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BAY DELTA CONSERVATION PLAN

Bay Delta Conservation Plan Alternatives Development Update

BDCP 404 Coordination Team Meeting
January 27, 2012

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Presentation Outline

- BDCP
  - Overview
  - Schedule
- BDCP EIR/EIS
  - Identification of Lead, Responsible, & Cooperating Agencies
  - Alternatives and Approaches to Modeling
  - Next Steps in Environmental Review Process

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What is BDCP?

Multiple Species, Contribute to Long-Recovery

Conservation Strategy

Aspects of Implementation

Conservation Plan

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Importance to Long-term Solution

- Comprehensive ecosystem approach
- Better separates water delivery system from the Delta estuary
- Extensive tidal marsh and flood plain habitat
- Improves Delta flows
- Addresses other stressors - predation, invasive species, pesticides, toxins

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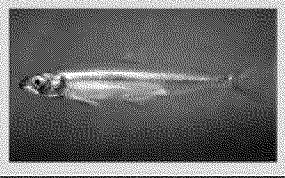
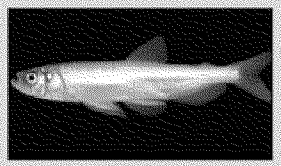
Covered Species

DELTA SMELT



LONGFIN SMELT



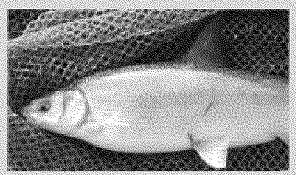
CHINOOK SALMON

winter, spring, fall and late fall

GREEN AND WHITE STURGEON

CENTRAL VALLEY STEELHEAD

SACRAMENTO SPLITTAIL



APPROXIMATELY 50 TERRESTRIAL SPECIES

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Aquatic Conservation Measures

BIOLOGICAL GOALS & OBJECTIVES FOR COVERED FISH SPECIES

Improve survival
Improve fitness
Improve distribution
Improve growth rate
Decrease mortality

HABITAT RESTORATION CONSERVATION ACTIONS

Phytoplankton and zooplankton (fish food)
Spawning and rearing

OTHER STRESSORS CONSERVATION ACTIONS

Reduce contaminants
Reduce predation effects
Improve fish passage
Reduce Disease
Reduce non-natives

WATER OPERATIONS CONSERVATION ACTIONS

Improve water quality
Reduce entrainment
Improve water flow and habitat conditions

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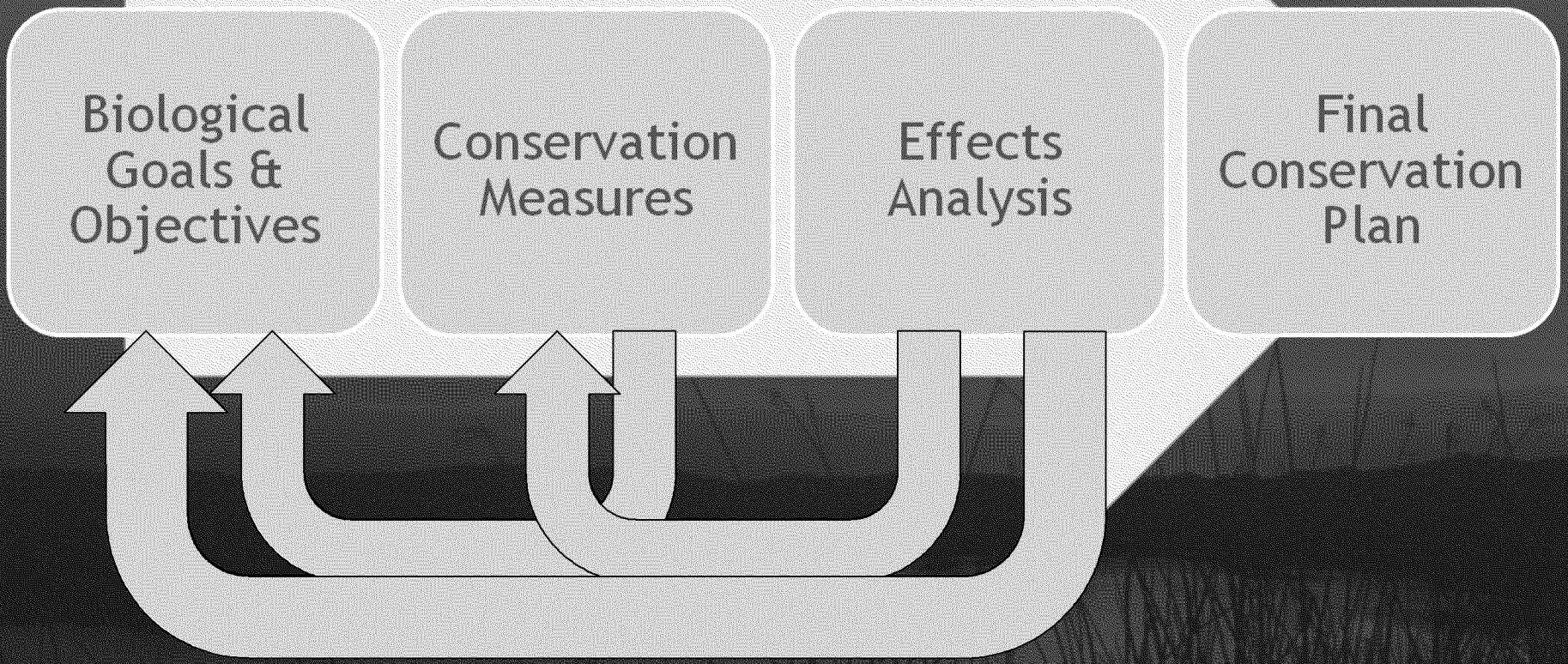
EA, G&Os, Conservation Measures



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Schedule

- Administrative Draft BDCP (incl. Effects Analysis): February 27, 2012
- Public Draft BDCP: Expected late June 2012
- In meantime:
  - Releasing revised working draft chapters
  - Releasing working draft Appendices of Effects Analysis

BDCP EIR/EIS

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EIR/EIS Lead Agencies

- CEQA Lead Agency
  - California Department of Water Resources
- NEPA Lead Agencies
  - Bureau of Reclamation
  - U.S. Fish and Wildlife Service
  - National Marine Fisheries Service

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CEQA Responsible or Trustee State Agencies

- California Department of Fish and Game
- California Department of Parks and Recreation
- California State Water Resources Control Board
- Air Quality Management Districts
- California Department of Boating and Waterways
- California Department of Transportation
- California State Lands Commission
- San Francisco Bay Conservation and Development Commission
- Delta Stewardship Council

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NEPA Cooperating Agencies

- U.S. Environmental Protection Agency
- U.S. Army Corps of Engineers
- State and Federal Contractors Water Agency
- Contra Costa, Sacramento, Solano, and Yolo counties
- North Delta Water Agency
- Reclamation Districts 3, 150, 550, 999

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BDCP EIR/EIS

Alternatives
&
Approaches for Modeling

Identification of Initial Alternative Concepts

- Concepts in the Notice of Preparation and Notice of Intent
- Concepts identified during Scoping Process
  - Over 1,051 comments related to alternatives
  - Requests to include concepts described in 2007 and 2008 reports by Public Policy Institute of California
  - Request to include concepts presented to the Delta Vision Blue Ribbon Task Force
- Concepts included in BDCP Steering Committee handouts over past four years

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All Initial Alternative Concepts include Three Components

- Restoration Components
- Measures to Reduce Other Stressors Components
- Conveyance Components
  - Isolated Conveyance
  - Dual Conveyance
  - Through Delta Conveyance
  - Range of Operations Criteria

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Isolated Conveyance Concepts (North Delta Intakes)

- Central Delta Pipeline/Tunnel from North or West Delta
- Eastern Unlined and Lined Canal from North or West Delta
- Eastern Unlined Canal plus connection to San Joaquin River near Mossdale
- Eastern Unlined Canal plus connection to EBMUD and SFPUC with possible connections to American, Calaveras, and Stanislaus river water rights holders
- Western Unlined and Lined Canal and Pipeline/Tunnel from North or West Delta
- Western Unlined Canal, Use of Sacramento Deep Water Ship Channel, and Pipeline/Tunnel
- Eastern Foothill Unlined Canal from Sacramento River near Verona

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Dual Conveyance Concepts (North and South Delta Intakes)

- Central Delta Pipeline/Tunnel from North or West Delta
- Eastern Unlined and Lined Canal from North or West Delta
- Eastern Unlined Canal plus connection to San Joaquin River near Mossdale
- Western Unlined and Lined Canal and Pipeline/Tunnel from North or West Delta
- Western Unlined Canal, Use of Sacramento Deep Water Ship Channel, and Pipeline/Tunnel
- Eastern Foothill Unlined Canal from Sacramento River near Verona

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Through Delta Conveyance Concepts (South Delta Intakes)

- Continued use of existing water supply systems
  - Levee armoring and new setback levees along South Fork Mokelumne and Middle rivers and Victoria Canal
  - Increased use of local and regional water supplies to reduce use of Delta water outside of the Delta
  - Manage Delta for habitat, not local or SWP/CVP water supplies
- Separate Corridors
  - Water supply corridor along Mokelumne and Middle rivers and fish movement corridor along Old River
- Use of existing water supply systems with Delta salt water barrier installed near Benicia Bridge

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Range of Operations Criteria

- Range of North Delta Intake Capacities
- Operational Considerations
  - Criteria for North Delta Intake Operations
  - Criteria for South Delta Intake Operations - including Old and Middle River Flow and Inflow/Export Ratio Criteria
  - Criteria for Delta Outflow - including Spring and Fall X2
- Range of Habitat Restoration Components

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Multiple-Step Screening Criteria Process

- First and Second Screening Levels
  - Defining alternatives under CEQA and NEPA
- Third Screening Level
  - Defining "potentially feasible alternatives" under CEQA and "reasonable alternatives" under NEPA
- Consideration of Sacramento-San Joaquin Delta Reform Act requirements
- Consideration of criteria identified by CEQA responsible agencies and NEPA cooperating agencies raised during scoping

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First and Second Screening Levels

- First Screening Level
  - Could the potential alternative concept meet the project's purpose/objectives in Notice of Preparation and Notice of Intent?
- Second Screening Level
  - Under CEQA, consider: Would the potential alternative avoid or substantially lessen any of the expected significant environmental effects of the proposed project?
  - Under NEPA, consider: Would the potential alternative address one or more significant issues related to the proposed action?

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Third Screening Level

- Could the potential alternative concept be "feasible" under CEQA?
  - Capable of being accomplished in reasonable time period taking into account economic, legal, social, and technological factors?
- Could the potential alternative concept be "reasonable" under NEPA?
  - Practical or feasible from technical or economic standpoint?

CEQA and NEPA allow consideration of a reasonable balance of environmental, economic, social, and technical factors and legal feasibility under species protection and other laws

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Consideration of Sacramento-San Joaquin Delta Reform Act

- Do alternatives provide a reasonable range of:
  - Flow criteria? Diversion rates?
  - Other operational criteria to satisfy the criteria of approval as a Natural Community Conservation Plan?
  - Hydrologic conditions?
- Does the range of alternatives include a:
  - Through Delta Conveyance alternative?
  - Dual Conveyance alternative?
  - Isolated Conveyance alternative?
  - Dual or Isolated Conveyance – Lined Canal alternative?
  - Dual or Isolated Conveyance – Unlined Canal alternative?
  - Pipeline/Tunnel Conveyance alternative?

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Consideration of Responsible/Cooperating Agencies Scoping Comments

- Does range of alternatives include:
  - Broad range of water quality objectives and operational strategies?
  - Potential interim changes to SWRCB Bay-Delta Water Quality Control Plan?
  - Long-term changes to SWRCB Bay-Delta Water Quality Control Plan with and without new conveyance facilities?
  - Reduced diversions lower than diversions allowed in USFWS and NMFS biological opinions to assure continued existence of the species and some level of rehabilitation for estuary?
  - Delta outflows, and potentially inflows, that reflect a more natural hydrograph than current SWRCB Bay-Delta Water Quality Control Plan?

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Current Range of Alternatives

Restoration	Alternative	Alignment / Conveyance	No. of Intakes	Diversion	Operation
1A	Tunnel / dual	5	15,000 cfs	BDCP Strg Comm	BDCP SC
1B	East canal / dual			Jan 2010 Mtg (BDCP SC)	
1C	West canal / dual				
2A	Tunnel / dual	5	15,000 cfs	Scenario 6 w Fall X2	BDCP SC
2B	East canal / dual				
2C	West canal / dual				
3	Tunnel / dual	2	6,000 cfs	BDCP SC	BDCP SC
4	Tunnel / dual	3	9,000 cfs	Scenario 6 w Fall X2	BDCP SC
5	Tunnel / dual	1	3,000 cfs	ND - BDCP SC	BDCP SC, modified
				SD - existing Biops	
6A	Tunnel / isolated	5	15,000 cfs	BDCP SC w Fall X2	BDCP SC
6B	East canal / isolated		no SD intakes		
6C	West canal / isolated				
7	Tunnel / dual	3	9,000 cfs	BDCP SC, modified	BDCP SC, modified
8	Tunnel / dual	3	9,000 cfs	≤ 1.5 MAF Delta Outflow	BDCP SC
9	Through Delta	DCC and Georgiana Slough	15,000 cfs	Like Delta Corridors	BDCP SC, modified

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Modeling for System Operations and Water Quality Integration

- CALSIM II simulates monthly system operations
- DSM2 predicts Delta hydrodynamics and salinity
- System operations often restricted by WQ requirements
- Artificial Neural Network:
  - mimics DSM2 flow-salinity relationships
  - provides rapid transformation of functional relationships to usable form for CALSIM II operations

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BDCP Temporal Definitions that Affect CALSIM II and DSM2 Models

- **BDCP** Alternatives modeled at Early Long-Term (ELT) (2025) and Late Long-Term (LLT) (2060)
- Sea Level Rise and Climate Change Different for Each Time Period
  - Example: Sea Level Rise - 15 cm at 2025
    45 cm at 2060
- Tidal Marsh Restoration Different for Each Time Period
  - For All Alternatives - 25,000 acres at 2025
  - For Most Alternatives - 65,000 acres at 2060

Next Steps in Environmental Review Process

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- Information Availability for Preliminary Draft
  - December 8, 2011: Batch A, B1
  - December 14, 2011: Batch B2
  - February 27, 2012: Batch C
- CEQA Agency Review Process for Administrative DEIR/S
  - February 27: Batch A and B transmitted for comment to Responsible and Trustee Agencies
  - May 9, 2012: Batch C transmitted for comment to Responsible and Trustee Agencies
- NEPA Agency Review Process for Administrative DEIR/S
  - February 27: Batch A and B transmitted for comment to Cooperating Agencies
  - May 9, 2012: Batch C transmitted for comment to Cooperating Agencies

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BACKUP SLIDES

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Adaptive Management and Monitoring Program

Mechanism to adapt conservation strategies. The program will:

- Prioritize key targeted research questions
- Define process to adjust conservation measures
- Define process to establish and adjust monitoring and research program
- Define clear decision making process

- Balances need to be flexible but specific (e.g., existing monitoring programs)

BDCP Chapters

- Ch. 1: Introduction (Jan. 2012)
- **Ch. 2: Existing Conditions** (Sept. 2011)
- Ch. 3: Conservation Strategy (Admin Draft)
- **Ch. 4: Covered Activities** (Oct. 2011)
- Ch. 5: Effects Analysis
- **Ch. 6: Implementation** (Nov. 2011)
- **Ch. 7: Implementation Structure** (Sept. 2011)
- Ch. 8: Cost and Funding (Cost – Dec. 2011)
- **Ch. 9: Alternatives to Take** (Nov. 2011)
- **Ch. 10: Scientific Input** (Aug. 2011)

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Technical Appendix Status

- A: Conceptual Foundation and Analytical Framework (Sept. 2011)
- B: Entrainment (Sept. 2011)
- C: Flow, Salinity, Temperature (Oct. 2011)
- D: Toxins (Oct. 2011)
- E: Habitat Restoration (Jan. 13, 2012)
- F: Ecological Effects (Dec. 16, 2011)
- G: Fish Population (Nov. 2011)
- H: Construction Effects on Fish (Feb. 2012)
- J: Analysis Not Used (January 2012)

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Models Used in the Effects Analysis

- Conceptual models
  - Capture ideas, organize analysis, describe assumptions
  - DRERIP, IEP, BDCP specific
- Environmental models
  - Evaluate environmental change
  - CALSIM II, DSM2
- Biological models
  - Evaluate environmental change in terms of species performance
  - Based on Environmental Models
- Habitat Suitability models
  - Evaluate habitat restoration
  - Weight restored habitat for species perception
- Population and life history models
  - Integrate flow/entrainment analyses

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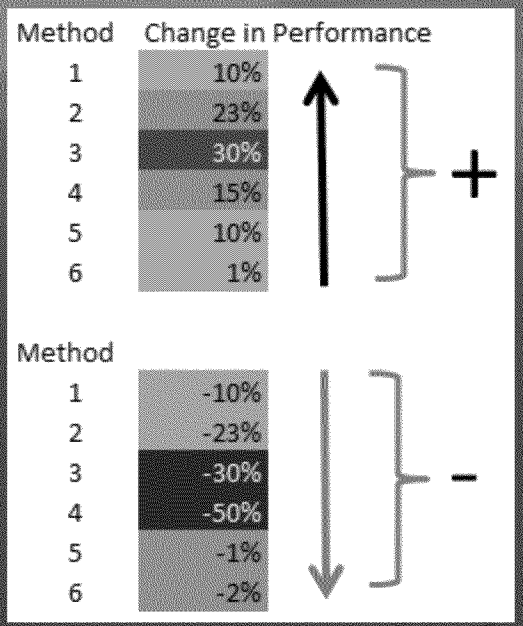
Reconciling Results from Multiple Analyses

- Weight of Evidence
  - Direction of change
- Evaluate
  - Reliability of methods
  - Direction of conclusions
  - Value of the metrics



Factor	More Weight	Less Weight
Scientific credibility	Peer-reviewed in published literature	Unpublished with limited documentation
Usage	Widely used in the Delta or other systems (utility independently verified)	New and untested model (unverified)
Strength of conclusion	Highly statistically significant result or technically robust	Weak statistical significance or based on limited theory and data
Variability of results	Highly consistent results with different inputs (low uncertainty)	Highly variable results depending on inputs (high uncertainty)

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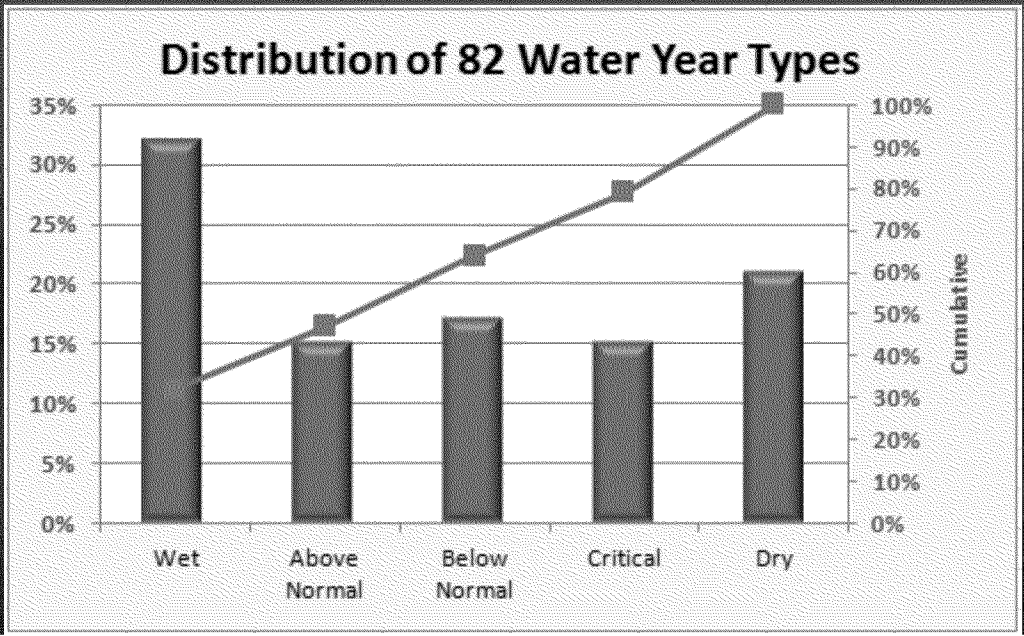
BDCP Analytical Structure

Baseline Scenario	Regulatory Basis	Description
EBC1	CEQA	2008 USFWS BO and 2009 NMFS BO, but without Fall X2
EBC2	ESA Section 7 and NEPA	2008 USFWS BO and 2009 NMFS BO
PP	BDCP	BDCP Preliminary Project Description (19 Conservation Measures)

Description	Time Period
Early Long Term (ELT)	2025
Late Long Term LLT	2060



Environmental Review Process

The EIR/EIS will evaluate the effects of the conservation plan on both the natural (biological) and the human environment. This will include addressing impacts to:

- Water Supply
- Surface Water
- Groundwater
- Water Quality
- Geology and Seismicity
- Soils
- Fish and Aquatic Resources
- Terrestrial Biological Resources
- Land Use
- Agriculture
- Recreation
- Socioeconomics
- Visual Resources
- Cultural and Historic Resources
- Transportation
- Public Services and Utilities
- Energy
- Air Quality and Greenhouse Gas Emissions
- Noise
- Hazards and Hazardous Materials
- Public Health
- Mineral Resources
- Paleontological Resources
- Environmental Justice
- Climate Change
- Growth Inducement

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Water Supply Modeling

- CALSIM II is a general-purpose water resource systems model
  - Numerical representation of SWP and CVP
  - A simplification of the system it describes
  - Represents relationships among the components of a real-world system
  - Used to evaluate the system response to a given hydrologic input, operational criteria and any proposed actions or facilities to evaluate “what-if “ scenarios
  - Supports planning processes to evaluate alternatives to meet a planning objective
- 82 year simulations (WY 1922 – 2003)
- Monthly time series outputs of flow, diversions and storage

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Hydrodynamic and WQ Modeling

- DSM2 is a one-dimensional hydrodynamics, water quality and particle tracking model (HYDRO, QUAL and PTM)
  - Represents Sacramento – San Joaquin Delta bounded by Sacramento, Vernalis and Martinez
  - Channel bathymetry is represented by cross-sections defined by elevation – area – wetted perimeter
  - Open water bodies represented as instantly mixed vertical tanks connected to Delta channels via nodes
  - Planning simulations are generally run for 16 year period (WY 1976 – 1991)
  - 15 min timeseries outputs of stage, velocity, flow, EC etc.