

Sacramento River Temperature Task Group (SRTTG) Meeting
June 9, 2022, | 1:00 PM – 2:15 PM
Meeting Summary

Participants

Craig Fleming, USFWS
Craig Williams, SWRCB
Charles Chamberlain, USFWS
Chris Laskodi, Yurok Tribe
Claudia Bucheli, SWRCB
Crystal Rigby, CDFW
David Mooney, Reclamation
Doug Killam, CDFW
Elissa Buttermore, Reclamation
Eric Danner, SWFSC
Erica Meyers, CDFW
Garwin Yip, NMFS
Gabe Singer, CDFW
Janice Pinero, Reclamation
Jefferey Onsted, DWR
Jeff Laird, SWRCB
James Earley, USFWS
James Gilbert, SWFSC
Jo Anna Beck, Reclamation
John Hannon, Reclamation
John Williams, CDFW

Josh Israel, Reclamation
Kristin White, Reclamation
Kevin Reece, DWR
Levi Johnson, Reclamation
Lewis Bair, SRSC
Liz Kiteck, Reclamation
Mary Suppiger, Reclamation
Matt Brown, USFWS
Matt Holland, SWRCB
Michael Macon, SWRCB
Michael Prowatzke, WAPA
Michael Wright, Reclamation
Mike Ford, DWR
Miles Daniels, SWFSC
Russel Weatherbee, NPS
Stephen Maurano, NMFS
Seth Naman, NMFS
Tom Patton, Reclamation
Vanessa Kollmar, CDFW

Facilitation Team

Terra Alpaugh, Kearns & West
Adam Fullerton, Kearns & West
Maria Bone, Kearns & West

**Key Discussion Topics with
Summary of Recommendations and Outcomes**

Action Items

- 1) Tom Patton, Reclamation – Will check about regularly updating Spring Creek Powerplant temperature data on CDEC
- 2) Tom Patton, Reclamation – Will look into and report back on why the model run from March projected a 4.2 higher temperature for Lewiston in October than the June model run.
- 3) Adam Fullerton, Kearns and West – Set aside time in the next meeting to discuss Southwest Fisheries Science Center (SWFSC) request for feedback on whether to change their modeling approach for the implementation season.
- 4) All SRTTG Members: Provide feedback on the SWFSC’s modeling approach, i.e., what information (planning vs. implementation approach) is most useful to your agencies in decision-making throughout the rest of the temperature management season. Email feedback to Miles Daniels (miles.daniels@noaa.gov)

1. Welcome, Agenda Review, and Purpose

Terra Alpaugh, Kearns and West welcomed all participants and reminded the group that now that the Temperature

Management Plan (TMP) is done, SRTTG meetings will revert to the standard agenda form.

2. 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.”

3. Prior Action Items

Action Items from April 28, 2022

1. **Eric Danner, SWFSC**
 - a. Delete or caveat End of September (EOS) storage number
 - This was discussed at a previous meeting and while there was not consensus among the SRTTG members, SWFSC decided not to remove or caveat the EOS storage number.

Action Items from May 26, 2022

1. **Tom Patton, Reclamation** – Will send out new temperature reservoir profiles to SRTTG next week.
 - Complete
2. **Adam Fullerton, Kearns and West** – Will update and distribute the Model Assumptions Table to the group
 - Complete. The model assumptions table was shared with the group, and past tables will be uploaded and updated at meetings when there are multiple models’ results to compare.

4. River Fish Monitoring

Doug Killam, CDFW reported out on data that is posted on a weekly basis including shallow redds, stranding, and the aerial redd surveys.¹

1) Carcass surveys

- Carcass observations: 100 carcasses observed; this is less than half of what was seen at this point last year but more than in 2020.
- A medium to low population estimate is expected for this year, but it won’t be clear until September.

2) Redd counts

- Three aerial surveys have been completed this year so far. There are 37 winter run redds, all above Highway 44 in the upper six miles of the river, which is similar to last year’s distribution.
- Tracking a few shallow redds
- Observing less prespawn mortality than last year, 12% this year versus 61% last year at this time

¹

https://www.calfish.org/ProgramsData/ConservationandManagement/CentralValleyMonitoring/CDFWUpperSacRiverBasinSalmonidMonitoring/tabid/357/Agg2208_SelectTab/2/Default.aspx

The group discussed what year to year comparisons of the carcass counts are useful given different conditions; for instance, last year's warm water bypass might have affected the number of carcasses. Doug Killam commented that the usefulness of comparing carcass counts across years depends on what analysis is being done; the carcass count is an index not a population estimate, but it will be one input into the population estimate.

5. 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 Hatchery

Matt Brown, USFWS, reported that:

- The number of fish at the Red Bluff Diversion Dam rotary screw traps have declined; however, there was a small pulse of fish following last week's rain event.
- Green sturgeon have not arrived yet.

No report from Livingston Stone Hatchery

6. Hydrology, Operations, Forecasts, and Temperature Management

Tom Patton, Reclamation, reviewed the SRTTG Packet. Please see the SRTTG Packet for the graphs. Tom reviewed the following topics and made the following observations highlighting key information:

- Precipitation
- CA Snowmelt
- Air Temperature Forecasts
 - a. Heat is expected this week
- Daily CVP Water Supply Report
 - a. Flow releases
 - On June 4, Reclamation increased the Keswick release to 4,000 cfs.
 - Temperature Control Device (TCD) changes:
 - On June 3, two additional pressure relief gates (PRGs) were opened, so now four of the five PRGs are open.
 - Starting on June 7, the target temperature is 54.5° F; opening the PRGs has kept the Shasta release temperatures consistently at about 52 ° F, providing cool water through Keswick and bringing the temperature at the Sacramento gauge (SAC) just below the target.
 - On June 1st, Whiskeytown Dam releases into Clear Creek was changed from 200 cfs to 150 cfs, which is the normal summertime flow. Whiskeytown is in the warmest gate configuration to conserve cold water for later in the season. Adjustments will be made as water temperature gets close to 60° F. There will be a small pulse flow on Clear Creek in late June.
 - Trinity is at the minimum summertime flow of 450 cfs. Temperatures are warming in the river, but there is still flow moving through the system to try to keep Lewiston cool while maintaining storage in Trinity.

- There are limited options to address issues, but Reclamation will raise possible actions with the SRTTG if they arise; the Spring Creek Powerplant is moving about 600 AF a day or 25 TAF a month from Trinity into the Sacramento River system via Carr Power Plant.
- Shasta Temperature Profiles: 5/25 and 6/1 actuals and modeled profiles for end of month.
 - a. The modeled profile projected reservoir temperatures to be a little warmer on the surface at the end of May than they were in reality, and between the middle gates and the PRGs, temperatures were projected to be a little cooler than the actual profiles showed.
 - b. The end of May model shows that what we predicted back in late April/early May is a little different than what we are seeing now because of what went into latest model run; the model is only as good as what it thinks the profile will be moving forward.
 - c. Temperatures are tracking a little warmer than what was projected in the Temperature Management Plan (TMP), which is why the latest model run is showing an earlier side gate pull. TMP said 7/27 per Reclamation modeling (or 7/5 per SWFSC modeling), but Reclamation modeling now anticipates first site gate use on 6/26 (and full use on 8/29). This is probably attributable to changes in the month of May – additional heating or cooling, and some different operations, but it is hard to say exactly why changes have occurred because there are lots of variables in play; the modeling is very sensitive to change at this point given how Shasta Reservoir is starting to stratify.
 - Most of the water is being released from the PRGs as 51° F water; the layers above the PRGs are having impact on the release temperatures. All of the middle gates are open and releasing warmer water; Reclamation could close those if they need cooler water and open the last PRG; some leakage in the TCD is also raising the temperature.

The group discussed that the real time temperature gauges are down at Spring Creek and Pitt River, and there is interest in getting more daily information. Tom will check with the data managers about whether there is a plan to push daily data to CDEC.

7. Temperature Management and Temperature Dependent Mortality Modeling

Tom Patton, Reclamation reported on the most recent Reclamation modeling. Please see the SRTTG Packet for the graphs. Highlights included:

- The model is targeting 54.5° F; Reclamation released additional cool water to meet cooler temp target. The model does really good job with meteorology to meet target temp; meteorology is latest forecast from NWS L3MTO with 25% exceedance.
 - a. Temperatures at the SAC gage still looks good in near term.
 - b. The model shows the last full side gate opening at the end of August; there is then some uncertainty in what the model thinks will happen in late summer/early fall.
 - c. What has improved in this model run:
 - Reclamation is releasing a little less than forecasted.
 - Now forecasting 221 TAF for end of September cold water pool.
 - EOS Shasta storage of 1.32 MAF; that volume will probably be even higher in next month's modeling with continued reduced Keswick releases and late rains to improve inflows.
 - d. Updated projections for Clear Creek and Trinity below Lewiston:
 - Digging into both sets of results to see if there are calibration issues.
 - Previous results were based on forecasted very warm meteorology; now models are showing air temperatures warmer earlier in summer and a little cooler later in the summer.
 - The model does not include any low-level bypass at the Trinity dam

There was a question about the difference in projected October Trinity temperatures between the March model run and this model run. The temperatures were above 58.6° F in the March handouts, 4.2° F warmer than in projected October temperature in this model run.

- Reclamation reported that a few things have changed including updated hydrology, better storage, and adjusted versions down a little bit.
- Reclamation acknowledged that while the late summer NWS forecasted temperatures were lower in this run, they are unsure whether that would be driving such a big difference in modeled water temperatures.
- Reclamation will reassess the results to determine what could be driving this change.

Miles Daniels, SWFSC, presented the latest model results from SWFSC and discussed a potential change in how SWFSC will conduct modeling during the temperature management implementation phase of the year. See presentation that was shared following the meeting for further details. SWFSC's objectives for the presentation were (1) to make sure the SRTTG understands exactly how the results they provide are generated and (2) to get feedback on which modeling approaches are providing the most useful information at a given time of year. Highlights:

- SWFSC is considering using different modeling approaches during different phases of the temperature management season:
 - a. **Planning:** The first phase is before active temp management, when SWFSC modeling is assisting with identifying temp management strategies (e.g., window shaping, release scenario comparison, redd distribution, and sensitivity analysis).
 - The modeling during this phase would use SWFSC models of Shasta and the TCD gate operations algorithm within that model, which selects how to blend TCD gates to meet a temperature target, and then use the planned temperature target and release operations to feed into the through SWFSC temperature (Keswick model, RAFT) and TDM models.
 - The SWFSC stressed that this modeling provides temperature and TDM results based on what their model suggests downstream temps will be based whatever it determines are optimal gate operations. This blending routine is not the prescribed schedule for the TCD gate operations, which Reclamation determines. This information is useful during the planning stage in helping the SRTTG think about a range of operational alternatives and the associated outcomes.
 - The assumptions in the model are included in the presentation and will be updated in the assumptions table.
 - For the Planning Phase model outputs for June 9, the only inputs that have changed since the last model run are profile dates and temperature targets. There have not been major changes from the last run's results; Changes from last meeting are:
 - i. The first use of the side gate use is pushed out by about a week.
 - ii. End of Storage (EOS): 1.33MAF to 1.38MAF
 - iii. TDM dropped by 4%.
 - iv. Many inputs affect these changes including:
 - Air temps were slightly different
 - Inflow to Shasta was slightly higher
 - Outflow was a little less
 - b. **Hybrid**
 - The Hybrid approach would use:
 - i. SWFSC models of Shasta.

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- ii. The Reclamation TCD gate algorithm or plan (This is the primary difference from the Planning phase approach)
 - iii. The SWFSC Keswick model
 - iv. RAFT
 - v. TDM
- c. **Implementation:** during the active temperature management phase, SWFSC is considering shifting from the “Planning” modeling approach above, which uses all SWFSC-generated inputs, and instead using Reclamation’s operational plan data and run it through the SWFSC’s RAFT and TDM models.
- The implementation phase approach would:
 - i. Use Reclamation’s operational plan to estimate TDM.
 - ii. Includes release schedules and TCD gate operations from HEC-5Q.
 - iii. This requires SWFSC to run the RAFT river temperature model with Reclamation’s predicted Keswick release temperatures.
 - iv. This approach does not use the SWFSC reservoir models upstream. *There is a version of the SWFSC models on CVTEMP.
 - v. SWFSC runs this implementation model every day on CVTEMP with updated information.
 - There are often slight changes in TDM estimates as new data (i.e., observed river temperature) are ingested by the model.
 - There are often larger changes in TDM when a new Reclamation operational forecast (i.e., forecasted temperatures out of Keswick) is released.
- d. The most recent TDM results for the two approaches are:
- Planning Approach: 56% TDM
 - Implementation Approach: 47% TDM
- e. SWFSC has been using the Planning approach to this point and would like input on potentially shifting to the Implementation approach to modeling.

SWFSC asked for questions and input from the group about the merits and concerns with using the Implementation modeling approach. The group’s discussion included:

- *A clarification about model names and usage on the CVTEMP website*, which refers to Reclamation HEC5Q and NOAA Leakage approaches: SWFSC explained that the Reclamation HEC5Q modeling is the Implementation Approach described in today’s presentation, while the NOAA Leakage model referred to on the website is the Hybrid approach described today; the NOAA Leakage model is a W2 version of Shasta reservoir which has certain calibrations of leakage through the TCD; the modeling under that name uses Reclamation operations and SWFSC estimates of how leakage is apportioned through the gates.
- *The utility of continuing to run the Planning type analyses if it shows that SWFSC’s gate selection algorithm might be working better than gate selection algorithm coming from Reclamations HEC5Q model.* The State Board is interested in having the ability to do hindcasts and compare the potential results of different decision-making approaches regarding gate selection, which suggests there is value in running both the Planning and Implementation-type analyses. After there are not operational choices left to make, then it is less clear what the difference in the two models would be.
- The SWRSC stressed that the results from the various models are not that different from each other, which is encouraging. The very detailed differences between the models may not be helpful for decision making.
- The State Board emphasized that it is up to the SRTTG and Shasta Planning Group to ensure decisionmakers are getting the best information but also not unnecessary information.

- The group discussed the need to continue this conversation with this group, potentially including the Shasta Planning Group or having members of the Shasta Planning Group on the SRTTG call, and any others who are actively using this data.
- The group decided that the discussion of this proposal should be continued at the next SRTTG meeting.

8. Review Action Items and Meeting Scheduling

Kearns and West reviewed the action items listed at the top of the meeting summary. The next meeting is scheduled on June 23.