

## **Sacramento River Temperature Task Group**

### **Special Meeting on 6/8/12**

**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 SWRCB. 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:** Alice Low, Patricia Bratcher

**Reclamation:** Paul Fujitani, Thuy Washburn

**SWRCB:** Kari Kyler

**NOAA:** Bruce Oppenheim, Garwin Yip

**WAPA:** Tom Patton

**FWD:** not present

**Hoopa:** not present

**Note Taker:** Barbara Rocco, Independent Contractor

#### **Agenda:**

This special meeting was convened to discuss temperature operations and future plans. The following table was provided to SRTTG members in a previous email correspondence.

#### **Background:**

Washburn (Reclamation) sent an email earlier this week to the SRTTG members stating that there were concerns about the Sacramento River temperatures last week and asking to meet today to discuss the temperature operations and future plans and compliance points. She provided a summary of temperature operations as follows:

- May 29, open middle gate to cool water for lower compliance pt starting June 1st.
- Took action to opening the middle gates, a few days before the new compliance point in June. This is a good first step towards cooling the river downstream. When in transition of new compliance point target, it takes a few days for temperature to settle out.

Bend Bridge -- BND					JELLYS FERRY -- JLF				
Date	TEMPERATURE, WATER (DEG F)				Date	TEMPERATURE, WATER (DEG F)			
MM/DD/YYYY	HRS	MAX	Min	MEAN	MM/DD/YYYY	HRS	MAX	Min	MEAN
6/1/2012	24	59	55.1	57.2	6/1/2012	24	58.8	53.9	56.5
6/2/2012	24	58.8	55.2	57.4	6/2/2012	24	58.4	54.3	56.6
6/3/2012	24	58.4	55	56.7	6/3/2012	24	57.8	54	56
6/4/2012	24	57.6	53.9	55	6/4/2012	24	57.1	53.3	54.3
6/5/2012	24	56	52	54	6/5/2012	24	56.1	51.6	53.7
6/6/2012	24	56.7	52.4	54.6	6/6/2012	24	56.7	51.9	54.2

**Discussion:**

The fish agencies met yesterday at 10:00 a.m. to discuss temperature compliance on the Sacramento River and where the compliance points should be for the rest of the summer. This is what we need to discuss today. Yesterday, concern was expressed for the fall-run Chinook salmon because it is predicted to be a very large run on the Sacramento River this year and we want to have cold water for them in September and October.

Reclamation reported that operations at the end of May were looking at cooling down the streams. Reclamation took action on 5/29 to open the middle gate and tracked temperatures, which were exceeded 2 days at Jellys Ferry and 3 days at Bend Bridge. Reclamation increased releases at Keswick for temperature and outflow. During that time, temps cooled off significantly. Efforts were taken to decrease downstream temperatures; however, they didn't make it. It is very hard to hit target temperatures and Reclamation didn't want to overshoot them by opening two middle gates and letting too much cold water go through without knowing the effect of opening one gate first.

Could Reclamation use more real-time information to make decisions on flows and what temperature control devices to use? Can fish agencies use Reclamation's model—would that help make real-time decisions over a 3-day period?

Reclamation does have models on temperature and releases from tributaries and a model that runs out about 5 to 7 days. Reclamation felt that its action was an appropriate first-step action for a first-time meeting a new compliance point.

If you took that action and then monitored it for a few days, how do you make a decision on whether to continue?

Most likely management would make that decision. Reclamation felt it was a good first action to take. It later received the cool weather forecast and so didn't take any further action. It was looking at what actions to take given the forecasted temperatures; it was actually hotter than forecasted. Maybe that had a play in it. Today, the temperature is 54.4°F at Jellys Ferry. It's not a good idea to raise and close the gates without first assessing what's going on with water and air temperatures. Things need to settle out first before we can receive and analyze good data.

There was a question on what is meant by “good data” and how Reclamation makes a decision on when to take an action given that part of water temperature is air temperature and air temperature changes—swings up and down. There is also a warming trend coming; an action now would not be prudent given the forecast. Jellys Ferry water temperature will go up to about 56°F.

The question was raised about whether we could actually conserve water for an extra week if the gate were closed. There was another question about how Reclamation makes the decisions: on a daily basis or some other criteria. Are they restricted to the work week? If so, who is the alternate person on days that Washburn is off?

Washburn mentioned that she actually works every day but there are times when I take off during those days. Flows are not really operated on a day-by-day basis and part of the problem is making a change because of hydrodynamics and what the anticipated water temperatures will be at the power plants. Operations are based on more of a “trend” than day-to-day temperatures. The forecast is still variable and that’s critical to temperature operations. Reclamation tries to operate on more of a general trend for what the temperatures are doing but need to look at the forecast and implement an action now for 2 days out. Right now, it’s best to leave gates where they are and be prepared for a change. The next action will be to open another gate for the next warm trend.

Appreciate the comment about not so much changing gates but changing flows. At this point we’re not making changes in flows to make the target compliance point. In the past, temperatures were tracked closer and changes in releases were made to keep temperatures close to the criteria. The SRTTG would like to provide constructive input to operators; maybe have more coordination and potentially use the NMFS model.

Concern was expressed about whether the NMFS model would provide much more information. It’s difficult to operate with these changes happening so quickly right now. To make the changes that quickly, especially this early in the season that it occurs is also difficult. Also, when we make changes on the river, we’re looking at need on the rest of the system so we’re trying to match our releases with needs in the rest of the Delta.

In yesterday’s discussion, we talked 1) when the Bend Bridge compliance actually began (5/25 or 6/1); however, this is a moot point now. We also made assumptions. In the future, we should be clear on when the decisions would be in effect. 2) Need more coordination; if there is exceedance of an RPA action, we should be apprised of it when it happens and not “x” amount of days afterward. NOAA might not have answer, but needs to know to address it when other ask about it. 3) We discussed what could have been done. Is the NMFS model the answer and can and should we use it? This also was brought up on the last 2 annual reviews.

A link to the NMFS model will be forwarded. The last time we discussed it, it forecast 3 days out. The Southwest Fisheries Center is working modifying the model to present a 6-day forecast. This might be on the website now.

Yaworsky (Reclamation) spoke with Danner this morning. There are issues with this model that we need to discuss. We definitely need a 6-day model and we're not confident that what this model is tracking is what we see at CDEC. Models are good because they sometimes change your mind about various factors but not confident whether this model is reflecting flow and temperatures for this time of year. We need to test it and see how it's working. It provides good information on what's happening and the weather forecast in a real time situation. We will be tracking what it's predicting over next 3 days and whether it reflects reality. Given that compliance is measured by what comes over CDEC, I'll be tracking that as well.

It was suggested that Yaworsky test the model with different criteria and/or send it to the SRTTG to also test.

DFG expressed concern that there had been a discussion about moving the compliance point from Bend Bridge to Jellys Ferry without its knowledge. SRTTG had not been consulted and felt that if there's a change, the group needed to agree to it.

Reclamation believed that, even though SRTTG recommended Bend Bridge as a compliance point in its last meeting, it wouldn't be able to meet Bend Bridge for the entire year and wanted to assess the pros and cons with that recommendation.

DFG again expressed concern that that data needed to be presented to the SRTTG members; that SRTTG members need to know about these kinds of decisions. This decision and meeting caught us off guard because we had just had that call and thought that there was an agreement and now find that there's apparently some concern about maintaining that compliance point. Another meeting should have been called at that point.

If we look at the real numbers, we find that the cold water pool condition as of May 31<sup>st</sup>. is about 200,000 af less than last year and there is a warmer pool. Latest from late last week, doesn't bode well for the BB target. If Reclamation were operate be Bend Bride, it would have to open the side gate earlier. Reclamation is looking at pros and cons of how to meet the temperature compliance. The fact that we did note that target at Bend Bridge shows that we'd need to go to the side gate in early August—very early this year. Reclamation believes that the compliance point needs to be at Jellys Ferry.

DFG asked to see the modeling on that before decisions are made. You gave us model at last meeting that indicated something different.

Based on latest profile, it more supports the model run. The profile is supportive of earlier model runs. The runs were at 50% because trends are closer to 50% than to 90%.

Is it 50% at Bend Bridge that was possible through August? Yes, but in October, you risk having to go as far upstream as Balls Ferry; however, there wasn't much difference seen between Jellys Ferry and Bend Bridge.

There are two pieces of information to look at: the remaining volume at Shasta reservoir; there is a significant difference at the end of September. Another piece of information predicts when

we need to go to a side gate. For Jellys Ferry, the target indicates going to a side gate at about the first of September. This gives more confidence that we will hold that compliance point through fall. Bend Bridge is indicated about a month earlier than that.

At our last discussion, we agreed to keep the compliance point at Bend Bridge for now and if it gets hot, we would adjust it upstream. We did not agree to keep it at Bend Bridge for the remainder of the season, but would adjust as necessary.

Reclamation's concern is generic across the Valley. An appropriation that overshoots a target early in the year part with projected fall-run populations seems to be a risk with which we are not comfortable. If we go back to a cooler target downstream and historic resources support that, we are okay with that. Whatever level we need to have, this discussion is centered on the strategy of how much risk we are willing to take for fall run. This is consistent with the thinking on Klamath/Trinity right now. It's not only how you see the risk shaping up, but subtle temperature differences between Jellys Ferry and Bend Bridge that have cumulative effects, and we can just switch and go back to Jellys to mitigate those.

NMFS felt that it didn't matter whether it was Bend Bridge or Jellys Ferry because the compliance point was being exceeded up to 3 days. We could talk about fall run and conditions of runs later this year. There's a difference in the Sacramento River; there's not that much production of fall run in the American or other rivers. We recognize that. If the group wants to consider cold water for fall run this year, we're thinking about Jellys Ferry, but we don't want to change it unless we have some assurance that compliance will be met there.

DFG mentioned that clearly winter-run Chinook are our highest priority because we have an endangered species with a declining population for 5–6 years. In terms of management, we need to put as much emphasis as needed on winter run. This is not to say that we need a Bend Bridge compliance point. In the bigger picture, a tradeoff would be to manage winter-run protection this year.

We could go back to the protocol criteria for making management decisions on the compliance point. This was in the annual report. If fall run have been declining on the mainstem Sacramento River, they do spawn farther down from RBDD and we do need cold water for them.

In the 90-5 context, would like to hear what SWRCB thinks. We understand the balance with fall run. We thought we had some spawning and rearing concerns that might influence the area between Bend Bridge and Jellys Ferry. The goal is to balance. If there is a benefit to keeping Bend Bridge and the area in between would provide good potential habitat for spawning and rearing, we want to discuss that here and it will be presented to Reclamation management, who would make a recommendation.

It was noted that the current redd surveys are very helpful right now. We have spawning information and are about one-third to one-half through the spawning period. So far, fish are spawning quite a ways upstream. Monitoring is important to deciding where the control point should be. Also, the run size for winter run is not very good. They will most likely spawn farther

upstream. To a large degree, our monitoring information suggested that we could protect winter run with the Jellys Ferry compliance point.

What was not considered at the last meeting was the available coldwater pool at end of summer. What is 300,000-af difference and how does it translate into success at end of season?

The 300,000 af is current and this is very significant. Usually, a difference from 300,000 to 400,000 af is almost like moving one compliance point up or down. It's significantly different from last year and the earlier model runs are consistent with that. Understand that when making the target Bend Bridge and moving upstream later, the risk is that if you open the side gate too early, you lose a lot of flexibility. There's not much reserve left and that makes it harder to control temperatures after that. We would not want to tap into that last side gate before September.

What is estimated volume of below 56°F in Shasta? It could be that we're talking about a lower volume than previous model runs tracked. Reclamation feels strongly about the Jellys Ferry target through fall. Based on where we are in terms of storage and the model, we're consistent with model and where we stand right now. Jellys is a firm target based on this.

There's little difference in fall between Jellys Ferry and Bend Bridge. Also, for coldwater volume in September, the model is not reliable in fall. It doesn't do a good job of when stratification happens in the reservoir and when cool water is accessible to that side gate. Coldwater may be left over but the gate doesn't necessarily grab that cool water. The model doesn't track that very well in fall. We need to model in terms of whether we're going to open the side gate a month earlier. Shasta temperatures are tracking lower. Has to do with timing of side gate operations. Lot of things in play here.

DFG stated that we don't know whether fall run concerns are that great this year. A lot of times, we let temperatures ride in September because fall run aren't spawning until the second week in October, so we have let temperatures go up in September. I don't think fall-run concerns should be that great this year; probably won't be that big of an issue for fall run at either target.

Any other biologist concerned about fall run? If as Yaworsky said, it is somewhat predicated on fall run; the reliability of those temperatures predicted by the model are a bit sketchy because of variability of tapping into that side gate and because there's a lot more variation when we get into fall.

We also need to consider spring run in October and trying to get to 56°F there as much as possible. We cannot leave spring run out of the equation. Sounds like that would be the early part of their spawning and when they would be most vulnerable. Because fall run spawn further down and later, they're not as susceptible to temperatures as winter and spring runs. It's not as big of an issue for fall run. We do have that October period to be concerned about; the model is not reliable for that period.

The model runs are trying to be maintained through the season; we're considering from June through November. We have always maintained that the model is not reliable from the

beginning of September. It's not just the model, but also predicting how ambient temperatures impact stratification in the reservoir and timing.

From an operations standpoint, a warning sign is how quickly you get to the middle gate and how much cold water you have at any point in time. We're taking on a level of risk on temperature releases in a good range in September and October. The timing and what you have left come on 9/1; if we don't have a coldwater pool, it makes our job impossible to get there at that point.

The river diversions need to also be considered. The Trinity is not going to be able to bail us out any longer.

Anything more in context of water-year type? Have never heard exactly what water year type we're in. Is it average, below, dry, critically dry? What we need is to reevaluate later on in summer and fall and what is contingent on this, or we need to evaluate those kinds of effects in making decisions.

This group works on data storage and current conditions. The water year issues come in at the early planning stages in February and March; current and water year type don't make much difference to us as a group now.

Some suggested reduced storage in Shasta; however, there was a difference of opinion. We have good storage this year in Shasta; there's a lot of storage even though this is a below-normal water year. The coldwater pool in Shasta is not always based on water year type. The pattern of when we get the rain and where is important.

Even for a below-normal year, we anticipate that a Jellys Ferry target throughout season is reflective of good storage conditions. We're operating to the actual storage and coldwater pool in Shasta.

The group was asked whether we need to move the compliance point. Reclamation maintained that we need to move it to Jellys Ferry.

It was pointed out that if we haven't met Bend Bridge yet and Jellys Ferry was barely 56°F, it might make sense to go to Jellys Ferry. We might need to see additional model runs and take into consideration the current status of winter run and how much habitat we need to provide.

Is there information on a projection for spring-run return size? We have lots on fall-run return but we're not hearing a lot about spring run. We're not sure about the mainstem Sacramento River, but Battle Creek looks like it's at its highest since 2007. Deer Creek is over 2,000 so far. Looks like good year for spring run but we don't know what the numbers are for Clear Creek because it's too soon to tell.

Often, if there's a strong spring run, there's also a strong fall run but it varies from creek to creek. Battle Creek is more of a fry outmigration. We might see more spring run than normal in September. If there is more fall run, we could see more spawning in September as well.

Typically, very few are spawning in the mainstem in September, but this could be different if we get a nice group of fish coming down. The general feeling is that a large fall run population will be dominated by hatchery fish. What happens in the mainstem is different from what you see on the American River.

It was decided that it would be helpful to have another discussion to get back to Reclamation to discuss the move from Bend Bridge to Jellys Ferry. We normally make this kind of decision with good model runs and we're talking now about data we haven't seen. It would be nice to have that before we make any decisions.

Reclamation stated that the data could be available next week. They would need to make some adjustments for missing data but can provide something. We would be surprised if it didn't indicate still at Jellys Ferry as the compliance point.

After that spike in temps at end of May and the first of June, things have cooled off. With current flows through 6/6 and 6/7, we're seeing compliance... One concern is getting a base plan into the record books at NOAA fisheries. We're more concerned about that; we will have a little bit of time before we make the next adjustment but we need to confirm.

With the warmer trend, the next action is to open another middle gate. We may have to do this as early as Monday (6/11). We'll need to take an action to target Bend Bridge before you meet again. It would take opening another middle gate to improve temperature, flows will not accomplish the cooling in the river. It would be worse to reduce flows. Keep in mind that we are still using May operations forecasts.

We would prefer to have models in hand to document that we made a decision based on current information rather than what we're doing today over the phone. We also have to have some assurances that if we move the compliance point. The agencies are feeling uncomfortable this year because we haven't had sufficient notice of violations and believe that there was discussion going on that we wouldn't have gotten in a timely manner. We need to have some assurance that this process will continue for decisions making as we have operated in the past.

The group concurred that some better reporting out on the exceedance is required and that we need to work on that. If there's one day of violation, Reclamation doesn't believe that the operators sent a notice out to the group that we violated. A letter is sent out to the SWRCB but not group. After 3 days, Reclamation always notifies NMFS.

Part of this is dialing down the Hazel location. Need to work on better communication on tracking particularly in stretches of hot weather.

Are you looking at CDEC to make a decision or other information? Air temps?

Reclamation is looking at daily temps and the trend and also have a model that we can predict 5 or 7 days out. This model is different from Russ' model—it's more of a real-time model—and is probably more similar to the NMFS model.

The group decided to meet again next week (6/13) to discuss the exceedance points and notification (the target is 56°F. It was pointed out that there are two definitions of exceedance. One that is anything >56°F. The group should be apprised if temperatures are predicted to be above 56°F. The group should be notified if it's over 56°F and any expectation that it will continue for >2 days. Notification is useful if an action needs to be taken to bring temperatures down. The agencies need to know whether there is protection. If it's over 56°F, an action should have already been taken or take place pretty quickly. We've seen exceedances occurring but not a concurrent action.

That's not true; Reclamation has taken action several days before compliance is exceeded.

This may be, but WE don't see it. A flow increase was done for water quality. If an action is taken for temperature control, that's what we're not seeing.

We may see some numbers that approach the 56°F, but if we're making releases, we need to articulate them to give you an idea of what we're doing and why. Let us take that approach and see how that plays out. Reclamation proposed that 1) weekly we will send temperature at the compliance point in a table, and 2) also if we are seeing something >56°F, we give the group a heads up, 3) if Reclamation takes an action that is in part temperature related, we send something slightly more detailed to the group. You'll get something once/week for temperatures and actions being taken. If there's a concern, we can get a call together with the group.

NOAA folks want to hear about when an exceedance is occurring and be notified about that. If people get 7-day summary maybe that's not necessary. It wouldn't be more information in the change orders itself but for the sake of SRTTG, it would explain how a particular action is part of a temperature action. If it's something for 3 days or above that, maybe a call is appropriate or a letter stating that we see a trend and our responses. We would send a note to group if there were significant changes. We could get a 7-day summary from the website.

We tend to follow temperatures closely up here near Shasta. A summary would not help. How about a summary at the monthly meeting? That's already provided – or supposed to be provided. Typically, we're supposed to go over temperature operations as part of agenda on what happened previously.

Reclamation will go ahead and email the weekly summary but also include the link to data and then assess this in a month or so. We will work on the improved email alerts but for the weekend, while Russ is compiling things for the model, we need to know if we need to make a change on Sunday. Are we going to try to keep Bend Bridge or Jellys Ferry as the compliance point? Any preference by the group as guidance?

We're not planning to meet today after this call. For the weekend, you could target Jellys Ferry. When we get information from Russ, we can make a more formal determination for the compliance point for summer. We don't want to make another change at this point. The NMFS temperature model shows that we should be able to make Bend Bridge on Sunday.

Reclamation will stick where we are for purposes of hitting Jellys Ferry and hold on any type of gate change until we can assess Russ' latest model runs and then have a call. If we see things heating up, we will send a note out to group to ask whether everyone is still comfortable with that compliance point.

Everyone agreed to this approach.

The group will hear from Reclamation with the package from Russ early next week, and Reclamation will work on a prototype for an email template.

**Next meeting:** 6/13/12 at 1:00 p.m.

**Adjourn:** The meeting was adjourned at 11:11 a.m.