
State Water Resources Control Board

August 31, 2020

Kristin White
Central Valley Project Operations Manager
U.S. Bureau of Reclamation
knwhite@usbr.gov

ORDER 90-5 SACRAMENTO RIVER TEMPERATURE MANAGEMENT

Dear Ms. White:

This letter is in regard to the State Water Resources Control Board's (State Water Board or Board) request for the U.S. Bureau of Reclamation (Reclamation) to develop a protocol for Sacramento River temperature planning pursuant to Water Right Order 90-5. The State Water Board initially requested that Reclamation develop a protocol for Sacramento River temperature management planning in 2018. In response to the State Water Board's initial request, Reclamation produced an interim one-year protocol and indicated that it would develop an updated long-term protocol following completion of an updated Biological Opinion (BiOp) from the National Marine Fisheries Service (NMFS), which occurred in 2019.

As part of the State Water Board's conditional approval of Reclamation's 2020 Temperature Management Plan (TMP), Reclamation is required to develop an initial draft protocol by September 30, 2020. The State Water Board will hold a public workshop this fall in coordination with Reclamation to receive public comment on the initial draft protocol to inform its completion. Once public comments are received, the Board intends to work with Reclamation to refine and finalize the protocol before the beginning of the next temperature planning and water supply allocation season in February 2021. The Board has requested that the protocol include the elements specified in the settlement agreement with the California Sportfishing Protection Alliance, et al., which the Board recently forwarded to Reclamation. This letter provides additional detail regarding issues that should be addressed as part of the protocol.

E. JOAQUIN ESQUIVEL, CHAIR | EILEEN SOBECK, EXECUTIVE DIRECTOR

Background

Order WR 90-5 requires Reclamation to operate Keswick Dam, Shasta Dam, and the Spring Creek Power Plant to meet a daily average water temperature of 56 degrees Fahrenheit (F) on the Sacramento River at Red Bluff Diversion Dam (RBDD) during periods when higher temperatures will be detrimental to fish. If there are factors beyond Reclamation's reasonable control that prevent Reclamation from meeting 56 degrees F at RBDD, Reclamation in consultation with staff from the State Water Board, fisheries agencies (NMFS, United States Fish and Wildlife Service, and California Department of Fish and Wildlife), and the Western Area Power Administration, may develop a plan (Temperature Management Plan or TMP) and propose that the compliance point be moved upstream.

Reclamation's proposed operations described in its Biological Assessment (BA) for the Coordinated Long Term Operations (LTO) of the Central Valley Project (CVP) and State Water Project and the associated NMFS BiOp also include temperature management measures that differ to some degree from the requirements in Order 90-5. The requirements of Order 90-5 are focused on actions within Reclamation's control and reasonable protection of fish and wildlife under State law. The BiOp standard is a lower minimal standard of avoiding jeopardy to the continued existence of species listed as threatened or endangered under the federal Endangered Species Act (ESA). Due to these differences in required levels of protection, additional measures may be needed to comply with Order 90-5 beyond those included as part of the proposed action evaluated in the NMFS BiOp.

Reclamation's operations described in the BA and BiOp effectively anticipate movement of the temperature compliance point for temperature management pursuant to Order 90-5 upstream of RBDD in nearly all years. Accordingly, it is anticipated that a TMP pursuant to Order 90-5 will be needed each year for Reclamation's proposed operations. Reclamation produced a guidance document for implementation of temperature operations pursuant to the BA and BiOp. Reclamation has requested that the Board identify changes or additions to the Guidance Document that are needed to meet the requirements of Order 90-5. Because Order 90-5 requires implementation of measures within Reclamation's control to provide reasonable protection of fish and wildlife, which goes beyond the current BiOp's emphasis on avoiding jeopardy to listed species, additional measures beyond those described in the Guidance Document will be needed to better understand, evaluate, and document actions within Reclamation's control, including on a seasonal basis and a longer term basis as described below.

Seasonal Elements of the Protocol

To inform in-season temperature management pursuant to Order 90-5 starting this year, the following elements are requested to be included in the protocol:

Early Drought Planning

1. An initial report at the beginning of the water year (by October 15¹ each year) to facilitate planning for possible dry year conditions. This report should specifically include:
 - a. An assessment of storage conditions in Shasta and Trinity Reservoirs and how those storage conditions may affect temperature management the coming season;
 - b. An assessment of operational alternatives (including any prospective water transfers) to manage storage through the fall and early winter to provide for cold water pool protection during the following summer and fall;
 - c. Measures to avoid significant flow fluctuations and other possible impacts to fall-run Chinook salmon; and
 - d. An assessment of winter precipitation forecasts.

TMP Development

2. Development of a TMP each year that describes actions to be undertaken that year to reasonably protect winter-run Chinook salmon, as well as spring-run and fall-run Chinook salmon and other native species, including the following:
 - a. An initial draft TMP provided two weeks prior to initial water supply allocations in February. The State Water Board understands that hydrologic conditions will continue to evolve and that planning for Sacramento River temperature management will also need to evolve. Accordingly, the initial plan should identify how Reclamation will retain adequate flexibility in its operations and water supply allocations to allow for changes that may be needed later in the season for temperature management pursuant to Order 90-5 as the hydrology changes and becomes more certain over time.
 - b. With the initial draft TMP, a summary report, developed in coordination with the Sacramento River Temperature Task Group (SRTTG), prepared at the conclusion of each temperature management season describing temperature

¹ Given the timing issues with this element of the protocol this year, the State Water Board is requesting that Reclamation produce an assessment this year prior to finalization of the protocol.

- management operations during the year, including a summary of hydrologic and meteorological conditions, cold water pool resources, releases and temperature control device operations, hydropower operations, Trinity River imports, temperature targets for the season, relevant fisheries issues (timing of spawning and egg incubation, estimates of the spawning population, estimates of temperature dependent mortality, and other relevant issues), other relevant factors, and any lessons learned in that year to inform future management actions.
- c. Updates to the initial draft TMP based on hydrologic forecasts in March and April to refine proposed operations,² with submittal of a final proposed TMP in May. The draft and final TMPs should:
- i. Evaluate a range of reservoir releases and associated water supply deliveries under Reclamation's water right permits to Central Valley Project (CVP) contractors for improving temperature management, including but not limited to operational scenarios that assume lower releases from Shasta Reservoir during the spring and summer and possible changes in the timing or quantity of CVP deliveries to service, settlement, and exchange contractors in order to conserve cold water resources in Shasta Reservoir and control temperature in the Sacramento River throughout the temperature control season without redistributing impacts to Folsom or Oroville reservoirs or causing water quality or flow violations in the Sacramento-San Joaquin Delta Estuary;
 - ii. Evaluate possible changes to hydropower operations to improve temperature conditions, including power bypasses and adjustments to hydropower peaking operations;
 - iii. Evaluate possible changes to the timing or volume of Trinity River imports that do not adversely affect fish and wildlife on the Trinity River;
 - iv. Coordinate with water supply contractors on evaluation of trade-offs related to improvements in temperature management, including

² The draft TMPs should continue to demonstrate that operational flexibility is being maintained to provide for temperature management needs pursuant to Order 90-5 and should evaluate possible needed operational measures for temperature control prior to submittal of a final TMP.

possible reductions in water supplies for agricultural, municipal, and refuge uses;

- v. Evaluate the feasibility of meeting temperature compliance under Order 90-5 under the scenarios identified above at different compliance points (including RBDD, Bend Bridge, Jelly's Ferry, Ball's Ferry, Clear Creek, and Keswick Dam) for all or part of the temperature management season;
 - vi. Evaluate temperature management actions throughout the winter-run Chinook salmon spawning and incubation period, including before May 15 and beyond October 31, consistent with the requirements of Order 90-5 that calls for temperature management whenever temperatures in excess of 56 degrees F at RBDD would be detrimental to the fishery;
 - vii. Describe in detail any proposed voluntary and other coordination efforts with water users, including improved coordination of downstream diversions, demand shifting, and other measures;
 - viii. Describe planned or potential measures to avoid redd dewatering and stranding; and
 - ix. Describe other possible actions that may be taken during the upcoming temperature management season.
- d. Presentation of the draft TMP at one or more State Water Board meetings or workshops each year to receive public input on Reclamation's draft TMP before it is formally submitted to the State Water Board for approval. The final TMP submitted to the State Water Board should address major substantive comments received on the draft TMP.

Modeling and Documentation

3. Posting the draft TMPs, final TMP, SRTTG meeting materials, and meeting notes on Reclamation's website as soon as practicable.
4. Methods for developing modeling inputs that are transparent and reproducible, including inputs for temperature and mortality modeling and forecasts of accretions, depletions, and operations. All data and assumptions and their basis used in the

draft and final TMPs and related analyses should be made available at the same time as the results and should be provided in a transparent and accessible manner. NMFS has developed the attached proposed table for documenting mortality modeling assumptions that should be considered.

- a. Although the use of portable document format (PDF) files is convenient and appropriate to convey information to a wide audience, their exclusive use hinders substantive collaboration and analysis by modeling and scientific staff. Monitoring data and modeling results that support the TMP should be made readily available on Reclamation's website or a designated file transfer protocol (ftp) site (which can be hosted by the State Water Board) in machine-readable formats to facilitate rapid assessment by trained personnel.
5. Provide technical documentation of methods for monitoring and reporting of the temperature of Trinity River/Whiskeytown Reservoir imports into Keswick Reservoir to facilitate improved evaluation and documentation of the effects of Trinity River imports.

Efforts To Inform Long-Term Temperature Management

To inform longer-term management actions pursuant to Order 90-5, the protocol is requested to include a plan and time schedule for completing the following analyses and documentation in coordination with the State Water Board and fisheries agencies:

6. A comprehensive overall assessment and summary report, supported by modeling and monitoring information, on the possible range of longer term actions within Reclamation's control to manage temperatures on the Sacramento River that is completed by September 15, 2021, including an evaluation of:
 - a. Operations within Reclamation's control under different hydrological and other conditions (including water supply operations, hydropower operations, and Trinity River imports) to inform longer term planning for temperature management beyond the analyses identified above for in season management;
 - b. Completion of analyses to evaluate Whiskeytown and Lewiston Reservoir thermal curtain deployment and operations;
 - c. Possible physical facilities improvements to Whiskeytown Reservoir to improve cold water pool availability; and

- d. Any other factors within Reclamation's control that may be identified during the protocol development process.
7. Cooperation with the fisheries agencies and State Water Board in efforts to evaluate needed temperature dependent winter-run Chinook salmon survival levels to support population-scale viability and recovery of the species below Shasta and Keswick dams.
8. A plan to improve Sacramento River temperature monitoring and modeling capabilities, including completion of a summary report on Reclamation's findings by June 15, 2021, that addresses the following issues:
 - a. Modeling tools to dynamically evaluate Trinity River imports and Whiskeytown Reservoir operations;
 - b. Real-time cold water pool monitoring in Shasta Reservoir, including possible installation of a permanent telemetered device capable of providing real-time measurements of cold water pool levels and a permanent meteorological station at Shasta Reservoir to inform modeling and management activities. Current and historical data on reservoir temperature profiles and temperature control device operations should also be migrated to machine-readable formats and made publicly available as soon as practicable;
 - c. Completion of analyses to better understand and model Shasta Reservoir temperature control device operations, including hydrodynamics within the temperature control device, and their effect on temperature management;
 - d. Coordination with the fisheries agencies and State Water Board on the development of standardized methods to calculate and report on estimates of temperature dependent mortality that would be subject to independent scientific peer review;
 - e. Incorporation of ensemble modeling methods to better account for uncertainty in model performance and future conditions; and
 - f. Other improvements in modeling and other tools that allow for evaluation of different operational scenarios as described above.

State Water Board staff understand that developing an effective temperature management protocol will require an iterative process and that Reclamation may have input on the information requested in this letter. To this end, we are happy to discuss elements of the draft protocol with Reclamation and fisheries agency staff to ensure the requested information is feasible, and to further refine the protocol. Those discussions may result in modification to this protocol request. We also look forward to continuing to coordinate with Reclamation on a workshop and public comment process for the draft protocol this fall. Based on public comments received, the State Water Board may provide further input related to development of a final protocol.

If you have any questions regarding this letter, please contact Diane Riddle at diane.riddle@waterboards.ca.gov. Please be aware that due to the public health concerns regarding the COVID-19 virus and the resulting pandemic, many State Water Board staff are telecommuting; therefore, the best avenue of communication at this time is via email.

Sincerely,



Eileen Sobeck
Executive Director
State Water Resources Control Board