CA Save Our Streams Council

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Via E-mail

Re: Conservation, Fishing and Tribal Comments on Draft Supplemental Environmental Impact Statement for Shasta Lake Water Resources Investigation

These are comments on the draft Supplemental Environmental Impact Statement (DSEIS) for the Bureau of Reclamation's Shasta Lake Water Resources Investigation ("Project") from the Center for Biological Diversity, AquAlliance, California Native Plant Society, California Save Our Streams Council, California Sportfishing Protection Alliance, California Water Impact Network, Environmental Water Caucus, Friends of the River, Planning and Conservation League, Save the American River Association, Sierra Club California, Southern California Watershed Alliance, and Winnemem Wintu Tribe.

The DSEIS fails to provide analysis of numerous significant changes since the Final EIS for the Project was released in 2015. These include recent and pending changes in protected status under the federal Endangered Species Act (ESA) and California Endangered Species Act (CESA) for Shasta salamanders and Shasta snow-wreath, including changes in taxonomic status that reveal anticipated impacts to salamanders to be more severe than disclosed in the DSEIS.

The DSEIS fails to fully analyze and disclose upstream and downstream impacts of the Project on aquatic, riparian, and floodplain rearing and breeding habitats for ESA listed salmonids and riparian-dependent species such as the yellow-billed cuckoo. Reclamation has failed to complete ESA consultation for spring-run Chinook salmon, winter-run Chinook salmon, Central Valley steelhead, western yellow-billed cuckoo, southern green sturgeon, northern spotted owl, California red-legged frog, and gray wolf. The DSEIS does not comply with the ESA or CESA.

The DSEIS relies on flawed climate change modeling and analysis regarding cold water flows for salmonids.

The Project fails to comply with the requirements of the Clean Water Act.

The DSEIS fails to adequately address and disclose seismic issues.

Changes in funding and a new cost allocation method for the Project necessitate a new economic analysis. Reclamation is using one set of numbers to minimize the benefits for allocating repayment costs and another set of calculations to determine the cost benefit ratio for the Project.

The proposed Project is intended to increase water supply to meet increasing demand, but justification for the project is cloaked in unsupportable claims of benefits for listed salmonids and climate change needs. The Project will significantly degrade breeding, feeding, and sheltering habitat for several listed species. Sacramento winter-run Chinook salmon and the western yellow-billed cuckoo are particularly vulnerable to adverse habitat impacts that will result from the Project.

The Project is inconsistent with the recovery plan for winter-run Chinook salmon, spring-run Chinook salmon, and Central Valley steelhead trout, which proposes fish passage at Shasta Dam to provide access to high elevation and historical, cold-water salmonid habitat. Managing downstream water temperatures for spawning winter-run salmon through cold-water releases from Shasta Dam should be considered a stopgap measure until safe and effective fish passage for salmonids is in place. Reclamation has the ability without the Project to release riparian floodplain activation flows to benefit juvenile salmonids and to conserve western yellow-billed cuckoo habitat, while fulfilling the secondary Project objective to reduce flood damage along the Sacramento River.

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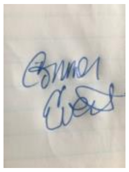

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1. New Information and Status for Shasta Salamanders

The DSEIS falls short in failing to mention, let alone evaluate and disclose, impacts to two of the three special-status endemic salamanders that could be affected by the Project. These endemic salamanders are protected under the California Endangered Species Act (CESA), and therefore the Project's potential effects on these species must be assessed within the DSEIS.

The Project seeks authorization under the Water Infrastructure Improvements for the Nation Act (WIIN Act, P.L. 114-322). (DSEIS, p. 1-2.) Despite the DSEIS's assertion that compliance with state laws, such as the California Wild and Scenic Rivers Act, is not required for this Project (see DSEIS, p. 5-3), the WIIN Act clearly requires consideration and adherence to state law. The text of the WIIN Act establishes Reclamation's duty to comply with "all applicable environmental laws" when discussing the Secretary's participation in federally owned storage projects. (WIIN Act § 4007(b)(4). The WIIN Act further states that "nothing in this section preempts or modifies any obligation of the United States to act in conformance with applicable state law." (WIIN Act § 4007(j); see also § 4012(a)(1).) The WIIN Act's savings clause (section 4012(a)(2)) requires any Project authorized and pursued under the WIIN Act to comply with the Central Valley Project Improvement Act (CVPIA). The CVPIA, in turn, requires that operation of the Central Valley Project (CVP) must "meet all obligations under State and Federal Law …" (CVPIA, P. L. 102-575 § 3406(a).) As the Project directly implicates the operation of the CVP, the DSEIS that considers raising the Shasta Dam must disclose and fully analyze the Project's potential impacts on California state-listed species.

Moreover, this action is governed by the Council on Environmental Quality's 1978 regulations, as amended, and so all references to the CEQ regulations are to those in effect prior to September 14, 2020 unless otherwise noted. Although CEQ issued a final rulemaking in July 2020 fundamentally rewriting those regulations, the new rules apply only "to any NEPA process begun after September 14, 2020," or where the agency has chosen to "apply the regulations in this subchapter to ongoing activities." 40 C.F.R. § 1506.13 (2020). The NEPA process for this Project began before September 2020, and the Bureau of Reclamation does not appear to allege it has chosen to apply the 2020 rules to the Project. To ensure certainty, Reclamation should exercise its discretion to continue to apply the 1978 rules here. Attempting to apply the new CEQ regulations without adequate guidance or training, and with conflicting agency policies and procedures still on the books would be highly inefficient and lead to legal liability. Further, the future of the 2020 rules is still uncertain due to pending litigation.

Accordingly, and relevant here, the operative CEQ regulations provide that when determining the severity of an impact, the Bureau must consider, among other things, "[w]hether the action threatens threatens a violation of Federal, state, or local law or requirements imposed for the protection of the environment." 40 C.F.R. § 1508.27(b)(10). Here, Reclamation must consider whether the Project could result in unlawful harm to state-listed salamanders.

The Shasta salamander (*Hydromantes shastae*) is a small lungless salamander that occupies an extremely restricted range in Shasta County, California, adjacent to Shasta Lake. This salamander is primarily a habitat specialist and limestone obligate, found among rock outcrops in habitats with limestone substrates; although some individual salamanders have been found in a broader range of habitats away from limestone.

At the time of the FEIS in 2015, the Shasta salamander was considered a single species, but the publication of an April 2018 scientific study (Bingham et al. 2018) split it into three species, based on mitochondrial DNA analysis. The paper reclassifies the Shasta salamander (*Hydromantes shastae*) as being restricted to populations found in the eastern portion of its former range, while formally describing two new species, the Samwel Shasta salamander (*Hydromantes samweli*), and Wintu Shasta salamander (*Hydromantes wintu*). Although genetically distinct, the Shasta salamander, Samwel Shasta salamander, and Wintu Shasta salamander are morphologically cryptic (indistinguishable from one another).

The DSEIS fails to mention the existence and critically imperiled status of the Samwel Shasta salamander and the Wintu Shasta salamander. All three species of salamander will be affected by the Project at some level, but Reclamation has failed to include mention of the newly identified species in the DSEIS. And based on the taxonomic split, it is likely that some or all of the distinct taxonomic units will be affected more severely than anticipated in the DSEIS.

Prior to its reclassification as three species, the Shasta salamander already had the smallest known range of any Pacific Northwest amphibian, endemic to a very small portion of the Cascade Range near Shasta Lake. The estimate of the entirety of the suitable habitat for the three Shasta salamander species within their known range is approximately 730 km^2. The three reclassified species, by definition, inhabit even smaller zones within that range, and are thus even more vulnerable to extinction.

The Shasta salamander is listed as a “threatened” species by the State of California under the California Endangered Species Act. The state has not yet adjusted its listing to acknowledge the new classification of the Shasta salamander as three unique species, but all three species are protected as threatened under the umbrella of the Shasta salamander listing.

The DSEIS fails to update the FEIS to reflect the administrative history of the impending federal ESA listing of the Shasta salamander and how the Samwel Shasta salamander and Wintu Shasta salamander will be addressed in the ESA listing process. The Center for Biological Diversity petitioned the USFWS to list the Shasta salamander under the ESA in 2012 (CBD 2012). In 2015, the USFWS responded to the petition and made a finding that listing the Shasta salamander as endangered or threatened may be warranted (USFWS 2015, p. 56429). On April 23, 2018, the Center for Biological Diversity notified the USFWS that the Shasta salamander was actually three distinct species that are only found in the Shasta Lake watershed (CBD 2018). All three species continue to be included as part of the original petition to list the Shasta salamander. Reclamation was made aware of the new scientific information regarding the salamanders during Fish and Wildlife Coordination Act discussions with the USFWS in 2018 and 2019, and during ESA consultation on upstream impacts of the Project in 2019.

A Stipulated Settlement Agreement and Proposed Order pursuant to 4(b)(3)(B) of the ESA and its implementing regulations was filed on June 26, 2019 (*Center for Biological Diversity v. David Bernhardt*), requiring the USFWS to make a final determination whether or not the Shasta salamander complex should be proposed for listing under the ESA by April 30, 2021. The DSEIS lacks an update on the timing of the ESA listing process for the species and fails to disclose the potential future listing of one or all of the species in the Shasta salamander complex. The SEIS should describe the administrative history on the potential listing of the species and provide a clear articulation of how each of the three Shasta salamander species could be affected by the Project.

All three species in the Shasta salamander complex are small salamanders that are closely associated with caves, limestone outcrops, and loose rocks with interstitial moisture. Each species has a suite of both similar and distinct habitat requirements, and all will be impacted in varying degrees by the Project. Reclamation has failed to analyze the impacts of the Project on these species and quantify reductions in their populations, including the potential of local extirpation, or even extinction, from direct and indirect effects of the Project.

The original filling of Shasta Lake caused significant loss of suitable habitat for Shasta salamanders, and was the most significant historical impact they faced. The dam substantially raised the level of a smaller lake at the site, submerging a portion of the species' historical habitat. The creation of Shasta Reservoir led to continued threats to the salamanders, including constantly expanding recreational development along the shoreline area. Filling of the dam also led to isolation of salamander populations in the Shasta salamander complex, preventing the metapopulation dispersal and breeding that is important for recolonizing extirpated localities. Increasing the size of Shasta Lake and the elevation of the reservoir is likely to further exacerbate these types of population-level impacts.

The plans to raise the level of Shasta Dam and Reservoir poses an imminent threat to the survival and recovery of all three salamander species. Raising the level of the dam by 18 ½ feet would raise the level of the reservoir by 20.5 feet, further flooding hundreds to thousands of acres of the salamanders' already restricted habitat. The proposed Shasta Dam raise would cause extensive take of salamanders and loss of irreplaceable suitable habitat for Shasta salamanders; the loss of 42-51 acres of limestone habitat and of 4,056-5,266 acres of non-limestone habitat. In addition to the direct flooding of additional salamander habitat, the dam raise is expected to cause an upland shift of the housing, businesses, roads, and recreational development that are currently along the reservoir's shoreline, destroying additional salamander habitat, as well as cause an increase in human activities in and near their habitats.

The FEIS considers impacts to Shasta salamanders to be significant and unavoidable. The proposed mitigation measures for the significant loss of suitable habitat and take of salamanders is "avoidance," relocation of salamanders, and acquisition of mitigation lands. However, the flooding of 42-51 acres of limestone habitat and of 4,056-5,266 acres of non-limestone habitat cannot be avoided under the project. There is no evidence that salamanders can be successfully relocated, nor that there is any suitable salamander habitat to relocate them to where they could successfully persist. Likewise, due to the habitat specialization of this species, it is unclear whether mitigation lands with suitable habitat can be acquired.

The Wintu Shasta salamander is a species with a highly restricted range. The species is only found near the McCloud River Arm of Shasta Lake. It has only been detected in eight locations associated with limestone outcrops and caves (Evelyn and Sweet 2018). Due to its highly restricted range and low number of detections within the range, the species is vulnerable to extinction from stochastic events such as fire, Chytrid fungus, and overstory changes leading to loss of shade and to increased desiccation. The DSEIS fails to address the extraordinary rareness of this species, potential threats to its survival, and the effect the Project will have on any of the remaining populations.

The Samwel Shasta salamander has three locality groupings: along the western edge and drainages of Shasta Lake; along the McCloud River and its upper drainages; and an isolated population on a tributary to the Pit River. The DSEIS does not quantify the percent of Samwel Shasta salamander populations that would be lost as a result of the Project.

The Shasta salamander's range is along the southern edge of Shasta Lake and between the Squaw Creek Arm and Pit River Arm of Shasta Lake. Many of the detections for this species are in upland and updrainage areas of Shasta Lake, but an unquantified number of populations will be lost as a result of the Project.

The three species in the Shasta salamander complex also continue to be threatened by wildfire, mining, timber management, and human recreational activities. Wildfires remove overstory and prey base, potentially leading to desiccation, heat stress, and starvation for Shasta salamanders. It is unclear what the level of impact these has been from wildfires around Shasta Lake since the FEIS was written. In addition, in the spring of 2020, a significant amount of the Shasta salamander range was treated with prescribed fire. Although the full effect of these fires on the species is unknown, it is a cumulative threat that should be quantified and considered in the SEIS. The amount of high-intensity fire wildfire in the habitat of any of the species in the Shasta salamander complex has not been quantified; and this is a cumulative effect that should be considered and quantified in the DSEIS. The combination of wildfire and prescribed-fire effects may be increasing the risk to the species in the Shasta salamander complex and should be discussed in the DSEIS in the context of how the Project may be adding to the risk of localized extirpation for all three species.

Reclamation staff has been made aware of the speciation in the Shasta salamander complex, the threat of fire and reservoir inundation to these species, and the legal actions relative to listing as threatened or endangered under the ESA. A full reporting of these issues, and quantification of specific localities that will be lost, was not provided in the DSEIS and is a serious omission.

Another newly described endemic amphibian species, the Shasta black salamander (*Aneides iecanus*), was recently split from other black salamanders in California (Reilly and Wake 2019). The Shasta black salamander occurs only in north central and western Shasta County as well as extreme southeastern Siskiyou County in the vicinity of Castle Crags, and ranges in elevation from 300 m (near the surface of Lake Shasta) to over 1,000 m in Castle Crags (Reilly and Wake 2019). Given that the type locality of the species was drowned by the filling of Lake Shasta (Reilly and Wake 2019), it is likely this species lost considerable habitat due to the original dam and reservoir. This species is a streamside salamander whose habitat could be significantly impacted by the dam raising proposed in the Project. The SEIS should discuss whether the Project will have population level impacts on Shasta black salamander that could lead to listing under CESA or the federal ESA.

References:

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2. Changed Status for Shasta Snow-Wreath

The DSEIS fails to mention the state protected status of the Shasta snow-wreath and pending consideration of listing under the federal ESA, nor does it adequately evaluate the Project's impacts to the snow-wreath.

The Shasta snow-wreath (*Neviusia cliftonii*) is a dicot shrub in the rose family that is found exclusively in western Shasta County around the perimeter of Shasta Lake. The species was first described in 1992 and is now known from a total of 24 occurrences, restricted almost entirely to National Forest System lands (CDFW 2020). Because of extensive searching between 1992-2016, it is unlikely that there will be many more occurrences discovered (Roche 2019).

The Shasta snow wreath was severely impacted by the initial construction of Shasta Dam (CDFW 2020). Shasta snow-wreath is presumed to have been more widespread and populations more connected along river corridors before the filling of Shasta Lake in 1948, as evidenced by the many populations that reach their lower limit at the full pool line of Shasta Lake (Lindstrand and Nelson 2006; DeWoody et al. 2012a).

The DSEIS fails to mention the September 30, 2019 petition to list the species as endangered or the California Fish and Game Commission's April 21, 2020 formal designation of the Shasta snow-wreath as a protected candidate species under the California Endangered Species Act (CFGC 2020), or to consider the information presented in the federal or state listing petitions regarding the imperiled status of the snow-wreath. Under CESA, species designated as candidate species are afforded the full protection of the law, equal to species listed as threatened or endangered. (Cal. Fish & Game Code § 2068.) In accordance with Reclamation's duty to comply with applicable state environmental laws, discussed above, the DSEIS's failure to adequately analyze impacts to the Shasta snow-wreath violates its NEPA mandate.

Despite the protections due Shasta snow-wreath under CESA, the DSEIS only mentions the Shasta snow-wreath in passing in the geology section of Chapter 5, which covers the Wild and Scenic River designation of the McCloud River. Given that the Project was identified by the California Fish and Game Commission (CFGC 2020) and the California Department of Fish and Wildlife (CDFW 2020) as the primary threat to the Shasta snow-wreath and its habitat, the failure of the DSEIS to include the status of this species is a serious omission.

According to the CESA listing record, the Shasta snow-wreath is threatened with significant destruction, modification and curtailment of habitat and range as a result of the Project proposal to raise Shasta Dam, which would inundate thousands of additional acres and move infrastructure into suitable snow-wreath habitat, with additive impacts from changed hydrology and construction. The California Department of Fish and Wildlife estimated that this inundation and other associated actions would impact 71-79 percent (17-19 of 24 occurrences) of all the known occurrences of Shasta snow-wreath (CDFW 2020; CFGC 2020). The proposed 18.5-foot dam raise would inundate about 32,300 acres of land surrounding the existing Shasta Reservoir (USDI BOR 2015a). Inundation would destroy 9 known Shasta snow-wreath occurrences and additional potential habitat, as well as change hydrology and drainage of habitat areas (Lindstrand and Nelson 2005a, 2005b; Lindstrand 2007; USDI BOR 2013). Other Shasta snow-wreath subpopulations could be disturbed by the relocation of roads, bridges, campgrounds, and other facilities (Lindstrand 2007; USDI BOR 2015).

The USFWS received a petition to list the Shasta snow-wreath under the federal ESA on October 3, 2019 (Roche 2019). To date, the USFWS has not responded to the petition with a 90-day finding to determine whether or not the petition contains sufficient information to move forward with the listing process. Although not currently responsive to the petition, Reclamation and the USFWS are required to give full consideration to the California Fish and Game Commission findings and notice of the CESA status of the Shasta snow-wreath, pursuant to ESA Section 4(b)(1)(B)(ii). (16 U.S.C. § 1533(b)(1)(B)(ii).) By not acknowledging the existence of the USFWS petition and the CDFW status of the species in the DSEIS, Reclamation is keeping crucial information from decision-makers, and violating the requirements of the ESA and CESA.

The DSEIS is conspicuously silent on the existence of the November 2015 Final Fish and Wildlife Coordination Act Report (FWCAR) for the Project (USDOI BOR 2015b). Reclamation is aware that the 2014 version of the FWCAR document was withdrawn from Reclamation by the USFWS for minor editing and that the document was finalized with the necessary edits. In both the 2014 and 2015 versions of FWCAR, there is significant discussion of the threats of the Project to the Shasta snow-wreath. The 2015 FWCAR found that 46 percent of all known occurrences of the plant species would be adversely affected by the Project (USDOI BOR 2015b); however, the current scientific understanding of the Project is that it is expected to impact 71-79 percent of the known locations (CDFW 2020; CFGC 2020).

In the FEIS, Reclamation concluded that the fragmented Shasta snow-wreath populations around Shasta Lake are more vulnerable to extirpation (FEIS, p. 12-219). Throughout the FEIS it is disclosed that the proposed Project mitigation calling for relocation, transplanting, and artificial propagation of Shasta snow-wreath are unproven, with Reclamation concluding that the impacts would remain significant and unavoidable. The SEIS needs to clearly state the CESA status of the species, the USFWS process on the ESA petition to list the species, and updated information on the Project's expected impacts to the species quantified by CDFW and the California Fish and Game Commission in the spring of 2020.

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3. Failure to Fully Analyze Upstream and Downstream Impacts to Aquatic, Riparian, and Floodplain Habitat for Listed Salmonid and Riparian Species; and Failure to Complete ESA Consultation

A. Lack of ESA Consultation

In the DSEIS for the Project, Reclamation based its satisfaction of the federal Endangered Species Act (ESA) consultation requirement on two Biological Opinions: the U.S. Fish and Wildlife Service (USFWS) October 21, 2019, *Biological Opinion for the Reinitiation of Consultation on the Coordinated Operations of the Central Valley Project and the State Water Project* (USFWS 2019) and the National Marine Fisheries Service (NMFS) October 22, 2019, *Biological Opinion for the Reinitiation of Consultation on the Long-Term Operation of the Central Valley Project and State Water Project* (NMFS 2019). Yet these Biological Opinions explicitly do <u>not</u> include an analysis of effects to ESA-listed species that would occur as a result of the raising of Shasta Dam in the current Project, and cannot be relied upon here.

NMFS has not completed ESA consultation on either upstream or downstream effects of the Project, and these effects have not been fully analyzed by Reclamation in the FEIS or DSEIS. NMFS addressed the lack of information on the Project effects in a footnote to its 2019 Biological Opinion for the Long-Term Operation of the Central Valley Project and State Water Project (NMFS 2019 OCAP BiOp): "There are no operational scenarios in the [biological assessment] to evaluate to confirm beneficial or adverse effects of a raised Shasta Dam and NMFS therefore cannot further evaluate the Shasta Dam raise in this opinion" (NMFS 2019, Footnote 8, page 203).

Reclamation has not consulted with NMFS on the effects of the Project on Recovery Plan implementation for the NMFS *Central Valley Chinook Salmon and Steelhead Recovery Plan* (NMFS 2014b). In their Biological Opinion on operations, the NMFS 2019 OCAP BiOp included an unfounded expectation of a commitment carried over from the NMFS 2009 *Biological Opinion and Conference Opinion on the Long-Term Operations of the Central Valley Project and State Water Project* RPA Action Suite V, NF 4: Implementation of Pilot Reintroduction Program (which included above Shasta Dam). While the NMFS 2019 OCAP BiOp describes the 2018 Reclamation funding for the Pilot Reintroduction Program, it does not include any discussion of the funding withdrawal directed by Reclamation in the summer of 2019. In addition, the FEIS expressly did not include the Shasta Dam Fish Passage Evaluation because Reclamation considered it "too speculative."

The USFWS addressed the consultation on future effects through an incomplete ESA consultation on both upstream and downstream effects and by deferring ESA consultation on the future downstream effects of raising Shasta Dam in its 2019 OCAP BiOp. On April 3, 2019, Reclamation initiated ESA consultation with the USFWS on the upstream effects of raising the elevation of Shasta Dam on the northern spotted owl, California red-legged frog, and gray wolf. On August 12, 2019, USFWS staff at the Bay Delta Fish and Wildlife Office were directed by their Field Supervisor to put the consultation on hold and no further ESA consultation on upstream effects ensued. On page 30 of the USFWS 2019 OCAP BiOp, further consultation on downstream effects was deferred in the following way:

> "There is a separate process and environmental impact statement for the Shasta Dam Raise, for which a Record of Decision and Biological Opinions have not been completed. Reclamation would not change operations described in the [Proposed Action] until the Shasta Dam Raise ROD and separate ESA consultations are completed. In the interim, Reclamation would operate

> the enlarged reservoir consistent with the operations and requirements of the [Proposed Action]."

After construction on raising Shasta Dam is completed, on or before the Project has captured 634,000 acre-feet of wet-season flow and snowmelt, operational criteria are likely to change and Reclamation is expected to reinitiate formal ESA consultation on Project effects and take of listed species. Prior to conducting the deferred ESA consultations there will be significant impacts on numerous listed species and their critical habitats: spring-run Chinook salmon, winter-run Chinook salmon, and Central Valley steelhead juvenile rearing habitat will have been lost or seriously degraded; additional ecological riparian function that maintains western yellow-billed cuckoo Critical Habitat will be permanently removed from the Sacramento River; essential habitat types of Critical Habitat for winter-run Chinook salmon, spring-run Chinook, and Central Valley steelhead will be degraded or lost; spawning flows for southern green sturgeon may be compromised; northern spotted owl nesting territories may lose foraging habitat, resulting in nest failures; and California red-legged frogs may be subjected to habitat loss and increased predation.

Reclamation is planning to commit the financial and staffing resources to raise the elevation of Shasta Dam, but to defer ESA consultation until after construction is completed and the reservoir is filling or full and there becomes a need to change the operational criteria. ESA consultation after-the-fact is not consistent with Section 7(d) of the ESA and its implementing regulations under the Code of Federal Regulations (50 CFR **Part** 402.09). Section 7(d) of the ESA reads as follows:

> "7(d) Limitation on Commitment of Resources. After initiation of consultation required under subsection (a)(2), the Federal agency and the permit or license applicant shall not make any irreversible or irretrievable commitment of resources with respect to the agency action which has the effect of foreclosing the formulation or implementation of any reasonable and prudent alternative measures which would not violate subsection (a)(2)."

Reclamation has completed a Biological Assessment pursuant to ESA Section 7(c) and its implementing regulations (50 CFR Part 402.12) for upstream Project effects to the northern spotted owl, gray wolf, and California red-legged frog. After Reclamation initiated ESA consultation with the USFWS, the USFWS and Reclamation made full use of the 90 days of consultation period prescribed in section 7(b)(1)(A) of the ESA. To date, the ESA consultation with the USFWS has not been concluded – there is no Biological Opinion or concurrence regarding effects of the Project, including for the original four ESA-listed species and the downstream effects of the Project on the western yellow-billed cuckoo and its proposed Critical Habitat.

Regarding effects on ESA listed species and their habitat from raising Shasta Dam, Reclamation has put forward the argument in the DSEIS that operational criteria will not change and thus no further ESA analysis or consultation is needed at this time for downstream effects. Reclamation is not upholding their obligations under Section 7(a)(2) of the ESA, by failing to quantify loss of riparian floodplain activation and function, not asking NMFS and the USFWS to conduct jeopardy or adverse modification analyses, not considering the effect of removing 634,000 acre-feet of wet season flow and snowmelt from the Sacramento River, and not considering future losses of wet-season flow.

NMFS and USFWS have accepted deferment of ESA consultation; however, once the Project is completed NMFS and USFWS will not have the ability to formulate a Reasonable and Prudent Alternative that would include flows used to effectively maintain and conserve habitat for ESA listed species. The Project will also inundate potential winter-run salmon rearing habitat in the McCloud River in a stretch of river that would have contributed to winter-run Chinook salmon survival and recovery when the Pilot Reintroduction Program is reestablished in the future. Without a firm commitment to restore winter-run Chinook salmon upstream of Shasta Dam, this vital recovery action may be further delayed or potentially abandoned. The construction of the Project will not be reversable without significant additional cost and analyses, and the expenditure of greater than $1.4 billion will be irretrievable.

In order to be compliant with 50 CRF 402.12, 50 CFR 402.14, and ESA Sections 7(a)(2), 7(c)(1), and 7(d), Reclamation must consult with NMFS on all upstream and downstream Project effects to listed salmonids and their Critical Habitat. Essential habitat types that are found in Critical Habitat along the Sacramento River for the listed salmonids include, but are not limited to: juvenile rearing areas, juvenile migration corridors, and areas for growth and development to adulthood. Within these areas, NMFS (2000) identified essential features of Critical Habitat to include adequate: "(1) substrate, (2) water quality, (3) water quantity, (4) water temperature, (5) water velocity, (6) cover/shelter, (7) food, (8) riparian vegetation, (9) space, and (10) safe passage conditions." Water velocity, cover/shelter, food, riparian vegetation, space, and safe passage conditions for salmonids will all be compromised by the lack of riparian edge and floodplain activation that will be a direct and indirect effect of the Project.

Riparian edge and floodplain activation consists of flows outside of the river channels that are periodically inundated to connect floodplains to a river and nourish riparian habitat. Reclamation must confer with the USFWS on the impact to proposed western yellow-billed cuckoo Critical Habitat that is likely to occur with curtailment of riparian activation flows. As the Sacramento River population western yellow-billed cuckoo continues to decline toward zero, Reclamation should consider the combined effects of existing Shasta Dam operations on the species and the accelerated loss of habitat that is expected to occur as a result of the Project.

ESA consultation with both agencies is required to quantify take resulting from the Project of winter-run Chinook salmon, spring-run Chinook salmon, Central Valley steelhead, southern green sturgeon, western yellow-billed cuckoo, northern spotted owl, and California red-legged frog. Because of the outstanding dispersal ability of the gray wolf, serious consideration should be given to the future risk of take if a California pair of gray wolves establish a breeding territory in or near the reservoir inundation zone.

Reclamation has yet to take a hard look at the Project's effects in reducing the amount of Sacramento River downstream rearing habitat available for winter-run Chinook salmon, spring-run Chinook salmon, Central Valley steelhead, and western yellow-billed cuckoo. In particular, winter-run Chinook salmon and western yellow-billed cuckoo in California are perilously close to extirpation. Only offering surveys, monitoring, and planning while these salmon and cuckoo populations continue to decline will not protect the limited remaining habitat upon which these species depend.

B. Downstream Effects to Riparian Corridor

The Project is intended to hold back 634,000 acre-feet water that comes into Shasta Lake as wet season flows and snowmelt. By holding back wet season flows and snow melt, Reclamation will potentially prevent the 634,000 acre-feet of water from contributing to downstream riparian edge and riparian floodplain inundation (collectively called "riparian activation") during the reservoir fill period. Planned future operations are highly likely to reduce the sustainability of riparian floodplain habitat. During the period of reservoir fill, wet-season and snowmelt flows up to the reservoir capacity will no longer be available for riparian edge and floodplain activation downstream of Shasta Dam.

The entire package of the FEIS, DSEIS, and the purported ESA consultations are characterized by a lack of quantification of effects to riparian ecosystems downstream of Shasta Dam and complete disregard for the ecological needs of listed species dependent upon activated riparian habitat. Reclamation included extensive modeling in the FEIS but the EIS remains silent on Sacramento River flows during the reservoir fill period following construction of the Project.

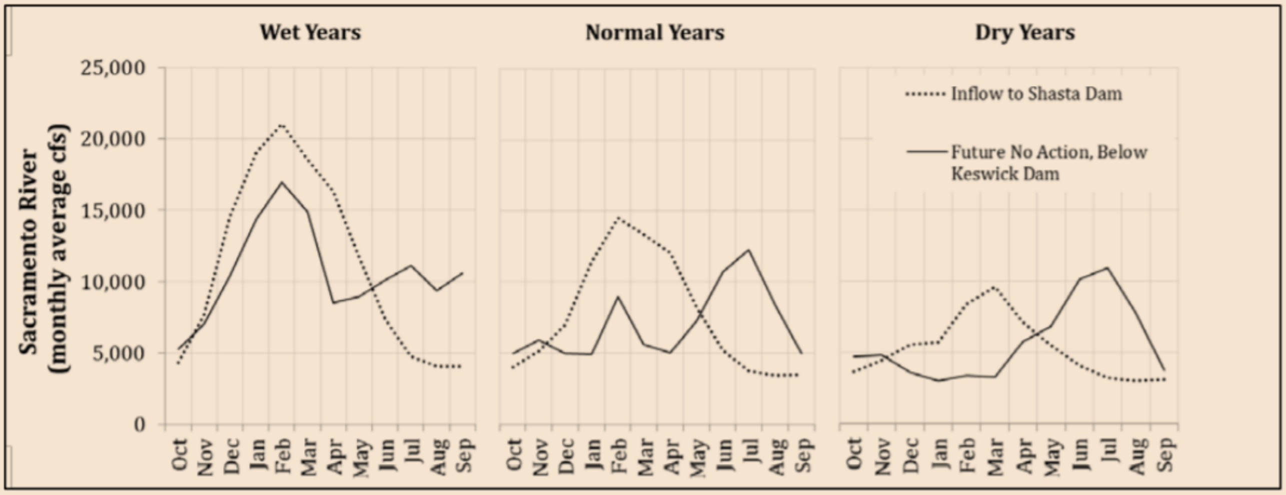
The Project effect of riparian habitat loss for winter-run Chinook salmon, spring-run Chinook Salmon, Central Valley steelhead, and the western yellow-billed cuckoo has not been quantified by Reclamation, NMFS, or USFWS. Mitigation described in the FEIS is only to "Implement a Riverine Ecosystem Mitigation and Adaptive Management Plan." Direct and indirect impacts to the riparian ecosystem and ESA listed species habitat are likely to occur several years in advance of a finalized plan, and the water to activate the riparian floodplain will already be obligated for other uses.

Riparian restoration without a committed level of floodplain activation (such as 28 to 56 days of flooding on established upland vegetation) is not likely to provide for optimal juvenile salmonid growth. Jeffries et al. (2008) found that juvenile Chinook salmon reared on vegetated ephemeral floodplain for up to 56 days had faster growth than juveniles in the river below the floodplain and in unvegetated sites. Meyers (2018) found significant growth in the riparian floodplain after 28 days. These periods of floodplain activation have been demonstrated to optimize juvenile salmonid growth, and potentially survival. Reclamation's dependence on Mitigation Bot-7 as mitigation for loss of habitat avoids any acknowledgement of the level of riparian activation needed to maintain healthy riparian ecosystems in the lower Sacramento River.

If the reservoir fill period occurs during wet years, that water would not be available for riparian activation downstream of Shasta Dam. Wet years are essential for activating the riparian floodplain and enhancing the habitat, making it available for breeding, feeding, and sheltering of ESA listed species. If the reservoir fill period occurs during dry years, followed by wet years or average years, the period of hydrograph diminishment will be prolonged. Reclamation has not provided an analysis of the potential number of years that activated riparian floodplains will be prevented by reservoir fill.

C. **Hydrograph Diminishment**

Shasta operations have already modified and diminished the natural hydrograph of the Sacramento River (Figure 1, from FEIS Figure 4-9). This diminishment of the hydrograph has impacted riparian ecosystems along the Sacramento River to the point that the capacity of the river to support and sustain high quality riparian habitat is largely dependent on flows from tributaries downstream of the Project, such as Cottonwood Creek and Battle Creek (USFWS 2020). The suppression or removal of natural hydrograph components, such as winter freshets, wet-season flows, and summer flow recession all result in diminishment or loss of ecological function, riparian habitat diminishment and loss, systemic and systematic loss of western yellow-billed cuckoo breeding habitat, and loss of access to feeding and migration habitat for juvenile salmonids.



Notes:
Wet Years comprised of water years (October – September) classified under State Water Board Decision 1641 as "Wet"
Normal Years comprised of years classified as "Above Normal" and "Below Normal"
Dry Years comprised of years classified as "Dry" or "Critical"

Figure 4-9. Comparison Between Inflow to Shasta Dam and No Action Alternative Releases at Keswick Dam

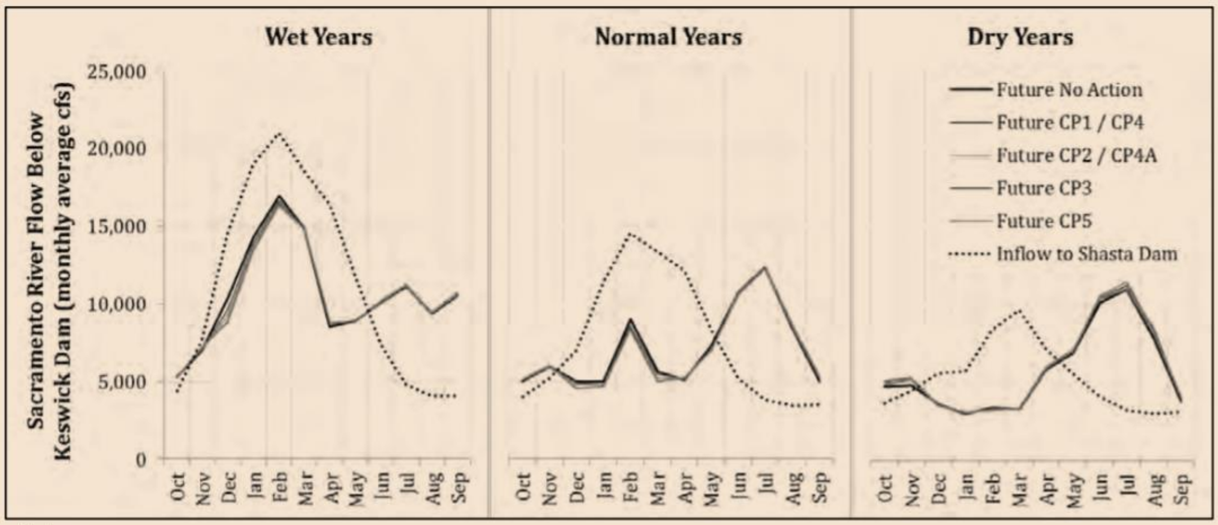
Figure 1. Graphic from Chapter 4 of the FEIS quantifying the loss of water to the Sacramento River from Shasta Dam Operations. From December through April (and May in High Water Years), the amount of water no longer available for floodplain activation is the area below the "Inflow to Shasta Dam" curve and above the "Future No Action" curve.

Existing operation of Shasta Dam has removed the winter freshets from the hydrograph, and current operations do not have streambed mobilization flows, such as those offered by Reclamation for Clear Creek (NMFS 2019 BiOp, p. 327). Current operation also lacks a moderated flow recession in late spring and early summer that would provide for germination and establishment of riparian trees. The wet-season component of the natural hydrograph will be further diminished as a result of raising the level of Shasta Dam. High, wet-season (winter and spring) flows result in riparian edge and floodplain inundation amount, duration, and timing which activate the riparian food web and provide food and cover for juvenile salmonids.

Reclamation's graphics of the hydrograph, measured downstream of Keswick Dam, do not include projections of the hydrograph during the reservoir fill period of the Project. Habitat loss from current Shasta operations can be ascertained by the amount of riparian activation flows no longer available for floodplain activation. This can be quantified as the area below the "Inflow to Shasta Dam" curve and above the "Future No Action" curve in Figure 1.

The USFWS has collected instream flow incremental methodology (IFIM) data for select areas along the Sacramento River that can be used to determine the level of loss or diminishment of habitat from removal of flows and hydrographic components from the riparian edge of the Sacramento River (CDFW et al. 2014; USFWS 2015). Reclamation did not quantify the baseline effects to the area under the curve to the changes in the hydrograph expected during the reservoir fill period or from post-Project operations.

The scale of the graphic in FEIS Figure 4-12 (Figure 2) obscures the effect of loss of these flows to the riparian edge and riparian floodplain in the Sacramento River. Reclamation did not quantify the number of acres or number of miles of riparian edge and riparian floodplain that would not be activated as a result in the change in flows. Due to the fact that these reductions occur during juvenile salmonid rearing and migration, the loss of even a limited number of acres could amount to several miles of loss of juvenile salmonid habitat and could significantly affect juvenile salmonid survival.



Notes:
Wet Years comprised of water years (Oct – Sep) classified under State Water Board Decision 1641 as "Wet"
Normal Years comprised of years classified as "Above Normal" and "Below Normal"
Dry Years comprised of years classified as "Dry" or "Critical"

Figure 4-12. Comparison Between Inflow to Shasta Dam and Future Alternative Releases from Keswick Dam

Figure 2. Graphic from Chapter 4 of the FEIS comparing alternatives in the FEIS. The scale of the graphic obscures the effect of the additive loss of riparian floodplain activation downstream of Shasta Dam.

In other rivers, it has been shown that the restoration of a flow regime that supports riparian regeneration has led to the return of large riparian trees and diverse riparian cover (Mahoney and Rood 1993; Hughes and Rood 2003; Rood et al. 2003; Rood et al. 2005). A river's flow regime affects the ability of that river to recruit large overstory trees and to support diverse riparian structure and composition (Richter and Richter 2000; Bovee and Scott 2002; Lytle and Poff 2004; Poff et al. 2007; Poff and Zimmerman 2010). Diverse riparian structure supports overhead and instream cover for juvenile salmonids, and diverse organic material that supports riparian and riverine insects that are important food resources for salmonids. Diverse riparian structure with a cottonwood overstory, in areas greater than 50 acres, support western yellow-billed cuckoo breeding and foraging (USFWS 2104).

The relationship between flow and establishment of cottonwoods has been well-documented (e.g. Busch and Smith 1995; Fenner et al. 1995; Naiman and Décamps 1997; Mahoney and Rood 1998; Rood et al. 2003b; Poff et al. 2007; Braatne et al. 2007; Carlisle et al. 2010; Opperman et al. 2010). Determining whether riparian establishment flows have occurred is a simple matter of modeling, per Mahoney and Rood (1998). Identifying when riparian establishment flows have occurred would provide the information necessary for determining when Project operations support riparian establishment and when they do not. Because riparian establishment flows are bimodal in nature (they have either occurred or not occurred), testing the probability that riparian establishment flows have an average probability of occurrence can be tested against water year type.

Removal of Spring Pulse Mitigation

In their 2019 OCAP BiOp, NMFS accepted a Spring Pulse as mitigation for planned reductions in flow under current operations. While a Spring Pulse will not make up for the loss of juvenile salmonid rearing habitat from lack of riparian activation, it may effectively increase outmigration survival for spring-run Chinook salmon and steelhead trout. But it is not likely to increase overall outmigration survival for winter-run Chinook salmon. The Spring Pulse is not offered or discussed in the FEIS or DSEIS. During the fill period, Reclamation may not make Spring Pulse flows available for downstream juvenile migration, because such flows are likely to interfere with the ability to meet performance objectives.

Current operation of Shasta Dam removes a significant amount wet-season floodplain activation from November through May. Through the OCAP ESA consultation, Reclamation offered a Spring Pulse Flow from April 1 through May 15 in some years as mitigation for existing operations. Unfortunately, the Spring Pulse flows offered by Reclamation in the NMFS 2019 OCAP BiOp are only offered "if the pulse does not interfere with the ability to meet performance objectives or other anticipated operations of the reservoir." With this caveat on a Spring Pulse flow, Reclamation has the ability to hold back water following construction of the Project at its discretion. This will have the compounded effect of removing riparian activation wet season flows from the downstream riverine and riparian ecosystem while also not providing the Spring Pulse flows mitigation, which were designed as a pulse flow of 150,000 acre-feet that could be released up to 57 percent of years.

In their 2019 OCAP BiOp, NMFS describes at length the proposed Spring Pulse flow from May 1 through May 15, which is only intended to enhance juvenile salmonid outmigration. No provisions are made for loss of activated riparian floodplain during the natural hydrograph period of juvenile rearing and migration from mid-November through May. The wording of the Spring Pulse provision under current operations does not provide a firm commitment to mitigate for the loss of juvenile salmonid rearing habitat or loss of riparian regeneration flows in cuckoo Critical Habitat from existing operations and does not provide any additional mitigation for the impacts of raising Shasta Dam and does not mitigate for current operations.

Reclamation's analysis of a Spring Pulse flow did not call for such flows from Shasta Dam in 43 percent of years. Based on the current scientific understanding of the importance of these flows for juvenile salmonid outmigration, this would result in serious impacts to outmigrating winter-run Chinook salmon, spring-run Chinook salmon, and Central Valley steelhead, potentially leading to cohort failure. There have not been analyses of how potential cohort failure would affect the survival and recovery of these species.

The loss of rearing and outmigration flows for winter-run Chinook salmon in the Sacramento River is particularly dire: "For winter-run Chinook salmon juveniles, exposure to the spring pulse is small, occurring in fewer than 75 percent of years, and in those years, less than 5 percent of the year-class is expected to be influenced. We expect increased survival for those juveniles exposed to the spring pulse as a result of decreased travel time and decreased predation risk" (NMFS 2019 OCAP BiOp, p. 229).

D. Loss or Diminishment of Ecological Function

There is no commitment in the FEIS or DSEIS to provide the riparian activation (flows outside of the river channels that nourish riparian habitat) that is necessary to enhance juvenile salmonid growth and survival and to enhance, sustain, and conserve western yellow-billed cuckoo habitat. In addition, current

Shasta Dam operations do not have a flow recession that would allow the riparian forest to regenerate, and none is proposed in the FEIS or DSEIS. Riparian forests along the Sacramento River contain Critical Habitat for the western yellow-billed cuckoo and are an important source of prey biomass for the cuckoo and for salmonids. Terrestrial invertebrates from riparian forests fall into or interface with the river where they can be preyed upon by salmonids. This in-fall of insect biomass is considered a “terrestrial subsidy” to salmonid bioenergetics. The sedimentation deposited during riparian activation is important for enhancing western yellow-billed cuckoo prey base in the summer. Therefore, without regeneration of the riparian overstory and floodplain habitat, there will be decreased food availability for foraging salmonids and yellow-billed cuckoos and their populations are likely to continue to decline.

Reduction of Overstory Canopy and Composition

Lack of riparian floodplain and loss of riparian overstory are common side effects of regulated rivers, due to lack of conditions that lead to riparian regeneration and to a diminished or constrained area for tree establishment. The relationship between flow and establishment of cottonwoods (*Populus spp*.) has been well-established (e.g. Fenner et al. 1985; Busch and Smith 1995; Naiman and Décamps 1997; Mahoney and Rood 1998; Rood et al. 2003; Braatne et al. 2007; Poff et al. 2007; Carlisle et al. 2010; Opperman et al. 2010). A river’s flow regime affects the ability of that river to recruit large overstory trees and to support diverse riparian structure and composition (Richter and Richter 2000; Bovee and Scott 2002; Lytle and Poff 2004; Poff et al. 2007; Poff and Zimmerman 2010). Once riparian-regeneration flows are removed from the ecosystem, the cottonwood canopy ultimately becomes decadent and dies out.

The DSEIS and FEIS are silent regarding the importance of cottonwood trees in the riparian ecosystem downstream of Shasta Dam, which are vitally important for maintaining ecological diversity and invertebrate prey biomass in riparian ecosystems in the west. Cottonwood trees are a significant species for contributing to western yellow-billed cuckoo prey base (USFWS 2013, 2014, and 2020) and for contributing to juvenile and adult salmonid prey base (as discussed below). Rood et al. (2003) provide an excellent summary of the effects of a reduced hydrograph on riparian cottonwoods. The secondary objective to “Promote Great Valley cottonwood regeneration along the Sacramento River” was deleted in the FEIS for the Project.

Riparian plantings and restoration could return some ecological function of riparian habitat to the Sacramento River, but Reclamation has not quantified the additional loss of habitat and ecological function that would occur as a result of the Project. Reclamation has only committed to “Implement a Riverine Ecosystem Mitigation and Adaptive Management Plan to Avoid and Compensate for the Impact of Altered Flow Regimes on Riparian and Wetland Communities” (FEIS Mitigation Measure Bot-7). The proposed planning under Mitigation Measure Bot-7 calls for “no-net-loss performance standards for riparian habitat functions” without having quantified the loss of riparian function that could have been calculated using existing data. Planning to plan is not a valid mitigation for Project impacts. No commitments have been made to ensure that restoration projects will receive the wet-season flows needed to sustain woodland health and to activate the riparian food web.

Even though Reclamation removed “Promote Great Valley cottonwood regeneration along the Sacramento River” from the FEIS (FEIS p. 2-13), it was weakly retained in the environmental commitments Table 3-42 Summary of Mitigation Measures as “Feasible modifications to dam operation procedures identified as reducing adverse impacts on meander migration or ecologically important bankfull and overbank flows, or as facilitating cottonwood establishment…” The operational flows for

Shasta Dam in the OCAP biological opinions do not contain this commitment, and it is unlikely that Reclamation would consider these flows as feasible when their single flow commitment for listed species, the Spring Pulse, may or may not occur in the 58 percent of years offered.

Activated riparian floodplain is expected to have the greatest benefit to healthy riparian forests along the Sacramento River. It is vitally important that riparian restoration includes riparian activation; for example, Rubin et al. (2019) found that restoration sites out of the floodplain along the Lower Colorado River had only 4 percent of the aquatic insects and 20 percent of the total insects compared to sites adjacent to and connected with the river. If they are not a part of an activated riparian floodplain, riparian plantings may not have the capacity to mitigate for the importance of riparian flows for maintaining cottonwood overstory and riparian forests. The importance of flow regime for regeneration and maintenance of cottonwood trees and riparian forests in the west has been well established (e.g. Scott et al. 1967; Mahony and Rood 1993; Stromberg 1993; Poff et al. 1997; Mahoney and Rood 1998; Stromberg 1998; , Richter and Richter 2000; Stromber 2001; Rood et al. 2003a, 2003b; Stromberg et al. 2007; Poff and Zimmerman 2010). The importance of cottonwood trees to western yellow-billed cuckoo survival has also been well established (USFWS 2013, USFWS 2014, USFWS 2020).

Reduction of Invertebrate Biomass

Dams are known to reduce aquatic biodiversity and impact the food web downstream (Power et al. 1996; Freeman et al. 2003; Tonra et al. 2015). The primary energetic drivers of riparian ecosystem function are organic matter from riparian vegetation and riparian insects combined with the marine-derived nutrients from anadromous fish (Ward and Stanford 1995; Pozo et al. 1997; Cummins et al. 1989; Cederholm et al. 2000; Allan et al. 2003). Without the invertebrate contribution from the riparian edge and floodplain, food availability for juvenile salmonids is severely limited. It is the ecological processes of the riparian habitat that function to enhance food quantity and availability. For example, Cummins et al. (1989) describe a suite of invertebrate taxa grouped in a category called “shredders” that collectively contribute to the invertebrate biomass in rivers. Shredders feed on “conditioned” plant litter that has been leached in the aquatic environment and colonized by microorganisms, with the conditioning taking “. . . from weeks to months depending upon plant species and stream temperature.” Common prey species, for both adult and juvenile salmonids, fall into the category of shredders (i.e., amphipods, isopods, stoneflies, caddisflies, and some mayflies). Shredders convert organic matter (e.g., leaves, twigs, and woody debris) into fine particulate organic matter. Short and Maslin (1977) found that the fine particulate organic matter contribution made by shredders contributed significantly to the food resource base for the invertebrate “collectors” that are also important prey for juvenile and adult salmonids. Consequently, the ecological chain of shredders, conditioners, and collectors allows the riparian ecosystem to provide prey biomass to both the main channel and off-channel areas.

Benthic Macroinvertebrates and Reduction of Terrestrial Subsidies

Aquatic benthic macroinvertebrate (BMI) assemblages are communities of aquatic macroinvertebrates that are an integral part of a stream's ecosystem and are important food sources for resident stream fish. The quality of the BMI community and its structure reflects the degree of impairment that exists within a stream's ecosystem. Terrestrial subsidies from the riparian overstory are an important component of salmonid food supply, especially in summer (Mason and MacDonald 1982; Wipfli 1997; Nakano et al. 1999; Nakano and Murakami 2001). Like benthic macroinvertebrates, terrestrially derived invertebrates are partially or fully dependent upon the plant biomass provided by riparian trees. The riparian tree energy and biomass contributes to the food chain, and terrestrially derived invertebrate inputs contribute to 50 to 80 percent of salmonid biomass (Allan et al. 2003; Kawaguchi et al. 2003). In rivers with riparian overstory with high canopy closure (i.e., 95 to 97%), bioavailability of terrestrially derived invertebrates is greatest in the summer, when benthic macroinvertebrate bioavailability has tapered off (Nakano and Murakami 2001). Because of this difference in seasonal bioavailability, terrestrially derived invertebrates are the primary food source for rearing and over-summering salmonids.

Reduced Marine-Derived Nutrients

When salmon returns are low, ecological processes in a river are diminished. The food web of nutrient exchange becomes suppressed, with less nutrients becoming available for riparian food webs and a feedback loop of fewer terrestrial invertebrates being produced and becoming bio-available to foraging fish. Marine-derived nutrients and the macronutrient pulse from adult salmon carcasses are one of the primary drivers of aquatic invertebrate abundance (Bilby et al. 1996; Bilby et al. 1998; Moore et al. 2007). Reduced levels of salmon carcasses in the lower Sacramento River and Shasta Lake watershed reduces the nutrient and micro-nutrient boost that would have occurred if robust and stable salmonid populations were present. A deficiency in marine-derived nutrients reduces the ability of the ecosystem to support large numbers of stream invertebrates and reduces the quantity of available food resources for juvenile salmonids rearing (Bilby et al. 1996; Bilby et al. 1998; Zhang 2003; Moore et al. 2007; Wipfli and Baxter 2010).

The upstream migrations of adult salmonids bring large amounts of essential nutrients from the ocean into stream and river systems, where they drive primary and secondary productivity (Bilby et al. 1996; Bilby et al. 1998; Merz and Moyle 2006; Anders and Ashley 2007; Janetski et al. 2009). These nutrients, which include nitrogen, carbon, and phosphorous, are accumulated in salmon as they gain approximately 95% of their body mass in the ocean (Groot and Margolis 1991). The nutrients brought into stream and riparian ecosystems are resource subsidies that strongly influence the structure and function of freshwater ecosystems and beyond (Merz and Moyle 2006; Janetski et al. 2009).

When salmon return to their natal stream or river to spawn and die the nutrients in their excretion, carcasses, and gametes are released into the river and riparian systems. The amount of nutrients that are moved into otherwise nutrient-limited systems can be immense. [See Merz and Moyle (2006) for example of quantification of this effect]

Salmon flesh and gametes are also important food sources for juvenile fish and invertebrates. Juvenile salmon and trout and invertebrates will preferentially ingest highly nutritious eggs or flesh from carcasses. For example, Bilby et al. (1998) found that when available, eggs and carcass flesh from spawning salmonids were 60-96% of the stomach contents of juvenile coho and steelhead. Eastman (1996) and others have also found that when marine derived food sources are available, they are often the primary food source of stream-dwelling salmonids and can increase their growth and condition factor (Bilby et al. 1998; Janetski et al. 2009).

The benefits brought by marine derived nutrients in the bodies of anadromous salmonids extend far beyond freshwater habitat and into the surrounding area. For example, Helfield and Naiman (2001) used isotope analyses to test for signatures of marine derived nutrients in riparian vegetation and found that foliage of trees and shrubs near spawning streams consisted of 22-24% marine derived nitrogen. Bilby et al. (1996) used similar methods and found that 18% of the nitrogen in the foliage of plants along sampled Washington streams was marine derived from coho salmon. Nitrogen availability is the limiting factor for terrestrial plant growth in many forests (Chabot and Mooney 1985; Kimmins 1997), and marine derived nitrogen is known to increase the growth rates of plants near spawning areas (Helfield and Naiman 2001; Naiman et al. 2002). Healthy riparian vegetarian increases the quality of instream habitat through shading, sediment and nutrient filtration, nutrient transfers in the form of foliage, and production of large woody material. Thus, salmon-borne marine derived nutrient inputs that enhance riparian production also drive a positive feedback loop in which nutrients improve spawning and rearing conditions for subsequent generations of salmonids. This positive feedback mechanism historically helped maintain the long-term productivity of river corridors along the Pacific coast of North America, including the Sacramento, McCloud, and Pit rivers. Reclamation should estimate the loss of contribution of marine-derived nutrients to the Sacramento River upstream and downstream of Shasta Dam using target numbers provided by NMFS.

The effects of reduced nutrient availability and biological production on naturally reproducing anadromous Pacific salmon populations are well known and extensively described in scientific literature (e.g. Schindler et al. 2003; Wipfli et al. 2003; Janetski et al. 2009). Low salmon returns create deficits in marine-derived nutrients, limiting primary and secondary productivity, food availability for juvenile salmonids, riparian vegetation growth and regeneration, and large woody material. If the reduced flows from the Project cause cohort failures in outmigrating juvenile salmonids, and Reclamation continues to be an obstacle in salmonid recovery implementation upstream of Central Valley Project dams, the nutrient contribution to the ecosystem from marine derived nutrients will be significantly diminished.

E. Downstream Effects to Western Yellow-Billed Cuckoo

The western yellow-billed cuckoo is a migratory bird that depends on healthy stands of riparian habitat for optimal breeding as well as for foraging during the breeding season. The species was listed as threatened under the ESA in 2014 because of habitat destruction, modification, and degradation from dam construction and operations; water diversions; river flow management; stream channelization and stabilization; conversion to agricultural uses, such as crops and livestock grazing; urban and transportation infrastructure; and increased incidence of wildfire. Dams and altered hydrology are principal drivers of these threats, as discussed at length in the proposed and final listing determinations (USFWS 2013, 2014). The importance of the Sacramento River to the western population of the cuckoo is highlighted in the listing (USFWS 2014). 35,406 acres of Critical Habitat for the cuckoo was designated along the Sacramento River between Red Bluff and Colusa (USFWS 2020) downstream of the project, habitat identified as essential for the survival and recovery of the species.

Riparian activation, including periodic flooding, sedimentation and erosion, is important to maintaining a healthy riparian forest and successional riparian ecosystems that western yellow-billed cuckoos depend on for breeding habitat (USFWS 2014). Reclamation has not addressed this ecological feature in the FEIS, DSEIS, or through ESA consultation.

Reclamation has never consulted with the USFWS on the downstream effects of the Project on the western yellow-billed cuckoo. Instead, Reclamation based its satisfaction of the ESA 7(a)(2) requirement for the Project on their having completed ESA consultations on existing operations of the Central Valley Project (CVP) and State Water Project (SWP). In addition, Reclamation is attempting to rely on the deeply flawed USFWS 2019 OCAP BiOp.

In their 2019 OCAP BiOp, the USFWS did not do an analysis of effects of current CVP operations on western yellow-billed cuckoo or its habitat. They did not determine: (1) the number of acres of activated riparian floodplain lost by current operations or proposed flow reductions; (2) loss or absence of riparian generation, especially the cottonwood trees that are habitat for cuckoo prey, or; (3) the effect of summer flooding on prey base. In addition, the USFWS assumed that the proposed spring pulse flows offered as mitigation for current operations would benefit the western yellow-billed cuckoo. The USFWS focused on willows, which consist of a suite of riparian understory species along the Sacramento River, some of which may persist under Reclamation's altered hydrograph. However, willows depend on winter flooding and scouring to promote the shrubby regrowth and dense willow thickets where cuckoos nest. The USFWS disregarded the floodplain activation flows, summer recession flows, and water table maintenance needed by the overstory cottonwoods that cuckoos depend upon for their invertebrate food sources.

Instead of analyzing how either current operations or the proposed Project would degrade western yellow-billed cuckoo Critical Habitat Physical or Biological Feature 3, the USFWS simply focused on the fact that degradation has been occurring for a long time and, " [t]he effects of the [proposed action] will be imposed on an already degraded, fragmented, and ecologically constrained riparian system" (USFWS 2019 OCAP BiOp, p. 376). The USFWS also pointed out that "Reclamation did not provide information on how past and current water operations has affected cuckoo, nor was habitat suitability modeling provided for the Action Area."

The USFWS accepted Reclamation's argument that proposed flow decreases in November and increases in May and June of less than 5 percent "are unlikely to produce any measurable change in quantity or quality of western yellow billed cuckoo habitat" and that there is "no apparent mechanism by which these changes could result in harm to individual western yellow billed cuckoos." Reclamation's position is contrary to the ecological needs of the western yellow-billed cuckoo. Flow decreases in November may affect the water table and result in death of riparian trees. Flow increases in May and June may inundate riparian habitat, including the food resources upon which western yellow-billed cuckoos depend. Rather than determining the effect of the action on the species, the USFWS response was: "Without detailed ecological flow modeling…We assume that the proposed spring pulse flows could benefit the cuckoo to an unknown amount from now until 2030" (USFWS 2019 OCAP BiOp, p. 377).

Assuming a benefit to the cuckoo without analyzing effects to the species or its Critical Habitat is inconsistent with Section 7 of the ESA, implementing regulations under 50 CFR 402, and the legislative history of the ESA from the 1979 amendments to section 7. Assuming a benefit when none can be deciphered does not give the benefit of the doubt to the species.

In summarizing operational effects for the OCAP consultation, the USFWS did not measure or quantify effects to the cuckoo, but then determined that "no measurable effects of the [Proposed Action] on reproduction of cuckoo are expected to occur" (USFWS 2019 OCAP BiOp, p. 383). This summary of effects is based on the fallacious argument that the USFWS can make a conclusion about effects without looking for effects or quantifying them accordingly.

Lack of Jeopardy or Adverse Modification Analyses.

The most egregious failings in the USFWS 2019 OCAP BiOp were that Shasta Dam's contribution to the factors that resulted in the listing of the western yellow-billed cuckoo were not considered, nor were the importance of Physical or Biological Feature 3 of its Critical Habitat.

In their 2019 OCAP BiOp, the USFWS did not mention that increasing the elevation of Shasta Dam by 18.5 feet was one of the major threats to the western yellow-billed cuckoo and a significant factor contributing to its ESA status. In the final rule listing the western yellow-billed cuckoo as threatened (USFWS 2014), a primary threat to the species was the present or threatened destruction, modification, or curtailment of its habitat or range in the form of habitat loss from dams and alteration of hydrology from dams (USFWS 2014, p. 60015). In the listing, raising of dams or control structures was identified as an even larger current threat to the species, of which the proposal to enlarge Shasta Dam by up to 18.5 feet was called out specifically.

In the ESA listing of the cuckoo, the USFWS (2014) noted that flood events from Cottonwood Creek and Battle Creek contributed to the highly dynamic mosaic of cuckoo habitat patches along the Sacramento River from Red Bluff to Colusa, by enhancing the floodplain still hydrologically connected to the river. The cuckoo listing clearly articulated how winter and spring flows once activated the floodplain and that the hydrograph on the Sacramento River is impaired and will continue to be impaired without changes to water release strategies and management. Instead of providing flows that would enhance the riparian floodplain and western yellow-billed cuckoo habitat, Reclamation plans to remove more riparian activation flows from the river, both in the course of continued operations and as a result of the Project.

Rather than analyze the contribution of operations to the reduction of cuckoo numbers since surveys began in 1972, the USFWS 2019 OCAP BiOp focused on the relative rarity of birds and general threats to the species. The USFWS 2019 OCAP BiOp provides a general explanation of the effect continued operation of dams and water diversions have on riparian habitats into the future, but then makes a vague reference to riparian restoration on USFWS refuges that has occurred or may occur—also referring to other riparian restoration efforts along the Sacramento and San Joaquin rivers. No effort was made to determine whether the Project would result in less riparian activation in the Sacramento River or how it would affect restoration actions on USFWS refuges or along the Sacramento River.

In their 2019 OCAP BiOp, the USFWS explained that trends in the detection rate of western yellow-billed cuckoos are indicative of the general trend in the species' population, supporting the conclusion that the population in the Sacramento River Valley continues to decline. The USFWS provided population graphics but did not project the outcome of the projected decline. Because it could be argued that reduced number of cuckoo detections could be a result of reduced level of effort, USFWS (2013) normalized the data by reporting number of cuckoos detected per hour (See Figure 3, Figure 15-4 in USFWS 2019 OCAP BiOp). This is a graphic that demonstrates both the population trend and the increasing rarity of the yellow-billed cuckoo along the Sacramento River.

The FEIS and DSEIS do not address downstream effects to the cuckoo, even thought is well established in the record that the Project is a serious threat to the species. Proposed Critical Habitat for the western yellow-billed cuckoo (USFWS 2020) identifies altered hydrology as a primary threat to the conservation of the species. In proposing Critical Habitat for the cuckoo, the USFWS (2020) found that habitat patches between Red Bluff and Colusa are still relatively intact, but this is largely due to flow contributions from Cottonwood Creek and Battle Creek—tributaries to the Sacramento River. Hydrologic processes in natural or altered systems that provide for maintaining and regenerating breeding habitat as identified in physical or biological feature 3 (PBF 3) occurs within this Critical Habitat CA-1. These hydrologic processes depend on river flows and the timing of riparian floodplain activation. Changes in hydrology from upstream dams is identified as a threat to Critical Habitat Unit CA-1 along the Sacramento River from Red Bluff to Colusa and native habitat regeneration and survivability has been compromised by altered hydrology. There is a special management recommendation in the Proposed Critical Habitat rule to: “manage hydrology to mimic natural flows and floodplain/drainage processes.”

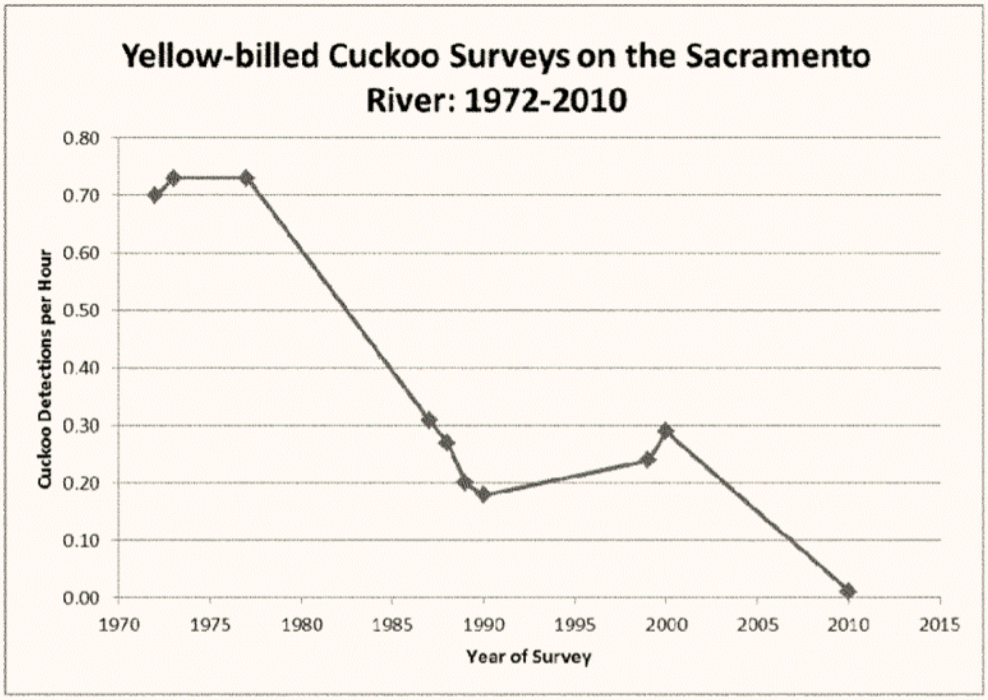


Figure 15-4. Yellow-billed cuckoo detections during surveys on the Sacramento River on 10 separate years from 1972 to 2010. Source: Proposed Threatened Status for the Western Population Segment of the Yellow-billed Cuckoo (Service 2013).

Figure 3. Graphic from USFWS 2019 OCAP BiOp (p. 374, fig. 15-4) demonstrating the increasing rarity of the Western Population Segment of the yellow-billed cuckoo along the Sacramento River.

The proposed rule for designating western yellow-billed cuckoo Critical Habitat (USFWS 2020) contains a three-part conservation strategy that included identifying and conserving habitat in large river systems outside the southwest that are being consistently used as breeding areas by western yellow-billed cuckoos. This resulted in the proposed designation of Critical Habitat Unit 63:CA-1, along the Sacramento River in Colusa, Glenn, Butte, and Tehama Counties in California. Designation of Critical Habitat Unit 63:CA-1 is intended to maintain a robust, well-distributed population of the western yellow-billed cuckoo and enhance survival and productivity of the species as a whole. Successful breeding and maintenance of numbers of yellow-billed cuckoos along the Sacramento River contributes to as much as one third of the range of the species. The hydrologic processes that provide for maintaining and regenerating breeding habitat are features that are essential to the conservation of the species (USFWS 2014). In spite of this, the USFWS in its 2019 OCAP BiOp has not taken a hard look at the effect of current operations on the conservation of the species, nor has it considered the effect that loss of western yellow-billed cuckoo breeding in Critical Habitat Unit 63:CA-1 will have on the survival and recovery of the species.

There are three data points that constitute full population-survey data for cuckoos on the Sacramento River: 1973, 1977, and 2013 (Figure 4). Running a simple regression through the population-level data points indicates that the Sacramento River population of the western yellow-billed cuckoo may become extirpated on or around 2026 in the context of existing operations.

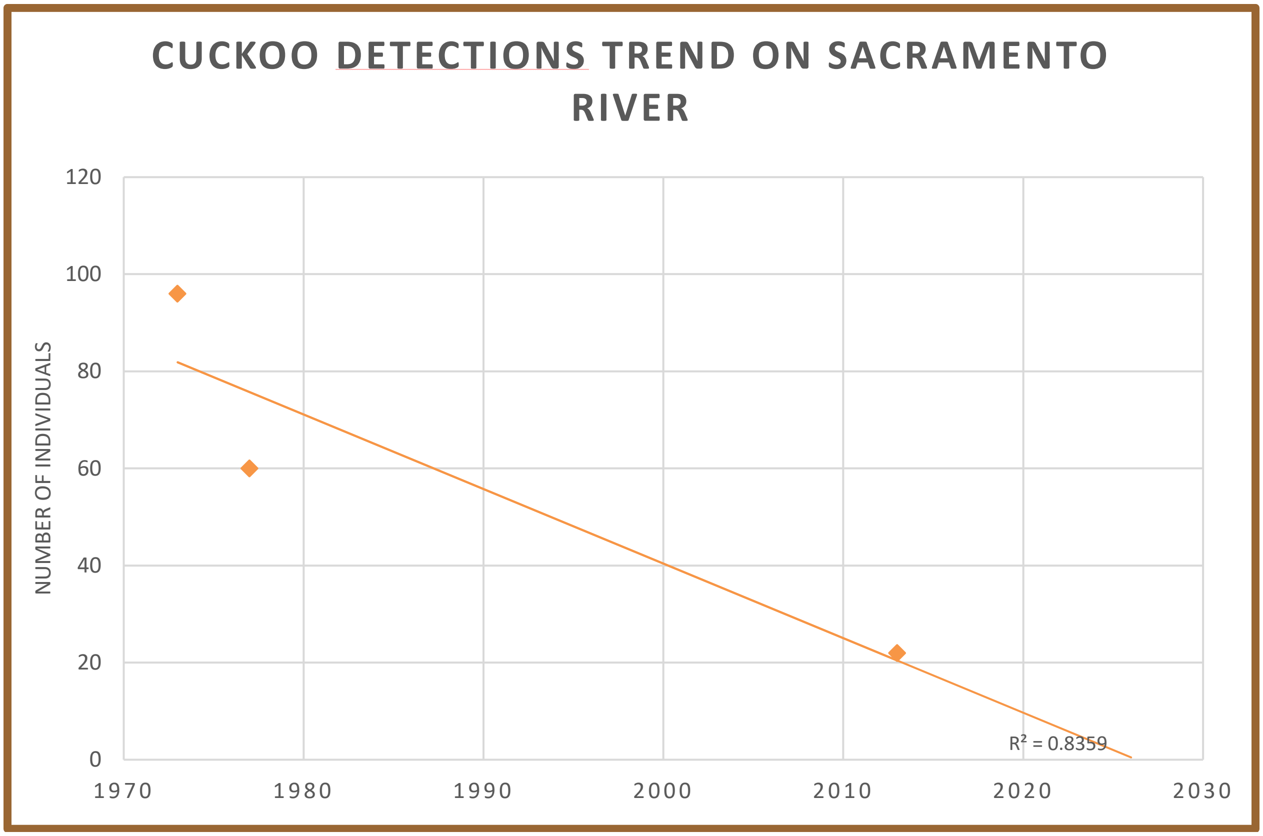


Figure 4. Trend in western yellow-billed cuckoo detections along the Sacramento River from surveys conducted in 1973, 1977, and 2013. Note that a simple regression line indicates that there will be no projected detections by the end of the timeline of the OCAP consultation period (i.e., 2030).

This type of decline in numbers is appreciable and significant, potentially reducing the range of the species by as much as one-third and removing one of three components of the physical or biological features essential to the conservation of western yellow-billed cuckoo: Physical or Biological Feature 3—Hydrologic processes in natural or altered systems that provide for maintaining and regenerating breeding habitat (USFWS 2020, p.11476).

Along the Sacramento River, no appreciable reductions in the threats to the species have occurred, so it is logical to expect numbers to continue to decline. Due to the lack of any substantive measures to protect the species, western yellow-billed cuckoo breeding along the Sacramento River is expected to continue to decline and Critical Habitat Unit 63:CA-1 will continue to be degraded. If the expected trajectory continues, western yellow-billed cuckoos breeding along Sacramento River could be extirpated before the end of the OCAP implied consultation period of 2030 is reached.

F. Downstream Effects on Juvenile Salmonids

Anadromous salmonids have complex habitat needs that reflect the natural dynamics of their natal rivers. Some primary habitat needs are: substrate for spawning, water temperatures that support healthy metabolism and viable egg production, water quality that supports in-water prey, riparian overstory for terrestrial infall of prey items, attraction flows for upmigrating adults, dispersal flows for outmigrating juveniles, woody material for juvenile cover and foraging, and floodplain inundation for juvenile access to prey supporting enhanced growth and survival. Clearly temperatures are not the only factor in determining survival of salmonids. The FEIS focuses heavily on the temperature component of survival but is blind to the loss of winter-run Chinook salmon, spring-run Chinook salmon, and steelhead trout juvenile foraging and outmigration habitat that is essential for cohort survival and ultimately survival and recovery of these listed species.

Reclamation is basing its conclusion of a fishery benefit on flawed premises and a lack of ESA consultation on the direct and indirect effects of the project to the Sacramento winter-run Chinook salmon, Central Valley spring-run Chinook salmon, Central Valley steelhead trout, and their Critical Habitat. Reclamation did not consult with NMFS on Project impacts to juvenile salmonid rearing habitat in the Sacramento River. The FEIS and DSEIS have no discussion or analysis of the effect of removing wet season flows from juvenile salmonid rearing habitat or how loss of riparian activation is expected to result in decline and degradation of Critical Habitat for the species. The operational criteria for Shasta Dam address flood-control and water delivery, but do not provide flows for maintaining riparian habitat or activating juvenile salmonid rearing habitat along the Sacramento River. Reclamation could operate Shasta Dam in a way that would significantly enhance juvenile salmonid habitat while also significantly reducing flood risk along the Sacramento River.

Reclamation based satisfaction of ESA consultation requirements for Project effects to Sacramento winter-run Chinook salmon, Central Valley spring-run Chinook salmon, Central Valley steelhead trout, southern green sturgeon, and their Critical Habitat on the deeply flawed NMFS 2019 OCAP BiOp. In their 2019 OCAP BiOp, NMFS did not do an analysis of effects of current CWP operations on the listed salmonids, green sturgeon, or critical habitat. They did not determine: (1) the number of acres of activated riparian floodplain lost by current operations or proposed flow reductions; (2) loss or absence of riparian generation, especially the cottonwood trees that are major contributors to the salmonid prey base; or (3) the effect of summer flooding on prey base. NMFS determined that the proposed spring pulse flows offered as mitigation for current operations would have an uneven benefit across these species. NMFS focused on temperatures for winter-run and spring-run holding habitat but ignored the effects of current and future operations on the ecological processes essential to maintaining Critical Habitat for these species. NMFS disregarded the floodplain activation flows, summer regression flows, and water table maintenance needed by the riparian overstory to provide for successful juvenile salmonid development and survival and to provide functional ecological processes.

Reclamation has not recognized the importance of healthy floodplains to Chinook salmon and steelhead trout (NMFS 2104a) and has failed to make commitments to implement the NMFS Recovery Plan for the species (NMFS 2014b). The FEIS and DSEIS overlook the fact that dams reduce the amount of wet season flows in rivers. This means that holding back wet-season flows for the purposes of increasing anadromous fish survival, increasing water supply, and addressing water resource problems will result in reduction and direct losses of downstream fish and wildlife riparian habitat during the wet season and result in reduced juvenile salmonid survival, loss of riparian function, degradation of riparian habitat, reduced species diversity in the downstream riparian area, and ultimately chronic and systemic reduction of native fish habitat.

The Project's failure to provide or promote riparian activation is also inconsistent with the Recovery Plan for Sacramento River Winter-Run Chinook, Central Valley Spring-Run Chinook, and Central Valley Steelhead (NMFS 2014b) The Recovery Plan specifies a range of recovery actions, including restoring and providing access to floodplain habitats, and implementing floodplain and riparian habitat restoration projects. The Recovery Plan specifically calls out as recovery actions: the need to "restore and maintain riparian and floodplain ecosystems along both banks of the Sacramento River to provide a diversity of habitat types including riparian forest, gravel bars and bare cut banks, shady vegetated banks, side channels, and sheltered wetlands, such as sloughs and oxbow lakes"; and the need to "develop and implement a river flow management plan for the Sacramento River downstream of Shasta and Keswick dams that considers the effects of climate change and balances beneficial uses with the flow and water temperature needs of winter-run Chinook salmon, spring-run Chinook salmon, and steelhead. The flow management plan should consider the importance of instream flows as well as the need for floodplain inundation." The DSEIS does not adequately evaluate the Project's consistency with these recovery actions, despite its potential to conflict with and actively impede these actions, and therefore to impair the conservation and recovery of these species. 40 C.F.R. § 1508.27(b)(9).

Critical Habitat for Sacramento winter-run Chinook salmon in the Sacramento River includes the river water, river bottom, and the adjacent riparian zone (NMFS 1993). NMFS (1993) includes reference to a 1992 report by the USFWS that states that riparian streambanks are composed of natural, eroding substrates supporting vegetation that either overhangs or protrudes into the water and which provides shade and escape cover for salmonids. They also noted that riparian vegetation increases river productivity which ultimately provides prey for salmonids. Although NMFS (1993) limits the extent of the Critical Habitat to that which is accessible to winter-run Chinook salmon, it addresses the floodplain and essential habitat of the Sacramento River winter-run Chinook salmon in the following way: "…(5) habitat areas and adequate prey that are not contaminated, (6) riparian habitat that provides for successful juvenile development and survival, and (7) access downstream so that juveniles can migrate from the spawning grounds to San Francisco Bay and the Pacific Ocean" (NMFS 1993, p. 33217).

Critical Habitat for Central Valley spring-run Chinook salmon and steelhead trout include all areas along the Sacramento River that are reachable to the species. Included in this area is the riparian zone adjacent to the Sacramento River within the Critical Habitat Units (NMFS 2000). Critical Habitat riparian zone is not identified by delineated area but is identified as the part of adjacent riparian habitat that has the functional ecological processes to support the species.

Riparian overstory and inundated riparian habitat is critically important for juvenile salmonid growth and survival, because they provide food, cover, refugia from high flows, and thermal diversity. Reclamation has not addressed the essential life-history stage of juvenile salmonid rearing that occurs in activated riparian habitat. The FEIS and DSEIS are absent of explanation about how flows during the reservoir filling period and during future operations will affect juvenile salmonid rearing habitat and how the limited access of juvenile fish to the floodplain may affect juvenile salmonid survival in the Sacramento River. It is unfounded to conclude that low return rates are a result of out-of-basin mortality influences, when the size-recruitment relationship described by Magnusson and Hilborn (2003) and Woodson *et al*. (2013) has not been addressed.

The prolonged lack of floodplain inundation, year after year, is likely to reduce the survivorship of juvenile salmonids in the Sacramento River. If the floodplain fails to activate for two or more consecutive years, this is expected to result in significant cohort suppression or even cohort failure. The pressure of potential cohort suppression and failure on the salmonid populations in the Sacramento

River has not been addressed. Survival and production of key life stages may vary among streams and populations for a variety of reasons but identifying and conserving the limiting life stage is essential for population (and species) recovery (Petrosky et al. 2001). The entire suite of methods for life cycle monitoring currently used in some coastal California streams (Adams et al. 2017) may be difficult to implement on larger rivers such as the Sacramento River, but the concepts of assessing life-stage-specific effects on populations are certainly applicable. Rates such as parr-to-smolt and smolt-to-adult survival have been estimated (e.g., Petrosky et al. 2001; Achord et al. 2007; Chesney et al. 2009; USFWS 2010a).

Access to inundated (active), vegetated floodplain and riparian areas results in positive, population-level effects to steelhead trout (Hayes et al. 2008), and the benefit of off-channel and floodplain access to juvenile Chinook salmon growth and survival has been well established (Sommer et al. 2005; Jeffres et al. 2008; Limm and Marchetti 2009). Terrestrial in-fall of riparian invertebrates contributes to the energetics of the river and to the salmonid food web (Allan et al. 2003) and insect biomass from in-water decomposition or inundated riparian vegetation significantly enhances juvenile salmonid recruitment (Cederholm et al. 2000). Chinook salmon and steelhead trout that rear in off-channel areas have greater growth rates than those that rear in the river channel (Jeffries et al. 2008; Limm and Marchetti 2009; Meyers 2018), and juvenile Chinook salmon with greater size and growth rates typically have higher survivorship in low recruitment years (Magnusson and Hilborn 2003; Woodson et al. 2013). Figure 5 shows the growth and biomass advantage to juvenile salmon that have access to an activated floodplain.

Figure 5. Graphic from USFWS August 29, 2018, presentation to Federal Energy Regulatory staff under Federal Power Act 10(j) for the Yuba River Development Project. The larger fish are juvenile Chinook salmon reared on an activated floodplain. The smaller fish are the same cohort of fish but were reared in the river during the same time period. The images illustrate the well-established benefit of off-channel and floodplain access to Chinook salmon growth and survivorship.

In two studies of the effect of floodplain inundation on juvenile salmonid survival, the USFWS found a correlation between the number of acre-days of inundated floodplain and juvenile salmonid survival in the river (USFWS 2014, unpublished data in USFWS files). Based on that understanding, an acre-day analysis can be used to estimate the number of acres of habitat lost as a result of reduction in wet season flows caused by dam operation (DOI/USFWS 2017, DOI/USFWS 2018, DOI/USFWS 2019), and the relative commensurate mitigation (floodplain restoration) that is based on the managed flow regime.

The amount of time that the riparian floodplain is inundated, and the duration of the inundation are two important metrics for determining habitat availably for juvenile salmonids, because both of these conditions contribute to food and cover availability. The longer the floodplain is inundated the more time juvenile salmonids are able to forage on it and the more the invertebrate food-web becomes activated. The more acres of habitat that are inundated, the more area is available to juvenile salmonids for foraging. Because both area and time are important considerations in estimating juvenile salmonid rearing habitat during the springtime high-flow period, the USFWS uses the metric of number of acres multiplied by the number of days, or "acre-days." Acre-days is a metric that takes into consideration both area and time, so it can be used to measure the decrease in floodplain area and decrease in inundation duration caused by dams. In two studies of the effect of floodplain inundation on juvenile salmonid survival, the USFWS found a correlation between the number of acre-days of inundated floodplain and juvenile salmonid survival in the river (USFWS 2014, unpublished data in USFWS files).

The during the reservoir fill period, the Project will effectively remove the existing levels of riparian inundation that are provided by Shasta Dam releases. Reclamation did not quantify this loss of juvenile salmonid habitat empirically, and instead relied on their existing modeling efforts.

G. **Quantifying Project Effects to Downstream Riparian Edge and Floodplain**

The FEIS and DSEIS do not quantify the amount of optimal juvenile salmonid rearing habitat available in the lower Sacramento River, and estimates of the amount of habitat needed to sustain salmonid populations has not been conducted. Although riparian, floodplain, and side channel habitat restoration are proposed at one or more unspecified areas, Reclamation has not made it clear whether the proposed restoration is for existing Shasta Dam impacts that would be funded pursuant to the CVPIA or for Project impacts. It would be very useful to determine the timing and amount of juvenile rearing habitat lost from existing operations as a baseline, then to compare Project impacts to the baseline to quantify the difference and determine the additional mitigation needed for the Project.

An acre-day analysis is a simple and established methodology for determining the amount of riparian edge and floodplain that is lost by diminishment or removal of wet-season flows (DOI/USFWS 2017). It is important to parse the acre-day analysis by water-year type, to determine the level of effects during periods when salmonids are subjected to different stressors and to quantify the periods with the most relative impact to habitat availability. The acre-day analysis provides an empirical quantification of habitat loss and provides a useful metric for testing water-modeling outputs.

Based on empirical data and peer-reviewed scientific literature, the Emigrating Salmonid Habitat Estimation (ESHE) model calculates the amount of rearing habitat needed for a target number of juvenile salmonids. This robust model has been widely used in the Central Valley including in: the San Joaquin "Minimum Floodplain Habitat Area for Spring and Fall-Run Chinook Salmon" (2012) report; the Stanislaus Scientific Evaluation Panel (SEP) document (2017); the Central Valley Flood Protection Plan Conservation Strategy (2017); and efforts by the State of California to develop goals and objectives for San Joaquin tributaries. It would be useful to apply the ESHE model to the Sacramento River to estimate the amount of rearing habitat needed for juvenile salmonids.

The acre-day analysis and the ESHE model can be used together in order to compare habitat loss and habitat needs. Reclamation should make the effort to measure habitat loss rather than discounting it.

H. Loss of Vital Fishery Habitat on the McCloud River

The NMFS Recovery Plan (NMFS 2014b) puts forward an extensive argument regarding the importance of fish passage to high elevation and historical, cold-water salmonid habitat. A significant focus of the NMFS Recovery Plan was the importance of the basalt and porous lava diversity group that includes the McCloud River. The McCloud River is a Primary Reintroduction Area in the NMFS Recovery Plan, and its importance is mentioned 56 times.

Other than a nod to "Assist in recovery efforts for threatened and endangered species" (FEIS p. 12-101), there are no commitments in the Project to move forward with Chinook salmon recovery actions on the McCloud River. The DSEIS makes no mention of the Pilot Reintroduction Program that was planned to begin in 2019. The Shasta Dam Fish Passage Evaluation was not included in the 2014 FEIS because Reclamation considered it to be too speculative (FEIS p. 33.3-159). Reclamation has not quantified the effect of the Project on successful recovery implementation for winter-run Chinook salmon in the McCloud River. Instead of considering the Recovery Plan's extensive explanation of the vital need for fish passage to support recovery of listed salmonids, Reclamation only uses minor discussions in the NMFS Recovery Plan to justify the Project. It is disingenuous to ignore the overarching objectives of the NMFS Recovery Plan and attempt to use it as a justification for a water delivery scheme. Undermining recovery implementation is inconsistent with the purposes of the ESA.

By withdrawing funding and participation in the Pilot Reintroduction Program that would have reintroduced winter-run Chinook salmon to the McCloud River, Reclamation has signaled their lack of commitment to fulfilling a promise NMFS depended upon in their 2019 OCAP BiOp. The fact that Reclamation shut down the Pilot Implementation Plan several months prior to NMFS completing their 2019 OCAP BiOp shows, at best, a serious lack of communication and documentation. At the very least, that "new" information would trigger reinitiation of ESA consultation on current operations and require NMFS to look more closely at the Project's impediment to survival and recovery of listed salmonids.

The DSEIS mischaracterizes the hydrograph in the lower McCloud river as being "highly regulated" and asserts that these flows "do not follow a pattern typical of an unimpaired mountain river in northern California" (DSEIS p. 5-11). These misleading statements are most likely the result of using gauge data from directly downstream of McCloud Dam (USGS Gages 11367800 or 11367760), where flows are highly regulated, but not taking into consideration the enhanced hydrology provided by flows from Claiborne Creek, Squaw Valley Creek, Tuna Creek, Little Bollibokka and Big Bollibokka Creeks, Nawtawaket Creek, and Chatterdown Creek. Hydrographic conditions in the lower McCloud River improve with each sequential contribution from these tributary creeks, with the most optimal hydrographic conditions existing downstream of Squaw Valley Creek. As the hydrograph of the lower McCloud River becomes more natural with the contribution each tributary, the result is an approximated natural hydrograph, as measured at USGS Gage 113680000 near Shasta Lake.

Reclamation's position that the project would "have some effect on the free-flowing condition of the lower McCloud River and the wild trout fishery within the part of the lower McCloud River" (FEIS p. 1-36) does not address the effect of McCloud River habitat loss on fully implementing NF 4 of the Near Term Fish-Passage Actions in the NMFS 2009 OCAP BiOp RPA Action Suite V, NF 4: Implementation of Pilot Reintroduction Program (Implementation of Pilot Reintroduction Program above Shasta Dam). Nor does it address the extensive argument put forward in the NMFS Recovery Plan regarding the need for Chinook salmon reintroduction into the lower McCloud River. This position is also contrary to

Reclamation's statement: "Although mitigation has been identified, this impact would be significant and unavoidable" (FEIS p. 25-40).

The Project's new inundation zone on the lower McCloud River will eliminate more than one-third of the most dynamic part of the stream reach between Little Bollibokka Creek and the current inundation zone, and it will destroy the truly outstanding fishery habitat and potential future juvenile salmonid rearing habitat in that reach. The larger trout that utilize the larger riverine area and greater food resources of reach 4 are currently the hard-fighting rainbow trout prized by sportfishers. Neither the FEIS nor the DSEIS offer mitigation that will allow the persistence of salmonids in the densities that are currently supported in the habitat that will be lost through inundation. Loss of riverine habitat cannot be realistically mitigated by conversion or enhancement of any other habitat type. When the river is gone, it is gone.

The FEIS downplays the impact of the Project on lower McCloud River salmonid habitat by describing it as "affecting about 3 percent of the lower McCloud River" although they recognize the loss of 3,550 linear feet or river would compromise approximately 26 percent of Segment 4 (FEIS page 25-37). Tributaries downstream of McCloud Dam contribute to approximately 55 percent of the hydrograph and dominate the wet season flows. Wet season flows provide the streambed mobilization, gravel cleaning, sediment redistribution, and active riparian floodplain processes that provide optimal conditions for salmonids. The lower reaches of rivers and streams provide for the larger territories needed by larger juvenile salmonids as they grow in size and expand their territories in preparation for outmigration. If the fish passage action described in the NMFS Recovery Plan is implemented, this would be the habitat that juvenile salmonids would be optimizing foraging in Reach 4 and consequently optimizing growth and potentially survival. Removing this habitat from a NMFS Recovery Plan action will remove the significant value this stretch of river would have for recovery of winter-run Chinook salmon.

The FEIS calls for "constructing additional resident fish habitat" along the lower reaches of Shasta Lake tributaries, specifically the Sacramento River, the McCloud River, and Squaw Creek (FEIS p. S-24). Reclamation's plan to inundate nearly one mile of blue-ribbon fishing habitat (the best of the best) in the lower McCloud River (USFS 1994, DSEIS p. 5-7), and only offer of a plan to construct man-made habitat that may or may not provide optimal or even useful habitat for native salmonids, demonstrates an astonishing amount of hubris.

The Emigrating Salmonid Habitat Estimation (ESHE) model calculates the amount of rearing habitat needed for a target number of juvenile salmonids. This robust model is based on empirical data and peer-reviewed scientific literature, and a similar modeling effort could be implemented for the lower McCloud River. A habitat-needs model, such as ESHE, can be paired with a habitat-loss model, such as an acre-day analysis, to fully quantify the effect of the Project on salmonid numbers in the river. Reclamation should make the effort to use appropriate modeling to measure the loss of salmonid habitat loss rather than discounting the amount or importance of the habitat.

I. Impacts to Ongoing Restoration Actions

Reclamation has not modeled the effect of reservoir fill on overtopping flood flows from Fremont and Sacramento weirs that result in floodplain activation flows in the Yolo Bypass. These overtopping flood flows from Fremont and Sacramento weirs are essential to the Yolo Bypass Restoration Salmonid Habitat Restoration and Fish Passage Implementation Plan (Yolo Bypass Fish Passage Improvement), which is a $190 million project that includes notching Fremont Weir for increased survival of juvenile spring-run Chinook salmon and steelhead. The Yolo Bypass Fish Passage Improvement project is intended to satisfy RPA Action I.6.1 in the 2009 NMFS OCAP BiOp. It involves a partnership between Reclamation and California Department of Water Resource and is designed to reconnect floodplain habitat in the Yolo Basin specifically improve fish passage for young salmon outmigrating in the Sacramento River. According to Reclamation's web page (https://www.usbr.gov/mp/bdo/yolo-bypass.html), the action includes modifying the Fremont Weir to "to reconnect the floodplain for fish during the winter season and improve connectivity within the bypass and to the Sacramento River. The project provides seasonal inundation that mimics the natural process of the Yolo Bypass floodplain and improves connectivity within the bypass and to the Sacramento River." Failure to quantify the effect of removing floodplain activation flows during the reservoir fill period, and potentially in subsequent operation of Shasta Dam, is a serious omission.

In the NMFS 2019 OCAP BiOp, five RPA actions from the original 2009 OCAP BiOp are considered as part of Baseline for the ESA analysis. This is in spite of the fact that none of these RPA actions have been completed and two of the RPA actions (i.e., RPA Action Suite V NF 4 and RPA Action I.2.6) are unfunded. The funding status of the remaining three RPA actions is unclear. Disturbingly, the 2019 NMFS OCAP BiOp remains silent on completion of the NMFS 2009 OCAP BiOp RPA Actions NF 5, LF 1, and LF 2. RPA Action NF 5 is the Comprehensive Fish Passage Report, which is an essential step in decision-making for long-term passage at Shasta Dam. The long-Term fish passage actions include LF 1, Long-term Funding and Support for the Interagency Fish Passage Steering Committee, and LF 2, which is the Long-term Fish Passage Program. These recovery implementation actions appear to have been arbitrarily dropped from discussion of Project impacts on the survival and recovery of listed salmonid species.

At the time NMFS finalized their 2019 OCAP BiOp, they were fully aware that RPA Action Suite V, NF 4 from the 2009 NMFS OCAP BiOp was unfunded. Their Draft Jeopardy OCAP BiOp from July 2019 states:

"In July, 2018, Reclamation informed the Steering Committee that the project was "on hold" and had been defunded for the foreseeable future. Since July, 2018, DWR has continued to move forward with the juvenile collection facilities, but has not received additional financial contributions from Reclamation. Progress on RPA V implementation, aside from DWR's efforts, has stopped."

In their finalized 2019 OCAP BiOp, NMFS only referred to Reclamation's 2018 funding of the Pilot Reintroduction Program, not the subsequent removal of the funding.

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4. Flaws in Climate Change Modeling and Analysis Regarding Cold Water Flows for Salmonids

Reclamation has used climate change as a foundational rationale for the Project but has utterly failed to consider the importance of the cold water needed for winter-run Chinook salmon, spring-run Chinook salmon, and Central Valley steelhead trout in the McCloud River. The FEIS puts forward a distorted interpretation of the Recovery Plan as justification for the Project without disclosing the intent of the Recovery Plan and its stated importance of the McCloud River as a "Primary," top priority reach for reintroduction of winter-run Chinook salmon, spring-run Chinook salmon, and Central Valley steelhead trout (NMFS 2014b, p. 77).

Reclamation has not included any discussion of the existing cold-water temperatures in the McCloud River or explained the reason why the basalt lava cold-water flows in the Shasta Lake watershed are so important for the survival and recovery of winter-run Chinook salmon, spring-run Chinook salmon, and Central Valley steelhead trout.

In Appendix 6 of the FEIS, Reclamation shows modeled temperature rise in the Sacramento River at two locations downstream of Shasta Dam (e.g., Table 2-21, FEIS Appx 6). These locations have projected mean air temperature increases of 1.3°F in the 2020s, 3.0°F in the 2050s, and 4.2°F in the 2070s. Reclamation has not modeled projected mean air temperature increases for the lower McCloud River; data that is essential for comparing potential Project benefits to salmonid recovery benefits.

Reclamation only modeled the effects of climatic uncertainties for water supply and did not address climatic uncertainties or accepted climate change predictions for the Shasta Lake watershed. Because a significant part of the cold-water contribution into Shasta Lake comes as snowmelt, it would be meaningful to model and quantify projected water temperature changes for at least the next 80 years for the McCloud, Sacramento, and Pit rivers. Modeled temperature changes for these rivers should include the projected tipping point for each river and the projected time in which summer snowmelt would no longer contribute to cooling in the rivers. If any of these rivers have a modeled tipping point that occurs at any time within projected Reclamations modeling scenarios, the cold-water contribution from that river would no longer contribute to the cold-water pool in Shasta Lake. Not modeling the potential loss of cold-water contribution from snowmelt is a serious flaw in the FEIS.

Reclamation has never conducted or completed ESA consultation on Project effects. The NMFS 2019 OCAP BiOp is flawed in its analysis of downstream effects, and NMFS has compounded that error by arbitrarily constraining its analysis of climate change effects. For example, in their 2019 OCAP BiOp on current operations, NMFS limited their period of analysis for climate change effects to the period from 2019 through 2030 and made their no jeopardy and no adverse modification conclusions based on what appears to be a 2030 sunset of the BiOp. Although NMFS refers to their 2016 Revised Guidance for Treatment of Climate Change in NMFS Endangered Species Act Decisions (Climate Change Guidance, NMFS 2016) 7 times in their 2019 OCAP BiOp, they did not follow the guidance in theory or in practice. By only considering short term increases in temperature and not extending their consideration of effects beyond 2030, NMFS selected an arbitrary point in time upon which to base their conclusions.

The 2016 Climate Change Guidance directs NMFS to use the best available science regarding climate warming scenarios, advising NMFS that when they are "uncertain of the relative magnitude of effects, more weight will be given to the detrimental effects in decisions made after the initial listing determination." On pages 52 and 153 of their 2019 OCAP BiOp, NMFS presents more extreme temperature increases for 2050 and 2100 than they used when they accepted the 2030 sunset of the consultation. They also concluded: "NMFS expects that climate conditions will follow a more extreme trajectory of higher temperatures and shifted precipitation into 2030 and beyond" (NMFS 2019, p. 708). Even in the face of uncertain modeling, it is unsupportable for NMFS to casually discount scientific data in deference to a timeline with a more favorable outcome.

NMFS referenced the Intergovernmental Panel on Climate Change (IPCC)'s Representative Concentration Fifth Assessment Report (AR5) and their own Regional Guidance in their 2019 OCAP BiOp, but the existence of these documents is largely irrelevant to their argument. AR5 might have been relevant to their argument if NMFS had looked at the climate impact of increased agricultural production from increased water deliveries proposed by Reclamation, but they did not. Instead, NMFS concluded: "Modeling for the proposed operations that uses data specific to [Representative Concentration Pathway] 8.5 is currently unavailable. Therefore, this consultation assumes that the provided modeling represents a best-case scenario regarding climate conditions through 2030" (NMFS 2019 OCAP BiOp, p. 51). NMFS assumed that that temperatures would increase up to 3.4°F between 2020 and 2059 and precipitation changes would range from -6 percent to +24 percent in the same period, but then limited their period of analysis to only 2019 through 2030 and assumed that Reclamation's modeling "represents a best-case scenario regarding climate conditions through 2030" (NMFS 2019, p. 52).

NMFS selectively recognized climate change projections in 2050 and 2100, but then ignored their data and constrained their analysis to only up to 2030. The 2030 sunset included in the NMFS 2019 OCAP BiOp is suspiciously concordant with the timing of the beginning of the Project's reservoir fill period beginning in 2025 and a likely fill period of five years. During the 2025 to 2030 time period, the first serious impacts to juvenile salmonid outmigration will have occurred and the impacts will be irreversible.

USFWS also accepted Reclamation's proposed term of the ESA consultation through the year of 2030 in their 2019 OCAP BiOp and did not address Reclamation's inconsistent record of compliance with biological opinions or follow-through on proposed mitigation. USFWS recognized that global warming is expected to continue through the century, but constrained their period of analysis to a period where water temperature warming is measurably less, stating: "The amount of anticipated change to the regional climate expected in the near term is lower than it is for the latter half of the century. Therefore, it is less certain that any measurable change from current conditions will occur in the next approximately 10 years than by the latter half of the century" (USFWS 2019 OCAP BiOp, p. 208).

Significant salmonid population increases would occur if the NMFS 2019 OCAP BiOp Reasonable and Prudent measure Near Term Fish Passage Actions (NF 4 and 5) and Long-Term Fish Passage Actions (LF 1 and 2) were implemented. The modeled population increases from the Project should be compared to the projected populations increases from full implementation of RPA NF 4 through LF 2.4, which includes the Pilot Reintroduction Program through subsequent long-term fish passage. Before committing to spending more than 1.5 billion dollars to build the Project, Reclamation should consider an alternative that meets a comparable fish-conservation objective: such as upstream passage for winter-run Chinook salmon, spring-run Chinook salmon, and Central Valley steelhead trout. Fish passage implementation might cost a fraction of the cost of the Project over the next 50 years. Reclamation is moving forward with a costly water delivery scheme without looking closely at the cost comparison of successfully reintroducing winter-run and spring-run Chinook salmon and Central Valley steelhead into the cold climate-buffered waters upstream of Shasta Dam. At a bare minimum, Reclamation should compare the cost of CP4A against the cost of reintroduction of winter-run and spring-run Chinook salmon and Central Valley steelhead into the climate-buffered waters upstream of Shasta Dam. The fact that the cost is for the reintroduction is likely to be from one-fifth to one-tenth of the cost of the Project is an important economic consideration for decision-makers.

Reclamation is not meeting the Project's Primary Objective of increasing the survival of anadromous fish populations in the Sacramento River, leaving the other Primary Objective of increasing water supply and water supply reliability as the only remaining Primary Objective. Implementing the Recovery Plan would satisfy the objective of increasing the survival of anadromous fish populations in the Sacramento River for a fraction of the cost. With many of the upstream impacts to fish and wildlife described in the FEIS as significant and unavoidable, these impacts are in direct conflict with the Project's Secondary Objective of conserving, restoring, and enhancing ecosystem resources in the Shasta Lake area.

In its rush to move forward with the Project, Reclamation is depending on two flawed biological opinions that do not adequately address Project effects to listed species or Critical habitat and that limit their analyses to the arbitrary period between 2019 and 2030. Lack of consideration of listed-species conservation, Recovery Plan implementation, and Critical Habitat conservation are hallmarks of the FEIS and DSEIS. Reclamation should conduct the analyses required by the ESA, comply with the ESA and its implementing regulations, abandon dependence on biological opinions that do not address Project effects and that arbitrarily address climate change, model riparian floodplain restoration flows downstream of Shasta Dam, and thoroughly model and report climate change cumulative effects in the largest Shasta Lake tributaries.

References:

NMFS 2014b. Recovery Plan for the Evolutionarily Significant Units of Sacramento River Winter-Run Chinook Salmon and Central Valley Spring-Run Chinook Salmon and the Distinct Population Segment of California Central Valley Steelhead. California Central Valley Area Office. July 2014.

National Marine Fisheries Service (NMFS). 2016. Revised Guidance for Treatment of Climate Change in NMFS Endangered Species Act Decisions. June 16, 2016, memorandum to NMFS Leadership Council from Eileen Sobeck, NMFS Assistance Administrator for Fisheries. 10pp. https://www.fisheries.noaa.gov/national/endangered-species-conservation/endangered-species-act-guidance-policies-and-regulations

National Marine Fisheries Service (NMFS). 2019. Biological Opinion for the Reinitiation of Consultation on the Long-Term Operation of the Central Valley Project and State Water Project.

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5. Failure to Comply with the Clean Water Act

The DSEIS does not contain sufficient information to meet permitting requirements under the Clean Water Act (CWA). The stated purpose of the SLWRI Draft SEIS is to provide information relevant to the application of § 404(r) of the Clean Water Act (CWA) for the SLWRI. There is, however, no basis for invoking CWA§ 404(r). The conditions have not been met, including the requirement for a completed environmental impact statement transmitted to Congress prior to invoking § 404(r), or a Congressional appropriation for construction. The Draft SEIS fails to meet the statutory hurdles necessary to evade CWA § 401 and §402 and §404 permitting requirements. First invoking § 404 (r) requires that the project has been "*specifically authorized.*" Reclamation's own publication indicates this is not the case: The DSEIS notes that Congress has neither “authorized construction nor appropriated funds for construction.” (DSEIS p. 1-2)

Furthermore, the construction impacts, the required NPDES permit for storm water runoff, groundwater dewatering and discharge of fill into the waters of the state trigger federal compliance with state water quality permits and disclosure of the impacts of these discharges downstream of the dam. Insufficient information is provided in the Draft SEIS to remedy these fundamental flaws in the DSEIS. Reliance on CALFED Bay-Delta [Public Law 108-361] is not sufficient in that it is not an authorizing act for this project. In summary, this project has not met the necessary conditions for proceeding to construction or compliance with federal statute:

1. Congress has not specifically authorized this project;
2. Reclamation has not provided evidence that they have a State water right for the project;
3. The required cost sharing partner has not been identified;
4. Reclamation has not documented compliance with CVPIA § 3406 and § 3411;
5. Federal compliance with federal and state water quality statutes is absent including necessary permit approvals from the State Water Resources Control Board with regard to CWA § 401, §404 and § 402.

The failure to meet the aforementioned conditions not only disqualifies the Project from consideration under CWA § 404(r), but also demonstrates a failure to comply with state water quality certification requirements.

6. Undisclosed Seismic Issues

Reservoirs are known to trigger earthquakes (Simpson et al. 1988; Talwani 1997; Chen and Talwani 1998; Wang and Manga 2010). Large new reservoirs and enlarged reservoirs are of particular concern, because the massive weight of the impounded water can lead to seismic instability. The energy released in a reservoir-triggered earthquake is from the normal tectonic strain energy being prematurely released due to reservoir filling (Simpson et al. 1988; Chen and Talwani 1998).

Reclamation has found fault lines near Shasta Dam. Although Reclamation has documents indicating that there is a seismic risk from enlarging the reservoir, the fault lines and the risk of a reservoir-triggered earthquake has not been provided in the DSEIS or FEIS. This is a serious omission. Not including an analysis of the increased earthquake risk from reservoir fill and loading prevents public comment and misleads decision-makers. A full evaluation of the potential for seismic instability from the additional weight from 640,000 acre-feet of water (i.e., more than 870 million tons) should be included in the FEIS. The cost of seismic risk amelioration and a thorough reporting of the potential risk of a reservoir-triggered earthquake should be provided in the FEIS to allow the public and decision makers to make an informed decision.

References:

Chen, L. and Talwani, P., 1998. Reservoir-induced seismicity in China. In Seismicity Caused by Mines, Fluid Injections, Reservoirs, and Oil Extraction (pp. 133-149). Birkhäuser, Basel.

Simpson, D.W., Leith, W.S. and Scholz, C.H., 1988. Two types of reservoir-induced seismicity. Bulletin of the Seismological Society of America, 78(6), pp.2025-2040.

Talwani, P., 1997. On the nature of reservoir-induced seismicity. Pure and applied Geophysics, 150(3-4), pp.473-492.

Wang, C.Y. and Manga, M., 2010. Earthquakes influenced by water. In Earthquakes and Water (pp. 125-139). Springer, Berlin, Heidelberg.

7. Need for a New Cost Analysis

Reclamation is required to prepare an updated cost analysis for the Project, given the recent (January 2020) adoption of a new Cost Allocation Methodology and recently proposed (November 2019) P&G and CVPIA restoration funding changes. The Shasta Feasibility and NED relied upon out of date cost allocations. It appears Reclamation is using one set of numbers to minimize the benefits for allocating repayment costs and another set of calculations to determine the cost benefit ratio for the Project. Exaggerating the benefits in one analysis while minimizing the benefits to reduce repayment in another is arbitrary and fails to accurately disclose the costs of the Project.

There is an inconsistency between the cost figures Reclamation is using for the Shasta feasibility study completed in 2015, the economic analysis used in the FEIS SLWRI, and justifications relied upon in the Draft SEIS. Reclamation is using two different set of accounting principles: One to determine how much contractors must repay the federal taxpayer for the Project and another to economically justify the Project.

For example, the Cost allocations for CVP capital repayment purposes adopted in January 2020 minimize repayment by arbitrarily minimizing benefits of the CVP. See the following comments on the Cost Allocation methodology, adopted here by reference (http://calsport.org/news/wp-content/uploads/Conservation-Fishing-and-Tribe-Cmts-RE-CVP-Cost-Allocation-Study-Burman-1-2-2020-.pdf). Under that newly adopted methodology the Bureau assumed that roughly 80% of the CVP water benefits exist without the CVP. The NED for Shasta SLWRI, on the other hand, exaggerates or inflates the amount of water benefits of the project so it will appear cost effective in the feasibility study sent to Congress. This is arbitrary. Furthermore, the Bureau has recently proposed changes in funding with regard to the CVPIA mitigation and restoration obligations. The California Department of Fish and Wildlife estimates these changes will have a significant impact on CVP environmental mitigation and restoration programs (see https://calsport.org/news/wp-content/uploads/CVPIA-RestorationFund2020Letter-9-11-2020.pdf).

The Hoopa Tribe also has raised objections highlighting the serious environmental impacts to their traditional way of life along with legal financial obligations to the restoration of the Trinity River from CVP diversions (see Hoopa Valley Tribal Council September 10, 2020 letter to Mr. Wilson Orvis, Deputy Regional Director for the Mid-Pacific Region of the Bureau of Reclamation). National and local groups representing state and national wildlife refuges have also commented on how this defunding of the required mitigation and water supplies required under the CVPIA will cause significant environmental harm (see references below). The DSEIS fails to disclose or analyze these impacts.

The impact of defunding and/or shifting these statutorily required funds necessary for the mitigation of fish and wildlife impacts from the CVP have not been analyzed in the DSEIS nor modeled to disclose the impacts on existing operations. Many of the undersigned have commented and raised significant environmental issues with regard to these changes (see https://calsport.org/news/wp-content/uploads/Env-Advocates-Cmts-CVPIA-Restoration-Fund_True-Up-_-Proportionality-9....pdf).

The SLWRI 2015 feasibility study determined a final recommendation regarding the project could not be made until a cost-share agreement and other relevant considerations are addressed (page ES-2 Final – July 2015). At present no cost-share agreement has been provided to the public for review.

We find that the DSEIS is not being conducted consistent with the 1983 U.S. Water Resources Council Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies (P&G), Reclamation directives and standards, National Environmental Policy Act (NEPA), Central Valley Project Improvement Act (CVPIA), and the Endangered Species Act (ESA).

References:

https://calsport.org/news/wp-content/uploads/GWD-Comments-2020-CVPIA-Accounting-Guidelines.pdf

https://calsport.org/news/wp-content/uploads/Joint-Ltr.-to-Reclamation-re-CVPIA-Accting-09-10-20.pdf

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