



State Water Resources Control Board

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Dear You Chen Chao,

COMMENTS ON DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE LONG-TERM OPERATION OF THE STATE WATER PROJECT

Thank you for the opportunity to comment on the Department of Water Resources' (DWR) Draft Environmental Impact Report (DEIR) for the Long-Term Operation (LTO) of the State Water Project (SWP) prepared pursuant to the requirements of the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 21000 et seq.) and CEQA Guidelines (Cal. Code Regs., tit. 14, § 15000 et seq.).

The mission of the State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (Regional Water Boards) is to preserve, enhance, and restore the quality of California's water resources and drinking water for the protection of the environment, public health, and all beneficial uses, and to ensure proper water resource allocation and efficient use, for the benefit of present and future generations. The State Water Board administers water rights in California, including DWR's water rights for the SWP and the various conditions placed upon those rights in State Water Board Decision 1641 (D-1641) and other orders and decisions. The State Water Board and Regional Water Quality Control Boards also have primary authority over the protection of the State's water quality. To protect water quality, the State and Regional Water Boards develop water quality control plans that identify beneficial uses of water, water quality objectives to protect those beneficial uses, and a program of implementation to achieve the objectives, as well as monitoring and special studies and reporting requirements. These water quality control plans include the State Water Board's Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta Plan) and the Central Valley and San Francisco Bay Regional Water Boards' water quality control plans for the Central Valley and San Francisco Bay that are relevant to this project.

This comment letter is focused on the DEIR and not the associated application to the California Department of Fish and Wildlife (CDFW) for an Incidental Take Permit (ITP) pursuant to the California Endangered Species Act (CESA). A full analysis of the ITP project should be provided in the EIR, including complete hydrologic modeling analyses for review with an opportunity for comment.

E. JOAQUIN ESQUIVEL, CHAIR | EILEEN SOBECK, EXECUTIVE DIRECTOR

The State Water Board acknowledges that a potential voluntary agreement (VA) may be developed by water users (including DWR) that could improve protections for fish and wildlife in the Bay-Delta watershed and may help address issues identified in this comment letter. State Water Board staff look forward to continuing to work with DWR on the development of a robust VA.

The State Water Board recognizes that, in addition to the VA discussions and DWR's CEQA process and ESA ITP application, multiple other regulatory processes in the Bay-Delta watershed are underway. This includes proposed changes to Central Valley Project (CVP) operations by the U.S. Bureau of Reclamation (Reclamation) to maximize CVP export pumping and the related reinitiation of consultation under the Federal Endangered Species Act (FESA) on the coordinated long-term operations of the CVP and SWP (collectively Projects), including receipt by Reclamation of biological opinions (BiOps) from the National Marine Fisheries Service (NMFS) for marine species and the United States Fish and Wildlife Service (USFWS) for all other federally listed species that could be affected by the Projects' joint operations and issuance of an Environmental Impact Statement pursuant to the National Environmental Policy Act (ROC LTO EIS). The State Water Board previously issued a comment letter (attached) on Reclamation's Draft ROC LTO EIS (see attached). To the extent those comments are related to the DEIR, they are incorporated by reference. Comments in this letter regarding monitoring, workgroups, and other issues are also applicable to actions by Reclamation.

Proposed Project and Alternatives

The purpose of the proposed project is to continue the operation of the SWP in a coordinated manner with the CVP, consistent with each project's authorized purposes, in a manner that enables DWR and Reclamation to maximize water deliveries and optimize marketable power generation consistent with applicable laws, contractual obligations, and agreements; and to augment operational flexibility by addressing the status of listed species. DWR has also indicated that the proposed project seeks to strengthen safeguards for fish without increasing exports. The proposed project includes proposed modifications to Old and Middle River (OMR) flow management; elimination of export constraints from the 2009 NMFS BiOp/Reasonable and Prudent Alternatives (RPAs - measures to prevent jeopardy to the continued existence of the species); elimination of fall X2 actions from the 2008 USFWS BiOp/RPAs; actions in the summer and fall for the management of Delta smelt; and other components. As discussed further below, it is not clear from the DEIR that the proposed project would strengthen safeguards for fish or limit exports to existing levels. Alternatives to the proposed project would potentially increase protections over the proposed project, but it is not clear that those alternatives would improve protections for fish over existing conditions and that those alternatives would avoid further impacts to native fish species.

As part of the description of the proposed project, the EIR should include a description of the exact changes to existing regulatory constraints that are proposed in a table or other easily discernable format for ready comparison, including a clear description of the existing constraints that are proposed to be eliminated and what they are proposed to be replaced with, if anything. In addition, the project description should clearly document the scientific basis for each of the changes and should explain how the proposed constraints will prevent harm and, where applicable, improve conditions for the various listed fish species compared to the 2008 and 2009 BiOps and associated RPAs and the 2009 ITP relative to the current degraded conditions of those species.

In general, the proposed project has the potential to increase water deliveries and exports, increase net cross-Delta flows (reverse flows, or more negative OMR flows) to the export facilities, and decrease Delta outflows during the spring and fall. According to the DEIR, Delta outflows under the proposed project would be decreased by almost 400 thousand acre-feet (TAF) on average annually. Water exports would be increased through the SWP's Banks Pumping Plant by 220 TAF and the CVP's Jones Pumping Plant by 155 TAF on average annually. On average, the largest reductions in Delta outflow would occur in the months of April (2,748 cubic feet per second (cfs)), May (2,677 cfs), September (1,846 cfs), and November (2,985 cfs). Delta outflows would be decreased the most (6,237 cfs) in September of wet water years.

Alternatives to the proposed project include additional protections over the proposed project, but not above existing conditions. Alternative 2A maintains the spring (April 1 to May 31) export constraints included in the 2009 NMFS BiOp/RPAs for the SWP share only resulting in additional spring outflows above the proposed project but less than existing conditions. Alternative 2B builds on alternative 2A and includes a block of additional summer or fall outflow of 100 TAF in wet and above normal years. Alternative 2B provides more outflows than 2A but still less than existing conditions. Alternative 3 is built on the proposed project and includes physical (Head of Old River Barrier) and nonphysical (Georgiana Slough) barriers. Alternative 4 is built on the proposed project and includes alternate summer and fall actions to those included in the proposed project. Only limited modeling results are provided for the alternatives, but based on the project description for each, all of the alternatives and the proposed project would potentially reduce protections provided in the 2008 and 2009 BiOps/RPAs, and particularly reduce Delta outflows during the spring.

As described in the peer-reviewed *Scientific Basis Report in Support of New and Modified Requirements for Inflows from the Sacramento River and its Tributaries and Eastside Tributaries to the Delta, Delta Outflows, Cold Water Habitat, and Interior Delta Flows* (Scientific Basis Report) produced by State Water Board staff in 2017 (Scientific Basis Report) in support of potential updates to the Bay-Delta Plan and scientific literature referenced in that report, available scientific knowledge indicates that decreasing freshwater outflows, particularly during the winter and spring and increasing exports and associated reverse flows in the interior Delta is expected to have a negative impact on the survival and abundance of native fish species, including threatened and endangered species that are the subject of the DWR's ITP application and BiOps/RPAs issued by USFWS and NMFS for the Projects in 2008 and 2009, respectively. New BiOps issued in 2019 (2019 USFWS and NMFS BiOps) decrease those protections as Reclamation likewise proposes to increase water deliveries and exports, resulting in increased reverse flows and decreased Delta outflows.

This is contrary to the broad agreement in the scientific community that increased freshwater flows through the Delta and aquatic habitat restoration are needed to protect Bay-Delta ecosystem processes and native fish species.¹ As stated in the Scientific Basis Report:

It is widely recognized that the Bay-Delta ecosystem is in a state of crisis. Changes in land use due to agricultural practices, urbanization, and flood control combined with substantial and widespread water development, including the construction and operation of the Projects, have been accompanied by significant declines in nearly all species of native fish, as well as other native and nonnative species dependent upon the aquatic ecosystem...water project operations in the southern Delta alter circulation patterns, interfering with fish migration, changing water quality, and entraining fish and other aquatic organisms...upstream diversions and water exports in the Delta have reduced January to June outflows by an estimated 56 percent (average) and annual outflow by an estimated 52 percent (mean).

(Scientific Basis Report at pp. 1-4, 1-5.)

The Scientific Basis Report concluded that increased Delta inflows and outflows, and cold-water habitat and constraints on pumping in the interior Delta are necessary in order to reasonably protect at-risk fish species. Accordingly, it is not clear how the proposed project will not further degrade conditions for fish and wildlife species that are already in poor conditions, some of which are on the verge of functional extinction or extirpation. Given this, it is also not clear how the proposed project is consistent with existing obligations, including the California Delta Reform Act,² CESA,³ the California Porter-Cologne Water Pollution Control Act (Porter-Cologne Act), various provisions of the California Water Code governing water rights, and the public trust doctrine. (See *National Audubon Society v. Superior Court* (1983) 33 Cal.3d 419). Further, it is

¹ National Academy of Sciences Natural Resource Council Committee on Sustainable Water Management in California's Bay-Delta (2012) Report: Sustainable Water and Environmental Management in California's Bay-Delta "...sufficient reductions in outflow due to diversions would tend to reduce the abundance of these organisms ["these organisms" refers to 8 Bay Delta aquatic species at various trophic levels]" (page 60); "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); 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); Executive Summary; 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" (page 2); http://www.ppic.org/content/pubs/report/R_413EHR.pdf; State Water 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]; State Water Board (2016) Technical Report on the Scientific Basis for Alternative San Joaquin River Flow and Southern Delta Salinity Objectives. https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/bay_delta_plan/water_quality_control_planning/2018_sed/docs/appx_c.pdf.; State Water Board (2017) Scientific Basis Report in Support of New and Modified Requirements for Inflows from the Sacramento River and its Tributaries and Eastside Tributaries to the Delta, Delta Outflows, Cold Water Habitat, and Interior Delta Flows. https://www.waterboards.ca.gov/water_issues/programs/peer_review/docs/scientific_basis_phase_ii/201710_bdphasell_sciencereport.pdf.

² The 2009 Delta Reform Act and Delta Plan call for reducing water supply reliance on the Delta (Wat. Code, § 85021). The proposed project appears to increase reliance on the Delta.

³ It is the policy of the state that all state agencies, boards, and commissions shall seek to conserve endangered and threatened species and shall utilize their authorities in furtherance of CESA's goals (Fish & G. Code, § 2055). Conserve means to use, and the use of, all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to CESA are no longer necessary (Fish & G. Code, § 2061).

not clear how the DEIR can find no impacts to fish and wildlife from the proposed project in light of this science. The proposed project should provide a commitment to protecting winter and spring outflows and preventing increased volumes of water exports out of the Delta. The DEIR should also evaluate a more protective alternative given the current poor status of listed species that would increase Delta outflows during the winter and spring, along with measures to protect fish and wildlife during the summer and fall, including flow and cold water habitat measures that provide protections similar to those that would be provided under the July 2018 Framework for potential updates to the Bay-Delta Plan produced by State Water Board staff and the State Water Board's 2018 update to the Bay-Delta Plan establishing revised Lower San Joaquin River flow objectives. An alternative with higher outflows was included in Reclamation's ROC LTO EIS (Alternative 4). The State Water Board provided comments on this alternative (see attached) that should also be considered by DWR.

Specific Elements of the Proposed Project

OMR Management

It is not clear that the proposed OMR operational constraints will provide for rigorous protection of listed fish species or adequate oversight by regulatory agencies. It is also not possible to adequately model or predict the effects of such operations on the environment or listed species.

The proposed project would replace the 2008 USFWS and 2009 NMFS BiOp/RPA OMR constraints with largely open-ended real-time OMR management by DWR and Reclamation informed by hydrologic and fisheries modeling and monitoring. It is not clear how modeling and monitoring information will inform real time decision making and whether the constraints will be protective. The proposed project would eliminate the current real-time assessment groups comprised of regulatory agency experts that currently inform OMR management under the 2008 and 2009 BiOps/RPAs (e.g., DOSS and SWG). DOSS and SWG rely on multiple lines of evidence and utilize critical scientific judgement to formulate recommendations for OMR operations. Under the proposed project, it appears that a single line of monitoring or modeling evidence could be employed to make decisions that may not reflect actual risk to the species. In particular, as part of the project, real-time management actions are proposed to be largely informed by monitoring of whether species are present or absent from a monitoring location. Because listed species are very rare and not easily detected, it is very likely that false negatives would occur in monitoring data and that such monitoring would result in a lack of protection for rare species, particularly with further species declines. In addition, current monitoring that is proposed to be relied upon was not designed for real-time decision making and it is not clear that such monitoring will be adequate for real-time decision making. Further, it is not possible to determine that yet to be completed tools (e.g., Delta smelt life cycle model) will be adequate to inform management actions, particularly before they have been developed and peer reviewed. Given these issues, it is not possible to determine whether the operations under the proposed project will be protective or not. The proposed project should include clear protective OMR operational rules that can be assessed for effectiveness and should provide for full and regular involvement by regulatory agencies in technical assessments and decision making. Specific comments on various components of the proposed OMR criteria are provided below.

OMR Constraints for Delta and Longfin Smelt

The DEIR indicates that when managing for OMR flows, DWR will share its technical analysis and supporting documentation with CDFW on an "as needed basis" and seek their technical assistance. The proposed project should be modified to make it clear that CDFW and other regulatory agencies will be consulted in real-time on "all" OMR management decisions and not

only on an “as needed” basis as determined by DWR and that ultimate authority over OMR management will reside with the regulatory agencies. The DEIR identifies a process for resolving disagreements regarding OMR limits between DWR and CDFW that could take a protracted amount of time during which needed protections may be delayed. This process should be expedited to provide for more real-time species protections, particularly given elimination of triggers for OMR restrictions that were included in the 2008 and 2009 BiOps/RPAs.

The DEIR states that “Grimaldo et al. (2017) indicated that -5,000 cfs OMR flow is an inflection point for fish entrainment” and used this citation as the basis for the -5,000 cfs OMR criteria for Delta and longfin smelt and salmon. The reference cited is an unpublished manuscript that has not been peer-reviewed. This paper also does not address longfin smelt or salmon that have different entrainment relationships with OMR flows. The 2008 USFWS BiOp included extensive information on OMR effects on Delta smelt and determined the inflection point for adult Delta smelt salvage to be an OMR flow of -1,800 cfs. Prior to relaxing the existing OMR constraints, the scientific basis for that relaxation should be published and subject to peer review.

The proposed project would modify the high river flow offramps for OMR flow management substantially from the 2008 USFW BiOp levels of 90,000 cfs on the Sacramento River at Rio Vista and 10,000 cfs on the San Joaquin River at Vernalis that were designed for Delta smelt protection to 55,000 cfs and 8,000 cfs, respectively, that were identified in the 2009 longfin smelt ITP. The scientific basis for applying the proposed offramp to Delta smelt should be provided in the project description with citations to peer-reviewed literature.

The proposed project states that DWR will operate to meet its proportional share of proposed operational constraints but that DWR cannot guarantee that Reclamation will meet its share of the operational constraints. As acknowledged in the DEIR, this circumstance will limit whether the proposed project will provide the intended benefits and speaks to the need for comprehensive and coordinated regulatory requirements. The DEIR should include an evaluation of the proposed project if Reclamation does not meet its share of the operational constraints.

It is not clear how the various OMR flow constraints designed for different fish species would interact with one another. The DEIR states that during any time an OMR flow restriction for either Delta smelt or longfin smelt is being implemented, additional OMR flow requirements for protection of the other species shall not occur. It is not clear how such a constraint would be applied in practice. The DEIR should clarify.

For the Turbidity Bridge Avoidance trigger, the DEIR indicates that “if 5 consecutive days of OMR flow that is less negative than -2,000 cfs does not reduce daily average turbidity at Bacon Island below 12 NTU in a given month, DWR, in coordination with Reclamation, may determine that OMR restrictions to manage turbidity are infeasible and will instead implement an OMR flow target that is deemed protective based on turbidity and adult Delta Smelt distribution and salvage, but will not be a more negative OMR flow than -5,000 cfs.” The basis for limiting OMR constraints to 5 days to avoid a turbidity bridge should be provided and the method by which a protective OMR flow target will be arrived at should be further described. In addition, the DEIR indicates that “To avoid excessive OMR restrictions during a sensor error or a localized turbidity spike, DWR, in coordination with Reclamation, will consider and review data from other locations and sources. Additional information that will be reviewed include regional visualizations of turbidity, alternative sensors, and boat-based turbidity mapping, particularly if

there was evidence of a local sensor error.” The process for using alternate turbidity metrics should be better defined.

The Turbidity Bridge Avoidance criteria uses a monitoring location in Old River at Bacon Island. The DEIR states that this trigger is to avoid entrainment of adult Delta smelt into the reaches between the San Joaquin River shipping channel and the south Delta water export facilities (page 3-23). The monitoring location for turbidity (Bacon Island) is roughly the mid-point from the confluence of the San Joaquin to the entrance to Clifton Court Forebay. DWR should consider moving the turbidity monitoring location further downstream closer to the San Joaquin River to improve protection.

The DEIR states that the OMR flow management, Integrated Early Winter Protection (First Flush Turbidity event) would be triggered more often under the proposed project than existing conditions (page 4-170); however, the figure describing the occurrence (Figure 4.4-50, page 4-170) is not consistent with this statement. The EIR should clarify the findings of this analysis.

OMR Constraints for Salmon

The proposed project would replace the daily loss thresholds for OMR management in the 2009 NMFS BiOp/RPA that provides for real-time adjustments to OMR operations to avoid entrainment of salmonid species with a less protective single-year loss threshold that does not trigger until significant impacts have already occurred. Specifically, the proposed project would require that OMR flows be managed to prevent salvage in any one year greater than 90% of the greatest juvenile salmonid salvage loss that occurred during 2010–2018. Allowing for the same or greater increases in juvenile mortality in declining salmonid populations than existing conditions is not a protective loss threshold. Further, the trigger for OMR flows to be constrained to -3,500 cfs and -2,500 cfs (when salvage exceeds 50 and 75% respectively of the annual salmonid loss threshold) would not apply until significant impacts have occurred. A more protective loss threshold for salmonids should be included in the proposed project. In addition, the proposed project should be modified to include specific operational constraints to protect federally and state listed spring-run Chinook salmon.

The proposed project includes convening of an independent review panel to provide recommendations on OMR management for salmonids to stay within permitted take limits. The process for conducting such reviews and for incorporating recommendations from such reviews into OMR management requirements should be better described and should provide regulatory agencies with final decision making authority and oversight.

The proposed project includes provisions for OMR flows to be further limited below -5,000 cfs if loss thresholds are exceeded “unless DWR, in coordination with Reclamation, determines that further OMR restrictions are not required to benefit fish movement because a risk assessment shows that the risk is no longer present based on real-time information.” The project description should make it clear that decision making authority for these and other off-ramps are vested with regulatory agencies and not the project operators. Further, the proposed risk assessment methodology should be better described in the proposed project with specific operational rules.

OMR Flexibility

The proposed project (page 3-28) allows for OMR flows more negative than -5,000 cfs and up to -6,250 cfs when there are excess flows in the Delta, defined as “flow in excess of that required to meet Water Quality Control Plan flow and salinity requirements and other applicable regulations.” This is a very broad offramp that could allow for substantial additional negative

OMR flows and reduced Delta outflows that would not be protective as discussed in this letter. The scientific basis for this measure should be explained in the project description and supported by peer reviewed scientific information. Further, the methodology for determining excess and balanced conditions is not documented and is determined solely by DWR and Reclamation. The methodology for determining excess and balanced conditions should be documented and should provide for regulatory oversight.

Delta Smelt Summer-Fall Habitat Actions

The proposed project would eliminate the fall X2 action from the 2008 USFWS BiOp/RPA (requiring that X2 be maintained at 74 km and 81 km following wet and above normal years, respectively), which has not yet been fully implemented or evaluated. The fall X2 RPA action would be replaced with: a relaxed X2 action (80 km during September and October following wet and above normal years) that would be implemented initially (page 3-30); operations of the Suisun Marsh Salinity Control Gates (SMSCG) in the summer and fall (June through October) of below normal and above normal years, and possibly wet years if the action shows benefit; and food enhancement actions. The DEIR states that these actions and implementation of other actions will be more fully defined and developed through the structured decision-making or other review process and that the review will include selection of appropriate models, sampling programs, and other information to be used. It is not clear what degree of population-level benefits the proposed actions would provide and what the basis is for relaxing the existing fall X2 constraints while the proposed actions are being developed and evaluated, particularly given the current poor status of the Delta smelt population. It is also not clear what initially is intended to mean for the relaxed fall X2 action or why wet years are not included in initial implementation of the SMSCG operations if this action is expected to provide benefits. The DEIR cites a single reference for the potential benefits of SMSCG operations to a briefing document (page 4-157) but does not cite to any published or peer reviewed sources, which it should if this is the primary basis for relaxation of the fall X2 action in the 2008 USFWS BiOp/RPA.

Export Rates

The proposed project eliminates the San Joaquin River flow to export ratio (SJR I:E) constraint which will likely result in an increase in entrainment losses of San Joaquin River juvenile salmonids. Previous studies have shown that higher inflow to export ratios are positively associated with higher juvenile salmonid survival through the South Delta, as well as, adult escapement. This suggests that the elimination of the inflow to export ratio restrictions will result in an increase in mortality of migrating juvenile salmonids. This change from baseline should be clearly described in the proposed project description along with the scientific justification for the change, including how San Joaquin River salmonids will continue to be protected absent this constraint.

The proposed project also includes a minimum export rate of -1,500 cfs for “health and safety purposes.” The DEIR should identify the basis for this minimum export level given historical practices and available storage supplies.

Transfer Window

The proposed project would expand the allowable transfer window into the fall. The scientific basis for allowing for this extension should be provided in the project description and the potential environmental impacts should be evaluated in the EIR. It seems likely that if the transfer window is expanded that overall transfers would increase. The potential impacts of

increasing transfers should be evaluated in the DEIR, including impacts to fall-run Chinook salmon related to redd dewatering, impacts to terrestrial species, and impacts to groundwater.

Head of Old River Barrier

The Proposed Project does not include installation of the Head of Old River Barrier (HORB). The State Water Board's Scientific Basis Report in support of updates to the Bay-Delta Plan for Lower San Joaquin River flows summarizes multiple studies that found that the installation of the HORB contributes to increased survival of migrating San Joaquin River-origin juvenile salmonids. Increased juvenile survival is attributed to both reduced entrainment toward the export pumps as well as improved water quality downstream of the HORB. The DEIR does not specifically evaluate the effect of discontinued installation of the HORB on juvenile survival or water quality impacts downstream; however, consistent with the previous studies, the Delta Passage Model estimates a decrease in juvenile survival under the Proposed Project scenario. Likewise, the reduction in juvenile survival is consistent with the significant increases in entrainment losses as a result of the proposed project. The DEIR should specifically identify the scientific basis for eliminating installation of the HORB as well as evaluate the impact of the discontinued installation of the HORB on juvenile salmonid migration and returning adults and downstream water quality during the spring and fall.

Real-Time Water Operations Process

The DEIR states that "DWR, in coordination with Reclamation, would implement activities, monitor performance, and report on compliance with the commitments in the Proposed Project. Implementing the proposed action would require coordination between CDFW, DWR, USFWS, NMFS, Reclamation, and the SWP-CVP water contractors. The federal government is proposing a Real-Time Operations Charter to facilitate federal coordination with the State." The Real-Time Water Operations Charter states that the 'Core Water Operation' serves as the foundation for meeting the requirements of D-1641 and that "implementing the core water operation will require coordination between CDFW, DWR, FWS, NMFS, and Reclamation (collectively, the 5 Agencies)."⁴ The State Water Board should be included in this process as it is responsible for implementation of D-1641 and other applicable requirements for the reasonable protection of fish and wildlife and other beneficial uses of water, as well as the continuing oversight of DWR and Reclamation's water rights.

Drought Actions

The DEIR states that DWR will coordinate with Reclamation to develop a voluntary toolkit of drought actions that could be implemented at the discretion of DWR and/or Reclamation. On October 1st, if the prior water year was dry or critical, DWR, in coordination with Reclamation, shall meet and confer with USFWS, NMFS, CDFW, and Public Water Agencies on voluntary measures to be considered if drought conditions continue into the following year. If dry conditions continue, DWR, in coordination with Reclamation, will regularly meet with this group (and potentially other agencies and organizations) to evaluate hydrologic conditions and the potential for continued dry conditions that may necessitate the need for development of a drought contingency plan (that may include actions from the toolkit) for the water year. By February of each year following a critical hydrologic year type, DWR, in coordination with Reclamation, shall report on the measures employed and assess their effectiveness. The toolkit shall be revisited at a frequency of not more than 5-year intervals.

⁴ Final Biological Assessment Reinitiation of Consultation on the Coordinated Long-Term Operation of the Central Valley Project and State Water Project, Appendix C, page 1.

While voluntary measures are strongly encouraged, the proposed project should also include specific drought year commitments for evaluation, planning, and management to ensure the protection of fish and wildlife. Actions that are within DWR and Reclamation's control include planning and management of all water diverted under DWR and Reclamation's water rights, including Settlement contract deliveries of water under DWR and Reclamation's rights. The State Water Board should be added to the list of agencies to be consulted in such processes. Further, it is not clear why there is a limitation on how frequently any drought toolkit should be revisited. It would seem to be appropriate to employ an adaptive management approach with such a toolkit with ongoing and regular assessments of the effectiveness of actions given that these actions can be assessed in real-time in many cases and by the end of the temperature control season in nearly all cases.

Restoration Actions

The Proposed Project includes a program to create or restore a minimum of 8,000 acres of intertidal and associated subtidal habitat in the Delta and Suisun Marsh (page 4-317). This habitat restoration requirement was one of the RPAs contained in the 2008 USFWS and 2009 NMFS BiOps/RPAs designed to allow for continued operations of the water exports without causing jeopardy to listed species. The 2008 USFWS BiOp mandated DWR to complete the restoration projects within 10 years of the BiOps. However, the DEIR (Table 4.6-2) shows that only 1,571 acres of tidal habitat restoration projects have been completed as of 2019, with an additional 3,040 acres planned to be completed by 2022, resulting in a total tidal restoration of 4,611 acres, short of the target of 8,000 acres (by 2018). Relaxations to existing protections should not be considered before the previously required restoration is completed and providing for necessary protections to list species.

Environmental Impacts Assessment

Thresholds of Significance for Environmental Impacts

The thresholds of significance used in the DEIR to determine whether an impact is significant or less than significant should be refined to be less vague and more informative to decision makers. A threshold of significance should be an identifiable quantitative, qualitative, or performance level parameter of a particular environmental effect. Instead, the DEIR relies on a generalized approach that effects are "greater or lower under the Proposed Project, relative to the Existing Conditions scenario" (DEIR at p. 4-115) and imprecise impact conclusion terms such as that impacts are "similar," "slightly reduced," "limited," "potentially beneficial overall," or "slightly lower" (such as food availability for Delta smelt). Where impacts are deemed "appreciably greater" or "increased" such as for Delta smelt and longfin smelt entrainment, no mitigation is required based on general assumptions regarding measures such as less-restrictive OMR limitations, real-time management decision-making that leaves significant discretion to DWR. The conclusion that all impacts to aquatic resources are less than significant and thus no mitigation is required is then carried forward into the cumulative impacts section which states that all cumulative impacts are also less than significant because "the Proposed Project would essentially 'self-mitigate' for its proportional share of its contribution to the cumulative impact. Therefore, the proposed project's contribution to cumulative impacts would not be cumulatively considerable" (DEIR at p. 4-317).

Additional facts and analyses are needed to support both the direct and indirect impact conclusions, particularly since OMR flow, San Joaquin River inflow to export ratios, and fall outflow protections are reduced under the proposed project and exports are increased. Facts and analyses are also needed in the cumulative impacts section to explain why the proposed

action when viewed in combination with other closely related past, present, and reasonably foreseeable future projects, including proposed changes to CVP operations, does not result in potentially significant effects that are cumulatively considerable.

Project Objectives

The DEIR describes the project's objectives as to "deliver water pursuant to water contracts and agreements up to full contract quantities" (pages 3-1; 1-5.) The DEIR describes the contracts as Table A contractual entitlements; Feather River settlement contract amounts; and, Article 21 "interruptible water supply." Article 21 is any water in excess of contractual Table A that can be deemed "project water." Project water is defined broadly under the Contracts as "water made available for delivery to the contractors by the project conservation facilities and the transportation facilities included in the System." (Contract, Article 1(l).) Article 21 can also be "reclassified later" as Table A if a contractor has not received its full Table A amounts. (DEIR at p. 3-11.) There is no cap on the quantity of Article 21 water the SWP can deliver other than water supply availability, water demand, and the physical and regulatory constraints of the Projects' operations.

Reclamation's ROC LTO DEIS and related BiOps propose to change CVP operations by maximizing exports, which in turn will reduce species protections. Likewise, the DEIR proposes to "operate the SWP in a manner that maximizes exports" but states it will do so "while minimizing direct and indirect impacts on state and federally listed fish species." (DEIR at p. 3-18.) The DEIR should provide additional factual support for the conclusion that it can maximize exports above existing conditions in an already severely degraded estuary while minimizing impacts to the listed species.

As noted above, the ROC LTO EIS project description proposes maximizing Delta exports, which will in turn reduce Delta outflows and lead to increased straying, impingement and entrainment of fish species, among other impacts. Similarly, the SWP is proposing to increase exports, prohibit pumping reductions below 1,500 cfs, reduce Delta outflows, and increase transfers, among other measures. Under the Coordinated Operations Agreement, SWP actions include conveying water for the CVP, which does not appear to be adequately evaluated in the DEIR. For example, the DEIR provides a table labeled as comparing SWP pumping plant exports and SWP deliveries to existing conditions but caveats the table with a statement that "[r]eported values only reflect SWP deliveries and exports and do not include any CVP wheeling or water transfers" (DEIR at p. 4-17).

The CVP Jones Pumping Plant has a permitted capacity of 4,600 cfs that is further limited to approximately 4,200 cfs by the ability of the CVP Delta-Mendota Canal to convey water supplies due to subsidence and other issues. The SWP Banks Pumping Plant has a capacity of 10,300 cfs, which is limited by U.S. Army Corps of Engineers regulatory conditions and other factors but is still substantially greater than CVP capacity at Jones (DEIR at p. 4-11). As a result, the CVP seeks SWP wheeling capacity through Banks Pumping Plant and the SWP California Aqueduct whenever CVP supplies and demand exceed CVP operational capacity and such wheeling capacity is available. In addition, the CVP and SWP are physically connected through the Delta-Mendota Canal/California Aqueduct Intertie which allows the SWP California Aqueduct to convey up to 900 cfs to the Delta-Mendota Canal using gravity flow (DEIR at p. 4-295). The DEIR should evaluate the degree to which the proposed changes in regulatory constraints will change CVP diversions through the Banks Pumping Plant. The DEIR should also provide substantial evidence to support its conclusions that increased exports, individually and cumulatively, including when the SWP is wheeling, transferring, or otherwise facilitating CVP

water deliveries, will not cause potentially significantly impacts to aquatic biological resources already impacted by the Projects' operations, including fish species listed as threatened and endangered under FESA, CESA, or both.

Proportional Responsibilities

The DEIR states in multiple sections that the SWP will only provide its "proportional share" of measures needed to protect aquatic biological resources, such as OMR flow requirements, which are already less protective under the proposed action (DEIR at pp. 3-21, 3-22, 3-23, 3-24, 3-25, 3-27, 3-29, 4-317, 5-6, 5-7, 5-38). However, the DEIR also states that "DWR can take actions to make OMR flows more positive, but there are circumstances when the actual OMR flow may not respond to DWR's actions, particularly if the CVP is operating differently" (DEIR at 3-23). As measures for the protection of aquatic biological resources in the ROC LTO EIS and BiOps are vague and often dependent on Reclamation's own judgment for initiation or continuation, actions by the CVP to mitigate the potentially significant impacts of joint operations are uncertain. Given that uncertainty, the DEIR should provide facts and analyses to demonstrate how DWR's provision of a proportional share of the joint operations will result in less than significant impacts from the proposed project on aquatic biological resources, including less than significant cumulative impacts.

Minimum Export Level

The description of project operations states that the CVP and SWP would be allowed to export 1,500 cfs in order to "meet human health and safety" and cannot be required to reduce export pumping below that rate (DEIR at p. 1-5). This element of the project description is then defined somewhat differently on DEIR page 3-29 as being needed "in order to meet health and safety needs, critical refuge supplies, and obligations to senior water rights holders." This language prohibits even temporarily reducing exports below 1,500 cfs in order to protect aquatic biological resources, including populations of critically endangered and threatened native fish species. California water supplies are complex and varied. Water is stored south-of-Delta in San Luis, Diamond Valley, and other reservoirs and water users, including senior water rights holders, often rely upon a mix of water supplies including local surface water, groundwater, and recycled water. As noted in the DEIR, "water agencies have been making improvements to regional and local water supplies through enhanced water conservation efforts, wastewater effluent and stormwater recycling, construction of local surface water and groundwater storage facilities, and construction of desalination treatment plants for brackish water sources and ocean water sources." (DEIR at p. 4-13.) The DEIR should evaluate the potential significance of increased impacts to aquatic biological resources if actions to avoid or minimize effects are prohibited in any circumstance that would require combined operations to drop below 1,500 cfs.

Prevention and Mitigation of Impacts

Measures to prevent or mitigate impacts are frequently characterized in the DEIR as being implemented on an as-needed basis, as determined by DWR. This includes measures to prevent impacts to aquatic biological resources, which often rely upon a consultation process between DWR and CDFW on an "as needed" basis (DEIR 3-21, 3-22, 3-24, 3-27, 3-28). CEQA prohibits a public agency from approving a project as proposed if there are feasible alternatives or mitigation measures available that would substantially lessen any significant effects that the project would have on the environment. CEQA requires that measures to mitigate or avoid

significant impacts on the environment are fully enforceable through permit conditions, agreements, or other measures (Pub. Resources Code, § 21081.6).⁵

The DEIR should explain the range of potentially significant impacts to species from reliance on measures that are implemented on an “as-needed” basis and based on yet to be developed methods and tools. The analyses should address what assumptions are included in the conclusion that a change in the baseline of project operations from numeric take limits and OMR restrictions based on specified triggers to a negotiation process between DWR and CDFW, results in less than significant impacts to aquatic biological resources, especially in light of the proposed change to CVP operations under the ROC LTO EIS. For example, for adult longfin smelt, the DEIR states that DWR will share its technical analysis and supporting documentation with CDFW “on an as-needed basis” (DEIR page 3-21). If DWR decides that its technical analysis supports imposing a more restrictive OMR flow requirement upon its own operations than the maximum of -5,000 cfs, DWR discusses its risk assessment with the “Water Operations Management Team (WOMT) at its next meeting.” The WOMT is “responsible for overseeing the Watershed Monitoring Workgroups and elevating disagreements to the Directors of CDFW, DWR, Reclamation, USFWS and NMFS, where necessary” (DEIR at p. 3-37) If there is disagreement, the Director of CDFW notifies the Director of DWR and they confer for up to 3 days. If there is no resolution, then DWR takes no protective action unless CDFW provides “an explanation and supporting documentation of how failing to increase the OMR flow requirements would *result in take that would not be minimized or fully mitigated.*” If CDFW meets its burden, then DWR is only obligated to continue to provide its “proportional share of the requirement” (DEIR at p. 3-21; emphasis added.)

The DEIR does not describe how often the WOMT meets, who has the authority to set a meeting, or who decides if elevating a disagreement is “necessary.” Assuming the WOMT met weekly and decided to elevate a disagreement, the DEIR is outlining a process where DWR only raises issues if, in its own discretion, it believes such issues require elevation and where there could be a 10-day lag or more between when the need for a protective measure is identified and such measure is implemented, if at all. In general, a clearer decision process should be considered that ensures timely decision making that protects listed species.

The definition of “take” under CESA is to “hunt, pursue, catch, capture, kill, or attempt to hunt, pursue, catch, capture, or kill” (Fish & G. Code, § 86). In other words, actions causing mortality to species. This is a more restrictive standard than FESA, which also includes the broader categories of “harass” or “harm” in its definition of take (16 U.S.C., § 1532 (19)). CESA requires that where take is authorized, the “impacts of the authorized take shall be minimized and fully mitigated *roughly proportional in extent to the impact of the authorized taking on the species*” (Fish & G. Code, § 2081(a)(2); emphasis added). The DEIR states that “[a]ssessment of direct impacts [to aquatic biological resources] is based upon the likelihood of physical injury or mortality to individuals from SWP facilities and operations” adding however that “*it is not possible to predict the number of individuals that would be subject to direct impacts*” (DEIR at p. 4-115, emphasis added). The DEIR caveats that the accuracy of physical and hydrodynamic models used to assess impacts to species is “unknown and unquantifiable because of the

⁵ Similarly, CESA requires an analysis of whether issuance of the incidental take permit would jeopardize the continued existence of a species that includes consideration of the species' capability to survive and reproduce and any adverse impacts of the taking on those abilities in light of known population trends; known threats to the species; and reasonably foreseeable impacts on the species from other related projects and activities. CESA also requires proposed measures to minimize and fully mitigate the impacts of the proposed taking and a proposed plan to monitor compliance with the minimization and mitigation measures and the effectiveness of the measures (Cal. Code Regs., tit. 14, § 783.2).

planning-level nature under which assumptions of the projected conditions have been established” (DEIR at p. 4-116) and that “uncertainty exists in the relationships used in [biological] models, and, subsequently, in their results” (DEIR at p. 4-118).

Real-Time Management

The as-needed real-time negotiation process between DWR and CDFW is part of the project description for the proposed project and is relied upon for conclusions that mitigation measures for the project are unnecessary because “no potentially significant impacts were identified in the analysis of the Proposed Project on special-status, or recreationally and commercially important fish and aquatic resources. Therefore, no mitigation is required” (DEIR at p. 4-289). In support of this conclusion the DEIR assumes that, for example, under the as-needed decision-making process “real-time management would be intended to limit entrainment risk to low levels similar to the levels achieved following implementation of the USFWS (2008) BiOp.” (DEIR at p. 4-171.)

The DEIR should provide factual support and analyses for how the real-time decision-making process proposed as part of the project description will achieve the same levels of protection as the required processes in the USFWS 2008 BiOp/RPAs. The 2008 BiOp/RPAs requires the Projects to operate so the OMR flow would be maintained no more negative than -1,250 cfs to -5,000 cfs to prevent Delta smelt *entrainment* based upon a collaborative process led by the agencies responsible for the protection of public trust resources meeting weekly in consultation with the Projects. The DEIR proposes a real-time as-needed decision-making process led by DWR where project operations cannot be required to pump less than 1,500 cfs under any circumstance and, in order to protect species, the SWP *may* reduce its “proportional share” of an OMR flow less negative than the previous maximum of -5,000 OMR; however, it can only be *required* by the CDFW Director to do so upon a demonstration, within 72 hours, that *take* cannot be *minimized and fully mitigated*. This is not a real-time standard. The development by CDFW of measures to minimize and fully mitigate take are roughly proportional based upon anticipated take over the requested period of the permit, which in this case is 10 years. (DWR ITP Application at p. 1-3.) Because the application of the requirement is vague and potentially unenforceable, it is unclear how the DEIR can reasonably rely upon it as equivalent to the protections in the 2008 BiOp/RPAs, how it is a sufficient and feasible avoidance or mitigation measure within the context of either CEQA or CESA, or how it constitutes part of a stable project description that can be appropriately analyzed in sufficient detail.

Impacts on Tributaries

The DEIR does not evaluate potential impacts of the proposed project on Project tributaries. However, the elimination of the 2008 USFWS BiOp/RPA fall X2 action and other components of the proposed project have the potential to change upstream operations that should be evaluated and disclosed in the EIR. Appendix G of the DEIR discusses the geographic scope of the project and states (page G-2) that operations of the Oroville Complex and resulting Feather River flows are not included in the DEIR because Oroville operations are governed by separate legal authorizations, and that no changes to operations of the Oroville Complex are proposed. However, the proposed project includes changes to SWP operations that affect surface water hydrology in the Lower Sacramento River and it is presumable that such actions could result in changes in streamflows and reservoir levels upstream in the Project tributaries. Accordingly, the EIR should present model results and include impact analyses for Project tributaries.

Impacts to the Listed Species

The DEIR compares conditions under Existing Conditions to the Proposed Project to determine whether there are any significant impacts to listed fish species. Existing Conditions include the current regulatory constraints for water exports and river flows including those imposed through the USFWS (2008) and NMFS (2009) BiOps/RPAs. These constraints were placed as protective measures to avoid jeopardy to listed fish species (i.e., extinction of natural populations). However, the population abundances of listed fish species, including winter-run Chinook salmon and Delta smelt, have continuously declined over the last 10 years (2008-2018) from levels observed during the previous decades. Average escapement of winter-run Chinook salmon after the implementation of 2009 BiOp RPAs (2010-2018) was about 2,500 fish, which is much lower than the average escapement of more than 7,600 fish during the 10-year period prior (2000-2009) to the implementation of the BiOp. Delta smelt abundance based on the Fall Midwater Trawl (FMWT) also shows a precipitous decline during the last decade despite the protective measures included in the 2008 USFWS BiOp.

The conclusions derived in the DEIR of “no significant impacts” of the Proposed Project compared to the Existing Conditions indicate that the pattern of fish population decline could continue and increase under the Proposed Project. Modeling data suggest that the Proposed Project will result in more negative OMR flows and decreased Delta outflows during several important months for fish species compared to Existing Conditions. These relaxed environmental constraints would degrade habitat conditions and increase entrainment risks for listed fish species. Given the current historically low abundance levels of listed fish species, it is reasonable that the proposed project strengthen protections for fish species.

The DEIR analyzed the impacts of the Proposed Project to listed fish species on each life stage instead of the whole life history. Impacts on each life stage are generally concluded to be “less than significant” in spite of the analyses frequently showing significant, adverse effects on listed species (e.g., larval/juvenile Delta smelt entrainment through PTM). The DEIR does not appear to include an analysis of the cumulative effects of impacts on the different life stages on the population, including to genetic and life history diversity of the species critical to conservation of species at the ESU and DSP level. Such an analysis should be included in the EIR. Impacts to salmonid species should specifically be assessed based on the viable salmonid population (VSP) parameters that have been used in the previous BiOps. Similar metrics should also be used for other species considered in the EIR.

Impacts During Droughts

The EIR should also include a specific analysis of the impacts of the proposed project during drought conditions. During the most recent drought listed and non-listed native species were significantly impacted both by the combination of dry conditions that were exacerbated by water diversions. The EIR should include an analysis of how the proposed relaxed operational constraints will affect fish and wildlife and water quality conditions during future droughts. Additional protective measures should also be considered during drought conditions to address current impacts of SWP operations.

Modeling

Evaluation of a Range of Operational Constraints

Given the vague nature of the proposed operational constraints, and particularly the OMR constraints, the DEIR should evaluate a range of possible operations from least to most

restrictive to better inform the range of operations that could occur under the proposed project. Specifically, the modeling assumes limited use of OMR flexibility during excess conditions. However, it is not clear that such limitations would occur under the proposed operational constraints. The DEIR assumes that there would be OMR flexibility in January and February and never in wet years. However, flexibility would be possible any time the Delta is in excess conditions which can occur fairly frequently throughout the winter and spring, particularly in wet years. Further assumptions are made about how many flexibility events would occur, with only 2 events in above normal and below normal years and 1 in dry years. The DEIR should evaluate the possibility for OMR flexibility anytime the Delta is in excess conditions given that the proposed project does not include any other clear constraints. In addition, a range of assumptions for turbidity bridge avoidance and single-year salmon loss thresholds should be evaluated.

Baseline OMR Assumptions

The DEIR includes changes to the assumptions for OMR operations under baseline from previous assumptions and those used in Reclamation's ROC LTO EIS that generally reflect less stringent constraints. As a result, when comparing the DEIR baseline to the proposed project, the differences in operations are smaller. The DEIR should include a sensitivity analysis to document how these different assumptions affect the analysis.

Southern Delta Salinity

The DEIR states that modeling results of salinity levels at the three D-1641 south Delta agricultural compliance locations are not presented due to arguments DWR and Reclamation make about their respective responsibilities for meeting these objectives.⁶ D-1641 requires Reclamation and DWR to maintain salinity levels at the three interior southern Delta locations (LSJR at Brandt Bridge, Old River at Tracy Road Bridge, and Middle River near Old River). These salinity objectives were modified in the 2018 Bay-Delta Plan, but responsibility for meeting the objectives was not removed from DWR and Reclamation.⁷ As such, the effects of

⁶ Activities associated with operating the CVP in the San Joaquin River basin are the principle cause of elevated salinity conditions at Vernalis and partially the cause of elevated salinity conditions in the interior Southern Delta. The State Water Board does not agree with DWR and Reclamation's position that "the Southern Delta salinity standards are beyond the control of the SWP and CVP due to localized impacts and the lack of sufficient circulation within the South Delta channels." The State Water Board found in D-1641 that, "The salinity problem at Vernalis is the result of saline discharges to the river, principally from irrigated agriculture, combined with low flows in the river due to upstream water development. The source of much of the saline discharge to the San Joaquin River is from lands on the west side of the San Joaquin Valley which are irrigated with water provided from the Delta by the CVP, primarily through the Delta-Mendota Canal and the San Luis Unit. The capacity of the lower San Joaquin River to assimilate the agricultural drainage has been significantly reduced through the diversion of high-quality flows from the upper San Joaquin River by the CVP at Friant. The USBR [Reclamation], through its activities associated with operating the CVP in the San Joaquin River basin, is responsible for significant deterioration of water quality in the southern Delta." (D-1641 page 83).

⁷ The 2018 Bay-Delta Plan program of implementation for the interior Southern Delta compliance locations recognizes the complexity of salinity management in the interior southern Delta. In D-1641 the State Water Board concluded that DWR and Reclamation are partially responsible for salinity problems in the interior southern Delta due to hydrologic changes caused by export pumping. D-1641 imposes conditions on DWR's and Reclamations' water rights requiring implementation of EC levels of 0.7 dS/m from April through August and 1.0 dS/m from September through March at the three compliance stations in the interior southern Delta. As part of implementing the 2018 Bay-Delta Plan salinity water quality objective for the interior southern Delta, the State Water Board will amend DWR's and Reclamations' water rights to require 1.0 dS/m EC year-round as a monthly average at the interior southern Delta compliance locations. Reclamation would still be required to continue to comply with the 0.7 dS/m salinity level for the Lower San Joaquin River at Vernalis in D-1641 to provide the assimilative capacity needed to maintain 1.0 dS/m EC as the required EC condition at the interior Delta locations. The State Water Board may also consider the

the proposed project on salinity levels at these locations should be evaluated. Providing the southern Delta salinity modeling results for the interior Delta compliance locations is also necessary to support CEQA findings. If modeling results show that there are additional exceedances in southern Delta salinity objectives, the CEQA finding of "less than significant" should be reevaluated.

Transfers

The DEIR indicates in the modeling assumptions section that water transfers are assumed to be the same as existing conditions, however, the proposed project would expand the transfer window. The EIR should specifically evaluate the potential effects of this expanded transfer window. Specifically, impacts to adult and juvenile fall-run Chinook salmon and adult steelhead entrainment and migration should be evaluated. It also seems likely to assume that if the transfer window is expanded that overall transfers would likely increase under the Proposed Project. The potential impacts of increasing transfers should be evaluated.

Alternatives

The DEIR only includes limited modeling results for other Alternatives (2A, 2B, 3, and 4) limiting the ability to fully evaluate the potential impacts of these alternatives. The full modeling results for these other alternatives should be provided with a further opportunity to review and comment on the analyses.

Delta Smelt Protection

It is well documented that the Delta Smelt population has been declining during recent years, despite protective measures placed in the 2008 USFWS BiOp. The Proposed Project would increase Delta exports during April and May, the period most larval Delta smelt are in the Delta, while making the trigger for increased larval and juvenile protections more constricted and limited in application. Kimmerer (2008) estimated population level effects of entrainment mortality to range from 1% to 50% of the adult population.

Particle tracking model (PTM) analyses conducted in the DEIR show significant potential entrainment-related impacts under the Proposed Project to larval and early juvenile Delta smelt compared to Existing Conditions. The PTM analysis indicates that larval and early juvenile Delta smelt entrainment to the Clifton Court Forebay (SWP) under the Proposed Project (Table 4.4-8) could increase considerably during April (31% in critical years to 233% in wet years) and May (26% in critical years to 321% in below normal years) compared to Existing Conditions. In addition, the particles entrained into the CVP export facilities (DEIR Appendix, Table E.2-4) would also be much higher under the Proposed Project than Existing Conditions in April (up to 106%) and May (up to 166%).

The PTM analyses conducted in the DEIR show that a significant proportion of the Delta smelt population could be entrained each year during the larval and juvenile life stages (Table 4.4-8; DEIR Appendix, Table E.2-4). In April, the percentages of particle entrained into the both CVP and SWP water export facilities would be more than doubled in wet (1.54% under existing conditions vs. 4.13% under the proposed project) and above normal (3.54% under existing

responsibility of others for implementing the interior southern Delta salinity objective based on implementation or completion of the Comprehensive Operations Plan, Monitoring Special Study, modeling, or Monitoring and Reporting Plan, or development of other information.

conditions vs. 7.92% under the proposed project) water years and nearly doubled during below normal (7.57% under existing conditions vs. 14.45% under the proposed project) and dry (8.97% under existing conditions vs. 12.08% under the proposed project) years under the proposed project compared to existing conditions. In May, the percentage of particles entrained into both the CVP and SWP water export facilities were also much higher under the proposed project compared to existing conditions in wet (3.13% under existing conditions vs. 8.59% under the proposed project), above normal (5.8% under existing conditions vs. 18.25% under the proposed project), below normal (5.62% under existing conditions vs. 18.76% under the proposed project), and dry (9.28% under existing conditions vs. 15.69% under the proposed project) years.

Previous PTM modeling efforts included in the 2008 USFWS BiOp suggested that particle entrainment should be measured cumulatively over time which would yield even higher entrainment rates. When combined with indirect entrainment losses that are not fully accounted for in PTM analyses, these impacts are substantial. For larval Delta smelt, the 2008 USFWS BiOp, through the PTM analysis, concluded that up to 70% of small organisms in the Old River south of Franks Tract and up to 10-20% of larval Delta smelt located in the San Joaquin River at Fisherman's Cut would be entrained within 30 days under an OMR flow of -3,000 cfs. The EIR should explain why these analyses from the 2008 BiOp are not used.

The DEIR states that, despite the PTM modeling results that suggest substantial impacts to larval and juvenile Delta smelt from the proposed project, there would be no expected impacts because real-time operational decision-making, modeling, and OMR flow management would minimize entrainment. It is not clear that the proposed real-time management will be adequate to avoid significant entrainment impacts to the Delta smelt population resulting from increases in water diversions during the sensitive April to May time period without more specific explicit operational constraints.

The Delta Smelt Summer-Fall Action includes three components to replace the fall X2 action from the 2008 BiOp: fall X2 at 80 km in wet and above normal water years in September and October; Suisun Marsh Salinity Gate (SMSCG) operations for up to 60 days in June through October of below normal and above normal years (and potentially for wet years); and food enhancement action in the north Delta and Suisun Marsh. The proposed project would decrease low salinity habitat in wet years and provide slightly more habitat in above normal years (DEIR page 4-157). The DEIR postulates the combined actions under this Summer-Fall Habitat Actions would provide habitat benefits to Delta smelt and would potentially increase Delta smelt habitat suitability. However, the real-time operations for OMR management and water exports and their impacts have not been modeled or fully evaluated and should be.

Pilot operations of SMSCG were conducted only once in 2018. The benefits (Delta smelt presence and water quality conditions) of the pilot application were cited in the DEIR, but the information is not yet published or peer reviewed. The DEIR also includes Food Enhancement Actions through the use of Yolo Bypass and Colusa Basin Drain and Suisun Marsh Food Subsidies, and some actions have been implemented as pilot studies. However, information from these pilot studies are also not yet available. It appears to be premature to determine that these habitat-food enhancement action under the proposed project will provide equivalent or better protection for listed species than the fall X2 action from 2008 BiOp RPA to support a less than significant impacts determination.

Longfin Smelt Analysis

Analyses included in the DEIR suggest that the proposed project would result in considerable impacts to the longfin smelt population. An analysis of the effects of reduced outflows during December-May on the predicted Fall Midwater Trawl abundance index of longfin smelt indicates that median longfin smelt abundance would be expected to decrease by 4% to 11% under the proposed project compared to existing conditions (Figure 4.4-55; Table 4.4-10). Yet, the DEIR claims that there would only be 0% to 2% difference in longfin smelt abundance when accounting for the high signal to noise ratio of the abundance estimates (calculated by dividing the differences in median abundances between the proposed project and existing conditions by the differences in minimum and maximum estimates of the 95% confidence interval under existing conditions). The method used to arrive at the lower population level effects in the DEIR is not an established statistical procedure to compare the differences between two data groups nor an established mathematical process to “reduce” the impacts of high variability of the estimates. This analysis should be revisited as well as the determination that there would not be significant impacts from the proposed project on the longfin smelt population.

The DEIR provides a PTM analysis to evaluate the potential risk of entrainment of larval longfin smelt during winter months (January-March) indicating that there is little difference in entrainment under the proposed project compared to existing conditions during the 3 months evaluated. However, most spawning of longfin smelt occurs during February through April (USFWS 1995⁸) and metamorphosis into the juvenile form may require 3 months to complete (Rosenfield 2010⁹) with larval longfin smelt present in the Delta possibly until June. This period includes April and May when the SWP water exports could be considerably increased under the proposed project. The PTM analysis provided in the DEIR is not adequate to evaluate the effects of the increased water exports on longfin smelt entrainment under the proposed project and should be revised to provide results for the full time period when longfin smelt may be present in the Delta. Based on this analysis the impacts determination should also be revised.

The DEIR states that the real-time operational adjustments would reduce the difference in entrainment between the scenarios. The DEIR further states that the longfin smelt losses under the proposed project likely represent a low percentage of the overall juvenile longfin smelt population (Table 4.4-14) because the species is widely distributed in the Bay-Delta. However, the DEIR does not provide any practical procedure to implement the real-time operations as discussed above. In addition, the DEIR does not include any system-wide population estimates of longfin smelt for the Bay-Delta ecosystem to properly assess the relative contribution to the population of longfin smelt residing in the Delta and thus affected by the proposed project.

Salmonid Analyses

The analyses included in the DEIR fail to account for the genetic diversity of San Joaquin River (SJR) Steelhead. The single year juvenile steelhead loss thresholds under the proposed OMR flow management include a separate time frame (April 1 to June 15) to account for SJR Steelhead. However, the analysis of project impacts on juvenile steelhead loss (Table 4.4-20) treats all steelhead as a single run. While all steelhead show modest increases in salvage rates of 5 to 16% (Table 4.4-20f), SJR Steelhead show increased salvage rates of -1% to 247%,

⁸ US Fish and Wildlife Service. 1995. Sacramento-San Joaquin Delta Native Fishes Recovery Plan. U.S. Fish and Wildlife Service. Portland, Oregon. https://ecos.fws.gov/docs/recovery_plan/961126.pdf.

⁹ Rosenfield, J.A. 2010. Life History Conceptual Model and Sub-models for Longfin Smelt, San Francisco Estuary Population. DRERIP Report. <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=28421>.

depending on water year type. If the Steelhead are being separated for OMR management based on genetic diversity, then the impact analysis should follow suite for complete transparency. The impact assessment should also account for disproportionate impacts to SJR salmonids.

The DEIR shows that the proposed project will result in an increase in annual entrainment losses of juvenile Chinook salmon and steelhead at the SWP export pumps for fall-run (21-166%, i.e., up to two and a half times greater than existing conditions, Table 4.4-18f, page 4-230 in the DEIS), spring-run (35-154%, Table 4.4-17f, page 4-214), and steelhead (5-16%, Table 4.4-20f, page 4-241). Baseline conditions include the export restrictions in the 2009 NMFS BiOp/RPAs. The relative losses of SJR-origin fall-run Chinook are likely much greater than the DEIR analysis suggests. The entrainment analysis of juvenile losses at the SWP export facility combines Sacramento River and SJR fall-run Chinook which dilutes the estimated proportional impact to SJR salmon. The SJR fall-run Chinook population size is substantially smaller than the Sacramento River population. The increase in juvenile mortality at the pumps will affect the SJR population more because SJR fall-run migration pathways are much closer to the export pumps than Sacramento River fall-run Chinook.¹⁰ The DEIR estimates the proposed project will increase juvenile losses at the export pumps by 21 - 166%, depending on water year type. The majority of this additional loss is likely to be absorbed by the smaller SJR fall-run population, which already experiences 95% mortality in the Delta. Combining Sacramento and SJR fall-run Chinook in the DEIR analysis masks the greater proportional impact to juvenile SJR fall-run Chinook salmon. The EIR should include an analysis that accounts for fish from the two basins.

The large increases in entrainment losses for fall-run Chinook, spring-run Chinook, and Central Valley steelhead estimated by the entrainment loss method are not consistent with a CEQA finding of "less than significant." Entrainment losses are a direct result of SWP/CVP operations. Large increases in juvenile entrainment losses to depleted salmon and steelhead populations suggests that proposed project impacts to salmonid species could be significant. The EIR should be revised to address this issue.

Modeling results for juvenile losses at the SWP export facility for alternatives 2A and 2B are not provided in the DEIR. However, Figures 5.2-2, 5.2-3, 5.3-2, and 5.3-3 show that exports in alternatives 2A and 2B will be higher than existing conditions. Increased exports are likely to result in increased juvenile losses at the SWP export facilities. Although juvenile losses associated with alternatives 2A and 2B may be less than the proposed project, increases in juvenile mortality to populations that are already in decline suggests that project impacts from alternatives 2A and 2B may also be significant.

Monitoring and Assessment

The proposed project relies heavily on monitoring programs and structured decision making. The decision rules and risk assessment tools for real-time operations should be fully described in the EIR. It is not clear whether some or all of the risk assessment and decision support tools have been developed or are in a state of development. The EIR should explicitly identify monitoring data that is provided by existing monitoring programs to be used in the proposed OMR flow management decisions, use of decision rules, and risk assessment tools. The EIR

¹⁰ The study cited in the DEIR, Zeug and Cavallo 2014 found that "fall run Chinook Salmon released into the San Joaquin River experienced a greater relative loss at the diversions [SWP/CVP export pumps] than any run released in the Sacramento River."

should also describe any additional or supplemental monitoring efforts that are needed to support OMR flow management under the proposed project.

Existing monitoring programs, such as the fish surveys conducted by CDFW for the Interagency Ecological Program (IEP), provide important information about the impact of the CVP/SWP on native and migratory fish species and ecosystem conditions which are important for managing and protecting the estuary. These programs should continue to provide information on status and trends in the abundance and distribution fish species and lower foodweb resources in the estuary. Any new monitoring the proposed project requires for decision making should be in addition to this existing monitoring.

The proposed project includes a description of “monitoring for the proposed real-time management” (section 3.3.4.1) of coordinated CVP/SWP operations. This section appears to omit important monitoring programs and should be updated to explicitly identify which existing monitoring programs, elements of existing monitoring programs, and/or new monitoring activities DWR and Reclamation consider necessary to inform coordinated CVP/SWP operations. For example, the list of monitoring programs and activities identified for proposed real-time management (section 3.3.4.1, page 3-35) identifies monitoring for Delta smelt and longfin smelt but omits monitoring activities specific to SJR salmon. The DEIR impact assessment identifies a large increase in juvenile salmon mortality as an outcome of increasing exports. This impact will be greatest on SJR juvenile Chinook salmon but the DEIR omits the Mossdale trawl, which provides information regarding juvenile SJR salmon entry to the Delta, from the monitoring programs to be used in real-time decision-making for OMR management.

Monitoring programs that provide real-time or near-time information used to inform operations of SWP/CVP are omitted from the monitoring programs identified as needed for proposed real-time management of the SWP/CVP. For example, FMWT is specifically identified in Table 4.4-2 (page 81) as being used to set salvage limits for the CVP and SWP, but this program is omitted from the list of monitoring efforts considered relevant to core operations. Similarly, the 20-mm survey is omitted from the list of monitoring programs to be used for decision making about real-time decisions for core operations but the description of the 20-mm survey in Table 4.4-2 states, “Data from this network of stations are used by Delta managers and scientists to make *real-time decisions* and plan for future events, such as climate change, water operations, restoration projects, evaluations of fish transport, and migration issues,” (emphasis added).

Similarly, the proposed CVP LTO project description includes a Real Time Operations Charter that identifies a monitoring program for “core water operations,” “status and trends,” and “adaptive management” (CVP Biological Assessment, Appendix C, Exhibit A, Tables C-1, C-2, and C-3). Some of the monitoring programs identified as “status and trends” provide monitoring data for real-time decision making but are not included in Table C-1 which lists the current programs in place that Reclamation considers as supporting Core Water Operations for the CVP ROC on LTO. For example, the San Francisco Bay Study and the Environmental Monitoring Program are compliance requirements of D-1485 and D-1641 and are necessary to inform core operations. However, these monitoring programs are not identified as supporting “core operations.”

The DEIR and the EIS for the ROC LTO does not explain reasons the identified monitoring activities are considered relevant to inform coordinated CVP/SWP operations or why omitted monitoring programs are not included. Several monitoring programs listed as “status and trends monitoring” in section 3.3.4.1 of the DEIR provide information relevant to real-time or near-time operations. In section 4 of the DEIR, Table 4.4-2 (page 4-81) lists monitoring programs and

activities performed by DWR as a member agency of IEP. Many of these monitoring programs are described as generating data and information relevant to the coordinated operations of CVP and SWP, but they are not on the list of monitoring programs for use in proposed real-time management or for core operations.

Table 1 below lists existing monitoring programs that provide real-time or near-time monitoring information relevant to operations of CVP/SWP (as described in Table 4.4-2 in the DEIR) but are not included in the list of monitoring programs for use in proposed real-time management in section 3.3.4.1. The same issue occurs in Appendix C “Status and Trends” section and Table C-2 of the CVP LTO BA. Many programs listed as status and trends are defined as generating data relevant to real-time operations. These monitoring programs generate information that is used to assess water quality objectives and implementation measures.

Table 1: Monitoring Programs Listed in the DEIR as “Status and Trends” and Omitted from Monitoring Programs for proposed Real-Time Management of Coordinated CVP and SWP Operations (see section 3.3.4.1)

Monitoring Program	Connection to SWP/CVP Coordinated Operations*
Fall Midwater Trawl	Delta Smelt data are used to calculate a recovery index and to set salvage limits.
20-mm Survey	Data are used to make real-time decisions and plan for future events.
Juvenile salmon monitoring program and Mossdale trawl	Data provide “near-time” information on the relative vulnerability of key fish species (primarily Chinook Salmon and steelhead) to water project operations.
Environmental Monitoring Program	Continuous collection of water quality data for multiple parameters, including salinity, are available on a near real-time basis for day-to-day CVP and SWP operational decisions.
Spring Kodiak Trawl	Survey detects mature and maturing Delta smelt from January through May. Improved detection of Delta smelt will better inform water export facility operators of the potential to entrain adult Delta Smelt in subsequent weeks, as well as their offspring later in the year.
SJR DO Monitoring	Data are used to guide operations.
Smelt Larva Survey	Survey provides near real-time distribution data for longfin smelt larvae in the Delta, Suisun Bay, and Suisun Marsh to assess vulnerability of larvae to entrainment in export pumps.
Central Valley Juvenile Salmon and Steelhead Monitoring – Knights Landing	Provides an early warning of when juvenile salmon emigrate from the Delta and allow for real-time adaptive management of water operations.

Coordinated monitoring efforts are important for the continued operation of SWP and CVP. If changes are needed to the existing patchwork of monitoring programs, they should be initiated through existing Interagency Ecological Program procedures and/or reviewed through the State Water Board public process.

Monitoring Workgroups

Many of the monitoring workgroups described in section 3.3.5 are similar to groups that exist as required under the 2008 and 2009 BiOps/RPAs. These work groups also address compliance with State Water Board decisions. State Water Board staff should be identified as participants in these workgroups. The State Water Board is responsible for implementing D-1485 and D-1641 which are a substantial element of CVP/SWP core operations. In addition, the impacts of CVP/SWP on fish and wildlife beneficial uses is directly relevant to the State Water Board's responsibilities to protect fish and wildlife and the associated oversight of water diversions by the SWP and CVP as well as efforts to update and implement the Bay-Delta Plan. The EIR should explain how these groups will change from existing monitoring workgroups already in place such as, but not limited to, Delta Operations for Salmon and Sturgeon, Stanislaus Operations Group, Smelt Working Group, and the WOMT.

Conclusions

State Water Board staff appreciates the opportunity to provide comments on the DEIR. As indicated above, the State Water Board may have further comments upon further review and release of the ITP application.

If you would like to discuss these comments further, please contact me at diane.riddle@waterboards.ca.gov or (916) 341-5297.

Sincerely,

ORIGINAL SIGNED BY

Diane Riddle, Assistant Deputy Director
Division of Water Rights