BUREAU OF RECLAMATION

Sacramento River Temperature Task Group Notes

May 11, 2023

Members Attending

- USBR: Elissa Buttermore, Elizabeth Kiteck, Emilia Barnum, Emily Van Seeters, John Hannon, Tom Patton
- USFWS: Charles Chamberlain, Craig Fleming, James Earley, Kaitlin Dunham, Matt Brown
- CDFW: Crystal Rigby, Doug Killam, Erica Meyers, Tracy Grimes, Vanessa Gusman
- NMFS: Garwin Yip, Stephen Maurano
- SWFSC: Eric Danner, James Gilbert, Miles Daniels
- DWR: Mike Ford, Kevin Reece
- SWRCB: Craig Williams, Diane Riddle, Jeff Laird, Matt Holland
- SRSC: Mike Deas
- WAPA: Michael Prowtzke
- MBK Engineers: Anne Williams
- Yurok Tribe: Christopher Laskodi, Cort Pryor
- Hoopa Tribe:

Topics/Actions

- Reclamation will work on modeling based on an alternative control point to look at the potential for meeting 53.5°F downstream.

Welcome, Agenda Review, and Purpose

Adam Fullerton, Kearns and West welcomed all participants.

Purpose and Objective

The purpose of the SRTTG is to "share operational information monthly and improve technical dialogue on the implementation of the temperature management plan." Reclamation provides "a draft temperature management plan to the SRTTG in April for its review and comment, consistent with WRO 90-5."

Hydrology, Operations, Forecasts, and Temperature Management

Reclamation presented the hydrology, operations, and temperature management updates.

Releases and Storage:

- Shasta:
    - Keswick releases are at 13,000 cfs with no immediate plans to adjust.
    - Shasta Reservoir storage is essentially full with 4.45-million-acre feet (MAF) and only 100 TAF of space available.
    - There have been negative power pricing issues that have caused flow through the river outlets to bypass the powerhouse.
- Trinity River Division:
    - Whiskeytown flows into Clear Creek experienced a small pulse flow of 800 cfs, but flows have since decreased.
    - Whiskeytown Reservoir storage is full.
    - The Trinity River also experienced pulse flows, but flow is now down to 2,000 cfs into Lewiston. There are still no plans to divert water through Carr to the Sacramento basin.

Water Temperatures:

- Shasta:
    - TCD: all upper gates are open with 51°F water being released. Water temperatures are generally stable with a slow increase.
    - Flows from the power outlets are going to be cooler than the flows through the TCD.
    - The Sac gauge is hovering close to 51°F, and the CCR gauge is slightly warmer at 51.5°F.
    - The temperatures are slowly beginning to rise with the increasing air temperatures, but there is no concern with temperatures exceeding 53.5°F at CCR over the next week.
    - 54.5°F target will be adjusted to 53.5°F at CCR. Reclamation will adjust as needed on the TCD, but it is not needed at this time given the high flows. TCD will be adjusted as flows decrease later in the season.

SRTTG representatives' questions and comments included:

- SRSC asked if it was possible to spill water through the drum gates instead of the 950'-elevation gates?

- Reclamation responded that they could use the drum gates, but it would be more complex. They have put in the flash boards so those would need to be adjusted on the top of the drum gates to spill the water. Because temperature is not an issue right now, it is simpler to use the 950'-elevation gates.

Draft Temperature Management Plan (TMP):

Tom Patton, Reclamation, updated the SRTTG group that Reclamation will be incorporating a new set of runs into the Draft TMP. The May forecast will also be incorporated when it is complete, but they do not expect the profile temperatures to change much, if at all, and therefore, it will not significantly affect the TMP. The profile continues to look cold with some warming of water on the surface.

SRTTG representatives' questions and comments included:

- The group reviewed NMFS comments about the different ways to analyze the data and asked how redd distribution would be considered.
    - Reclamation responded that they have reviewed the 2019 redd inputs, aerial surveys, and carcass surveys that used spatial and temporal redd distribution for the Draft TMP. They got very low temperature dependent mortality (TDM) estimates – 0% for stage independent & 3% for stage dependent. It did not matter what redd distribution was used, it did not make a difference in the TDM estimates.
- NMFS commented that based on their high-level review of the data on CalFish and other resources, it seems that the number of winter-run Chinook redds has been in decline since the 1980s downstream of CCR. Assuming that is the case, based on the visual analysis there is the impression that there has been a contraction in the amount of spawning habitat. It would make sense that during drought years, downstream would not be the best strategy for spawning considering the water temperatures. In wet years, such as the current year, there may be an opportunity to try to extend temperature control further down the river to Balls Ferry for better habitat for successful egg incubation. If this happens, it could be possible the fish would take advantage of this area because they tend to move into areas that open up from restoration or temperature control. They are not necessarily advocating for cooler temperatures downstream because it could affect fall-run Chinook conditions and end of September storage but would like to know if it is possibility. NMFS commented that if it is feasible to change the compliance point from CCR to Balls Ferry, it would be informative to see what happens to the entire system.
    - Reclamation responded that this is not something they have evaluated thus far because it not in the BiOp or in the Proposed Action; however, it is something that can be modeled and reviewed by the SRTTG. This information is not something they can guarantee would be available before the finalization of the TMP.
    - The amount of release will likely remain consistent because of storage control, so they would likely need to think about using the side gates.

- Reclamation commented that the 2019 PA requires 53.5°F at CRR and the SWRCB's Water Rights Order (WRO) 90-5 has its own requirements. They are unsure whether these preclude targeting lower temperatures; it's unclear if these targets are a floor or a ceiling for operations, because this is the first time they've been in Tier 1.
    - SWRCB thanked Reclamation for including their request for 56 °F at Red Bluff Diversion Dam. This would likely get close to something NMFS is asking for at Balls Ferry. They want to make sure that WRO 90-5 is satisfied as well as the public.
    - A member commented that the target is rarely ever met, but identifying where it could be met further upstream would yield relevant information.
    - A member commented that changing the scenarios would put stress on the cold-water pool. It is also necessary to think about how to deal with the water coming from the creeks. More modeling will be necessary.
- A member commented that 56°F is not as protective a temperature at any given location as 53.5°F. To maintain something colder throughout the river, it may mean getting CCR to something colder than 53.5°F. Aiming for something colder downstream could result in a situation in which they lose temperature control while not achieving a significantly different TDM, because the fish are still further up the river.
- SWRCB commented that 90-5 was adopted in 1990, and the science has improved since, but it is still the requirement on the books and the one they need to administer. They want to make sure that they aren't operating to something that would ultimately provide less protection for fish.
- SRSC asked whether fish spawn when water temperatures are more than 53.5°F? Are the fish moving above CCR to spawn because it is colder? Is there a connection between historic spawning distribution and associated flow and temperatures to provide some context for extending cold water further downstream?
    - CDFW responded that adult salmon in the mainstem of river will spawn in warmer waters, such as 56°F and 59°F. The reason fish were increasingly concentrating in the upper part of the river to spawn, is that juveniles have a harder time in the warmer waters, and eggs do not survive. Therefore, there are no adults to return to that spawning area. The colder water closer to Redding allows the fish to survive and return. During these drought years, the water temperature has been managed very carefully and fish have been concentrating in the colder water and have been somewhat trained to spawn in the upstream area. If there was cold water downstream for a couple years, they would likely start migrating back down.
    - SRSC asked whether it would be better to try to protect 53.5°F further downstream to help fish successfully spawn there?
    - CDFW responded that ideally that could work but water management is the limiting factor and we have not had that opportunity over the 7 to 10 years.

- NMFS commented that the goal is to try and balance outcomes in a given year versus over multiple years. Trying to figure out how to reverse the decline in spawning and incubation habitat.
- Reclamation commented that there was a requirement in NMFS' 2009 BiOp that mandated that the Red Bluff Diversion Dam (RBDD) gates be open year-round to allow fish passage year-round.
    - CDFW responded that at the time, the RBDD gates were thought to be the cause of delay of winter-run Chinook salmon and in the 1990s gate operations at RBDD were modified. Originally the gates were in the water year-round, but then they started putting in the gates later in the spring to allow for a longer duration of unrestricted passage. However, the problem continued and the amount of time they were in the water was decreased to only the summer months. 2011 was the last year that the gates were in the water for even a short time. At that time, the Red Bluff Pumping Plant and the fish screen were operational to allow for pumping for irrigation.
- NMFS asked whether there was the same pattern with fall-run as there was with winter-run?
    - The fish have been trained to move upstream, and there have only been a few fish spotted downstream of CCR in the last 10 years. Fall-run is also different based on timing, because they can keep moving upstream but will not find cooler water to spawn in, even up near Keswick, at that time of year.
- NMFS asked, in a year when there is a lot of water available across the system, what are the operational constraints to Keswick flows during June and July? July is the peak time period for winter-run, so it could help if flows remained steady at 8,500 cfs across the two months instead of 8,000 cfs in June and 9,000 cfs in July. If the flow remains consistent, winter-run spawning might occur at slightly lower riverbed elevations. The impact will not be on winter-run per se, but it would help set up options for fall operations. Specifically, how much higher are flows going to remain in the winter.
    - Reclamation responded that they are looking at between 9,000 cfs or 10,000 cfs throughout the summer based on the forecast. There is flexibility during June and July but there is still concern with Shasta being too full. We are trying to transition to fall-run flows and stabilize for them.
- NMFS asked Reclamation to consider fall dewatering issues when thinking about planning for the fall, specifically July flows.
    - Reclamation responded that they can flatten out flows as much as possible, but additional modeling for this may not be necessary. Flows can be fine-tuned during the USST Fall Flows meetings.

Topics for Elevation to Shasta Planning Group:

- Extension for finalizing the TMP in order to model an alternative control point at Balls Ferry and discuss during the next SRTTG meeting on May 18.

Adjourn