UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
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SEP 29 2015

David G. Murillo
Regional Director
Bureau of Reclamation, Mid-Pacific Region
2800 Cottage Way
Sacramento, CA 95825-1898

Subject: Coordinated Long-Term Operation of the Central Valley Project and State Water Project Draft Environmental Impact Statement, Multiple Counties, California [CEQ# 20150214]

Dear Mr. Murillo:

The U.S. Environmental Protection Agency has reviewed the Draft Environmental Impact Statement (DEIS) for the Coordinated Long-Term Operation of the Central Valley Project and State Water Project. Our review and comments are 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 DEIS evaluates the impacts of operating the Central Valley Project (CVP) and State Water Project (SWP) with implementation of Biological Opinions (BOs) issued by the US Fish and Wildlife Service (FWS) and National Marine Fisheries Service (NMFS) in 2008 and 2009, respectively. Those BOs concluded that continued operation of the CVP and SWP is likely to jeopardize the existence of endangered Delta smelt and Sacramento River winter-run Chinook salmon, and threatened Central Valley spring-run Chinook salmon, Central Valley steelhead, and southern resident killer whales. The BOs identified Reasonable and Prudent Alternatives (RPAs) designed to enable the CVP/SWP to continue operations without jeopardizing those species. The RPAs include pumping restrictions, habitat restoration, specific monitoring and reporting requirements, fish passage improvements, temperature management tools, and gravel augmentation.

EPA supports full implementation of the RPAs, assuming that habitat restoration sites and methods are carefully selected to avoid increasing the production and distribution of methylmercury. The No Action Alternative and Alternative 5 would each fully implement the RPAs; Alternatives 1, 2, 3 and 4 would not implement, or would only selectively implement, them. Because Reclamation did not identify a preferred alternative in the DEIS, we are rating all alternatives and the document. We are rating the No Action Alternative and Alternative 5 as *Environmental Concerns* (EC); and Alternatives 1, 2, 3, and 4 as *Environmental Objections* (EO). We are rating the document as *Insufficient Information* (2) (see enclosed "Summary of EPA Rating Definitions"). While we have concerns about all of the alternatives, as discussed below and in the enclosed Detailed Comments, we believe that Alternatives 1-4, in particular, would not protect aquatic life beneficial uses and would perpetuate the poor habitat conditions that have characterized the past fifteen years of declining resident and migratory fish

populations in the Sacramento and San Joaquin river systems and estuary. Because Alternatives 1, 3, and 4 would implement few, if any, of the measures included in the RPAs, they appear less likely to avoid jeopardy to listed species. Alternative 2 includes the operational RPA actions, but not the important structural improvements, such as fish passage, gravel augmentation, improvements to hatchery operations, or fish collection facility improvements. Alternatives 1-4 introduce possible mitigation measures for water quality and aquatic and terrestrial resources that appear to reflect the BOs and RPAs, but the DEIS provides no details as to how the mitigation would differ from the No Action Alternative.

It is important to note that the Delta estuary ecosystem, habitat conditions in the upper watershed rivers, and populations of resident and migratory fish continue to decline, despite the partial implementation of the RPAs that has already occurred, and this decline is expected to continue even as implementation of the RPAs proceeds. The DEIS indicates that, even with full implementation of the RPAs, aquatic life beneficial uses and threatened and endangered fishes may not be fully protected for the duration of the project study period, which ends in 2030:

> "*Currently low levels of relative abundance do not bode well for the Delta Smelt or other fish species in the Delta in 2030. Challenges to fish species in the Delta are many, and would continue in the future under the No Action Alternative, including high water temperatures, reduced flows, habitat degradation, barriers, predation, low dissolved oxygen, contamination, entrainment, salvage, poaching, disease, competition, non-native species, and lack of available food*" (page 9-139).

Many of these stressors are a function of the timing, magnitude, and duration of freshwater flow in the Sacramento and San Joaquin rivers, upper tributaries, and estuary. Alleviating them to allow native fishes to persist in the watershed will likely necessitate additional changes to CVP/SWP (including dams) operations and species management. We encourage Reclamation to make full use of the iterative evaluation and adjustment processes outlined in the BOs to further improve conditions in those waters.

We appreciate the opportunity to review and comment on this DEIS, and are available to discuss the recommendations provided. When the FEIS is released for public review, please send one hard copy and one CD to the address above (Mail Code: ENF 4-2). Should you have any questions, please contact me at (415) 972-3873, or contact Jean Prijatel, the lead reviewer for the project. Jean can be reached at (415) 947-4167 or prijatel.jean@epa.gov.

Sincerely,

Kathleen H. Johnson, Director
Enforcement Division

Enclosures: Summary of EPA Rating Definitions
EPA Detailed Comments

cc: Kim S. Turner, U.S. Fish and Wildlife Service, Bay-Delta Office
Garwin Yip, National Oceanic and Atmospheric Administration, West Coast Region

SUMMARY OF EPA RATING DEFINITIONS*

This rating system was developed as a means to summarize the U.S. Environmental Protection Agency's (EPA) level of concern with a proposed action. The ratings are a combination of alphabetical categories for evaluation of the environmental impacts of the proposal and numerical categories for evaluation of the adequacy of the Environmental Impact Statement (EIS).

ENVIRONMENTAL IMPACT OF THE ACTION

"LO" (Lack of Objections)

The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

"EC" (Environmental Concerns)

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

"EO" (Environmental Objections)

The EPA review has identified significant environmental impacts that should be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

"EU" (Environmentally Unsatisfactory)

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potentially unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the Council on Environmental Quality (CEQ).

ADEQUACY OF THE IMPACT STATEMENT

"Category 1" (Adequate)

EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

"Category 2" (Insufficient Information)

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analysed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

"Category 3" (Inadequate)

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analysed in the draft EIS, which should be analysed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

*From EPA Manual 1640, Policy and Procedures for the Review of Federal Actions Impacting the Environment.

U.S. EPA DETAILED COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR COORDINATED LONG-TERM OPERATION OF THE CENTRAL VALLEY PROJECT AND STATE WATER PROJECT, MULTIPLE COUNTIES, CA SEPTEMBER 29, 2015

Aquatic Resources

In 2009, several federal agencies, including Reclamation and EPA, declared that the Sacramento-San Joaquin River Delta ecosystem, part of the larger San Francisco estuary, was in a state of collapse.[1] This declaration was made after several years of sharp population declines in four resident fishes, commonly referred to as the pelagic organism decline (POD), followed by sharp drops in Chinook salmon abundance. Two of the POD fishes were already rare while the other two were formerly the most abundant fishes in the estuary. Low Chinook salmon populations resulted in a multi-year closing of commercial and recreational fishing.

Populations of all the species covered by the 2008 Fish and Wildlife Service and 2009 National Marine Fisheries Service Biological Opinions (BOs), as well as several non-listed resident and migratory fishes, have continued to decline since the BOs were finalized. For example, the 2015 summer townet survey for Delta smelt recorded a zero juvenile Delta smelt abundance index.[2]

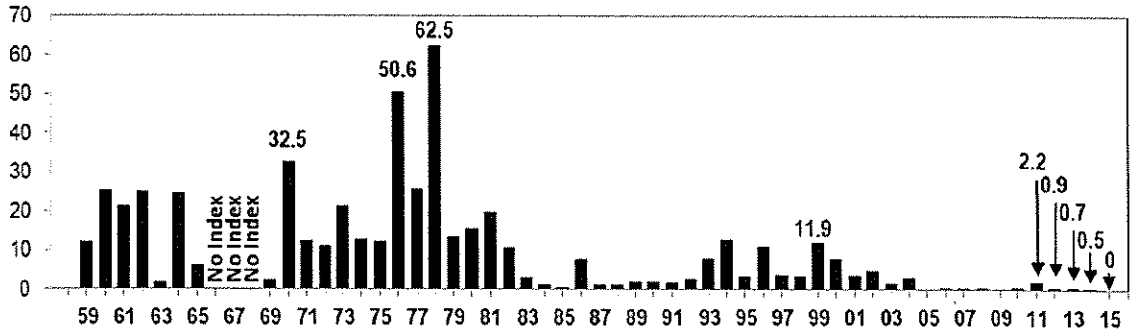

Figure 1. Summer Townet Survey Age-0 Delta Smelt Abundance Indices, 1959-2014

The continued decline of resident and migratory fish populations suggests that the suite of Reasonable and Prudent Alternatives implemented to date, plus commitments[1] to improve protection for aquatic habitat in the San Francisco estuary watershed, have not yet been successful in protecting aquatic habitat, reversing population declines, actually avoiding jeopardy, and/or improving aquatic life beneficial use protection. The pace and severity of the decline highlight the urgent need to move forward with full implementation of the RPAs and, perhaps, additional measures in an adaptive management context to ensure their effectiveness. Alternatives 1, 2, 3 and 4 would discontinue implementation, or would only selectively implement, the Reasonable and Prudent Alternative (RPA) actions identified in the BOs, which are designed to improve riverine and estuarine aquatic habitat to avoid jeopardizing the existence of multiple threatened and endangered species. The DEIS fish analysis for Delta smelt and longfin smelt show that Alternatives 1, 3 and 4 would result in adverse impacts to these species relative to the No Action Alternative. Discontinuation of RPA actions is likely to also negatively impact non-listed fishes that benefit from improved aquatic habitat conditions the RPAs provide. Full

[1] California Bay-Delta MOU (http://www2.epa.gov/sites/production/files/documents/baydeltamousigned.pdf); Interim Federal Action Plan (https://www.doi.gov/sites/doi.gov/files/migrated/news/doinews/upload/CAWaterWorkPlan.pdf)
[2] California Department of Fish and Wildlife Memorandum (June 26, 2015) to Scott Wilson from Felipa La Luz regarding 2015 Summer Townet Survey Age-0 Delta Smelt Abundance Index.

implementation of the RPAs, as would occur under the No Action Alternative and Alternative 5, may minimize adverse effects of the CVP/SWP operations on fishes, but may not be sufficient to increase fish populations and improve aquatic life beneficial use protection in the estuary and upper watershed.

> ***Recommendations***: For the No Action Alternative and Alternative 5 in the FEIS, provide a timeline for implementation of the remaining measures in the RPAs and disclose any impacts that the timing of various measures may have on their effectiveness in avoiding jeopardy for subject species. Indicate how changing conditions in the study area would be incorporated into managing operations and implementation of the RPAs.
>
> For Alternatives 1, 2, 3, and 4 in the FEIS, provide a detailed description of proposed mitigation measures (page 9-421) that would reduce the anticipated adverse impacts to fish species, including implementing fish passage and coordinating operations between Reclamation, Department of Water Resources, FWS, and NMFS.

The DEIS fish impact analysis presents many results that are contrary to the NMFS BO. Alternative 1 describes the project area without the RPAs, and the No Action Alternative (NAA) assumes full implementation of the RPAs. These two alternatives are the most divergent of the 6 alternatives considered; however, the DEIS analysis often concludes that there is little difference between impacts to fish species between Alternative 1 and the NAA. Some fish analyses in the DEIS even suggest that implementing the BO RPAs in the NAA would have slightly greater adverse impacts than not implementing the BO RPAs in Alternative 1. These conclusions are inconsistent with the conclusions in the BOs and the intent of the RPAs.

Conclusions of no difference among alternatives in the DEIS' fish analysis rely on analytical tools that are not precise enough to identify such differences, specifically with regard to water temperature. Temperature is an important aquatic habitat element that is a driver of early life stage survival for fish species addressed in the BOs. Temperature criteria for protecting fish are often based on a daily or weekly averaging period; however, available temperature and flow models, including those relied upon for the DEIS' fish analysis, are currently limited to using a monthly time step (page 9-109). Monthly temperature averages mask the biologically meaningful differences among alternatives. For example, a temperature threshold of 56 degrees as a daily average is identified as protective of spawning and egg incubation for several salmonid species; however, the temperature analysis estimates a monthly temperature average, which could include many days that exceed 56 degrees by many degrees. Thus, reliance on monthly averages in the DEIS obscures the daily temperature differences among alternatives. Temperature analyses will not be useful for distinguishing among alternatives until daily temperature and flow models are built and validated using daily observations.

The DEIS analysis of impacts to striped bass and American shad is based solely on water temperature; however, changes in salinity gradient impacts, as approximated by Delta outflow or X2, are correlated with striped bass abundance and should be included in the analysis.

> ***Recommendations***: In the FEIS, include a discussion about the limitations of the available models and analytical tools in making distinctions between impacts to fish species among the alternatives, particularly with regard to monthly average temperatures. Revise conclusions about the differences, or lack thereof, in impacts to fish species among the alternatives accordingly.
>
> Include a discussion of salinity gradient in the impact analysis for striped bass and American shad.

Water Quality Impacts

The water quality discussion in the DEIS includes a description of constituents of concern, water quality standards, and designated beneficial uses in the study area, but does not include a quantitative water quality analysis that is compared to all water quality standards and objectives described. EPA notes that there are many quantitative and qualitative water quality standards that apply to CVP/SWP operations, as described in the Water Boards' Basin Plans and Water Rights Decision 1641. We also observe that no key is provided for Table 6.2 Designated Beneficial Uses within Project Study Area (page 6-12). We have assumed that "E" signifies *existing* and "P" signifies *potential.*

> ***Recommendation***: In the FEIS, discuss how each alternative would affect water quality with respect to narrative and numeric water quality objectives, highlight any predictions of exceeded water quality standards, and identify mitigation strategies that would prevent such exceedances.

The DEIS discusses how droughts are incorporated into the CalSim model for water supply and quality impact analysis, and acknowledges that drought can and has altered hydrology in the Delta (page 9-139); however, contingency procedures for severe droughts are not discussed in the document. In our existing drought conditions, multiple water quality objectives have not been met for the last two years, resulting in a substantial impact on aquatic life beneficial uses throughout the study area.[3]

> ***Recommendations***: In the FEIS, discuss the need to develop drought contingency procedures that protect aquatic life beneficial uses, including the protection of ESA listed species, during drought conditions. Provide a description of the adjustments to the RPAs made during the current drought conditions and report their impacts on covered fishes. EPA recommends that Reclamation commit to include in its ongoing monitoring and reporting program any deviations from the RPAs for drought conditions.

X2

EPA appreciates that the DEIS includes a year-round X2 (2 parts per thousand salinity isohaline) analysis to evaluate Delta outflow, changes to estuarine habitat, and migration conditions. The DEIS does not, however, include an interpretation of the results with respect to aquatic life beneficial use protection, other than to note that the location of X2 is important for aquatic life and water supply beneficial uses (page 6-17). More recently than the 2008 and 2009 BOs, multiple scientific panels have identified the need for more freshwater outflow, signified by a lower X2 position, in the estuary to reverse the decline of several resident and migratory fish.[4] This recommendation is based largely on the

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[3] California Department of Fish and Wildlife Memorandum (June 26, 2015) to Scott Wilson from Felipa La Luz regarding 2015 Summer Townet Survey Age-0 Delta Smelt Abundance Index; California Department of Fish and Wildlife Fall Midwater Trawl Indices for Select Fish http://www.dfg.ca.gov/delta/data/fmwt/indices.asp; 95% mortality of 2014 winter-run Chinook salmon juveniles as estimated in NMFS 2015 Juvenile Production Estimate http://www.westcoast.fisheries.noaa.gov/publications/Central_Valley/Water%20Operations/20150116_nmfs_winter-run_juvenile_production_estimate_nr.pdf.

[4] 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

X2-abundance correlations, regardless of the mechanistic knowledge gap.[5] The State Water Resources Control Board D-1641 provides criteria that require reservoir releases from CVP and SWP from February through June to protect aquatic life in the western Delta. The FWS BO includes an additional salinity requirement for September and October in wet and above normal water years. Alternative 5 in the DEIS provides for additional flows in April and May in all water year types beyond those provided in SWRCB D-1641 and the FWS BO.

As an editorial note, the X2 analysis is referenced to the wrong appendix in Chapter 6 of the DEIS (page 6-86).

> ***Recommendations***: In the FEIS, include a discussion of the impacts of Delta outflow, as documented by X2 location, on aquatic life beneficial uses, utilizing the references provided above and including relative impacts from each of the alternatives. Update the text to reflect that the X2 tables are in Appendix 5A, Section C, not appendix 6E as stated in DEIS Chapter 6.

Selenium

EPA is in the process of updating its national recommended chronic aquatic life criterion for selenium in freshwater and revising selenium water quality criteria for San Francisco Bay to reflect the latest scientific information, which indicates that toxicity to aquatic life is driven by dietary exposures. These criteria may be lower than the threshold used in comparison in the DEIS.

The selenium water quality analysis in the DEIS concludes that there would be minimal difference in estimated selenium water column and fish tissue concentrations among the project alternatives. However, average selenium concentrations in sturgeon tissue for all alternatives are near to or slightly exceed the low toxicity 5 mg/kg threshold established by Presser and Luoma[6] (see Table 6D.17 Summary of Annual Average Selenium Concentrations in Whole-body Sturgeon). FWS also uses a lower threshold of 4 mg/kg for sensitive species such as sturgeon and salmon.[7] This suggests that all alternatives have the potential to adversely impact fish tissue concentrations by establishing conditions that enhance selenium exposure and uptake in sensitive species such as sturgeon.

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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

[5] 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 "*...this implies that sufficient reductions in outflow due to diversions would tend to reduce the abundance of these organisms.*" 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

[6] Toxicity thresholds are those reported in Presser and Luoma (2013) Low = 5 mg/kg, dw and High = 8 mg/kg, dw. Presser (2010) Ecosystem-scale Selenium Modeling in Support of Fish and Wildlife Criteria Development for the San Francisco Bay-Delta Estuary, California. Administrative Report December. Reston, Virginia: U.S. Geological Survey; Ecosystem-scale Selenium Model for the San Francisco Bay-Delta Regional Ecosystem Restoration Implementation Plan. San Francisco Estuary and Watershed Science 11(1):1-39. http://www.escholarship.org/uc/item/2td0b99t

[7] lower FWS threshold of 4mg/kg dw in Lemly, A.D. 1996. Selenium in aquatic systems. In: W.N. Beyer, G.H. Heinz and A.W. Redmon-Norwood, eds., Environmental contaminants in Wildlife: Interpreting tissues concentrations. CRC Press, Lewis Publishers, Boca Raton, Florida. p. 427-445.

The CVP supplies irrigation water for agricultural lands that discharge irrigation return water with high concentrations of selenium. A pending prohibition to discharge in 2019 will take effect if selenium loads from some of these lands are not sufficiently reduced to protect aquatic life and meet selenium standards in the San Joaquin River.[8] We encourage Reclamation to work with its CVP partners to improve selenium source control and reduce fish impacts in the Delta and San Francisco Bay.

> ***Recommendation***: In the FEIS, identify measures that could reduce the selenium load coming into the San Joaquin River from agricultural lands through source control, such as meeting or exceeding the selenium load reductions outlined in the 2009 Agreement for the Continued Use of the San Luis Drain (Appendix C).[9]

Mercury

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[10] 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 NMFS BO requires floodplain restoration in the lower Sacramento River Watershed. The DIES identifies the Yolo Bypass as a restoration area with high potential to improve juvenile salmonid survival to the ocean by restoring access to, and improving, rearing habitat that has substantial food resources and is safe from predators, relative to the mainstem Sacramento River. The Bay Delta Conservation Plan DEIS, 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.[11] The current DEIS discloses that, for all alternatives, values for mercury concentrations in largemouth bass throughout the study area "exceed the threshold of 0.24 milligram/ kilogram wet weight (mg/kg ww) for mercury" (page 6-86).

EPA strongly supports restoration of aquatic habitat in the Delta, however caution must be exercised to ensure that it does not result in unintended consequences that adversely affect water quality. Minimizing the formation and mobilization of methylmercury in wetlands is critical.

> ***Recommendation:*** In the FEIS, explain how habitat restoration locations and methods will be selected to avoid methylmercury production that cannot otherwise be reduced or mitigated.

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[8] California Central Valley Water Board (2010) Resolution R5-2010-0046 Amendment to the Water Quality Control Plan for the Sacramento and San Joaquin River Basins for the control of Selenium in the Lower San Joaquin River Basin, Attachment A, p. 1 http://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/resolutions/r5-2010-0046_res.pdf

[9] http://www.waterboards.ca.gov/centralvalley/water_issues/grassland_bypass/gbp_2010_2019_use_agree.pdf

[10] SWAMP- Surface Water Ambient Monitoring Program http://www.waterboards.ca.gov/water_issues/programs/swamp/rivers_study.shtml

[11] 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; Ackerman, J. "Agricultural Wetlands as Potential Hotspots for mercury bioaccumulation: experimental evidence using caged fish" Environmental Science and Technology 2010, 44, 1451-1457. Draft Bay Delta Conservation Plan DEIS http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/periodic_review/docs/periodicreview2009.pdf

Pesticides
The discussion of "Other pesticides" (page 6-24) in the DEIS does not include pyrethroid pesticides: They are mentioned briefly in "other sources of toxicity" in the Sacramento River Region description of existing conditions/existing environment; however this is insufficient discussion of this group of pesticides as water quality stressors.

> ***Recommendation***: In the FEIS, include a description of pyrethroid pesticides, their sources, and their role as water quality stressors in the study area.

Mitigation Measures
The DEIS provides a very brief description of mitigation measures for each of the action alternatives, particularly in the water quality, aquatic resources, and terrestrial resources chapters. Mitigation for Alternatives 1, 2, 3, and 4 would include provisions that appear similar to the No Action Alternative and the BOs (aquatic resources page 9-421; water quality page 6-118; terrestrial biological resource page 10-89), including fish passage and coordinating operations with FWS, NMFS, and the Department of Water Resources. The mitigation measures are not well described, their expected effectiveness is not disclosed, and they are not identified as commitments.

> ***Recommendation***: In the FEIS, further define the mitigation measures and explain how those for Alternatives 1, 2, 3, and 4 are similar to or different from the No Action Alternative and BOs. Provide an analysis of the measures' predicted effectiveness in mitigating impacts from the Alternatives.

Climate Change
EPA appreciates the consideration that the DEIS gives to the impacts that climate change will have on the operations of the CVP/SWP. The DEIS explains that the project's study period only extends to 2030 because climate change, sea level rise, and other factors will likely impact operations in that timeframe and will necessitate new consultations with FWS and NMFS (page 1-12). The FWS and NMFS BOs and RPAs include fish passage at several dams, and the DEIS acknowledges that improving passage to provide access to additional cold water habitat will be particularly important, considering anticipated climate change scenarios (page 9-117).

The DEIS references the California Climate Change Portal 2007 as the source for potential effects of a warming climate in California and references the climate change analysis conducted for the Bay Delta Conservation Plan DEIS for its modeling. The current DEIS briefly summarizes climate change impacts at several points in the document, but does not provide a summary of the climate change and sea level rise assumptions in the discussion of any of the alternatives. While much of this information is available in appendices, the descriptions of alternatives in Chapter 3 would benefit from a discussion of the assumed changes to snow pack, seasonal flows, and sea level.

On December 24, 2014, the Council on Environmental Quality released revised draft guidance for public comment that describes how federal departments and agencies should consider the effects of greenhouse gas emissions and climate change in their NEPA reviews.[12] The revised draft guidance supersedes the draft greenhouse gas and climate change guidance released by CEQ in February 2010. The new draft guidance explains that agencies should consider both the potential effects of a proposed action on climate change, as indicated by its estimated greenhouse gas emissions, and the implications of climate

[12] www.whitehouse.gov/sites/default/files/docs/nepa_revised_draft_ghg_guidance_searchable.pdf

change for the environmental effects of a proposed action. Neither the 2010 nor the 2014 guidance are included in the regulatory framework section of the DEIS.

> ***Recommendations***: In the FEIS, we recommend including a summary discussion of climate change assumptions for each alternative. We also recommend adding a description of CEQ's draft guidance for greenhouse gas emissions and climate change impacts to the regulatory requirements section of the FEIS. EPA recommends that Reclamation enhance its consideration of future climate scenarios by including a review the U.S. Global Change Research Program[13] assessments to assist with identification of potential project impacts that may be exacerbated by climate change and to inform consideration of measures to adapt to climate change impacts.

Groundwater

The DEIS describes beneficial impacts on groundwater resources under Alternatives 1, 3, and 4 because they would provide more water deliveries than would the No Action Alternative (page 7-125-133). It states that increases in surface water supplies as a result of these alternatives would result in diminished use of groundwater; however, no documentation is provided to support this assumption.

The assumption that groundwater use would decrease with increased water deliveries under Alternatives 1, 3, and 4 is used to conclude that, under the other alternatives, including No Action, groundwater quality would diminish, overdrafts from groundwater basins would occur more frequently, and irreversible subsidence would occur. On the contrary, EPA believes 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 Alternatives 1, 3, and 4.

The DEIS discusses the California Sustainable Groundwater Management Act, which requires the formation of Groundwater Sustainability Plans by 2020 or 2022. Sustainable groundwater operations must be achieved within 20 years following completion of the plans. The DEIS analysis assumes that the groundwater users will have developed their plans by 2030, and may begin to plan, design, and build facilities and operations to achieve compliance with those plans; however, the analysis also assumes that the plans will not be implemented by the end of the study period, and does not account for reductions in groundwater use that will be associated with those plans (page 7-109).

> ***Recommendations:*** Explain the basis for the assumption that increases in surface water supplies would result in diminished use of groundwater. Discuss the likelihood and potential impacts of increased use of surface water supplies for aquifer storage and recovery.
>
> Consider development of a mitigation measure to address management of groundwater resources in the interim period before implementation of the Groundwater Sustainability Plans.

[13] www.globalchange.gov/