

**Sacramento River Temperature Task Group (SRTTG) Meeting**  
**May 26, 2022 | 1:00 PM – 2:45 PM**  
**Meeting Summary**

***Participants***

Bill Poytress, USFWS  
Charles Chamberlain, USFWS  
Chris Laskodi, Yurok Tribe  
Claudia Bucheli, SWRCB  
Crystal Rigby, CDFW  
Doug Killam, CDFW  
Eric Danner, SWFSC  
Erica Meyers, CDFW  
Garwin Yip, NMFS  
Gabe Singer, CDFW  
James Earley, USFWS  
James Gilbert, SWFSC  
Jo Anna Beck, Reclamation  
John Hannon, Reclamation  
Josh Israel, Reclamation  
Kevin Reece, DWR

Kim Holley, CDFW  
Kristal Davis-Fadtke, CDFW  
Lauren McNabb, CDFW  
Lee Bergfeld, SRSC  
Liz Kiteck, Reclamation  
Matt Brown, USFWS  
Michael Harris, CDFW  
Michael Macon, SWRCB  
Michael Prowatzke, WAPA  
Miles Daniels, SWFSC  
Stephen Maurano, NMFS  
Tom Patton, Reclamation

***Facilitation Team***

Julie Leimbach, Kearns & West  
Adam Fullerton, Kearns & West

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

**Action Items**

- a. Tom Patton, Reclamation – Will send out new temperature reservoir profiles and model run to SRTTG next week.
- b. Adam Fullerton, Kearns and West – Will update and distribute the Model Assumptions Table to the group

**1. Welcome, Agenda Review, and Purpose**

Julie Leimbach, 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, with the adjustment of moving the modeling presentations to earlier in the meeting to ensure all of the modelers are available.

**2. Purpose and Objective**

The purpose of the Sacramento River Temperature Task Group (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. Final Temperature Management

Tom Patton, Reclamation, reported that the Final TMP is consistent with the Draft TMP and the technical input provided by the SRTTG in April. Reclamation made the following minor updates to the Draft TMP, which were included in the Final TMP:

- Reclamation included the same scenario submitted in the Final TMP as discussed in the April SRTTG meeting.
- Reclamation adjusted the Final TMP to be responsive to input from NMFS and other SRTTG members.

Reclamation has received comment letters on the Final TMP from NMFS and the State Board.

### 4. Temperature Management and Temperature Dependent Mortality Modeling

Miles Daniels, SWFSC, presented on the Science Center's most recent modeling results (full presentation included in the SRTTG Meeting Packet). Highlights included:

- SWFSC Modeling
  - Assumptions: Miles reviewed the modeling assumptions which are listed in slide 2 in his presentation.
  - Model Outputs: May 25, 2022, Scenario 1, 54.5° F Target
  - Highlights:
    - a. Not much has changed since model run in April.
    - b. Temperature Dependent Mortality (TDM) – 47% - 54% depending on redd distribution, 5-6% reduction from forecast in April.
    - c. Changed from April model run
      - End of Season (EOS) storage increased
      - Temperature dependent mortality decreased a bit
        - Explanation of changes between model runs:
          - Presented 3 time series to show meteorological curve of mean daily air temperature, mean daily inflow to Shasta Reservoir, mean daily outflow from Shasta Reservoir.
          - More inflow and less outflow than assumed in their earlier May model runs, which means there are more cold water resources to work with over the season.
          - Air temperatures changed from those predicted.
    - Mean annual TDM estimates at 47-54%. This is a reduction of 5-6% from last model run. The difference is based on:
      - Differences between redd distribution assumptions between April 27 and May 25 model runs.
      - Change in forecasted versus observed model forcing, for example, the inflow and outflow volumes from Shasta.
- Modeling Assumptions Table

- a. Kearns & West will update the Model Assumptions Table in real-time in the SRTTG meetings when there are model runs to compare. The purpose of the table is to document the comparison between model run assumptions and changes in assumptions during the temperature management season.
- b. SWFSC was the only entity with model results at this time and they confirmed the updates to their model assumptions for the May model run.

## 5. River Fish Monitoring: 1) carcass surveys 2) redd counts 3) stranding and dewatering surveys

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

### 1) Carcass surveys

- Carcass observations: 41 total fish, 2.4% of expected carcasses based on average counts for past 20 years. While that is a little below the 20-year average of total carcasses to date, it is too early to draw any conclusions from this number about eventual distributions.

### 2) Redd counts

- 8 redds, all above Anderson Cottonwood Irrigation District.
- No shallow redd data yet.
- Surveys and redd construction just getting underway.

### 3) Stranding and dewatering surveys

- Mortality for fresh females is 10, and five are reported as unspawned as of May 25.
- Similar river conditions to last year
- Unspawned fish aren't showing much in the way of saprolegnia (fish fungus). There is no certainty about cause of death in the carcasses that have been seen. Otters may have chased some of them. Photos of gills and bodies have not indicated conclusively a cause of death.

## 6. 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

Bill Poytress, USFWS reported out on the following fish distribution and forecasts:

- 1) **Estimated percentage of the population upstream of Red Bluff Diversion Dam for steelhead, winter-run, and spring-run Chinook salmon and**
- 2) **Sampling at rotary screw traps at Red Bluff Diversion Dam**
  - 93-100% passage rate for juvenile fall-run and winter-run Chinook salmon at Red Bluff Diversion Dam for brood year 2021.
  - Late fall run is running sporadically every few days.
  - Few rainbow trout observed

- Water temperatures at Red Bluff Diversion Dam hit 69°F on 5/25, which is the highest water temperature recorded at this location (RDB station) in at the last 20 years of sampling at this site. Typically, Red Bluff water temperatures are 10 degrees higher relative to upstream locations (i.e., Sac or KWK). Maximum air temperature was 102°F in Red Bluff in May.

### 3) Steelhead update

- No Steelhead update

### 4) Livingston Stone Hatchery

Taylor Lipscomb, Livingston Stone Hatchery reported out on the hatchery:

- Collected and retained 114 female winter run Chinook salmon (WCS), 150 male WCS, spawned 22 females WCS to date.
- Continuing max collection effort through the month.

## 7. 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
- Daily CVP Water Supply Report
  - a. Flow releases
    - Generally, Keswick Reservoir flow releases have been a bit lower than planned in the Final TMP. Inflow to Shasta Reservoir has been a bit higher than forecasted also.
    - Trinity River flows – 450 cfs minimum. Completed pulse flow in mid-May. Pretty low storage.
    - Keswick Reservoir flows – increased to 3,500 cfs on May 11, then increased to 3,750 cfs on May 24
  - b. Storage
    - Trinity – 744 TAF
    - Shasta – 1.82 MAF
  - c. Accumulated inflow
    - Trinity – 51% of 15-yr avg
    - Shasta – 60% of 15-yr avg
- Mean Daily Temperature
  - a. Reclamation used the Temperature Control Device (TCD) to cool the Keswick Reservoir flow releases a bit. Since the operational change to open #1 Pressure Relief Gate (PRG, lower gate), Keswick Reservoir flow release temperatures have slowly increased again.
  - b. When Reclamation opened the #3 PRG of the TCD, operators expected cooler flow release temperatures, but they only observed cooler water through Unit 3. Patton has surmised that warm

- water is leaking into the TCD and being pulled down into the other penstocks. Reclamation is observing that Unit 3 produces the overall coolest flow release temperature. Reclamation can use operations of the gates to blend the temperature and to adjust temperatures of flows.
- c. If there is a heat wave, Reclamation's next step would be to pull PRG number 2 or 4 to help cool more of the flow releases from the penstocks.
  - d. Comparison with the TMP modeling
    - In the Final TMP, Reclamation assumed pulling the first PRG on the Shasta Reservoir on May 10. This is roughly in line with the actual current operations.
    - At this time, actual operations are generally following what is outlined in the Final TMP.
    - Variables outside of operational control are a bit different than what was expected in the Final TMP. For example, air temperature, inflows, and outflows are all varying from what was expected in the Final TMP.
  - e. Daily water temperatures increased May 25, probably in response to very high, record-setting air temperatures in Redding.
- Operations
    - a. Reclamation is not running any flow through Spring Creek Powerhouse into the Sacramento River; all flows are coming from Shasta Reservoir through Keswick Reservoir.
    - b. Reclamation will continue this operation through the end of May, then consider changes to this operation weekly in June.
  - Sacramento and Trinity River Mean Daily Temperatures
    - a. Low flow on the Trinity River has allowed the temperatures to warm the river up resulting in warmer temperatures downstream.
  - Shasta Lake Isothermobaths and Coldwater Pool Volume < 52° F, 50°F, and 48°F
    - a. Reclamation will send out new temperature reservoir profiles to SRTTG next week.
    - b. The current isothermobath plots are showing cold water pool volumes comparable to 2021.
    - c. Exceedances are showing extreme levels.
  - Trinity and Whiskeytown Isothermobaths and Coldwater Pool Volume < 52° F, 50°F, and 48°F
    - a. Trinity system current isothermobaths compare with exceedances for 2000 and 2021 period.
  - Estimated CVP Operations 90% Exceedance
    - a. Shasta Reservoir – End of September Storage forecast based on projected release plan is 1.322 MAF.
  - Shasta Temperature Profiles
    - a. Includes profiles from May 25, 2022
    - b. Description of the graph
      - 2 upper black lines on graph are where the middle gates indicate 57° F.
      - Red line is the penstocks at 815-foot elevation.
      - Two lower black lines indicate the PRGs at 46° F and 47°F.
    - c. There is quite a disparity between the temperature profiles at the PRGs and the middle gates.
  - Modeling
    - a. Reclamation will run the model based on the latest temperature profile and distribute to the SRTTG next week.
    - b. Tom Patton does not expect much difference between the previous temperature profile and model results.
    - c. There will be new temperature profiles in June as well and that can be compared to the May 25 temperature profile.
    - d. Outcomes of operations are tracking closely to the Final TMP.

## Coordinated Operations Agreement Debt

Tom Patton, Reclamation gave an update on the Coordinated Operations Agreement debt.

- The State is making progress paying off the COA debt. At the end of April, the debt from the SWP to CVP was 216 TAF.
- The COA debt figure does not include the adjustments for last year's New Melones release which is still being discussed.

## Gate Operations Alternatives and Constraints

Tom Patton, Reclamation reported on the gate operations alternatives and constraints as follows:

- Cooler weather in May has kept Reclamation from opening another PRG. This may change with warming temperatures. Currently operating all five middle gates and one PRG.
- The group discussed what gate configurations are possible. Reclamation reported the following:
  - a. There must be five gates open at once at the Shasta Reservoir. If there is less than 10 feet of head above the middle gates, they no longer count as open, and other gates will need to be used.
  - b. Operations can switch to a side gate configuration, but hopefully they will not need to make that switch until later in the year.
  - c. Shasta Reservoir is currently at 946 feet elevation. This is 11 feet above the elevation that will require opening all the PRGs.
  - d. Reclamation stated that the current Shasta Reservoir elevation should be sufficient for the current operations.
  - e. If warmer air temperatures cause Shasta Reservoir to warm faster than expected, Reclamation may have a hard time meeting the 58°F target and will adjust operations.
  - f. Reclamation reported that they think the lake levels may force early opening of the rest of the PRGs.

## Travel Time

The group discussed the time it takes for cold water to travel downstream of Keswick Reservoir, i.e., the time required from a change in operations at the Shasta TCD to see a resulting change in water temperature at the SAC gage.

- Reclamation calculates the rough flow travel times through Keswick Reservoir based on timing of operations changes, flow release magnitude, and Mean Daily Water Temperature as tracked in the SRTTG May 26 packet, page 6. The travel times at varying flows are as follows.
  - a. 4 days at 3,500 cfs Keswick Reservoir flow release
  - b. 2-3 days at 8,000 cfs Keswick Reservoir flow release
- Length of time for temperatures to change based on change in operations of the gate.
  - a. Description of graph
    - The green plot is the TCD change on May 17 when temperatures started to drop off; however, there was no change downstream.
    - Blue line is Keswick, which shows temps kept rising as the cold water was moving through Keswick Reservoir, which is a 20,000 AF reservoir.
  - b. These results show a flow release at 3,500 cfs from the TCD on May 17. The temperature decrease was observable at Keswick Dam on May 21.

- c. On May 24, Reclamation increased Shasta Reservoir and Keswick Dam flow releases. Reclamation is not sure if the increased flows will reduce the travel time through Keswick Reservoir. Reclamation estimates that the travel time for cooling flows might still take 3-4 days at the increased flow release.
- d. The increased travel time at lower flows requires greater planning. Operations will need to plan for 3-4 days for travel time.

## **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 9.