assessment locations under Scenarios H1 and H2 would exhibit similar increases ranging from up to 3% at San Joaquin River at Buckley Cove to 9% at the Sacramento River at Mallard Island. The comparison to the No Action Alternative reflects chloride changes due only to the different operational components of Scenarios H1–H4 for Alternative 4.

The following outlines the modeled chloride changes relative to the applicable objectives and beneficial uses of Delta waters.

Municipal Beneficial Uses–Relative to Existing Conditions

Estimates of chloride concentrations generated using EC-chloride relationships and DSM2 EC output (see Section 8.3.1.3) were used to evaluate the 150 mg/L Bay-Delta WQCP objective for municipal and industrial beneficial uses on a basis of the percent of years the chloride objective is exceeded for the modeled 16-year period. The objective is exceeded if chloride concentrations exceed 150 mg/L for a specified number of days in a given water year at both the Antioch and Contra Costa Pumping Plant #1 locations. For the Alternative 4 Scenarios H1–H4, the modeled frequency of objective exceedance would approximately double at the Contra Costa Pumping Plant #1 from 6% of years under Existing Conditions, to 13% of years under all of the Alternative 4 scenarios (Appendix 8G,Table Cl-64). Similarly, estimates of chloride concentrations generated using EC-chloride relationships and DSM2 EC output (see Section 8.3.1.3) were also used to evaluate the 250 mg/L Bay-Delta WQCP objective for chloride at Contra Costa Pumping Plant #1 where daily average objectives apply. The basis for the evaluation was the predicted number of days the objective was exceeded for the modeled 16- year period. For Alternative 4, the modeled frequency of objective exceedance would decrease similarly for the H1–H4 Scenarios by approximately one half, from 6% of modeled days under Existing Conditions, to 3–4% of modeled days under the Alternative 4 operational scenarios (Appendix 8G, Table Cl-63). Given the limitations inherent to estimating future chloride concentrations (see Section 8.3.1.3), estimation of chloride concentrations through both a mass balance approach and an EC-chloride relationship approach was used to evaluate the 250 mg/L Bay-Delta WQCP objectives in terms of both frequency of exceedance and use of assimilative capacity. When utilizing the mass balance approach to model monthly average chloride concentrations for the 16-year period, the predicted frequency of exceeding the 250 mg/L objective would decrease at the Contra Costa Canal at Pumping Plant #1 from an exceedance frequency of 24% under Existing Conditions to a range of 18% (for H1) to 12–13% (for H3 and H4) (Appendix 8G, Table Cl-27 and Figure Cl-5). However, the frequency of exceedances would increase slightly for the 16-year period modeled at the San Joaquin River at Antioch (i.e., from 66% under Existing Conditions to 68% to 70% for the H1–H4 Scenarios) and Sacramento River at Mallard Island (i.e., from 85% under Existing Conditions to 86% to 88% for the H1–H4 Scenarios) (Appendix 8G, Table Cl-27). The mass balance results also indicate that the increased concentrations would reduce assimilative capacity with respect to the 250 mg/ objective, thus causing further degradation at Antioch in March and April, with similar maximum reductions under H1 and H3 of up to 54% to maximum

reductions of up to 42% for H3 and H4 for the 16-year period modeled, and 100% reduction, or elimination of assimilative capacity, for all of the H1–H4 Scenarios during the drought period modeled) (Appendix 8G, Tables Cl-29A/29D and Figure Cl-5). Assimilative capacity at the Contra Costa Canal at Pumping Plant #1 also would be similarly reduced in September and October under the H1 and H2 scenarios (i.e., up to 100%, or elimination) when chloride concentrations would be near, or exceed, the objectives, thus increasing the risk of exceeding objectives (Appendix 8G, Figure Cl-5), but would not be substantially reduced under the H3 or H4 scenarios.
In comparison, when utilizing the chloride-EC relationship to model monthly average chloride concentrations for the 16-year period, trends in frequency of exceedance and use of assimilative capacity would be similar to that discussed when utilizing the mass balance modeling approach (Appendix 8G, Table Cl-28 and Tables Cl-30A/30D). However, as with Alternative 1A the modeling approach utilizing the chloride-EC relationships predicted changes of lesser magnitude, where predictions of change utilizing the mass balance approach were generally of greater magnitude, and thus more conservative. As discussed in Section 8.3.1.3, in cases of such disagreement, the approach that yielded the more conservative predictions was used as the basis for determining adverse impacts.

Based on the additional predicted annual and seasonal exceedances of one or both Bay Delta WQCP objectives for chloride, and the associated long-term average water quality degradation in the western Delta, the potential exists for substantial adverse effects under all of the Alternative 4 H1–H4 Scenarios on the municipal and industrial beneficial uses through reduced opportunity for diversion of water with acceptable chloride levels.

303(d) Listed Water Bodies–Relative to Existing Conditions

With respect to the 303(d) listing for chloride in Tom Paine Slough, the monthly average chloride concentrations for the 16-year period modeled at Old River at Tracy Road would generally be similar under all of the Alternative 4 H1–H4 Scenarios compared to Existing Conditions, and thus, would not be further degraded on a long-term basis (Appendix 8G, Figure Cl-6). With respect to Suisun Marsh, the monthly average chloride concentrations for the 16-year period modeled would generally increase under all of the Alternative 4 H1–H4 Scenarios compared to Existing Conditions in the months of March through May at the Sacramento River at Collinsville (Appendix 8G, Figure Cl-7), Mallard Island (Appendix 8G, Figure Cl-5), and increase substantially at Montezuma Slough at Beldon's Landing (i.e., over a doubling of concentration in December through February) (Appendix 8G, Figure Cl-8), thereby contributing to additional, measureable long-term degradation that potentially would adversely affect the necessary actions to reduce chloride loading for any TMDL that is developed.

Municipal Beneficial Uses–Relative to No Action Alternative

Similar to the assessment conducted for Existing Conditions, estimates of chloride concentrations generated using EC-chloride relationships and DSM2 EC output (see Section 8.3.1.3) were used to evaluate the 150 mg/L Bay-Delta WQCP objective for municipal and industrial beneficial uses. For Alternative 4, the modeled frequency of objective exceedance would increase at the Contra Costa Pumping Plant #1 from 6% under the No Action Alternative to 13% of years under all of the Alternative 4 H1–H4 Scenarios (Appendix 8G, Table Cl-64).
Similarly, estimates of chloride concentrations generated using EC-chloride relationships and DSM2 EC output (see Section 8.3.1.3) were also used to evaluate the 250 mg/L Bay-Delta WQCP objective for chloride at Contra Costa Pumping Plant #1 where daily average objectives apply. For Alternative 4, the modeled frequency of objective exceedance would decrease minimally under all the H1–H4 Scenarios, from 5% of modeled days under the No Action Alternative to 4–3% of modeled days under the Alternative 4 scenarios (Appendix 8G, Table Cl-64).
Similar to Existing Conditions, a comparative assessment of modeling approaches was utilized to evaluate the 250 mg/L Bay-Delta WQCP objectives in terms of both frequency of exceedance and use of

assimilative capacity on a monthly average basis. When utilizing the mass balance approach to model monthly average chloride concentrations for the 16-year period, a small increase in exceedance frequency would be predicted at the Sacramento River at Mallard Island (i.e., from 86% for the No Action Alternative to a slight 2% increase [up to 88%] for H1 and H3), with no change in exceedances under H2 or H4 (Appendix 8G, Table Cl-27). The frequency of exceedances would decrease slightly at the San Joaquin River at Antioch (i.e., from 73% for the No Action Alternative to a range of 68% [H2 and H4] to 70% [H1]), and the frequency of exceedances at the Contra Costa Canal at Pumping Plant #1 would depend on the scenario from 14% under the No Action Alternative increasing by 2–4% for H1 and H2 (i.e., up to 18%) and decreasing at H3 and H4 [to 12%])(Appendix 8G, Table Cl-27). Substantial reductions in available assimilative capacity compared to the No Action Alternative condition would occur at Antioch under H1 and H3 (i.e., 24% in April) and no substantial reduction under H2/H4 for the 16-year period modeled, and up to 100% in April [i.e., eliminated] for the drought period for all H1–H4 scenarios). Assimilative capacity also would be reduced substantially at the Contra Costa Canal at Pumping Plant #1 at similar levels for H1 and H2 in August through November (i.e., up to 100% elimination in October) to only in August and September under H3 and H4 (i.e., up to 29%) for the 16-year period modeled, with 100% elimination in at least one month under all of the H1–H4 scenarios for the drought period) (Appendix 8G, Tables Cl-29A/29D), reflecting substantial degradation during months when average concentrations would be near, or exceed, the objective.

In comparison, when utilizing the chloride-EC relationship to model monthly average chloride concentrations for the 16-year period, trends in frequency of exceedance and use of assimilative capacity would be similar to that discussed when utilizing the mass balance modeling approach (Appendix 8G, Tables Cl-30A/30D). However, as with Alternative 1A the modeling approach utilizing the chloride-EC relationships predicted changes of lesser magnitude, where predictions of change utilizing the mass balance approach were generally of greater magnitude, and thus more conservative. As discussed in Section 8.3.1.3, in cases of such disagreement, the approach that yielded the more conservative predictions was used as the basis for determining adverse impacts.

Based on the additional predicted annual and seasonal exceedances of one or both Bay Delta WQCP objectives for chloride, and the associated long-term average water quality degradation in the western Delta, the potential exists for substantial adverse effects under all of the Alternative 4 H1–H4 Scenarios on the municipal and industrial beneficial uses through reduced opportunity for diversion of water with acceptable chloride levels.

303(d) Listed Water Bodies–Relative to No Action Alternative

With respect to the 303(d) listing for chloride, Alternative 4 would generally result in similar changes for all of the Alternative 4 H1–H4 Scenarios to those discussed for the comparison to Existing Conditions. Monthly average chloride concentrations at Tom Paine Slough would not be further degraded on a long-term basis (Appendix 8G, Figure Cl-6). Monthly average chloride concentrations at source water channel locations for the Suisun Marsh (Appendix 8G, Figures Cl-5, Cl-7 and Cl-8) would increase substantially in some months during October through May compared to the No Action Alternative conditions. Therefore, additional, measureable long-term degradation would occur in Suisun Marsh that potentially would adversely affect the necessary actions to reduce chloride loading for any TMDL that is developed.

SWP/CVP Export Service Areas

Under the Alternative 4 H1–H4 Scenarios, long-term average chloride concentrations based on the mass balance analysis of modeling results for the 16-year period modeled at the Banks and Jones pumping plants would decrease compared to Existing Conditions. Reductions at Banks would be slightly larger than at Jones, ranging from 37% (H1) to 45% (H4) (Appendix 8G, *Chloride*, Table Cl- 25A/25D). Compared to No Action Alternative, the pattern of reductions would be similar with Banks ranging from 32% (H1) to 38% (H4). The modeled frequency of exceedances of applicable water quality objectives/criteria would decrease relative to Existing Conditions and No Action Alternative, for both the 16-year period and the drought period modeled (Appendix 8G, *Chloride*, 1 Table Cl-27).

Consequently, water exported into the SWP/CVP service area would generally be of similar or better quality with regards to chloride relative to Existing Conditions and the No Action Alternative conditions. Results of the modeling approach which used relationships between EC and chloride (see Section 8.3.1.3) were consistent with the discussion above, and assessment of chloride using these data results in the same conclusions as are presented above for the mass-balance approach (Appendix 8G, Tables Cl-26A/26D [for concentration changes] and Table Cl-28 [for frequency of exceedances]). Commensurate with the reduced chloride concentrations in water exported to the service area, reduced chloride loading in the lower San Joaquin River would be anticipated which would likely alleviate or lessen any expected increase in chloride at Vernalis related to decreased annual average San Joaquin River flows (see discussion of Upstream of the Delta).

Maintenance of SWP and CVP facilities would not be expected to create new sources of chloride or contribute towards a substantial change in existing sources of chloride in the affected environment. Maintenance activities would not be expected to cause any substantial change in chloride such that any long-term water quality degradation would occur, thus, beneficial uses would not be adversely affected anywhere in the affected environment.

Electrical Conductivity pgs 8-436

Impact WQ-11: Effects on Electrical Conductivity Concentrations Resulting from Facilities Operations and Maintenance (CM1)

Upstream of the Delta

Alternative 4, Scenarios H1–H4, would alter the magnitude and timing of water releases from reservoirs upstream of the Delta relative to Existing Conditions and the No Action Alternative. With respect to EC, an increase or decrease in river flow alone is not of concern. Measureable changes in the quality of the watershed runoff and reservoir inflows would not be expected to occur in the future; therefore, the EC levels in these reservoirs would not be expected to change relative to Existing Conditions or the No Action Alternative. There could be increased discharges of EC- elevating parameters in the future in water bodies upstream of the Delta as a result of urban growth and increased runoff and wastewater discharges. The state has begun to aggressively regulate point-source discharge effects on Delta salinity-elevating parameters, capping dischargers at existing levels, and is expected to further regulate EC and related parameters upstream of and within the Delta in the future as salt management plans are developed. Based on these considerations, EC levels (highs, lows, typical conditions) in the Sacramento River and its tributaries, the eastside tributaries, or their associated reservoirs upstream of the Delta would not be expected to be outside the ranges occurring under Existing Conditions or the No Action Alternative.

The effects on lower San Joaquin River EC would be somewhat different. Elevated EC in the San Joaquin River can be sourced to agricultural use of irrigation water imported from the southern Delta and applied on soils high in salts. This accumulation of salts is a primary contributor of elevated EC on the lower San Joaquin River. Tributary flows generally provide dilution of the high EC agricultural drainage waters. Depending on operational scenario, long-term average flows at Vernalis would decrease about 6% (as a result of climate change and increased water demands) relative to Existing Conditions, and would increase about 0.1% relative to the No Action Alternative (Appendix 5A). These decreases in flow, alone, would correspond to a possible increase in long-term average EC levels. The level of EC increase cannot be readily quantified but, based on estimated increase in bromide and chloride concentrations, to which EC is correlated, would be relatively small and on the order of about 3% relative to Existing Conditions, and less than 0.1% relative to the No Action Alternative. However, with the implementation of the adopted TMDL for the San Joaquin River at Vernalis and the ongoing development of the TMDL for the San Joaquin River upstream of Vernalis and its implementation, it is expected that long-term EC levels will improve. Based on these considerations, substantial changes in EC levels in the San Joaquin

River relative to Existing Conditions or the No Action Alternative would not be expected of sufficient magnitude and geographic extent that would result in adverse effects on any beneficial uses, or substantially degrade the quality of these water bodies, with regard to EC.

Delta

Modeling scenarios included assumptions regarding how certain habitat restoration activities (CM2 and CM4) would affect Delta hydrodynamics. To the extent that restoration actions alter hydrodynamics within the Delta region, which affects mixing of source waters, these effects are included in this assessment of operations-related water quality changes (i.e., CM1). Other effects of CM2-22 not attributable to hydrodynamics, for example, additional loading of a constituent to the Delta, are discussed within the impact header for CM2-22. See section 8.3.1.3 for more information.
Relative to Existing Conditions, Alternative 4, Scenarios H1–H4, would result in an increase in the number of days the Bay-Delta WQCP EC objectives would be exceeded in the Sacramento River at Emmaton, San Joaquin River at San Andreas Landing and Prisoners Point, and Old River near Middle River and at Tracy Bridge (Appendix 8H, Table EC-4). The percent of days the Emmaton EC objective would be exceeded for the entire period modeled (1976–1991) would increase from 6% under Existing Conditions to 23–25%, depending on the operations scenario, and the percent of days out of compliance would increase from 11% under Existing Conditions to 35–38%, depending on the operations scenario. The percent of days the San Andreas Landing EC objective would be exceeded would increase from 1% to 3–4%, depending on the operations scenario. The percent of days out of compliance with the EC objective for San Andreas Landing would increase from 1% to 5–7%, depending on the operations scenario. The percent of days the Prisoners Point EC objective would be exceeded for the entire period modeled would increase from 6% to 20–31% and the percent of days out of compliance with the EC objective would increase from 10% to 22–31%, depending on the operations scenario. The increase in percent of days exceeding the EC objectives and days out of compliance at the Old River locations would be 1–2% at Tracy Bridge and less than 1% at Middle River for all operations scenarios. Average EC levels at the western and southern Delta compliance locations would decrease, except at Emmaton, from 1–36% for the entire period modeled and 2–33% during the drought period modeled (1987–1991) (Appendix 8H, Tables EC-15A through EC-15D). At Emmaton, there would be an increase in average EC under all operational scenarios, though the increase would be less for scenarios H3 and H4 (0% for entire period; 8% for drought period) than for scenarios H1 and H2 (13–14% for entire period; 12–13% for drought period). There would be increases in average EC at two interior Delta locations under all operational scenarios: the S. Fork Mokelumne River at Terminous average EC would increase 5% for the entire period modeled and 4% during the drought period modeled; and San Joaquin River at San Andreas Landing average EC would increase 0–9% for the entire period modeled and 7–13% during the drought period modeled. In addition, under Scenarios H1 and H2, there would be slight increase (<1–2%) in drought period average EC in the San Joaquin River at Prisoners Point. On average, EC would increase at San Andreas Landing from March through September under all operations scenarios; Scenarios H1, H2, and H4 also would increase EC at this location in February and Scenarios H1 and H2 would increase EC in October. Average EC in the S. Fork Mokelumne River at Terminous would increase during all months (Appendix 8H, Tables EC-15A through EC-15D). The comparison to Existing Conditions reflects changes in EC due to both Alternative 4 operations (including north Delta intake capacity of 9,000 cfs and numerous other operational components of Scenarios H1–H4) and climate change/sea level rise.

Relative to the No Action Alternative, the percent of days exceeding EC objectives and percent of days out of compliance would increase at: Sacramento River at Emmaton, San Joaquin River at Jersey Point, San Andreas Landing, and Prisoners Point; and Old River near Middle River and at Tracy Bridge (Appendix 8H, Table EC-4). The increase in percent of days exceeding the EC objective would be 19–30% at Prisoners Point, depending on the operations scenario, and 13% or less at the remaining locations. The increase in percent of days out of compliance would be 21–30% at Prisoners Point, depending on

the operations scenario, and 16% or less at the remaining locations. For the entire period modeled, average EC levels would increase at western (scenarios H1 and H2 only), interior, and southern Delta locations; the average EC increase would be 12–13% at Emmaton (western Delta; for scenarios H1 and H2 only), 5–15% at interior Delta locations and 2% or less at southern Delta locations, depending on the operations scenario (Appendix 8H, Tables EC-15A through EC-15D). During the drought period modeled, average EC would increase at western (scenarios H1 and H2 only), interior, and southern Delta locations. The greatest average EC increase during the drought period modeled would occur in the interior Delta in the San Joaquin River at San Andreas Landing (7–13% depending on the operations scenario); the increase at the other locations would be <1–9% (Appendix 8H, Tables EC-15A through EC-15D). The comparison to the No Action 1 Alternative reflects changes in EC due only to the different operational components of Scenarios H1–2 H4 of Alternative 4. 3

For Suisun Marsh, October–May is the period when Bay-Delta WQCP EC objectives for protection of fish and wildlife apply. Average EC for the entire period modeled would increase in the Sacramento River at Collinsville during the months of March through May under all operations scenarios of Alternative 4, relative to Existing Conditions, by 0.3–0.9 mS/cm (Appendix 8H, Table EC-21). Long-term average EC would decrease under all operations scenarios, relative to Existing Conditions, in Montezuma Slough at National Steel during October–May (Appendix 8H, Table EC-22). The most substantial EC increase would occur near Beldon Landing, with long-term average EC levels increasing by 1.3–6.0 mS/cm, depending on the month and operations scenario, at least doubling during some months the long-term average EC relative to Existing Conditions (Appendix 8H, Table EC-23). Sunrise Duck Club and Volanti Slough also would have long-term average EC increases during all months ranging 0.5–3.9 mS/cm (Appendix 8H, Tables EC-24 and EC-25). The degree to which the long-term average EC increases would cause exceedance of Bay-Delta WQCP objectives is unknown, because objectives are expressed as a monthly average of daily high tide EC, which does not have to be met if it can be demonstrated "equivalent or better protection will be provided at the location" (State Water Resources Control Board 2006:14). The described long-term average EC increase may, or may not, contribute to adverse effects on beneficial uses, depending on how and when wetlands are flooded, soil leaching cycles, and how agricultural use of water is managed, and future actions taken with respect to the marsh. However, the EC increases at certain locations would be substantial and it is uncertain the degree to which current management plans for the Suisun Marsh would be able to address these substantially higher EC levels and protect beneficial uses. Thus, these increased EC levels in Suisun Marsh are considered to have a potentially adverse effect on marsh beneficial uses. Long-term average EC increases in Suisun Marsh under Alternative 4, Scenarios H1–H4, relative to the No Action Alternative would be similar to the increases relative to Existing Conditions.

SWP/CVP Export Service Area 28

At the Banks and Jones pumping plants, Alternative 4, Scenarios H1–H4, would result in no exceedances of the Bay-Delta WQCP's 1,000 µmhos/cm EC objective for the entire period modeled (Appendix 8H, Table EC-10). Thus, there would be no adverse effect on the beneficial uses in the SWP/CVP Export Service Areas using water pumped at this location under the Alternative 4.

At the Banks pumping plant, relative to Existing Conditions, average EC levels under Alternative 4, Scenarios H1–H4, would decrease 23–27% for the entire period modeled and 21–27% during the drought period modeled, depending on the operations scenario. Relative to the No Action Alternative, average EC levels would similarly decrease, by 17–22% for the entire period modeled and 16–22% during the drought period modeled. (Appendix 8H, Tables EC-15A through EC-15D)

At the Jones pumping plant, relative to Existing Conditions, average EC levels under Alternative 4, Scenarios H1–H4, would decrease 21–26% for the entire period modeled and 17–23% during the drought period modeled, depending on the operations scenario. Relative to the No Action Alternative, average EC levels would similarly decrease by 17–22% for the entire period modeled and 14–20%

during the drought period modeled. (Appendix 8H, Table EC-13)
Based on the decreases in long-term average EC levels that would occur at the Banks and Jones pumping plants, Alternative 4, Scenarios H1–H4, would not cause degradation of water quality with respect to EC in the SWP/CVP Export Service Areas; rather, Alternative 4, Scenarios H1–H4, would improve long-term average EC conditions in the SWP/CVP Export Service Areas. Commensurate with the EC decrease in exported waters, an improvement in lower San Joaquin 3 River average EC levels would be expected since EC in the lower San Joaquin River is, in part, related to irrigation water deliveries from the Delta. While the magnitude of this expected lower San Joaquin River improvement in EC is difficult to predict, the relative decrease in overall loading of EC-6 elevating constituents to the Export Service Areas would likely alleviate or lessen any expected increase in EC at Vernalis related to decreased annual average San Joaquin River flows.

The export area of the Delta is listed on the state's CWA Section 303(d) list as impaired due to elevated EC. Alternative 4, Scenarios H1–H4, would result in lower average EC levels relative to 10 Existing Conditions and the No Action Alternative and, thus, would not contribute to additional beneficial use impairment related to elevated EC in the SWP/CVP Export Service Areas waters.

To: Hessert, Aimee[Hessert.Aimee@epa.gov]
From: Rader, Cliff
Sent: Thur 3/13/2014 1:40:29 PM
Subject: FW: powerpoint for an overview
NEPA Overview Briefing - CEH Conf Call.pptx

From: Rader, Cliff
Sent: Wednesday, March 12, 2014 2:43 PM
To: Bohan, Suzanne; Strobel, Philip
Subject: powerpoint for an overview

Here's one we used recently….just thinking about the presentation we need to pull together for the HF call…

To: Bohan, Suzanne[bohan.suzanne@epa.gov]; Strobel, Philip[Strobel.Philip@epa.gov]
From: Rader, Cliff
Sent: Wed 3/12/2014 6:43:47 PM
Subject: powerpoint for an overview
NEPA Overview Briefing - CEH Conf Call.pptx

Here's one we used recently….just thinking about the presentation we need to pull together for the HF call…

To: Miles, Erin[Miles.Erin@epa.gov]
From: Rader, Cliff
Sent: Wed 3/5/2014 6:02:52 PM
Subject: RE: URGENT - Congressional Response
denham response.docx

From: Miles, Erin
Sent: Wednesday, March 05, 2014 11:15 AM
To: Rader, Cliff
Subject: RE: URGENT - Congressional Response

Can you email me the final word doc for this? Thanks!

From: Rader, Cliff
Sent: Wednesday, February 26, 2014 12:22 PM
To: Spraul, Greg; Miles, Erin
Cc: Carney, Kimberley
Subject: URGENT - Congressional Response

Greg and Erin –

We are two days overdue on this response to AL-14-000-4733 (Denham).

Can you take a quick look?

Thanks.

Cliff

To: Spraul, Greg[Spraul.Greg@epa.gov]; Miles, Erin[Miles.Erin@epa.gov]
Cc: Carney, Kimberley[Carney.Kimberley@epa.gov]
From: Rader, Cliff
Sent: Wed 2/26/2014 5:22:18 PM
Subject: URGENT - Congressional Response
denham response.docx
14-000-4733 - Congressional-Bay Delta EIS.pdf

Greg and Erin –

We are two days overdue on this response to AL-14-000-4733 (Denham).

Can you take a quick look?

Thanks.

Cliff

JEFF DENHAM
10TH DISTRICT, CALIFORNIA

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Congress of the United States
House of Representatives
Washington, DC

HOUSE AGRICULTURE COMMITTEE

HOUSE TRANSPORTATION AND INFRASTRUCTURE COMMITTEE

CHAIRMAN, SUBCOMMITTEE ON RAILROADS, PIPELINES AND HAZARDOUS MATERIALS

HOUSE VETERANS' AFFAIRS COMMITTEE

January 29, 2014

The Honorable Sarah "Sally" Jewell
Secretary
U.S. Department of the Interior
1849 C Street, NW, Room 6156
Washington, DC 20240

The Honorable Regina A. "Gina" McCarthy
Administrator
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, NW, Room 3000
Washington, DC 20460

The Honorable Penny S. Pritzker
Secretary
U.S. Department of Commerce
1401 Constitution Avenue, NW
Washington, DC 20230

Mr. John Laird
Secretary
California Natural Resources Agency
1416 Ninth Street, Suite 1311
Sacramento, CA 95814

Dear Secretaries Jewell, Pritzker and Laird, and Administrator McCarthy:

The recent release of the Bay-Delta Conservation Plan (BDCP) and the associated Environmental Impact Report and Environmental Impact Statement (EIR/EIS) marks the first time the public can truly review the Plan. Constituents of mine, many of which reside within the Sacramento-San Joaquin Bay-Delta region, believe they have not been provided with a complete and detailed description of the project, an assessment and characterization of the potential impacts, and the specific elements of a comprehensive mitigation strategy to compensate for the impacts of the project.

The BDCP and the Public Review Draft EIR/EIS amount to nearly 40,000 pages. Given the size, complexity and potential impacts of the project, the 120-day public comment period I feel is inadequate.

On behalf of concerned constituents within my district I respectfully request that the public comment period for the BDCP EIR/EIS be extended beyond the current 120-day comment period.

Thank you for your consideration.

Sincerely,

JEFF DENHAM
United States Representative

Cc: San Joaquin County
San Luis & Delta-Mendota Water Authority

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To: Roemele, Julie[Roemele.Julie@epa.gov]
Cc: Hessert, Aimee[Hessert.Aimee@epa.gov]
From: Rader, Cliff
Sent: Fri 2/21/2014 10:00:39 PM
Subject: powerpoint for CEH call
NEPA Overview Briefing - CEH Conf Call.pptx

How does this look?

To: Marshall, Tom[marshall.tom@epa.gov]
From: Rader, Cliff
Sent: Fri 2/14/2014 6:15:30 PM
Subject: FW: Final One Pager on BDCP
BDCPOnePager021214Final.docx

fyi; let's talk at some point.

Cliff Rader
Director, NEPA Compliance Division
202-564-7159

From: Goforth, Kathleen
Sent: Friday, February 14, 2014 1:03 PM
To: Rader, Cliff
Subject: FW: Final One Pager on BDCP

FYI.

Kathleen Martyn Goforth, Manager

Environmental Review Section

EPA Region 9 (ENF-4-2)

75 Hawthorne Street

San Francisco, CA 94105

415-972-3521

From: Hagler, Tom
Sent: Wednesday, February 12, 2014 6:10 PM
To: Gorke, Roger; Ryerson.Teddy
Cc: Vendlinski, Tim; Goforth, Kathleen; Moyer, Robert
Subject: Final One Pager on BDCP

Per your request, here is a final version (as edited by Kathy Goforth (309 Office) and Tim Vendlinski (Water Division)) of the one page summary you had each asked for independently.

****

Tom Hagler

Assistant Regional Counsel

U.S. Environmental Protection Agency

Region 9

75 Hawthorne Street, RC-2

San Francisco, California 94105-3901

Phone (415)972-3945

Email: hagler.tom@epa.gov

To: Wright, Justin[wright.justin@epa.gov]; Aresta-DaSilva, Jessica[Aresta-DaSilva.Jessica@epa.gov]; Hessert, Aimee[Hessert.Aimee@epa.gov]
From: Rader, Cliff
Sent: Fri 2/7/2014 8:49:41 PM
Subject: Fw: Final Bay Delta Briefing Paper
BDCP Briefing paper Feb 7 2014.pdf

From: Gorke, Roger
Sent: Friday, February 07, 2014 3:44:33 PM
To: Kopocis, Ken; Blumenfeld, Jared; Diamond, Jane; Vendlinski, Tim; Hagler, Tom; Goforth, Kathleen; Johnson, Kathleen; Bromm, Susan; Rader, Cliff; Giles-AA, Cynthia
Cc: Lousberg, Macara; Pendergast, Jim; Best-Wong, Benita; Goodin, John; Southerland, Elizabeth; Buffo, Corey; Behl, Betsy; Hisel-Mccoy, Sara; Metzger, Philip
Subject: Final Bay Delta Briefing Paper

All,

Attached is the final briefing document that will go in the Administrator's book for this weekend. The schedulers were threatening to cancel the briefing on Monday if they didn't get the document. So, here it is.

Thanks again for everyone's effort on such a short notice to get this done.

Let me know if you have any questions,

Roger

Roger Gorke

Senior Policy Advisor

Office of Water

U.S. Environmental Protection Agency

PH: 202-564-0470

FAX: 202-564-0500

gorke.roger@epa.gov