UNITED STATES DEPARTMENT OF COMMERCE National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE West Coast Region
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OCT 27 2014

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Dear Ms. Harris:

This letter is in response to the September 5, 2014, public draft of the U.S. Bureau of Reclamation (Reclamation) Draft Environmental Impact Statement (DEIS) for the Upper San Joaquin River Basin Storage Investigation (USJRBSI), California. NOAA's National Marine Fisheries Service (NMFS) has reviewed the portions of this draft regarding anadromous fishes under our jurisdiction, and we are providing comments on the analysis as it relates to those sections. As a Cooperating Agency under the National Environmental Policy Act (NEPA), we propose to work closely with Reclamation to evaluate key sections of the Final Environmental Impact Statement prior to release. We view the analyses presented in the DEIS as foundational for additional analysis necessary to support the Endangered Species Act (ESA) and essential fish habitat (EFH) consultations for the proposed action.

Our comments are summarized here and more fully explained in the enclosure:

- The San Joaquin River downstream of Friant Dam is designated as EFH for Pacific salmon *(Oncorhynchus tshawytscha).* The DEIS does not analyze impacts of the project on fall-run Chinook salmon, which is necessary to analyze adverse effects to EFH.

- The DEIS does not include analysis of impacts of the project on California Central Valley steelhead *(Oncorhynchus mykiss).* Through actions of the San Joaquin River Restoration Program (SJRRP), steelhead are expected to establish in the San Joaquin River below Friant Dam. Impacts to California Central Valley steelhead should be assessed using a modeling approach.

- The analysis uses EDT as the only modeling tool to assess impacts to Central Valley (CV) spring-run Chinook salmon, in a manner that likely exceeds the reliability of the model outputs to determine effects. We suggest that additional modeling approaches (e.g. SALSIM, life cycle modeling) be utilized to assist Reclamation in determining effects.

- NMFS is concerned that the DEIS temperature analyses do not use the proper threshold temperatures for different life stages of CV spring-mn Chinook salmon, and that "mean daily temperature" is not biologically relevant to assess impacts to salmonids.

- The DEIS does not analyze the effect of the proposed project on historical habitat for anadromous fish above Friant Dam. The NMFS Recovery Plan for California Central Valley salmonids (NMFS 2014) identifies the need for an additional independent population of California Central Valley steelhead (beyond the Calaveras River) in the San Joaquin River basin. Recovery actions identify the need to assess the feasibility of steelhead reintroduction in upper watersheds in the San Joaquin River Basin, including above Friant Dam. The proposed project would complicate implementation of this action and alter potential habitats for steelhead. The Temperance Flat Reservoir would inundate tributary waterways below Kerckhoff Dam that are presently used by resident *O. mykiss* and potentially used in the future by anadromous *O. mykiss*.

- The DEIS does not adequately address the impact of the project on flood flows, and on habitat conditions for salmonids related to those flood flows. An evaluation of flood flows should include the environmental functions of flood flows and how changes in flood flow releases will modify Delta water export operations.

In addition to a further explanation of these key concerns summarized above, we offer some specific comments and suggestions in the enclosure.

Thank you for the opportunity to comment on this important document. In the short-term, if you have any questions regarding our input, please contact Ms. Sierra Franks at sierra.franks@noaaigov, or (916) 930-3727. We would like to meet with you and discuss modeling tools and other methods to respond to our comments. We will contact you soon to schedule a working session.

Sincerely,

Maria Rea

Maria Rea
Assistant Regional Administrator
California Central Valley Area Office

Enclosure
cc: Copy to file: ARN 151422WCR2014SA00262

Enclosure 1

The following provides more details and clarifications to the overarching issues with the analysis provided in the U.S. Bureau of Reclamation's Draft Environmental Impact Statement for the Upper San Joaquin River Basin Storage Investigation.

Essential Fish Habitat: The effect of the operation of Temperance Flat Dam and Reservoir on fall-run Chinook salmon was not analyzed nor discussed. The San Joaquin River below Friant Dam is designated as essential fish habitat for Pacific Salmon (which includes fall-run Chinook salmon) defined in Amendment 14 of the Pacific Salmon Fishery Management Plan pursuant to the Magnuson-Stevens Fishery Conservation and Management Act. An analysis should be performed to examine the effect of Temperance Flat Dam on fall-run Chinook salmon in the San Joaquin River.

California Central Valley Steelhead: The effect of the operation of Temperance Flat Dam and Reservoir on California Central Valley steelhead was not analyzed. Self-sustaining populations of steelhead are expected to be reestablished in the Restoration Area of the San Joaquin River through actions of the SJRRP and would therefore be affected by the project. A modeling analysis should be performed to examine the effect of Temperance Flat Dam on steelhead in the San Joaquin River.

One of the recovery actions for Central Valley steelhead in the San Joaquin River, recommended by the 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 (NMFS 2014), is to evaluate the feasibility and habitat conditions for steelhead reestablishment above Friant Dam. Construction of Temperance Flat Dam would inundate the San Joaquin River below Kerckhoff Dam and prevent steelhead from being able to reestablish above Friant Dam in this section of river. The loss of a section of river where steelhead could potentially be reestablished by construction of Temperance Flat Dam should be acknowledged. The presence of rainbow trout in the San Joaquin River between Kerckhoff Dam and Millerton Lake suggests that there is suitable habitat for steelhead in that section of river.

EDT Model:

The limitations, uncertainty, and assumptions of the EDT model are not described in the DEIS. In addition, EDT is largely based on professional judgment and not empirical data. The data used to develop EDT came largely from spring-run Chinook salmon populations in the Pacific Northwest. River habitats, as well as spring-run Chinook salmon life history strategies, are quite different between the Pacific Northwest and California. The EDT version used in this analysis was based on some Central Valley Chinook salmon data inputs but none of the data were from the San Joaquin River or its tributaries. San Joaquin River basin fall-run Chinook salmon survival data, for example, could be used as a surrogate to better emulate salmon habitat conditions in the San Joaquin River.

McElhany *et al.* (2010) and Steel *et al.* (2009) strongly recommended performing sensitivity analyses in order to understand the variability of EDT model prediction results. No sensitivity analyses were performed for the EDT model results for the effect of Temperance Flat Dam on conditions in the San Joaquin River below Priant Dam for spring-run Chinook salmon. Prediction intervals for the EDT-based estimates of abundance, productivity, and capacity have been shown to be large (McElhany *et al.* 2010, Steel *et al.* 2009); McElhany *et al.* (2010) suggested that EDT is not appropriate for many management decisions due to this issue. Large prediction intervals for EDT outputs suggest that actual effects of a project could vary widely. For the San Joaquin River, the largest increase in weighted average abundance (4.9%) is for Alternative Plan 4 under the high smolt-to-adult return rate (SAR) condition. However, assuming the large prediction intervals associated with this estimate, the change in weighted average abundance for Alternative 4 with high SAR is expected to be between -5.1% and 14.9%. In this example, the alternative that was predicted to provide the largest modeled benefit for spring-run Chinook salmon (4.9%) could have either a much more positive or notable negative effect on spring-run Chinook salmon in the San Joaquin River. Knowing the prediction intervals for modeled results allows for greater confidence in the range of modeled results. The modeled benefits to San Joaquin River spring-run Chinook salmon from construction of Temperance Flat Dam are small for all alternatives in most years and overall. Large prediction intervals around these small benefits, as produced by EDT, show that there is large uncertainty in the effects of Temperance Flat Dam on spring-run Chinook salmon.

The EDT model for the San Joaquin River was run with high and low SAR values for spring-run Chinook salmon. However, without knowing the values used for high and low SAR and how they were derived, we cannot evaluate their suitability for use in the San Joaquin River. There are studies that have examined salmonid survival through the lower San Joaquin River. Buchanan *et al.* (2013) found very low survival rates (0.05) for acoustically-tagged juvenile Chinook salmon through the San Joaquin River Delta during 2010. A very low survival rate for juvenile Chinook salmon through the Delta suggests that spring-run Chinook salmon that migrate from Reach 1 of the San Joaquin River upstream of the Delta would have an exceedingly low SAR. The limited data on juvenile Chinook salmon survival in the San Joaquin River bring into question the suitability of using a high SAR. In addition, SAR is naturally highly variable from year to year depending on many conditions, particularly environmental conditions in the river and ocean, as well as Delta water operations.

The EDT model predicts abundance of salmon for a single year based on data input for that year (whether it was wet, normal, dry, critical, *etc.).* However, population dynamics of salmon are not static, as what happens in one year effects populations in following years. It would be valuable to evaluate effects of the project on spring-run Chinook salmon using a model, such as SALSIM, that has multi-year sequential modeling that allows for examination of the salmon population trajectory over time.

The EDT modeling analysis assumes "as built" conditions for both Temperance Flat Dam and the SJRRP. However, these are both long term projects and the timing of construction of SJRRP projects and Temperance Flat Dam could have an effect on the reestablishment of salmonid populations. The potential effect of the timing of construction of Temperance Flat Dam, as well as SJRRP construction projects, to salmonids cannot be evaluated using EDT and is not discussed nor analyzed in the DEIS.

Temperature Impacts Analyses:

Selective Level Intake System (SLIS): As a result of the benefits of having a SLIS to fisheries resources below Friant Dam, and particularly for the salmon reintroduction effort by the SJRRP due to improved water temperature conditions, a SLIS should be included in all of the alternatives, and not just Alternative 4.

Water Temperature Below Friant Dam: The temperature analyses in the DEIR evaluate impacts using the metric of Mean Daily Temperature for assessing impacts to salmon. This metric can have limited biological relevance, as it can mask the occurrence and duration of maximum daily temperatures that are unsuitable for salmonids. The HEC-5Q temperature model can be adapted to evaluate temperatures using the metric of "Maximum Daily Seven-Day Average," which is a biologically relevant metric (USEPA 2003), and the temperature analysis should be revised using this metric.

The use of 55 degrees Fahrenheit (°F) as the threshold water temperature for spring-run Chinook salmon benefits is not appropriate. Different life stages of spring-run Chinook salmon have different threshold water temperatures, and this should be recognized and discussed in the DEIS. Water temperature analyses should be re-done using different water temperature thresholds for different life stages. The water temperature thresholds used by the SJRRP for spring-run Chinook salmon in the San Joaquin River are the following (SJRRP 2010 Fisheries Management Plan Exhibit A, Table 3-1): 1) Adult migration from March through June; optimal is 5. 57°F and upper limit is 5_ 64°F (upper portion) and 5 68°F (lower portion), 2) Adult holding from April through September 5 59°F, 3) Adult spawning from August through October .5 57°F, 4) Egg incubation and emergence from August through December 5 55°F, 5) In-river fry and juvenile rearing all year; optimal 5_ 59°F and upper limit (during early rearing) 5. 61°F and upper limit (during late rearing) .5. 64°F, and 6) Juvenile outmigration from January through June; optimal .5 56°F and upper limit 5 59°F.

Upstream Fish Passage and Climate Change:

Riverine habitat upstream of Millerton Reservoir and downstream of Kerckhoff Dam that is used by rainbow trout, American shad, and striped bass for spawning will be inundated if Temperance Flat Dam is constructed. The riverine habitat will be turned into reservoir habitat that does not serve as spawning habitat for these three species. The loss of spawning habitat for these species is considered not mitigatable in the DEIS. Removal of Kerckhoff Dam to allow fish access to riverine habitat could serve as mitigation, but this idea was not explored in the DEIS.

The building of Temperance Flat Dam would preclude any future opportunities to return listed salmonids to part of their historical habitat above Friant Dam. Evaluating the reestablishment of steelhead above Friant Dam is one of the proposed recovery actions for steelhead in the San Joaquin River (NMFS 2014) and could make the steelhead population in the San Joaquin River more resilient to climate change. While reestablishing Chinook salmon and steelhead above Friant Dam is not a proposed or planned action at present, future climate conditions could increase the need for Chinook salmon and steelhead to access such habitats. See "California Central Valley Steelhead" section, above.

Flood Flows:

The operation of Temperance Flat Dam and Reservoir under all of the Action Alternatives will reduce the frequency, magnitude, and duration of flood flows below Friant Dam. Flood flows have many benefits for spring-run Chinook salmon, steelhead, and other native fishes that would be reduced or eliminated by the project. Flood flows, by definition, inundate the floodplain and create significant favorable habitat for juvenile spring-run Chinook salmon. Studies in the Cosumnes and Sacramento (Yolo Bypass) rivers have shown increased growth (Jeffres *et al.* 2008) and enhanced growth and survival (Sommer *et al.* 2001) of juvenile Chinook salmon that reared on floodplains. In addition, many studies have found a correlation between smolt survival to the ocean and high river flows (Kjelson and Brandes 1989, Moyle and Yoshiyama 1997, Smith *et al.* 2003, Connor *et al.* 2003). The benefit of flood flows and floodplain rearing for juvenile spring-run Chinook salmon is mentioned in the DEIS, but the effect of reduction in magnitude, frequency, and duration of flood flows due to Temperance Flat Dam on Chinook salmon and steelhead need to be analyzed.

Reduction in frequency, magnitude, and duration of flood flows in the San Joaquin River below Friant Dam would also negatively affect fall-run Chinook salmon and steelhead smolts that are emigrating out of tributaries to the San Joaquin River. The effect of altered flood flows due to Temperance Flat Dam on salmonid smolts emigrating out of San Joaquin River tributaries should be analyzed.

Flood flows also have geomorphic effects that benefit salmonids, anadromous fish habitat, and the overall river ecosystem. Flood flow helps to clean and reorganize sediment and the channel to create high quality spawning and rearing habitats. In addition, riparian vegetation recruitment is enhanced by flood flows. These geomorphic effects should be analyzed.

The reduction in frequency, magnitude, and duration of flood flows below Friant Dam due to construction of Temperance Flat Dam would affect conditions in the Delta and may affect water supply and Delta pump operations. The effect of altered flood flows to conditions in the Delta and potential effects on water supply and Delta pump operations should be discussed.

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