State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
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GAVIN NEWSOM, Governor
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January 28, 2022

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SITES RESERVOIR PROJECT RECIRCULATED DRAFT ENVIRONMENTAL IMPACT REPORT/ SUPPLEMENTAL DRAFT ENVIRONMENTAL IMPACT STATEMENT (RDEIR/SDEIS) SCH# 2001112009

Dear Ms. Forsythe:

The California Department of Fish and Wildlife (CDFW) received and reviewed the Notice of Availability of a Recirculated Draft EIR/ Supplemental Draft EIS (RDEIR/SDEIS) from the Sites Project Authority (Authority) for the Sites Project (Proposed Project) pursuant the California Environmental Quality Act (CEQA) statute and guidelines.[1] It is important to note that CDFW has previously submitted comments to the Authority on January 12, 2018, in response to the Notice of Availability of the Draft EIR prepared on August 10, 2017, as part of an earlier phase of Project development.

Thank you for the opportunity to provide comments and recommendations regarding those activities involved in the Proposed Project that may affect California fish and wildlife. Likewise, we appreciate the opportunity to provide comments regarding those aspects of the Proposed Project 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

[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.

sustainable populations of those species. (*Id.*, § 1802.) Similarly for purposes of CEQA, CDFW provides, as available, biological expertise during public agency environmental review efforts, focusing specifically on projects and related activities that have the potential to adversely affect fish and wildlife resources.

CDFW may also act as a **Responsible Agency** under CEQA. (Pub. Resources Code, §21069; CEQA Guidelines, § 15381.) The Proposed Project may be subject to CDFW's lake and streambed alteration regulatory authority. (Fish & G. Code, § 1600 et seq.) Likewise, to the extent the Proposed Project's implementation 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.), such activities are prohibited by the Fish and Game Code. CDFW also administers the Native Plant Protection Act, 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: Sites Reservoir Authority

Project Overview: In October 2019, the Authority pursued a value planning process to refine Proposed Project construction and operational alternatives presented in the 2017 Draft EIR/EIS. Through the value planning process, the Authority selected three alternatives for assessment in the RDEIR/SDEIS (i.e., a 1.5 MAF Sites Reservoir, alternatives 1 & 3 and a 1.3 MAF Sites Reservoir, alternative 2), in addition to a No Project/ No Action Alternative. Proposed Project alternatives 1 & 3 differ only in the level of investment by the Bureau of Reclamation (Reclamation), with Reclamation investing up to 7% in the Proposed Project under alternative 1, versus 25% under alternative 3. Alternative 1 is the Authority's preferred alternative. Consistent to all alternatives, the Proposed Project would use existing infrastructure to divert water from the Sacramento River at Red Bluff and Hamilton City and convey water to the new off stream Sites Reservoir approximately 10 miles west of the town of Maxwell, in Glenn and Colusa counties, California. New and existing facilities would move water out of the reservoir via existing canals and a new pipeline located near Dunnigan, eventually returning water to the Sacramento River system downstream. The 1.5 MAF Project alternative would include two dams, seven saddle dams, and two saddle dikes with construction of a bridge crossing the reservoir and construction of the Dunnigan Pipeline extending from the Tehama-Colusa (TC) Canal to the Colusa Basin Drain (CBD). The 1.3 MAF Project alternative would include two dams, four saddle dams, and three saddle dikes with construction of a bypass road and the Dunnigan Pipeline extending to the Sacramento River allowing the Sacramento River to serve as the primary release location with only partial discharges to the CBD. Components of the individual Proposed Project alternatives could be interchanged as determined necessary by the Project.

Location: The Proposed Project area (Figure 1) for the purposes of CEQA includes the inundation area of Antelope Valley (between 13,200 and 12,600 acres) located in Glenn and Colusa counties, and Project components located in Tehama County, Glenn County, Colusa County, and Yolo County. The Proposed Project would influence biological resources in the Sacramento River, Colusa Basin Drain, Funks Creek, Stone Corral Creek, Hunters Creek, Feather River, American River, and Delta, as well as both Sutter and Yolo bypasses.

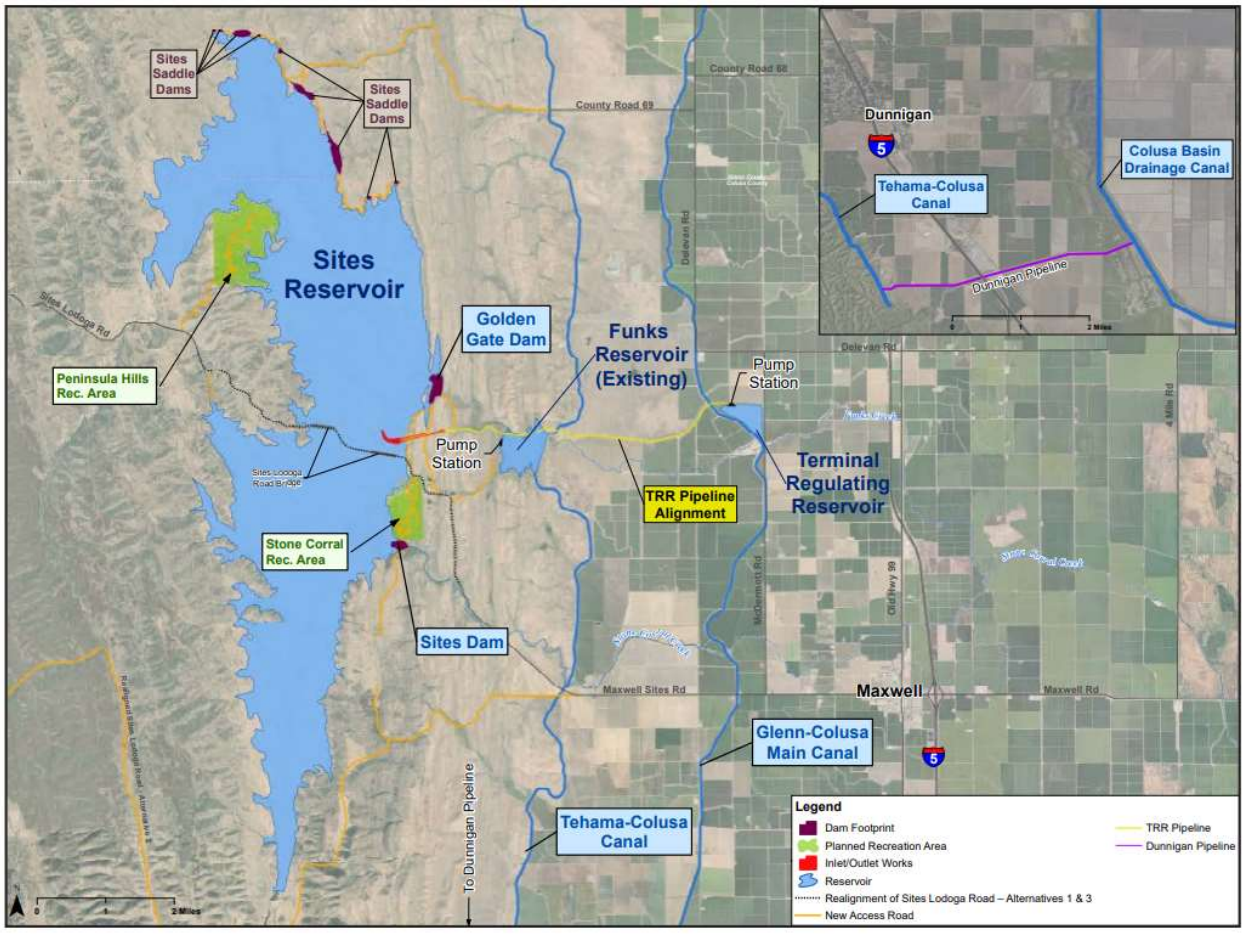

Figure 1: Proposed Project Location and Facilities (Sites Reservoir Project RDEIR/SDEIS Fact Sheet 2021).

OVERVIEW OF ATTACHED COMMENTS

CDFW appreciates the Authority'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 attached Appendix to assist the Authority 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 the Authority in identifying a reasonable range of alternatives that would avoid or minimize adverse impacts.

Consistent with CDFW's trustee role, the attached comments address all fish and wildlife resource areas. However, CDFW acknowledges the Proposed Project's potential impacts on aquatic species are of particular note. Therefore, CDFW prioritized efforts to address those impacts. While the attached comments are extensive, CDFW understands the Authority is seeking all possible input and CDFW strove to be thorough in the review of the RDEIR/SDEIS in order to be of the greatest assistance to the Authority. CDFW looks forward to continuing to work with the Authority 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 RDEIR/SDEIS 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 Kristal Davis Fadtke, Environmental Program Manager, at (916) 701-3226 or Kristal.Davis-Fadtke@wildlife.ca.gov.

Sincerely,

DocuSigned by:
Josh Grover
703E59B6647A482...

Joshua Grover, Chief
Water Branch

Enclosures: Appendix A - Comments and Recommendations
Appendix B – References

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

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Chapter or Appendix - Section	Page(s)	Comments and Recommendations
Chapter 1 - Section 1.1, Sites Project Authority	p. 1-2	The RDEIR/SDEIS states that "[California Department of Water Resources] *DWR, on behalf of the State of California, is also a non-voting member of the Reservoir Committee. The State of California would provide funding through the California Water Commission (CWC) for the Project and receive ecosystem, recreation, and flood control benefits from the Project*" (p. 1-2). While DWR is a member of the Reservoir Committee, they do not represent the State's interests in administration of ecosystem benefits. Suggest removing "*on behalf of the State of California*" since DWR will not be administering ecosystem benefits.
Chapter 2 - Section 2.4, No Project/No Action Alternative	pp. 2-7,8	The RDEIR/SDEIS states, *"Because none of the facilities would be constructed or operated, the No Project Alternative would not materially change conditions as compared to existing conditions. Section 3.2.1 describes how the reasonably foreseeable future conditions under the No Project Alternative would not be materially different from the existing conditions that were used as the environmental baseline. The No Project Alternative assumes the same regulatory criteria as existing conditions*" (pp. 2-7,8). The purpose in the California Environmental Quality Act (CEQA) of the No Project Alternative is to allow decision makers to compare the impacts of approving the Proposed Project with the impacts of not approving the Proposed Project. As a result, there could be a difference between existing conditions (i.e., baseline conditions) and the No Project Alternative. The No Project Alternative should include an analysis that is comparable to the other Project Alternatives, considering changing conditions such as climate change and/or include reasonably foreseeable future project or operational changes, such as the Delta Conveyance Project (DCP). Existing conditions should be a set point in time (typically the Notice of Preparation or the current conditions at the time of analysis). It is important a project assess the baseline conditions in the proposed area including the continuing trends in those conditions (i.e., the No Project Alternative) to evaluate both future impacts and benefits of a project. California Department of Fish and Wildlife (CDFW) recommends the Authority include a separate analysis in the Final Environmental Impact Report/ Final Environmental Impact Statement (FEIR/FEIS) considering a No Project Alternative which incorporates climate change projections and foreseeable future projects or operational changes that will impact water supply or water quality, additional to the existing baseline.
Chapter 2 - Project Description and Alternatives	General Comment	Alternative 1, 2, and 3 in the RDEIR/SDEIS all have the same operational diversion criteria. CDFW finds the Proposed Project, as currently described, and the mitigation measures currently proposed in the RDEIR/SDEIS are not sufficient to reduce impacts to less than significant for salmonids, Delta Smelt, and Longfin smelt (see CDFW comments on Chapter 11 impact analyses and mitigation measures). CDFW recommends the FEIR/FEIS include an Alternative with operational criteria that both meets Proposed Project objectives and includes bypass flow criteria at Wilkins Slough of at least 10,712 cfs across the entire salmonid migration period of October to June, in addition to the other currently proposed operational diversion criteria, to minimize impacts to aquatic resources.

Chapter or Appendix - Section	Page(s)	Comments and Recommendations
Chapter 2 - Section 2.5.1.1, GCID Main Canal Diversion and System Upgrades	p. 2-9	The RDEIR/SDEIS states that "*The Project would involve the installation of a new 3,000-cfs GCID Main Canal head gate structure about 0.25 mile downstream of Hamilton City Pump Station*" (p. 2-9). However, the existing head gate structure would be left in place to continue to serve as a bridge and continue to be operated during construction of the new head gate. The FEIR/FEIS should include the monitoring protocols necessary to ensure the new setbacks do not increase fish entrainment.
Chapter 2 - Section 2.5.1.2, Funks Reservoir	p. 2-13	The RDEIR/SDEIS states that "*The Project would not alter the footprint of Funks Reservoir; however, 740,000 cubic yards of sediment that has accumulated since its constructed would be excavated from the reservoir*" (p. 2-13). This could significantly impact native fish species that may be present in the reservoir. CDFW recommends listing existing fish population in Funks reservoir, detailing the work window when the excavation will occur, and where the excavated material will be deposited.
Chapter 2 - Section 2.5.1.4, Inlet/Outlet Works	p.2-17	Insufficient information was provided to assess whether the I/O Tower port elevations will provide sufficient flexibility in the management of water temperature and/or water quality. CDFW recommends conducting an analysis of operational flexibility resulting from the proposed port locations for inclusion in the FEIR/FEIS.
Chapter 2 - Section 2.5.1.4, Dams and Dikes	p. 2-20	The RDEIR/SDEIS states that *"Water in Stone Corral Creek would be diverted directly into the creek diversion pipeline through the Sites Dam abutment and re-enter the creek channel on the east side of the Sites Dam work area. The outlet tunnel with two 84-inch-diameter fixed cone valves would accommodate these releases, and an energy dissipating chamber would reduce the velocity of the water released"* (p. 2-20). CDFW recommends the FEIR/FEIS include provisions to monitor the velocities and temperatures of water releases into Funks and Stone Corral creeks.
Chapter 2 - Section 2.5.1.5, Dunnigan Pipeline	p. 2-22	The RDEIR/SDEIS states that "*construction would include open cut of approximately 100 feet to cross Bird Creek in the dry season*" (p. 2-22). CDFW recommends that the FEIR/FEIS include baseline conditions for Bird Creek in the Proposed Project analysis.
Chapter 2 - Section 2.5.1.6, Recreation Areas	p. 2-22	CDFW recommends defining what exact uses are planned for the recreation area regarding angling and hunting. The reservoir is likely to attract a large contingent of migratory waterfowl, deer, dove, and turkey populations. The fluctuating water level will likely result in regions of green vegetation due to receding water, creating a potential for increased tule elk usage. CDFW recommends considering coordination and use of lawful public hunting to manage increased populations.
Chapter 2 - Section 2.5.1.7, New and Existing Roadways	p. 2-23	The RDEIR/SDEIS states that *"It is anticipated that all construction activities associated with the recreation areas would occur within the footprints of the recreation areas and the temporary and permanent access road areas*" (p. 2-23). The RDEIR/SDEIS should include details on what restoration activities are planned for areas impacted by temporary access roads.

Chapter or Appendix - Section	Page(s)	Comments and Recommendations
Chapter 2 - Section 2.5.1.7, Construction Access	p. 2-27	The FEIR/FEIS should disclose Proposed Project impacts related to increased traffic. If these impacts are considered significant, the FEIR/FEIS should disclose additional avoidance, minimization and or mitigation measures to offset the impacts.
Chapter 2 - Section 2.5.2.1, Water Operations	p. 2-29	The timing and magnitude of reservoir releases for Storage Partners along the Colusa Basin Drain (CBD), Yolo Bypass, and North Bay Aqueduct is unclear. The RDEIS/SDEIS states that reservoir releases for Storage Partners "*would generally be made from May to November but could occur at any time of the year, depending on a Storage Partner's need and capacity to convey water to its intended point of delivery*" (p. 2-29). However, all analyses related to flow deliveries through the Yolo Bypass were limited to the August-October time-period. CDFW recommends providing more detail about the timing and magnitude of releases for Storage Partners along the CBD, Yolo Bypass, and North Bay Aqueduct. If the timing and/or magnitude of these releases are substantially different from the proposed "habitat flows" from August-October, additional analyses on the potential impacts of moving that water through the region is needed.
Chapter 2 - Section 2.5.2.1, Diversion to Sites Reservoir	p. 2-30	The RDEIR/SDEIS states that "*up to 2,100 cfs, plus losses would be diverted at the RBPP for the Project*" (p. 2-30). CDFW recommends the FEIR/FEIS explains what is meant by the term "losses" and quantifies the magnitude of these losses.
Chapter 2 - Section 2.5.2.1, Water Operations, Bend Bridge Pulse Protection	pp. 2-31, 32	The RDEIR/SDEIS included a pulse protection that is flow based because real-time fish monitoring and presence-based pulse operational adjustments cannot be captured in a model. Commonly, the intention of a pulse flow protection measure is to protect pulses of fish migration rather than pulses of water, with flow-based pulse protection modeled as a proxy for real-time fish presence-based protection. Similarly, real-time fish monitoring and associated criteria are the norm rather than the exception for large scale diversion projects in the Sacramento-San Joaquin Delta ecosystem (CDFW 2019 State Water Project Incidental Take Permit (ITP), United States Bureau of Reclamation (USBR) 2019 Biological Assessment (BA)). CDFW supports the inclusion of pulse flow protection in the operation of the Proposed Project and anticipates working with the Authority to develop a process to implement this measure in real time based on fish presence.
Chapter 2 - Section 2.5.2.1, Diversion to Sites Reservoir	p. 2-32	A ramping schedule will need to be developed to ensure that when pumping resumes upon cessation of the pulse event, flows in the river are not decreased at such a rapid rate that fish are adversely impacted.
Chapter 2 - Section 2.5.2.1, Diversion to Sites Reservoir	p. 2-32	Three Core-1 Central Valley (CV) spring-run tributaries, two Core-2 CV spring-run tributaries, 3 Core-1 CV steelhead tributaries and 2 Core-2 CV steelhead tributaries (Antelope, Mill, Deer, Big Chico, and Butte Creeks) enter the Sacramento River downstream of Red Bluff Diversion Dam (RBDD). The Adaptive Management Plan and fish monitoring program should take these into consideration and use existing or new juvenile monitoring programs to inform Proposed Project operations.

Chapter or Appendix - Section	Page(s)	Comments and Recommendations
Chapter 2 - Section 2.5.2.1, Water Operations	p. 2-35	The RDEIR/SDEIS states, "*The Authority is currently working with Reclamation and DWR to establish operating principles with both agencies that would describe the details of the coordination and collaboration that would take place during the operation of the Project*" (p. 2-35). Coordinating operations between the Proposed Project, Central Valley Project (CVP), and State Water Project (SWP) is complicated and there could be unintended consequences resulting from proposed water transfers and exchanges. Little detail is provided describing coordinated operations between the three entities, which hinders the evaluation of potential impacts of the Proposed Project. The information provided suggests that there may be impacts associated with the proposed coordinated operations.
Chapter 2 - Section 2.5.2.1, Shasta Lake Exchanges	p. 2-36	The critical months for cold water pool management are incorrectly listed as August through September. CDFW recommends correcting this statement in the FEIR/FEIS and any subsequent analyses to cover the critical period for cold water pool management of August through November.
Chapter 2 - Section 2.5.2.1, Funks Creek and Stone Corral Creek Releases	p. 2-38	CDFW recommends the Proposed Project consider including all perennial creeks and rivers potentially impacted in the baseline studies.
		CDFW requests that all baseline data (not synthesized data) be shared with CDFW.
Chapter 2 - Section 2.5.2.4, Reservoir Management Plan	p. 2-43	CDFW recommends the development of a site-specific Aquatic Invasive Species Management Plan, coordinated with CDFW.
Chapter 2 - Section 2.5.2.4, Reservoir Management Plan	p. 2-43	CDFW recommends the development of a site-specific Fisheries Management Plan, coordinated with CDFW.
Chapter 2 - Section 2.5.2.4, Recreation Management Plan	p. 2-43	CDFW recommends considering hunting and firearm use, and their respective limitations or regulations, within the Recreation Management Plan. CDFW recommends considering the management and regulation of public use facilities to discourage habituation of wildlife to people.
Chapter 5 - Hydraulic Modeling Results	General Comment	The RDEIR/SDEIS presented hydrologic modeling results as averaged percent changes in flow and storage by water year type. Averaged results across water year type can obscure potentially significant impacts as there can be substantial hydrologic variation within the same water year type. CDFW recommends that the Proposed Project examine and present the results of individual years on the extreme ends of the water year type classification, wet and critically dry, to provide a better understanding of the magnitude of range in flow and storage under the different alternatives. The Proposed Project's hydrologic analysis suggests that the greatest impacts from Proposed Project operations occur in drier years. CDFW recommends that the Proposed Project analyze and discuss the potential impacts from Proposed Project operations under successive dry and critically dry years in the FEIR/FEIS, as there is the potential that under drought conditions impacts from the Proposed Project may be compounded and warrant additional avoidance, minimization, and mitigation measures.

Chapter or Appendix - Section	Page(s)	Comments and Recommendations
Chapter 5 - Section 5.3, Hydrologic Modeling Methods	p. 5-26	The CalSim II model does not include inflow or outflow for Funks and Stone Corral creeks. The USRDOM should include estimates for these, as well as "emergency spill" operations, minimum flows in the creeks, and channel maintenance pulses (if proposed). As the operational requirements are drafted and refined, a detailed operations model is needed that includes all inflows and outflows of the Proposed Project.
Chapter 5 - Section 5.4.1, CALSIM	General Comment	The CalSim II model uses a monthly time step leading to the use of monthly averaged flow data as inputs. Proposed Project diversion operations are most likely to occur on a sub-monthly time step targeting specific flow events with many associated impacts likewise occurring on a sub-monthly flow event specific basis; therefore, the use of average monthly flow data is unlikely to capture the relative peak timings of flows and outmigration of the more vulnerable life stages. Similarly, the use of summary statistics as inputs and grouping of results can dampen the level of modeled effect fish may experience at a smaller time scale, which may underestimate the actual impact of modeled operations on fish survival. As such, presentation of results in this format coupled with analysis dependent on CalSim II monthly average flow inputs may be incapable of detecting, accurately quantifying, or portraying the comparative effect of significant impacts of Proposed Project operations alternatives on fish species (Simenstad et al. 2017).
Chapter 5 - Section 5.4.1.1, Summary of General Changes in Hydrology	pp. 5-30, 5-33	The Proposed Project would exchange water with Shasta Lake to help preserve the cold water pool and provide benefits to anadromous fish. The hydrologic analyses presented in the RDEIR/SDEIS (Table 5-11, p. 5-30) shows on average no increases in Shasta Lake storage in wet years and minimal increases (2-4%) on average in critically dry years, while flow on the Sacramento River decreases by 10-11%, on average, in May (Table 5-16, p. 5-33) of critically dry years due to the exchanges, when compared with the No Action Alternative. There are many factors that affect Shasta Lake cold water pool management and preserving relatively small volumes of water in Shasta Lake in the spring and summer will not necessarily result in meaningful temperature benefits later in the year. CDFW is concerned that any benefit derived from these exchanges may be overshadowed by the adverse impacts to anadromous fish caused by the reduction in flow on the Sacramento River, due to exchanges, in the spring of critically dry years.
Chapter 5 - Section 5.4.1.1, Summary of General Changes in Hydrology	p. 5-33	The RDEIR/SDEIS shows potentially significant adverse impacts to aquatic biological resources due to Proposed Project diversions on the Sacramento River during the October-June period for Alternatives 1, 2, and 3. CDFW is concerned that reductions in flow due to Proposed Project operations are most pronounced in critically dry years, when biological aquatic resources are stressed and most vulnerable to further reductions in flow. For example, Table 5-16 (p. 5-33) shows an average 5-11% reduction in flow in critically dry years, near Wilkins Slough, for the period between December-May when flows during that time are on average already significantly below the 50% survival threshold of 10,712 cfs (Michel et. al. 2021) for juvenile Chinook salmon. Adverse impacts, caused by the reduction of flow from Proposed Project diversions, are likely to occur to many aquatic species, not just juvenile Chinook salmon, already stressed in the Sacramento River system. As a result, CDFW recommends the Proposed Project increase minimum bypass flow requirements to reduce the adverse impacts of diversions to less than significant.

Chapter or Appendix - Section	Page(s)	Comments and Recommendations
Chapter 5 - Section 5.4.1.1, Summary of General Changes in Hydrology	p. 5-36	The Proposed Project proposes exchanges that would preserve storage and the cold water pool in Lake Oroville for use later in the season (August and September). The preservation of the cold water pool in Lake Oroville is generally not an issue of concern given the depth of the reservoir and sufficient volume of cold water through the summer. CDFW is concerned that these exchanges could alter flows on the Feather River adversely impacting biological aquatic resources. For example, the Proposed Project increases flow in the fall of critically dry years by 5-25% (Table 5-23, p. 5-36), which could result in the dewatering of fall-run Chinook salmon redds and steelhead redds when flows recede. The RDEIR/SDEIS's hydrologic analysis also shows flow declines of 3-14% (Table 5-23, p. 5-36) on the Feather River in critically dry years, in the months of June and July, which has the potential to adversely impact migrating and emigrating spring-run Chinook salmon and green sturgeon. CDFW is also concerned that the proposed exchanges could interfere with Oroville Reservoir operations, potentially impacting future planned ecosystem water releases out of the reservoir. CDFW recommends that the FEIR/FEIS include a detailed analysis of the effects of the proposed exchanges on Oroville Reservoir operations, to assess potential impacts and weigh the costs versus benefits of conducting the proposed exchanges.
Chapter 5 - Section 5.4.1.1, Summary of General Changes in Hydrology	p. 5-37	Folsom Lake Exchanges could potentially lead to decreased releases from Folsom Lake in the spring and early summer, which could result in decreased rearing habitat and elevated temperatures for steelhead. The RDEIR/SDEIS's hydrologic analysis shows further cause for concern as flows on the American River in the spring and summer of critically dry years decrease on average by 1-9% (Table 5-25, p. 5-37), under the preferred action alternative. Additionally, higher releases in the fall often result in fall-run Chinook salmon redd dewatering when flows cannot be maintained for egg-incubation through to emergence. CDFW recommends that the FEIR/FEIS include a detailed analysis of spring, summer, and fall releases from Folsom Lake to assess potential impacts that may result from the proposed exchanges with the Proposed Project.
Chapter 6- Surface Water Quality	General Comment	Water quality analyses depend on models that use outputs from CalSim II, for which the output is on a monthly time step. However, daily and weekly changes to water quality can often have lethal or sub-lethal effects on aquatic resources, which a monthly time step cannot capture. Although the timestep for the Sacramento River temperature model (HEC-5q) is 6-hours, the inputs and outputs were monthly-averaged. To adequately analyze and disclose potentially significant impacts, CDFW recommends that the RDEIR/SDEIS's analyses of water quality impacts include a daily time series analysis. Additionally, the worst-case conditions must be analyzed on a daily time-step, e.g., Sacramento River daily maximum temperature increases in summer due to maximum allowable diversions.
Chapter 6 - Section 6.2.2.6, Harmful Algal Blooms (HABs)	p. 6-23	Harmful algal blooms (HABs) include a wide range phytoplankton such as diatoms and dinoflagellates, in addition to cyanobacteria. Cyanotoxins may be present in water, sediment, and biological organisms even if a bloom isn't observed. Microcystis is the dominant cyanobacteria in California, but Aphanizomenon and Dolichopermum are becoming more abundant (Lehman et al. 2021). CDFW recommends that the FEIR/FEIS consider other potential sources of HABs in its analysis.

Chapter or Appendix - Section	Page(s)	Comments and Recommendations
Chapter 6 - Section 6.3.2.5, Water Temperature	p. 6-34	Model limitations may obscure the magnitude of the Proposed Project's temperature impacts to the Sacramento River. The Sites reservoir temperature model does not include inflows or outflows for Funks Creek or Stone Corral Creek. It is assumed that the reservoir will stratify as a typical Northern California Reservoir, but the pump outlet location and flat topography (higher winds) may lead to a well-mixed reservoir. An example from another "off-channel" storage project, the San Luis Reservoir Draft Resource Management Plan (2012, p. 2-19) states "*Because of constant pumping and mixing of its water, San Luis Reservoir does not typically develop a thermocline*." CDFW recommends further analysis on the Proposed Project's stratification potential.
Chapter 6 - Section 6.3.2.5, Water Temperature	p. 6-34	The RDEIR/SDEIS's temperature modeling does not consider agricultural runoff, which may increase the solar radiation potential of the discharged water. Warm releases from the Proposed Project are targeted for rice farming, and this water will warm further on the rice fields, which presumably will be returned to the Yolo Bypass and/or Sacramento River. This has the potential to impact water quality in the Yolo Bypass and Sacramento River through reductions in dissolved oxygen and increases in water temperature. CDFW recommends that the FEIR/FEIS include an analysis of the effects of agricultural runoff, resulting from Project operations, on dissolved oxygen levels and water temperature.
Chapter 6 - 6.3.2.8, Harmful Algal Blooms (HABs)	pp. 6-37, 38	The RDEIR/SDEIS takes into consideration reservoir water levels and potential effects of HABs. However, it is unclear and unlikely that the reservoir modeling conducted can evaluate whether or not HABs or toxins will be released from the reservoir. CDFW recommends the creation of a monitoring plan of phytoplankton and cyanotoxins that includes the reservoir and downstream locations.
Chapter 6 - Section 6.3.2.9, Mercury and Methylmercury	p. 6-38	CDFW suggests that the FEIR/FEIS provide additional analysis on the potential impacts of increased flooding on methylmercury formation in the Yolo Bypass due to August-October flows and releases for Storage Partners. Table 11-13 (p.11-115) indicates that Yolo Bypass flooding could increase by hundreds of acres between August-October due to these flows, which would potentially increase methylmercury formation. Releases for Storage Partners along the CBD, Yolo Bypass, and North Bay Aqueduct may also impact methylmercury formation if releases are not contained within the Tule Canal/Toe Drain.

Chapter or Appendix - Section	Page(s)	Comments and Recommendations
Chapter 6 - Impact WQ-2, Violate any Water Quality Standards or Waste Discharge Requirements or Otherwise Substantially Degrade Surface Water Quality During Operation	p. 6-72	The RDEIR/SDEIS states that "*Sites Reservoir releases to the Yolo Bypass would not be expected to violate water quality standards or waste discharge requirements or otherwise substantially degrade water quality in Yolo Bypass . . . with regard to . . . [Dissolved Oxygen] DO*" (p. 6-72). CDFW disagrees with this conclusion as DWR's recent synthesis report for the North Delta Food Subsidy study from 2013-2019 showed DO levels in the Yolo Bypass Toe Drain at Lisbon Weir were reduced during the flow pulse in all years (Davis et al. 2021). As indicated in Appendix 6A, the CBD and Knights Landing Ridge Cut (KLRC) are both on the 303(d) List of Impaired Water Bodies for DO. Conveying water through the CBD and KLRC has the potential to transport low-DO water downstream into the Yolo Bypass. The proposed Yolo Bypass habitat flows will occur within a three-month period between August-October, potentially impacting DO levels in the Yolo Bypass during the entire release period. Releases for Storage Partners along the CBD, Yolo Bypass, and North Bay Aqueduct may also impact DO levels. CDFW recommends providing additional analysis on the potential impacts of transporting water through the Yolo Bypass on DO levels. CDFW suggests including relevant findings from the 2013-2019 North Delta Food Subsidy study related to DO.
Chapter 6 - Impact WQ-2, Sites Reservoir	pp. 6-88, 89	The RDEIR/SDEIS considers that the concentration of cyanotoxins would depend on the magnitude of the bloom, but the assumptions listed in the RDEIR/SDEIS for considering causes of concern are overly simplistic. Microcystis has a pelagic and benthic state. Microcystins can be found in water, sediment, and biological organisms. Latour et al. 2007 found benthic Microcystis colonies at 70 centimeters deep in sediment, with an approximate age of 14, suggesting Microcystis and it's toxin can persist in lake sediments. Biodegradation does occur but it depends on other conditions such as adsorption rate, temperature, and pH. A strain of microcystin, Microcystin-LR, has high affinity to organic matter (Wu et al. 2011; Pawlick and Kornijo et al. 2010). Dissolved microcystins can adsorb to suspended particulate matter as a pathway of transport to downstream regions, including marine environments. (Liu et al. 2008). Bivalves, or clams, can have long depuration phase of removing toxins as found in Miller et al. 2010 and Gibble et al. 2016. CDFW recommends that the Proposed FEIR/FEIS acknowledge the complexities of cyanobacteria as being both pelagic and benthic. Cyanotoxins are extremely complex and while they may biodegrade and photodegrade, they can be present in water, suspended sediment, bottom sediment, and biological organisms.
Chapter 6 - Impact WQ-2, Yolo Bypass and The Delta	p. 6-90	Aulacoseira is a diatom, which is considered a good food source in general. However, results from Jungbluth et al. 2020, suggests Aulacoseira may not serve as an accessible food source. The North Delta Food Subsidy Synthesis (Davis et al. 2021) found the flow action in 2016 significantly lowered biovolume (Figure 4-1 and Table 4-2). While Aulacoseira was detected in downstream stations, it is unlikely that it was transported from the north due to the flow action since Aulacoseira was observed at very low levels at the upstream stations. Frantzich et al. 2021 conclude phytoplankton taxa were not significantly different before, during, and after the flow pulse.

Chapter or Appendix - Section	Page(s)	Comments and Recommendations
Chapter 6 - Impact WQ-2, Violate any Water Quality Standards or Waste Discharge Requirements or Otherwise Substantially Degrade Surface Water Quality During Operation	p. 6-90	The RDEIR/SDEIS states that "*according to the* [Harmful Algal Blooms] *HABs voluntary reports database (California HABs Portal maintained by the California Water Quality Monitoring Council; State Water Resources Control Board 2021a) HABs have not been reported in Yolo Bypass in previous years.*" (p. 6-90) Microcystis has been observed in the north delta and Yolo Bypass areas in the datasets from the following sources: DWR's Yolo Bypass Fish Monitoring Program; DWR's North Central Region Office dataset; CDFW's Fall Midwater Trawl Survey; and CDFW's Summer Townet Survey. The California HABs portal currently is missing all or most of Interagency Ecological Program data. CDFW suggests that the Proposed Project incorporates this information into their impact analysis in the FEIR/FEIS.
Chapter 6- Pesticides	pp. 6-91, 92	The RDEIR/SDEIS states that "*there is still some uncertainty about whether augmented flows through the Yolo Bypass could cause increases in pesticide levels in the bypass that might be detrimental to fish or could cause increases in pesticide levels in plankton within the bypass that may provide food for fish in the Cache Slough Complex*" (p. 6-91,92). CDFW agrees that there is uncertainty surrounding this issue but is concerned that the RDEIR/SDEIS's pesticide impact analysis is based on a qualitative rationale that only considers why "*Sites Reservoir releases through the Yolo Bypass could have a limited effect on pesticides in the Delta"* (p. 6-91). There is evidence to suggest that increased flows through the Yolo Bypass could increase pesticide concentrations and that exposure to these pesticides could adversely impact aquatic biological resources. Davis et al. 2021, found significantly higher pesticide concentrations in water and zooplankton during flow pulses (Figure 3-60 and Figure 3-62). In some cases, pesticides detected exceeded EPA aquatic life benchmarks for chronic and acute toxicity. Additionally, synergistic or additive effects of pesticides, along with other stressors, may have a significant adverse impact on biological aquatic resources. 11A.1.8.4 of the RDEIR/SDEIS states that "*sturgeon are at risk of harmful accumulations of toxic pollutants in their tissues, especially pesticides such as pyrethroids and heavy metals such as selenium and mercury (Israel and Klimley 2008; Stewart et al. 2004)*" (p. 11A-56). Additionally, Fong et al. 2016, noted that Delta Smelt populations and other pelagic organisms are in decline likely due to the effects of multiple stressors. CDFW recommends that the FEIR/FEIS's impact analysis consider the potential impacts that may occur should the Proposed Project operations increase pesticide levels through the Yolo Bypass. CDFW also recommends that the FEIR/FEIS consider adding a section to the Water Quality chapter discussing impacts that could occur as a result of synergistic effects from multiple stressors related to water quality.
Appendix 6D - Section 2.1.2, Modeling Input Data	p. 6D-2	The only meteorological input mentioned for the CE-QUAL W2 model is evaporation, which itself was not mentioned or detailed in Appendix 5B or its references. Typically, reservoir temperature models also require wind direction and speed, air temperature, and solar radiation as meteorological inputs. CDFW recommends including more meteorological inputs to CE-QUAL W2 to increase confidence in the results or expand on the description of inputs if others were included in the model.

Chapter or Appendix - Section	Page(s)	Comments and Recommendations
Chapter 7 - Impact FLV-1, Substantially Alter the Existing Drainage Pattern of the Site or Area	p. 7-1	The Proposed Project is estimated to have a 2% reduction in suspended sediment as a result of direct diversions from the Sacramento River. This analysis does not consider the additional sediment reduction from the impoundment of sediment due to the 12,000-acre drainage area of Sites Reservoir itself. CDFW recommends analyzing the impacts due to the reduction in sediment and if necessary, mitigating for reduced sediment supply in the Delta in the FEIR/FEIS.
Chapter 7 - Section 7.3.2, Operation	p. 7-10	The RDEIR/SDEIS used suspended sediment transport, bedload, and river meandering models that "*were previously utilized in the 2017 Draft EIR/EIS for a 1.8-MAF reservoir with a Delevan Intake location on the Sacramento River*" (p. 7-10). The RDEIR/SDEIS states that the previous model results are valid for the Proposed Project, because "*the previous modeling results are generally conservative (i.e., higher in volume) relative to the amount of diverted water (and sediment) being considered under Alternatives 1, 2, and 3*" (p. 7-10). However, while the overall amount of water being diverted has decreased in comparison to the previous configuration of the Proposed Project, the amount of water being diverted further upstream has increased to compensate for the loss of the Delevan Intake. This could result in impacts that are not captured in the current modeling. CDFW recommends that the modeling be updated to reflect the current configuration of the Proposed Project.
Chapter 7 - Section 7.3.2, Operation	p. 7-10	The RDEIR/SDEIS states that "*the flood metrics evaluated are monthly average flows exceeded 10% of the time because this is the percent of time during which flows are relatively high and most of the geomorphic work would be performed on the Sacramento River system. These values are very close to the 2-year flood event at each station*" (p. 7-10). CDFW believes that the 10% exceedance of monthly averaged flow does not have a significant meaning for geomorphic work. No supporting documentation is provided that shows that the flow values are close to the 2-year flood event. It is incorrect to assert that a change to the 2-year peak flow (50% annual exceedance probability) is equivalent or proportional to a change in the monthly-averaged 10% exceedance value. CDFW recommends that the Proposed Project complete an impact analysis using changes to 1.5 or 2-year peak flows (67% or 50% annual exceedance probability, respectively).

Chapter or Appendix - Section	Page(s)	Comments and Recommendations
Chapter 8 - Groundwater Resources	General Comment	The RDEIR/SDEIS relies on modeling from the 2017 DEIR/DEIS. The baseline conditions, as well as the alternatives, have changed since groundwater modeling was last completed. The timing and magnitude of diversions, and reservoir depth and storage all have an impact on the groundwater modeling results. The models used (CalSim, CVHM, and SACFEM) are large in geographic scope, and may not be calibrated well to local hydrology and monitoring wells. No information was provided about the localized calibration or validation of these models. For example, CalSim II does not include any local inflow to the Proposed Project, nor releases to Funks or Stone Corral creeks. Additionally, the RDEIR/SDEIS states "*because diversions required to operate a larger reservoir capacity would have minimal effects on groundwater elevation and groundwater/surface water interaction (Section 8.3.2, Operation), it is reasonable to assume these effects would be even smaller under Alternatives 1, 2, and 3 because less water would be diverted for operations*" (p. 8-15,16). While the RDEIR/SDEIS considers a smaller reservoir, it has also eliminated the Delevan diversion point and diversion rates at the two remaining diversion points may be higher than modeled. Therefore, the potential impact to groundwater elevations and river stage is unknown but will likely be greater than originally modeled. CDFW recommends that the Authority update the modeling to reflect the Proposed Project's current configuration and that local impacts to groundwater be modeled with the state-of-the-art and locally focused groundwater model used by the Colusa Groundwater Authority for the Colusa Subbasin: CV2SimFG-Colusa.
Chapter 8 - Groundwater Resources	General Comment	It is anticipated that the Colusa, Yolo, and Red Bluff groundwater subbasins will formally adopt groundwater sustainability plans (GSPs) by January 31, 2022. Sustainable Management Criteria, as established in each basin's GSP, will determine what impacts to groundwater resources would be considered significant or unreasonable. CDFW recommends that the FEIR/FEIS compare the Proposed Project's anticipated impacts on groundwater resources throughout the study area to the Sustainable Management Criteria adopted in each subbasin's GSP when making significance determinations for each Project alternative.

Chapter or Appendix - Section	Page(s)	Comments and Recommendations
Chapter 8 - Impact GW-2, Substantial Decrease in Groundwater Supplies or Substantial Interference with Groundwater Recharge That Would Impede Sustainable Groundwater Management of the Basin	pp. 8-13-8-18	The RDEIR/SDEIS estimates that the Proposed Project will use up to one million gallons of groundwater per day for construction needs over a period of 4.5 years (p. 8-13), amounting to as much as 15% of the total annual groundwater use within the basin (p. 8-18). The RDEIR/SDEIS also anticipates that construction techniques would require dewatering (i.e., pumping and removing water from the aquifer) down to depths as great as 30 feet below ground surface to install features such as the Dunnigan pipeline (p. 8-15). Following construction, the RDEIR/SDEIS also anticipates that Proposed Project operation will reduce groundwater elevations near the diversion points. Specifically, based on the previous groundwater modeling, which as noted above likely underestimates impacts, groundwater elevations may decrease as much as 2.5 feet near the Red Bluff Pumping Plant and the GCID Hamilton City Pump Station (p. 8-15). The RDEIR/SDEIS states that the construction groundwater use "*would result in a less-than-significant reduction in groundwater supply*" (p. 8-18). However, the RDEIR/SDEIS only considers the potential impacts of temporary construction-related and ongoing operation-related decreased groundwater levels on sustainable groundwater management for human users of groundwater but does not consider the potential impacts on environmental users of groundwater, such as groundwater dependent ecosystems and interconnected surface waters. According to the Natural Communities Commonly Associated with Groundwater dataset (DWR 2021) (https://gis.water.ca.gov/app/NCDatasetViewer/), there are groundwater dependent ecosystems located both near the construction area (along Stone Corral Creek and Funks Creek in between the proposed reservoir location and the Glenn Colusa Canal) and near the diversion points. Decreased groundwater elevations for multiple years in these areas could negatively impact groundwater dependent ecosystems and interconnected surface waters. CDFW recommends that the FEIR/FEIS quantitatively assess the potential impacts of reduced groundwater levels, both due to construction and ongoing operations, on environmental users of groundwater near the construction area and the diversion points. Resources developed for preparation of Groundwater Sustainability Plans may be helpful, such as the Plant Rooting Depth Database (developed by The Nature Conservancy, https://groundwaterresourcehub.org/sgma-tools/gde-rooting-depths-database-for-gdes).
Chapter 9- Mitigation Measure VEG-1.1, Conduct Appropriately Timed Surveys for Special-Status Plant Species Prior to Construction Activities	p. 9-26	Mitigation Measure VEG-1.1 discusses conducting surveys for special-status plant species prior to construction and states the Authority will comply with the "*Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities (California Department of Fish and Wildlife 2018)*" (p. 9-26), or the most current protocols, specifically with respect to the number and timing of surveys, use of reference populations, and evaluation of negative findings. Surveys for rare annual plants need to consider compounding influences from low rainfall and rainfall timing conditions. Many annual species of the 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 previous year surveys. CDFW recommends the FEIR/FEIS be updated to include rare plant surveys on the Proposed Project site will be conducted on the entire Proposed Project area where habitat is present and over multiple growing seasons before assuming that the species are not present within Proposed Project areas.

Chapter or Appendix - Section	Page(s)	Comments and Recommendations
Chapter 10, Impact WILD-1g: California Red-legged Frog	p. 10-68	The RDEIR/SDEIS establishes minimum flows between 0 to 100 cfs and the use of larger pulse flows to maintain habitat present immediately downstream from the Proposed Project. The minimum flows and the larger pulse flows are an estimation and will be finalized later after the RDEIR/SDEIS is certified. The RDEIR/SDEIS determines that many of the impacts to species and habitat present downstream from the reservoir within Funks and Stone Corral Creeks are less than significant based on the assumption that minimum and larger pulse flows will continue after construction of the Proposed Project. Minimum bypass flows and pulse flows are essential to maintain the habitat characteristics and the existing geomorphology of these creeks. The RDEIR/SDEIS cannot guarantee the existing Proposed Project design allows for larger pulse flows, but the less than significant determination to the species and habitat relies on the assumption that these larger pulse flows will continue after construction of the Proposed Project. Therefore, due to the uncertainty of whether these pulse flows can continue, CDFW recommends that the FEIR/FEIS include provisions to modify the Proposed Project design to allow for adequate releases that will be calculated after the document is certified. If these post-certification modifications are not feasible, the FEIR/FEIS should include an impact analysis to the species and habitat present within Funks and Stone Corral Creeks caused by missing adequate pulse flows and describe any additional avoidance, minimization, and/or mitigation measures that would be needed to reduce any potentially significant impacts to a less-than-significant level.
Chapter 10, Mitigation Measure WILD-1.24: Conduct Surveys for Western Burrowing Owl	p. 10-89	Mitigation Measure WILD-1.24 of the RDEIR/SDEIS states that the Authority will "*conduct burrowing owl surveys in accordance with CDFW's 2012 Staff Report on Burrowing Owl Mitigation (2012 Staff Report) (California Department of Fish and Game 2012*)" (p. 10-89). The 2012 Staff report concludes that because burrowing owls may re-colonize a site after a few days, subsequent surveys should be conducted if more than two days pass between Proposed Project activities. CDFW recommends the FEIR/FEIS state that additional surveys will be conducted if a lapse in Proposed Project activities of two days or greater occurs.

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Chapter 10, Mitigation Measure WILD-1.26: Rodenticide Use	p. 10-91	The 2012 Staff Report also includes avoidance measures to help avoid negative impacts that could result in take of burrowing owls, nests, or eggs through efforts to control nuisance animals as the use of rodenticides may impact non-target wildlife. Anticoagulant rodenticides, including diphacinone, have been detected in the majority of predators and scavengers tested in California (Hosea 2000), including bobcats (Lynx rufus) (Serieys et al. 2015) and raptors (Kelly et al 2014). Acute rodenticides, such as zinc phosphide, and fumigants carry much less risk of secondary exposure in wildlife and should be prioritized over anticoagulant rodenticides. CDFW recommends that the FEIR/FEIS include a measure for the Authority to develop an Integrated Pest Management Plan (IPMP) which focuses on long-term prevention of pest damage through habitat modification (Van Vuren et al 2014), incorporates biological control methods such as raptor perches and owl boxes to increase natural raptor predators, and includes limited and targeted rodenticide use when necessary. The IPMP should include measures to reduce rodent density before any anticoagulant baits are placed to reduce the number of contaminated rodents available to predators and scavengers. It should also include regular monitoring to ensure rodent control measures are taken only in response to current rodent activity. Additionally, CDFW recommends that rodenticides, anticoagulant or non-anticoagulant, are not broadcast to minimize the risk to non-target species from ingesting it directly. Furthermore, CDFW recommends that the Authority consult with California Department of Pesticide Regulation's PRESCRIBE database (https://www.cdpr.ca.gov/docs/endspec/prescint.htm) prior to any vertebrate pest control activity. The database incorporates section by section coordination with CDFW's Biogeographic Information and Observation System (BIOS) and the California Natural Diversity Database (CNDDB) to provide species-specific use restrictions over and above anything generic already on the pesticide label including use of modified bait stations (and what those modifications must be).
Chapter 10 - Mitigation Measure WILD -1.28	p. 10-97	A requirement in Mitigation Measure WILD-1.28 states that, "*a minimum of two aerial surveys or ground observation periods lasting at least 4 hours each will be conducted…to confirm presence/absence of golden eagle*" (p. 10-97). Aerial survey methods can cover more area than ground survey efforts. CDFW recommends increasing the minimum time spent conducting ground surveys to no less than 6 hours. CDFW also requests that the Authority coordinate with CDFW regarding any potential mitigation related to bald eagle and golden eagle.
Chapter 10 - Mitigation Measure WILD-1.31, Compensate for the Loss of Foraging Habitat for Swainson's Hawk and White-tailed Kite	p. 10-106	The Proposed Project will result in the significant loss of foraging habitat, which could contribute to the reduction of Swainson's hawk range and abundance in Glenn County and California. To reduce the impacts to a less than significant level, CDFW recommends the FEIR/FEIS require acre for acre habitat replacement in the form of fee title acquisition with a conservation easement to protect Swainson's hawk foraging habitat. Implementation of this mitigation measure would ensure consistency of the FEIR/FEIS with the Yolo Habitat Conservation Plan/Natural Community Conservation Plan and the South Sacramento Habitat Conservation Plan mitigation strategies for this species.

Chapter or Appendix - Section	Page(s)	Comments and Recommendations
Chapter 10 - Mitigation Measure WILD-1.23, Conduct Preconstruction Surveys for Non-Raptor Nesting Migratory Birds and Implement Protective Measures if Found	p. 10- 114	It is unknown if the Proposed Project will impact some of the state-listed species with the potential to occur in the Proposed Project area until surveys are conducted. CDFW recommends that Mitigation Measure WILD-1.23: Conduct Preconstruction Surveys for Non-Raptor Nesting Migratory Birds and Implement Protective Measures if Found is revised in the FEIR/FEIS to also implement protective measures if preconstruction surveys detect state-listed bird species in areas outside their modeled habitat. This is especially important if the species or their nesting habitat are located within the direct project footprint. CDFW recommends that if state-listed species are found during surveys that the FEIR/FEIS includes provisions to contact CDFW to establish compliance with CESA and obtain any applicable permits prior to impacting the species. If the Proposed Project results in permanent impacts to any of these species, mitigation already disclosed in the RDEIR/SDEIS should also be implemented.
Chapter 10 - Impact WILD-1o: Bank Swallow	p. 10-117	Timing of flow releases can have both direct and indirect impacts to bank swallow populations. Direct impacts and potential take can occur if high flows during the late spring and summer nesting season cause inundation of burrows or loss of nests caused by localized bank sloughing. Indirect impacts could occur with changes in flow regimes as bank swallows need winter and early spring flows to allow refreshing of erosional banks. Therefore, a change from current operations of flows on the Sacramento River as a result of the Proposed Project could beneficially or adversely impact bank swallows depending on the timing, duration, and volume of flows. CDFW recommends the FEIR/FEIS include the consideration of bank swallow life cycle in any changes in flows as a result of the Proposed Project, especially during nesting season (April 1 - August 31).
Chapter 10 - Mitigation Measure WILD -1.26	p. 10-134	Mitigation Measure WILD-1.26 includes the installation of signage discouraging feeding of wildlife to aid in the reduction of potential nuisance rodents. While signage can be effective at reducing the number of visitors feeding wildlife, it does not eliminate feeding or the resulting wildlife dependency on handouts. Example regulations include, the California Code of Regulations Title 14, section 251.3, which specifically states that it is illegal to feed big game mammal; section 251.1, which addresses feeding as “harassment” of animals. “Harass,” as defined in this section, as an “*intentional act which disrupts an animal’s normal behavior patterns, which includes, but is not limited to, breeding, feeding or sheltering*.” Any applicable local regulations should also be considered by the Proposed Project.
Chapter 11 - Section 11.3.2, Operations	p. 11-57	The RDEIR/SDEIS states that "*where feasible, and when modelers indicate using them is appropriate, daily model outputs are utilized*" (p. 11-57). However, use of USRDOM daily time step hydrologic data is limited to juvenile stranding analysis, redd scour, and redd dewatering analysis for evaluating impacts FISH-2 through FISH-5 as stand-alone, not cumulative projections of impacts.

Chapter or Appendix - Section	Page(s)	Comments and Recommendations
Chapter 11 -Impact Fish-2, Delta	General Comment	CDFW is concerned that important changes in location and timing of available Delta rearing and migratory habitat under the Proposed Project are not being captured by model projections in the RDEIR/SDEIS. Delta abiotic factors that influence habitat suitability and the subsequent rearing and survival components of salmonid life history is a significant knowledge gap that is not currently resolvable. This should be acknowledged throughout the text of Chapter 11. However, it is well established that the quality and quantity of habitats available for Chinook salmon and steelhead in the Delta depend on inflows from the Sacramento River (del Rosario et al. 2013). CDFW recommends that the Proposed Project utilize the California Water Fix analysis done for potential impacts to reduced inundation of river adjacent floodplain bench habitat to assess changes in the location and timing of available Delta rearing and migratory habitat due to Proposed Project operations.
Chapter 11- Yolo Bypass and Fremont Weir Spill Flow and days of Yolo Bypass Inundation	p. 11-114	As noted in the RDEIR/SDEIS, Proposed Project operations could reduce recruitment of juvenile salmonids onto the Yolo Bypass via Fremont Weir during overtopping events and through the proposed Fremont Weir Notch Project headworks structure. CDFW is concerned that the analyses conducted are lacking in fully evaluating the potential impact of operations on juvenile salmonid access to floodplain rearing habitat in the Yolo Bypass. The RDEIR/SDEIS analysis for flow reductions at Fremont Weir only spans January-June, thereby missing November and December when overtopping may occur. Additionally, the total reduction in inundated habitat is skewed by adding modeled inundated habitat in the August-October period during conditions when juvenile salmon most likely will not have access to that habitat. To fully assess potential impacts, CDFW suggests the RDEIR/SDEIS include an analysis of how Proposed Project diversions will reduce flow entering the Yolo Bypass on a daily time-step during Fremont Weir overtopping events and through the proposed Fremont Weir Notch headworks structure for the time period of November 1 through May 31, to adequately capture Fremont Weir spill events and Fremont Weir notch operations. Changes in flow entering the Yolo Bypass on a daily time scale may be more important than monthly changes to inundated acres because it is assumed that fish access to the Bypass is the limiting factor for rearing rather than total inundated acres. CDFW suggests using the two-dimensional TUFLOW model developed for the Fremont Weir Notch EIR/EIS (BOR and DWR 2019). Reductions in flow should be related to reductions in juvenile salmonid entrainment onto the Yolo Bypass using best available information such as entrainment models developed for the Fremont Weir Notch Project.
Chapter 11 - Floodplain Inundation and Access	General Comment	A key objective of the Fremont Weir Notch Project is to improve connectivity between the Sacramento River to provide safe and timely passage for adult winter- and spring-run Chinook salmon, Central Valley steelhead, and green sturgeon. CDFW recommends the FEIR/FEIS include an impact analysis of Proposed Project operations to the Fremont Weir Notch Project, considering impacts to the number of adult fish passage days. This analysis should be based upon the fish passage criteria developed for the Fremont Weir Notch Project. Since the Fremont Weir Notch Project is also a mitigation project for CVP & SWP operations, any changes to floodplain inundation frequency and duration should be considered when developing mitigation strategies to address those potential impacts.

Chapter or Appendix - Section	Page(s)	Comments and Recommendations
Chapter 11 - Impact Fish-2, Yolo Bypass Inundated Area	pp. 11-115, 11-301	In the analysis of changes in access to suitable juvenile salmonid (and splittail) rearing habitat, the RDEIR/SDEIS describes the August - October flows through Yolo Bypass as creating "habitat". The RDEIR/SDEIS also notes very few to no juvenile salmonids (or splittail) will be present or able to access this flooded land and, therefore, additional flows through the Yolo Bypass in August - October will not provide "suitable habitat" or "habitat acreage". CDFW recommends the FEIR/FEIS reflect this clarification and that analysis of changes in access to suitable rearing habitat not include the additional flows proposed to be released through the Yolo Bypass in August - October.
Chapter 11 - Floodplain Inundation and Access for Sutter Bypass	pp. 11-118,119; 11-147; 11-179; 11-205	"*The results of the frequency analysis of weir spills shows reductions in the number of spills, especially for the Sutter Bypass, indicating a reduction in bypass entry opportunity for juvenile salmonids*" (p. 11-118, 119). Similar analyses are provided on p. 11-147 for spring-run Chinook salmon, p. 11-179 for fall and late-fall-run Chinook salmon, and p.11-205 for Central Valley steelhead. CDFW believes that the existing analyses and discussion of results on the potential impact of operations on juvenile salmonid access to floodplain rearing habitat in the Sutter Bypass do not fully capture potential impacts. It is not clear from the text what time period was modeled to assess reduction in weir spill events, the modeling results are not presented and the impact of the described reduction in weir spill event is not evaluated. Like for the Yolo Bypass, Sites operations could reduce beneficial recruitment of listed juvenile salmonids onto the Sutter Bypass via Moulton, Colusa, and Tisdale Weirs. Operations also have the potential to impact juvenile rearing habitat at the southern end of the Sutter Bypass due to a reduction of floodplain inundation arising from backwatering around the confluence of Sacramento River and Feather River. CDFW recommends that the same level of detail in-text as is provided for Yolo Bypass for potential changes to weir spill flows, days of inundation, and inundated area in Sutter Bypass. As for the Yolo Bypass, additional analyses should be conducted to better assess how operations will impact juvenile salmonid access to floodplain rearing habitat in the Sutter Bypass. This should include an analysis of how Sites proposed diversions will reduce flows in the Sutter Bypass on a daily time-step. CDFW suggests using the two-dimensional TUFLOW model developed for the Big Notch Project EIR/EIS (BOR and DWR 2019). Reductions in flow should be related to reductions in juvenile salmonid entrainment onto the Sutter Bypass using best available information.
Chapter 11 - Floodplain Inundation and Access for Sutter Bypass	General Comment	The potential impacts of operations on adult fish passage through and out of the Sutter Bypass were not analyzed. Proposed Project operations may reduce the number of days that adult salmonids and acipenserids can pass from the Sutter Bypass back to the Sacramento River during weir overtopping events (e.g., at Moulton, Colusa, and Tisdale Weirs) and at the planned fish passage notch in Tisdale Weir. Additional analyses should be conducted to better understand how the Proposed Project will impact adult fish migration within Sutter Bypass and out of Sutter Bypass. This should include an analysis of how diversions will reduce flow entering the Sutter Bypass on a daily time-step over associated flood weirs and at the planned fish passage notch at Tisdale Weir. Flow reductions should be related to the adult fish passage criteria for depth and velocity that were developed for the BNP (DWR 2017).

Chapter or Appendix - Section	Page(s)	Comments and Recommendations
Chapter 11 - Impact Fish-2, Yolo Bypass Inundated Area	p. 11-118	Katz et al. 2017 and Bellido-Leiva et al. 2021 do not provide evidence that the Yolo Bypass provides good rearing habitat for juvenile salmonids. Please remove and provide additional reference by Sommer et al. (2001).
Chapter 11 - Impact Fish-2, Delta	p. 11-125	Appendix 11J does not include specific information regarding the sensitivity analysis (e.g., What were the assumptions and parameters of the sensitivity analysis? What time of year was the Georgiana barrier assumed operational?). It is unclear if 50% reduction in mortality is an appropriate assumption under all alternatives, given the study did not take into consideration reduced outflow conditions as a result of Sites proposed alternatives. Also, it is not clear if 50% should be assumed across all flow conditions, months, and water years. The BAFF was only studied in 2011 (wet WY) and 2012 (below normal WY); therefore, there are no above normal, dry, or critical years studied. CDFW suggests including a detailed description of the modeling assumptions included in the sensitivity analysis.
Chapter 11 - Tables 11-17, 11-18, 11-27, and 11-28	p. 11-126, 27, 11-154	The current Salvage Density Method only includes water years 2009-2019, which omits above normal water year types. Previous applications of this model (i.e., SWP EIR and Incidental Take Permit Application) included all water years analyzed with CalSim (1922-2003), which includes above normal water year types. CDFW recommends the interpretation of the results from this analysis and how they are applied to the evaluation of potential impacts consider the limited years of data used, which may underestimate potential impacts.
Chapter 11 - Tables 11-17, 11-18, 11-27, and 11-28	p. 11-126, 11-127, 11-206	The results of the Salvage Density Method are averages across water year type rather than by month and water year type. For winter-run and spring-run Chinook Salmon, salvage is not consistent across the year therefore the modeling results may underrepresent any changes to salvage during the months of peak salvage. Historically, peak salvage of winter-run Chinook Salmon occurs in March (with a smaller peak in January) and peak salvage of spring-run Chinook Salmon occurs in April. CDFW suggests presenting the results of the Salvage Density Method by month and water year type.
Chapter 11 - Life Cycle Models	pp. 11-127 - 11-129	The OBAN winter-run Chinook salmon life cycle model was run to provide an analysis of the potential integrated effects of Alternatives 1, 2, and 3 on the species relative to the NAA. As noted in the RDEIR/SDEIS, OBAN does not have a flow survival component capable of analyzing primary impacts of the Proposed Project on winter-run Chinook salmon. Given the absence of a flow survival component, OBAN provides limited utility for evaluation of Proposed Project impacts on winter-run Chinook salmon.
Chapter 11- Mitigation Measure FISH-2.1: Wilkins Slough Flow Protection Criteria	pp. 11-131,132	The Flow Threshold Survival Analysis to Assess Potential Effects of Sites Reservoir Project Mitigation Measure FISH-2.1 should be conducted separately for winter-run Chinook salmon because the key input relies on a Wilkins Slough Bypass Flow of 10,172 cfs from March through May after which most winter-run Chinook salmon have passed Wilkins Slough. Thus, winter-run Chinook salmon are not currently accounted for in this analysis.

Chapter or Appendix - Section	Page(s)	Comments and Recommendations
Chapter 11 - Impact Fish-4, Sites Reservoir Release Effects	pp. 11-180, 11-206	Any inundation of lands in Yolo Bypass that occurs between August-October will impact landowners in the Bypass. Relevant land uses (and approximate timing) include waterfowl season (typically mid-October to through mid-January); flooding of seasonal wetlands (typically September or October through April); rice harvest (typically September to October). CDFW recommends that the Proposed Project provide additional analysis on the potential impacts to landowners from conveying flow deliveries through the Yolo Bypass.
Chapter 11 - Impact Fish-4, Sites Reservoir Release Effects	pp. 11-180; 11-206	"*Fall-run Chinook salmon entering the Toe Drain may eventually reach the Wallace Weir, where fish rescue and relocation to the Sacramento River by CDFW occurs, either at the recently completed Wallace Weir Fish Rescue Facility or by beach seine in the vicinity of the Wallace Weir*" (p. 11-180 for fall-run, p. 11-206 for steelhead). Operations of the Wallace Weir Fish Salvage Facility should not be considered an avoidance or minimization measure for potential impacts from conveying water through the Yolo Bypass on adult salmonids. The purpose of the Wallace Weir Fish Rescue Facility is to prevent listed adult fish from entering the Colusa Basin Drain and increase the efficiency of potential fish salvage operations. The long-term goal for the Yolo Bypass fisheries enhancement efforts is to reduce fish salvage at Wallace Weir. Increasing reliance on the facility to reduce impacts from Proposed Project deliveries conflicts with this goal. As such, it is inappropriate to use operations of the fish rescue facility as a rationale for explaining why Proposed Project reservoir releases would not impact adult fall-run Chinook salmon and steelhead. Additionally, increased flows through Colusa Basin Drain and Wallace Weir may impact the operational capacity of the Wallace Weir Fish Rescue Facility, further increasing the chance of stranding, migratory delays, and exposure to poor water quality conditions to fish being present downstream of Wallace Weir between August and November. Increased reliance of the Wallace Weir Fish Rescue Facility should be put in context of the objectives of the facility and a discussion of how handling and transporting anadromous fish potentially impacts their fitness should be included. Overall, the Proposed Project should provide a more objective description of the potential impacts of reservoir releases through the Yolo Bypass on increased stranding of fall-run Chinook salmon and steelhead, as well as impacts to operations of Wallace Weir Fish Rescue Facility.
Chapter 11 - Impact Fish-6, Flow Effects	p. 11-223	Fish screen entrainment assessment is based on pallid sturgeon (Mefford and Sutphin 2008). This species is a poor proxy for green or white sturgeon. More suitable references would be products of the Cech or Fangue labs at UC Davis such as Poletto et al. 2014 and Mussen et al. 2014.
Chapter 11 - Impact Fish-6, Flow Effects	p. 11-223	The RDEIR/SDEIS states that "*The* [green sturgeon] *adults spawn primarily from March through July, although they periodically spawn in late summer and fall (as late as October) (Heublein et al. 2009, 2017, NMFS 2018b)*" (p. 11-223). This statement is not consistent with the cited literature. The first two citations do not support this statement and the last citation (NMFS 2018) states that larvae have been found in late summer and fall. The latest reports of larvae have been around early October, which would correspond to spawning in July or August, not in the fall. Green sturgeon have never been reported spawning that late in the season.

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Chapter 11 - Impact Fish-6, Table 11-48	p. 11-228	The RDEIS/SDEIS notes flow at Hamilton City will be reduced to 5-13% of average flow. This is of concern for green and white sturgeon. January – February corresponds with peak adult white sturgeon up-migration, and March with the start of green sturgeon up-migration for spawning. While it is unlikely that these reductions would be enough to limit passage, it is not known if they would impact migratory cues and change or alter the timing of migrations. CDFW recommends this potential impact be addressed in the FEIR/FEIS.
Chapter 11 - Impact Fish-6, Table 11-48 and Flow Effects, Adult Migration and Holding	p. 11-240	Green sturgeon spawning in the Feather River is limited to wet and above normal years due to blocked passage at Sunset Weir (as noted on p. 11-240); however, there are ongoing plans to improve passage at that barrier. If passage is improved, it is likely that spawning will occur in the Feather River in lower water years. Even if passage is improved, the reductions in flow predicted in June and July would impact rearing of larval green sturgeon. Note that one of the reasons the species was listed was that there was only one small spawning area in the Sacramento River, making the species susceptible to catastrophic events. Enhancing and supporting spawning in the Feather River (and other rivers) is an important component of the NMFS Recovery Plan (NMFS 2018). CDFW recommends the FEIR/FEIS address potential impacts to larval green sturgeon rearing habitat.
Chapter 11 -Impact Fish-6, Appendix 11L Sturgeon Delta Analyses	General Comment	The RDEIR/SDEIS finds the Proposed Project to have Less Than Significant (LTS) effects on both green sturgeon and white sturgeon. However, the Proposed Project has the potential to impact sturgeon survival and recruitment due to reductions in Sacramento River flow associated with input flows to the reservoir, which are not sufficiently offset by protective bypass flow criteria. Additionally, as larval sturgeon could likely be in close proximity to points of diversion at the time of diversion for the Proposed Project, an analysis of the screening efficacy on larval sturgeon may be warranted.
Chapter 11 -Impact Fish-6, Appendix 11L Sturgeon Delta Analyses	General Comment	Spawning success and juvenile recruitment are poorly understood for both species of sturgeon due to the difficulty of monitoring the benthic, dispersed, and cryptic early life stages of these fishes. The best available evidence indicates that white sturgeon only have large, successful recruitment events approximately every 8-10 years, correlated with wet water years, especially those associated with high spring outflow (Fish 2010; Stevens and Miller 1970). It appears that green sturgeon show a similar pattern. Reports from the USFWS Red Bluff office show green sturgeon eggs captured on egg mats and larvae captured in both rotary screw traps and benthic D-nets show high numbers in wet years with high water levels (B. Poytress, USFWS, personal communication). Operations of Proposed Project that reduce flows during wet and above normal years, during the periods of egg development, larval rearing, and juvenile migration carry a strong risk of harming those early life stages and reducing these rare successful recruitment years. To minimize these potential impacts, Proposed Project operations should time reservoir inflow so that it does not meaningfully reduce flows in the Sacramento River during critical sturgeon rearing and migration, especially during the wettest years. Additionally, monitoring of early life stage abundance or YCI should be funded through the Proposed Project in order observe the effects of Proposed Project operations on sturgeon and inform adaptive management of Proposed Project operations, as necessary.

Chapter or Appendix - Section	Page(s)	Comments and Recommendations
Chapter 11 - Impact Fish-6, Delta Outflow Effects	p. 11-242	The RDEIR/SDEIS suggests that even if upstream passage of adults is blocked briefly, "*it is likely adults would hold and continue their migration and spawning after flow subsequently increased*" (p. 11-242). There is nothing in the literature to suggest this. Evidence suggests that when passage is blocked, green sturgeon will move back downstream (e.g., adults blocked by the insertion of the gates at Red Bluff Diversion Dam prior to 2011; Heublein et al. 2009). It is not known whether they attempt to spawn lower in the system or simply abort the migration and return to salt water. Suggesting that Proposed Project operations will not have an impact on sturgeon should not be based on the assumption that they will wait until later to migrate, as it is possible that the fish will not spawn at all.
Chapter 11- Impact-Fish-8: Operations Effects on Delta Smelt	pp. 11-250 - 11-258	The RDEIR/SDEIS's analysis of effects from reservoir releases to CBD/Yolo Bypass begins by asserting that providing flow through CBD and Yolo Bypass may benefit Delta smelt. This section cites Bush (2017) to assert that 23% of the population may benefit from releases through the Yolo Bypass. This is not an accurate representation of the findings of that study. Bush (2017) found that the proportion of freshwater resident Delta smelt was variable and that summer water temperature was likely the main driver of the proportion of freshwater residents that are present in the Cache Slough complex. Furthermore, the North Delta food web actions (NDFA) have not demonstrated a measurable improvement in the Delta smelt population, habitat, or abundance of prey items. The only NDFA having a phytoplankton bloom observation, occurred in 2016 and was comprised of Aulacoseira, a long chain-forming diatom that copepods (a major food item for Delta smelt and longfin smelt) do not consume at high rates during blooms (Jungbluth et al. 2020). Other NDFA have resulted in no observed increase in phytoplankton. These results show the uncertainty associated with food web benefits of the NDFA. Further discussion of this action in the RDEIR/SDEIS describes the uncertainty in the extent to which Delta smelt could be affected by an increase in pesticides in the lower Yolo Bypass, as Proposed Project habitat flows would redirect CBD water that is relatively high in pesticides into the Yolo Bypass, and the potential deleterious effects that Delta smelt in the Yolo Bypass could experience due to exposure to low dissolved oxygen (p. 11-255). The RDEIR/SDEIS also acknowledges water temperature in this region is frequently at the cusp of the upper thermal maximum for Delta smelt, concluding that as a result "*there is some uncertainty in the potential for effects on Delta Smelt*" (p. 11-258). As stated above, Bush (2017) found that high water temperature may lead to lower frequency of freshwater resident Delta smelt in the North Delta. Therefore, any increase in water temperature in the Yolo Bypass or North Delta is likely to reduce the frequency of freshwater resident Delta smelt. CDFW suggests revising this section for clarity and clearly stating the potential benefits, uncertainties, and potential deleterious effects of reservoir releases to CBD/Yolo Bypass on Delta smelt.
Chapter 11- Impact-Fish-8: Operations Effects on Delta Smelt	General Comment	The RDEIR/SDEIS does not currently address the role of outflow on the transport and dispersal of Delta smelt larvae. Reduced delta outflow reduces the transport and dispersal of Delta smelt larvae downstream to areas of higher quality habitat (IEP MAST 2015, CDFW 2020). Polansky et al. 2021 also found that outflow is important for post-larval survival. CDFW suggests adding in a discussion of the Proposed Project's operational effects on survival of Delta smelt larvae in the FEIR/FEIS to better inform Proposed Project impacts to Delta smelt.

Chapter or Appendix - Section	Page(s)	Comments and Recommendations
Chapter 11- Impact-Fish-8, Flow-Related Effects	pp. 11-260, 261	The RDEIR/SDEIS analyzed expected decreases in Delta outflow and the abundance of Eurytemora affinis, a copepod that is an important food for Delta smelt and found that there would be less prey available to Delta smelt in spring under all three operational scenarios compared to the No Action Alternative (p. 11-260). However, these analyses used statistical relationships between outflow and Eurytemora abundance observed over several months of the spring period. The largest decrease in Delta outflow under the operational scenarios would be in March, with relatively little change in Delta outflow in April and May. Therefore, decreases in food availability in March would be expected to be greater than those represented in Table 11-58 (averaged over March through May) and Table 11-59 (averaged over March through June) (p. 11-261). The conclusion that such small decreases are unlikely to be "statistically detectable" does not mean that such decreases would not be biologically significant or deleterious to a species already suffering from food limitation. The ability to statistically detect the decrease in Eurytemora abundance is influenced by the large variability in the zooplankton data, which is inherent in zooplankton data as copepod distribution is patchy. Even at relatively low abundance, Eurytemora is highly positively selected for by Delta smelt in spring and increasing or extending its period of abundance provides feeding benefits to larval and small juvenile Delta smelt (Slater and Baxter 2014). Therefore, the negative impacts to Delta smelt from reduced prey availability may be greater than what is presented in the RDEIR/SDEIS.
Chapter 11- Impact-Fish-8, Flow-Related Effects	pp. 11-263, 264	The RDEIR/SDEIS highlights a debate regarding the importance of low salinity zone habitat to Delta smelt, citing a small set of references (pp. 11-263, 264). Yet, throughout the Delta Smelt Flow-Related Effects section (pp. 11-260-264), the RDEIR/SDEIS states that an average of 23% of Delta smelt surviving to adulthood are freshwater residents and the remainder either migrate to the low salinity zone or are resident there (Bush 2017). This contradicts the assertion that the low salinity zone is possibly not an important habitat for Delta smelt, when an average of 76% of Delta smelt surviving to adulthood reside there or migrate there for a portion of their life. CDFW suggests the Proposed Project either remove the suggestion the low salinity zone is not an important habitat for Delta smelt or expand the discussion. Specifically, the discussion should include the importance the Suisun Bay where habitat quality is maximized (Feyrer et al. 2007, Feyrer et al. 2011, Kimmerer et al. 2013) and Delta smelt foraging efficiency and success is greater (Hammock et al. 2017, Hammock et al. 2019). Recent statistical analyses conducted by USFWS also provide strong support for the importance of fall habitat to recruitment of Delta smelt (Polansky et al. 2019 and Polansky et al. 2021).

Chapter or Appendix - Section	Page(s)	Comments and Recommendations
Chapter 11- Impact FISH-9: Operations Effects on Longfin Smelt and Appendix 11A	General Comment	There is a well-documented positive correlation between winter and spring Delta outflow and the abundance of longfin smelt the following fall. Adults, immature sub-adults, eggs, larvae, and young juveniles are all present during some portion of this period and may be affected by various factors associated with Delta outflow. While the underlying mechanism or mechanisms driving this relationship remain unclear, the correlation between outflow and longfin smelt abundance has remained strong across multiple decades and through a substantial decrease in abundance (Maunder et al. 2015; Nobriga and Rosenfield 2016; Rosenfield and Baxter 2007; Stevens and Miller 1983; Tamburello et al. 2019; Thomson et al. 2010). Other analyses examined the magnitude of Delta outflow associated with positive longfin smelt population growth (State Water Resources Control Board (SWRCB) 2017, Rosenfield et al. 2010). The magnitude of outflow required varied depending on what averaging period was considered, however, both examinations concluded that the probability of positive population growth decreases with reduced outflow (SWRCB 2017) indicating that further reduction in winter/spring outflow may exacerbate the current decline in longfin smelt population.
Chapter 11- Impact FISH-9: Operations Effects on Longfin Smelt and Appendix 11F	General Comment	The effect that Proposed Project operations would have on longfin smelt was modeled using a reconstruction of analysis conducted by Nobriga and Rosenfield (2016). The intent of the original Nobriga and Rosenfield analysis was to test various life history conceptual models using contrasting variants of a generalized population model. The analysis using Nobriga and Rosenfield approach may not accurately convey Proposed Project impacts. Visual examination of model fit as presented in Figure 11F-1 showed that the model 2abc median differed from empirical data by as much as an order of magnitude in some years and that the 95% confidence intervals spanned multiple orders of magnitude indicating a high degree of uncertainty. The results are presented in such a way that mask Proposed Project effects by including all variation due to all factors including a multiple order of magnitude decline in the population and error associated with model coefficients. To facilitate clearer interpretation of impacts to longfin smelt, the results should be presented as a proportional change in the modeled FMWT index under NAA conditions prior to averaging by water year type. A second approach based on previously published regression analysis described by Kimmerer et al. (2009) and Mount et al. (2013) was also presented. The results of this second approach were similar to the Nobriga and Rosenfield method in that there was a high degree of uncertainty and that the Proposed Project operations resulted in a net negative impact on longfin smelt abundance.

Chapter or Appendix - Section	Page(s)	Comments and Recommendations
Chapter 11- Mitigation Measure FISH-9.1: Tidal Habitat Restoration for Longfin Smelt and Appendix 11F.5 Tidal Habitat Restoration Mitigation Calculations for Longfin Smelt	p. 11-274 and pp. 11F-32, 33	The proposed mitigation to offset the effect of reduced outflow used an equation described by Kratville (2010). This equation may not be appropriate due to the fact that it was developed to calculate the acreage required to mitigate the direct and indirect loss of larval Delta smelt associated with SWP/CVP exports. The equation is based on the findings of Kimmerer and Nobriga (2008) which applied a particle tracking model to estimate the proportion of simulated Delta smelt larva that would be entrained into the south Delta Export facilities from various locations in the Delta. Kratville (2010) does state that this analysis is generally representative of the effects that SWP/CVP exports have on longfin smelt larvae in dry years. However, it does not encompass the full period in which larval longfin smelt are present. Larval longfin smelt are present in the estuary beginning as early as mid-December when the E:I ratio is 65%. Therefore, this equation may be appropriate to calculate the acreage needed to offset any increase in south Delta exports associated with Proposed Project operations, if it is adjusted to account for the different E:I ratio in December and January. However, it does not account for impacts associated with reduced Delta outflow due to Proposed Project diversions.
Impact Fish-10 through Impact Fish-17	General Comment	The projections of Proposed Project effects on native and introduced fish species (Impact Fish-10 through Impact Fish-17) do generally use the best available species life history accounts and current information. The uncertainty associated with projections of less than significant Proposed Project impacts on these fish is especially high because there is no precedent for these effects because quantitative models and analysis of fish response for a project of this type and scale are nonexistent. In other words, the best available science to evaluate Proposed Project effects on these fish species results inevitably in conclusions that are speculative. Because of this uncertainty, CDFW recommends that the FEIR/FEIS fully describe this level of uncertainty and include these fish species in the adaptive management program.
Appendix 11A - Section 11A.1.3.2, Life History and General Ecology	p. 11A-25	RDEIR/SDEIS states: "*Until recent years, salmon passage was not possible above the Coleman Hatchery barrier weir located on Battle Creek.*" This is not correct. Fish passage is always possible at the Coleman National Fish Hatchery barrier weir. The Coleman National Fish Hatchery controls fish passage at the weir for hatchery operations.
Appendix 11A - Section 11A.1.3.2, Table 11A-2	p. 11A-27	The RDEIR/SDEIS uses National Marine Fisheries Service 2019 for their table of general life stage timing for winter-run Chinook salmon. However, this table should be updated to include Glenn Colusa Irrigation District's long-term winter-run monitoring data and Tisdale's Rotary Screw Trap data from CDFW's Tisdale Monitoring Program to reflect best available science and provide winter-run emigration information between RBDD and Knights Landing.
Appendix 11A - Section 11A.1.4.3, Distribution and Abundance	p. 11A-32	The RDEIR/SDEIS states "*Today, only the mainstem Sacramento River and Butte, Mill, and Deer Creeks maintain wild spring-run Chinook salmon populations*" (p. 11A-32). Battle Creek should be added to the list of creeks containing wild spring-run (NMFS 2016).
Appendix 11A- Section 11A.1.4.4, Stressors	p. 11A-36	The reference National Marine Fisheries Service 2014 appear to have been taken out of context with regards to discussing stressors on spring-run Chinook salmon. The text should be revised to reflect the literature cited or removed. Specifically, stressors in Deer, Mill, and Antelope creeks include agricultural water diversions primarily, with loss of habitat due to urban development secondary.

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Appendix 11F - Section 11F.5	p. 11F-34	The RDEIR/SDEIS calculated tidal habitat restoration mitigation for longfin smelt. "*The overall area of effect for each scenario was calculated as 10% of the area of the above calculations, consistent with calculations for the mitigation requirements used by California Department of Fish and Game (2009) and California Department of Water Resources (2019)*" (p. 11F-34). However, the description is confusing, and it is unclear how the overall area for each scenario was calculated. CDFW suggests the FEIR/FEIS provide a clear step-by-step description of the calculation.
Appendix 11I - Winter-Run Chinook Salmon Life Cycle Modeling	General Comment	Clarification is needed on the flow scenarios used for IOS CalSim II inputs specific to the Proposed Project and to determine if Yolo (including Big Notch restoration project) and Sutter Bypass Project associated flow changes are accounted for in IOS. Temperature inputs for the Sacramento River are derived from the USBR SRWQM temperature model but it is not clear if the modeling is specific to the Proposed Project based on the documentation. Temperature inputs are only applied to the spawning reach from Keswick to Balls Ferry, but Proposed Project related flow changes are not accounted for in this section of the Sacramento River. Therefore, redd dewatering is another component of IOS that was not modeled. Chinook salmon redd dewatering could occur or be exacerbated by Proposed Project operations depending on water year type and water transfers.
Appendix 11I - Winter-Run Chinook Salmon Life Cycle Modeling	General Comment	IOS has been updated to include a flow survival component for migrating winter-run smolts. The simple linear regression presented was based on seven years of winter-run Chinook salmon acoustic tag data; however, the specific years utilized are not provided and the linear regression does not include the data points that were used to develop the linear regression (Figure 4, Appendix 11I). The survival values range from approximately 25% at 3,250 cfs to 37% at 60,000 cfs from Bend Bridge to Verona. It is unclear how the regression was interpolated, extrapolated, and fit to the data points utilized. It has been shown in other flow survival analyses that there may be inflection points and thresholds of flow related survival that are vastly different than what was presented in the RDEIR/SDEIS analysis (Michel et al. 2021). Therefore, the actual impact of Proposed Project operations on salmonid survival in the Sacramento River may be under-represented.
Appendix 11I - Winter-Run Chinook Salmon Life Cycle Modeling	General Comment	The Delta Passage Model (DPM) component of IOS relies on monthly average CalSim II flows as an input and variable entry timing for each year in the model simulation. It is unclear if river migration has a pulse flow component or is simply a function of smolt maturation, and how year-specific entry to the Delta curves are generated. As such, CDFW cannot determine if these entry curves coincide with actual Proposed Project diversions. When coupled with the use of monthly averaged flow inputs, there is significant potential for the IOS model to under-represent Proposed Project impacts on through Delta survival. It is also unclear if the DPM component of IOS relies on Perry 2010 or if it has been updated to the more recent Perry 2018 model. CDFW recommends that the DPM component of IOS including the smolt entry component of the IOS life cycle model be more thoroughly documented in Appendix 11I-2.

Chapter or Appendix - Section	Page(s)	Comments and Recommendations
Appendix 11K - Weighted Usable Area Analysis	General Comment	The RDEIR/SDEIS relies on Weighted Usable Area (WUA) curves developed by USFWS to determine potential impacts to salmonid rearing habitat in the Sacramento River and states "*The results of the analyses suggest that Alternatives 1–3 would cause few large changes in spawning WUA in any of the rivers and would generally result in more increases than reductions in rearing WUA in the Sacramento River, especially for juveniles (53% increases in total)*" (p. 11K-77). Salmonids tend to rear in off-channel and side-channel habitat, characteristic of slower velocities and shallower depths. As a result, decreased flow in the Sacramento River subsequently leads to slower and shallower conditions, potentially indicating higher WUA. However, the assessment presented in the RDEIR/SDEIS is inadequate in analyzing impacts to rearing habitat in the Sacramento River as it fails to assess other important habitat components including the potential for habitat fragmentation, inundation frequency and duration, as well as complexity. Therefore, the potential impacts to salmonid rearing habitat may be underestimated. CDFW recommends the FEIR/FEIS include additional assessment of the Proposed Project's impacts to rearing habitat availability within the Sacramento River system, as well as the other systems (i.e., the American and Feather Rivers) impacted by the Proposed Project.
Appendix 11K - Weighted Usable Area Analysis	General Comment	The RDEIR/SDEIS states that "Rearing habitat WUA was estimated only for the Sacramento River because no adequate flow versus rearing WUA curves located for the Feather or American River were available. The available flow versus rearing WUA information for these rivers is old, limited, and potentially unreliable (Appendix 11K)" (p. 11-58). Instream juvenile rearing habitat data for fall-run Chinook salmon from instream flow studies conducted by Mark Gard (CDFW) for the American River are available online at http://cvpia-habitat-docs-markdown.s3-website-us-west-2.amazonaws.com/watershed/american_river.html (Gill and Tompkins 2020a). Instream spawning and rearing habitat data for fall-run Chinook salmon and steelhead in the Feather River are available online at http://cvpia-habitat-docs-markdown.s3-website-us-west-2.amazonaws.com/watershed/feather_river.html (Gill and Tompkins 2020b). Additionally, instream spawning and rearing habitat data for fall-run Chinook salmon and steelhead in the Feather River from the California Department of Water Resources (DWR) and from Thomas R. Payne & Associates were used in instream flow evaluations for the relicensing of the Oroville facilities. These evaluations determined relationships between flow and both suitable spawning and rearing habitat for 23.25 miles of the Feather River. In addition, the CVPIA Structured Decision Making process utilizes the DWR Federal Energy Regulatory Commission (FERC) instream spawning and rearing habitat data for the Feather River. CDFW recommends the Proposed Project utilize these WUA curves to assess potential impacts to rearing Weighted Usable Area for juvenile salmonids in the Feather and American River systems.
Appendix 11M - Section 11M.2.1, Bypass and Side Channel Inundated Habitat Area	p. 11M-1	The one-meter threshold for optimal floodplain depth is somewhat arbitrary, from both a fish ecology perspective and in context of the modeling accuracy. CDFW recommends an analysis of changes to inundated surface area with removal of discussion related to optimal/suboptimal depths.

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Appendix 11M - Section 11M.2.2, Bypass Flow and Weir Spill	p. 11M-5	The RDEIR/SDEIS Appendix 11M states, "*Note, however, that the total flow in the bypass is not always a good indicator of suitable habitat availability, as shown in Figures 11M-1 and 11M-2"* (p. 11M-5). CDFW disagrees with this statement. Flow is a good metric of available suitable habitat in both Sutter Bypass and Yolo Bypass, as increased flows equal increased entrainment of fish.
Appendix 11P - Riverine Flow-Survival	Figure 11P-1	The RDEIR/SDEIS's analysis showed that estimated survival for the status quo and Proposed Project scenarios was similar (Figure 11P-1), with the exception of two wet years (2011 and 2017). This illustrates that the Proposed Project diversion criteria generally minimize diversions during the historical periods of fish movement, as reflected in Red Bluff rotary screw trap data. However, fish presence/passage at the RBDD rotary screw traps is an incomplete reference point to assess impacts of Proposed Project diversions on juvenile salmonid flow-survival relationships. Listed fish (Central Valley spring-run Chinook and steelhead) enter the Sacramento River downstream of Red Bluff Diversion Dam (RBDD) (e.g., Antelope, Deer, Mill Creek populations) October through June. Additionally, peak passage events of fish at the RBDD rotary screw traps should be evaluated by juvenile life-stage (e.g., fry, parr, smolt). For example, fry life-stage individuals are caught at much higher rates than larger-sized individuals, and flow-survival impacts should be weighted towards parr and smolt life stages, which are more actively out-migrating through Sacramento River mainstem to reach the ocean versus fry life-stages that are still rearing in the lower Sacramento River and Delta, often for extended periods of time. This is a key consideration for evaluating survival for status quo and Proposed Project scenarios and concluding whether or not survival would be similar in real-life scenarios based on the fish presence criteria used in the Sites Diversion tool. The analysis also omits Proposed Project impacts on Butte Creek and Feather River origin salmonids, including CESA listed salmonids which enter the Sacramento River below Wilkins Slough.
Appendix 11P - Riverine Flow-Survival	p. 11P.2	The RDEIR/SDEIS analyzes the effects of in-river flow generally utilizing the best flow survival science available (Michel et. al. 2021) and has documented the methodology well in Section 11P.2. The RDEIR/SDEIS assesses the proposed diversion criteria by application of published flow-survival relationships to daily flow data, while accounting for historical fish migration patterns as represented in monitoring data. The Sites Reservoir Daily Divertible & Storable Flow Tool provided daily Sacramento River at Wilkins Slough flows for the flow-survival analysis, which include daily diversions by the Red Bluff and Hamilton City diversions. However, the period of record is limited to 2009-2018 and does not include above normal year types during which Proposed Project diversions would be expected.

Chapter or Appendix - Section	Page(s)	Comments and Recommendations
Chapter 16 - Section 16.2.2.1, Table 16-2	p. 16-4 -16-6	Table 16-2 Key Recreational Characteristics of Recreation Area Potentially Affected by Proposed Project-Related Changes to SWP or CVP Operations is missing the Yolo Bypass Wildlife Area, a significant public recreation area in the Yolo Bypass. Additionally, some recreational areas are grouped while others are not (e.g., Sutter Bypass and Sutter National Wildlife Refuge are grouped within Sutter Bypass Wildlife Area). Table 16-2 inconsistently identifies acreage as part of each recreational area description. These details are important for understanding the scale of potential Proposed Project impacts. CDFW recommends the FEIR/FEIS include an updated table that identifies each individual wildlife area potentially affected, with each area's acreage clearly stated.
Chapter 28 - Section 28.4.1.3, Sites Reservoir Operation	General Comment	The modeling conducted in the RDEIR/SDEIS compares both with and without climate change future scenarios for all alternatives. The results from the analyses were then used to qualitatively assess the impacts and benefits that the Proposed Project might have with climate change. The RDEIR/SDEIS states that overall, it is not expected to have adverse effects on aquatic species under climate change (p.28-29). However, analyses in the RDEIR/SDEIS demonstrate that the Proposed Project operations will have an adverse impact on aquatic species and results from the climate modeling indicate the Proposed Project under climate change would likely exacerbate these adverse impacts. For example, the RDEIR/SDEIS states that it "*would result in larger reductions to flow under climate change in Critically Dry Water Years from December to March and larger increases in August to make up for the significantly decreased flow*" (p. 28-16). A reduction in flow in the months of December to March, particularly in critically dry years, which are predicted to increase under climate change, would have adverse effects on rearing and emigrating salmonids. Likewise, the RDEIR/SDEIS's analysis indicates that Delta outflow decreases with climate change, which could further exacerbate impacts to longfin smelt. CDFW recommends establishing more protective bypass flow criteria and include in the Proposed Project's adaptive management plan strategies to address how the Proposed Project may alter future operations to account for the potential adverse effects of climate change.
Chapter 31 - Section 31.3.1, Surface Water Resources and Water Quality	pp. 31-18, 19	Section 31.3.1 discusses diversions within the Central Valley and Delta as related to Table 31-1. However, the discussion does not include the Delta Conveyance Project (DCP) (although it is included in Table 31-1). The DCP has planned exports ranging from 3,000 cfs to 7,500 cfs, which will affect water supply and water quality. CDFW recommends revising the text to include proposed DCP construction and operations in analyzing the cumulative effects of the Proposed Project with past, present, and foreseeable future projects.

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