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Santa Barbara Channelkeeper
Santa Monica Baykeeper
Ventura Coastkeeper

April 22, 2011

Erin Foresman
U.S. Environmental Protection Agency
75 Hawthorne St.
San Francisco, CA 94105

Re: Comments on "Water Quality Challenges in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary," 76 Fed. Reg. 9709 (Feb. 22, 2011)

Dear Ms. Foresman:

On behalf of the California Coastkeeper Alliance, which represents 12 Waterkeepers spanning the entire California coast and reaching inward into the San Francisco Bay-Delta Estuary, we welcome the opportunity to provide comments on the above-described Advance Notice of Proposed Rulemaking (ANPR). In brief, CCKA urges U.S. EPA to:

- take aggressive action to regulate pesticide pollution in light of modern data on its ecosystem impacts, and
- mandate that states list waterways impaired by altered flows, and ensure that states take appropriate action to address the impacts to beneficial uses associated with those altered flows.

These issues are described in more detail below.

PESTICIDE POLLUTION

The Delta Independent Science Board's recently-released Delta Stressors Memo[1] highlights pesticide pollution as a key Delta stressor. Contamination from pollutants such as pesticides currently harms and kills fish and degrades ecosystems even at low *and legal* concentrations. For example, a study by NOAA and Washington State found that five of the most common pesticides used in California and the Pacific Northwest – diazinon, malathion, chlorpyrifos, carbaryl and carbofuran – act in "deadly synergy" by suppressing an enzyme that affects the nervous system of salmon.[2] Even where exposures to a single chemical did no

[1] Memorandum from Delta Independent Science Board to Delta Stewardship Council, "Addressing Multiple Stressors and Multiple Goals in the Delta Plan," Attachment 2, p. 4 (Jan. 26, 2011), available at: http://deltacouncil.ca.gov/delta_science_program/isb/isb_meetings.html (highlighting "pesticide release" from agriculture, industry and residential use as a current Delta stressor).
[2] Laetz, Cathy, *et al*, "The Synergistic Toxicity of Pesticide Mixtures: Implications for Risk Assessment and the Conservation of Endangered Pacific Salmon," *Environmental Health Perspectives*, Vol, 117, No. 3 (March 2009), at: http://www.eenews.net/public/25/9960/features/documents/2009/03/03/document_gw_01.pdf.

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harm, pairing chemicals lowered enzyme activity, sometimes fatally. Scientists concluded that "[s]ingle-chemical risk assessments are likely to underestimate the impacts of these insecticides on salmon in river systems where mixtures occur." In other words, even if current laws are implemented fully, they will fail to protect fish, because the standards on which they are based are too low.

A NOAA/NMFS study of juvenile fall Chinook salmon similarly found that salmon accumulate significant concentrations of chemical contaminants even during relatively short residence times in estuaries, and that juvenile salmon from polluted environments "exhibit abnormalities ranging from subcellular effects to changes in immune function and growth. In many cases the effects alter physiological processes, such that the potential for survival is reduced." The study further found that because the pollutants suppressed the salmons' immune systems, there was an increased susceptibility to infectious disease.[3]

These studies are consistent with multiple sets of findings from scientists presenting at the 2008 Annual Meeting of the American Association for the Advancement of Science (AAAS), who reported that pesticides that run off the land and mix in rivers and streams *combine to have a greater than expected toxic effect* on the salmon nervous system than the pesticides would have individually. The scientists concluded that "[c]urrent risk assessments based on a single chemical will likely underestimate impacts on wildlife in situations where that chemical interacts with other chemicals in the environment." Scientists also noted that these findings may have relevance for human health because the toxins act on the nervous systems of salmon and humans similarly.[4]

The above research and numerous other studies demonstrate that even where concentrations of contaminants such as pesticides are low and/or legal, they can still kill and injure fish, including salmon, and potentially injure humans. Unfortunately, many Delta waterways do not even meet current, inadequate, standards, and are in fact significantly polluted, in many cases well above standards.

In the first comprehensive water quality monitoring study after several years of implementation of the Central Valley Regional Water Board's irrigated agriculture program, surface water monitoring data collected by U.C. Davis and agriculture coalitions revealed that:[5]

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[3] Casillas, E., *et al,* NOAA-NMFS-NWFSC, "Estuarine Pollution and Juvenile Salmon Health: Potential Impact on Survival" (2007), available at: http://www.nwfsc.noaa.gov/publications/techmemos/tm29/papers/casillas.htm.

[4] Scholz, Nat, NOAA, "Health effects of pesticide mixtures: Unexpected insights from the salmon brain," (AAAS Annual Meeting, Feb. 2008), available at: http://www.eurekalert.org/pub_releases/2008-02/nh-nsa_1021208.php; *see also* NOAA Office of Communications, "New findings on emerging contaminants: Chemicals in our waters are affecting humans and aquatic life" (AAAS Annual Meeting, Feb. 2008), available at: http://www.eurekalert.org/pub_releases/2008-02/s-nfo020808.php.

[5] Central Valley Regional Water Quality Control Board, "2007 Review of Monitoring Data: Irrigated Lands Conditional Waiver Program" (July 13, 2007), available at: http://www.waterboards.ca.gov/centralvalley/water_issues/irrigated_lands/monitoring_data/staff_monitoring_data_analysis/2007_monitoring_data_report/index.shtml (covering monitoring conducted May 2004 - Oct. 2006). *See also* "Data Sources for Organochlorine (OC) Pesticides in the Central Valley," available at: http://www.swrcb.ca.gov/rwqcb5/water_issues/tmdl/central_valley_projects/central_valley_organochlorine_pesticide/index.shtml.

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- Toxicity to aquatic life was present at 63% of the sites monitored for toxicity, with over half toxic to more than one species.
- Pesticide water quality standards were exceeded in over half of the sites, many for multiple pesticides.
- Standards for one or more metals were violated at two-thirds of the sites monitored for metals.
- More than 80% of the sites tested exceeded standards for general water health (dissolved oxygen, pH, salt and total suspended solids).
- Human health standards for bacteria were violated at 87% of monitored sites, demonstrating that the harm we do to the Delta does not extend solely to fish populations.

The State Water Board has prepared a statewide, detailed, interactive map of impaired surface waters that provides additional information the extent of contamination in the Delta and environs.[6] Pesticides and metals are the top causes of water body impairment in the state.[7]

This pollution is causing clear disturbances in Delta ecosystem health. For instance, University of California studies of bellwether species such as striped bass found that *all* of the fish tested from Central Valley waters all had at least two distinct problems with gastric inflammations, parasitic infestations, infections and/or liver lesions. These findings were consistent with earlier work that found nerve damage and developmental abnormalities among newborn bass. Scientists attributed these problems to a chemical stew of pesticides, herbicides and other contaminants in Delta waters.[8] In fact, pesticides are so ubiquitous in the area that a USGS study found two nervous system pesticides in all *rainfall* samples collected around Modesto.[9]

Again, even legal concentrations of contaminants can kill and injure fish; *illegally* high concentrations are an even more certain death sentence. Just as we should grant to ecosystems in law the right to *sufficient* water flows, so should we ensure that our water laws ensure that ecosystems enjoy *clean* water flows, which will benefit fish and wildlife as well as humans.

In light of this information, U.S. EPA should consider and recommend significant enhancements to the implementation, enforcement, and (as needed) language of federal policies and regulations to ensure that California achieves its goal of clean water. In addition, water

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[6] State Water Resources Control Board, "2010 Integrated Report (Clean Water Act Section 303(d) List / 305(b) Report)," available at: http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml.

[7] State Water Resources Control Board, "California 2006 303(d) List: Total Number Pollutants Listed by Pollutant Category," available at: http://www.waterboards.ca.gov/water_issues/programs/tmdl/docs/303dlists2006/epa/stats_2006_303dlist.xls.

[8] "Baby Fish In Polluted San Francisco Estuary Waters Are Stunted And Deformed," *Science Daily* (Dec. 23, 2008), available at: http://www.sciencedaily.com/releases/2008/12/081209100940.htm; *see also* Thompson, Don, Associated Press, "Chemicals Become Focus for Researcher Studying Delta's Decline" (Jan. 2, 2006), available at: http://www.watershedportal.org/news/news_html?ID=483.

[9] Zamora, Celia, *et al*, USGS, "Diazinon and Chlorpyrifos Loads in Precipitation and Urban and Agricultural Storm Runoff during January and February 2001 in the San Joaquin River Basin, California," Water–Resources Investigations Report 03-4091 (2003); available at http://pubs.usgs.gov/wri/wri034091/wrir034091.pdf.

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quality criteria need to be re-evaluated and tightened to fully reflect the synergistic effects of pollutants.

WATERWAY FLOWS

A close relationship exists between flows and water quality. Among the tools that U.S. EPA and the states have to deal with flow-related impairments of beneficial uses is the federal Clean Water Act's "303(d)" program. Extensive comments were submitted by CCKA and a coalition of groups on the need for the state to identify and restore water bodies impaired by altered flows, as required by the Clean Water Act.[10] This is particularly true for the Delta, which suffers from severe over-diversion.

A. U.S. EPA and the States Must Address Impacts to Beneficial Uses of Water Bodies Caused By Alterations in Natural Flows.

The health of rivers, streams, creeks and other waterways is inextricably linked to the volume, frequency, magnitude, timing, and duration of flows.[11] "[W]ater quantity is closely related to water quality; a sufficient lowering of the water quantity in a body of water could destroy all of its designated uses, be it for drinking water, recreation, navigation, or . . . a fishery."[12] As the U.S. Supreme Court has held,

> there is recognition in the Clean Water Act itself that reduced stream flow, *i.e.,* diminishment of water quantity, can constitute water pollution. First, the Act's definition of pollution . . . encompasses the effects of reduced water quantity. *33 U.S.C. 1362(19).* This broad conception of pollution – one which expressly evinces Congress' concern with the physical and biological integrity of water – refutes petitioners' assertion that the Act draws a sharp distinction between the regulation of water 'quantity' and water 'quality.'[13]

The state's ability to ensure healthy waterways hinges in part on its ability to identify waterways impaired or threatened by altered natural flow, and to take targeted action to restore and maintain necessary flow regimes.

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[10] Letter from California Coastkeeper Alliance *et al.* to State Water Resources Control Board, "Notice of Public Solicitation of Water Quality Data and Information for 2012 California Integrated Report" (Aug. 30, 2010), available at: http://www.cacoastkeeper.org/document/ccka-comments-on-2012-303%28d%29-list.pdf. This letter also provides relevant discussion regarding the Clean Water Act requirements to address impaired groundwater that may be threatening hydrologically connected surface water.

[11] MacDonnell, Lawrence J., "Return to the River: Environmental Flow Policy in the United States and Canada. Journal of the American Water Resources Association" 45(5):1087-1099 (2009), DOI: 10.1111/j.1752-1688.2009.00361 *citing* Poff, N.L., *et al.,*"The Natural Flow Regime: A Paradigm for River Conservation and Restoration," *BioScience* 47:769-784 (1997); Poff, N.L., "Managing for Variation to Sustain Freshwater Ecosystems," *Journal of Water Resources Planning and Management* 135:1-4 (2009).

[12] *PUD No.1 v. Washington Department of Ecology*, 511 U.S. 700, 719 (May 31, 1994).

[13] *Id. See also* U.S. EPA, "Guidance for 2004 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d) and 305(b) of the Clean Water Act" (July 21, 2003) ("2004 Guidance"), available at: http://www.epa.gov/owow/tmdl/tmdl0103/2004rpt_guidance.pdf *(2004 (*"Low flow can be a man-induced condition of a water (i.e., a reduced volume of water) which fits the definition of pollution. Lack of flow sometimes leads to the increase of the concentration of a pollutant (e.g., sediment) in a water.")

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Water quality standards encompass both the designated uses of a water body and the water quality criteria established to protect those uses, as well as antidegradation requirements. Altered natural flows (usually reduced flows) may impact a water body's beneficial uses in a number of ways, causing a violation of standards that prompts 303(d) listing. For example, if a river is designated for use as a coldwater fishery, but reduced flows have resulted in increased temperatures and lowered water depths such that the river can no longer support fish, low flows clearly have impacted the water body's designated use.[14] Where low flows in rivers, creeks, and stream have impaired a beneficial use, the water quality standards have been violated, and the water body segment must be listed under Section 303(d).[15]

For example, in the Russian River Watershed, excessive water diversions have turned fish-bearing creeks such as Mark West Creek and Macaama Creek into dry stream beds.[16] In the Klamath River Watershed, high diversion rates from agricultural developments limit flow levels in river mainstems and tributaries, which raise water temperatures and lower water quality, making segments of the Scott and Shasta Rivers unsuitable for rearing juvenile coho salmon.[17]

In addition, excessive withdrawals, water diversions and dams can concentrate pollutant loadings, resulting in higher in-stream concentrations and impacts. For example, rivers in the Klamath watershed are impaired by toxic algae, temperature, and nutrient pollution caused by dams, cattle grazing and irrigated agriculture.[18] All of these problems are made significantly worse by reduced natural flows. In 2006, U.S. EPA formally recognized that dam impacts to flow caused the impairment of the Klamath River by toxic blue green algae *Microcystis aeruginosa*, a liver toxin and known tumor promoter.[19]

1. Altered Flows Must Be Identified as *Causes* of Impairment, Not Solely *Sources* of Impairment

The State Water Board has identified altered natural flows in its just-adopted 303(d) list as a potential *source* of impairment of dozens of water body-segment pollutant combinations. However, California generally has avoided its responsibility to recognize reduced natural flows, streamflow alterations, water diversions, or similar flow issues as *independent causes* of

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[14] For example, adult coho salmon migrate at water temperatures of 45 to 59ºF, a minimum water depth of approximately seven inches, and streamflow velocities less than eight ft/sec. National Marine Fisheries Service, "Magnuson-Stevens Reauthorization Act Klamath River Coho Salmon Recovery Plan," p. 4 (July 2007), available at: http://www.swr.noaa.gov/salmon/MSRA_RecoveryPlan_FINAL.pdf. Research has demonstrated that upstream migration of Klamath River Chinook salmon is suppressed at mean daily water temperatures above 23.5°C if temperatures are falling.

[15] Attachment 2 provides photos and other information of waterways in California so impacted, such as the Scott River.

[16] *See* Appendix A and A-1 for more information.

[17] NMFS, "Magnuson-Stevens Reauthorization Act Klamath River Coho Salmon Recovery Plan Prepared by The National Marine Fisheries Service Southwest Region," p. 32 (July 10, 2007), available at: http://www.swr.noaa.gov/salmon/MSRA_RecoveryPlan_FINAL.pdf.

[18] *See* SWRCB, "2010 California 303(d) List of Water Quality Limited Segments: Category 5," North Coast RWQCB, available at: http://www.waterboards.ca.gov/water_issues/programs/tmdl/2010state_ir_reports/category5_report.shtml.

[19] http://www.klamathriver.org/media/pressreleases/Press-Release-032008.html.

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impairment that require listing of the waterway for "flow alterations" under Category 4C *at a minimum*, or Category 5 where appropriate.[20] This failure to address flow alterations directly is a serious omission by the State Water Board and must be addressed in upcoming 303(d) Lists.

The *source* of impairment provides available information tied to the impaired segment that generally describes the type of *activity* that has resulted in the impairment. Typical examples in California's 303(d) list include, but are not limited, to the following: range grazing, silviculture, agriculture, construction/land development, urban runoff/storm sewers, mine tailings, onsite wastewater systems (septic tanks), and marinas and boating. This information is generally used to help sort out which parties will be allocated responsibility for addressing the contamination at issue.

By contrast, altered natural flows can be the *cause* of impairment of a water body – just as altered concentrations of various contaminants (dissolved oxygen, mercury, temperature, etc.) similarly *cause* impairment. The *sources* of the listings for "altered natural flows" would then be activities such as agriculture, mining, construction, grazing, etc. The parties undertaking these activities would then be contacted to take action to reduce the impacts of their various operations on waterway flow.

This distinction is important if the actual impairment of a water body is to be properly addressed. For example, if natural flows in a creek that has been designated as "cold freshwater habitat" have been diverted to the point that the shallow water becomes too warm to be adequate fish habitat, the water body should be listed as impaired in Category 5 because of *both* low natural flow *and* elevated temperature, rather than improperly listed only for elevated temperature, with flow alteration as a mere "source" of impairment. If the creek is solely listed as impaired because of elevated temperature, the mitigating action could be (for example) solely planting trees along the banks to create shade. If a creek is listed because of both flow and temperature impairments, responsive actions are much more likely to include increased flows as well as increased shade, which would provide for a healthier outcome for the stream and its inhabitants overall.[21]

EPA's 2006 Guidance specifically describes "lack of adequate flow" as a *cause* for listing an impaired or threatened segment on the 303(d) list,[22] distinguishing it from listings of *sources* contained in separate summary tables.[23] A number of states accordingly include flow alterations as a cause of impairment in their 303(d) lists. Specifically, **U.S. EPA has compiled nationwide data submitted by states showing that 56,981 miles of rivers and streams, 517,857 acres of lakes, reservoirs and ponds, 299 square miles of bays and estuaries, and 33,054 acres of wetlands nationwide have been listed on states' 303(d) lists as impaired by**

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[20] Exceptions include Regional Water Quality Control Board 4's listing of Ballona Creek Wetlands as impaired by "Hydromodification" and "Reduced Tidal Flushing," and applicable segments of the Ventura River as impaired by "Pumping" and "Water Diversion." *See infra* n. 48.

[21] Of course, the listing should also ideally include the "sources" of both the temperature and low flows impairments, such as agriculture or other activities.

[22] "Examples of circumstances where an impaired segment may be placed in Category 4c include segments impaired solely due to lack of adequate flow or to stream channelization." 2006 Guidance at 56.

[23] *See* U.S. EPA, "National Causes of Impairment" versus "National Probable Sources Contributing to Impairment," available at: http://iaspub.epa.gov/waters10/attains_nation_cy.control#causes.

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"Flow Alterations."[24] This corresponds to listings for over 100 water bodies nationwide in the District of Columbia, Idaho,[25] Michigan, Wyoming, Ohio and California.[26]

2. Waterways Impaired by Altered Flows Must at a Minimum Be Listed in Category 4C of the 303(d) List, and Also May Be Listed in Category 5

As discussed above, U.S. EPA's and California's Category 4C *must* be populated with all waterways that are impaired or threatened solely due to the presence of non-pollutants. At a minimum, then, *all* flow-related impairments in California *must* be included in the Category 4C portion of the 2012 303(d) list. We would argue as well, however, that many if not all of these impairments could be included in Category 5.[27]

In California, "Pumping" and "Water Diversion" are listed as the sole causes of impairment for the water body segment Ventura River Reach 4.[28] This water body segment is listed specifically in Category 5 and requires a TMDL by 2019, even though Pumping and Water

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[24] *See* U.S. EPA, "Specific State Causes of Impairment That Make Up the National Flow Alteration(s) Cause of Impairment Group," available at: http://iaspub.epa.gov/tmdl_waters10/attains_nation_cy.cause_detail?p_cause_group_name=FLOW%20ALTERATION%28S%29. *See also* details of flow impairment listings at U.S. EPA, "Impaired Waters , Cause of Impairment Group: Flow Alteration(s)," available at: http://iaspub.epa.gov/tmdl_waters10/attains_impaired_waters.control?p_cause_group_id=545. For information on the status of data collection by state for these tables, *see* U,S, EPA, "Status of Available Data Used in This Report," available at: http://iaspub.epa.gov/waters10/attains_nation_cy.control?p_report_type=T#status_of_data.

[25] Idaho's 2008 Integrated Report shows more than 100 waterbody-pollutant segment listings for low flow alterations and other flow regime alterations under its "Section 4C Waters Impaired by Non-Pollutants." Idaho 2008 Integrated Report: "Section 4c Waters Impaired by Non-Pollutants," http://www.deq.state.*Id.*us/water/data_reports/surface_water/monitoring/integrated_report_2008_final_sec4c.pdf.

[26] *See* U.S. EPA, "Watershed Assessment, Tracking and Environmental Results: Specific State Causes of Impairment That Make Up the National Flow Alteration(s) Cause of Impairment Group," (last updated August 12, 2010), available at: http://iaspub.epa.gov/tmdl_waters10/attains_nation_cy.cause_detail_303d?p_cause_group_id=545. Conversation with Douglas Norton, U.S. EPA Headquarters (August 9, 2010).

[27] Idaho, which deferred to EPA's preference that flows be included in Category 4C, tried to provide a rationale for EPA's preference on flows as follows: "A pollutant is a substance, such as bacteria or sediment, that is identifiable and in some way quantifiable. Some unnatural conditions that impair water quality, such as flow alteration, human-caused lack of flow, and habitat alteration, are considered pollution, but are not caused by quantifiable pollutants. Temperature, while not a substance, is considered a pollutant, as changes in water temperature are quantifiable." Idaho DEQ, "Surface Water: Water Quality Improvement Plans (TMDLs), available at: http://www.deq.state.Id.us/water/data_reports/surface_water/tmdls/overview.cfm#Pollution. This loyal though somewhat strained reasoning ignores the fact that flow itself, as well as its impacts, is most certainly quantifiable – as are Pumping and Water Diversion, for which California waters have been listed in Category 5 as discussed below.

[28] SWRCB, "2010 California 303(d) List of Water Quality Limited Segments: Category 5," "Ventura River Reach 4 (Coyote Creek to Camino Cielo Road)," available at: http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml?wbid=CAR40220021199902030 90836. Ventura River Reach 3 had an identical listing in 2006, also with a 2019 TMDL, though Indicator Bacteria was added as a cause of impairment in the 2010 list update. SWRCB, "2006 CWA Section 303(D) List of Water Quality Limited Segments Requiring TMDLS," Region 4: "Ventura River Reach 3 (Weldon Canyon to Confl. w/ Coyote Cr)," available at: http://www.waterboards.ca.gov/water_issues/programs/tmdl/docs/303dlists2006/epa/r4_06_303d_reqtmdls.pdf.

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Diversion are the *only* causes of impairment. Water Diversion is specifically identified as a "Pollutant" in the Fact Sheet[29] describing this listing, as is the case with Pumping.[30]

California's choice to list, and most recently uphold the listing of, flow-caused impairments as a "pollutant" under Category 5 is not prohibited by the definition of "pollutant" or by U.S. EPA guidance. First, courts have interpreted the definition of "pollutant" broadly, as noted above, stating that it is "meant to leave out very little."[31] Second, U.S. EPA Guidance, while favoring a position that flow-related impairments are "pollution," does so in a less than definitive manner and without analysis, leaving room for California to make its own determination. For example, the 2004 Guidance states simply that "EPA does not *believe* that flow, or lack of flow, is a pollutant as defined by CWA Section 502(6)."[32] The 2006 Guidance similarly simply asserts without further support or discussion that "[e]xamples of circumstances where an impaired segment may be placed in Category 4c include segments impaired solely due to lack of adequate flow or to stream channelization."[33]

In sum, California can and should protect its waterways as fully as possible, including through the complete identification and listing of waterways impaired by the *cause* of natural flow alterations. Other states have shown leadership in this regard, and California's waters are no less precious or threatened.

Moreover, to ensure full protection and restoration of the waterways' beneficial uses, the identified waters should be placed on the 303(d) list under Category 5 (most certainly if there are additional pollutant impairments), and at a minimum in Category 4C. Section 510 of the Clean Water Act sets a floor but no ceiling for state action to protect and enhance the health of waters of the United States. California should make full use of this provision, and should leverage its prior flow-related listings in Category 5 into a comprehensive effort to address *all* flow-related impairments under the federal Section 303(d) listing and TMDL program, as well as under state law and other programs.

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[29] Supporting Information, 2010 Integrated Report, Ventura River Reach 4: Water Diversion, http://www.waterboards.ca.gov/water_issues/programs/tmdl/2010state_ir_reports/01015.shtml#7310.

[30] Supporting Information, 2010 Integrated Report, Ventura River Reach 4: Pumping, http://www.waterboards.ca.gov/water_issues/programs/tmdl/2010state_ir_reports/01015.shtml#7308.

[31] *See supra* n. 8. The definition of "pollutant" in Section 502(6) includes: "dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water." Several other items are specifically excluded; flow alteration is not one of those items. Arguably, the actions taken by industrial, municipal and agricultural operations (*i.e.* essentially all activities that could impact flow) could be viewed as the discharge of "waste," which is undefined in Section 502 but which could readily be interpreted as the by-product of "operations"; *i.e.* changes in the health of the waterway to its detriment.

[32] U.S. EPA, "Guidance for 2004 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d) and 305(b) of the Clean Water Act," p. 8 (July 21, 2003) (emphasis added), available at: http://www.epa.gov/owow/tmdl/tmdl0103/2004rpt_guidance.pdf. It also states, as quoted above, that reduced water volume "fits the definition of pollution" – which could be the case for essentially any water impairment, including more traditional "pollutants."

[33] 2006 Guidance, *supra* n. 1, at 56.

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B. U.S. EPA Must Ensure that the States Use and Consider All Readily Available Information Related to Identifying Natural Flow-Related Impairments.

Under federal law[34] and the California Listing Policy, California's State and Regional Water Boards must "actively solicit, assemble, and consider all readily available data and information,"[35] including from local, state and federal agencies, for purposes of developing the 303(d) list. This includes but is not limited to: reports of fish kills; dilution calculations; and "predictive models for assessing the physical, chemical, or biological condition of streams, rivers, lakes, reservoirs, estuaries, coastal lagoons, or the ocean."[36]

Accordingly, U.S. EPA should ensure that the State Water Board examine and consider all readily available information that could inform 303(d) decisions related to alterations in natural flow. This includes but is not limited to the following:

- Data collected through the Department of Fish and Game's Instream Flow Program[37]
- Information compiled pursuant to programs and funding by the Ocean Protection Council[38]
- The findings of the recently-adopted State Water Board report on Delta flow criteria requirements (attached)[39]
- All comments, information and associated data sets submitted to the State Water Board during the development of its AB 2121 "Policy for Maintaining Instream Flows in Northern California Coastal Streams"[40]
- Flow data released by the California Department of Water Resources,[41] including data from the Water Data Library[42] generally and the Interagency Ecological Program[43] in particular, as well as and outside compilations of DWR data organized by waterbody segments[44]

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[34] 40 CFR 130.7.(b)(5), see http://law.justia.com/us/cfr/title40/40-21.0.1.1.17.0.16.8.html.
[35] SWRCB, *Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List* (Listing Policy) (Sept. 2004), Section 6.1.1" Definition of Readily Available Data and Information (emphasis in original), available at http://www.waterboards.ca.gov/water_issues/programs/tmdl/docs/ffed_303d_listingpolicy093004.pdf.
[36] *Id.* (emphasis added).
[37] *See* DFG Instream Flow Program, http://www.dfg.ca.gov/water/instream_flow_docs.html. *See also* DFG Water Rights Program, http://www.dfg.ca.gov/water/water_rights_docs.html.
[38] This includes but is not limited to Instream Flow Analysis – Santa Maria River, http://www.opc.ca.gov/2009/05/instream-flow-analysis-santa-maria-river/, Instream Flow Analysis – Big Sur River, http://www.opc.ca.gov/2009/05/instream-flow-analysis-big-sur-river/, and Instream Flow Analysis – Shasta River, http://www.opc.ca.gov/2009/05/instream-flow-analysis-shasta-river/.
[39] SWRCB, "Final Report on Development of Flow Criteria for the Sacramento-San Joaquin Delta Ecosystem" (Aug. 3, 2010) (Delta Flow Report), available at: http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/deltaflow/final_rpt.shtml.
[40] As required by California Water Code § 1259.4 (AB 2121), available at http://www.waterboards.ca.gov/waterrights/water_issues/programs/instream_flows/.
[41] DWR, California Data Exchange Center, http://cdec.water.ca.gov/.
[42] DWR, Water Data Library, http://www.water.ca.gov/waterdatalibrary/.
[43] Interagency Ecological Program, http://www.water.ca.gov/iep/.
[44] "CA DWR CDEC Interface," a compilation of data from DWR's California Data Exchange Center, available at: http://acme.com/jef/flow/cdec.html.

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- Data in the Klamath Resource Information System (KRIS);[45]
- Information and datasets presented at "My Water Quality" meetings,[46] including data from the Department of Natural Resources presented at the August 11, 2010 meeting
- Data contained in CalFish, the California Cooperative Anadromous Fish and Habitat Data Program,[47] especially the Passage Assessment Database.[48]

Note that Federal agencies, such as the U.S. Fish and Wildlife Service,[49] Federal Energy Regulatory Commission,[50] NOAA (particularly the National Marine Fisheries Service[51] and analyses such as the Magnuson-Stevens Reauthorization Act Klamath River Coho Salmon Recovery Plan[52]), USGS[53] and U.S. EPA, must also be "*actively*" solicited for data and information.[54]

This and other flow information can provide invaluable insight into the "physical, chemical, or biological condition" of the state's waterways as required by federal law and state Policy. It should be considered carefully in developing a comprehensive Category 4C list as well as Category 5 listings that appropriately include impairments caused by altered natural flows, and combinations of altered natural flows and pollutants.

C. Delta Waterways Must Be Listed as Impaired Due to Reduced Natural Flows

Numerous beneficial uses are impaired by the altered flows, including but not limited to GWR (groundwater recharge discussed separately below), COLD (cold freshwater habitat), MIGR (fish migration), SPWN (fish spawning) and RARE (preservation of rare and endangered species). In fact, *all* of the Delta waterways examined in the State Water Board's recently-adopted "Final Report on Development of Flow Criteria for the Sacramento-San Joaquin Delta Ecosystem" should be considered for flow impairments. This Report concluded unequivocally that **"[r]ecent Delta flows are insufficient to support native Delta fishes for today's habitats."**[55] More specifically, the Report found that:

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[45] http://www.krisweb.com/index.htm.
[46] http://www.waterboards.ca.gov/mywaterquality/monitoring_council/meetings/index.shtml.
[47] www.calfish.org;
[48] http://www.calfish.org/portals/0/Programs/CalFishPrograms/FishPassageAssessment/tabid/83/Default.aspx. This letter incorporates by reference the comments of Heal the Bay with respect to required 303(d) listings needed for beneficial uses impaired by fish passage barriers. The same legal and policy requirements that call for 303(d) listing of water bodies impaired by altered natural flows also apply to listings for water bodies impaired by fish barriers. The Water Board should review the Passage Assessment Database, which has extensive information on barriers, to ensure that all impaired waterways are properly included on the Section 30(d) list. *See also* CCKA's compilation of fish barriers impacting the RARE beneficial use at: http://www.cacoastkeeper.org/programs/mapping-initiative/fish-barriers.
[49] *See, e.g.*, U.S. FWS, Water and Fishery Resources Program, http://www.fws.gov/cno/fisheries/.
[50] *See* http://elibrary.ferc.gov/idmws/search/fercgensearch.asp to search for details of California hydropower projects, which would provide further information on flows.
[51] California is in the Fisheries Service's Southwest Region; *see* http://swfsc.noaa.gov/ for data and publications.
[52] National Marine Fisheries Service, "Magnuson-Stevens Reauthorization Act Klamath River Coho Salmon Recovery Plan" (July 2007), available at: http://www.swr.noaa.gov/salmon/MSRA_RecoveryPlan_FINAL.pdf.
[53] *See* USGS, "What kinds of water data does the U.S. Geological Survey gather?" available at: http://www.usgs.gov/faq/index.php?action=artikel&cat=102&id=1148&artlang=en.
[54] Listing Policy, Section 6.1.1: Definition of Readily Available Data and Information (emphasis added).
[55] Delta Flow Report, *supra* n. 59, at p. 5 (emphasis added).

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In order to preserve the attributes of a natural variable system to which native fish species are adapted, many of the criteria developed by the State Water Board are crafted as percentages of natural or unimpaired flows. These criteria include:

- 75% of unimpaired Delta outflow from January through June;
- 75% of unimpaired Sacramento River inflow from November through June; and
- 60% of unimpaired San Joaquin River inflow from February through June.

It is not the State Water Board's intent that these criteria be interpreted as precise flow requirements for fish under current conditions, but rather they reflect the general timing and magnitude of flows under the narrow circumstances analyzed in this report. In comparison, historic flows over the last 18 to 22 years have been:

- approximately 30% in drier years to almost 100% of unimpaired flows in wetter years for Delta outflows;
- about 50% on average from April through June for Sacramento River inflows; and
- approximately 20% in drier years to almost 50% in wetter years for San Joaquin River inflows.[56]

In other words: (a) the Delta is always impaired for flow in drier years and potentially impaired seasonally in wetter years, (b) the Sacramento River is regularly flow impaired, and (c) the San Joaquin River is always flow impaired. Note that this comparison is based on averages over the past two decades; flow data from more recent years (available from the citations above and other readily available sources) would likely skew these results towards more, not less, impairment, as noted in the Report quote above.

Accordingly, U.S. EPA should demand that *all* Delta waterways for which the Report has found flow-related impairments of beneficial uses be listed in California's 303(d) lists as impaired by water diversion, flow alteration, and/or other appropriate cause, with the specific sources (agriculture, etc.) clearly delineated.

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Thank you for considering these comments on two critical problems affecting the health of the Bay-Delta Estuary. Please feel free to contact us if you have any questions or require additional information.

Best,

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[56] *Id.*

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