State Water Resources Control Board

June 14, 2024

Levi Johnson
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U.S. Bureau of Reclamation
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ORDER 90-5 SACRAMENTO RIVER TEMPERATURE MANAGEMENT PLAN

Dear Mr. Johnson:

This letter is in response to the U.S. Bureau of Reclamation's (Reclamation) Final Sacramento River Temperature Management Plan (TMP) submitted on June 4, 2024, pursuant to State Water Resources Control Board (State Water Board or Board) Water Right Order 90-5 (Order 90-5). The TMP is conditionally approved, as described below.

Background

Order 90-5 included conditions in the water right permits and licenses for Keswick Dam, Shasta Dam, and the Spring Creek Power Plant that obligate Reclamation to meet temperature requirements on the Sacramento River for the protection of Sacramento River fish species, including winter-run and fall-run Chinook salmon. Specifically, Order 90-5 requires Reclamation to operate to achieve an average daily temperature of 56 degrees Fahrenheit (F) on the Sacramento River at Red Bluff Diversion Dam (RBDD), located 60 miles downstream of Keswick Dam, to protect aquatic habitat conditions for spawning, rearing, and migration needs of salmon and other native fish populations during periods when higher temperatures would adversely affect the fishery. If there are factors beyond Reclamation's reasonable control that prevent Reclamation from meeting 56 degrees F at RBDD, Reclamation is required to identify an alternative compliance location and prepare an associated TMP for consideration by the State Water Board.

The 2024 Sacramento River TMP Development

The Sacramento River watershed and the entire Central Valley are currently experiencing above normal hydrologic conditions. Shasta Reservoir benefited from significant precipitation this winter and as of early June storage is near 4.3 million acre-feet (MAF), approximately 95 percent of maximum storage.

On April 25, 2024, Reclamation released a Draft TMP reflecting favorable storage conditions in Lake Shasta. The Draft TMP evaluated operations with and without spring pulse flows and outlined a release schedule for the irrigation season that would begin at 11,250 cubic feet per second (cfs) in June, peak at 13,250 in July, and remain between 10,500 cfs and 8,000 cfs in August and September, respectively. Modeling results indicated that the end of September (EOS) storage would be 2.55 MAF and 2.7 MAF with and without a pulse flow, respectively. Reclamation developed a draft temperature management strategy based on its proposed release schedule, meteorological assumptions, and Reclamation's April 90 percent exceedance forecast of operations that proposed to meet 53.5 degrees F upstream of the Clear Creek confluence (CCR gauge, river mile (RM) 290) from May 15 through October 31.

Based on these operations, National Marine Fisheries Service (NMFS) modeling indicated an estimated winter-run Chinook salmon egg (stage independent) temperature dependent mortality (TDM) of 13 percent with a pulse flow and 8 percent without a pulse flow. Reclamation modeling indicated a stage independent TDM of 9.9 percent with a pulse flow and 3.4 percent without a pulse flow. Additionally, Reclamation modeling estimated EOS cold water pool storage less than 56 degrees F of 381 thousand acre-feet (TAF) with a pulse flow and 502 TAF without a pulse flow.

Various pulse flow scenarios were considered by the Upper Sacramento Scheduling Team and Sacramento River Temperature Task Group (SRTTG) during development of the Draft TMP and Final TMP (Final TMP Attachment 1). Cold water storage improved between the time the Draft TMP was developed and the Final TMP was submitted on June 4th.Modeling results that were provided to the SRTTG ultimately indicated that TDM would be 0.1 percent higher under the pulse flow scenario (Final TMP Table 6). Accordingly, based on this information a pulse flow was provided this spring as reflected in the Final TMP.

Before the final TMP was submitted, the SRTTG agencies agreed that the temperature management target of 53.5 degrees F at CCR should be delayed until there was evidence of winter-run Chinook salmon spawning occurring to preserve cold water longer into the fall for both winter-run and fall-run Chinook salmon, which have experienced significant population declines. Consistent with advice from the SRTTG, temperature management to meet 53.5 degrees F at CCR began on May 24, 2024, based on evidence of winter-run spawning.

The Draft TMP proposed to meet a temperature of 53.5 degrees F at CCR, which generally equates to meeting temperatures of 56 degrees F or lower at Balls Ferry, which is located approximately 14 miles downstream of CCR (at RM 276). However, temperature modeling produced by Reclamation during development of the Final TMP showed that there could be instances of temperatures above 56 degrees F at Balls Ferry when operating to meet 53.5 degrees F at CCR. To inform the Board's

consideration of the TMP, staff requested that Reclamation evaluate an operational strategy for consistently meeting a temperature of 56 degrees F at Balls Ferry.

The Final TMP

Reclamation submitted its Final TMP to the State Water Board on June 4, 2024. The Final TMP is supported by the fisheries agencies (including NMFS, the U.S. Fish and Wildlife Service, and the Department of Fish and Wildlife), and reflects the temperature management strategy of the Draft TMP, with a temperature target of 53.5 degrees F at CCR from May 24 through October 31 and an increased modeled EOS cold water pool storage of 863 TAF under the 90 percent exceedance forecast (TMP Attachment 3). In addition, the Final TMP includes modeling that evaluated a temperature compliance location at Balls Ferry per the Board's request. Those results indicate that operating to fully meet 56 degrees F at Balls Ferry for the duration of the season would result in temperatures and EOS cold water pool storage similar to Reclamation's proposed operation under the 90 percent exceedance forecast (TMP Attachment 6). Modeled stage-independent TDM levels range from 0.3 to 0.4 percent (Reclamation modeling; TMP Table 6) and 1 to 2 percent (NMFS modeling; TMP Attachment 10).

The Final TMP includes a forecasted operation for the irrigation season with Keswick reservoir releases of 10,500 cfs in June, 13,850 cfs in July, 10,500 cfs in August, and 8,000 cfs in September (TMP Table 1). In response to concerns expressed by the fisheries agencies and State Water Board about potential winter-run Chinook salmon redd dewatering due to high flow releases during July, the TMP includes commitments to attempt to minimize these releases during the peak of winter-run Chinook salmon spawning to the extent that Reclamation is able. Further, based on additional input provided by the fisheries agencies and State Water Board regarding the additional need to protect both winter-run and fall-run Chinook salmon (as well as other runs), the Final TMP identifies the need to improve decision support tools to manage conditions for fall-run Chinook salmon and to better integrate evaluations of expected winter-run Chinook salmon TDM and redd dewatering.

Public Input Received

On June 4, 2024, Defenders of Wildlife, California Sportfishing Protection Alliance, Friends of the River, Golden State Salmon Association, Institute for Fisheries Resources, Northern California Council of Fly Fishers International, Pacific Coast Federation of Fishermen's Associations, Restore the Delta, Sacramento River Council, San Francisco Baykeeper, Save California Salmon, Sierra Club California, and the Winnemem Wintu Tribe (Defenders, et al.) submitted a letter objecting to the Draft TMP submitted by Reclamation on April 25, 2024. The letter requests that the State Water Board object to the Draft TMP and formally initiate a water rights proceeding to modify Order 90-5. Defenders, et al. allege that the Draft TMP violates Order 90-5 by (1) failing to demonstrate that factors beyond Reclamation's reasonable control prevent maintenance of water temperatures of 56 degrees F at RBDD; (2) failing to demonstrate

that factors beyond Reclamation's reasonable control prevent maintenance of water temperatures of 56 degrees F at times when higher temperatures would be detrimental to the fishery; (3) appearing to conflict with the Proposed Action authorized under the 2019 NMFS Biological Opinion pursuant to the Endangered Species Act; and (4) failing to indicate if Reclamation will maintain water temperatures of 56 degrees F or lower in the Trinity River at Douglas City and the North Fork confluence. Defenders, et al. cite temperature and TDM modeling that accompanied the Draft TMP to conclude that Reclamation's proposed operation will result in high levels of TDM for winter-run Chinook salmon and will result in avoidable impacts to fall- and spring-run Chinook salmon as well. They further cite procedural concerns related to the timing of water management actions related to release of water to contractors prior to the preparation and review of the TMP.

As described above, State Water Board staff requested evaluation of an operational strategy for consistently meeting a temperature of 56 degrees F at Balls Ferry throughout the temperature management season. Staff did not request evaluation of actions needed to meet 56 degrees F at RBDD for two reasons. First, during the period of operation of the Shasta Temperature Control Device, 1997 to present, Reclamation has never successfully managed to a daily average water temperature of 56 degrees F at RBDD for a full temperature control season. Second, in the course of consultation with the fisheries agencies, Reclamation, and other parties through the SRTTG and Shasta Planning Group (SPG), all of the fisheries agencies supported Reclamation's proposal to operate to 53.5 degrees F at CCR from May 24 through October 31, and none supported an operation that would require maintaining 56 degrees F further downstream than Balls Ferry. The primary factors cited in support of this operation were the risk of losing temperature control during the fall and the likelihood that winter-run Chinook salmon redds will be distributed primarily between Keswick reservoir and CCR. Loss of temperature control during the fall would lead to temperature impacts to fall- and spring-run Chinook salmon that could contribute to continued closures of the ocean salmon fishery in future years. Accordingly, I conclude that meeting 56 degrees F below Balls Ferry would not be within Reclamation's reasonable control, and the Final TMP, as conditioned below, is consistent with Order 90-5.

With respect to water temperature conditions on the Trinity River, consistent with prior correspondence (available on request), the State Water Board intends to re-evaluate the regulatory landscape following the ongoing ESA consultation regarding Trinity River operations. At this time, there is no indication that Reclamation will violate the narrow provision of Order 90-5 that prohibits Reclamation from operating the Trinity River for upper Sacramento River temperature control to the detriment of Trinity River salmonids.

Finally, the State Water Board recognizes the procedural concerns raised by Defenders, et al. However, under the current hydrological circumstances and expected TDM levels between 0 and 2 percent, I conclude that it would be unreasonable to limit

Reclamation's operations to deliver water to its contractors below the levels that have been allocated to date.

Conditional Approval of the TMP

The TMP is conditionally approved in recognition of the factors discussed above and in recognition of the importance of preserving Reclamation's ability to maintain cold water releases necessary to support winter-run, as well as spring- and fall-run Chinook salmon spawning and egg incubation. This is particularly true due to the drought related impacts that have occurred in recent years to spring- and fall-run Chinook salmon and the resulting closure of the recreational and commercial California ocean salmon fisheries, comprised largely of fall-run Chinook salmon.

As discussed above, Reclamation's Final TMP indicates that its strategy of meeting 53.5 degrees F at CCR will likely result in average daily temperatures at or near 56 degrees F at Balls Ferry, while acknowledging that conservative modeling demonstrates there may be instances where meeting 56 degrees at Balls Ferry could require operations that are detrimental to optimal temperature management throughout the season (e.g., earlier side gate operations). Thus, it is our expectation that 56 degrees average daily water temperature will generally be achieved at Balls Ferry unless doing so would entail an unacceptable risk to the attainment of other temperature management goals. I have determined that Reclamation's final TMP complies with Order 90-5 and is approved, subject to the conditions set forth below:

1. Reclamation shall notify the State Water Board within 72 hours if real-time conditions or ongoing evaluation indicate that daily average water temperatures of 56 degrees F will not be achieved at Balls Ferry and provide a description of the factors beyond Reclamation's reasonable control (e.g., extreme heat event, high temperature inflows downstream of Clear Creek) that would make achieving 56 degrees F at Balls Ferry detrimental to the fishery and overall temperature management throughout the temperature management season.
2. Reclamation shall take actions, independently or in collaboration with other agencies, to increase the spatial resolution of the array of temperature monitoring stations to provide additional potential temperature compliance points consistent with historical practice. Reclamation shall submit a plan that ensures functionality of the temperature monitoring stations downstream of the CCR temperature monitoring location by March 1, 2025. Restoration of stations between CCR and Balls Ferry (historical station at Anderson) and between Balls Ferry and Bend Bridge (historical station at Jelly's Ferry) should be prioritized for implementation.
3. Reclamation shall prioritize implementation of the updated Water Temperature Modeling Platform to be used for seasonal temperature planning for the Sacramento River system and shall provide updates on progress as part of its monthly reporting on compliance with Order 90-5, including updates on

performance relative to actual conditions and Reclamation's existing modeling platform.

4. Reclamation shall submit its outstanding required annual water diversion and use reports for water rights for its Shasta Division and other outstanding unfiled reports, beginning with water years 2022 and 2023, as soon as practical and not later than 3 months from the date of this letter, unless an extension is approved by the Board's Deputy Director for Water Rights.
5. Reclamation shall continue to evaluate observed conditions and consult with the fisheries agencies and State Water Board as appropriate to maximize protections for winter-, spring-, and fall-run Chinook salmon should conditions change relative to the conservative forecasts used to develop the TMP.
6. By February 1, 2025, Reclamation shall report in writing to the State Water Board and fisheries agencies on improvements to tools to manage conditions for fall- and spring-run Chinook salmon as well as improvements to decision support tools to better integrate assessment of TDM and redd dewatering.
7. I reserve continuing authority to modify my approval of the TMP to ensure compliance with Order WR 90-5 in light of new information or changed circumstances.

Thank you for your continued cooperation and coordination on this matter. If you have any questions regarding this letter, please contact Matthew Holland at matthew.holland@waterboards.ca.gov.

Sincerely,

Erik Ekdahl
Deputy Director, Division of Water Rights
State Water Resources Control Board