

Sacramento River Temperature Task Group

Meeting Notes from 5/24/12

Objective: Provide advice to the Water Operations Management Team (WOMT) and National Marine Fisheries Service (NMFS) on measures to assist with improving and stabilizing Chinook population in the Sacramento River. Annually, Reclamation develops temperature operation plans for the Shasta and Trinity divisions of the CVP. These plans consider impacts on winter-run and other races of Chinook salmon, and associated project operations. SRTTG meets to discuss biological, hydrologic, and operational information, objectives, and alternative operations plans for temperature control. Once SRTTG has recommended an operation plan for temperature control, Reclamation then submits a report to the SWRCB¹. After implementation of the operation plan, the SRTTG may perform additional studies and commonly holds meetings as needed typically monthly through summer and into fall to develop revisions based on updated biological data, reservoir temperature profiles and operations data.

Attendees:

FWS: Craig Anderson, Matt Brown, Jim Smith

DFG: Mike Berry, Alice Low, Patricia Bratcher

Reclamation: Paul Fujitani, Stacy Smith, Mary Suppiger, Thuy Washburn, Rod Wittler, Josh Israel

SWRCB:

Hoopa: Sean Ledwin,

NOAA: Bruce Oppenheim, Garwin Yip, Seth Naman

FWD:

Note Taker: Barbara Rocco, Independent Contractor

Agenda

- 1) Introduction
- 2) Review official list of agency representative to the Sacramento River Temperature Task Group
- 3) Fishery update
- 4) Hydrology & operations update
 - a. Daily CVP water supply report***
 - b. Reservoir conditions***
 - c. May 90% and 50% forecasts***

¹ Upon review of the draft notes, a comment from CDFG suggested that the sentence be modified to, "Once SRTTG has recommended an operation plan for temperature control, Reclamation then submits a report to NMFS, requesting concurrence, with a final report being jointly submitted to SWRCB to address the SWRCB 90-5 requirements." This suggestion was neither incorporated nor a response/explanation provided regarding why it was not incorporated.

- 5) Discussion of recent temperature model runs
 - a. Temperature studies packet***
 - b. Temperature Management Plan
- 6) Update on Matt Brown's proposal

Action items:

- a. They will work with NCAO to determine the cost and schedule of replacing the Oak Bottom TCC.
 - b. Matt will provide the proposed action to forward to NMFS.
 - c. Matt will provide meeting notes for the full power peaking proposal discussion.
 - d. Matt will provide equipment for water temperature monitoring.
 - e. Barry will work with Matt to develop scenarios to test the hypothesis of variable Carr generation amounts and associated impact on water temperatures at the Oak Bottom curtain.
 - f. Barry will check to see what temperature probes are currently installed at generator penstocks and if there is "real-time" access to those temperatures.
 - g. They will check to determine what temperature studies are to be performed at Lewiston (handout provided)
 - h. Matt will commit to collecting water temperature data but will discuss with NCAO if they would rather do the work using the hydro-techs that already download temperature on the reservoirs.
 - i. Tracy [dependent on funding] will develop scheduling for the experimental power operations and sampling locations for water temperatures.
- 7) Next meeting: Thursday, June 28th

***handouts

Introduction: The meeting was convened at 1:00 p.m. and introductions were made.

Agency Representatives: Jim Smith provided a list of members from last year's annual work plan, which was deemed to be the official list. Everyone felt that it was important to identify members of the group, and especially those who designated by their agencies to speak for or represent them. This is particularly important when a member states a specific position on an issue under discussion. It was suggested that an email be circulated to all representing agencies to ask for the name of a designated spokesperson for that agency. Others can join the meeting if there's a proposal in which they are interested. There would be one agency representative that would provide the group with an "official stance" on an issue under discussion. Other members could be designated to represent an agency as a "point of contact" but not one who would make a decision; these people would defer to their management and report back to the group at the next meeting. It was decided that people would check with their agencies and report back to the group at the next meeting with designees; however, a few were confirmed at this meeting as follows:

- Reclamation: Thuy Washburn is the point of contact. If there are issues, she will talk with her supervisor and report back to the group. Josh Israel will join the meeting to provide a fish-biologist perspective. He suggested that, if the SRTTG members do not agree on an issue, that SRTTG should make recommendations or present alternatives to give to WOMT and let WOMT make the decisions on which to implement.
- NOAA: Bruce Oppenheim is the contact person for the Sacramento River; Seth Naman is the contact for the Trinity River
- SWRCB: Kari Kyler was suggested but she (and her role) needs to be confirmed.
- Hoopa: Sean Ledwin (need to confirm role)
- Yurok: Tim Hayden was named; however, it wasn't clear whether Yurok wanted to be involved or what role it would have. If so, they were welcome to join.

Both FWS and DFG will need to check with their agencies and report back with the designee and/or contact person.

Fishery Update: Smith reported that there are two basic monitoring programs to help us to some degree with our activities.

Aerial Redd Surveys: DFG conducts aerial redd counts for each year. They conducted two flights beginning in May and have seen 9 winter-run redds, all located above the Highway 44 Bridge. It's early in the spawning season, so that distribution could change; it tends to peak sometime toward the middle of June. We did not have this information last time.

Carcass Surveys: Winter-run carcass surveys began at the end of April/first of May. It is still early in the season so DFG will continue to find carcasses. As of 5/22, DFG saw 10 carcasses, more than this time last year (5 carcasses); there was no distribution information available. Israel asked to receive the information and be added to the distribution list.

Numbers from Keswick on Keswick Dam: There have been 281 winter-run Chinook trapped and from which samples have been taken and genetic sampling done. There is another grouping trapped but without samples taken. The grand total trapped is 729 but 378 were trapped and released without determining race. The trapping information is updated every few weeks and the majority trapped is of hatchery origin. These reports will be sent to Garwin Yip at NOAA. Trapping will continue until June to reach the goals of the program.

There was no information or breakdown on whether those trapped were 2 or 3 year olds but we can find out whether that is being determined. The 281 winter run includes those that were trapped and released and it's not known whether scale samples are taken from them.

There is no information about the distribution of the acoustically tagged fish. The results will be presented at the winter-run project work team meeting in July. The general recollection is that these salmon are distributed anywhere from Colusa up to below Keswick. In the last survey, most were above the Highway 299 Bridge but they have moved around quite a bit. They are

either in the survey area or way out of the survey area. For DFG's work, the redd distribution surveys are probably the best information currently available on distribution. By the next PWT meeting, we'll have all the information wrapped up and will report out.

Hydrology & Operations:

Daily CVP water supply report: Sacramento River flows will be ramping down to be at 9,500 cfs on 6/8/12; the American River flows will ramp down to about 2,000 cfs; Goodwin will be at 900 cfs by 5/27.

Reservoir conditions: The federal share of San Luis Reservoir is 629 TAF. Shasta is at 97% of capacity; Trinity Lake is at 96% of capacity; Folsom Lake is at 94% of capacity; Lake Oroville is at 99% of capacity; New Melones is at 77% of capacity.

May 90% and 50% storage forecasts: The 90% forecast for Trinity is 1.7 TAF by September 2012 vs the 50% forecast of 1.8 TAF. For Shasta, the forecast is 2.58 TAF at 90% and 2.91 at 50%. At Whiskeytown, the forecast is .230 TAF at 90% and 0.238 at 50%.

Temperature Model Runs (see attachment for complete information):

Temperature studies: 90% exceedance will meet a Jellys Ferry control point throughout summer; a Bend Bridge control point is less likely for the 90%-exceedance outlook than for 50% exceedance outlook. Results for both 90 and 50% are similar except in September and October. There are no 90% graphs this time because they are so similar to 50% graphs. It was noted that it is important to have both sets of information, especially if SRTTG meets early in the year. We don't want to get into the habit of only producing the 50% exceedance. For now, it is fine to have just the 50% information because both the 50 and 90% are pretty much merged.

Control point: SRTTG was asked for suggestions on where control points should be. Given current water-year conditions with storage at 97%, we should try to do the best we can as far as temperature compliance; therefore, we favor the Bend Bridge compliance point from here on. It was noted that this is based on 50% or average meteorology, so if it gets hotter, that puts us more at risk of running out of cold water. At 90% exceedance, the Bend Bridge control point is less likely to be attainable. The 90% exceedance is based on hydrology not on whether it's a hot or colder summer. We tend to be looking backward when modeling; the job of this group is to look forward to predict future operations. Although we might never meet the RPA; when you meet it in 50% of years, you're doing something beneficial to the fish.

The question was raised as to when is the most important time in the river—early summer or late summer (August, September). If there is a critical point, maybe we should focus on that. What if we shot for Jelly's Ferry in June, take a look at it in a month, and then go to Bend Ferry? Reclamation had concerns that if the target was at Bend Bridge in June, there may not be efficient cold water left for the rest of the summer.

It's a long period of time; we're trying to protect eggs in the gravel. This begins in May and lasts through September. The peak times with peak number of eggs in gravel depend on how you define it (75, 80, 90%?). It varies. Last year, everything was a month later than normal. Do we target conservatively early in the year to save what for later when it's needed? This issue is compounded by where the salmon actually spawn and we can't predict where they will spawn. At the last meeting, John Hannon (Reclamation) provided a chart of 10 years of salmon spawning; the majority was higher up in the river system. This is most likely the result of fish passage improvement and fish being able to move upstream to the dam, and the fact that populations have been so small in last several years; all the fish when up to the base of the dam. If we had a higher population, the fish would move farther downstream and would distribute over a much wider area.

DFG attempts to plan out the entire season through fall. We don't want to target low in the river and then not have enough cold water at the end of the year to support the system.

According to the Science Panel observation, given conditions in 2011, we should have been trying to meet Bend Bridge and we didn't and that was when we had a good year and high storage. They couldn't understand why we weren't targeting as far downstream as possible. In other words, if we can't meet Bend Bridge in a wet year, we would have problems meeting it in other years.

It is not expected that there will be the delay that was seen last year; we will see more spawning this year than last year so we should try to provide as much cold water as we can to them. If there are fish going all the way to Colusa, at some point they will turn back upstream and will probably spawn farther downstream than the dam.

There was a question about Red Bluff Diversion Dam and whether operating the gates differently will change the fish distribution. In past year, the gates were up until 6/15; however, they are not going in at all this year so it is unlikely that there will be a change in distribution, especially given that the vast majority of fish are already past Red Bluff. There could be a slight effect but not much.

It was suggested to begin with Bend Bridge as the compliance point. That will most likely change in Oct/Nov. It is a tradeoff at this point. The question was raised about whether the group agreed that if Bend Bridge was targeted now but later in the year we ran out of cold water, would we agree to move the compliance point up to another spot. The group agreed that the compliance point could be changed as long as we met Bend Bridge up to August. By that time, we would have redd distribution data and a better idea of where the fish are spawning and could make a more informed decision. We're making an assumption that fish distribution is not going to be past Jellys or Balls Ferry; however, if they do spawn farther downstream, we don't want to run out of cold water. We shouldn't make a decision to cut it off at Jellys Ferry but should use

Bend Bridge for now and address it again in July. This would satisfy the RPA (performance measure compliance date of 5/15).

The final proposal as agreed was to target Bend Bridge starting June 1, 2012 to the rest of the summer but to continue to assess and update monthly.

Matt Brown Proposal

Action item a: To update, there is still no funding for project but we did get on the Oak Bottom Curtain on the RAX list for funding; if there's any kind of maintenance required, the project gets put on the funding list. The curtain is 5 years out; it will cost is \$1.5 million. Every year, Reclamation prioritize the RAX items. This project could move up or down on the list depending on what else is listed and priorities for maintaining other projects. There seems to be no other source of funding. We cannot get CALFED or CVPIA funds if it would take money away from monitoring and CVPIA, such as monitoring in Battle Creek. NOAA will need to look at that. In terms of CALFED funds, there may not be a large amount of proposition money available right now. Low (DFG) agreed to check on this.

From the latest reports, we don't believe that the curtain is working very well. We need people in SCUBA gear to actually inspect it, assess its efficiency, and report to us on its effectiveness. We know that it isn't working well because it has not been fully deployed for quite a while. It may even be in shreds at this point. It is being deployed at least partially during the year and retracted in winter, but is working poorly—we don't know how poorly or whether there are annual inspections.

Action Item: They will get someone to update and report on this at the next meeting

Action item b: Brown's proposal was sent to NMFS. Maria Rey, NMFS Central Valley Office supervisor) is currently out of town and has not had a chance to look at it. She will return next week and we expect her to review it at that time.

Action item c: Brown provided notes for full power peaking proposal discussion. There is some disagreement on the proposal; however, whether all SRTTG members agree, the proposal will still be submitted to NOAA and WOMT and any disagreements will be pointed out and explained. We have conclusions from Reclamation stating that there's a negative effect on full power peaking on water temperature (base on an old report from 1997, Reclamation has expressed that there have been many changes to the system since 1997 and the report is outdated). There needs to be a decision on whether to avoid power peaking to avoid water temperature changes. We might want to form a more technical subgroup to discuss how to evaluate this.

The group was asked for suggestions on an alternative if there is a disagreement. It was suggested that it would be prudent to refer to the proposal as a pilot program or consider it an experimental or testing program. The objective is to limit power peaking during summer over a 2.5-month period. No counter proposals were presented to avoid power peaking. Three proposals were identified: 1) evaluate the temperature control curtains and their performance 2) replace the curtain, and 3) avoid full-power peaking (sounds like that's a "no go").

It was suggested that before a proposal is submitted, more facts and information was needed; however, that was also considered a "delay tactic" by Matt Brown because it is already known that the curtain changes water temperature by 3 degrees. We do not need to generate more data to evaluate this. The situation is even more important because there is less cold water coming through. There are four temperature curtains: three are in place and operational and one is not. We should see an effect with three of them working with the full power peaking proposal.

Does NMFS want to see all latest information before elevating this to WOMT? As far as the process goes, whether there's a consensus, the proposal would still be submitted to NMFS. Considering Brown's proposal now, does it change any of the operations or considerations from the group? If yes, the group should revisit it; if no, then that's the proposal we have. It appears as though the situation has not changed. The water is a little different in Trinity and there is less coming over and is not as cold or it warms up faster, so there's more relevance to any proposal to increase the amount of cold water or decrease the temperature of the water. In the NMFS letter submitted with the 2011 amendments to the RPA, it stated noncompliance with IGO; anything Reclamation can do or any proposal could be implemented to help fisheries. We should take this noncompliance more seriously and not delay the project for another year.

The conflict seems to be more of whether the existing information in power peaking is sufficient enough or additional information is needed. If that can't be resolved within our group, is that something that gets sent up to NMFS?

It is not "all or nothing". From our last call, it's the reach between the power plant and the Oak Bottom curtain that warms up. There is some disagreement about minimum flows needed to be maintained out of Carr to prevent that warming so that when we did peaking, we didn't put hot water out into the lake. It's not necessarily the flow coming over the hill; it's actually the physical mixing; the surging of water in Whiskeytown that causes the water to get mixed. That's the affect that was of concern here.

We're talking about a minimum amount of water to bring over that prevents that surging or mixing. You always have to have some water coming over. That will avoid full power peaking. We can still do power peaking.

We're proposing an alternative set of operations that are undefined. In the past, typically one generator would go out and one would stay on. What we're proposing now is different; you can't lose that power generation because there's a value there.

There was a suggestion that we do a pilot program until 7/15 and after 7/15 propose the power peaking; however, there was some disagreement in that a pilot project would not be protective – only 3-4 days of protection.

It was noted that NMFS will take care of the proposals already submitted when Rey returns. SRTTG will be notified of the results of her review.

Action item d: There is an acquisition in to get some equipment for water temperature monitoring. We are waiting for funding also for action items H (collect water temperature data) in terms of the study and I (develop scheduling for experimental power operations and sampling location for water temperatures). It would be critical if we can get action items d, h, and i funded together. Where do we stand on funding now? We're hoping to hear from Reclamation in Sacramento any day. This would be money through RPA funding from Reclamation (Hannon) and Tom K. lead CVPIA for Clear Creek. They will probably go ahead and install the temperature monitoring devices even if funding isn't approved. We're waiting for the pilot proposal on dates and where to monitor. This will happen between now and 7/15. Matt will update the group monthly.

Action item f: Barry Mortimeyer (Reclamation) sent an email on 5/9 stating that there are temperature probes installed at generator penstocks and that Reclamation has real-time access to Trinity. There is real-time data but they are not posted on Internet. It was not known whether the data are actually stored; it might be information that goes into the controllers but don't know for sure. We need to check that.

***Follow-up action item.** Check for data from Trinity and Carr powerhouse whether they are available on the Internet. Stacy Smith checked during the meeting and reported that there were no real-time water temperature data at Carr or Trinity in our database.

Action item g: The following report was submitted before the meeting and points were discussed:

NCAO has temperature data loggers (downloaded monthly) in the tailrace of Trinity Powerplant and Lewiston spillway (catches output from both the spillway and Lewiston Powerplant, but not the hatchery). The hatchery folks collect their own temperature data. I haven't talked with them recently, though I plan to soon.

NCAO collects temperature profiles in Lewiston Reservoir monthly at 4 locations:

1. US temperature curtain
2. DS temperature curtain
3. Entrance to Clear Creek tunnel
4. Entrance to Hatchery (inside hatchery curtain; sometimes outside of curtain depending on curtain position – it floats!)

NCAO also collects mussel water quality information. See results at <http://g.co/maps/bn3qx> (the thumbtack markers are Calcium sampling from the Trinity Lake Houseboat Owners).

CVO maintains temperature prediction models for both Trinity and Lewiston reservoirs. The models are both HEC-5Q, separate implementation for each reservoir. They are 1-D models. The data is coupled – that is the output from the Trinity 5Q model is input to the Lewiston 5Q model.

TRRP is fielding a new CD-Qual-W2 model for Lewiston. W2 is a 2-D model (laterally averaged).

Together these models have been/will be employed in a number of analyses of temperature response to operations and other management decisions.

TRRP is currently undertaking a study of potential changes to Lewiston Reservoir for the purpose of increasing the efficiency of cold-water transmission and increasing the amount of salmonid habitat on the Trinity River. Alternatives at this time include:

- 1) The removal or partial removal of Lewiston Dam.
- 2) The dredging or reshaping of the bottom of the middle portion (Pine Cove - ~1.5 miles downstream) of Lewiston Reservoir.
- 3) Tunnel or pipe for Trinity flows to the Lewiston Dam (replacing flows through the reservoir), and
- 4) Raising Lewiston Dam.

The different scenarios have to do with annual flow scheduling, which can vary to meet various circumstances. We can use temperature models based on expected or possible schedules and CVO forecasted allocations. We combine those and predict what the temperature will be.

Do you look at carryover storage and how it affects temperatures for fall-run? No, because we don't have the luxury of carryover of restoration volumes. We look at 10/1 through 9/30 each year. Temperature targets move to the north fork from 10/1 to 12/31; after 11/1, it's no longer an issue. We try to extend the temperature run. The flow schedule network has met for the first time to increase fall flows but don't have any resolution on that; we are beginning to consider it now.

Other business:

SRTTG note taker: Barbara Rocco, an independent contractor, is taking notes from today through August. NOAA coordinated with Donna Garcia (Reclamation) who indicated an effort to get a contract in place for a note taker beginning in August. Rocco will take draft notes and send them to Washburn to modify. Washburn will send them out to SRTTG members for their input. The plan is to post the final notes on the website.

Additional agenda items:

NMFS temp model: Last year we had presentation in NMFS office with the Science Lab and Reclamation. We agreed to 1-year trial pilot program to test that model. How does everyone feel about using it and how will we integrate that information into this group's decision-making process? NMFS will run the temperature model. It has not yet been this year. This model is beneficial because we can actually adjust if we see that temperatures will go up within the next few days. We should discuss how we want to use this information, which we would need to be submitted to Reclamation every 3 days. The model is for operators; it is not for SRTTG to use; however, if SRTTG wanted to use it, there could be a small group put together to assess how to incorporate it in the group's needs. Three-day forecasting models are difficult to schedule out. The weak link is the temperature forecast because it varies. If we want to do a 1-year test, we should get a small group together to assess how to use it. Oppenheim mentioned trying to get someone in the NOAA office to use the model and that they are looking at avoiding the delays in changing operations to protect fish. Even though this is a real-time model, there are still some presumptions involved because temperatures change when flows and air temperatures change.

Action item: Oppenheim will put small group together to study and assess the model.

Compliance: How did we do in terms of compliance this year? In April, we exceeded temperature by 4 days; in March, it was 5 days. Washburn will send out the compliance letter to NMFS. For last year's operations, we exceeded temperature on exactly the same days (maybe off by 1); that time of year, it was difficult to get the flows right—a hard balancing act. This year, we found out that farmers were taking more water for their fields so that was different from past years as well. It's hard to catch up after that. That's the place where a short-term model would help. It's hard to predict how much water the farmers are pulling out. In the short term, the flow rate and temperature in the tributaries change rapidly, which makes it difficult to forecast.

It was suggested that high side flows in April that made water warmer; however, there was some disagreement in that side flows are not an issue when we are only controlling to Balls Ferry. We need to look at temperatures in Redding that soared over a day also, which was predicted 3 days in advance. There were 3 days in May when the same thing happened. Base flows were low; temperatures increased.

This would be a good agenda item for next meeting.

Next meeting: Update on contracts that Garcia is working on for a water modeler for the Sacramento River temperature control plan and assess improvement to modeling water temperatures in Clear Creek. Garcia said that Reclamation was pursuing a contractor and had acquired one for American and Sacramento Rivers but did not mention whether Clear Creek was included. Some heard that Clear Creek was not included.

In the RPA, there are 5 or 6 important research items that were to be done in the first year of BiOp, one of which was the Clear Creek temperature model effort; however, this has never gotten off the ground and it's now coming on 3 years. We need an update on where we are and if we can have access to the contractor to find out what he's going to do. We are concerned about going into the 4th year with no activity on the Clear Creek water temperature RPA. This was originally in the presentation last year but was removed because there was to be a contract to cover that work. Only the Sacramento and American River modeling analysis report is being prepared and the contractor is working on it. There are no details on Clear Creek.

Everything we're talking about with the temperature probes in Whiskeytown, etc., would feed into that modeling effort. A good agenda item for next month would be what model we will use. We could use Le-Ming He's ("Lee's", NMFS) model that has been circulated; he has received feedback on it from several agencies.

Next month, we can discuss how we would use a seasonal model for Clear Creek. Who will research this? It's a Reclamation obligation but don't know who would do this. Lee could give a report on status of his model. Is it anticipated that this model will be used to shape water operations or help with the biology of things? It's an operational model. Lee's is more of a model looking at Clear Creek temperatures downstream. What would be more helpful would have a more integrated model that would include Trinity, Lewiston, and Whiskeytown.

This would be a perfect example for changing operations and run through this model to see which would provide best scenario for Clear Creek temperatures, as well as for the Sacramento River and other rivers as well. It seems to make sense that if there's a contract to the Sacramento River in place, we could extend it to other parts of the system.

Next meeting: 6/28/12 at 1:00 p.m.

Adjourn: The meeting was adjourned 2:40 p.m.