BUREAU OF RECLAMATION

Sacramento River Temperature Task Group Notes

February 22, 2024

Members Attending

- USBR: Chase A. Ehlo, Derek L. Rupert, Drew A. Loney, Elissa Buttermore, Elizabeth G. Kiteck, Emilia H. Barnum, Jo Anna M. Beck, John M. Hannon, Karissa Bridges, Mary B. Suppiger, Mechele V. Pacheco, Thomas K. Patton,
- USFWS: Bill Poytress, Craig A. Fleming, Matt Brown
- CDFW: Crystal Rigby, Doug Killam, Mallory Boro, Marelle Arndt, Tracy Grimes, Travis Apgar, Vanessa Costa
- NMFS: Evan Sawyer, Garwin Yip, Stephen Maurano
- SWFC:
- DWR: Kevin Reece, Kurt Ryon, Mike Ford
- SWRB: Claudia Bucheli, Craig Anderson, Craig Williams, Diane Riddle, Jeff T. Laird, Matthew Holland, Shay Richardson
- SRSC: Lee Bergfeld (MBK Engineering), Mike Deas
- WAPA: Michael Prowatzke
- Yukon Tribe:
- Hoopa Tribe:

Topics/Actions

- Reclamation will confirm Coordinated Operation Agreement (COA) status and will share any updates at the next SRTTG monthly meeting.
- Garwin Yip to check on whether SRTTG should elevate to SPG and/or WOMT and then update the SRTTG at the next monthly meeting.
- CDFW will provide an update to the SRTTG on the handling of hatchery winter-run found in the side channel pools at the April SRTTG Meeting
- By Friday, March 1 all agencies are requested to confirm and/or update the K&W rosters (distribution list) for SRTTG, SPG, and the SRTTG 6-agency caucus, and the Spring Pulse

USST meetings.

Welcome, Agenda Review, and Purpose

Terra Alpaugh, Kearns & West (K&W) welcomed all participants.

Purpose and Objective

Sacramento River Temperature Task Group (SRTTG) consists of agency representatives having direct interest on cold water pool management on the Sacramento River and meets at least monthly February through October. The purpose of the SRTTG is to "share operational information monthly and improve technical dialogue to inform the development and the implementation of an annual Temperature Management Plan (TMP) for the Sacramento River." The TMP is developed by the U.S. Bureau of Reclamation (Reclamation) in accordance with California State Water Resources Control Board Water Rights Order 90-5 to assist with improving and stabilizing Chinook salmon populations in the Sacramento River.

The objective of today's meeting is to launch the SRTTG technical team for the 2024 water year.

Water year 2024 Meeting Schedule Update

- Terra Alpaugh, K&W, opened the meeting with introductions and reviewed purpose of both the SRTTG and the Shasta Planning Group (SPG).
    - The SRTTG provides technical input to Reclamation on its temperature management plan. The input focuses on technical recommendations it does not provide policy recommendations.
    - The SPG serves as a policy level group; issues that SRTTG raises that are not of a technical nature shall be raised to the SPG which seeks consensus on project operations related to temperature management. The SPG includes representatives from 6 federal and state agencies engaged with Long Term Operations (LTO) of the Central Valley Project as follows: federal agencies (Reclamation; USFWS; NOAA-NMFS) and state agencies (SWRCB; CDFW; DWR). Those six agency representatives on the SRTTG form the SRTTG caucus. The SRTTG caucus determines issues to be raised to the SPG. Once issues are raised to the SPG, the SPG will meet and resolve and decide on (or elevate) issues associated with Shasta operations. SPG decisions will be documented and distributed to the SRTTG via email by K&W.
- Some discussion ensued regarding SPG membership.
    - MBK Engineering asked the SRTTG to identify SPG representatives for this year.
    - Several SPG representatives for Water Year 2024 were confirmed.
    - K&W shared that a request had been sent out to agencies requesting confirmation regarding each agencies' representatives and are waiting for responses by March 1.

- After March 1, Kearns & West will distribute via email the confirmed SRTTG and SPG rosters list to the full SRTTG.

Hydrology, Operations, Forecasts, and Temperature Management

Reclamation presented the hydrology, operations, and temperature management updates referencing the meeting packet items below.

Northern Sierra Precipitation: 8-Station Index, February 21, 2024

- Water Year 2024 started off with little precipitation but is now close to average for this time of year. Last year resulted in a lot of carry-over storage. The region may be going into a drier period in the next week, but the longer-range forecast suggests moisture during the first week of March.
- Snow plots: California Snow Water Content, February 21, 2024, Percent of April 1 Average.
- This group focuses primarily on the northern region snow plot, which is at 79 inches of water content and at 100% average for the state accumulated snowpack. Warmer storms and temperatures are being recorded but the temperatures are expected to decrease. The expectation is that this snow plot will continue to exceed average. Cooler inflow and higher snowpack help to keep the cold-water pool high.
- The April 1 snowpack total is a benchmark: currently snowpack in the region is over 69%of the April 1 and 86% for the state average.

Current Storage, Releases, Water Temperatures and Current Operations: Daily CVP Water Supply

- Overall, water supply conditions are looking good. Accumulated inflow and precipitation for the WY looks good across all reservoirs although more precipitation inthe northern region than the southern region.
- Trinity Reservoir: Trinity Reservoir is releasing 300 cfs, normal wintertime releases until the Record of Decision (ROD) water year type is determined, which is expected to be normal or wet. The Trinity in terms of snowpack is looking good. Trinity Reservoir is at 1.7 MAF and is recovering from the drought; it could get above 2 MAF and possibly fill this year.
- Shasta and Keswick Reservoirs: Shasta Reservoir is at 3.9 MAF. Because of encroachment in the flood space at Shasta, flood management releases started in late January and early February: releases were about 15,000 cfs at Keswick Dam; they recently ramped up to 20,000 cfs, then 25,000 cfs and finally this morning (2/23) to 35,000 cfs. The high releases will aid in avoiding encroachment onto flood space prior to the next wave of storms.
- Oroville Reservoir: experiencing higher than normal flow releases into the Feather River.
- Folsom Reservoir: experiencing higher than normal releases (6,000 cfs) due to encroachment into flood space.
- New Melones Reservoir: looks good.

- All reservoirs are exceeding the 15-year average storage to date.
- Whiskeytown Reservoir: received a lot of inflow from the last storm and started to spill in the last couple of days. The spill peaked at just under 3,000 cfs and is now spilling at 2,700 cfs, which is resulting in large flows down at Clear Creek near Igo (USGS monitoring station). There is only one unit operating at Spring Creek power plant (1,800 cfs); the other unit is offline and will be operable next month. As a result, there is not a large release capability, so when there is a lot of precipitation, it is hard to keep the reservoir low. There are a few diversions through the Carr Tunnel, though some water was moved through the Carr Tunnel when Lewiston Reservoir had high local flows.

Temperature Management: Mean Daily Temperature Profiles

- Water temperatures are not as cool as last winter. The river temperatures are a lot cooler this time of year than in the summer. A TCD change was made on February 20th when all the upper and middle gates were opened. There is a chance that Shasta Reservoir storage will decrease, so keeping the middle gates open. That may change when going into a "fill mode" at Shasta in order to maximize storage. The lake temperature is the generally the same throughout the profile, so it does not matter where the water is being released from. 50°F is being calculated at the TCD, and there is cool water in Sac River at Clear Creek (CDEC gage CCR), which was last year's temperature control point. Also, cool temperatures have been recorded at Clear Creek and the Trinity Reservoir.
- Profiles and Cold-Water Pool: Graphs on Isothermobaths-2024, Graphs on Cold Water Pool Volume, Percent Exceedances (1998-2023)
- Sacramento River temperatures are cool.
- Shasta had the latest profile taken on February 7th. The profiles are being collected once a month and will switch to every other week collection in March and then to a weekly basis in the summer. Temperatures are cool from the surface all the way down to elevation 650 ft. The profile at Shasta Lake shows cool temperatures. The temperatures compare to some other years of interest (1998-2023). Cold water pool temperatures started off in a positive direction relative to the 52°F benchmark and are still on the lower side. The 48°F cold water pool volume model does not look as good, while the 50°F benchmark cold water pool chart is not as good compared to the 52°F plot.
- Trinity River system is fairly stable and cool. Exceedance levels at Trinity Reservoir show colder water than in recent years; storage is also much higher.
- Whiskeytown is showing cool water temperatures as well. It is where you would expect it to be this time of year.

Seasonal Temperature and Precipitation Outlook

- Forecasts for February, March, April, and May are showing warmer than average temperatures. Forecasts indicate above average precipitation for northern California in March.
- 90% forecast: Estimated CVP Operations 90% Exceedance

- Reclamation has not conducted any temperature modeling this early in the season but will make modeling runs next month. There was also time constraints getting a forecast finalized prior to this meeting.
- Reclamation will be monitoring and operating to the 53.5 degrees F at CCR as they see how the cold-water pool sets up. Hopefully the March profile and temperature model run indicate that is possible; adjustments may be made after seeing what the modeling shows.
- The 90% forecast is slightly outdated. Estimates for runoff into Shasta reservoir are about 1 MAF and will end up higher than 1 MAF runoff this month. Even at 90% it will be a little on the low side. Shasta Reservoir storage forecasted close to 4 MAF around late March early April.
- Trinity Reservoir storage over 1.9 MAF. Storage looks good. Higher release are occurring in February.
- Shasta releases are expected to peak at around 10-12,000 cfs in the summertime. The expectation is that summertime releases will be comparable to last year and some concerns with the drawdown in the fall.
- There are moderate diversions from the Trinity system. This forecast assumed the ROD flow for Trinity is normal based on the monthly releases of 4,200 cfs, but it will probably be a wet year for the ROD flows.

50% forecast: Estimated CVP Operations 50% Exceedance

- Maximum storage in Shasta Reservoir will be around April or May, then end-of-September carry-over storage at around 3 MAF. The forecast is similar to what was seen last year.
- Storage at Trinity Reservoir gets over 2 MAF and has good carry-over going into next year (2025) as well. Releases at Trinity Reservoir are set according to wet year ROD flows, which results in higher flows there. Similarly, there are higher flows on the Sac River in the summer, close to 12,000 cfs. It may be on the lower side based on the precipitation that we are seeing right now. Higher flows of 5,000 cfs will occur in the fall and into next winter. In terms of the 50% forecast, there are higher Trinity diversions because there is more water to move around. There is not a lot more diversions compared to last year but significantly more than previously seen in the drought years.

Questions and Comments

SRTTG member questions and comments included:

- USFWS, asked if the best estimate for Keswick Reservoir releases 35,000 cfs for the next day or two.
    - Reclamation confirmed this approach and shared that high releases will continue for the next week in order to get out of encroachment, followed by a slow ramp down. The Shasta flood diagram is unique and based on inflow: the inflow drives the amount of space and increases the amount of space you need; as water dries up the diagram allows for storage. The goal is to get out of encroachment prior to

the next storm. Reclamation has a slow ramp down rate at 15% a day.

- K&W asked Reclamation if there is an update on the COA?
    - Reclamation shared that it should be similar to last year but will confirm. When there are high flows like presently, the process is to go to excess delta conditions and tno accumulation to COA accounting.
- USFWS asked whether the higher Clear Creek flows starting in March is reflective of a pulse flow.
    - Tom shared that it is. Reclamation kept the pulse flow in there. There is documentation stating that if the Reservoir experiences three days of spill, then the managed geomorphic pulse could go away. This spill will not fulfill that requirement, so we still think we will need a geomorphic pulse and spring attraction flows. These are monthly average flows with estimated volume incorporated.
- K&W asked Reclamation if there a sense of what the timeline is for developing the TMP?
    - Reclamation shared that it will be similar to last year: they will use the April forecast to develop a draft by the end of April and then use the May forecast to develop a final TMP, shooting for the end of May. The timing is estimated at about 8 weeks (2 months) to turn around with distributing a final TMP at the end of June. It could change based on the court ruling, but it will likely be the same as last year.
- USFWS asked if the TMP will include the Spring Pulse flow.
    - Reclamation confirmed that there will likely be a Spring Pulse flow in the TMP this year.
- K&W shared that an invitation for a Spring Pulse flow meeting on March 7th had been distributed to the contacts from last year's distribution list and asked the group to send contact info to K&W if any additional members would like to join. The SRTTG will still receive updates on the outcomes of the Spring Pulse group discussions but there will be a separate distribution list to minimize email traffic.
- Reclamation reported that ACID is looking to get the diversion dam installed in mid to late March and are getting ready for diversion season starting in April. This is harder to do in a wetter WY, but Reclamation is going to try to keep their request in mind to keep flows down to more manageable levels under 10,000 cfs for the installation. Reclamation noted ACID would prefer flows around 3,250 cfs, but flow will not likely reach that level. In the past years, Reclamation has sometimes had to adjust the ramping rates slightly so that they can drop flow more quickly to accommodate this installation.
- There was discussion around the annual installation, requirements, and timing of the ACID Dam.

- CDFW asked if Reclamation could share what the maximum flow is after ACID dam is installed.
- Reclamation responded that maximum flow after ACID dam installation is around 18,000 cfs. Reclamation further noted that if they think that there will be high flows later in the year, ACID will not install as many of the upper flashboards; and that once they the main structure is in place, the preference is to keep flows lower than the flows being released right now. ACID got a new general manager, and the newer crew may take longer to install the dam due to safety concerns. They asked for multiple weeks to complete.

- CDFW asked if a Spring Pulse flow is released in April/May, would it be higher than 15,000 cfs? If ACID dam is installed in March and then a Spring Pulse flow in April or May, would there be operational impact on the pulse flow that could be sent to the downstream areas?
    - Reclamation said that constraint was a concern last year. If ACID removes all of the plexiglass flashboards, they can handle about 20,000 cfs. With some warning, they can prepare for higher flows, but it takes some coordination. Sometimes it may be necessary to drop flows below 10,000 cfs so that the crew can make the adjustments before ramping back up.
    - K&W recalled from last year's conversations that the target flow that the SWFSC had modeled found the most biological benefit was near the maximum capacity for the boards.
    - Reclamation shared that it depends on the downstream flows since the target flow rate being identified is near Wilkins Slough. The pulse flow does not have a peak limitation other than what ACID can handle. The pulse volume should be 150,000 acre feet or less. There is no need to identify a specific peak flow upstream.
- NMFS asked if it would be good idea to run this process and any accelerated ramping rates through WOMT.
    - Reclamation hopes there will be no need to address this, but it is possible with the high flows.
- K&W asked whether the group will need another meeting to discuss the ACID dam installation timing and conditions in greater detail and what would be the desired process and timing.
    - Reclamation shared that an ad hoc meeting might be in order, for everyone to walk through the scenario. When flows are above 6,000 cfs, to 15% per day and then 2.5% per hour are our restrictions. The group would discuss whether exceeding those limits would be necessary.
- K&W asked if the ad-hoc meeting would occur in mid-March.

    - Reclamation agreed that mid-March would be the likely timeline for the Spring Pulse flow meeting.

- K&W requested that NMFS check on whether proposed adjustments to ramping rates would need to run through WOMT or the SPG and then update the group.
- USFWS shared that the timeline for the ad-hoc meeting is important if ACID is to complete their work in March because SRTTG will not meet until the end of March.
- K&W shared that once further clarification has been provided, then K&W will touch base with the SRTTG before adding another meeting to everyone's calendars.

River Fish Monitoring: 1) carcass surveys 2) Redd counts 3) stranding and dewatering surveys.

Doug Killam, CDFW, provided River Fish Monitoring updates.

- CDFW shared that there are late fall-run Chinook salmon spawning in the mainstem Sacramento River currently. The high flows in the river are flushing most of the available carcasses making surveys difficult. Most of the late fall spawning is done. The winter-run carcass surveys do not start until May 1st depending on conditions. The fish that are migrating upstream now are likely those being observed at Keswick trap. Keswick trap is not operational in higher flows. Livingston Stone National Fish Hatchery (LSNFH) will resume broodstock collection when flows are reduced to under 20 thousand cfs.. Broodstock efforts to collect late fall- run fish began earlier before the current flow increase.
- Summary recap of last year: Winter-run Chinook salmon are primarily 3-year-old fish. In 2020, escapement was 6,386; in 2023 escapement was 2,427, approximately 40% of the winter-run spawners compared to 2020. Unfortunately, based on drought like conditions coupled with the thiamine deficiency present in 2021 that resulted in about 2.5% egg-to-fry survival of natural-origin winter-run, CDFW expects low escapement in 2024. However, we won't know for sure until June or July. The successful hatchery-origin survival of the 2021 juveniles may result in many 2024 spawners, since they are released later and were treated for thiamine deficiency.
- Reclamation shared that the Keswick fish trap is not currently operating. The flows are too high.
- NMFS asked if the ocean fishery closure is going to influence winter-run Chinook salmon escapement this year.
    - CDFW responded that it could. The ocean commercial fishery takes a large portion of winter-run Chinook salmon on a normal basis when it is open. Closure of commercial fishing should help bring winter-run Chinook salmon back. Every fish in the ocean has survived the poor conditions in the river from 2021. Fish that have not been caught in the ocean will return to spawn in the upper river.
- Reclamation shared a few more fish updates. LSNFH released fish in three different occasions. All the fish reared are out of the Hatchery. There are good release conditions

for each of those three releases. Coleman National Fish Hatchery struggled this fall. There was a low return of fall-run Chinook salmon, and they were not able to meet their egg-take goals with Battle Creek fish alone. They try to get 12 million juveniles produced a year and were only able to get about 9 million fry out of the adult returns. They are low in the number of fish they will be releasing this spring. They brought in eggs from other Central Valley hatcheries to boost production, but those fish are behind in their development. All the fish that are not from Battle Creek are being transported to the Bay by USFWS. The few fish that were retrieved to Battle Creek that were able to get spawned at Coleman would benefit from good release flows to help get them to the ocean safely since there are so few of them.

- USFWS asked when additional flows would be beneficial for those fish.
    - Reclamation will have to coordinate with Coleman on timing the additional flows in April/May to aid in hatchery fish migration and will work with Coleman to specify the date.
- USFWS commented that Tom Patton and Reclamation did a good job last year with accommodating the hatchery releases that were occurring at Coleman and coordinating them with the pulse flows and suggested that the SRTTG do something similar this WY.
- K&W added that coordination is needed to overlap and synergize these concerns.
    - USFWS shared that the releases are set to occur between May/June.
- NMFS shared that they have discussed the possibility of geomorphic flows and determined that it is premature to implement those right now. The question is whether some of the flood releases that Reclamation is conducting can be used for geomorphic benefit to help move spawning gravel into position or otherwise improve habitat. Such releases might be considered closer to Spring Pulse Flow time and potentially when hatchery releases are ongoing: that timing would be more beneficial in terms of late fall-run Chinook salmon redds. It could be part of the pulse flow discussions.

Fish Distribution/Forecasts: 1) Estimated percentage of the population upstream of Red Bluff Diversion Dam for steelhead, winter-run, and spring-run Chinook salmon 2) Sampling at rotary screw traps at Red Bluff Diversion Dam 3) Steelhead update 4) Livingston Stone National Fish Hatchery

Bill Poytress, USFWS, presented on the most recent Fish Distributions/Forecasts:

- The rotary screw traps at Red Bluff Diversion Dam are out of the water right now and are waiting for flood control releases to ramp down before sampling continues. There are no specific numbers at this point. Currently, they are out of the winter-run Chinook salmon migration period, although during wet years, juveniles tend to have longer run times travelling past Red Bluff, so USFWS is still seeing small amounts of winter-run Chinook salmon. Regarding hatchery winter-run Chinook salmon releases, there is an acoustic tag component to the most recent release that occurred last Friday. As is typical with some wet years, fish are not moving as rapidly and USFWS has only seen 13% at Red Bluff so far

this year. That said, sometimes the fish tend to linger in holes when flows decrease from ramp down, and the fish are still in the upper system as far as USFWS can tell.

- CDFW shared that the slow migration of fish out of the system has been a major concern. The hope was that the last fish released from the LSNFH would have migrated out of the system. Flows at 39,000 cfs inundate a lot of areas that form side channel pools not normally present between Keswick Dam and Cow Creek. These pools provide suitable habitat for migrating fish which may delay their migration. CDFW expects to be rescuing a lot of hatchery winter-run Chinook salmon that are getting "fat and happy" in the side channel pools and will provide an update at the next meeting.

Livingston Stone National Fish Hatchery Update:

Garwin Yip, NMFS, shared that Kaitlin is on extended leave; he provided the hatchery updates:

- Through February 16, 2024, 1 female and 2 males are on hand.
- The current goal is 60 females and 120 males.

Additional Announcements:

- K&W shared that SRTTG agencies' management requested more in-person meetings this year. The initial proposal is to think about doing the April and May meetings in person and hybrid to have longer conversations around the TMP in a face-to-face environment. The format for meetings from June onward can be scheduled depending on the WY.
- K&W shared that all in-person meetings will be hybrid.
- K&W reminded SRTTG of the request that all agencies update the SRTTG, SPG, and SRTTG caucus contact list and roster by March 1.
- K&W inquired whether there was a format preference for the March meetings: in person or virtual. Hearing no preference, K&W noted that the March meeting will be virtual.

Topics for Elevation to Shasta Planning Group:

- N/A

Adjourn