State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
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GAVIN NEWSOM, Governor
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December 16, 2022

Marcus Yee
Environmental Compliance Manager, Delta Conveyance Office
Department of Water Resources
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Sacramento, CA 94236-0001

DRAFT ENVIRONMENTAL IMPACT REPORT (DEIR) FOR THE DELTA CONVEYANCE PROJECT SCH# 2020010227

Dear Mr. Marcus Yee:

The California Department of Fish and Wildlife (CDFW) received and reviewed the Notice of Availability of a Public Draft EIR (DEIR) from the Department of Water Resources (DWR) for the Delta Conveyance Project (DCP) pursuant the California Environmental Quality Act (CEQA) statute and guidelines.[1]

Thank you for the opportunity to provide comments and recommendations regarding those activities involved in the DCP that may affect California fish and wildlife. Likewise, we appreciate the opportunity to provide comments regarding those aspects of the DCP for which CDFW, by law, may need to exercise its own regulatory authority under the Fish and Game Code. CDFW appreciates that with most large projects there may be a continuing effort to analyze impacts and revise the various project alternatives. CDFW remains available for coordination for those purposes.

CDFW ROLE

CDFW is California's **Trustee Agency** for fish and wildlife resources and holds those resources in trust by statute for all the people of the State. (Fish & G. Code, §§ 711.7, subd. (a) & 1802; Pub. Resources Code, § 21070; CEQA Guidelines § 15386, subd. (a).) CDFW, in its trustee capacity, has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and habitat necessary for biologically sustainable populations of those species. (Id., § 1802.) Similarly for purposes of CEQA, CDFW is charged by law to provide, as available, biological expertise during public

[1] CEQA is codified in the California Public Resources Code in section 21000 et seq. The "CEQA Guidelines" are found in Title 14 of the California Code of Regulations, commencing with section 15000.

agency environmental review efforts, focusing specifically on Projects and related activities that have the potential to adversely affect fish and wildlife resources.

CDFW is also submitting comments as a **Responsible Agency** under CEQA. (Pub. Resources Code, § 21069; CEQA Guidelines, § 15381.) CDFW expects that it may need to exercise regulatory authority as provided by the Fish and Game Code. The Project may be subject to CDFW's lake and streambed alteration regulatory authority (Fish & G. Code, § 1600 et seq.) or the Native Plant Protection Act (Fish & G. Code, § 1900 et seq.). Likewise, to the extent implementation of the Project as proposed may result in "take" as defined by State law of any species protected under the California Endangered Species Act (CESA) (Fish & G. Code, § 2050 et seq.), related authorization as provided by the Fish and Game Code will be required. CDFW also administers the Natural Community Conservation Program and other provisions of the Fish and Game Code that afford protection to California's fish and wildlife resources.

PROJECT DESCRIPTION SUMMARY

Proponent: Department of Water Resources

Project Overview:
The DCP involves the construction, operation, and maintenance of new State Water Project (SWP) water conveyance facilities located in the Sacramento-San Joaquin Delta (Delta) that would be operated to meet the following objectives: 1) respond to sea level rise and other reasonably foreseeable consequences of climate change; 2) minimize water delivery disruption due to Delta seismic risk; 3) improve water supply reliability; and 4) provide operational flexibility to the SWP.

The preferred Alternative 5 Bethany Reservoir Alignment (Proposed Project) comprises two new intake facilities located in the north Delta, along the Sacramento River, designed with a conveyance capacity of up to 6,000 cfs. Diverted water would move through a single tunnel on an eastern alignment through Lower Roberts Island, terminating at the Bethany Complex, located in the south Delta near Mountain House (Figure 1). The proposed Bethany Complex is located south of Clifton Court Forebay and would include a Bethany Reservoir Pumping Plant, surge basin, aqueduct, and tunnel that conveys flows to a new Bethany Reservoir Discharge Structure on the shore of the existing Bethany Reservoir. Intake components would include cylindrical tee fish screens, intake structures, sedimentation basins, sediment drying lagoons, flow control structures, tunnel inlet, and other inlet structures.

The DEIR includes analysis of two additional DCP alignments, central and eastern. Under these alternatives to the Proposed Project, the single tunnel would convey water

from the new north Delta intakes through either the central or eastern alignments to existing SWP conveyance facilities and potentially to existing Central Valley Project (CVP) facilities through a new pumping plant and Southern Forebay on Byron Tract and other appurtenant facilities in the south Delta (Southern Complex), adjacent to the Clifton Court Forebay.

The Proposed Project or alternatives would operate the new conveyance facilities in conjunction with existing SWP south Delta export facilities at Clifton Court Forebay, creating a dual conveyance system. Water could be diverted from the new diversion facilities in the north Delta, the existing SWP south Delta export facilities, or both.

Location:
The Proposed Project area for the purposes of CEQA comprises areas in the SWP and CVP system upstream of the Delta, the Sacramento-San Joaquin Delta (i.e., the statutory Delta), and Suisun Marsh. The Proposed Project's area includes temporary and permanent construction areas and compensatory mitigation areas as well as areas outside the Proposed Project footprint (Figure 1) affected by the Proposed Project operations including waterbodies.

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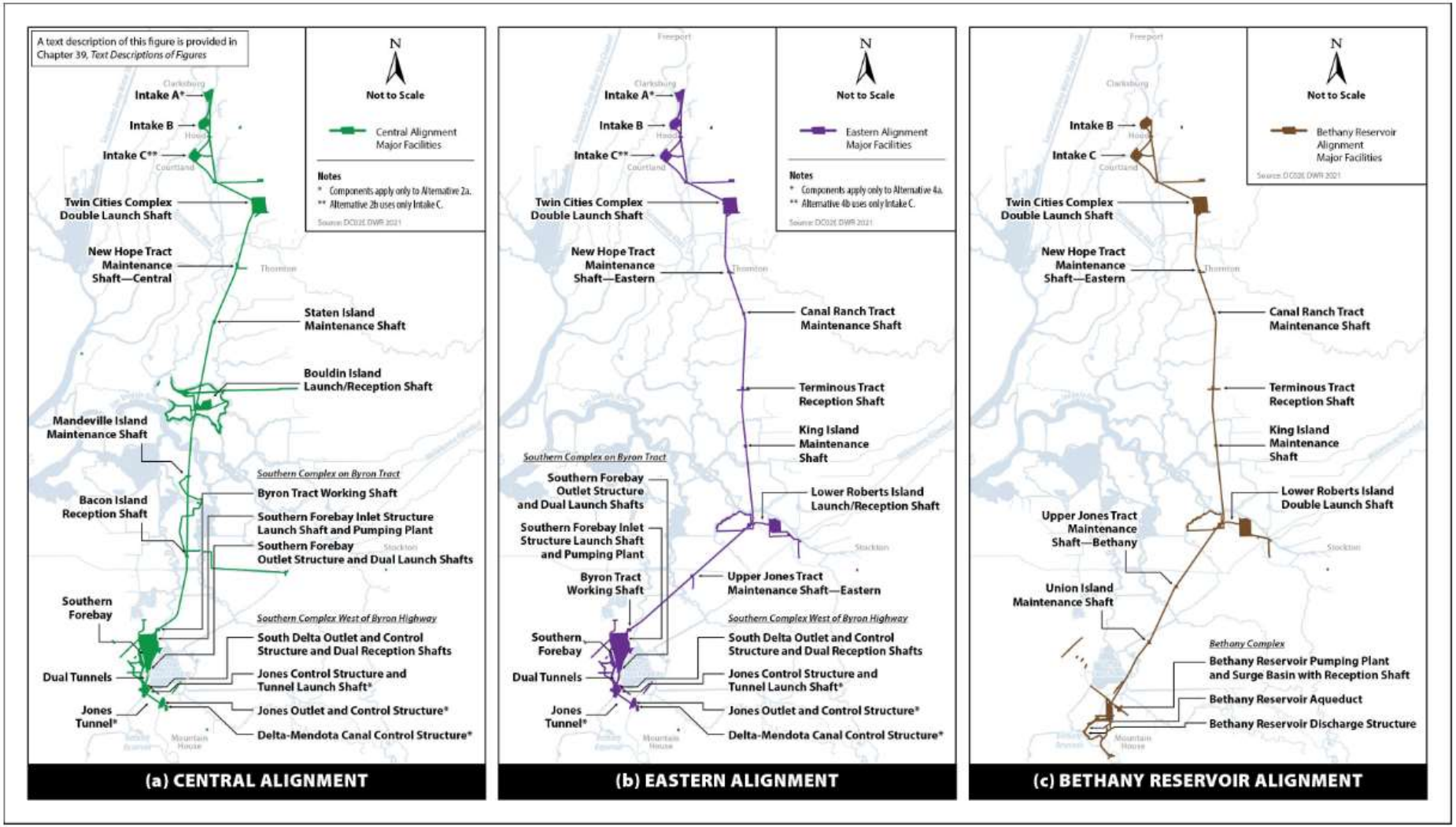

Figure 1. Proposed Project (Alternative 5 Bethany Reservoir Alignment) and Alternative Alignments and facilities. Figure from the Executive Summary of the DEIR p. ES-23.

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COMMENTS AND RECOMMENDATIONS

CDFW offers the following comments and recommendations to assist DWR, as lead agency, in adequately identifying and, where appropriate, mitigating the DCP's significant, or potentially significant, direct, and indirect impacts on fish and wildlife (biological) resources and identifying alternatives that would avoid or minimize adverse impacts.

IMPACTS TO COVERED SPECIES

The DEIR concludes that the Proposed Project with mitigation would result less-than-significant impacts to all species. Of particular interest to CDFW are the following aquatic species findings: winter-run Chinook salmon, spring-run Chinook salmon, Delta smelt, and longfin smelt. In some cases, additional analyses are necessary to fully consider potential Project impacts to these species; in other cases, analyses were conducted and demonstrate impacts that were determined less-than-significant within the DEIR but remain of concern to CDFW.

Proposed Project impacts that the DEIR appears to describe include:

- Substantially reducing Delta outflow, particularly in critical water years when aquatic resources are already limited and species survival is low,
- Reducing the frequency and duration of important pulse flows through the Delta, and
- Reducing the quality of aquatic habitat in the Delta that is critical to juvenile salmonid rearing and through-Delta survival and Delta smelt and longfin smelt recruitment and survival.

Details regarding CDFW's comments and concerns about these impacts are provided below along with CDFW's recommendations intended to help inform future DCP analysis, permits, and environmental documentation. Additionally, where appropriate, we include suggestions for improved mitigation strategies aimed at avoiding, minimizing and or compensating for impacts to fish and wildlife resources. CDFW offers these comments with the intention of ensuring that the EIR includes enough detail to enable those who did not participate in its preparation to understand, and to consider meaningfully, the issues raised by the Proposed Project and ensure its adequacy as an informational document.

Project Description and Alternatives

Need for Additional Operational Alternatives

The DEIR does not consider any alternatives with different project operational criteria, nor does it include an alternative that balances existing SWP diversions between south and north Delta export facilities to resemble the natural flow pattern into and through the

Delta. Although the DEIR evaluates different overall capacities (e.g., varying tunnel capacities for the Eastern and Central Alignment alternatives), this does not provide a range of operational rules within such capacities that could be designed to minimize impacts more effectively to species. CDFW notes that the Delta Plan includes recommendation WR R12b, that improved conveyance facilities consider a reasonable range of flow criteria and other operational criteria to satisfy requirements of State and federal fish and wildlife agencies to protect, restore, and enhance the Delta ecosystem (Delta Stewardship Council 2013).

Although the physical alternatives presented in the DEIR provide alternatives to potentially avoid or minimize terrestrial species impacts, DCP operations are expected to have the most substantial impacts on aquatic species. A range of operational scenarios is needed to compare impacts, develop meaningful mitigation, including actions to avoid or minimize impacts and reduce the need for compensatory mitigation, fully evaluate system-wide implications of alternative operational approaches, and ensure EIR durability should conditions change.

CDFW recommends including additional CEQA alternatives in the EIR that depict and evaluate different operational scenarios. Specifically, CDFW recommends the EIR include analysis and evaluation of additional operational alternatives that 1) apply pulse protections at the North Delta Diversions (NDD) based on real-time CESA- and ESA-listed fish monitoring of juvenile presence and movement, 2) include a decision tree for shifting SWP operations from Banks Pumping Plant to the NDD, 3) include a clear commitment to minimizing effects on spring outflow as a result of diversions included in the Proposed Project, and 4) operate to protect spring pulse flows as well as maintain compliance with D-1641 water quality objectives (i.e., without reliance on Temporary Urgency Change Petitions and by maintaining compliance to standards above those projected for the Proposed Project in Tables 4B-5 through 4B-6 of the DEIR).

CDFW also recommends analysis of an alternative using the above operational criteria, but with a physical alignment through Banks Pumping Plant as opposed to through the Bethany Reservoir, ensuring long-term consistency in minimum real-time diversion rates and improving our ability to understand the range of potential diversion rates from the facility when constructed. Finally, CDFW requests that the EIR include additional alternatives whereby the Proposed Project utilizes 1) north Delta preferential pumping and 2) south Delta preferentially pumping to help elucidate impacts to fish and wildlife species dependent on the Project's pumping preference.

No Project Alternative and Cumulative Impact Analysis

The DEIR Appendix 3C describes the programs, projects, and policies considered for Existing Conditions, No Project Alternative, and Cumulative Impact Analysis. Section 3C.2.2 states the "*No Project Alternative allows for DWR and other decision makers to*

use the DEIR to compare the impacts of approving the Delta Conveyance Project with the future conditions of not approving the Project in year 2040" (p.3C-3). It goes on to provide criteria for inclusion in the No Project Alternative such as those programs, projects, and policies included in the Existing Conditions as well as projects that would occur *in lieu* of the Proposed Project with clearly defined management and/or operational plans, including facilities under construction as of January 15, 2020; facilities and programs that received approvals and permits in 2020; or that have completed environmental review, received approvals and permits, or foreseeably will be approved and permitted by 2040 (p. 3C-3 through 3C-8). Yet, Table 3C-2 identifies multiple foreseeable projects which meet the above criteria but were excluded for consideration in the No Project Alternative. Some of these projects include: the Del Puerto Canyon Reservoir, Los Vaqueros Reservoir Expansion Project, Sites Reservoir Project, and the Bay-Delta Water Quality Control Plan Update to the 2006 Bay-Delta Water Quality Control Plan.

The Proposed Project will not be operational until many years in the future, when circumstances under which the Proposed Project operates will likely have changed. The No Project Alternative serves as an unusually important informational tool in understanding the breadth of potential impacts to species and their habitats resulting from operations proposed. Therefore, CDFW recommends all foreseeable projects be included in the No Project Alternative as these projects have been shown to meet the DEIR criteria for inclusion and will likely be constructed and operational by 2040, when the Proposed Project is assumed to be operational if it is approved.

Similarly, CEQA Guidelines, § 15130 requires consideration of the Proposed Project's cumulative impacts together with other projects causing related impacts. When utilizing a list of such related projects, the nature of environmental resources under evaluation, the location of a project, and its type, may be of importance, including where impacts are specialized.

The DEIR does not include the potential for cumulative impacts that could arise should reasonably foreseeable projects, such as Sites Reservoir Project or the Los Vaqueros Expansion Project, be built and operated ahead of the Proposed Project. Although listed in Table 3C-2 as included within the cumulative analysis, CDFW was able to locate only relatively general qualitative discussion, and no modeling or specific analysis that evaluated the potential cumulative impacts from the interactions of these projects and the Proposed Project.

To illustrate the interconnectedness of these related projects with the Proposed Project, CDFW provides three examples. First, without a comprehensive Cumulative Impact Analysis, the amount of water available for export at the NDD is unknown and impacts to species and Delta outflow because of Project operations cannot be assessed.

Second, operation of these new and/or expanded foreseeable large-scale water projects is likely to affect the pulse protections as described in the DEIR. Because the Proposed Project ties salmonid-related pulse protections to large flow events, it is probable that operation of Sites Reservoir Project would reduce those flow events, lessening the likelihood the Proposed Project will trigger pulse protections. Third, these projects cumulatively not only cause the most significant changes to surface water during the driest years when impacts to fish and wildlife, system-wide and from the Proposed Project, are likely to be the most severe, but would also diminish flows in wetter years, potentially shifting them drier in terms of flow, and likely decrease the frequency, duration, and/or magnitude of high flow benefits such as floodplain inundation and habitat rejuvenation.

Given the interconnected and complex dynamics of the Sacramento-San Joaquin Delta, it is critical to fully understand how such large projects would cumulatively affect the watershed and aquatic species. Therefore, CDFW recommends a more extensive and quantitative cumulative analysis analyzing and describing such interactions be conducted and included in the EIR.

Baseline Assumption of 2020 SWP ITP/ 2019 NMFS and USFWS BiOps

The DEIR uses the 2019 NMFS and USFWS Biological Opinions (BiOps) on the long-term operations of the CVP and SWP as well as the 2020 SWP Incidental Take Permit (ITP) for the long-term operation of the SWP in the Delta to establish the Existing Conditions and No Project Alternative scenarios, stating that reinitiation of consultation is underway but the issuance of new BiOps and SWP ITP is not anticipated for several years. It is foreseeable that the ongoing re-consultation process will require substantial changes to both CVP and SWP operations, currently not reflected in the 2019 BiOps and 2020 SWP ITP. Thus, the No Project Alternative as presented in the DEIR is likely not an accurate depiction of future conditions (2040) absent the Proposed Project. The Existing Conditions scenario is also not an accurate depiction of current conditions given ongoing litigation resulting in a court-ordered Interim Operations Plan for water year 2022, and ongoing proceedings related to operations in future years and until reinitiation is complete. This uncertainty in current conditions potentially hinders readers' understanding of potential Project impacts that may arise from changes to surface water operations and aquatic species conditions, when compared to the reasonably foreseeable future conditions without the Proposed Project. In addition, because multiple responsible agencies must rely on the EIR for discretionary decision making, modifications to CVP and SWP operations that occur during the Project approval process could complicate the CEQA processes for these responsible agencies.

CDFW recommends acknowledging the additional uncertainty regarding Existing Conditions and the No Project Alternative, given reasonably foreseeable changes to future operations of the CVP and SWP that are likely to arise out of the re-consultation

process, and propose a more comprehensive and cautious mitigation strategy reflective of the uncertainty, and responsive to the greatest potential impacts identified from operations of the Proposed Project to CESA- and ESA-listed species, to ensure those impacts are brought down to less than significant.

Operations

Spring Outflow Protections

The proposed spring outflow protections identified in Chapter 3 Table 3-14 of the DEIR do not include protections for outflow from the Sacramento River. The DEIR currently relies on the 2020 SWP ITP Condition of Approval 8.17 Export Curtailments for Spring Outflow to provide outflow protections to aquatic species. However, while spring outflow requirement is an existing regulatory requirement for the SWP (as noted on p. 3-151), the 2020 SWP ITP Condition of Approval 8.17 does not include NDD in the export term nor does the DEIR clearly commit to including the NDD into the export term of Condition of Approval 8.17. Furthermore, CDFW developed Condition of Approval 8.17 as a minimization measure for ongoing operations of existing SWP infrastructure in the south Delta, based on a relationship to the San Joaquin River inflow measured at Vernalis. That relationship serves as an operational mechanism to reduce Delta outflow-related impacts to aquatic species, caused by south Delta exports of the SWP. Given the location on the Sacramento River, and unique operations of the proposed NDD coupled with increased total annual SWP exports under the Proposed Project, CDFW requests the EIR commit to maintaining spring outflow based on the combined flow from both the Sacramento and San Joaquin rivers through the Delta.

OMR Flexibility During Delta Excess Conditions

Chapter 3, Table 3-14 includes proposed new criteria for the NDD operations, as well as existing south Delta criteria, such as OMR Flexibility as permitted under the 2020 SWP ITP (Condition of Approval 8.7 OMR Flexibility During Delta Excess Conditions) and the 2019 USFWS and NMFS BiOps. Under the Proposed Project, the NDD are designed to export water in winter and spring months during excess conditions as defined by DWR and the U.S. Bureau of Reclamation (Reclamation). The DEIR does not adequately explain how OMR Flexibility, as permitted in the south Delta, interacts with NDD under excess conditions. As written in the DEIR, it is possible that DWR may operate under OMR Flexibility in the south Delta at the same time pulse protections are implemented in the north Delta; thereby negating the benefits of a pulse protection period by maintaining south Delta exports at high levels that can increase juvenile and adult anadromous fish entrainment into the south Delta. CDFW requests that the EIR include additional descriptions of how south Delta OMR Flexibility will operate in conjunction with NDD pulse protections including assurances to coordinate operations when fish

protections are being implemented at the NDD to minimize impacts to migrating anadromous fish in the Delta.

SWP and CVP Export Capacity and Deliveries

The Proposed Project, in conjunction with SWP south Delta exports, includes a physical export capacity of up to 10,300 cfs per DWR's water right, without the physical limitations of the Banks Pumping Plant or the U.S. Army Corps of Engineers' limitations on Clifton Court Forebay diversions from Old River and West Canal. As presented in Chapter 6, Table 6-0, the Proposed Project, on average annually, will divert 543 TAF more than what is diverted under Existing Conditions and 4 TAF more than Alternatives 1 and 3. And of greater concern to species potentially stressed by decreased flows and limited habitat connectivity, is that in dry and critical years the Proposed Project will divert an average of 316 TAF more than Existing Conditions. Table 6-0 also shows an increase in CVP total deliveries under the Proposed Project resulting from an average increase of 46 TAF in CVP exports and increased wheeling. Increased exports reduce Delta outflow which in turn impacts CESA- and ESA-listed species with known abundance and/or survival outflow relationships, and impacts ecosystem function. Additionally, proposed wheeling operations between SWP and CVP under the dual operation scenarios are not clearly described in the DEIR, making it difficult to understand the potential impacts of these operations to flow, or subsequent consequences, if any, to species and their habitat. CDFW recommends the EIR include an analysis of the potential wheeling operations including the total exports and associated OMR flows and Delta outflow for the Proposed Project and each alternative.

Preferential Pumping

The DEIR does not include detail describing operations of the proposed NDD and how they will operate in conjunction with south Delta facilities. The somewhat vague description of proposed operations coupled with the generalized descriptions or exclusion of associated modeling in the DEIR allow for a wide range of Project operations, with varying consequences for fish and wildlife resources. This uncertainty hinders CDFW's ability to effectively understand the Project description and analyze potential Project impacts.

For example, 1) there is little detail as to how the SWP minimum health and safety diversion rate would be implemented. It is not clear whether proposed NDD maintenance minimum exports would be included as a part of the total SWP health and safety minimum exports in the south Delta or would be in addition to those. 2) The DEIR does not describe how water transfers may utilize the NDD. Because the Proposed Project is characterized as not integrated with the south Delta SWP facilities, CDFW assumes a) that the SWP will continue to export its identified proportional share of minimum health and safety exports identified in DWR's existing long-term operations for

the SWP (600 cfs, with 1500 cfs total between SWP and CVP), and b) that maintenance minimums for the NDD would be in addition to the south Delta minimums. This would result in SWP export minimums in excess of 600 cfs. CDFW recommends additional detail be added to the EIR clarifying the Proposed Project's operations so that potential impacts can be fully evaluated. Specifically, the EIR should describe what minimum health and safety diversion rates would be implemented by the Proposed Project, how water transfers may be utilized, and what SWP export minimums the Proposed Project anticipates considering both NDD and south Delta diversions.

Simulated Project operations in the DEIR do not depict the maximum amount of water that can be diverted through the NDD under the operational rules identified for the Proposed Project. A sensitivity analysis in Appendix 4B prioritizes SWP exports from the NDD from December through June, but modeling in June through November limits NDD exports below the allowable limits. Without modeling the maximum diversion possible from the NDD under the proposed operational criteria in all months and water year types, the potential impacts of the Proposed Project cannot be fully understood. CDFW recommends that maximum NDD exports under the operational criteria should be modeled and evaluated in the EIR. Additional information describing how the proposed NDD will operate in conjunction with the existing south Delta export facilities should be provided by water year type and month so that the description of operations can be compared with the life history stages of CESA- and ESA-listed fish species and consider potential impacts.

NDD Pulse Protection and Bypass Criteria

Flow-based Triggers for Salmonid Pulse Protections

The Proposed Project's Wilkins Slough flow criteria to initiate and offramp fish-pulse protections, rather than real-time fish presence monitoring, are not compatible with other proposed large scale diversion projects in the Sacramento-San Joaquin Delta ecosystem (2020 SWP ITP, 2019 NMFS and USFWS BiOps). The DEIR relies heavily on the findings of del Rosario et al. (2013) that showed a strong correlation between flow at Wilkins Slough (between 300-500 $m^3 s^{-1}$) and the first pulse of winter-run Chinook salmon presence at the Knights Landing rotary screw trap (5% of cumulative catch) based on water years 1999 through 2007. However, this relationship has not been substantiated in the recent historical record under water operations management defined in the 2008 USFWS BiOp and 2009 NMFS BiOp or under the current management strategies of the 2019 USFWS and NMFS BiOps and 2020 SWP ITP. Based on preliminary analyses presented to CDFW by DWR, CDFW is concerned that the proposed pulse protections triggered by flow, rather than fish presence, do not align with peak fish migration movements through the Sacramento River.

CDFW requests the EIR rely on fish presence in upstream monitoring stations along the Sacramento River to initiate and offramp pulse protections. Because new, large diversions upstream of Wilkins Slough would affect implementation of flow-based criteria, CDFW also recommends that the EIR include a comprehensive quantitative analysis of cumulative impacts including the Sites Reservoir Project as well as commitment to a coordinated approach with the Sites Reservoir Project operations to ensure that the biological rationale for each project's pulse protection is realized.

Frequency and Transition Criteria

The proposed pulse protection approach only allows for a second pulse protection if an initial pulse protection occurs prior to December 1st. If an early season (prior to December 1st) pulse does not trigger, only one pulse protection period would be provided by the Proposed Project prior to June 30th. Limiting pulse protections to a maximum of two periods disproportionately favors early migrating juvenile anadromous fish, does not effectively protect the diversity of migration strategies for juvenile winter-run Chinook salmon, and often does not provide protections for juvenile spring-run Chinook salmon later in the season.

By conditioning a second (i.e., later) pulse protection on the successful implementation of an early season event, the Proposed Project effectively reduces protections offered to Chinook salmon as their migratory season progresses. Specifically, bypass flow protections transition from level 1 (more stringent) to level 3 (less stringent) throughout the season with pulse protection events designed to reset bypass criteria (i.e., move from less stringent bypass criteria back to more stringent). Because pulse protections are reliant on flows upstream of the NDD, it is unclear how frequent and at what times of year pulse protections are likely to occur. By linking bypass criteria to pulse protections, it is likely that bypass flows later in the year will be reduced, compounding the potential Project impacts on spring-run Chinook salmon and other late migrating anadromous fish that will potentially only experience higher levels of diversions at the NDD (e.g., Levels 2 and 3). As a result, CDFW anticipates more impacts (as protections are reduced) to CESA- and ESA-listed species later in the season.

CDFW recommends the EIR include more protective operational criteria at the NDD that minimize take of, and impacts to, both juvenile winter-run and spring-run Chinook salmon throughout their migration season. Specifically, CDFW suggests including the following changes: 1) increasing the number of pulse protections to ensure that they span the entire migration season when winter and spring-run Chinook salmon juveniles migrate past the NDD, 2) committing to a minimum number of days per pulse protection period, and 3) including down-ramping criteria for bypass flows once pulse protections have ceased for the season.

Real-Time Operations and Adaptive Management

Chapter 3, Sections 3.17 and 3.18 of the DEIR include brief discussions of the role of real-time monitoring and adaptive management in a) addressing uncertainty in operational impacts of the NDD, and b) refining operational criteria to minimize impacts to aquatic resources. However, the DEIR currently lacks a detailed description of the process used to make refinements to operational criteria, and instead relies on flow-based operational criteria without any reference to the link between real-time fish monitoring data and proposed operations. Without establishment of performance criteria and a clear description of how criteria will be amended, it is unclear from the DEIR how real-time operations will be developed and implemented and how they will ensure less-than-significant impacts to aquatic resources, including CESA- and ESA-listed species. In the absence of such details, or evaluation in the EIR of operational alternatives that incorporate greater avoidance measures, it is difficult for CDFW or other readers to understand how impacts will be avoided through future real-time operational changes.

CDFW requests that the EIR include a complete Adaptative Management Plan based on established biological goals and objectives that utilize best available science to evaluate progress towards those objectives. The approach should include a clear decision-making structure through which any changes in approach to minimizing or mitigating impacts to species would ensure that biological objectives are met.

CalSim 3 Modeling Framework

As stated in Appendix 5A A.7, "*the use of CalSim 3 for the Draft EIR is the first application of the new model for environmental review purposes"* (p. A-3). Prior analyses for large scale diversion projects in the Sacramento-San Joaquin Delta ecosystem have relied on CalSim II, which went through a peer review process (Close et al. 2003). At the time the DEIR was released, CalSim 3 documentation was still in draft form, with the complete documentation released on November 15, 2022. Outputs from CalSim 3 are being used as inputs to many of the other models used to evaluate the Proposed Project (e.g., DSM2, HEC-5Q, LTGEN, SWP Power, DeltaGW). These models are subsequently used as inputs to biological models (e.g., SALMOD, Martin and Anderson models, SCHISM) which support the DEIR's findings of significance. As such, CDFW requests documentation of any rules and assumptions (e.g., 3,000 cfs south Delta water quality limitation) or updates (e.g., CAM Forecast, ANN) made within CalSim 3 as well as validation figures associated with CalSim 3 outputs to better understand 1) strengths and weakness of the updated model and associated model components, 2) areas of divergence between CalSim 3 outputs and known comparative historical data, 3) the utility of the model's outputs for subsequent biological impact assessment, and 4) the relative level of compounding uncertainty associated with specific outputs/ projections.

For CDFW and others to understand CalSim 3's limitations, model documentation and validation is necessary. While documentation has now been released (November 2022), it does not include thorough description and validation of key components like the Artificial Neural Networks (ANNs) and Forecasting routine. CDFW recommends DWR release more thorough documentation for CalSim 3 to facilitate transparent review and understanding of this keystone tool and its utility. For example, the ANNs which control flow-salinity relationships and carriage water benefits should be validated against historical operations when salinity was controlling. Such a calibration would inform how the water cost of salinity operations compares to historical operations. Other major model components like dynamic forecasting, groundwater returns, and reservoir operations should be documented and validated independently of the overall Calsim 3 model and provided for the EIR. Without thorough documentation, it is not possible to understand the model's limitations and to interpret results correctly.

Artificial Neural Networks

As described in Appendix 5A, Section B.3.5 and Section C.6.3, ANNs are used in CalSim 3 to approximate DSM2 salinity results and set flow-salinity relationships used in CalSim 3 to meet regulatory requirements. The ANNs have a complex training process involving CalSim 3 and DSM2, but the results of this training process are not presented. A validation report of the ANNs, comparing to DSM2 and to historical salinity, is necessary to enable users of CalSim 3 (and dependent models) to understand the errors associated with the predictions from the ANNs. Appendix 5A Section C states that the ANNs were trained with 6,000 cfs at the NDD with the Suisun Marsh Salinity Control Gates (SMSCG) operating throughout the year (p.C-15). However, Alternatives 2a and 4a both have up to 7,500 cfs diversions. Therefore, the results used to train the ANNs do not cover the full range of the diversion flow rates proposed, potentially leading to inaccurate results. Additionally, it is CDFW's understanding that SMSCG are not to be operated year-round, although the 2020 SWP ITP does include requirements in above normal, below normal, and dry years to increase the frequency of operations during the July through September period. Therefore, CDFW recommends the EIR include better documentation of proposed operational scenarios as well as a validation report for the ANNs, a critical component of CalSim 3, so that the uncertainty surrounding salinity control operations can be better understood.

Forecasting

As stated in Appendix 5A, Section B.3.7, "*CalSim 3 includes a dynamic forecasting routine to mimic DWR's forecasting procedures*" (p. B-13). The procedures (updating monthly) may be mimicked, but CDFW's review indicates that CalSim 3 does not consistently mimic the results of Bulletin 120 forecasting well. The Sacramento Valley water year index and San Joaquin Valley water year index, which are incorporated into CalSim 3 and set for the final time by CalSim 3's mimicking of the median May forecast,

result in incorrect water year type classifications almost twice as often as Bulletin 120. The DEIR therefore relies on CalSim 3 water year types that are skewed toward wetter-than-actual Sacramento Valley water year type schemes. For example, 1) from 1955 to 2022 (68 years), the Bulletin 120 May Median Forecast of the Sacramento Valley water year index was different from the actual runoff water year type six times (9%), three times wetter and three times drier than the actual runoff index. 2) CalSim 3 May Sacramento Valley water year type differs from historical in 18 out of 94 years (19%), with 14 of those being wetter and four of them being drier than historical runoff. 3) The May 90% Exceedance Forecast of the Sacramento River Index (SRI) triggers an off-ramp of May and June D-1641 requirements if it is below 8.1 MAF. Since 1978, the May 90% SRI forecast has been below the 8.1 MAF threshold four times, but in CalSim 3 all four of those years have a value greater than 8.1 MAF.

The wet bias of the Sacramento Valley water year index results in CalSim 3 over-predicting the environmental water requirements and releases, depicting better conditions for aquatic species than would realistically occur. Consequently, CDFW recommends the EIR use a water year type forecast routine that better mimics reality, a reduced variance version of the existing routine, historical, perfect foresight, or some combination thereof.

Temporary Urgency Change Order Considerations

The DEIR does not include Temporary Urgency Change Order relaxations in its CalSim 3 modeling (p. B-66). DWR and Reclamation have submitted Temporary Urgency Change Petitions (TUCPs) to the State Water Resources Control Board in water years 2021 and 2022 as well as in 2014 and 2015, requesting modifications to outflow requirements and other fish and wildlife-related criteria. TUCPs are one of the tools relied on in the drought toolkit. In light of this, CDFW recommends the EIR include a sensitivity analysis that evaluates operations of the Proposed Project, and associated impacts, during multi-year droughts when TUCPs might be requested.

Climate Change Modeling

Review of the 2040 Central Tendency (CT) climate CalSim model indicates the driest 10 water years in the record have an average of 2% more water (8 river index) under the 2040 CT climate scenario. The Sacramento Valley water year index, which should be more sensitive to snowpack, also moves to wetter water year types in the 2040 CT climate modeling with eleven years becoming wetter (May Forecast) and only two years becoming drier. The DEIR acknowledges reduced snowpack as a consequence of climate change (see e.g., p. 30-12), but it is not clear that the 2040 CT forecast routine properly accounts for reduced snowpack or other likely effects of climate change. For example, based on the 2040 CT climate CalSim model, it appears that both the Sacramento Valley and San Joaquin Valley water year indices shift toward wetter water

year types under the climate change scenario. CDFW recommends the EIR employ a new climate change analysis depicting an increase in frequency, duration, and/or severity of droughts and reduced snowpack, consistent with the narrative provided in Chapter 30.

Aquatic Biological Resources

CESA- and ESA-listed aquatic species in the Delta are at record low abundance following years of sharp population declines with uncertainty regarding their resiliency and recovery as prolonged drought exacerbates conditions in the Delta. CDFW requests the EIR link declining trends in species abundance and the current status of each species clearly with the analyses of anticipated impacts, including the 5% threshold of significance established for modeling results. CDFW requests the EIR include additional justification for the use of the 5% threshold across all modeled results, with an analysis of the potential increased effects associated with compounding impacts on multiple life stages of each species.

CalSim 3 uses a monthly time step to generate monthly averaged flow data that can be used subsequently as inputs to aquatic biological models. Operations of the NDD are most likely to change on a sub-monthly time step to target specific flow events. Project impacts associated with operations would likewise occur on a sub-monthly time step; therefore, the use of average monthly flow data is unlikely to capture the relative peak timings of flows and fish migration of the more vulnerable life stages. Similarly, the use of summary statistics as inputs and grouping of results can dampen the level of modeled effects fish may experience at a smaller time scale which may underestimate the actual impact of modeled operations on fish survival.

CDFW recommends that the EIR include results of individual years on the extreme ends of the wet and critical water year types, to provide a better understanding of the full range in flow and storage expected under the Proposed Project. CDFW recommends that the EIR analyze and discuss the potential impacts from the Proposed Project operations under successive dry and critical years, as there is the potential that the Proposed Project may exacerbate drought-related impacts to species and warrant the need for additional mitigation measures.

Winter-run and Spring-run Chinook Salmon

The NMFS Viability Assessment (NMFS 2022) identifies winter-run and spring-run (except Butte Creek population) Chinook salmon as having a high risk of extinction due to factors related to redundancy, resiliency, current population size and recent declines, and hatchery influence. Under 2040 conditions the Proposed Project operations are likely to affect the ongoing resiliency and ability of fish species to recover from periods of low abundance or stress induced by drought conditions, which may lead to a

destabilizing effect on fish populations. The modeling results provided in Chapter 12 and the associated appendices are concerning given the current status and declining trends with winter-run and spring-run Chinook salmon.

Chapter 12 of the DEIR concludes that impacts to winter-run and spring-run Chinook salmon are less- than-significant with mitigation; however, CDFW is concerned that the DEIR does not provide adequate mitigation to address impacts associated with a reduction in Sacramento River outflow and increased reverse flows at Georgiana Slough. Instead, the DEIR identifies an undetermined quantity of mitigation to offset impacts on winter- and spring-run Chinook salmon. CDFW strongly recommends that that the EIR include mitigation measures that will fully offset the increase in reverse flows at Georgiana Slough and provide increased juvenile rearing habitat both upstream and downstream of the proposed NDD.

Juvenile Salmonid Delta Routing

Chapter 12 DSM2 modeling results show reduced velocities downstream of NDD intakes (Table 12-28) and increased reverse flows at Georgiana Slough (Table 12-29) under the Proposed Project. Ongoing research shows that reductions in Sacramento River inflows can increase the frequency of reverse flows at Georgiana Slough and increase juvenile salmonid entrainment through Georgiana Slough (Hance et al. 2021; Perry et al. 2018 & 2010). Juveniles that enter Georgiana Slough have lower survival, greater migration duration, and higher risk of entrainment into the CVP and SWP export facilities than fish that remain in the mainstem Sacramento River (Newman and Brandes 2010; Perry et al. 2010). As river flow entering the Delta decreases, the tidal transition zone (or zone with bidirectional flow) can shift upstream, which leads to longer travel times and longer travel distances for juvenile salmonids advected upstream on flood tides (Moser et al. 1991). Increasing the travel time, travel distance, and frequency of reverse flows can disorient fish and lead to increased predator encounters (Perry et al. 2018; NMFS 2019). To further evaluate the impacts associated with increased reverse flows at this junction, CDFW requests the EIR include a junction analysis (e.g., STARS, Perry et al. (2018) spreadsheet tool) to better understand how reduced Sacramento River flows will impact juvenile route selection through the Delta so that potentially significant impacts to salmonids caused by the Proposed Project can be appropriately minimized or mitigated.

Additionally, increased reverse flows at Georgiana Slough under the Proposed Project may impact the efficacy of the Georgiana Slough Salmonid Migratory Barrier, which is required as a minimization measure in the 2020 SWP ITP to reduce entrainment of salmonids into the interior Delta (Condition of Approval 8.9.1). CDFW requests the EIR include ELAM and particle tracking modeling to better evaluate the potential impacts of increased reverse flows resulting from Proposed Project operations on the operation

and effectiveness (e.g., changes in juvenile survival and routing) of the Georgiana Slough Salmonid Migratory Barrier.

Juvenile Salmonid Through-Delta Survival

Chapter 12, Appendix 12B, and Appendix 12C provide through-Delta modeling results for juvenile Chinook salmon using the Perry et al. (2018) spreadsheet model, Delta Passage Model, and IOS model. The Perry et al. (2018) modeling results show a reduction in juvenile survival across each month and are supported by the Delta Passage Model results for winter-run and spring-run Chinook salmon and the IOS model results for winter-run Chinook salmon. Under the Proposed Project, through-Delta survival is estimated to decrease for all juveniles migrating downstream due to reduced velocities and increased reverse flows that can result in longer travel duration, longer exposure to poor conditions in the Delta, and increased entrainment into the interior Delta (Perry et al. 2018). Due to the difficulty of tagging small individuals, flow-survival relationships incorporated into these models rely predominantly on data from acoustic-tagging studies of large (>140 mm) Chinook salmon smolts; therefore, through-Delta survival estimates should primarily be used to inform smolt survival estimates and not be relied upon to represent rearing survival (Simenstad et al. 2017). Juvenile salmon less than 80 mm are more likely to rear in the Delta for extended periods of time rather than emigrate quickly from the Delta (Moyle 2002) and likely experience greater, prolonged impacts of reduced Sacramento River inflows south of the NDDs. Thus, the modeling results may underestimate the potential impacts of the Proposed Project on through-Delta juvenile salmonid survival.

Based on the results presented in the DEIR and given the likelihood that the models used are underestimating impacts of the Proposed Project on though-Delta juvenile salmonid survival, CDFW recommends the EIR identify the potentially significant impacts of the Proposed Project for winter-run and spring-run juvenile Chinook salmon and include an appropriate mitigation strategy to ensure those impacts are brought down to less than significant levels.

Juvenile Salmonid South Delta Entrainment

As noted above, under lower Sacramento River inflows, juvenile salmonids may move through Georgiana Slough more frequently, exposing them to lower survival routes in the interior Delta. Chapter 12, Tables 12-25, 12-26, 12-49, and 12-50 include entrainment results from the Salvage-Density Method that predict a reduction in entrainment of juvenile winter-run and spring-run Chinook salmon at the SWP export facility and a net increase in entrainment at the CVP export facility. The Salvage-Density Method does not incorporate the risk of increased routing of salmon into the interior Delta due to reduced flows downstream of NDD intakes; therefore, it does not reflect the potential increase in juvenile salmon exposure to export operations through increased

presence in the interior Delta. The Salvage Density Method also does not evaluate the risks of reduced Sacramento River flow (or any outflow conditions) on salvage in the south Delta. Therefore, the entrainment results presented for SWP and CVP export facilities may underestimate the level of juvenile salmonid entrainment under the Proposed Project operations. CDFW recommends the EIR include further analysis to assess potential Project impacts to routing of salmonids into the interior Delta as well as development of a robust mitigation strategy to offset the increased entrainment at the CVP resulting from the Proposed Project.

Winter-run Life-Cycle Modeling

The life-cycle modeling results for winter-run Chinook salmon are not consistent across the models presented in Chapter 12. IOS modeling results (Table 12-38) indicate an 8-11% decrease in female escapement under the Proposed Project across water year types, further supported by the OBAN modeling results (Table 12-43) that show a 12% decrease in total escapement (assuming no near-field mortality at the NDD intakes). In contrast, the Winter-run Chinook Salmon Life Cycle Model results (Table 12-43a) suggest an increase in spawner abundance by 5.19% under the Proposed Project. CDFW considers the life-cycle modeling results for winter-run Chinook salmon to be a critical aspect of the impact analysis, and to-date does not understand the mechanisms that are leading to these conflicting results. CDFW requests that the EIR include complete model documentation for the version of the Winter-run Chinook Salmon Life Cycle Model, including ePTMvII, used to produce Table 12-43a and a complete explanation of why these results differ from IOS and OBAN modeling results so that CDFW and other readers can better understand the significance of the Project impacts to the species.

Adult Salmonid Straying

The DEIR does not include a quantitative analysis regarding adult salmonid straying, but instead relies on the assumption that straying rates of adult hatchery-origin salmon are low when juveniles are released in river rather than released in the Bay during drought conditions. CDFW requests that the EIR include a flow change analysis for Sacramento River flows at Freeport during the period of adult upstream migration to better understand potential straying rates for adult salmon and how those could be affected by the Proposed Project.

Delta Smelt

Delta Smelt Reduced Spawning Habitat

Construction of the NDD is expected to limit access to Delta smelt spawning habitat by creating a passage barrier within the Sacramento River. Chapter 12 provides a series of assumptions related to Delta smelt such as current spawning locations and swimming

ability that are inconsistent with currently available data. For example, Delta smelt likely reach upstream spawning locations on the Sacramento River, such as those near the Garcia Bend boat ramp, by using low velocity habitat within the channel margins of the river (IEP 2022). Once constructed, the NDD would force Delta smelt further out into the channel where they are unlikely to swim against higher water velocities in all but the driest of years, thereby limiting Delta smelt's access to upstream spawning habitats. The DEIR assumes that Delta smelt will be able to swim past the NDD by using dry, low flow periods as representative flow in its analysis coupled with the assumption of stronger swimming ability compared to what current lab studies and conceptual models suggest (i.e., IEP-MAST 2015; Swanson et al. 1998). Because of this, the DEIR concludes that access to habitat upstream of the NDD would not be limited. CDFW disagrees with this conclusion on the basis that Delta smelt currently use upstream habitat and are not known to be a strong swimming fish, especially under typical flow conditions. Therefore, CDFW recommends that the EIR assume a poor swimming ability for Delta smelt and a reduced ability to swim past the NDD, consistent with current understanding of the species. Additionally, the EIR should quantify the loss of shallow sandy beach habitat upstream of the NDD for use as a basis for quantifying compensatory mitigation for Delta smelt due to construction of the NDD to mitigate the potentially significant Project impacts to the species.

Delta Smelt Experimental Releases

The DEIR does not incorporate experimental release of Delta smelt (CDFW 2021) within any analysis or as part of the baseline condition. The current approach adopted by the DEIR does not recognize the potential for experimental releases to affect Delta smelt distribution and abundance within the Delta. As such, analyses that rely on recent historic presence and draw conclusions based on such data under-represent the effect experimental releases may have and by extension, under-represent the impacts of the Proposed Project to the species. For example, the DEIR identifies a declining population trend of Delta smelt and therefore concludes that few smelt would be exposed to potential near-field effects of the NDD intakes. CDFW disagrees with this conclusion as experimental releases of Delta smelt could increase the number of individuals within the Delta and therefore increase the exposure of the NDD effects to the species. Because of this, the EIR should include assumptions about Delta smelt experimental release and its effect on Delta smelt abundance when evaluating the potential significance of the Project on the species and developing minimization or mitigation measures.

Longfin Smelt

Analysis provided in Chapter 12 of the DEIR shows substantial population level impacts to longfin smelt during all water year types due to the substantial reduction in spring outflows resulting from the Proposed Project (Table 12-144). Additionally, the DEIR

analyses show a greater than 50% chance that longfin smelt abundance will decrease from Existing Conditions in any given year (Table 12-145). The DEIR provides a modest amount of habitat restoration as mitigation for such impacts to longfin smelt and concludes that such impacts are less than significant for the species. CDFW is concerned that the Proposed Project will impact the population trajectory, and that such impacts warrant additional mitigation. CDFW strongly recommends that the EIR include feasible alternative operational approaches to minimize this impact, and mitigation measures to ensure any impact to longfin smelt caused by decreased spring outflow is less than significant. Specifically, measures should accommodate monthly forecasted storage and provide outflow objectives during the months when longfin smelt abundance has been shown to be linked with outflow, including March, April, and May.

Compensatory Mitigation

The Compensatory Mitigation Plan (CMP) in Appendix 3F proposes channel margin habitat be constructed on Bouldin Island (Table 3F-4) to offset construction related impacts to aquatic resources, including winter-run and spring-run Chinook salmon. Although this restoration would be beneficial to the ecosystem, it would not provide the most biologically meaningful benefit to the CESA-listed species that are impacted by the Proposed Project. CDFW requests the EIR prioritize areas that are within the main migratory pathway of Sacramento Basin CESA-listed species that would be impacted by the construction of the NDD, to effectively ensure less-than-significant impacts to those species.

The CMP also proposes a conceptual plan for tidal restoration to offset hydrodynamic impacts due to NDD, such as reverse flows at Georgiana Slough and reduced bench inundated habitat. However, the DEIR does not include any specifics regarding the siting of the restoration, or the acreage needed to offset impacts to salmonids. CDFW and other readers therefore lack important information to understand and consider the efficacy of tidal restoration in mitigating the hydrodynamic impacts of the NDD as well as the approach to evaluating the conceptual idea after the Proposed Project is constructed. The CMP's proposal also does not evaluate how tidal restoration proposed under the Proposed Project will interact with ongoing EcoRestore projects located in the Delta and existing North Bay Aqueduct operations. CDFW recommends the EIR contain a clear CMP that includes both mitigation for construction related impacts as well as operation related impacts, with sufficient detail and performance standards to avoid deferred mitigation.

Appendix 13C, Table 13C-9 identifies permanent, long-term temporary, and temporary habitat loss for terrestrial species under the Proposed Project. Chapter 12, Tables 12-11 and 12-12 identify permanent and temporary impacts to aquatic species under the Proposed Project. However, the CMP in Appendix 3F does not mirror the impacts

associated with Chapter 12 and Appendix 13C and does not fully describe which species and their habitats will receive mitigation. CDFW requests that the EIR's CMP clearly identify which habitats mitigate for each species, how much acreage and at what mitigation ratio species-specific mitigation will occur within initial mitigation sites and mitigation banking, and under what timeline mitigation will occur. CDFW recommends the EIR commit to a 10% stay-ahead requirement for habitat mitigation, consistent with historical agreements and based on previous large-scale water infrastructure projects. CDFW also requests the EIR commit to mitigating any loss of species habitat during implementation of the CMP itself.

The CMP includes a discussion of performance standards that will provide the basis for DWR's annual monitoring and evaluation of each mitigation site. The proposed performance standards rely on floristic, physical, and hydrologic components of the habitat without consideration of special-status species occupancy. CDFW requests the EIR consider occupancy as a performance standard and include occupancy monitoring to determine habitat use and subsequently to substantiate the effectiveness of compensatory mitigation and assumed reduction of potentially significant impacts to targeted species.

For both aquatic and terrestrial mitigation, CDFW requests that mitigation lands be conserved and managed in perpetuity under a CDFW-approved conservation easement and managed in perpetuity through secure management funding with an approved land manager.

I-5 Ponds

Appendix 3F states that the I-5 Ponds are not hydraulically connected to each other. Lands may not be considered suitable habitat sufficient for mitigation if targeted species are not able to access the habitat intended for their use. CDFW recommends the CMP commit to demonstrating occupancy of habitats created. Specifically, to allow for giant garter snake dispersal and occupancy, CDFW recommends the EIR commit to hydraulically connecting the I-5 Ponds to existing giant garter snake occupied habitat as well as providing continuous connectivity within the I-5 Ponds.

For all proposed compensatory mitigation, CDFW recommends that the CMP provide additional discussion of feasibility of potential mitigation actions, including considerations to avoid conflict or competition with already-conserved lands, sites targeted to meet existing compliance obligations, and grant-funded activities with funding restrictions.

Additional Comments

Consistent with CDFW's trustee role, the attached comments in Appendix A address all fish and wildlife resource areas and includes additional comments to those provided in the above letter. While the attached comments are extensive, CDFW understands DWR is seeking all possible input and CDFW strove to be thorough in the review of the DEIR in order to be of the greatest assistance.

RECOMMENDATIONS

CDFW appreciates DWR's continued effort to address the impacts of the Proposed Project on the State's biological resources. CDFW offers the comments and recommendations in the letter and attached Appendix A to assist DWR in its role as lead agency in adequately identifying and mitigating the Proposed Project's significant, or potentially significant, direct, and indirect impacts on fish and wildlife resources. The comments and recommendations are also offered to aid DWR in identifying a reasonable range of alternatives that would avoid or minimize adverse impacts and to help ensure the EIR's adequacy as an informational document.

Based on the information provided, CDFW currently does not see sufficient substantiation for the DEIR's determination of the following Project impacts to be less than significant with mitigation: AQUA-1: Effects of Construction of Water Conveyance Facilities on Fish and Aquatic Species, Aqua-2: Effects of Operations and Maintenance of Water Conveyance Facilities on Sacramento River Winter-Run Chinook Salmon, Aqua-3: Effects of Operations and Maintenance of Water Conveyance Facilities on Central Valley Spring-Run Chinook Salmon, Aqua-6: Effects of Operations and Maintenance of Water Conveyance Facilities on Delta Smelt, and Aqua-7: Effects of Operations and Maintenance of Water Conveyance Facilities on Longfin Smelt.

CDFW recommends the EIR is updated to provide quantitative analyses, discussed in these comments, to inform significance determinations for the Proposed Project (before mitigation), to inform development of alternatives and other means to avoid impacts, and the scope of mitigation actions. Quantitative analyses with accompanying documentation of the analysis methodology, assumptions, and decision processes are needed for CDFW and others to understand the basis for analytical conclusions reported, and to foster open and transparent discussion pertaining to the inherent uncertainty within the results and determinations presented. CDFW looks forward to continuing to work with DWR to refine the Proposed Project and associated mitigation measures.

ENVIRONMENTAL DATA

CEQA requires that information developed in environmental impact reports and negative declarations be incorporated into a database which may be used to make subsequent or supplemental environmental determinations (Pub. Resources Code, § 21003, subd. (e)). Accordingly, please report any special status species and natural communities detected during Project surveys to the California Natural Diversity Database (CNDDB). The CNNDB field survey form can be found at the following link: http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/CNDDB_FieldSurveyForm.pdf. The completed form can be mailed electronically to CNDDB at the following email address:CNDDB@wildlife.ca.gov. The types of information reported to CNDDB can be found at the following link: http://www.dfg.ca.gov/biogeodata/cnddb/plants_and_animals.asp.

FILING FEES

The Project, as proposed, would have an impact on fish and/or wildlife, and assessment of filing fees is necessary. Fees are payable upon filing of the Notice of Determination by the Lead Agency and serve to help defray the cost of environmental review by CDFW. Payment of the fee is required in order for the underlying project approval to be operative, vested, and final. (Cal. Code Regs, tit. 14, § 753.5; Fish & G. Code, § 711.4; Pub. Resources Code, § 21089.)

CONCLUSION

Pursuant to Public Resources Code §21092 and §21092.2, CDFW requests written notification of proposed actions and pending decisions regarding the Proposed Project. Written notifications should be directed to: California Department of Fish and Wildlife P.O. Box 944209, Sacramento, CA 94244-2090. CDFW appreciates the opportunity to comment on the DEIR to assist in identifying and mitigating Proposed Project impacts on biological resources. CDFW personnel are available for consultation regarding biological resources and strategies to minimize and/or mitigate impacts. Questions regarding this letter or further coordination should be directed to Paige Uttley, Acting Environmental Program Manager, at Paige.Uttley@wildlife.ca.gov.

Sincerely,

DocuSigned by:
Brooke Jacobs
63D88D861032425...

Brooke Jacobs
Water Branch Chief

Enclosures: Appendix A- Additional Comments and Recommendations Table
Appendix B- References

ec: State Clearinghouse, state.clearinghouse@opr.ca.gov

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Appendix A: Additional Comments and Recommendations

Chapter or Appendix and Section/ Figure	Page	Comment: Issue	Comment: Recommendation
Chapter 3- 3.4.1.2 Sedimentation Basins and Drying Lagoons	3-24	The DEIR states that sediment will be removed from NDD water prior to conveyance through the proposed tunnel. Settling ponds will be dredged once a year but the Proposed Project does not plan to return that sediment back to the system. Instead, the DEIR states that dried sediment would be removed by truck for disposal at a permitted disposal site or used for beneficial use off-site. Many fish species, including Delta and longfin smelt, are reliant on sediment transport instream for predator avoidance and for larvae to locate food items. Maintaining consistent levels of sediment in river based on Existing Conditions will also reduce erosive energy downstream of the NDD.	CDFW recommends the Proposed Project return the sediment diverted with Sacramento River water back to the river after dredging settling ponds at the intakes. CDFW looks forward to working out the details pertaining to sediment return with DWR to avoid any significant biological or other environmental impacts. For example, smaller sediment returns on a more frequent basis may be the best means to avoid impacting sediment transport and increasing erosion forces and will aid in providing habitat suitable for fish that rely on turbidity for predator avoidance and feeding.
Chapter 3- 3.4.1.2 Sedimentation Basins and Drying Lagoons	3-24	The DEIR states that the fill and drain/dry sequence for sediment basins and drying lagoons would take about 7 to 8 days, which would approximately match the dredged material filling rate so continuous operation would be possible (p. 3-24). However, the removal of sediment, although continuous, is not considered an impact of the Proposed Project.	CDFW recommends that the process of removing and disposing of dried sediment is evaluated as a potential biological resources impact in the EIR, with discussion of any minimization measures and/or mitigation added as appropriate.
Chapter 3- 3.4.6 Southern Complex West of Byron Highway	3-42	The DEIR states that gate operations at CCF and the new Southern Forebay (as proposed under all alternatives except the Proposed Project) will be operated in one of two modes-single or dual. It is unclear what would control operations of the gates and under which conditions one mode would be selected over the other.	CDFW requests that additional information on gate operation at the proposed Southern Forebay be added to the EIR for clarity, including any factors (e.g., biological, hydrodynamic, etc.) that impact gate operations.

Chapter or Appendix and Section/ Figure	Page	Comment: Issue	Comment: Recommendation
Chapter 3- 3.4.10 Electrical Facilities	3-48	The DEIR states power for construction and operation of the conveyance facilities would use existing power lines to the extent possible, but the location or required load of some facilities would require either new aboveground power towers with lines or, depending on site-specific parameters, underground conduit to serve those specific areas (p. 3-48). Powerlines can create inadvertent risk to a multitude of avian species, and collisions with powerlines often lead to injuries or mortality.	CDFW recommends the EIR evaluate where aboveground powerlines may be built as part of the Proposed Project and analyze related risks to species and commit to using the guidelines set forth by the Avian Power Line Interaction Committee (APLIC 2006 and 2012; APLIC and USFWS 2005) to minimize avian related injuries and mortalities due to contact with the newly constructed powerlines.
Chapter 3- 3.7 Alternative 2a-Central Alignment, 3.11 Alternative 4a-Eastern Alignment	3-80; 3-104	Section 3.2 of the DEIR describes the CEQA requirements for Project Alternatives 2a and 4a. However, it is unclear how the construction of a third intake on the Sacramento River that increases diversion capacity to 7,500 cfs would avoid or substantially lessen potentially significant Proposed Project impacts.	CDFW recommends the EIR include an analysis and description of how the new intake proposed for both the central and eastern alignment (Alternatives 2a and 4a) will avoid or substantially lessen potentially significant Proposed Project impacts and/or include minimization and mitigation measures as necessary.
Chapter 3- 3.14 Alternative 5-Bethany Reservoir Alignment, 6,000 cfs, Intakes B and C (Proposed Project)	3-116	The DEIR includes mention of construction and geotech through the Bethany Conservation Easement. However, the DEIR does not discuss, or analyze, the potential conflict (under all alternatives) resulting from the Project alignment across conserved lands, including the Cosumnes River Preserve, Woodbridge Ecological Preserve, and Bethany Reservoir Conservation Easement. The DEIR does not evaluate an alternative route for the Bethany Reservoir Aqueduct siting in a manner that could reduce impacts to the Bethany Reservoir Conservation Easement by following existing roadways and other highly disturbed areas and/or one that will avoid impacts to conserved lands similar to the alignments identified in the Delta Conveyance Project Final Draft Engineering Project Report (Delta Conveyance Design and Construction Authority 2022; Figure 10).	CDFW requests that the EIR include a comprehensive evaluation of conservation lands impacted by the Proposed Project (both temporary and permanent impacts) and alternatives. The evaluation should include identification of the number of acres to be impacted by each alignment including access areas, the biological quality and value of those acres, and the property owner and/or grantee if possible. Additionally, a discussion of the Project's potential to obtain in-kind mitigation should be included with appropriate lands identified.

Chapter or Appendix and Section/ Figure	Page	Comment: Issue	Comment: Recommendation
Chapter 3- 3.14.1.4 Bethany Reservoir Discharge Structure	3-125	The proposed Bethany Reservoir discharge structure would be located on a narrow strip of land between the Bethany Conservation Easement and Bethany Reservoir. The DEIR currently proposes a 10-foot-wide buffer to separate the disturbance area from the conservation easement.	CDFW requests the EIR include a larger buffer between the disturbance area and the conservation easement to limit impacts on the conservation easement, including impacts associated with edge effects.
Chapter 3- 3.15.2.1 Investigations at Facility Locations	3-136	The DEIR states that soil borings, overwater soil borings, and CPTs would be conducted within the construction boundaries; however, it is unclear what these boundaries are within the Project area.	CDFW requests that the EIR include a clear description of where the construction boundaries for soil borings, over water borings and cone penetration tests lay so that potential impacts can be assessed accordingly.
Chapter 3- 3.15.2.2 Geotechnical Pilot Studies for Settlement	3-137	For the Geotechnical Pilot Study, the DEIR states that test fill sites will either be placed within construction boundaries of the Proposed Project or next to a shaft pad site. It is not clear how large these fill sites will be, particularly if they are not located within the shaft pad site.	CDFW requests that a size estimation of test fill, at each study location, be added to the EIR so that an evaluation of potential Project impacts can occur.
Chapter 3- 3.15.2.5 Vibratory Testing of Dynamic Properties	3-138	The DEIR states that vibratory testing of dynamic properties of peat would be conducted in the Delta for validation of peat soil response during earthquakes. To better understand the impacts the vibratory testing will have on fish and wildlife (e.g., nesting birds, burrowing animals) a more detailed description of when tests will occur, and the length and frequency of each test is needed.	The EIR should include a more detailed description of when vibratory testing will take place, how frequently testing is need, and how long each test will be.
Chapter 3- 3.16.1.1 Approaching and Sweeping Velocity Requirements 3.17.2.1 Real-Time Decision-Making Framework	3-142; 3-158	The DEIR includes sweeping and approach velocities consistent with criteria for both Delta smelt and juvenile salmonids. However, it is unclear based on the DEIR if the approach and sweeping velocities will be recorded in real-time and what DWR's decision making process will be to shift criteria or relax criteria (as mentioned on page 3-158).	CDFW requests the EIR include a commitment to ensuring changes to the criteria would maintain or improve upon the existing level of protection. CDFW also requests that the EIR follow updated guidance from NMFS (2022) regarding fish screen criteria with assurances that criteria will be maintained across the length of the screens and that the design sweeping velocities will never be less than the design approach velocity.

Chapter or Appendix and Section/ Figure	Page	Comment: Issue	Comment: Recommendation
Chapter 3- 3.16.1.2 Bypass Flow Requirements	3-142	It is unclear based on the DEIR if the proposed bypass flow requirements would be subject to re-evaluation to consider sea level rise, and climate change impacts during the pre- and post-construction phase of the Project. In addition, it is unclear whether bypass flow re-evaluations would occur at any point during the operation of the Project.	CDFW recommends adding milestone language or criteria in the EIR that clearly denotes when bypass flow requirements are to be re-evaluated. Furthermore, a commitment should be included to ensure that changes to the criteria would only be made to maintain or improve upon the existing level of protection.
Chapter 3- 3.16.1.3 Pulse Protection	3-143	It is unclear based on the DEIR if pulse protections would occur in dry or critical years if Sacramento River flows are too low to be met to trigger an action. Furthermore, it is unclear if the pulse protections will be coordinated with pulse protection associated with the proposed Sites Reservoir Project.	CDFW requests that the EIR contain an analysis on the frequency of when both DCP and Sites Reservoir proposed pulse protections would occur across all water year types and include a discussion for when and how often pulse protections would be initiated in water years when flow criteria cannot be met. CDFW also recommends that the EIR include a comprehensive quantitative analysis of cumulative impacts including the Sites Reservoir Project to analyze whether the biological rationale for each project's pulse protection is realized.
Chapter 3- 3.16.2.3 Rio Vista Minimum Instream Flow Criteria	3-144	The DEIR indicates that the Proposed Project will operate in conjunction with the south Delta exports at Banks Pumping Plant to meet existing D-1641 requirements. However, the DEIR lacks analyses and discussions on how the Bay-Delta Water Quality Control Plan amendments for water quality criteria and flow objectives will be considered for future modeling and operational criteria at the SWP facilities.	CDFW requests the EIR include a thorough discussion of the Bay-Delta Water Quality Control Plan amendments to water quality criteria and flow objectives and how DWR will address these updates to criteria with proposed operations at the NDD and existing operations in the south Delta at Banks Pumping Plant.
Chapter 3- 3.16.2.4 Delta Outflow Criteria	3-145	The DEIR does not accurately reflect the 2020 SWP ITP Condition of Approval 9.1.3.1 Summer-Fall Action Plan, regarding Suisun Marsh Salinity Control Gates (SMSCG) operations.	CDFW requests that the language in the EIR acknowledge that SMSCG operation in dry years are not conditioned on the 100 TAF for Delta outflow, and that the 100 TAF is additive to the summer-fall requirements in the 2020 SWP ITP in AN and BN water year types and in D years that follow W or AN.

Chapter or Appendix and Section/ Figure	Page	Comment: Issue	Comment: Recommendation
Chapter 3- 3.16.3 Integration of North Delta Intakes with South Delta Facilities	3-145	The DEIR states that intakes would be used to capture excess flows when the south Delta exports are limited and unable to capture these flows.	Please provide examples of potential circumstances when south Delta exports would be limited but diversions from the north would be possible.
Chapter 3- 3.16.3 Integration of North Delta Intakes with South Delta Facilities	3-145	The DEIR states that south Delta exports and the NDD would be balanced and adjusted to meet the State Water Board D-1641 salinity requirements at the western Delta stations on the Sacramento and San Joaquin rivers.	CDFW requests that the EIR provide additional information on the proposed balancing strategy, particularly on its frequency. Furthermore, the EIR should include more information on operational strategies for scenarios when compliance can only be met at one Delta station, or if compliance cannot be met at any station.
Chapter 3- 3.16.4 Use of North Delta Intakes for Wheeling	3-147	The DEIR does not analyze water transfers at its fullest export capacity stating it is not currently achieved now and therefore is unlikely to change in the future. CDFW disagrees that this is sufficient reason for the analysis to be omitted. The Project should assess potential impacts which could be increased because of increased water transfer.	CDFW requests that water transfers be analyzed at the maximum allowable amounts (Appendix 3H) in CalSim to determine potential impacts with additional information explaining how the DCP will reduce the amount of carriage water required for moving water transfers across the Delta.
Chapter 3- Table 3-14. Delta Conveyance Project Preliminary Proposed Operations Criteria	3-150	The DEIR does not include operational criteria for the December through June period that defines how water will be diverted by NDD and the south Delta during Condition of Approval (COA) 8.17 (Export Curtailments for Spring Outflow) of the 2020 SWP ITP or during COA 8.18 (Potential to Redeploy up to 150 TAF for Delta Outflow) and COA 8.19 (Additional 100 TAF for Delta Outflow).	CDFW requests that the EIR include additional information on how export operations at the north and south Delta would interact with the current spring export curtailments (ITP COA 8.17) to ensure redeployed water is not exported after it is released from upstream reservoirs (COA 8.18 and COA 8.19).
Chapter 3- Table 3-14. Delta Conveyance Project Preliminary Proposed Operations Criteria	3-151	On October 1, 2021, USBR requested reinitiation of consultation on the 2019 NMFS and USFWS BiOps. Given the construction period presented in the DEIR, the 2019 BiOps are likely to be replaced before the Proposed Project becomes operational. The Bay-Delta WQCP update is also in process and would presumably result in changes to D-1641 prior to the operational phase of the Proposed Project.	CDFW recommends that the EIR explain the process the Proposed Project would follow to incorporate and adhere to updated standards during the permitting and construction phases of the Proposed Project.
Chapter 3- Table 3-14. Delta Conveyance Project Preliminary Proposed Operations Criteria	3-151	The DEIR does not state whether NDD diversion rates and other real-time hydraulic monitoring data (e.g., sweeping velocities, bypass flows) will be made publicly available in real time.	CDFW requests that real-time hydraulic monitoring at the NDD be made publicly available on CDEC, or similar data-sharing platform.

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Chapter 3- Table 3-15. Proposed North Delta Diversion Bypass Flow and Pulse Protection Requirements 3.16.1.3 Pulse Protection	3-152 3-143	Table 3-15 of the DEIR and Section 3.16.1.3 of the DEIR do not include consistent language regarding off ramping pulse protections. Table 3-15 indicates that pulse protections can offramp if Sacramento River flow at Wilkins Slough returns to pre-pulse flow level, as defined as flow on the first day of a 5-day flow increase. Section 3.16.1.3 indicates that pulse protections can offramp if Sacramento River flow at Wilkins Slough returns to pre-pulse flow level, as defined as flow on first day of pulse period.	CDFW requests the EIR more clearly explain the criteria used to offramp the pulse protection period. Specifically, explain which day is the first day of the pulse protection period and how that relates to the 5-day average used to onset the pulse protection.
Chapter 3- Table 3-15. Proposed North Delta Diversion Bypass Flow and Pulse Protection Requirements	3-152	The DEIR does not provide biological justification for bypass flow criteria or a description of how the criteria were developed as a minimization measure for NDD.	CDFW requests the EIR provide clarification on how the bypass flow criteria were developed and biological justification for these criteria supporting them as a minimization measure for NDD.
Appendix 3B- 3B.1.11 EC-10: Marine Vessels	3B-19	The DEIR does not include procedures for invasive species inspections on marine vessels.	CDFW recommends invasive species inspections before vessels are deployed, especially if the vessels do not originate from the Delta.
Appendix 3B- 3B.1.15 EC-14: Construction Best Management Practices for Biological Resources	3B-26	The DEIR states rodenticides and herbicides will be used in accordance with the manufacturer recommended uses. Rodenticides are not supported by CDFW as a form of pest management due to the risk of secondary poisoning.	CDFW requests that rodenticides not be used and removed as a method of rodent control in the EIR, especially in areas of suitable habitat for special-status species.
Appendix 3C- 3C.3.2.3.1 No Project Alternative Assumptions for Water Rights	3C-9	The DEIR states the No Project Alternative assumes there would be no changes to senior water rights in the Sacramento and San Joaquin River watersheds by 2025 through use of facilities currently available or under construction (p. 3C-9). However, the DEIR uses the two No Project Alterative timeframes of 2020 and 2040, neither of which align with 2025. For 2020, any Water Rights assessed should be included in existing conditions. For 2040, any Water Right changes associated with foreseeable projects should be included.	CDFW recommends potential Water Right changes be evaluated through 2040 and included as appropriate. There are multiple, foreseeable projects currently petitioning the Water Board for water right changes (e.g., Sites Reservoir is petitioning for new Water Rights). These foreseeable changes to water diversion rates, locations, and/or quantities should be included in the No Project Alternative 2040.

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Appendix 3C- Table 3C-2 Descriptions of Programs, Projects, and Policies Considered for Existing Conditions, No Project Alternative, and Cumulative Impact Analysis	3C-17	Del Puerto Canyon Reservoir will be an 800-acre reservoir storing up to 82,000 AF. Water will be diverted into the reservoir from the Delta-Mendota Canal. This project was approved in late 2020. Therefore, it is unclear why this project is not included in the No Project Alternative.	CDFW recommends the No Project Alternative include the Delta Puerto Canyon reservoir and its proposed operations.
Appendix 3C- Table 3C-2 Descriptions of Programs, Projects, and Policies Considered for Existing Conditions, No Project Alternative, and Cumulative Impact Analysis	3C-43	The DEIR lists the Yolo Bypass Salmonid Habitat Restoration and Fish Passage Project as included in Existing Conditions as well as included the project in the Cumulative Impact Analysis but excluded it from the No Project Alternative. It is unclear why the fish passage project is not included in the No Project Alternative.	CDFW recommends including the Yolo Bypass Salmonid Habitat Restoration and Fish Passage Project in the No Project Alternative.
Appendix 3C- Table 3C-2 Descriptions of Programs, Projects, and Policies Considered for Existing Conditions, No Project Alternative, and Cumulative Impact Analysis	3C-44	The Los Vaqueros Reservoir Expansion Project will increase the reservoir capacity to 275,000 AF from 160,000 AF, add a new 470 cfs connection to South Bay water agencies, and include construction of a new diversion at Old River with capacity of 170 cfs. Additionally, the reservoir project proposes doubling Contra Costa Water District's current diversion quantities from the Delta. The expansion is currently being permitted and expected to be completed by 2040. Therefore, it is unclear why it was not included in the No Project Alternative.	CDFW recommends including the Los Vaqueros Reservoir Expansion project and proposed operations in the No Project Alternative.
Appendix 3C- Table 3C-2 Descriptions of Programs, Projects, and Policies Considered for Existing Conditions, No Project Alternative, and Cumulative Impact Analysis	3C-66	The Bay-Delta Water Quality Control Plan Update to the 2006 Bay-Delta WQCP currently has amendments in process. Therefore, it is unclear why it is not considered in the No Project Alternative.	CDFW recommends the Bay-Delta Water Quality Control Plan Update be included in the No Project Alternative. This would also provide a useful comparison to the Alternate Regulatory Scenario presented in Appendix 4C.

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Appendix 3C- Table 3C-2 Descriptions of Programs, Projects, and Policies Considered for Existing Conditions, No Project Alternative, and Cumulative Impact Analysis	3C-74	Reclamation and DWR jointly manage San Luis Reservoir for the purpose of storing and reregulating CVP and SWP water from the Delta. In 2000, the CALFED Programmatic Record of Decision identified the need to resolve the low point problem to potentially increase use of water from San Luis Reservoir by up to 200,000 acre-feet. A public draft feasibility report was released April 2019 and an EIS/EIR was released in 2020; therefore, it is unclear why this project is not included in the No Project Alternative.	CDFW Recommends the San Luis Low Point Improvement Project be added to the No Project Alternative.
Appendix 3F- 3F.1 Introduction	3F-1	Appendix 13C, Table 13C-9 identifies permanent, long-term temporary, and temporary habitat loss for terrestrial species under the Proposed Project. Chapter 12, Tables 12-11 and 12-12 identify permanent and temporary impacts to aquatic species under the Proposed Project. However, the CMP in Appendix 3F does not mirror the impacts associated with Chapter 12 and Appendix 13C and is vague and often contradictory in terms of which species and their habitats will receive mitigation.	CDFW requests that the EIR's CMP identifies which habitats mitigate for each species, how much acreage and at what mitigation ratio species specific mitigation will occur within initial mitigation sites and mitigation banking, and under what timeline mitigation will occur. At minimum, CDFW recommends the EIR commit to a mitigation strategy that avoids temporal impacts to species. CDFW also recommends the EIR commit to mitigating any loss of species habitat during implementation of the CMP itself.
Appendix 3F- 3F.3.2.1 Hierarchal Approach	3F-12	The DEIR includes the following step in the hierarchical approach to mitigation: "permittee-responsible mitigation through off-site and/or out-of-kind mitigation." It is unclear what "out-of-kind mitigation" means and therefore it is unclear if it will be appropriate for mitigating impacts associated with construction and operation of the Proposed Project.	CDFW requests the EIR provide clarification on the meaning of "out-of-kind mitigation" demonstrating its appropriateness or include a commitment to mitigation under an appropriate hierarchical approach.
Appendix 3F- Table 3F-4. Summary of Compensatory Mitigation for Special-Status Species Habitat Created or Enhanced at Initial Mitigation Sites	3F-18	Table 3F-4 of the DEIR indicates there will be a net loss of foraging habitat for burrowing owl, Swainson's hawk, and greater sandhill crane as well as nesting habitat for burrowing owl. However, the DEIR does not include any mitigation for the loss of these habitat types.	CDFW requests that EIR include appropriate mitigation for the loss of habitat through the conversion of habitat and commit to mitigating for habitat loss impacts caused by the implementation of its mitigation actions.

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Appendix 3F- Table 3F-4. Summary of Compensatory Mitigation for Special-Status Species Habitat Created or Enhanced at Initial Mitigation Sites	3F-18	Table 3F-4 of the DEIR proposes channel margin habitat be constructed on Bouldin Island to offset construction related impacts to fisheries resources, including winter-run and spring-run Chinook salmon. However, Bouldin Island is located outside the main migratory route for winter-run and spring-run Chinook salmon that utilize the Sacramento River. Sacramento basin CESA listed species enter the Mokelumne River either through entrainment through Georgiana Slough or through "reverse" outmigration through the San Joaquin River. Both routes are known to have reduced survival based on telemetry data. CDFW suggests review of telemetry studies to better understand salmon use of this area.	Although this restoration would be beneficial to the ecosystem, CDFW requests the EIR prioritize areas that are within the main migratory pathway of Sacramento Basin CESA-listed species that would be impacted by the construction of the NDD. CDFW also requests the EIR clearly identify which Covered Species are included under fisheries as identified in Table 3D-4. CDFW has different considerations regarding mitigation for smelt versus salmonids.
Appendix 3F- 3F.4.1.3 Bouldin Island Mitigation Sites	3F-21	The DEIR states that enhancements and construction activities on Bouldin Island would begin once Metropolitan Water District gives their support for the projects. This implies that all enhancement activities proposed to occur on Bouldin Island do not currently have approval by the landowner and may not be a viable site for mitigation.	As with all mitigation, CDFW recommends that the EIR clearly explain the feasibility of mitigation, relying only on mitigation measures that can feasibly be implemented.
Appendix 3F- 3F.4.1.3.2 Site Selection Criteria and Baseline Conditions	3F-25	The DEIR states that a delineation of potentially jurisdictional wetlands and other waters were mapped from aerial imagery for Bouldin Island. Standard delineation is a more accurate way of mapping habitat types.	As the Proposed Project relies on Bouldin island to achieve much of the mitigation required, CDFW recommends the EIR include standard delineation of habitat on Bouldin Island to assess existing features more accurately on the island in planning mitigation.
Appendix 3F- 3F.4.1.3.3 Site Design and Development	3F-30	The DEIR states that "Removal of any nonnative trees would be performed outside the bird nesting season (p. 3F-30)." However, no additional information is provided pertaining to a process for which the value of nonnatives is assessed. Often, old growth nonnatives (e.g., eucalyptus) provide low quality, suitable habitat in areas where habitat is lacking. Removing the trees does not replace the habitat features provided by nonnatives if they are playing an ecologically significant role.	CDFW requests more information regarding the removal of nonnative trees be added to the EIR including a process for evaluation of habitat significance to the surrounding area.

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Appendix 3F- 3F.4.1.3.6 Construction Schedule	3F-34	The DEIR states habitat restoration-related construction would likely occur over a period of 2–4 years given the scale of the mitigation site. Therefore, these mitigation sites will not provide habitat, and replace habitat lost, until after they establish mature vegetation with maintained hydrologic connection.	CDFW recommends transplanting some mature trees in riparian areas to provide some habitat benefits in a shorter time scale. Please also see comments about ensuring that habitat mitigation occurs on a timescale relative to Proposed Project construction impacts that is sufficient to avoid temporal impacts to species.
Appendix 3F- 3F.4.1.4 DWR I-5 Ponds	3F-34	The DEIR identifies the I-5 Ponds (Ponds 6, 7, and 8) as an initial mitigation site for several special-status species habitats, including giant garter snake (Table 3F-1). Currently, all three ponds are managed by CDFW as Class C Wildlife Areas open to the public for hunting and fishing.	CDFW recommends the EIR describe how habitat enhancement and creation will impact existing land use while also enhancing species' conditions above existing conditions.
Appendix 3F- 3F.4.1.4.2 Site Selection Criteria and Baseline Conditions	3F-35	The DEIR states that creating and enhancing wetland habitat at the I-5 Ponds will promote population viability and genetic connectivity among otherwise isolated populations of giant garter snake in the Delta. There is no existing information in the DEIR regarding surveys within the I-5 Ponds documenting current presence or absence of giant garter snakes at the sites. The DEIR also lacks information on how existing populations outside of the mitigation sites will be connected to the I-5 Ponds to allow for giant garter snake dispersal and habitat use. For lands to be considered suitable habitat sufficient for mitigation credit, those species being mitigated for must not only be able to access the habitat intended for their use, but DWR should be able to demonstrate their occupancy.	CDFW requests the EIR include information on current occupancy of the I-5 Ponds by giant garter snake and other special-status species. To allow for giant garter snake dispersal and occupancy, CDFW recommends the EIR commit to hydraulically connecting the I-5 Ponds to existing giant garter snake occupied habitat as well as provide continuous connectivity within the I-5 Ponds.
Appendix 3F- 3F.4.1.4.3 Site Design and Development	3F-51	The DEIR states restoration would result in a net gain of freshwater marsh and open water (pond or depression), and a loss of riparian and grassland. However, there is no discussion of the degree existing suitable habitat for special-status species will be removed to provide a full understanding of the impact and confirmation of 'net' improvement.	CDFW requests the EIR include further discussion regarding the removal of existing suitable habitat and how this might be minimized or avoided further.

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Appendix 3F- 3F.4.2.1.1 Wetlands and Other Waters	3F-55	The DEIR states that impact on tidal habitats may also be compensated through wetland creation credits at an approved bank. However, it is unclear how tidal habitats can be compensated through vernal pool or alkaline wetlands that are not tidally influenced.	CDFW requests the EIR clarify how tidal habitats can be compensated through vernal pool or alkaline wetlands that are not tidally influenced or commit to in kind compensation.
Appendix 3F- 3F.4.2.2 Site Protection Instruments	3F-56	While the DEIR states the Compensatory Mitigation Plan (CMP) would be required to offset the impacts to tricolored blackbird nesting and foraging habitat, it states that no mitigation is specifically proposed for foraging habitat impacted by construction activities. While mitigation projects proposed to offset impacts to other resources may provide for suitable tricolored blackbird habitat, the lack of commitment to tricolored blackbird foraging habitat mitigation is questionable given that habitat loss in the Delta is a limiting factor for the species, particularly due to constant land use changes and deterioration of habitat. Reduced presence of tricolored blackbird in the Delta reflects the ongoing need to provide habitat protection and improvements.	CDFW recommends the EIR include mitigation for tricolored blackbird foraging habitat loss. Specifically, CDFW recommends the EIR mitigate for both nonbreeding and breeding foraging habitat in addition to nonbreeding roosting habitat at a ratio of 1:1 for breeding and nonbreeding foraging, 2:1 for roosting, and 3:1 for nesting. Mitigation should be applied to both temporary and permanent impacts caused by the Proposed Project.
Appendix 3F- 3F.4.3.1 Programmatic Approach	3F-56	The CMP of the DEIR proposes a conceptual plan for tidal restoration to offset hydrodynamic impacts due to NDD, such as reverse flows at Georgiana Slough and reduced bench inundated habitat. However, the DEIR does not include specifics regarding the siting of the restoration, or the acreage needed to offset impacts to salmonids. Without these details and associated modeling CDFW has concerns about the efficacy of tidal restoration in mitigating the hydrodynamic impacts of the NDD as well as the approach to evaluating the conceptual idea after the Proposed Project is constructed. It is also unclear how tidal restoration proposed under the Proposed Project will interact with ongoing EcoRestore projects located in the Delta and existing North Bay Aqueduct operations.	CDFW requests the EIR include modeling to demonstrate how the proposed conceptual plan for tidal restoration could influence hydrodynamics and beneficially affect routing and survival in the north Delta. CDFW also recommends the EIR contain a clear CMP that includes both mitigation for construction related impacts as well as operation related impacts to avoid deferred mitigation.

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Appendix 3F- 3F.7.1 Performance Standards	3-74	The DEIR includes a discussion of performance standards that will provide the basis for DWR's annual monitoring and evaluation of each mitigation site. The proposed performance standards rely on floristic, physical, and hydrologic components of the habitat without consideration of special-status species occupancy.	CDFW recommends the EIR consider occupancy as a performance standard and include occupancy monitoring to determine habitat use.
Appendix 4B- 4B.1.2.4 Delta Simulation Model 2 (Residence Time)	4B-17	Alternative 5 should include the assumption that diversions from the North Delta are prioritized over south Delta diversions instead of including this analysis as a sensitivity analysis. This operation (within operational flexibility) demonstrates the maximum change from current conditions allowable by the proposed operating criteria. Additionally, we suggest that diversions from north Delta be prioritized in every month, not just December through June as done in this Appendix. July through November also needs to be evaluated with maximized north delta diversions to assess the impacts of CHABs, and other potential effects.	CDFW requests Alternative 5 is adjusted to prioritize the North Delta Diversion, in all months, to evaluate the maximum impact of the Proposed Project within the range of operational flexibility included in the Project Description.
Appendix 4C- 4C.3 Alternative Regulatory Scenario Description and Modeling Results	4C-4	This assumption (limiting the north delta diversion's use to only when Delta outflow exceeds 29,000 cfs) is a significant change in operations, which makes it no longer directly comparable back to Alternative 5. The depiction of Project operations in the model should not be conservative or on the low end of the flexible operating range. The Project operations need to be modeled with the maximum allowed diversions, to assess the maximum impacts.	CDFW Recommends removing the conservative assumption, limiting the north delta diversion to be used only when Delta Outflow exceeds 29,000 cfs, to better depict potential project impacts.
Chapter 5- General Comment	Multiple	The reservoir storage and flow data presented in Chapter 5, Surface Water, is displayed as long-term averages and/or monthly long-term averages. This potentially provides an incomplete understanding of the impacts of the project, as the most acute impacts to fish and wildlife occur under extreme conditions and not when conditions are approximating the average. Additionally, the DEIR does not contain a discussion of the more extreme changes to reservoir storage and flow that could occur under conditions with the project. This is problematic as the Calsim 3 results provided in	CDFW recommends that the EIR provide an analysis that shows the variability in reservoir storage and flow that can be expected under conditions with the Proposed Project, when compared with existing conditions and the No Project Alternative. This includes providing data that show the greatest changes in reservoir storage and flow that might be expected under conditions with the Project. Additionally, detailed discussion should be provided to explain what is causing these changes, including information that details any

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		Appendix 5A, Section B, show that even when looking at averaged flow data, conditions with the project, at times, reduce and/or alter flow on the Sacramento River, far north of the project's diversions, during periods of time that could detrimentally affect fish and wildlife. No explanation is provided to account for these changes in flow, nor is any commentary provided acknowledging the potential impacts that could arise from these changes.	changes to the operation of other reservoirs in the system.
Chapter 5- 5.3.1 Methods for Analysis	5-11	The DEIR's analysis of changes to surface water does not include a quantitative assessment of potential cumulative impacts that could arise should reasonably foreseeable future projects, such as Sites Reservoir, the Los Vaqueros Expansion Project, and Harvest Water Project be built and operated ahead of DCP. Sites Reservoir could significantly alter flows on the Sacramento River, during the same time periods as DCP. Sites Reservoir, the Los Vaqueros Expansion Project, and Harvest Water Project could contribute to a reduction in Delta outflow, during periods of time that DCP also reduces Delta outflow. Additionally, these projects could cumulatively have the most significant changes to surface water, during the driest years, when impacts to fish and wildlife are likely to be the most severe.	CDFW recommends that the EIR provide a quantitative assessment of the cumulative effects to surface water, along with the corresponding impacts to fish and wildlife, of having reasonably foreseeable future projects, such as Sites Reservoir, the Los Vaqueros Expansion Project, and Harvest Water Project operate concurrently with DCP.
Chapter 5- Changes to Sacramento River Basin Flows	5-29	Graphical comparisons showing percent changes in long-term monthly average flows under the project alternatives relative to existing conditions are provided. However, it would also be useful to see a graphical comparison of the alternatives relative to the No Project Alternative, to compare potential impacts of the alternatives against future conditions without the project. Additionally, it is difficult to visually discern differences between the different alternatives, as they are displayed as overlapping lines on the same graphs. While the percent differences between the alternatives often only vary slightly, there are times when under some alternatives flows increase at given location, where for other alternatives they decrease. These differences between the alternatives occur at	CDFW recommends that graphical comparisons for the long-term monthly average flows under the project alternatives relative to the No Project Alternative be included in the chapter. Additionally, CDFW recommends revising the included graphical comparisons for long-term monthly average flow under the project alternatives relative to existing conditions, so that visually the differences between the alternatives can be compared more easily.

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		times that could have an impact on fish and wildlife. Thus, it would be helpful to be able to compare the differences better visually between the alternatives.	
Appendix 5A, Section B- Attachment 5- General Comment	Multiple	The data provided in Appendix 5A, Section B indicates that under with project conditions, flows on the Sacramento River at various locations upstream of the project diversions often decrease when compared with the No Project Alternative. For example, Table 5A-B5.2.5.4-D, shows averaged monthly flows, by water year type, at Wilkins Slough, under Alternative 5 (2040) minus the No Project Alternative. Flows under the Proposed Project are shown to decrease, at times, in all water year types, when compared to the No Project Alternative (2040). Of particular concern are decreases shown during below normal, dry, and critically dry years that occur at various times in the months of February through September. These decreases in flow could detrimentally affect fish and wildlife in several ways, including decreasing out-migrating juvenile salmonid survival, reducing juvenile salmonid rearing habitat, reducing floodplain inundation, and increasing water temperatures. Additionally, the DEIR does not include a quantitative assessment of reasonably foreseeable future water storage projects, such as Sites Reservoir, in its analysis, as this project would also be reducing flows on the Sacramento River during the same period.	CDFW recommends including an evaluation and discussion of the causes of the decreases in flow on the Sacramento River above the project's diversions. The EIR should closely assess the project's potential impacts to fish and wildlife during the times, when under with project conditions, changes to flow on the Sacramento River are the greatest. The EIR should also consider in its analysis the cumulative impact to flow on the Sacramento River that might occur if reasonably foreseeable future projects like Sites Reservoir operate concurrently. The detailed discussion should address how these impacts are being captured in the analysis and how they are being mitigated.
Appendix 5A, Section B- Attachment 5- General Comment	Multiple	The data provided in Appendix 5A, Section B indicates that under with-Project conditions, flows on the Sacramento River at various locations upstream of the Proposed Project diversions, as well as the Feather River at various locations upstream of the Proposed Project diversions, often decrease when compared with the No Project Alternative (2040). For example, Table 5A-B5.2.5.5-D, shows averaged monthly flows, by water year type, at Wilkins Slough, under the Proposed Project (2040) minus the No Project Alternative (2040). Flows are shown to decrease at times, in all water year types under with-	CDFW recommends including an evaluation and discussion of the causes of the modeled decreases in flow on the Sacramento and Feather rivers above the Proposed Project's diversions, including an explanation of why those impacts may or may not be limited by existing requirements. Specifically, the EIR should assess the Proposed Project's potential impacts to fish and wildlife during the times when changes to flow on the Sacramento River are the greatest under with-Project conditions. This analysis should also be completed for impacts to flows on the Feather River with assessment of the Proposed Project's potential impacts to salmonids when

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		Project conditions. Of particular concern are decreases shown during below normal, dry, and critical water years that occur at various times in the months of February through September. Table 5A-B5.2.14.5-D shows averaged monthly flows, by water year type, on the Feather River below Thermalito Afterbay Release, under the Proposed Project (2040) minus the No Project Alternative (2040). This table shows monthly averaged flows decreasing, under with-Project conditions, in the months of February through April and June, in dry and critical water years. Decreases in flow could detrimentally affect fish and wildlife by decreasing out-migrating juvenile salmonid survival, reducing juvenile salmonid rearing habitat, reducing the frequency and inundation of floodplain habitat, and increasing water temperatures. Additionally, because the data are presented as monthly averaged flows, it is likely that the more pronounced decreases in flow, along with their resulting impacts to fish and wildlife are not being adequately assessed or mitigated. This is further compounded by the fact that the DEIR does not include reasonably foreseeable future water storage projects, such as Sites Reservoir which would also be reducing flows on the Sacramento River during the same period.	changes to flow on the Feather River are the greatest.
Appendix 5A, Section B- B.10.1 Climate Change Under Existing Conditions	B-65	The DEIR states "while there has been no obvious trend in total water year runoff into the Sacramento and San Joaquin Rivers, there have been changes in the timing of that runoff. The fraction of snowmelt runoff between April and July relative to total year-round water runoff has declined over the past century" (p.B-65). This statement acknowledges that the existing conditions model is not depicting current hydrology nor hydrology that is expected to occur.	Without needing climate or rainfall-runoff modeling, DWR could modify the historical hydrology to reflect current conditions with respect to fraction of runoff occurring April to July (snowmelt). The snowpack ratio could be de-trended to current conditions, without changing annual runoff volumes (snowmelt runoff would shift to Oct-March runoff). Little to no adjustments would be made to recent years. This could be done as sensitivity analysis or used for the primary CEQA analysis and would not be

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			much different from using 2020-level land use, groundwater, or level of demand as the baseline.
Appendix 5A, Section B- Table 5A-B5.2.3.5-D, Sacramento River at Keswick Monthly Flow, Difference in Monthly Flow. (Revised Public Draft Appendix 5A- Attachment 5)	B-107	The data presented in revised Appendix 5A, Section B show that during periods when salmonids are spawning in the Sacramento River, flows at times, under with project conditions, have the potential to sharply differ in volume from one month to the next. For example, Table 5A-B5.2.3.5-D, shows averaged monthly flows by water year type at Keswick, under Alternative 5 (2040) minus the No Project Alternative (2040). Flows under Alternative 5 would, on average, in critically dry years, be 232 cfs higher in January and 789 cfs lower in February, when compared with conditions under the No Project Alternative. Sharp changes in flow from one month to the next have the potential to increase the risk of redd dewatering, particularly in drier years. The degree of risk is difficult to assess as the data is presented as monthly average flows. However, the data as presented indicates that there is the potential that Project operations could, at times, result in redd dewatering, particularly in drier years.	CDFW recommends the EIR assess the potential risk of redd dewatering on the Sacramento River considering the proposed Project's operations and any other requirements currently in place.
Appendix 5A, Section B- Attachment 5	B-185	The data provided for Fremont Weir spills indicate that there is the potential for spills to the Yolo Bypass to decrease, particularly in the January-February period, under with project conditions.	The EIR should analyze the project's effect on spills to the Yolo Bypass including the cumulative impacts of reasonably foreseeable future projects.
Appendix 5A, Section B- Attachment 5- General Comment	Multiple	The DEIR does not provide any data or analysis of the Project's potential impact to the Sutter Bypass. Sutter Bypass receives water from Tisdale and Colusa Weirs, which overtop, during high flow events on the Sacramento River. Under with project conditions, modelling indicates that flows on the Sacramento River are, at times, reduced upstream of the Project, during months when spills to the Sutter Bypass are likely to occur. This has the potential to reduce the occurrence and/or volume of spills to the Sutter Bypass, which could detrimentally impact fish and wildlife.	CDFW recommends that the EIR analyze potential changes to the occurrence and volume of spills to the Sutter Bypass, along with potential corresponding impacts to fish and wildlife, both project-specific, and cumulatively with other reasonably foreseeable projects or activities.

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Appendix 5A, Section D- Figure 5A-D1.1.7 through Figure 5A-D1.1.18, Figure 5A-D1.1.37-A through Figure 5A-D1.1.37-D, and Figure 5A-D1.1.38 through Figure 5A-D1.1.49	D-20 - D- 26 and D-45 - D–48	Multiple sets of figures were used to show the same model results. Figure 5A-D1.1.7 through Figure 5A-D1.1.18 show the same results as Figure 5A-D1.1.37-A through Figure 5A-D1.1.37-D, with only the x-axis reversed, and it is not clear whether these figures are for the full simulation period or a specific water year type. In addition, the information in these figures is included in Figure 5A-D1.1.38 through Figure 5A-D1.1.49. The comment also applies to figures for other model output locations.	CDFW requests re-organization of the figures to present model results concisely.
Appendix 5A, Section D- D.2.2.4 Simulation of Selective Withdrawal	D-7	The DEIR states the location of temperature compliance is at the Red Bluff Diversion Dam as required in Water Board Order 90-5. However, an approved annual Temperature Management Plan may designate a different location for temperature compliance, which may be at Clear Creek or some other locations.	CDFW recommends that the EIR acknowledge that the location for temperature compliance can be set based on Shasta storage volume and the Biological Opinion in place which includes Shasta reservoir operations.
Appendix 5A, Section D- Figures 5A-D1.1.7 through 5A-D1.1.18 and Figures 5A-D1.1.37-A through 5A-D1.1.37-D	D-20 - D- 26 and D-45 - D–48	Figures 5A-D1.1.7 through 5A-D1.1.18 show the same average monthly water temperature results for the American River above the confluence as Figures 5A-D1.1.37-A through 5A-D1.1.37-D. It is not clear whether these sets of figures are for the full simulation period or a specific water year type.	CDFW recommends model results are confirmed and corrected where appropriate in all tables and figures presented.
Appendix 5A, Section D- Figure 5A-D2.14.2 through Figure 5A-D2.14.5	D-785 - D-787	There appears to be an error in Figure 5A-D2.14.2 through 5A-D2.14.5 Sacramento River Below Keswick, Monthly Average Temperature (degree Fahrenheit). The October temperature for the No Project Alternative is lower than the Jan-Feb temperature. It looks like the curve for the No Project Alternative was shifted. All other model output locations have the same issue.	CDFW recommends revising these figures and updating them with corrected data for the No Project Alternative as needed.
Appendix 5A, Section D- Table 5A-D2.29.1-B Trinity River Above Lewiston, Monthly Average Temperature, No Project Alternative	D-1655	Table 5A-D2.29.1-B shows that at Trinity River above Lewiston, the modeled No Project Alternative monthly average temperature is lower in May than in February for the full simulation period, wet water years, below normal and dry water years. The modeled average temperature is lower in May than in January for wet water years. In addition, the modeled average temperature is lower in May than in March-April for all	CDFW recommends that the EIR review and if necessary, correct the model results reported in this table. If the numbers in this table match model results, the model assumptions and input data should be re-evaluated and fully described.

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		water years. It is not clear how the modeled May average temperature can be so low.	
Appendix 5A, Section E- Model Structure	E-2	SALMOD only calculates juvenile production each year as the cumulative survival of a predetermined set of eggs through the smolt life stage. There are several sources of mortality during these early life stages that vary based on flow and water temperature. SALMOD is not a true-life cycle model because it treats production results of each year independently such that outcomes do not accumulate year over year.	CDFW recommends using full life cycle models to evaluate impacts on listed salmonids.
Appendix 5A, Section E- Base Mortality	E-4	Recent observations of thiamine deficiency in winter- and spring-run Chinook salmon have led to significant mortality.	CDFW recommends reviewing and potentially modifying the base mortality calculations to incorporate the most recent estimates applied to winter- and spring-run Chinook salmon.
Appendix 5A, Section E- Modeled Salmon Species	E-7	Between Keswick and RBDD, during the spring, all four runs do occupy the space above RBDD. Although seasonal timing may indicate minimal overlap in competing life histories, distinct modeling runs may not be accurately characterizing the available habitat, for example, spring-run emigrating from natal tributaries will overlap with rearing and emigrating fall-run. Not including fall-run juveniles in the spring-run modeling runs may provide a false estimate of available habitat to spring-run.	CDFW recommends running the model with multiple Chinook runs combined.
Appendix 5A, Section E- Computational Units	E-10	Does the SALMOD model still assume operations for RBDD? In 2013 the dam was decommissioned, and the gates were held in the open position. The inundation pool (Lake Red Bluff) previously created by the dam no longer exists in the previous form.	CDFW recommends updating this component to existing conditions if not already applied.
Chapter 6-6.3.2.1 No Project Alternative	6-48	If there are extended outages at the Delta diversion facilities in the event of an earthquake and levee failure, it is unclear to what extent alternate supplies may be insufficient and how much of impact that will have on the delivery reliability.	CDFW recommends providing further details on the likelihood of earthquake and levee failure risks and resulting impacts to water supply.
Chapter 6-6.3.2.1 No Project Alternative	6-48	The DEIR states SGMA may limit groundwater pumping which would increase pressure on surface water supplies, but it does not attempt to quantify a level of impact reduced groundwater pumping might have on surface water supplies or demand.	CDFW recommends the EIR further elaborate on the potential cumulative impact of the Proposed Project in combination with SGMA.

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		Additionally, reduced groundwater pumping in some basins may positively affect surface flows because of groundwater basin recovery and surface water - groundwater interactions.	
Chapter 6-6.3.2.2 Project Alternatives	6-48	The DEIR states the Project will provide water supply reliability by adding additional diversions that can be used in the event of a levee failure in the Delta- which otherwise may cause diversions in the south Delta to cease. However, the DEIR does not speak to reliability improvements for the whole system. Therefore, it is unclear if the Project improves reliability during a seismic event to only apply some regions, including south of Delta, or to the entire system.	CDFW requests that the EIR add further explanation as to whether the reliability improvements will be for the whole system or only limited to some portion(s) of the system. Further information should be provided linking specific areas and facilities that would benefit to Project construction and or operational components.
Chapter 8 – 8.0 Summary Comparison of Alternatives	8-1	The DEIR in its assessment of potential groundwater-related impacts did not include the cumulative effects of Project operations a quantitative assessment of combined operations of reasonably foreseeable future projects, such as Sites Reservoir, the Los Vaqueros Expansion Project, and the Harvest Water Project in combination with the Proposed Project.	CDFW recommends that the EIR include a quantitative assessment of the cumulative effects of the Project on groundwater along with operations of reasonably foreseeable future projects, such as Sites Reservoir, the Los Vaqueros Expansion Project, and Harvest Water Project when analyzing potential groundwater-related impacts.
Chapter 8 – 8.1.3 Delta Region Groundwater; Figure 8-2	8-7	As shown in Figure 8-2, in addition to the Solano, South American, Tracy, Eastern San Joaquin, and Cosumnes Subbasins, portions of the Delta are underlain by the Yolo and East Contra Costa Subbasins.	CDFW recommends that the EIR identify each subbasin which underlies a portion of the Legal Delta as depicted in Figure 8-2. The subsequent discussions of groundwater quality (Section 8.1.3.2) and groundwater production and use (8.1.3.3) should discuss existing conditions in these subbasins.
Chapter 8 – 8.3.1 Methods for Analysis	8-13	The DEIR does not assess impacts on Groundwater Dependent Ecosystems (GDEs) within the study area and does not consider the sustainable management criteria thresholds that are identified in the Groundwater Sustainability Plans (GSPs) for the subbasins that underlie the study area. Potential declines in groundwater levels and altered interconnected surface water flows have the potential to reduce available shallow groundwater or disconnect GDEs from groundwater resources. Temporary disruption can stress GDEs, and sustained absence of	CDFW recommends that the EIR identify GDEs within the study area and assess the potential impacts to GDEs because of Project construction and operation that may result from changes in groundwater levels and interconnected surface waters.

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		shallow groundwater may lead to permanent GDE degradation or mortality.	
Chapter 8 - 8.3.1.2 Approach for Analysis	8-16	Limited groundwater-related impacts, within the DeltaGW Model domain, is not necessarily evidence that Project operations will have little to no groundwater-related impacts outside of the model domain. Project operations have different effects outside of the model domain and the groundwater basins in those areas are not the same as those inside of the model domain. Project operations alter surface water flows outside of the DeltaGW Model domain and there is the potential that those alterations will have groundwater-related impacts.	CDFW recommends that the EIR extend its quantitative analysis of potential groundwater-related impacts to encompass all areas where Project operations have the potential to alter conditions that could result in groundwater-related impacts.
Chapter 8 – 8.3.1.2 Approach for Analysis	8-19	The DEIR identifies thresholds for significance that include changes in stream gains or losses in interconnected stream reaches, changes in groundwater elevation, reduction in groundwater levels affecting supply wells, changes to long-term groundwater storage, and degradation of groundwater quality. The DEIR does not consider the sustainable management criteria thresholds that are identified in the groundwater sustainability plans (GSPs) for the subbasins that underlie the study area. In the GSPs for basins in critical overdraft and the remaining high and medium priority subbasins, submitted to DWR in January 2020 and January 2022, respectively, the plans have identified sustainable management criteria (SMC) thresholds related to changes to groundwater levels, groundwater storage, interconnected surface waters, and groundwater quality that would constitute locally determined significant and unreasonable, and undesirable results for all beneficial users of groundwater. The DEIR does not consider these locally defined significance criteria in its definition thresholds of significance for Project impacts. It is unclear how the study area GSPs' SMCs relate or compare to the DEIR's thresholds of significance and whether there is the potential for Project operations to limit groundwater sustainability agencies' ability to	CDFW recommends the EIR include a discussion of the relevant sustainable management criteria identified in GSPs submitted to DWR for the subbasins that underlie the study area. The EIR should include an assessment that demonstrates that the Project's thresholds for significance are at least as protective of groundwater users, including environmental users such as GDEs, as the locally determined SMCs in GSPs that were designed to avoid significant and unreasonable undesirable results.

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		meet their subbasin groundwater sustainability goals as defined in GSPs.	
Chapter 8 – 8.3.2.1 No Project Alternative	8-23	In its assessment of potential groundwater-related impacts, the DEIR did not explicitly consider SGMA implementation and associated groundwater management thresholds identified in groundwater sustainability plans (GSPs) for the subbasins underlying the study area. For the 2040 No Project Alternative, the DEIR asserts that there may be demand reduction or supply augmentation under SGMA that may reduce reported declines in groundwater levels; however, the DEIR does not identify or discuss the measurable objectives or minimum thresholds identified in GSPs which can be reasonably foreseen to occur by 2040. Some subbasin GSPs set measurable objectives or minimum thresholds at or below historic low groundwater levels. Without explicit identification of SGMA management criteria and comparison of SGMA groundwater thresholds to the reported groundwater level declines in the No Project Alternative, it is unsubstantiated to state that SGMA implementation may reduce groundwater declines. Additionally, it is possible that cumulative Project operations with SGMA implementation may cause potentially significant groundwater-related impacts.	CDFW recommends the EIR explicitly consider SGMA in its analysis of potential groundwater-related impacts in the 2040 No Project Alternative, as well as in the analysis of Project operations alternatives. The EIR should identify the relevant sustainable management criteria (SMC) thresholds in study area GSPs and assess potential cumulative impacts of Project operations with SGMA implementation.
Chapter 9- General Modeling Comment	Multiple	The DEIR does not address if the baseline conditions considered in the model include TUCPs or how Project exports impact the need for additional TUCPs in the future.	CDFW recommends analyzing Proposed Project operations during drought sequence in which a TUCP would be submitted to modify d-1641 standards as a sensitivity run in an appendix to the EIR to better understand Proposed Project operations under these conditions and associated impacts.
Chapter 9- 9.1.5.11 Cyanobacteria Harmful Algae Blooms	9-26	Benthic invertebrates are also impacted by toxins. CHABs can also have other negative impacts in addition to toxins. Blooms can alter water quality conditions. During a bloom pH can increase to above 9 shifting ammonium (non-toxic) to ammonia (toxic) to fish. Once the bloom recedes and starts to	CDFW recommends benthic invertebrates are added to as species impacted by toxins in the section describing negative water impacts of how blooms (pH, nutrients, dissolved oxygen).

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		decompose then dissolved oxygen levels can decline leading to hypoxia also killing fish, benthic invertebrates and other aquatic organisms that rely on dissolved oxygen	
Chapter 9- 9.1.5.11 Cyanobacteria Harmful Algae Blooms	9-28	The DEIR states hydrodynamic conditions of rivers in watersheds upstream of the Delta are not conducive to cyanobacteria bloom formation due to high velocity, high turbulence and mixing, and low residence times. However, CHABs have been found in a variety of aquatic environments in California. For example, benthic CHAB's, which have been present in the Eel River and DWR's Yolo Bypass Fish Monitoring Program also has observed Microcystis index scales in their data.	The EIR should include an analysis of the Project's potential to influence CHABs upstream of the Delta or provide discussion, including references, as to why this analysis is not needed.
Chapter 9- 9.1.5.11 Cyanobacteria Harmful Algae Blooms	9-28	The DEIR states large reservoirs upstream of the Delta are typically characterized by low nutrient concentrations, where other phytoplankton outcompete cyanobacteria. However, other cyanobacteria can occur in low nutrient water systems, such as the neurotoxin β-N-methylamino-l-alanine (BMAAa). Cyanobacteria are resilient and tend to outcompete other phytoplankton, so it is unclear if this statement is fully supported.	CDFW recommends the EIR provide references and further context to justify this conclusion or adjust analysis as needed.
Chapter 9- Bay Delta Water Quality Objectives	9-94	Exceedances based on water year type and month should be shown.	CDFW recommends that the EIR include more information on exceedances by month and water year type for last 10 years relative to the frequency Bay-Delta WQCP objectives are exceeded. Furthermore, clarification on real-time operations referenced are needed. Is this intended to reference currently proposed Project operations, or operations to be developed with fisheries regulatory agencies?

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Chapter 9- Impact WQ -7: Effects on Nutrients Resulting from Facility Operations and Maintenance	9-124	Throughout the chapter, the discussion of the source water fraction exported through CVP or SWP is unclear. For example, the DEIR states "The long-term average Sacramento River water fraction were modeled to increase by up to 5.5% in March while San Joaquin River water would decrease up to 4.5% and agricultural drainage waters would decrease by up to 0.7% in March, as a long-term average" (p. 124). It is unclear why there will be increases in source water from the Sacramento River through the CVP given that there will be less Sacramento River inflow into the Delta due to NDDs. CDFW assumes this increase is associated with wheeling between CVP and SWP; however, it is not clear based on proposed operations how wheeling will occur between the two facilities. It is also unclear why the highest increase in the fraction of source water occurs in March compared to other months.	CDFW recommends the EIR provide further explanation on the source water fraction exported through CVP or SWP and provide modeling to support analysis and conclusions. This analysis effects the level of potential Project impacts to water quality as well as other aquatic resources.
Chapter 9- Impact WQ-9: Effects of Dissolved Oxygen resulting from Facility Operations and Maintenance	9-131	The DEIR concludes "differences in Delta inflows that would occur under the project alternatives relative to existing conditions would not result in water temperature differences [that] would lead to lower dissolved oxygen concentrations" (p. 131). However, it is unclear if water temperatures were calculated by water year type or month. The scale of analysis could have an impact on the results presented.	CDFW recommends the EIR include a better description of the temperature analysis conducted. Specifically, water temperature impacts from the Project should be assessed at a minimum on a monthly time step but ideally daily. Extreme changes in water temperature could have detrimental effects to aquatic systems.
Chapter 12- Table 12-0, AQUA - 7	12-6	Text indicates entrainment results for the south Delta and the North Bay Aqueduct were combined. The facilities' entrainment results should not be combined. They are located far apart in the Project Area and are likely influenced by different hydrologic factors.	CDFW requests that the EIR separate entrainment results for south Delta and North Bay Aqueduct facilities.
Chapter 12-12.1 Environmental Setting	12-7	The DEIR does not discuss upstream (upstream of the Delta) environmental setting or stressors. Since the Project will impact aquatic resources, such as anadromous fish species, a discussion of the upstream habitat is critical to understand the impacts of the Project and impacts associated with upstream conditions.	CDFW recommends that the EIR include a section on upstream habitat (upstream of the Delta) within the Environmental Setting section to provide context for the analysis of impacts associated with upstream operations.

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Chapter 12- Table 12-1	12-8	Tule Perch, Pacific Herring, and Prickly Sculpin are species that produce young that rear in the Delta or Suisun Bay/Marsh and may be impacted by the Proposed Project construction and operations. These species are not currently included in Table 12-1 Fish and Aquatic Species of Management Concern Potentially Affected by the Project Alternatives.	CDFW recommends the EIR include Tule Perch, Pacific Herring, and Prickly Sculpin in Table 12-1, and include these species in its impact analysis.
Chapter 12-12.1.4.2, Delta, Aquatic Habitat	12-10	The DEIR states water temperatures in summer approach or exceed the upper thermal tolerances (e.g., 20°C to 25°C) for cold water fish species such as salmonids and Delta-dependent species such as Delta smelt. Longfin smelt also experience thermal stress at 20°C and should be included in any subsequent analysis and discussion.	CDFW recommends including Longfin Smelt to the examples of "delta-dependent species" and adding reference to Jeffries et al. (2016).
Chapter 12- 12.1.4.2, Delta, Aquatic Habitat	12-10	Current language in the DEIR leaves out Suisun and North Delta conditions when referencing high water temperatures contributing to low Delta smelt survival. High water temperatures in these regions may negatively impact the species and should be considered.	CDFW recommends including the recent FLOAT report as a reference. As temperature is increasingly becoming an estuary-wide issue subsequent analysis should consider Suisun and North Delta and not just the south Delta and San Joaquin River when assessing potential impacts.
Chapter 12- 12.1.4.2, Delta, Aquatic Habitat	12-11	CDFW is concerned about the conclusions drawn from the reference Murphy and Weiland (2019) and would like to continue to work with DWR to better understand the importance of including this material, in this context. Much of the Delta smelt population occupies the low salinity zone during the fall, with some individuals occurring in fresher habitats and some in more saline habitats (Hobbs et al. 2019; Eakin et al. 2020). The fact that some fish occur in fresher or more saline habitats (outside the LSZ) does not lessen, nor negate the need to continue to focus on habitat suitability within the Low Salinity Zone during the summer and fall.	CDFW recommends including Eakin et al. (2020) and Hobbs et al. (2019) to this discussion of fall X2 and juvenile Delta Smelt abundance/survival.

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Chapter 12- 12.1.4.2, Delta, Turbidity	12-14	The DEIR states "Recent modeling examining future climate scenarios, however, predicts significant increases in large flow events and sediment loading to the Delta from the Sacramento River over the next century for two representative greenhouse gas concentration pathways, which could increase turbidity"(p.11). The sentence seems to indicate that the predicted significant increases in large flow events and sediment loading that resulted from two representative greenhouse gas concentration pathways would increase turbidity. Is this meant to indicate that increased turbidity from climate change effects on flow and sediment loading would offset impacts to turbidity from the Proposed Project?	CDFW recommends the EIR clarify if this statement is intended to indicate that increased turbidity associated with high flow events would offset impacts to turbidity because of the Proposed Project. In its impacts analysis, CDFW recommends that the EIR clearly explain whether the Proposed Project's impacts related to turbidity are significant.
Chapter 12- 12.1.4.2, Delta, Turbidity	12-14	The DEIR states that 3550 cubic yards per day of sediment releases were needed to increase turbidity by 10 nephelometric turbidity units (NTU) between Emmaton and Mallard Island during May through September (p.14). However, it is unclear if the study concluded that sediment supplementation is feasible. Additionally, there is no information as to how many days of sediment releases would be needed to reach 10 NTU. Furthermore, the current language does not describe how the volume would compare to the to the expected volume settling in basins adjacent to the proposed North Delta export intake structures, nor does it include the volume of the drying lagoons in this section. Feasibility of turbidity supplementation in other regions has also not been addressed.	CDFW recommends the EIR: 1) include information on the number of days of sediment releases that would be needed to reach 10 NTU, 2) clarify how this volume compares to expected volume settling in the basins adjacent to proposed North Delta export intake structures, 3) include the volume provided by the drying lagoons described in Chapter 3, and 4) provide discussion whether turbidity supplementation in other regions is feasible.
Chapter 12- 12.1.4.2, Delta, Contaminants	12-16	The DEIR does not address risks to diving ducks, sturgeon, and splittail due to biomagnification of selenium before consuming *Potamocorbula*.	CDFW recommends that the EIR state that diving ducks, sturgeon, and Sacramento splittail are at greatest risk of selenium toxicity due to both selenium presence in nonnative benthic bivalves and biomagnification of selenium by *Potamocorbula*.

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Chapter 12- 12.1.4.2, Delta and North Delta Fish Passage and Entrainment	12-17	The DEIR does not indicate whether there will be changes to Barker Slough operations as part of the Proposed Project. Changes to Barker Slough operations could result in impacts to aquatic resources.	CDFW recommends that the EIR analyze impacts associated with any anticipated changes to Barker Slough operations as part of the Proposed Project.
Chapter 12- 12.1.4.2 Habitat Conditions and Environmental Stressors in Delta and Suisun Bay/Marsh	12-17	The DEIR states "Consequently, reduced Sacramento River inflow increases the frequency of reverse flows at this junction, thereby increasing the proportion of fish that are entrained into the interior Delta, where mortality is high" (p.17). In the statement, it is unclear if "frequency" is referring to the number of flow reversals or the magnitude and duration.	CDFW requests the EIR clarify the meaning of "frequency" discussed in this sentence. Specifically, does "frequency" refer to the number of flow reversals or the magnitude and duration of flow? This detail impacts how the information is interpreted for development of mitigation measures.
Chapter 12- 12.1.4.2, Delta, Fish Passage, and Entrainment, Central and South Delta Fish Passage and Entrainment	12-18	The text used in this sentence may downplay the effect of filling Clifton Court Forebay (CCF) during flood tides on Delta hydrology and may leave readers with the impression that fish may not be drawn toward Project facilities. Specifically, the SWP harnesses the power of flood tides to fill CCF. While it is true that tidal fluctuation causes reverse flows across the Delta, the SWP exacerbates this effect via filling of CCF on the flood tides.	CDFW recommends emphasizing a stronger effect on delta hydrology than what is conveyed here (i.e., changing language to "which draws fish" rather than "some fish").
Chapter 12- 12.1.4.2 Habitat Conditions and Environmental Stressors in Delta and Suisun Bay, Central and South Delta Fish Passage and Entrainment	12-22	The habitat information provided in Section 12.1.4 of the DEIR provides supporting evidence primarily for federally and state endangered and threatened species and does not provide sufficient habitat information relevant to non-endangered or threatened species.	CDFW recommends that the EIR include research and supporting evidence of non-endangered or threatened species to fully understand baseline habitat conditions for all aquatic species analyzed in the EIR.
Chapter 12- Table 12-2, Aquatic Habitat Sampling Platform: Platform Utility and Delta Implementation Studies	12-32	CDFW notes that the Sampling Platform can sample without “handling” the fish if the cameras are on, and the trailing net is open to allow fish to pass through. However, the act of guiding fish into a narrowing channel to be photographed can still have an impact.	CDFW recommends that the EIR acknowledge that the act of funneling fish into a narrow channel could still cause impacts to fish.
Chapter 12- 12.1.4.2, Yolo Bypass, Aquatic Habitat	12-35	The DEIR does not include a discussion about the frequency and duration of Yolo Bypass inundation, or at what river stage the Sacramento River is required to overtop Fremont Weir.	CDFW recommends including information on the frequency in which the Yolo Bypass is inundated, the average duration of inundation, and the river stage of the Sacramento River required to overtop Fremont Weir.

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Chapter 12- Table 12-3. Methods for Analysis of Potential Effects on Fish and Aquatic Resources	12-41	The DEIR analysis for fish and aquatic resources focuses on the analysis of smelt and salmonids. It only includes X2-abundance regression, underwater construction noise, and salvage-density analyses for other special-status fish and aquatic species.	CDFW recommends that the EIR include species specific analyses to identify Project operational impacts and fully analyze Project impacts to non-special-status fish and aquatic species. Specifically, analyses should identify migratory, entrainment, and indirect impacts (water quality, water temperature) to non-smelt and salmonid species.
Chapter 12- 12.3.3.1, predictable actions by others	12-47	The DEIR discussion in section 12.3.3.1 excludes consideration of interactions between the locations chosen for water diversions and operation effects. Intakes located within protected embayment might be proximal to important spawning or larval rearing habitat(s); similarly, intakes located at the convergence of two currents would be more likely to encounter more eggs and larvae than if located elsewhere.	CDFW recommends the EIR include a discussion of how intake location may affect operation effects so that these effects can be fully analyzed, and minimization approaches considered.
Chapter 12-12.3.3.2 Impacts of the Project Alternatives on Fish and Aquatic Resources, Impact Aqua-1	12-48	Impact Aqua-1 does not fully explore the sources of impacts to starry flounder, CA bay shrimp, and Central CA roach. Starry flounder might be directly impacted by the Proposed Project because some juveniles migrate to and upstream of the Proposed NDD and have been caught in the sport fishery at Miller Park. Starry flounder and CA bay shrimp also have a known outflow-abundance relationship (Kimmer 2002) and thus would be expected to be impacted by the Proposed Project because of reduced Delta outflows.	CDFW recommends that the EIR fully explain, with citations, the Project impacts to starry flounder, CA bay shrimp, and Central CA roach.
Chapter 12-12.3.3.2 Impacts of the Project Alternatives on Fish and Aquatic Resources, Tables 12-6 through 12-9	12-51	Tables 12-6 through 12-9 separate acoustic impacts by intake and are difficult to compare between DEIR alternatives, because each alternative includes multiple intakes.	CDFW recommends that the EIR include a discussion that considers total impacts associated with each alterative, then compares each alternative to the others to better illustrate large scale differences among alternatives in addition to the discussion of impacts related to individual intakes.
Chapter 12- Impact AQUA-1: Effects of Construction of Water Conveyance Facilities on Fish and Aquatic Species, Construction	12-56	The impacts of methylation of mercury, as sediment is disturbed, is not included in the DEIR as a construction impact.	CDFW recommends that the EIR include the methylation of mercury within Impact AQUA-1 and assess the potential impacts from the methylation of mercury.

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Chapter 12- Impact AQUA-1: Effects of Construction of Water Conveyance Facilities on Fish and Aquatic Species, Construction	12-57	Depending on the timing of withdrawals, changes to surface waters because of construction, may impact native fish.	CDFW recommends that the EIR evaluate the timing of withdrawals of surface water for construction to identify whether the EIR alternatives will impact native fish.
Chapter 12- Impact AQUA-1: Effects of Construction of Water Conveyance Facilities on Fish and Aquatic Species, Construction	12-58	The increased water temperature section does not discuss whether removed trees will be restored post-construction. Large riparian vegetation provide shade and help reduce water temperatures along channel margins.	CDFW requests that the EIR include a discussion or reference for restoration of riparian habitats post-construction within this section.
Chapter 12- Impact AQUA-1: Effects of Construction of Water Conveyance Facilities on Fish and Aquatic Species, Construction	12-59	It is unclear what is meant by “temporary” channel margin impacts. In the above section on increased water temperature, there is discussion about the removal of riparian habitat. This would not be considered “temporary” as the riparian habitat is unlikely to restore itself once construction is completed, and even if restored, will take some time to achieve pre-Project conditions.	CDFW requests that the EIR clarify what would be considered "temporary" in this context.
Chapter 12- Impact AQUA-1: Effects of Construction of Water Conveyance Facilities on Fish and Aquatic Species	12-62	The conclusion presented for Impact AQUA-1 provides insufficient detail to ascertain how it relates to the thresholds of significance, the specific impact mechanisms, and to “focal” species. Additionally, it is difficult to tell how impacts differ between the alternatives.	CDFW recommends that the EIR include a chart or other means to better disclose for the reader the scale or scope of the construction impacts of the Project, under the different alternatives.
Chapter 12- Impact AQUA-1: Effects of Construction of Water Conveyance Facilities and Fish and Aquatic Species, CEQA Conclusion	12-62	The DEIR states "The in-water work period varies depending on location/activity but is generally from June to October" (p.62). This in-water work window does not sufficiently address Chinook salmon races occurring in the Sacramento River Basin. Fall-run Chinook adults occur in the Sacramento River starting in July. Winter-run juveniles can emigrate through the lower Sacramento River generally starting in October, but as early as September.	CDFW recommends that the EIR acknowledge the potential for impacts to Chinook salmon races within the in-water work window and provide an analysis and mitigation plan for those potential impacts.
Chapter 12- Mitigation Measure AQUA-1a: Develop and Implement an Underwater Sound Control and Abatement Plan	12-63	The definitions for sound pressure level thresholds vary through the DEIR and some of the terms are not well described for the reviewer.	CDFW recommends that the sound pressure level thresholds be consistent throughout the EIR and explained in detail.

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Chapter 12- Mitigation Measure AQUA-1a: Develop and Implement an Underwater Sound Control and Abatement Plan	12-63	The DEIR defers the development of specific enforceable minimization measures to decrease pile driving impacts to a later date. As a result, it is unclear how protective these actions will be.	CDFW recommends that the EIR include specific enforceable measures to ensure the Project will not have significant impacts to special-state species. CDFW recommends including the following measures (1) specifying that the monitoring will be conducted by a NMFS/USFWS/CDFW approved fisheries monitor that is trained in fish behavior/biology/presence and timing concerns. If distress or injury result, CDFW suggests that the incident be reported to CDFW; (2) scheduling work for seasonal periods to avoid more sensitive life stages (i.e., eggs, larvae, and downstream migrating juveniles) that have no or limited capacity to avoid work areas; and (3) conduct monitoring that will detect signs of distress for fish.
Chapter 12- Mitigation Measure AQUA-1b: Develop and Implement a Barge Operations Plan	12-64	The DEIR defers the development of specific enforceable minimization measures to decrease barge impacts to a later date, making it unclear how protective these actions will be.	CDFW recommends that the EIR includes specific enforceable measures to ensure the Project will not have significant impacts to special-status species. CDFW recommends the EIR include the following measures (1) daily inspection and cleaning of barges to prevent the spread of invasive aquatic species; (2) if invasive aquatic vegetation is established near the construction site, DWR shall implement invasive plant control methods to prevent the spread of invasive aquatic plants during construction; (3) implementation of a process and timeline to avoid blockage if barges breakdown.
Chapter 12- Mitigation Measure AQUA-1b: Develop and Implement a Barge Operations Plan, All Project Alternatives, Performance Measures, Bank Erosion and Riparian Vegetation Loss	12-67	The DEIR indicates that barge work may cause erosion to the streambank and potentially significant impacts to the streambank and riparian habitat; however, the DEIR does not propose mitigation to decrease the impact to less than significant.	CDFW recommends that the EIR fully analyze the potential impacts and propose appropriate mitigation of those impacts, if found to be significant.
Chapter 12- Mitigation Measure AQUA-1c: Develop and Implement a Fish Rescue and Salvage Plan, Seining and Dip netting	12-70	The DEIR does not discuss development of site-specific plans with appropriate techniques to remove fish from work areas prior to seining and dip netting.	CDFW requests that prior to conducting seining and dip netting, that DWR develop a site-specific plan in consultation with CDFW and federal fisheries agencies to identify appropriate techniques to remove fish from work areas.

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Chapter 12- Mitigation Measure AQUA-1c: Develop and Implement a Fish Rescue and Salvage Plan, Electrofishing	12-70	The DEIR Mitigation Measure AQUA-1c does not commit to developing a dewatering and contingency plan minimization measures to protect aquatic resources during dewatering and fish rescue and salvage operations.	CDFW recommends the EIR include a dewatering and contingency plan that addresses measures to protect aquatic resources during dewatering and fish rescue and salvage operations. Measures should include having a designed fisheries biologist onsite and installing a fish screen, not to exceed 3/32 inches measured diagonally, around temporary water diversion pumps, consistent with NMFS (2017) and NMFS (2022) criteria for screen openings.
Chapter 12- Impact AQUA-1: Effects of Construction of Water Conveyance Facilities on Fish and Aquatic Species, Mitigation Impacts, Compensatory Mitigation	12-72	Mitigation Measure AQUA-1, compensatory mitigation impact summary does not include riparian and marshland habitat.	CDFW recommends that the EIR Mitigation Measure AQUA-1, compensatory mitigation summary include a discussion of the riparian and marshland habitat that is being proposed as mitigation for construction impacts.
Chapter 12- Impact AQUA-1: Effects of Construction of Water Conveyance Facilities on Fish and Aquatic Species, Mitigation Impacts, Compensatory Mitigation	12-73	The DEIR does not provide information regarding potential mitigation sites or types of sites that will be selected to implement the proposed mitigation.	CDFW recommends that the EIR include information regarding potential sites or types of sites selected for the proposed mitigation. This is important to providing an understanding of the feasibility of proposed mitigation measures.
Chapter 12- 12.3.3.2, Impact AQUA-2; Near-Field Effects	12-74	The DEIR lacks information regarding near-field effects of operations of the NDD on biofouling/debris loading as well as increased in-water structures (screens, refugia habitat, debris booms and pilings, increased artificial lighting, and increased SAV and FAV), all of which can increase predation risk by providing predator holding habitat.	CDFW recommends the EIR include analyses of the near-field effects of operations of the North Delta Diversion on biofouling/debris loading as well as increased in-water structures to better account for increased predation risk.
Chapter 12- 12.3.3.2, Impact AQUA-2; Near-Field Effects, North Delta Exports	12-74	The DEIR does not fully consider variation in the number of migrating individuals that would be passing the north Delta intakes. In 30-40% of years, when the Yolo Bypass is not inundated, the entire juvenile migrating winter-run Chinook salmon population would pass the NDD. It is likely that under climate change conditions, a larger proportion of the population of juveniles will be exposed to the NDD due to a reduction in Yolo Bypass inundation.	CDFW recommends the EIR clearly state the exposure risk of juvenile Chinook salmon at the NDD in terms of the proportion of the population exposed each year. CDFW recommends the EIR provide adequate mitigation for the migration of juvenile winter-run Chinook Salmon that remain in the mainstem of the Sacramento River and pass by the north Delta intakes.

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Chapter 12-12.3.3.2, Impact AQUA-2; Near-Field Effects	12-74	The DEIR does not include a discussion of potential changes in predator abundances and rates of predation on native fish populations as a part of the near-field effects of the NDD.	CDFW recommends the EIR include an analysis of increased predator abundance and rates of predation on native fishes near the NDD, and that predation risk be considered when refining operational criteria and NDD intake design to minimize near-field effects of the NDD.
Chapter 12- 12.3.3.2, Impact AQUA-2; Near-Field Effects; Tables 12-14 through Table 12-16	12-75 12-76	The DEIR does not include sufficient discussion to enable the reader to understand the implications of the results in Tables 12-14 through 12-16. It is not clear how to interpret results in relation to water surface elevation. For example, does Table 12-15 imply that when flows exceed 50% of the average (50% column), the screens will be in the upper water column 100% of the time (each month)? Is the idea that during higher flows, fish will be even higher than the screens and therefore less impacted by screen exposure? Table 12-16 is also difficult to interpret. For example, why can the screen at Intake C be in the lower position more frequently than at Intakes A or B?	CDFW recommends providing more information on how to interpret the results from Tables 12-14 through 12-16 so that CDFW and other users of the EIR can better understand the Proposed Project NDD intake configurations and consequent impacts.
Chapter 12-12.3.3.2, Impact AQUA-2; Near-Field Effects	12-78	The DEIR does not clarify the relationship between sweeping velocity and the critical streakline concept. It is unclear whether a fish that is on the intake side of the streakline would be able to navigate to the other side, or whether the approach velocity would be stronger than the sweeping velocity due to the flow of water being towards the intakes.	CDFW recommends that the EIR include more discussion of the relationship between sweeping velocity and the critical streakline concept. Additional detail should be provided to explain whether it is possible for a fish that is on the intake side of the streakline to be able to navigate to the other side.
Chapter 12- 12.3.3.2, Impact AQUA-2; Near-Field Effects	12-78	The DEIR potentially underestimates screen exposure time for juvenile Chinook salmon. Estimated fish exposure totaling 37.5 minutes should be considered with caution given that this assumes fish move downstream with flow (e.g., do not resist flow). This assumption does not apply well to juvenile Chinook salmon, which are known to resist downstream movement by facing into the direction of flow (Swanson et al. 2004). This behavior can result in a longer transit time than downstream flow, meaning that the estimated 37.5 minutes might be an underestimate of fish exposure.	CDFW recommends that the EIR, when discussing screen passage time, consider the direction which juvenile Chinook salmon swim when migrating. Fish exposure totaling 37.5 minutes should be considered as potentially underestimating passage time.

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Chapter 12- 12.3.3.2, Impact AQUA-2; Near-Field Effects; Table 12-17	12-79	Table 12-17 includes several confusing elements:1) The "Diversion Flow by Intake (cfs)" column does not clearly identify total maximum diversions under the intake combinations identified. For example, instead of saying 6,000 cfs for B&C combined, it says 3,000 cfs for B&C. This wording could confuse readers not familiar with the Project, implying total diversions only add up to 3,000 cfs. 2) The "Notes" column does not reflect the diversion rate modeled under the associated Freeport Flow.3) Information regarding the differences between assumptions for the model runs 5B, 5C, and 5D is important context, but is not provided.	CDFW recommends splitting the column "Diversion Flow by Intake (cfs)" in Table 12-17 to show intakes B and C each with means of 3,000 cfs (or 1,000 cfs) for each intake, for a total of 6,000 cfs (or 2,000 cfs) diversion flow. CDFW also recommends including the differences between the modeling scenarios 5B, 5C, and 5D and discussing why they were not modeled at different diversion rates like the other Freeport Flow scenarios. Finally, CDFW recommends including additional model results for tidally varying flows to better understand how tides influence operations at the NDD.
Chapter 12- 12.3.3.2, Impact AQUA-2; Near-Field Effects; Tables 12-18 through 12-22	12-80 through 12-86	The DEIR does not provide sufficient information to interpret the results found in Tables 12-18 through 12-22. Table 12-22 implies that the greatest frequency of NDD operations would occur during low Freeport flow conditions. Table 12-22 also shows different NDD diversion scenarios under different Freeport flows and has a scenario of 0 cfs for NDD diversion.	CDFW recommends that the EIR provide more information to support Tables 12-18 through 12-22, including a discussion on how to interpret the data presented. Results presented in Table 12-22 could be interpreted to imply that the Proposed Project will operate more frequently under low flow conditions, which is inconsistent with other information in the DEIR about planned operations. It is unclear why under higher Freeport flow conditions, the NDD rarely operate, even during summer months. CDFW requests additional explanation to interpret these results considering the description of operations in Chapter 3 that states the NDD will divert in the winter months during excess conditions. Additionally, CDFW requests that the EIR include a discussion of when the NDD would be expected to divert no more than 0 cfs.
Chapter 12- 12.3.3.2, Impact AQUA-2; Operations and Maintenance - All Project Alternatives, Near-Field Effects, North Delta Exports	12-89	The DEIR states "Fisheries studies would be undertaken to provide information on predatory fish and predation rate at the north Delta intakes once they are operational, to inform the refinement of future operations and adaptive management (p. 89)." However, baseline conditions also need to be evaluated prior to construction as well as post construction (prior to operations and with operations).	CDFW recommends that the EIR include an evaluation of baseline conditions or commitment to establishing baseline prior to construction and post construction (prior to operations) in addition to post construction (with operations).

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Chapter 12- 12.3.3.2, Impact AQUA-2; Operations and Maintenance - All Project Alternatives, Near-Field Effects, North Delta Exports, Entrainment, and Impingement	12-90	The DEIR is missing an analysis on bow wave effects; a potential hydrologic effect caused by the displacement of some water around cylindrical t-screens, as diversions pull water into the intakes.	CDFW recommends the EIR include an analysis on the bow wave effect during proposed operations to better understand the hydrodynamic effect of the proposed NDD intake structures.
Chapter 12- 12.3.3.2, Impact AQUA-2; Operations and Maintenance - All Project Alternatives, Near-Field Effects, North Delta Exports, Predation	12-91	The DEIR references Demetras et al. (2013) when discussing potential juvenile salmonid predators in the Sacramento River near the proposed intake locations. However, the maximum diversion capacities of the two facilities in Demetras et al. (2013) are 70 and 100 cfs, much lower than the proposed 3,000-7,500 cfs NDD. Additionally, the environmental characteristics in the study differ (e.g., water depth and predator type) from those of the Proposed Project. The proposed NDD have higher water temperatures than the locations studied under Demetras et al. (2013). As water temperatures increase, the metabolic rate and activity level of predators increase, which can increase the level of predation at a site. Based on these factors, the analysis in the DEIR appears to underestimate the potential for predatory fish to gather near in-water manmade structures by comparing the NDD to smaller scale diversions.	CDFW recommends including a more thorough discussion of the differences between the NDD and the two facilities studied in Demetras et al. (2013), as these differences should be considered when applying them to the NDD.CDFW recommends the EIR commit to conducting pre- and post-construction studies near the intakes to assess the abundance of predatory fish near the in-water manmade structures. There is no diversion of comparable scale and size in the Delta. Thus, a study of the effect of large diversions on predator attraction is warranted.
Chapter 12- 12.3.3.2, Impact AQUA-2; Operations and Maintenance - All Project Alternatives, Near-Field Effects, South Delta Exports, Juvenile Entrainment	12-93	The DEIR states "The risk of winter-run Chinook salmon entrainment under existing conditions and all alternatives would be minimized by the inclusion of the various regulatory requirements from the existing permits noted above (e.g., take limits for number of winter-run Chinook salmon lost to entrainment at the south Delta export facilities) (p. 93)". However, it is unclear how these existing regulations will minimize future Project impacts currently shown as they were designed to minimize impacts from other projects.	CDFW recommends providing additional information to explain how existing regulatory requirements that were designed in the context of south Delta facility operations without the NDD will minimize potential Project impacts. It is unclear from the current analysis how measures at the south Delta will minimize the additional impacts that could occur due to the addition of the NDD. The EIR should consider means to minimize NDD entrainment of Chinook Salmon.
Chapter 12- 12.3.3.2, Impact AQUA-2; Operations and Maintenance Far-Field Effects, Indirect Mortality Within the Delta, Hydrodynamic Effects; Table 12-28	12-96	The DEIR is missing discussion regarding the results in Table 12-28 Mean Channel Velocity (feet per second) in the Sacramento River Downstream of Intake C.	CDFW recommends including a discussion of the results shown in Table 12-28 to help the reader interpret them. For example, why is the velocity in April not impacted to the extent that the rest of the months are by Proposed Project operations?

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Chapter 12- 12.3.3.2, Impact AQUA-2; Operations and Maintenance, Indirect Mortality Within the Delta, Through-Delta Survival, Table 12-30, and Table 12-31	12-101 through 12-104	Based on the results presented in Table 12-30 and Table 12-31 it is unclear if juvenile routing was separated for Sutter and Steamboat sloughs or if these two paths were assigned as one route. Perry et al. (2018) shows that as Sacramento River flows increase, a greater proportion of fish enter the sloughs. There is a higher likelihood that fish will enter Sutter Slough because it is north of Steamboat Slough. However, as flows decrease Sutter Slough has overall lower survival compared to Sacramento River and Steamboat Slough (Perry et al. 2018). Results from Perry et al. (2018) are particularly interesting in the context of Condition of Approval 8.9.2 of the 2020 SWP ITP that requires investigations into the use of guidance structures to help entrain juveniles into Sutter and Steamboat sloughs.	CDFW recommends the EIR thoroughly explain the assumptions included in the Perry et al. (2018) model. Specifically, please explain the assumptions regarding survival rates through Steamboat and Sutter sloughs. CDFW also requests that EIR include separate analysis of these sloughs to better understand how juvenile routing and survival would be impacted from reduced outflow because of Project operations.
Chapter 12- 12.3.3.2, Impact AQUA-2; Operations and Maintenance, Indirect Mortality Within the Delta, Through-Delta Survival, Tables 12-30, and Table 12-31	12-101 through 12-104	The DEIR is missing a discussion of the modeling results from Tables 12-30 and 12-31. Specifically, it is not clear what is driving minimum changes in through-Delta survival in the months of April and May.	CDFW recommends the EIR include a clear discussion of how Proposed Project operations are dictating minimum changes in through-Delta survival in April and May.
Chapter 12- 12.3.3.2, Impact AQUA-2; Operations and Maintenance, Indirect Mortality Within the Delta, Through-Delta Survival, Table 12-32	12-105	Table 12-32 is missing Delta Passage Model results presented by month and water year type. This presentation is needed to understand how juvenile through-Delta survival is expected to change during peak presence in the Delta. This comment also applies to Appendix 12C, Table 12C-10.	CDFW recommends the EIR include results of the Delta Passage Model (both for 2020 and 2040 scenarios) by month in addition to water year type to be consistent with how results are presented throughout the section "Through-Delta Survival."
Chapter 12- 12.3.3.2, Impact AQUA-2; Operations and Maintenance Far-Field Effects, Habitat Suitability, Riparian and Wetland Bench Inundation, Table 12-33 Mean Riparian and Wetland Bench inundation Index by Geographical Group, Season, and Water Year Type	12-108 through 12-114	The DEIR is missing a thorough discussion of modeling results. Specifically, why are there more frequent events of increased wetland bench inundation than riparian? Are increased diversions expected to make these areas more suitable by increasing the area with lower inundation? If so, this result is not intuitive given that the benefits are also incurred in drier water years when less flow would likely cause a more substantial negative impact (i.e., make the area less suitable).	CDFW recommends the EIR expand the discussion on modeling results presented in Table 12-33 Mean Riparian and Wetland Bench inundation Index by Geographical Group, Season, and Water Year Type. Specifically, text should address why there are more frequent events of increased wetland bench inundation than riparian.

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Chapter 12- 12.3.3.2, Impact AQUA-2; Operations and Maintenance Far-Field Effects, Habitat Suitability, Water Temperature	12-115	The DEIR is missing discussion in context of the effects of various climate change scenarios on water temperature in the Sacramento-San Joaquin Delta.	CDFW recommends framing this analysis in the context of the effects of various climate change scenarios on water temperature in the Sacramento-San Joaquin Delta. Multiple studies suggest water temperatures will rise in the Delta leading to an increase in high mortality days for listed species and a decrease in successful adult maturation and spawning.
Chapter 12- 12.3.3.2, Impact AQUA-2; Adult Straying	12-120	The statement that "hatchery fall-run Chinook salmon straying rates of fish returning to the Sacramento River are always low" (p. 120), does not accurately capture the findings of Marston et al. (2012). The study found that while average stray rates for Sacramento Basin fish released upstream from the Delta is <1%, the range was between 0% - 6%. While it is true that this is comparatively lower than for the San Joaquin Basin (average of 18%; range of 0% - 70%), the range indicates that there are some years in which stray rates are higher than others in the Sacramento River. It is also important to note that the stray rates used in this study do not account for the altered hydrology in the Delta due to the Proposed Project. Therefore, it is inappropriate to use this study to conclude that Sacramento Basin stray rates would remain relatively low given that the north Delta exports will reduce Delta inflow from the Sacramento River. Furthermore, the study clearly shows that San Joaquin River stray rates are negatively correlated with pulse flow magnitude and positively correlated with Delta exports. In other words, reduced flow is the primary factor resulting in increased stray rates.	CDFW recommends that the EIR revise the text to reflect the conclusions in Marston et al. (2012) pertaining to Sacramento River Chinook salmon straying rates and the influence of reduced flows on increased stray rates. The EIR should also include a discussion of how returning adult salmonids find their way back to spawning grounds using a combination of olfactory and velocity/discharge cues (Keefer et al. 2006). It should also note that reduced flows in the Sacramento River because of the Project could be associated with a reduction of these cues, and subsequently increased straying. CDFW requests that the EIR include a flow change analysis for Sacramento River flows at Freeport during the period of adult upstream migration to better understand potential straying rates for adult salmon. Additionally, the EIR should include a discussion on the potential for increased straying into the Yolo Bypass because of the Project. It is hypothesized that tidal action provides attraction flows into the Yolo Bypass during non-flood periods, and that low Sacramento River flows amplify this by decreasing attraction to the main stem Sacramento River for adults passing through the North Delta (Gahan et al. 2016).
Chapter 12- 12.3.3.2, Impact AQUA-2; Riparian and Wetland Bench Inundation	12-106	The DEIR does not provide a clear description of whether there is other "unrestored" (e.g., natural) juvenile rearing habitat that would be impacted by the Project.	CDFW requests that the EIR describe whether there is additional juvenile rearing habitat (other than restored benches) that would be impacted by the Proposed Project. If so, additional analyses should be conducted, so that potential impacts to all juvenile rearing habitat are assessed.

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Chapter 12- 12.3.3.2, Impact AQUA-2; Riparian and Wetland Bench Inundation	12-106	In the DEIR's bench inundation analysis, the suitability of bench habitat is based entirely off the suitable depth criteria for juvenile winter-run Chinook salmon from USFWS (2005). Typically, approximation of suitable juvenile rearing habitat includes a velocity component as well. If water depth is suitable but velocities are too high, juveniles are unable to utilize the habitat for rearing. Additionally, the analysis represents bench habitat in only one dimension (length). Juvenile rearing habitat should be quantified as an area, given that fish will theoretically utilize the habitat along its entire length and width, as long as it meets whatever criteria you have specified (in this case, suitable depth).	CDFW recommends that the EIR either justify the exclusion or include the use of a suitable velocity criteria in the calculation of bench inundation indices. Additionally, the EIR should either justify why using length only (and not width as well) is appropriate for this analysis or include a width dimension for the calculation of bench habitat indices and mitigation calculations.
Chapter 12- 12.3.3.2, Impact AQUA-2; Riparian and Wetland Bench Inundation, Table 12-34	12-106; 12-115	The text in the DEIR provides percent differences relative to existing conditions for changes in bench inundation, but Table 12-34 only provides changes in linear feet. It is difficult to understand where the greatest percent change in bench inundation is located without having data presented as percent change.	CDFW requests that the EIR express the difference from existing conditions of bench lengths provided in Table 12-34 as percent differences.
Chapter 12- 12.3.3.2, Impact AQUA-2; Operations and Maintenance, Life Cycle Modeling, Table 12-43. OBAN Winter-Run Chinook Salmon Escapement Results	12-123	It is unclear how to interpret the OBAN modeling results in Table 12-43, as the DEIR-mentions median abundance in the discussion but shows mean escapement in the tables.	CDFW recommends including discussion to help the reader-interpret OBAN modeling results in Table 12-43. Additionally, CDFW recommends including results broken down by water years to serve as a comparison with the IOS results. CDFW also recommends including OBAN results for egg to juvenile survival for comparison with the IOS results provided.
Chapter 12- 12.3.3.2, Impact AQUA-2; Operations and Maintenance, Maintenance Effects	12-125	The DEIR is missing an analysis of impacts because of woody debris removal at each intake for long-term maintenance and associated mitigation. Removal of woody debris may impact species by eliminating cover, potentially increasing localized water temperatures, and or decreasing food sources.	CDFW recommends including analysis of impacts because of woody debris removal at each intake and mitigation for those impacts.

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Chapter 12- 12.3.3.2, Impact AQUA-3; Operations and Maintenance	12-132	The DEIR is missing a thorough discussion and/or analysis of the risks of impingement and increased predation for spring-run Chinook salmon at the NDD. Although spring-run size distribution may be larger than winter-run Chinook salmon, there is still a risk of impingement and predation the NDDs.	CDFW recommends including a thorough discussion and analysis of risks of impingement and increased predation for spring-run Chinook salmon at the NDD.
Chapter 12- 12.3.3.2, Impact AQUA-3; Operations and Maintenance	12-132	Table 12-48 should display data by month and water year type as opposed to total average for the water year only. Assessment of the results by water year type and month will provide greater clarity on potential impacts to spring-run Chinook salmon survival. Specifically, it is not clear why only Alternatives 2b and 4b show variation in the change of through-Delta survival in wet and below normal water year types when all other year types and Alternatives show the same change in survival irrespective of diversion capacity. Through-Delta survival is generally understood to be strongly influenced by flow through the Delta and the insensitivity of these results to variation in diversion rates is difficult to understand (Singer et al. 2020; Cordoleani et al. 2018). Additionally, modeling results and model uncertainty are not thoroughly discussed making it hard for the reader to understand what is driving some of these results.	CDFW recommends including results broken down by month and water year, consistent with results provided for winter-run Chinook salmon. This comment applies to Tables 12-48, 12-49, 12-50, and 12-51.CDFW also recommends including a thorough discussion of modeling results to help readers understand what is driving the results presented.
Chapter 12- 12.3.3.2, Impact AQUA-3; Operations and Maintenance; Table 12-51	12-134	Table 12-51 shows changes in through-Delta survival of spring-run Chinook salmon originating in the San Joaquin River, where survival is historically very low. Slight changes in the San Joaquin survival rate (as noted in the table with the same absolute values but different percent change values) can impact through-Delta survival to a much greater extent. It would be helpful to see more decimal places and results broken down by month and water year type.	CDFW recommends the EIR display through-Delta survival results with a greater number of significant digits so that small, yet potentially biologically significant, impacts can be identified and mitigated.

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Chapter 12- General comment on non-CESA listed species impacts	Multiple	The DEIR states that operation and maintenance effects will be less than significant for non-CESA/ESA listed special status species. However, the DEIR only utilizes the Salvage-Density Method to determine whether operations and maintenance activities will impact non-CESA/ESA listed special status species and does not analyze far-field impacts (e.g., aquatic weed establishment, decreased riparian habitat, decreased stream width) to non-CESA/ESA listed special status species.	CDFW recommends that the EIR analyze far-field effects to non-CESA/ESA listed special status species and develop specific enforceable measures to decrease all significant impacts to less than significant.
Chapter 12-12.3.3.2, Impact AQUA-6, Operations and Maintenance -All Project Alternatives, North Delta Exports	12-155	The DEIR states "The low population abundance of Delta smelt in recent years suggest that few Delta smelt would be exposed to potential near-field effects of the north Delta diversion intakes, including entrainment, impingement, predation, and upstream passage restriction" (p. 155). This species' extremely low abundance warrants very careful consideration of potential Project impacts. In addition, the discussion provided in this section has not addressed if the trend will continue after ongoing experimental releases of cultured Delta smelt.	CDFW recommends incorporating an analysis which establishes assumptions of Delta Smelt supplementation into the EIR to better address impacts of the Proposed Project on Delta smelt population abundance with hatchery supplementation.
Chapter 12- 12.3.3.2, Impact AQUA-6, Operations and Maintenance -All Project Alternatives, North Delta Exports, Upstream Migration effects and Predation	12-156, 12-157	The DEIR states "…the cylindrical tee fish screens and their associated manifolds, as well as the support piles for the log boom structure may provide velocity refuge for upstream migrating adult Delta smelt occurring near the intakes, thereby reducing the extent of the potential negative effect" (p.12-156,157). This language conflicts with the description of a bow wave effect stated on pg. 12-90; no explanation is provided addressing why bow waves would deter salmonids but provide a refuge for Delta smelt.	CDFW requests that the EIR clarify whether the hydraulic effects will provide refuge, or deter fish, and provide further analysis of the effect in Appendix 12b.11

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Chapter 12- 12.3.3.2, Impact AQUA-6, Operations and Maintenance -All Project Alternatives, North Delta Exports, Entrainment, and Impingement	12-159	Smelt eggs are demersal and adhesive, but their risk of entrainment depends upon what substrate they were spawned over. If spawned over a fixed substrate, then the risk of entrainment for eggs is zero, as long as they were not mechanically displaced (e.g., scoured off by high flows). If spawned on a sand substrate, they might be subject to suspension at higher flows. Smelt larva are demersal but swim into the water column to feed, and thus would be vulnerable to entrainment if hatched upstream on the same side of the river as the diversions (or were transported by flow to the same side as the diversions).	CDFW recommends that the EIR include language that acknowledges that eggs may have reduced entrainment risk relative to other life stages, but are still at risk of entrainment, depending on the substrate over which they are spawned.
Chapter 12- 12.3.3.2, Impact AQUA-6, Operations and Maintenance -All Project Alternatives, North Delta Exports, Entrainment, and Impingement	12-160	In discussing Entrainment and Impingement risk (Impact Aqua-6) the DEIR estimates the overall Delta smelt population exposed to the North Delta Diversion. The DEIR should recognize that climate change will likely result in rising sea level and salinity intrusion, which could expose a greater proportion of the Delta smelt population to the effects of the NDD in the future if X2 is shifted east.	CDFW recommends that the EIR acknowledge that rising sea level and salinity intrusion may affect the number Delta smelt that could be exposed to the effects of the NDD.
Chapter 12- 12.3.3.2, Impact AQUA-6, Operations and Maintenance -All Project Alternatives, North Delta Exports, Entrainment and Impingement, Table 12-88	12-160	The data presented in Table 12-88 is difficult to interpret. It is unclear how "minimum percent" is defined, and subsequently, how it defines the additional percentiles listed.	CDFW recommends that the EIR include a table listing the minimum percentiles for each month.
Chapter 12- 12.3.3.2, Impact AQUA-6, Operations and Maintenance -All Project Alternatives, Habitat Effects, Food Availability	12-167	The DEIR does not explain why less outflow is needed for meeting Delta salinity requirements under the Project alternatives. It is CDFW's understanding that south Delta exports would not be reduced to compensate for increased diversions from the north.	CDFW recommends that the EIR clarify whether the south Delta exports will or will not be reduced to compensate for increased diversions from the north. If south Delta exports will not be reduced CDFW recommends that the EIR explain why less outflow would be needed for meeting delta salinity requirements under the Project alternatives.
Chapter 12- 12.3.3.2, Impact AQUA-6, Operations and Maintenance -All Project Alternatives, CEQA Conclusions	12-179	While the north Delta intakes could result in a low percent reduction in sediment entering the Delta, even this small change could be impactful because sediment increases turbidity which is an important Delta smelt habitat attribute.	CDFW recommends further discussion on resuspension of sediment and the effect of available habitat for Delta smelt.

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Chapter 12- 12.3.3.2, Impact AQUA-7, Operations and Maintenance -All Project Alternatives, South Delta Exports	12-189	The DEIR notes that overestimates of Longfin smelt entrainment loss are only likely to occur in very wet years. However, Longfin smelt entrainment loss would likely be underestimated in dry years, as most fish are in Suisun and upstream regions and not in the bay. Impacts from the underestimate of Longfin smelt entrainment are further compounded by poor survival in drier years. Additionally, the DEIR did not include an analysis describing variation in downstream habitat suitability with changes in flow caused by Project operations. There is the potential for the Project to reduce downstream habitat suitability by reducing Delta outflow and thereby increasing salinity above levels that larval Longfin smelt can tolerate.	CDFW recommends that the EIR include language acknowledging that Longfin smelt entrainment loss is likely underestimated in drier years. Additionally, the EIR should include a detailed analysis assessing variation in downstream habitat suitability with changes in flow caused by Project operations.
Chapter 12- 12.3.3.2, Impact AQUA-7, Habitat Effects, Delta Outflow - Abundance	12-195	In 2019, CDFW considered DWR's application of the Nobriga and Rosenfield (2016) Longfin Smelt flow abundance model (Rosenfield 2020). The same model approach is used here in the DEIR. The model used in the DEIR, presents violin plots which include the variability of all factors that affect Longfin Smelt abundance (in addition to Delta outflow) and, as a result, do not provide a true comparison of flow scenarios. Additionally, changes in flow result in disproportionate changes in the modeled indices. Thus, the application of this model is not appropriate as prediction error is high, and the model consistently underestimates the FMWT index.	CDFW requests that the EIR address previous critiques of the model application by comparing alternatives for each run rather than all runs for each alternative. Additionally, results should be presented as a proportion of change in modeled indices for each run and should provide a full discussion of the uncertainty associated with the results.

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Chapter 12- Impact AQUA-11: Effects of Operations and Maintenance on Water Conveyance Facilities on Native Minnows (Sacramento Hitch, Sacramento Splittail, Hardhead, and Central California Roach)	12-214	The statement made in the DEIR is true, but only in wet years. Additionally, the contribution of reproduction in the Sutter Bypass can be sizable (Feyrer et al. 2005) and reproduction above the north Delta intakes is sizable as well, particularly as water levels decline in spring (Feyrer et al. 2005). Although young-of-the-year are recognized to move downstream at 25-50 mm, this may be a function of gear selectivity; larvae are also dispersed from floodplains (Baxter et al.1996) in the 7-12 mm range (Baxter unpublished). Also, historical USFWS beach seining shows substantial age-0 densities (the bulk of the catch) upstream of proposed north Delta intakes in 3 of 6 years investigated and these fish only represent those >=25 mm (Sommer et al. 1997), even though splittail <25 mm are caught (historically, records of some <25 mm splittail remain in the USFWS database; a 25 mm minimum size was implemented in the 1990s to speed field and lab identification). Splittail of all ages tend to be edge oriented, which would put them in proximity to shoreline or nearshore intakes (Baxter unpublished).	CDFW recommends revising splittail effects to include the likelihood of periodic events where larval and small juvenile splittail are encountering the proposed north Delta intakes. If screen porosity and approach velocities are as specified, entrainment and impingement should not have large effects.
Chapter 12- Impact Aqua-13: Effects of Operations and Maintenance of Water Conveyance Facilities on Northern Anchovy	12-222	Northern anchovy distribution in the upper estuary will likely be affected by reduced food availability (see Kimmerer 2006) in some water year types as noted in Table 12-0.	CDFW recommends that the EIR acknowledge and analyze this potential impact.
Chapter 12- Impact Aqua-13: Effects of Operations and Maintenance of Water Conveyance Facilities on Northern Anchovy	12-222	Citation should be Fleming 1999 rather than Baxter 1999.	CDFW requests that the EIR revise the citation.
Chapter 12- Impact Aqua-14: Effects of Operations and Maintenance of Water Conveyance Facilities on Striped Bass Impact Aqua-14: Effects of Operations and Maintenance of Water Conveyance Facilities on Striped Bass	12-224	To be consistent with previous text (e.g., salvage density results pg. 12-223, lines 39-40), this sentence should acknowledge that results indicate similar or negative effects on survival and abundance for all alternatives.	CDFW recommends that the EIR revise the text for consistency and cumulative effects.

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Chapter 12- Impact Aqua-14: Effects of Operations and Maintenance of Water Conveyance Facilities on Striped Bass	12-227	The conclusions presented in AQUA-14, generally acknowledge lower entrainment under Project alternatives. However, the conclusions do not acknowledge that the results also show generally lower survival or abundance.	CDFW recommends acknowledging lower survival and abundance for consistency and cumulative effects.
Chapter 12- Impact AQUA-15: Effects of Operations and Maintenance of Water Conveyance Facilities on American Shad	12-230	American shad are broadcast spawners so their larvae have a high chance of being entrained through the fish screens and removed from the Sacramento River, which would have impacts to the system and the species.	CDFW recommends that the EIR more thoroughly analyze American shad larval impacts.
Chapter 12- Impact Aqua-15: Effects of Operations and Maintenance of Water Conveyance Facilities on American Shad	12-231	The conclusions presented in AQUA-15, correctly acknowledge little difference in abundance between Project alternatives and existing conditions, but do not acknowledge that all those differences are negative.	CDFW recommends revising the EIR conclusions presented in AQUA-15 to point out consistently negative differences in abundance indices between existing conditions and project alternatives.
Chapter 12- Impact AQUA-16: Effects of Operations and Maintenance of Water Conveyance Facilities on Threadfin Shad	12-235	Threadfin larvae could potentially be entrained in Project intakes, which could adversely impact juvenile salmonids, as they are a food source.	CDFW recommends that the EIR discuss and analyze the potential for threadfin larvae entrainment into the Project intakes, as this could impact juvenile salmonids.
Appendix 12A- 12A.1 Fish and Aquatic Resources	12A-1	The DEIR states that the rationale to include species for description is that they were dealt with in previous env. documents. This seems like a citation/source of information, not a rationale for inclusion.	CDFW recommends revising the EIR to include species for description because of one or more of the following rationale:1) survival or abundance of one or more life stages is linked to a measure of flow,2) one or more life stages is known to be entrained or anticipated to be entrained in planned or current export facilities, or3) species that are listed or candidate for Threatened or Endangered Species status.

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Appendix 12A- 12A.1.1 Delta Smelt	12A-2	To this point in the section there has been no mention that Delta smelt are batch spawners capable of repeatedly spawning in a single spawning season, nor what proportion of females achieve spawning size through the spawning season.	CDFW recommends the EIR include: 1. additional text describing batch spawning and the potential for Delta smelt to spawn repeatedly during the spawning season if water temperatures remain in the range of about 9-18°C.; 2. that a sizable portion of the population achieves spawning size prior to the start of spawning, usually February; most achieve spawning size by March and all by April; 3. some mention should be made that females spawning in February could be prepared to spawn again in March or April. That all females achieve spawning size by April indicates that all are likely to spawn successfully at least once (Damon et al. 2016).
Appendix 12A- 12A.1.1 Delta Smelt	12A-2	Spring Kodiak Trawl begins in December to document Delta smelt distribution prior to high winter flows, smelt pre-spawning movements, and high exports which could increase risk of entrainment.	CDFW recommends that the text in the EIR be corrected to state that Spring Kodiak Trawl begins in December.
Appendix 12A- 12A.1.1 Delta Smelt	12A-3	Bennett et al. (2002) is a better citation for larval and juvenile depth distribution.	CDFW recommends using Bennett et al. (2002) as a reference.
Appendix 12A- 12A.1.1 Delta Smelt	12A-3	The text does not begin by explaining the primary reason for the high frequency of zeros.	CDFW recommends stating that a large number of zero catches occurs primarily because Delta smelt aggregate into relatively tight schools located in large areas of open water (Polansky et al. 2018).
Appendix 12A- 12A.1.1 Delta Smelt	12A-6	The DEIR states "Delta smelt are most vulnerable to entrainment at the SWP and CVP pumps when, as adults, they move from upstream into the central/southern Delta or as larvae, when they move from fresh water in the southern and central Delta downstream into the west Delta and Suisun Bay/Marsh" (p.12A-6). This is not quite the correct description for Delta smelt entrainment.	CDFW recommends: 1. Remove the 1st “from" in line 25, to read: "…they move upstream into the central/southern Delta…". 2. Revise the text to note that as larvae, Delta Smelt are most at risk as soon as they hatch until they successfully migrate west, not just during the movement.
Appendix 12A- 12A.1.1 Delta Smelt	12A-8	Unpublished gear comparisons from the 1990s onward and more recent gear evaluation work confirm primary, not exclusive, surface orientation of Delta smelt from about 30 mm (see Mitchell et al. 2017). Juvenile, sub-adult and adult fish move laterally (and vertically) with the tides to reposition or maintain	CDFW recommends changing the language to reflect results in published research, with associated citations.

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		position longitudinally in the estuary (Bennett and Burau 2015).	
Appendix 12A- 12A.1.2 Longfin Smelt	12A-21	Catchability may be a minor issue, because for most of the estuary light penetration is limited to the upper 2-3 m, particularly when longfin smelt are present. Rosenfield and Baxter (2007) do not mention any biases. Differences in catches between Mid Water Trawl (MWT) and Otter Trawl (OT) reflect differences in fish distribution and net deployment (MWT doesn't get to channel bottom or remain there long; OT does on both accounts). Lastly, CDFW does not understand what is meant by the DEIR stating "...used in surveys that suffer from mismatches in location and timing with the longfin smelt spawning season (Mahardja et al. 2017)" or this statement's relation to detection bias.	CDFW recommends that this section be revised as the implication is that the surveys are doing as poor job of capturing Longfin smelt due to a mismatch in locations and timing. CDFW does not believe Mahardja et al. 2017 supports this statement. CDFW recommends elaborating on this statement in the EIR or consider removing it.
Appendix 12A- 12A.1.3 - Winter-Run Chinook Salmon -Sacramento River ESU, Figure 12A-6	12A-22	Data from 2019 and 2020 was included in Figure 12A-6 in the DEIR, but not data from 2021.	CDFW recommends that the EIR include data from 2021 in Figure 12A-6.
Appendix 12A- 12A.1.3 - Winter-Run Chinook Salmon -Sacramento River ESU	12A-22	The quoted sentence implies that predation is the leading cause of mortality for juvenile salmonids in the Delta.	CDFW recommends that the EIR include a more comprehensive description of the factors that lead to increased mortality in the Delta, alongside analyses (e.g., acoustic telemetry) that identify through-Delta survival across different environmental conditions.
Appendix 12A- 12A.1.3 - Winter-Run Chinook Salmon -Sacramento River ESU	12A-23	The DEIR misrepresents the timing of when juvenile winter-run Chinook salmon enter the Delta. Rotary screw trap (RST) data at Knights Landing has shown that juvenile winter-run Chinook salmon begin entering the Delta as early as August.	CDFW recommends that the EIR be revised to show that juvenile winter-run Chinook salmon have been documented entering the Delta as early as August, as shown by RST data at Knights Landing.
Appendix 12A- 12A.1.3 - Winter-Run Chinook Salmon -Sacramento River ESU	12A-25	The DEIR only mentions water temperatures impacting winter-run embryo incubation. However, high water temperatures in the Sacramento River are a stressor for all life stages of winter-run Chinook salmon.	CDFW recommends that the EIR include language acknowledging that high water temperatures affect all life stages of winter-run Chinook in the Sacramento River.
Appendix 12A- 12A.1.3 - Winter-Run Chinook Salmon -Sacramento River ESU	12A-26	The DEIR does not fully characterize the primary factors that contribute to redd superimposition and predation in the upper Sacramento River. Redd superimposition is associated with reduced availability of suitable spawning habitat (due to temperature and	CDFW recommends that the EIR include language acknowledging that superimposition is associated with reduced availability of suitable spawning habitat (due to temperature and flow), and increased predation is associated with increased temperatures

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		flow). Increased predation is associated with increased temperatures (Nobriga et al. 2021) and increased SAV/in-stream structures.	(Nobriga et al. 2021) and increased SAV/in-stream structures.
Appendix 12A- 12A.1.3 - Winter-Run Chinook Salmon -Sacramento River ESU	12A-26	Dudley (2018) indicates that flow varies on a daily basis, and this can obscure its effect on juvenile stranding on an annual basis. Daily analysis shows that the risk of stranding increases as flow decreases. Dudley (2019) indicates that higher flow rates increased the out-migrant count. Dudley (2019) does indicate high flows can open more shallow pools that would not normally be inundated. However, it is important to note that flows in the Sacramento River are highly managed and shallow pools can become stranding pools when flow releases from Shasta Reservoir are reduced. Dudley (2019) also indicates that the density of outmigrants may impact the relationship with flow (low densities - strong effect of flow).	CDFW recommends revising section 12A.1.3 for clarity and to ensure that the citations provided (e.g., Dudley 2019) fully support the information being conveyed.
Appendix 12A- 12A.1.3 - Winter-Run Chinook Salmon -Sacramento River ESU	12A-26	The statement "flow increases velocity, increasing spawner energy expenditure and thereby reducing the time spent guarding the redd, allowing other spawners to make redds on top of the existing redds" p.12A-26) is not validated by field observations. Additionally, this sentence mischaracterizes the occurrence of superimposition. Regardless of how long a female guards its redd (1 day vs 7 days), there is always the opportunity for redd superimposition due to limited available (and suitable) habitat.	CDFW recommends revising the EIR to acknowledge that there is always the chance for superimposition of redds, as available and suitable spawning habitat is severely reduced.
Appendix 12A- 12A.1.3 - Winter-Run Chinook Salmon -Sacramento River ESU, Table 12A-2	12A-27	Table 12A-2 presents the temporal occurrence of Sacramento winter-run Chinook salmon by life stage in the Sacramento River. Data in the table only reflects the temporal occurrence of winter-run Chinook salmon based on when monitoring programs are operational. This likely does not capture the full range of winter-run Chinook salmon occurrence, as sampling is often limited in the summer months (June-August) due to elevated temperatures and the need to reduce handling of species exposed to those conditions. Lack of sampling does not indicate no presence. When Knights Landing Rotary Screw Trap	CDFW recommends that Table 12A-2 be updated to show that some of these monitoring locations are not able to be surveyed each month, but that this does not indicate that there is no winter-run Chinook presence during these months. For example, when Knights Landing rotary screw trap sampling has occurred in August, juvenile winter-run Chinook were captured. Additionally, the table should be updated to reflect recent changes to catch data at the sampling sites shown in the table. Specifically, September and October (and possibly November) at Red Bluff Diversion Dam should be changed to

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		sampling has occurred in August, juvenile winter-run Chinook salmon were captured.	"High" based on the catch data, while a "Low" classification in August and September for Knights Landing should be shown in the table. As analyses included in Chapter 12 rely on the timing of species presence to understand impacts, it's important to update these tables to accurately depict exposure time.
Appendix 12A- 12A.1.12 Sacramento Splittail	12A-63	Developmentally, the young-of-the-year present in April (and many in May) are all larvae.	CDFW recommends adding "Larvae" to considerations of this section in addition to juveniles. Because larvae are small and shore oriented, they will be vulnerable to entrainment and impingement at NDDs. The addition of larvae will recognize that very small fish will be migrating too, at least in the April and May period.
Appendix 12A- 12A.1.12 Sacramento Splittail	12A-63	The citation for this Sommer et al. 2007 is not present in the literature cited. This citation will need to include an "a" to separate it from one that discusses the Pelagic Organism Decline.	CDFW recommends including the associated full reference.
Appendix 12A- 12A.1.20.2 Smallmouth Bass	12A-73	Section 12A.1.20.1 is missing information that is important to characterizing the role of smallmouth bass in the environmental setting: Introduced species (Dill and Cordone 1997). No distribution in the system: lower portions of main rivers (Moyle 2002). Distribution in Delta and lower rivers (see Brown 2000, Brown and Michniuk 2007, Seesholtz et al. 2004, May and Brown 2002). Citations not already present in "References (as applicable)" column.	CDFW recommends including the topics listed, along with their associated citations: 1) Introduced species (Dill and Cordone 1997). 2) No distribution in the system: lower portions of main rivers (Moyle 2002). 3) Distribution in Delta and lower rivers (see Brown 2000, Brown and Michniuk 2007, Seesholtz et al. 2004, May and Brown 2002). Citations not already present in doc listed column L.
Appendix 12A- 12A.1.21 California Bay Shrimp	12A-74	Commercial trawling is not allowed in Suisun Bay nor the Delta. From title 14 section 119 of California Code of Regulations: "Trawl nets may be used only in the portions of Districts 2 and 3 lying westerly of a projected straight line beginning at Point Edith on the south and extending through Buoy "6" to the shoreline on the north."	CDFW recommends revising statement to clarify that trawling is limited to Carquinez Strait west of Buoy 6.
Appendix 12A- 12A.2.2.2.2, Habitat Conditions and Environmental Stressors in Sacramento River Area	12A-82	The DEIR does not clarify whether floodplains are accessible from Red Bluff to Chico Landing. Additionally, no discussion is provided regarding Project impacts to weirs and the Sutter Bypass.	CDFW suggests including discussion of weirs and Sutter Bypass.

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Appendix 12B- 12B.1- Juvenile Chinook Salmon Screen Passage Duration	12B-2	The DEIR states "Water temperature was assumed to be 12° Celsius, consistent with “winter and spring” conditions noted by Swanson et al. (2004)" (p. 12B-2). Results for a range of temperature values are necessary to determine if temperature influences screen passage time.	CDFW recommends that the EIR include an analysis and discussion of how different temperature ranges may impact screen passage time for juvenile Chinook salmon so that potential impacts can be disclosed and mitigated as necessary.
Appendix 12B- 12B.2 Salvage-Density Method, Table 12B-2	12B-4	The DEIR is unclear on why the Salvage-Density Method shows increased juvenile Chinook salmon entrainment at CVP under Project alternatives. Increases in entrainment under this modeling approach are attributed to increases in exports.	CDFW recommends that the EIR include a more thorough discussion regarding the results of the Salvage-Density Method. It would be beneficial for the reviewer to understand why the Proposed Project results in entrainment increases at CVP in the spring.
Appendix 12B- 12B.3 Juvenile Winter-Run Chinook Salmon Salvage Based on Zeug and Cavallo (2014)	12B-51	The DEIR is unclear regarding whether the Zeug and Cavallo (2014) models only salvage or if both entrainment and salvage are being modeled. This is important as entrainment and salvage are two different things.	CDFW recommends updating the text of the EIR to clarify if only salvage is being quantified in the model or if both entrainment and salvage are being modeled.
Appendix 12B- 12B.3 Juvenile Winter-Run Chinook Salmon Salvage Based on Zeug and Cavallo (2014)	12B-52	Fish are released to coincide with high flow events, which is known to increase survival probability. Based on the description in the DEIR it is unclear on whether this timing is reflected in the model. The presented findings seem to result from larger fish surviving outmigration and the salvage process. This model does not account for far- field effects to determine if fish are observed in salvage under other conditions, nor does it consider or explain the effects of exports particularly during low flows. Additionally, it is unclear if operation of the Delta Cross Channel Gates is closely correlated to this parameter.	CDFW recommends that the EIR include a more thorough discussion of the predictor variable in the selected model. For example, fish are released to coincide with high flow events, which is known to increase survival probability. It is unclear if this potential bias is reflected in the model. Additionally, the model does not account for far-field effects to determine if fish make it to salvage under other flow conditions, nor does it consider or explain the effects of exports, particularly during low flows. These issues should be addressed in the EIR. Lastly, CDFW requests that the EIR state whether operation of the Delta Cross Channel Gates is closely correlated to this parameter.
Appendix 12B- 12B.3 Juvenile Winter-Run Chinook Salmon Salvage Based on Zeug and Cavallo (2014), Figure 12B-2	12B-54	Figure 12B-2 is difficult to visually interpret, as the box plots for each water year type are too small to discern differences between the alternatives.	CDFW recommends that the EIR provide separate figures for each water year type and make each box plot much larger.
Appendix 12B- 12B.4 Hydrodynamic Effects Based on DSM2-HYDRO	12B-56	Figures 12B-2 through 12B-42, presented in Appendix 12B, are incomprehensible to people who are red/green color blind.	CDFW recommends that these figures be updated, in the EIR, with changes shown along a different

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Data, Figure 12B-3 through Figure 12B-42			color scale (for example blue/red or blue/yellow or grey scale) to meet ADA compliance.
Appendix 12B- 12B.4 Hydrodynamic Effects Based on DSM2-HYDRO Data, Figure 12B-13 through Figure 12B-31	12B-61 through 12B-65	The DEIR does not explain why modeled DSM2-Hydro Velocity results are grouped as averages across a three-month increment. Based on the entrainment and loss tables included earlier in Appendix 12B, it would be helpful to have velocity results for December, January, and February separated out, as the earlier modeling results show little difference in December, only slight differences in January, and more frequently a difference in February. Combining all of these months together could make it difficult for the reviewer to understand the magnitude of potential changes to specific time periods during juvenile salmonid migration. Additionally, it is difficult to understand the magnitude of the change observed and the direction of the change in the figures.	CDFW requests that the EIR describe how the months for these averaging periods were chosen and suggests breaking the months out separately, as the magnitude of the potential changes to specific time periods during juvenile migration is harder to understand when the months are grouped, potentially leading readers to misunderstand the results. Additionally, CDFW recommends that the EIR include tables or other graphical presentation to accompany the figures presented in this section.
Appendix 12B- 12B.4 Hydrodynamic Effects Based on DSM2-HYDRO Data, Figure 12B-28 through Figure 12B-32	12B-68 through 12B-70	DSM2-Hydro velocity modeling results presented in Figures 12B-28 through 12B-32 appear to conflict with entrainment results (Salvage-Density Methods). The model results show little to no change in velocities in the south Delta between March and May across all water year types and Project alternatives. However, Salvage-Density Method results showed up to an 8% increase in winter-run and up to a 9% increase in spring-run Chinook salmon entrainment/loss at the CVP as compared to Existing Conditions.	CDFW requests that the EIR add a discussion that links velocity results to the entrainment modeling results. The velocity modeling results in the south Delta show no changes, however the Salvage-Density Method showed increase salvage at CVP. Clarification needs to be provided to explain how the results should be interpreted when considered together.
Appendix 12B- 12B.4.2- Flow into Junctions, Figure 12B-44	12B-78	The results presented in Figure 12B-44 box plots for each water year type would be easier to interpret if accompanied by tabulated data.	CDFW recommends presenting results from this section in a table to assist in the interpretation of the data.
Appendix 12B- 12B.5 Delta Passage Model	12B-96	The DEIR discussion of the Delta Passage Model does not clearly identify which position the Delta Cross Chanel Gates were modeled (i.e., open or closed).	CDFW recommends that the EIR include a discussion describing what position the Delta Cross Channel Gates were modeled in for the Delta Passage Model.
Appendix 12B- 12B.5 Delta Passage Model	12B-102	The DEIR is unclear whether the Delta Passage Model includes salvage (trucking) as an emigration	CDFW requests that the EIR include detailed modeled documentation on the Delta Passage Model clarifying if salvage (trucking) is a emigration

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		pathway, and if so, whether it assumes 100% fish survival with handling.	pathway and if 100% fish survival with handling is assumed under this pathway.
Appendix 12B- 12B.7 Interactive Object-Oriented Simulation, Figure 12B-81 and Figure 12B-82	12B-127, 12B-128	The DEIR's IOS modeling results lack a thorough discussion of the flow management changes that will occur to increase egg and fry survival under the Proposed Project in critical water years. It is unclear from the Project Description what features of the Proposed Project would cause such results.	CDFW requests that the EIR include a discussion of the IOS modeling results to better explain increased survival under the Proposed Project during critical water years.
Appendix 12B- 12B.9 San Joaquin River Juvenile Chinook Salmon Through-Delta Survival (Structured Decision Model Routing Application)	12B-137	CDFW is concerned with the assumptions made in the Structured Decision Model Routing Application. The model assumes a positive relationship between survival and exports, which is based on research that suggests juvenile salmon entering the south Delta have higher survival if they are captured in the CVP salvage facility and re-released more seaward than those remaining in the Delta (Buchanan et al. 2013; Windell et al. 2017). However, little information exists to support this hypothesis, and data on post-release survival of salvaged fish is scarce (Allison et al. 2020). Only a subset of entrained fish is salvaged, and an even smaller subset of these fish survive the salvage process. Mortality rates prior to salvage can be high due to predation or poor water quality conditions, and handling can cause stress and injuries that reduce both short and long-term survival. The suggestion that survival is higher through the salvage process highlights the extremely poor survival rate of juveniles in the south Delta, which is hypothesized to result from poor rearing conditions (e.g., low refuge habitat and food availability) and high predation risk (Windell et al. 2017).	CDFW requests that the EIR include a detailed explanation to support the validity of the assumption that a positive relationship exists between juvenile survival and exports in the context of survival through the salvage process and after release and describe the potential uncertainties underlying this assumption.
Appendix 12B- 12B.11, Delta Smelt Upstream Migration Past North Delta Diversions	12B-143	The method chosen implies a speculative assumption – that Delta smelt are strong enough swimmers to swim past the screen. This assumption is inconsistent with the current conceptual model of Delta smelt swimming behavior as weak swimmers due to behavioral limitations on their ability to maintain steady swimming rates in lab studies (Swanson et al. 1998).	CDFW recommends including an analysis with two scenarios: one where Delta smelt are assumed to be stronger swimmers than previously described, and one where they display characteristically weaker swimming consistent with the current conceptual model of Delta smelt swimming behavior.

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Appendix 12C- 12C.2 Impact Analysis Impact AQUA-2: Effects of Operations and Maintenance of Water Conveyance Facilities on Sacramento River Winter-Run Chinook Salmon	12C-2	The DEIR states "Throughout this appendix, similar is generally taken to mean differences within a few percentage points (i.e., relative percentage difference between the project alternatives and No Project Alternative in 2040 compared to relative percentage difference between the project alternatives and existing conditions at 2020), although this is not necessarily applied in situations where small changes to low absolute differences may give relatively large relative changes" (p.12C-2). The statement is unclear on what range of percentages "similar" covers. It is also not clear why small changes in absolute values resulting in relatively large relative changes would be deemphasized.	CDFW requests that the EIR define the range of percentages in which "similar" covers when referring to the differences between the 2020 and the 2040 scenarios for winter-run Chinook salmon (and all other runs and species). CDFW also requests that the DEIR not devalue instances where large changes in relative values result from small absolute differences. A small change in absolute abundance when species are at historic low levels could result in a large relative difference and would have large biological implications.
Appendix 12C- 12C.2 Impact Analysis Impact AQUA-2: Effects of Operations and Maintenance of Water Conveyance Facilities on Sacramento River Winter-Run Chinook Salmon, Table 12C-3 and Table 12C-5	12C-3; 12C-5	The DEIR provides no explanation as to why there will be an anticipated increase in salvage, as presented in the Salvage-Density Method results in Table 12C-3, at the CVP facilities for below normal and dry years, given that the project description indicates that there will be no changes to CVP operations. There is also no discussion provided for Table 12C-5 to explain why entrainment loss at CVP increases much more in March of below normal and dry years, when compared with other months.	CDFW recommends that the EIR include a detailed discussion of the modeling results that address this issue.
Appendix 12C- 12C.2 Impact Analysis Impact AQUA-2: Effects of Operations and Maintenance of Water Conveyance Facilities on Sacramento River Winter-Run Chinook Salmon, Table 12C-6	12C-7	Table 12C-6 shows that juvenile winter-run Chinook salmon entrainment at the south Delta export facilities will decrease by a factor of 18% under the Proposed Project in wet years. The DEIR does not provide a discussion of what flow management will lead to a reduction in salvage in wet years.	CDFW recommends that the EIR include a detailed discussion of the modeling results that address this issue. Such a discussion is needed to help the reader to understand the DEIR's conclusions, as this result is not intuitive based on the Project Description.
Appendix 12C- 12C.2 Impact AnalysisImpact AQUA-2: Effects of Operations and Maintenance of Water Conveyance Facilities on Sacramento River Winter-Run Chinook Salmon, Table 12C-7	12C-7	The DEIR does not describe how there will be an increase in flows in February, March, and April of wet years under the Proposed Project according to the DSM2 modeling results. Additionally, no description is provided to explain what is driving positive velocity changes in May and June.	CDFW recommends that the EIR include a detailed discussion of the modeling results that address this issue. Such a discussion is needed to help the reader to understand the DEIR's conclusions, as this result is not intuitive based on the Project Description.

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Appendix 12C- 12C.2 Impact Analysis Impact AQUA-2: Effects of Operations and Maintenance of Water Conveyance Facilities on Sacramento River Winter-Run Chinook Salmon, Table 12C-8	12C-9	The DEIR does not provide an explanation of what is driving the increase in hours with reverse flows in some months. For example, Table 12C-7 shows increases in flow downstream of the intakes in February, March, and April of wet years under Alternative 5. However, Table 12C-8 shows an increase in reverse flows during that same time frame when flows are anticipated to be greater than the No Project Alternative. CDFW's understanding is that reverse flows can increase in November and January, because of shifting from south Delta to north Delta export operations to pull from excess flows. Additionally, it would be helpful to also have summary results from Appendix 12C (2040 scenario) compared to summary results for the 2020 scenario.	CDFW recommends the EIR include an explanation that addresses whether excess flows under the climate change scenario are anticipated to increase in the other months listed (September, February, and May). Such a discussion is needed to help the reader to understand the DEIR's conclusions, as this result is not intuitive based on the Project Description. Additionally, CDFW recommends that the EIR include a summary table that compares the 2020 to the 2040 scenario for reverse flows in the Sacramento River analysis.
Appendix 12C- 12C.2 Impact Analysis Impact AQUA-2: Effects of Operations and Maintenance of Water Conveyance Facilities on Sacramento River Winter-Run Chinook Salmon, Table 12C-9	12C-11	The DEIR includes the Perry et al. (2018) through-Delta survival analysis for both the 2020 and 2040 scenario, but only includes the assumption that Georgiana Slough BAFF reduces entry into Georgiana Slough by 50% for the 2020 scenario. It is unclear why the assumption that the BAFF will reduce entrainment was not modeled for the 2040 scenario.	CDFW requests that the DEIR include the through-Delta survival analysis based on Perry et al. (2018) with the assumption that the Georgiana BAFF reduces entry into Georgiana Slough by 50% for the 2040 scenario.
Appendix 12C- 12C.2 Impact Analysis Impact AQUA-2: Effects of Operations and Maintenance of Water Conveyance Facilities on Sacramento River Winter-Run Chinook Salmon, Table 12C-13	12C-21	The DEIR provides no explanation of why modeling results do not predict temperature changes associated with flows downstream of the Sacramento River, as compared to 2020, given that more flow will move down the river earlier in the season as precipitation instead of snow melt later in the season. Additionally, the benched habitat analysis shows potential increases in suitable bench habitat because of climate change; however, it is unclear how drought conditions associated with climate change impact habitat availability and water temperatures, or even if drought conditions were included in the model.	CDFW requests that the EIR explain why it anticipates that there will be no differences in temperature changes associated with flows immediately downstream of Intake C, Sacramento River at Rio Vista, and San Joaquin River at Jersey Point for all alternatives in the 2020 and the 2040 scenarios. Additionally, CDFW requests that the EIR include an analysis that compares existing conditions to all alternatives under the 2040 scenario.

Chapter or Appendix and Section/ Figure	Page	Comment: Issue	Comment: Recommendation
Appendix 12C- 12C.2 Impact Analysis Impact AQUA-2: Effects of Operations and Maintenance of Water Conveyance Facilities on Sacramento River Winter-Run Chinook Salmon, Table2 12C-14 and 12C-15	12C-23, 12C-24	The DEIR does not explain why modeled temperatures in the Sacramento River and San Joaquin River are unaffected by the Proposed Project.	CDFW recommends conducting a sensitivity analysis to determine at what change in outflow (if any), water temperatures will differ on the Sacramento River and the San Joaquin River.
Appendix 12C- 12C.2 Impact AQUA-3: Effects of Operations and Maintenance of Water Conveyance Facilities on Central Valley Spring-Run Chinook Salmon, Table 12C-26	12C-31	The DEIR does not include a clear discussion of Table 12C-26 explaining why the Proposed Project will lead to a decrease in loss of juvenile spring-sun Chinook salmon in wet and below normal water year types in March and April.	CDFW recommends that the EIR include a detailed discussion of the modeling results that address this issue with information regarding flow management.
Appendix 12C- 12C.2 Impact AQUA-3: Effects of Operations and Maintenance of Water Conveyance Facilities on Central Valley Spring-Run Chinook Salmon, Table 12C-27	12C-33	The DEIR does not provide an explanation of Table 12C-27 results that show Alternatives 2a/4a have modeled less loss of juvenile spring-run Chinook salmon than Alternatives 2b/4b and Alternatives 2c/4C. Alternatives 2a/4a have a higher diversion rate than the other alternatives modeled, but also show lower juvenile spring-run Chinook salmon modeled loss.	CDFW requests that the EIR provide an explanation for modeled loss of juvenile spring-run Chinook salmon under Alternatives 2a/4a regarding flow management.
Chapter 13- General Comment	Multiple	The DEIR does not address, or analyze, the potential conflict (under all alternatives) resulting from the project alignment across conserved lands, including the Cosumnes River Preserve, Woodbridge Ecological Preserve, and Bethany Reservoir Conservation Easement. The DEIR does not evaluate an alternative route for the Bethany Reservoir Aqueduct siting in a manner that could reduce impacts to the Bethany Reservoir Conservation Easement by following existing roadways and other highly disturbed areas and/or one that will avoid impacts to conserved lands similar to the alignments identified in the Delta Conveyance Project Final Draft Engineering Project Report (Delta Conveyance Design and Construction Authority 2022; Figure 10).	A comprehensive evaluation of conservation lands impacted by the Proposed Project (both temporary and permanent impacts) and alternatives should be included in the EIR. The evaluation should include identification of the number of acres to be impacted by each alignment including access areas, the biological quality and value of those acres, and the property owner and/or other holders of conservation interests in the property if possible. Additionally, a discussion of the Project's potential to obtain in-kind mitigation for impacts to conserved lands should be included with appropriate lands identified.

Chapter or Appendix and Section/ Figure	Page	Comment: Issue	Comment: Recommendation
Chapter 13- General Comment	Multiple	The DEIR includes mitigation measures to avoid and minimize impacts that include the language “to the extent feasible”, for numerous species including some that are fully protected (e.g., sandhill cranes), when discussing Project activities. If a mitigation measure is caveated as “to the extent feasible” it is difficult to analyze the likely benefits of the associated measure, and mitigation measures generally should be proposed and relied on only if they are feasible. It should also be noted that take of sandhill crane, which is a fully protected species under Fish and Game Code, section 3511, is prohibited.	CDFW requests that the EIR commit to mitigation measures identified or clearly specify when a measure would not be met or maintained, so that CDFW and other users of the EIR can better understand the specific mitigation activities to which DWR is committing.
Chapter 13- General Comment	Multiple	The DEIR generally commits to installing exclusion fencing no more than 14 days prior to the start of construction activities (e.g., California tiger salamander and giant garter snake).	CDFW recommends the EIR commit to a timeline for installation that is linked to and follows preconstruction surveys, to reduce the likelihood of species moving into the area after a survey has been conducted (i.e., within 24 hours of preconstruction surveys).
Chapter 13- 13.1.7.1 Habitat Conservation Plans Setting Overview	13-44	The DEIR does not clarify whether the Study Area contains conserved lands such as conservation easements, mitigation banks, and Natural Community Conservation Plan lands. Without this information disclosed in the DEIR, it is unclear how the Proposed Project will impact existing land use designated for conservation value.	CDFW recommends the EIR include whether the Study Area contains conserved lands and include figures detailing locations of conserved lands and how they interact with the Proposed Project alignment. CDFW suggests including a section that discusses potential impacts associated with the Proposed Project activities to conserved lands. Any impacts to conserved lands could impact special-status species, as these areas were designed to protect species and their habitat in perpetuity.
Chapter 13- General Comment Special-Status Plant Species	Multiple	The DEIR commits to conducting special-status plant species surveys consistent with protocols outlined in CDFW (2018), or the most current protocols, specifically with respect to the timing the surveys in the appropriate season and at the appropriate level of ground coverage. The DEIR indicates that the extent of mitigation for direct loss and indirect impacts on special-status plants will be based on survey results but lacks commitment to conduct floristic surveys across multiple years before evaluation of a negative finding (Mitigation Measure BIO-2a). CDFW (2018) concludes that surveys over several years may be	CDFW requests that the EIR commit to rare plant surveys within the entire Proposed Project footprint where habitat is present, and over multiple growing seasons, before assuming that a species is not present within the Proposed Project footprint.

Chapter or Appendix and Section/ Figure	Page	Comment: Issue	Comment: Recommendation
		needed for annual or short-lived plants before a negative finding can be made. Surveys for rare annual plants need to consider compounding influences from low rainfall and rainfall timing conditions. Many annual species of rare plants may not germinate during a prolonged drought or may be affected by rainfall timing. In some instances, it may be feasible to assume the species are present, especially if habitat is present and the species have been reported on the habitat in a previous year's surveys.	
Chapter 13- 13.3.1.2, Methods Used to Assess Impacts on Special-Status Species	13-57	The DEIR does not include non-riparian habitat in the impact analysis for elderberry longhorn beetles. Habitat for valley elderberry longhorn beetle includes both riparian and non-riparian areas where elderberry shrubs are present. Elderberry shrubs can be a common understory plant in non-riparian habitats. Riparian habitat provides more connectivity, because the elderberry is the sole host plant of the species, however, significant impacts to elderberry shrubs, at the individual shrub scale, can extirpate a local population in non-riparian habitats.	CDFW recommends the EIR revise the impact analysis, for elderberry longhorn beetles, to include non-riparian habitats where elderberry shrubs are present.
Chapter 13- 13.3.1.2, Methods Used to Assess Impacts on Special-Status Species	13-57	The DEIR includes dates (September 15 through March 15) that are narrow for when sandhill cranes may be present in the study area. Sandhill cranes have shown up within the study area during the month of August and may remain into April.	CDFW recommends the EIR includes additional language that states that sandhill cranes may arrive earlier and stay later than the specified dates. This is especially relevant in the context of changing climate conditions. Those dates are used throughout the chapter and should all be updated. Expanding Sandhill crane presence may impact minimization measures or mitigation required by the Project.
Chapter 13- 13.3.3.3, Impact BIO-11, CEQA Conclusions - All Project Alternatives, Mitigation Measure BIO-2b	13-122	"Mitigation Measure BIO-2a" is possibly a typo throughout the document under the "Mitigation Measure BIO-2b: Avoid and Minimize Impacts on Terrestrial Biological Resources from Maintenance Activities" headers.	CDFW recommends revising from "Mitigation Measure BIO-2a" to "Mitigation Measure BIO-2b" throughout the EIR when referencing Mitigation Measure BIO-2b.
Chapter 13- 13.3.3.4, Impact BIO-21: Impacts of the Project on Crotch and Western Bumble Bees	13-167	Crotch and western bumble bee species are designated candidates for endangered status under CESA. The Project is likely to impact areas overlapping with known ranges and suitable habitat for these species. However, the DEIR does not clearly	CDFW requests that the EIR include a clear description of potential impacts to, and planned mitigation for the loss of Crotch and western bumble bee modeled suitable habitat.

Chapter or Appendix and Section/ Figure	Page	Comment: Issue	Comment: Recommendation
		state how many acres of habitat for these species would be impacted or how grasslands mitigation identified in the CMP will reduce the level of impacts to less than significant with mitigation, nor does it state if the protection of grasslands will be within the range of known populations of Crotch and western bumble bee.	
Chapter 13- 13.3.3.4, Impact BIO-22: Impacts of the Project on California Tiger Salamander,Table 13-58	13-174	The DEIR should clarify why there are no identified permanent impacts on California tiger salamander aquatic habitat for Alternatives 1-4A given that permanent impacts are expected for vernal pool aquatic invertebrates. Vernal pools are a preferred breeding habitat for California tiger salamander. Based on the DEIR, is it unclear if these habitats are not currently occupied or deemed suitable for tiger salamander.	CDFW recommends the EIR analyze and provide a detailed discussion on whether there will be permanent impacts to California tiger salamander resulting from the impacts to vernal pools occupied by aquatic invertebrates, and if necessary, include minimization and/or mitigation.
Chapter 13- 13.3.3.4, Impact BIO-22: Impacts of the Project on California Tiger Salamander, Mitigation Measure BIO-22a	13-179	The DEIR does not include avoidance measures during maintenance operations, such as preconstruction surveys in suitable habitat and vehicle speed limits, for California tiger salamanders.	CDFW recommends the EIR includes avoidance measures for California tiger salamander during maintenance operations such as preconstruction surveys in suitable habitat and vehicle speed limits.
Chapter 13- 13.3.3.4, Impact BIO-22: Impacts of the Project on California Tiger Salamander, Mitigation Measure BIO-22a	13-179	The DEIR does not include measures to mow vegetation to aid in preconstruction surveys, nor conduct burrow surveys and develop measures to collapse burrows if not occupied by California tiger salamander.	CDFW recommends the EIR includes measures to mow vegetation to aide in preconstruction surveys. CDFW also recommends conducting burrow surveys and developing measures to collapse unoccupied burrows, if appropriate.
Chapter 13- 13.3.3.4, Impact BIO-22: Impacts of the Project on California Tiger Salamander, Mitigation Measure BIO-22a	13-179	Ground-disturbing activities may occur between April (May in wet years) through October 31. However, this period overlaps with the California tiger salamander breeding season.	CDFW recommends the EIR includes measures to limit ground disturbance to the dry season (non-breeding season for California tiger salamander), June 15 through October 15.
Chapter 13- 13.3.3.4, Impact BIO-22: Impacts of the Project on California Tiger Salamander, Mitigation Measure BIO-22a	13-180	The DEIR states that clearing habitat in California tiger salamander habitat could continue when rain is forecasted under supervision of a USFWS and CDFW approved biologist. CDFW does not support any ground disturbing activities occurring within suitable habitat during a rain event when California tiger salamanders are known to increase activity.	CDFW requests removal of this language in the EIR and commit to no ground disturbing events within suitable habitat for California tiger salamanders during a rain event due to the increased risk of impacts.

Chapter or Appendix and Section/ Figure	Page	Comment: Issue	Comment: Recommendation
Chapter 13- 13.3.3.4, Impact BIO-22: Impacts of the Project on California Tiger Salamander, Mitigation Measure BIO-22a	13-180	The text in the DEIR is unclear as to whether dewatering will only occur in aquatic habitats once USFWS and CDFW approve of the action.	CDFW recommends limiting dewatering in aquatic habitats for California tiger salamander to occur only after USFWS and CDFW approve of the specific dewatering activity.
Chapter 13- 13.3.3.4, Impact BIO-22: Impacts of the Project on California Tiger Salamander, Mitigation Measure BIO-22a	13-181	The DEIR states the perimeter of construction sites within or adjacent to California tiger salamander habitat will be fenced with fencing material suitable for excluding amphibians by no more than 14 days prior to the start of construction activities.	CDFW recommends the EIR commit to a deadline following preconstruction surveys in which exclusion fencing must be installed to reduce the likelihood of California tiger salamanders moving into the area after a survey has been conducted (for example, within 24 hours of preconstruction surveys).
Chapter 13- 13.3.3.4, Impact BIO-30: Impacts of the Project on Giant Garter Snake, Mitigation Measure BIO-30	13-239	The period listed in the DEIR to install the exclusionary fence does not assure CDFW that the worksite has been cleared of giant garter snake and will remain clear until exclusion fencing is installed.	CDFW recommends the EIR commit to a deadline following preconstruction surveys in which exclusion fencing must be installed to reduce the likelihood of giant garter snakes moving into the area after a survey has been conducted (for example, within 24 hours of preconstruction surveys). Additionally, the exclusion fencing should be placed between May 1 and September 1 in advance of giant garter snakes seeking overwintering refugia.
Chapter 13- 13.3.3.4, Impact BIO-30: Impacts of the Project on Giant Garter Snake, Mitigation Measure BIO-30	13-239	The DEIR does not include a buffer zone around the edge of the exclusion fencing to discourage giant garter snakes from using the vegetation along the fence.	CDFW recommends the EIR include maintaining a buffer zone around the edge of the exclusion fencing to discourage giant garter snakes from using vegetation along the fence.
Chapter 13- 13.3.3.4, Impact BIO-30: Impacts of the Project on Giant Garter Snake, Mitigation Measure BIO-30	13-239	The DEIR does not include surveying of all small mammal burrows within suitable habitat of giant garter snakes to determine occupancy.	CDFW recommends the EIR include a measure to survey all small mammal burrows within suitable habitat to determine if they are occupied. If they are unoccupied, CDFW suggests collapsing the burrows as long as they are less than 3 ft long.
Chapter 13- 13.3.3.4, Impact BIO-30: Impacts of the Project on Giant Garter Snake, Mitigation Measure BIO-30	13-240	The DEIR does not consider if giant garter snakes and California tiger salamanders may be present at the time ground clearing takes place with heavy machinery.	CDFW recommends the EIR include a measure for a biological monitor to clear vegetation ahead of heavy machinery ground clearing or mowing. This measure would also benefit both giant garter snakes and California tiger salamanders in upland habitat.
Chapter 13- 13.3.3.4, Impact BIO-30: Impacts of the Project on Giant Garter Snake	13-240	The DEIR is missing a commitment to report giant garter snake observations to the CNDDB within a specified timeframe or timely manner.	CDFW recommends the EIR include a commitment to report GGS observations to CNDDB in a specified timeframe.

Chapter or Appendix and Section/ Figure	Page	Comment: Issue	Comment: Recommendation
Chapter 13- 13.3.3.4, Impact BIO-30: Impacts of the Project on Giant Garter Snake, Mitigation Measure BIO-30	13-240	The DEIR allows for the dewatering of suitable giant garter snake habitat in the inactive season of giant garter snake and does not require a CDFW-approved relocation plan. This is potentially problematic as giant garter snakes are more sensitive to impacts than on snake species because they overwinter in underground burrows.	CDFW recommends the EIR include an analysis of the potential impacts of dewatering giant garter snake habitat during the inactive season (October 2 - April 30) and any other construction measures (ground disturbances) that will occur during the inactive season when giant garter snakes are overwintering in underground burrows. CDFW recommends mitigating for potential impacts by prohibiting dewatering during the inactive season and adhering to a CDFW-approved relocation plan, regardless of construction timing.
Chapter 13- 13.3.3.4, Impact BIO-30: Impacts of the Project on Giant Garter Snake, Mitigation Measure BIO-30	13-240	The DEIR is missing a commitment to consult with a CDFW biologist prior to work being conducted outside of the giant garter snake active season.	CDFW recommends the EIR include a commitment to meet with a CDFW biologist when work is conducted outside of the active season.
Chapter 13- 13.3.3.4, Impact BIO-33: Impacts of the Project on Greater Sandhill Crane and Lesser Sandhill Crane, Construction	13-269	The included reference in the DEIR supports the claim that cranes exhibit high roost site fidelity, but does not support the statement that they, in some cases, may still use artificially lit sites due to roost site fidelity.	CDFW recommends the EIR include a reference that supports the claim that cranes may still use artificially lit sites due to roost site fidelity.
Chapter 13- 13.3.3.4, Impact BIO-33: Impacts of the Project on Greater Sandhill Crane and Lesser Sandhill Crane, Mitigation Measure BIO-33	13-275	The language in the DEIR is unclear as to the frequency of surveys for sandhill cranes.	CDFW recommends the EIR includes measures for additional annual surveys of sandhill cranes. Surveys should be conducted annually, starting with the first winter prior to project implementation due to changing habitat conditions and the potential for sandhill cranes to use alternate sites.
Chapter 13- 13.3.3.4, Impact BIO-39: Impacts of the Project on Swainson's Hawk, Operations	13-335	The language in the DEIR is unclear if the proposed powerlines will be designed and constructed to follow APLIC guidelines.	CDFW recommends the EIR uses APLIC guidelines to design and construct powerlines and to clearly state that these guidelines were used.
Chapter 13- 13.3.3.4, Impact BIO-39: Impacts of the Project on Swainson's Hawk, Mitigation Measure BIO-39	13-338	The DEIR states that construction may occur within 0.5 miles of an occupied Swainson's hawk nest tree. CDFW has concerns that increased disturbance near an occupied nest site may lead to adult hawks abandoning the nest and/or reduced fledging success.	CDFW recommends the EIR include a measure to consult with CDFW prior to conducting construction work within 0.5 miles of a known Swainson's hawk nesting tree. CDFW also strongly recommends all construction activities wait until after the nesting season has ended (once young have fledged) when inside a nesting area.
Chapter 13- 13.3.3.4, Impact BIO-39: Impacts of the Project on Swainson's Hawk, Mitigation Measure BIO-39	13-340	The DEIR allows the removal of suitable or known nesting trees for Swainson's hawk when deemed necessary. CDFW has concerns that removing known nest trees will reduce nesting success.	CDFW requests the EIR include a measure to notify CDFW and get CDFW permission before removing suitable or known nesting trees for Swainson's hawk.

Chapter or Appendix and Section/ Figure	Page	Comment: Issue	Comment: Recommendation
Chapter 13- 13.3.3.4, Impact BIO-44: Impacts of the Project on Tricolored Blackbird, CEQA Conclusion	13-381-13-382	The DEIR finds impacts of the Proposed Project to be less- than- significant with mitigation for tricolored blackbird. However, while the DEIR states the Compensatory Mitigation Plan (CMP) would be required to offset the impacts to nesting and foraging habitat, it states that no mitigation is specifically proposed for foraging habitat impacted by construction activities. While mitigation projects proposed to offset impacts to other resources may provide for suitable tricolored blackbird habitat, it is important to also include a commitment to tricolored blackbird foraging habitat mitigation given that habitat loss in the Delta is a limiting factor for the species, particularly due to constant land use changes and deterioration of habitat. Reduced presence of tricolored blackbird in the Delta reflects the ongoing need to provide habitat protection and improvements. To avoid incurring significant project-specific and cumulative impacts to the species from habitat loss.	CDFW recommends the EIR mitigate for both nonbreeding and breeding foraging habitat in addition to nonbreeding roosting habitat. CDFW suggest using the following ratios: 1:1 for breeding and nonbreeding foraging, 2:1 for roosting, and 3:1 for nesting. Mitigation should be applied to both temporary and permanent impacts caused by the Proposed Project.
Chapter 13- 13.3.3.4, Impact BIO-44: Impacts of the Project on Tricolored Blackbird, Operations	13-383	The DEIR is missing a commitment to conduct surveys during the nonbreeding season of tricolored blackbird prior to construction to better understand roosting habitat use within the study area.	CDFW recommends the EIR include measures to conduct surveys during the nonbreeding season of tricolored blackbird (August 1 – March 14) one year prior to the start of construction and the year of construction to establish use of roosting habitat. CDFW also recommends the EIR commit to 3 surveys within 15 days prior to construction and another survey 5 days prior to the state of construction. CDFW also recommends commitment to avoid roosting sites during construction with the use of a 300-ft no-activity buffer surround the roasting sites.
Chapter 13- 13.3.3.4, Impact BIO-44: Impacts of the Project on Tricolored Blackbird, Operations	13-385	The DEIR states that helicopters will not be used between 30 minutes before sunset to 30 minutes after sunrise to avoid disturbing tricolored blackbird roosting. While CDFW agrees, the restrictions should be expanded to include operational buffer zones (i.e., horizontal, and vertical feet) within which helicopters will not fly relative to a tricolored blackbird roosting site.	CDFW recommends that the EIR include the exclusion of helicopters within 200 horizontal feet or 150 vertical feet of a tricolored blackbird roosting site.

Chapter or Appendix and Section/ Figure	Page	Comment: Issue	Comment: Recommendation
Chapter 13 Appendix B-13B.58.5.3 Habitat Value Categories, Table 13B.58-1. Greater Sandhill Crane Habitat Values and Table 13B.59-1 Lesser Sandhill Crane Habitat Values	13B-379	The DEIR devalues freshwater emergent wetland habitat for greater and lesser Sandhill cranes by classifying it as high or moderate as opposed to very high, although roosting habitat in the Delta is considered to be a priority for sandhill crane conservation.	CDFW recommends the EIR increase the habitat value class for emergent wetlands to very high value for the greater sandhill crane, consistent with Shuford and Dybala (2017) and Littlefield and Ivey (2000).
Chapter 13 Appendix B- 13B.59.5.3 Habitat Value categories, Table 13B.59-1 Lesser Sandhill Crane Habitat Values	13B-390	The DEIR classifies freshwater emergent wetlands as "moderate" habitat value class, rather than "high," although roosting habitat in the Delta is a priority for sandhill crane conservation.	CDFW recommends the EIR increase the habitat value class for emergent wetlands to high value for the lesser sandhill crane, consistent with Shuford and Dybala (2017) and Littlefield and Ivey (2000).
Chapter 13 Appendix B- 13B.72.2 Range and Distribution within the Study Area	13B-483	The DEIR states that over 75% of the statewide population of Swainson's hawk occurs within Yolo, Sacramento, Solano, and San Joaquin counties, but the reference included (Anderson et al. 2007) says 60%.	CDFW recommends the EIR update the percentage of Swainson's hawks that occur within Yolo, Sacramento, Solano, and San Joaquin counties in the EIR. The percentage listed in the DEIR does not match the reference included. Additionally, consider updating these population numbers with more recent publications such as, Battistone et al. (2019) or Furnas et al. (2022).
Chapter 13 Appendix B- 13B.72.3 Habitat Requirements	13B-483	The DEIR is missing a discussion on foraging patch size for the Swainson's hawk.	CDFW recommends the EIR include a discussion on foraging patch size, as it helps the reader understand why modeled foraging habitat layers with patch sizes of at least 5 acres were chosen.
Chapter 13 Appendix B- 13B.72.5.3 Habitat Value Categories, Table 13B.72-1. Swainson's Hawk Foraging Habitat Value Classes	13B-488	The DEIR updates Swainson's hawk foraging habitat values in Appendix 13B from the previous classification used in the California WaterFix EIR and ITP Appendix 4 (HM Lands Criteria) by removing very high value and no value habitat and reclassifying some habitat types previously identified as high value as medium value. For example, the habitat value class table in the DEIR does not include native pasture, mixed pasture, clover, miscellaneous grasses, non-irrigated native pasture and pasture, and native vegetation as High Value foraging habitat for the Swainson's Hawk.	CDFW recommends the EIR increase the habitat values to be consistent with standard valuations or provide clear justification for why habitat values have decreased. CDFW recommends the EIR include native pasture, mixed pasture, clover, miscellaneous grasses, non-irrigated native pasture and pasture, and native vegetation as High Value foraging habitat types for Swainson's hawk and mitigate accordingly.
Chapter 13 Appendix B- 13B.72.5.3 Habitat Value Categories,Table 13B.72-1. Swainson's Hawk Foraging Habitat Value Classes	13B-488	In the DEIR, mixed pasture and miscellaneous grasses were classified as Medium Value foraging habitat for Swainson's Hawk. CDFW considers these habitat types to be high value.	CDFW recommends the EIR classify mixed pasture and miscellaneous grasses as High Value foraging habitat for Swainson's hawk and mitigate accordingly.

Chapter or Appendix and Section/ Figure	Page	Comment: Issue	Comment: Recommendation
Chapter 16- General Comment	Multiple	Chapter 16 of the DEIR currently does not include a discussion of impacts to recreational fishing because of the Proposed Project construction and operation. As the Proposed Project spans the Sacramento River through the Delta and encompasses the south Delta, Proposed Project operations could impact recreational fishing opportunities via impacts to recreationally important fish species, such as striped bass, fall-run Chinook salmon, late fall-run Chinook salmon, white sturgeon, black basses, and steelhead.	CDFW recommends the EIR include an analysis and discussion of the potential impacts to recreational fishing opportunities and boating access from the Proposed Project and include minimization and mitigation as appropriate.
Chapter 30- 30.2.3.2 Climate Change Impacts in the Study Area Precipitation and Runoff	30-17	The DEIR states that Shasta Reservoir could be slightly more resilient to climate change due to its greater inflow of rain, rather than snowmelt. However, Shasta Reservoir is likely to be more resilient due to its uniquely high inflow of groundwater baseflow, not rainfall. The volcanic groundwater aquifers of the Shasta, McCloud and Pit Rivers provide years of additional storage, which creates resilience against extremes. Higher rainfall proportion does not increase resilience.	CDFW recommends correcting this statement in the EIR and ensuring any assumption included in the analysis are adjusted as needed.
Chapter 30- 30.4.2 Impacts of the Project Alternatives with Climate Change	30-24	CDFW was provided the 2040 CT climate scenarios but has not been provided with any of the modeling associated with the 2040 Median climate scenario.	CDFW requests receipt of the complete model files for all scenarios described in the DEIR.

Appendix B: References

14 California Code of Regulations § 119.

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