Sacramento River Temperature Task Group (SRTTG) Update Meeting

August 11, 2022, | 1:00 PM – 2:15 PM

Meeting Summary

Participants

Participants

Brian Mahardja, Reclamation
Craig Fleming, USFWS
Craig Williams, SWRCB
Craig Isola, USFWS
Charles Chamberlain, USFWS
Chris Laskodi, Yurok Tribe
Claudia Bucheli, SWRCB
Crystal Rigby, CDFW
Diane Riddle, SWRCB
Garwin Yip, NMFS
Gary Zhao, CDFW
Jeff Laird, SWRCB
James Gilbert, SWFSC
James Early, USFWS
Jo Anna Beck, Reclamation
John Hannon, Reclamation
Johnathan Williams, CDFW
Kristin White, Reclamation
Kevin Reece, DWR
Kristal Davis-Fadtke, CDFW
Lee Bergfeld, MBK Engineers
Lauren McNabb, CDFW
Levi Johnson, Reclamation
Liz Kiteck, Reclamation
Matt Brown, USFWS
Matt Holland, SWRCB
Michael Harris, CDFW
Michael Macon, SWRCB
Michael Prowatzke, WAPA
Michael Wright, Reclamation
Mike Ford, DWR
Miles Daniels,
Thad Bettner, GCID
Tom Patton, Reclamation
Taylor Lipscomb, USFWS
Vanessa Kollmar, CDFW

Facilitation Team

Terra Alpaugh, Kearns & West
Adam Fullerton, Kearns & West
Mia Schiappi, Kearns & West

Key Discussion Topics with

Summary of Recommendations and Outcomes

Action Items

- Tom Patton, Reclamation - Add to the process document: process and requirements for use of middle-gate temperature curtain; better define what conditions might make a bypass beneficial.
- Tom Patton, Reclamation – email update next week on temperature profile and potential need for a bypass
    - Ad-hoc meeting if the conditions warrant it
    - Likely need to do a test before a full run

Welcome, Agenda Review, and Purpose

Adam Fullerton, Kearns and West, welcomed all participants and reviewed changes to the agenda to focus on the process for a cold water bypass.

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."

Prior Action Items

1. Matt Brown, USFWS – will find out how the refuges can utilize the flexibility in water flows from Shasta Reservoir to address water needs in August. – Complete
2. Kearns and West (K&W)- will include discussion of the cold-water bypass- in the next meeting agenda and coordinate written communications as needed prior to the next meeting. - Complete

Cold Water Bypass

Introduction

- K&W recalled that in WY 2021 the SRTTG had briefly discussed the option for a cold water bypass, but by the time they were prepared to make a decision, the profiles indicated a bypass would be not create a benefit.
- Reclamation is drafting a document to help guide the warm water and cold water bypass discussions and outline the considerations taken during the decision-making process.
- Reclamation clarified that Reclamation is required to coordinate with Western Area Power Administration (WAPA), use best available science, and do their due diligence when making a decision on a cold water bypass. Findings do not have to be based on a specific metric but must show some determination of benefit.
- A bypass draws water from different levels through the power house. Prior to the installation of the Temperature Control Device (TCD), there were river outlet gates at the 750 foot, 850 foot, and 950 foot marks and the penstocks drew water at 815 feet. The only way to get water was through the 815 outlet as the lake stratified. This made using a power bypass much more beneficial.
- Unless there is an issue with how the TCD functions, typically the TCD has removed the need for a power bypass. Reclamation has attempted power bypasses since the TCD was installed but have not seen much difference in water temperatures in the river.

Temperature Curtain

- The flow of water from the TCD mixes temperatures from different levels of the reservoir. The side gates are on the side of the main structure and draw from the lowest elevation with an intake at 720 feet. When the TCD is working properly, it acts as a straw and pulls water from the lake that is lower than the side gate. This is more beneficial than releasing water from the 750 foot river outlet gates.
- Leakage can occur on the TCD as it is not built to be completely watertight. In the past, panels have been missing, or a gate that was thought to be closed was open.
- To help with this issue a Remote Operated Vehicle (ROV) surveys the TCD to verify gate settings. The ROV survey was recently completed.
- Typically, the majority of leakage occurs on Unit 1 and Unit 2 of the middle gates. To manage the leakage, the TCD has a temperature curtain. The curtains are rolled up and tied off like a blanket and sit above each of the middle gates and. when deployed. cover the middle gate openings. During drought years, when water levels are low, the temperature curtain is not accessible and cannot be used. Due to operations and low water levels this year, the temperature curtain was not deployed early in the season. To deploy it this season and future seasons with low water levels, would require a crane or people repelling down the side of the TCD, which was considered too dangerous.

- Reclamation believes that the low elevation of the reservoir and therefore, the reduced head, will result in less leakage from the middle gates, even though the temperature curtains are not deployed.
    - USFWS suggested including details about the usage and requirements for the temperature curtain in the cold water power bypass document.
    - NMFS commented that when the curtain was initially created and deployed there was a need to close the middle gate where the curtain would be deployed, and the adjacent gate(s). Since 5 gates need to be open at all times, closing up to 2 adjacent middle gates would require opening Pressure Release Gates (PRGs), at least temporarily, and result in drawing some colder water. They also noted that there are five pieces of the independent curtain, one for each middle gate.
- On 8/11 Reclamation closed the remaining 4 PRGs and moved to full side gate operations. Reclamation will continue to monitor the water temperatures coming out of the TCD and will reevaluate the TCD's function over the next week.
- There is no issue with the capability of the river outlet gates and there is no head requirement, and as long as the lake is above the invert elevation at the bottom of the outlet gate, it can release water. There is a lot of flexibility with the four river outlets: the gate can take one river outlet at the 750 foot elevation, which could be either a partial opening to restrict the amount of water coming through the gates, or a full opening.

Temperature Profiles

- The profile done on 8/10/22, shows the surface of Shasta Reservoir is roughly 80°F, and there is stratification occurring at that point. At the penstock level it is closer to 50°F.
    - There is not a significant difference in temperature between river outlets gates at 750 feet and at 720 feet where the side gates draw water.

September to October 2014

- Temperatures and conditions this year are similar to those in 2014, especially the cold-water pool storage. Releases are lower than they were in 2014. Shasta reservoir has 200-thousand-acre feet (TAF) more storage now than in 2014.
- In September 2014, all releases were being madw through the powerhouse. During the second week of September, the bypass began through the river outlet gate at 750 and continued through late October. During the two-month period, flows slowly decreased.
    - During this time, flows were released from both the TCD and river outlets, and the temperatures blended.
    - There was no indication of improved performance from a temperature standpoint. The release temperatures continued to warm, which is typical for that time of year.
- In 2014, there was concern that there was extra leakage at the TCD, and it was thought that the cold water bypass could help the situation
- Flows are lower this year than last year, so presumably the draw down of the cold water pool should be slower. As water is now drawn exclusively from the side gates, it will be possible to see how much leakage is occurring and how much the water is warming from the leakage.
- If closing the PRGs does not improve the temperature control, there may be a benefit to drawing on the lower river outlets.
- A test was done during the Spring of 2021 to validate the need and benefit of a bypass. Although the river outlets are at 750 feet, water would not only be drawn from that level but the surrounding levels as well. A test of the bypass would show the actual temperature benefit from a bypass.

- It is also necessary to consider the hatchery and the need to have some water flowing through the penstocks to reach the hatchery.
- After Reclamation closed PRG #5 on 8/8/22, they tracked the penstock temperatures on CDEC and did not see a noticeable improvement in temperature. Considering the triple digit heat coming into Redding the week of 8/15/22, the rest of the PRGs were closed on 8/11/22. If the water begins to get too cold, Reclamation will reopen the PRGs.

Questions/Discussions

- Does the bypass reduce the cold water pool faster? Will it cause problems for hatchery or other operations later in the season or next year? Need for longer chiller use?
    - No, it should not affect next year. It is all about keeping temperatures down now and should not have a major impact on the volume or future cold water operations. Reclamation will keep supporting chiller operations at the hatchery as long as necessary.
- How much water will still go through the penstocks?
    - A minimum of 10% will still need to go through penstocks (TCD); with the very low flows this year, we'll have to see if more than 10% is necessary.
    - Reclamation is going to continue reducing flow until releases out of Keswick are 3,250 cfs.
- How long can we continue to use the river outlet gates?
    - Reclamation will continue to monitor temperature profiles. The cold water pool and total storage is better this year because of low flows, but profiles and current conditions will determine what operations are possible and beneficial.
- How is the benefit decided?
    - Reclamation is working on how they are planning to decide if there is a benefit.
- Should a test be done sooner?
    - Reclamation just closed the PRGs so they are currently testing how using only the side gates will affect temperature; they need to give current operations a few days to see how the TCD is working, and then decide if a test of the bypass is warranted.
    - Also, any power bypass testing should be conducted as close to the need for the power bypass as possible.
- Is there anything from this conversation that needs to be brought to the Shasta Planning Group (SPG) right away?
    - The SPG should be meeting tomorrow, and there is nothing essential to bring to them, but they will be updated on the bypass conversation that occurred in this SRTTG meeting.