



UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
**NATIONAL MARINE FISHERIES SERVICE**  
West Coast Region  
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May 14, 2021

Ms. Kristin White  
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Central Valley Operations  
U.S. Bureau of Reclamation  
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3310 El Camino Ave #300  
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Re: 2021 Draft Sacramento River Temperature Management Plan

Dear Ms. White:

Thank you for the opportunity to review the Bureau of Reclamation's (Reclamation) draft Sacramento River Temperature Management Plan for Water Year 2021 (Draft Temperature Management Plan). Reclamation provides a draft Temperature Management Plan to the Sacramento River Temperature Task Group in April of each year for review and comment. Pursuant to the National Marine Fisheries Service's (NMFS) 2019 Biological Opinion, in developing the Temperature Management Plan, Reclamation must comply with the following Reasonable and Prudent Measure (RMP):

***RPM 1: Reclamation shall minimize the impact of the amount or extent of incidental take of listed species during operations of the Shasta Division.***

- a. *In coordination with NMFS and the Sacramento River Temperature Task Group, Reclamation shall consider technical assistance from NMFS regarding the development of annual temperature management plans, regardless of Shasta storage or tiered temperature management stratum. Reclamation shall submit the final temperature management plan to NMFS by May 20 of each year, as reporting under the opinion. NMFS does not expect Reclamation to seek NMFS concurrence on the plan.*

NMFS provides the following comments and suggestions for your consideration in developing the Final Temperature Management Plan. Our comments address modeling assumptions, operational considerations and additional conservation measures to consider that will reduce the amount and extent of incidental take of endangered Sacramento River winter-run Chinook salmon (SRWC) and will mitigate for the short- and long-term effects of recurring drought conditions.

**General Comments:**

NMFS recognizes the extreme challenges faced by Reclamation during this critical water year and appreciates the ongoing approach to bring parties together to work toward solutions. The proposed temperature management strategy in the Draft Temperature Management Plan includes



many of the management strategies that have been discussed between Reclamation and NMFS, to date, and NMFS supports moving them forward into a Final Temperature Management Plan. These include:

- Using a more conservative hydrology for the Final Temperature Management Plan.
- Avoiding use of the side gates until September or later, if possible.
- Considering life history diversity for shaping the temperature season. Due to the deteriorated hydrologic conditions in the upper Sacramento River Basin, protecting the entire SRWC spawning and egg incubation season from May 15-October by maintaining water temperatures near 53.5<sup>0</sup> Fahrenheit (F) seems unfeasible in 2021. NMFS supports a temperature management strategy that begins on June 15, 2021 and includes shaping as a means of decreasing temperature dependent egg mortality (TDM) for SRWC.
- A management approach that targets 53.7<sup>0</sup> F for the critical egg incubation period with 57<sup>0</sup> F shoulder temperatures.
- The approach to preserve redds downstream to the State Route 44 Bridge. This strategy has short term implications on spatial diversity but considering the current water year conditions is reasonable approach to protect habitat with the highest expected proportion of spawning adults and redds.
- Real-time management that responds to actual meteorological conditions.

In the future, we recommend developing a process, possibly as part of the drought toolkit, or through adjustments to the Sacramento River Temperature Task Group, where temperature management discussions are triggered earlier in the year. This could result in improved coordination on modeling, and early identification and sequencing of potential actions. We also encourage and would contribute technical support for the development of a Temperature Tier Selection Protocol (TTSP) that includes Tier 4 years.

NMFS will remain fully engaged in the Sacramento River Temperature Task Group and the Meet and Confer Process with the Sacramento River Settlement Contractors (SRCs) and other agencies, as necessary, and we hope to use these venues to collaboratively address our comments and suggestions to achieve the best possible results for Sacramento River temperature management in 2021.

### **Modeling Assumptions:**

1. The lack of power bypass representation in the current HEC-5Q modeling complicates interpretation of the results. Therefore, NMFS recommends that the evaluation of operational scenarios include results from the Shasta CE-QUAL-W2 modeling so as to more accurately represent the effect of power bypass operations.
2. Given the lack of precipitation, dry hydrology, significant moisture deficit and high evaporative demand, the application of an optimistic meteorology in the Draft Temperature Management Plan complicates interpretation of the results. NMFS recommends that Reclamation conduct a sensitivity analysis at least one addition scenario using the driest hydrology and hottest meteorology on record to reflect a conservative forecast of conditions.
3. This water year has caused a significant amount of uncertainty related to system conditions. The Final Temperature Management Plan should have a section committed

to uncertainty and assumptions including those related to hydrology, meteorology, snowpack, accretions and depletions.

**Operational Considerations:**

1. NMFS recommends that the Final Temperature Management Plan propose an operational scenario that targets the lowest feasible TDM for SRWC.
2. NMFS recommends prioritizing storage conservation at Shasta Reservoir to the extent that it does not interfere with Reclamation’s obligation to public health and safety.
3. May and June shoulder temperatures should take into account temperature tolerance of holding adults.
4. Proposed water transfers of approximately 170 thousand acre feet (TAF) present an opportunity to conserve cold water storage in Shasta Reservoir by adjusting the release of this water from spring to late-summer or fall. NMFS recommends releasing transfer water as late in the season as possible to provide the greatest cold water benefit possible.
5. To address the possibility of dry conditions continuing into WY2022, NMFS recommends, to the maximum extent practicable and given other biological constraints, that a Final Temperature Management Plan identify an End-of-September (EOS) storage target in anticipation of potential dry conditions continuing into the following year.
6. NMFS Southwest Fisheries Science Center modeling<sup>1</sup> indicates that reduced Keswick releases can improve TDM, EOS storage, and date of first side gate use (Table 1). The additional scenarios in Table 1 are provided for illustrative purposes with the recognition that there is variability in TDM depending on how temperature management windows are shaped, NMFS’ preferred approach is to implement, to the extent feasible, a lower-flow scenario than the base scenarios to reduce TDM and increase EOS storage using a combination of approaches including continued coordination with SRCs, changes in Delta outflow requirements through a Temporary Urgency Change Petition (TUCP), use of other Central Valley Project (CVP) and State Water Project (SWP) facilities (Folsom, Oroville and New Melones Reservoirs), export restrictions and other measures proposed by State and Federal fish and water agencies.

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<sup>1</sup>April 30 and May 7, 2021 modeling results from the Southwest Fisheries Science Center assuming USBR 90% Exceedance operational outlook dated 4/20/2021. Assumes 100% bypass from 4/23 to 5/31, unless CCR exceeds 60°F in which case the bypass is ended. Transfer of 150 TAF is the same as baseline with 150 TAF cumulative reduction to May-Oct releases, & 37.5 TAF added to Aug & Sep release, & 75 TAF added to Oct releases. “Flat” scenarios are the same as baseline but with Jun, Jul, & Aug releases set to 6,000, 6,678, and 7,500 cfs respectively.

Table 1. Sensitivity of TDM, EOS storage, and Side Gate Usage under Varied Keswick Flow Scenarios

Flow Scenario	Lowest Achievable TDM from Modeled Temperature Window Shaping Scenarios	Range in TDM from Modeled Temperature Window Shaping Scenarios	Scenario with Latest Date of First Side Gate Use	EOS (TAF)
Base	81%	81-86%	July 30, 2021	966
Transfer 150 TAF	76%	76-85%	August 6, 2021	1030
Flat 7,500	62%	62-85%	Aug 13, 2021	1204
Flat 6,678	48%	48-86%	August 2, 2021	1340
Flat 6,000	46%	46-88%	August 27, 2021	1465

#### **Additional Species Conservation Measures:**

NMFS provides the following additional conservation measures for Reclamation to consider in either the Final Temperature Management Plan or other drought planning documents such as a drought contingency plan or drought and dry year action toolkit, to improve SRWC resilience to drought conditions.

The conditions and challenges related to this critical water year demonstrate the need to advance the reintroduction of SRWC to historic habitat upstream of Shasta Reservoir in the McCloud River. An additional population of SRWC above Shasta Dam in the McCloud River could ease conditions facing the species in drought years. A second SRWC population would buffer the species' extinction risk if catastrophic losses to the downstream Sacramento River population occurred, as they did when 95% of the wild year classes were lost in 2014 and 2015. Without reintroduction, climate change is expected to cause management of Shasta Reservoir to remain tightly constrained to ensure enough cold water is available to protect the single remaining population of SRWC that spawns below Shasta Dam.

NMFS recommends that Reclamation support advancing the science to support reintroduction by taking action in 2021 to provide funding support to test and understand the performance of a Juvenile Salmonid Collection Structure (JSCS) installed in Shasta Reservoir. A structure like the JSCS could be used as part of a comprehensive reintroduction program at Shasta, however it remains unknown how effective the JSCS would be in Shasta Reservoir, particularly in low storage conditions as presented this year.

Similarly, Battle Creek provides another opportunity to expand the spatial structure and abundance of SRWC and buffer the species from the effects of drought. The Battle Creek Salmon and Steelhead Restoration Project and the Battle Creek Winter-run Chinook Salmon

Reintroduction Program has made important improvements in recent years but the Pacific Gas and Electric Company (PG&E) remains reluctant to accept facilities improvements funded by Reclamation on the North Fork of Battle Creek, thereby delaying reintroduction into important habitat upstream of Eagle Canyon Dam. NMFS recommends that Reclamation engage PG&E, NMFS and the California Department of Fish and Wildlife and the U.S. Fish and Wildlife Service to seek final resolution of facility modifications necessary for PG&E to accept ownership and maintenance of the facilities.

Please contact Howard Brown of my staff at (916) 930-3608 or [Howard.Brown@noaa.gov](mailto:Howard.Brown@noaa.gov) if you have any questions about our comments and recommendations.

Sincerely,



Cathy Marcinkevage  
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