



## American River Group

Note: The regular ARG meeting was held on 9/17/20. There were two supplementary ARG meetings held 9/24 and 9/25. The meeting notes for each meeting are organized sequentially below.

### 1) Action Items

- Peggy Manza will ask USGS whether the AFO gage is in a stagnant location.
- ARG to send any remaining feedback on the power bypass white paper to Peggy Manza by Friday, October 2.
- Chris Hammersmark will model the Alternative 1 scenario with a power bypass.
- Barb Byrne will notify the ARG if NMFS would like Chris to model an additional alternative.

## Monthly Meeting Notes 9/17/20

### 2) Introductions

- **USBR:** Carolyn Bragg, Will De Grush, Zarela Guerrero, Levi Johnson, Peggy Manza, Spencer Marshall, Sarah Perrin, Liz Kiteck, Justin Thompson, Ian Smith, John Hannon, Thuy Washburn
- **Water Forum:** Chris Hammersmark, Lilly Allen
- **SMUD:** Ansel Lundberg
- **PCWA:** Ben Barker, Darin Reintjes
- **PSMFC:** Cory Starr, Logan Day
- **SJWD:** Paul Helliker, Greg Zlotnik
- **CDFW:** Mike Healey, Jeannine Phillips, Ken Kundargi, Morgan Kilgour, Tanya Sheya, Duane Linander
- **NMFS:** Barb Byrne
- **USFWS:** Craig Anderson, Paul Cadrett
- **EBMUD:** I-Pei Hsiu
- **Westlands:** Tom Boardman
- **WAPA:** Michael Prowatzke
- **City of Sacramento:** Brian Sanders
- **Kearns & West:** Terra Alpaugh
- **Independent:** Rod Hall

### **3) Presentation: Hydropower Operations**

SMUD, PCWA, and WAPA presented on their respective roles in generating and selling electricity from hydropower. Refer to their slides for additional details.

USBR asked how these entities are addressing the need for long-term maintenance on aging infrastructure and whether the cost of those replacements is being reflected in power costs. SMUD explained that USBR only gets a certain amount of appropriations dollars for repairs, most of which go to water infrastructure rather than power infrastructure. Therefore, power customers generally provide the money for replacements and extraordinary maintenance. SMUD has committed to improvements in its FERC license, the cost of which will be integrated into its rates.

### **4) Fisheries Update: CDFW, CFS, PSMFC**

With spawning and juvenile salmonid outmigration season over, CDFW, CFS, and PSMFC did not provide updates.

### **5) Operations Forecast**

#### **a. SMUD**

For details on the upper American River SMUD Operations, including precipitation, reservoir storage, releases, and runoff forecast, see page two of the handout packet.

#### **b. PCWA**

For details on PCWA operations, including reservoir and snowpack storage, power production, and recreation flows, see pages three and four of the handout packet.

NMFS staff asked whether PCWA ever reduces its power generation at this time of year to conserve storage in case it is several months until it rains. PCWA explained that they continue regular releases from their reservoirs through October, November, and December even in a below-normal year. If weather continues to be dry through January and February, they might consider conservation.

#### **c. Central Valley Operations**

For details on September CVO operations, including releases, storage, inflow, accumulated precipitation, and temperature management measures, see pages five and six of the handout packet.

The fish picket installation on September 17 was quicker than anticipated, so CVO was able to increase flows sooner than they expected. Releases had been 2,000 cfs prior to the installation, but they were dropped to 1,750 cfs afterward because of reduced need in the

Delta. This drop will initiate the ramp down toward lower fall flows; CVO will drop them to 1500 cfs later this month if possible. CVO did not change the blend of releases from the Temperature Control Device because water temperatures remain under 68° F; if temperatures rise too much, CVO will make a blend change, though the next week's forecast predicts cooling, which should allow them to save some cool water.

There is currently higher storage (449 TAF) than anticipated based on August's 90 percent forecast, because CVO was able to release less than anticipated in August and early September.

## 6) Central Valley Operations

### a. Temperature Management

CVO staff referred to pages seven through twelve in the handouts in discussing water temperature management. There were several temperature exceedances in August (August 9-10, 12-15, and 17). During this period, the cold water blend was changed several times to offset the increased air temperatures; this is reflected in increased percentage of flows being released from Units 2 and 3 versus Unit 1 in the charts on pages seven and eight of the handouts. CVO staff observed that there was some confusion over the change order: the operator lowered the blend percentage from Units 2 and 3 before they should have, potentially resulting in delayed cooling of the in-river temperatures.

Unit 2 has been out for maintenance for two days (September 14 and 15).

The water temperatures taken in six profile locations in the reservoir are almost identical at all elevations. On both September 1 and 15, bottom temperatures were about 50° F. Between September 1 and 15, the surface of the reservoir cooled from 79-80 ° F to 74-75° F, most likely due to smoke cover blocking UV rays from warming the surface.

The isothermobath diagram on page 11 reveals that the top of the lake has continued to warm even as the coldest water from the bottom of the lake has been used up. Only 68.5 TAF of the reservoir is still less than 58° F. The temperature at the penstock is recorded as 61° F, though CVO staff believe that number should be lower; there could have been a mismeasurement due to a change in where operators took the temperature. If USBR implemented a power bypass, the water would be pulled from lower than the penstock level and would be colder than 61° F.

### b. Exceedance Forecasts

For the 90 and 50 percent exceedance forecasts, refer to page 13 of the handouts.

90 percent runoff exceedance outlook: CVO staff noted that the storage forecast is 100 TAF higher at the end of September than it was previously. As a result, CVO has increased

proposed releases to 1500 cfs in October and then kept flows around 1250 cfs through January with the intent of providing water for spawning habitat. Even with these higher flows, end-of-December storage is still 327 TAF. CVO staff stressed that none of these releases are set in stone; they are interested in feedback from the fisheries agencies. CDFW voiced approval for the stability of spawning flows between November and January. NMFS asked whether lowering the proposed flows slightly would better guard against the potential for salmonid redd dewatering in the event of a dry winter; CVO agreed that if precipitation does not materialize in January and February, they might not be able to continue implementing the higher flows.

50 percent runoff exceedance outlook: The 50 percent outlook shows higher storage and much higher releases in February because of the assumption of higher inflows.

### c. **Temperature Schedules**

CVO provided three temperature runs: the 90 percent outlook using the prior release schedule (i.e., 800 cfs releases through the end of the year); the 90 percent outlook with new higher proposed releases; and the 50 percent outlook with the new releases.

The 90 percent outlook with the old releases results in Temperature Schedule 39, a slight improvement from Temperature Schedule 40, which CVO has been operating to to-date. Temperature Schedule 39 targets temperatures of 68° F in September, 66° F in October, and 59° F in November.

The 90 percent outlook with the new releases results in Temperature Schedule 23, which targets 65° F through the end of October, then 59° F in November. CVO staff explained that they would not have been able to maintain 65° F temperatures all summer; they only have additional water now because they conserved cold water throughout the summer. The additional 450cfs of releases being proposed for October will increase the speed of overall flows and decrease the impact of solar radiation, thereby enabling cooler temperatures.

The 50 percent outlook with the new releases results in Temperature Schedule 22. Like Schedule 23, it targets 65° F through the end of October, but then targets 58° F in November – one degree cooler.

## 7) **Discussion**

### **Proposed Flows**

CVO staff noted that the higher proposed flows in October allow for better temperature control in that period. The staff member explained that she does not have to adhere to a single Temperature Schedule but can develop a custom pattern that might be more beneficial at this point in the year. She asked whether the ARG would like her to model a variety of scenarios: for instance, if she maintains 68° F for the rest of September and into early October, she can explore how far she can ramp temperature down in late October and

November. These scenarios could provide a baseline upon which the fisheries agencies can build a case for a bypass and explore options.

Water Forum staff pointed out that, according to the model, if CVO immediately implemented Temperature Schedule 23 to get to 65° F , they would have to pull two additional shutters on one temperature control unit and one on the second unit; this would release almost all the available cold water. CVO staff agreed and stated that she does not recommend trying to achieve 65° F right now.

Water Forum staff asked what the benefit of 65° F temperatures would be in late September: juvenile steelhead might experience less thermal stress, but given that they have been exposed to 68° F for weeks, would it make much difference at this point? CDFW staff noted that steelhead can withstand some warmer temperatures and posited that steelhead have likely already moved upstream to cooler waters. CDFW would prefer to focus on cooling water during the spawning period in order to rebuild salmon stocks. NMFS staff supported holding at 68° F for at least through the end of September.

CVO committed to running a variety of temperature model runs with the end goal of 56° F temperatures as of November 1<sup>st</sup>.

CDFW requested that one of CVO's model runs assess achieving 68° F at Watt Ave through October 15, 65° F October 15-31, then 56° F<sup>1</sup> starting November 1st.

USBR suggested that the ARG schedule an additional meeting in a week to discuss CVO's model runs. The group agreed on Thurs 9/24, 3:00-4:30pm.

The ARG also needs to schedule follow up on discussion of USBR's power bypass white paper.

## **Annual Report**

USBR staff shared an update on the annual report process, reminding the ARG that the report will be very similar to last year's organization with some additional sections related to the new proposed action. USBR has extended the schedule proposed at the last meeting by about a month to provide more time for review. They will be asking for contributions by 11/2 and then have an eight day review window. NMFS suggested that they give more time to review the first draft and less for the second draft. USBR thanked the ARG in advance

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<sup>1</sup> CVO reminded the ARG that the effective temperature compliance location moves upstream from Watt to Hazel in November. The change reflects the seasonal shift from water warming as it moves downstream to water cooling as it moves downstream, and the desire to have the temperature compliance location at the warmest end of the reach to ensure that the entire reach between Watt and Hazel does not exceed the targeted water temperature. CVO also observed that the location of the Hazel gage (AFO) was moved recently and reads higher temperatures than it used to; CVO believes it may be in a stagnant location and plans to follow up with USGS.

for their feedback and cited the important of documenting choices made during the water year.

SJWD asked for more detailed discussion of the impact of operating Folsom for State Water Project and Central Valley Project (CVP) needs (e.g., Delta operations). Ideally this would include information on tradeoffs to improve readers' understanding of the context of decisions being made on the American, though it would not need to be very detailed. USBR noted that a fully inclusive discussion of how Folsom is operated as part of the CVP is outside the scope of the report but agreed to continue discussing how that kind of information could be incorporated.

### **Fisheries Management Discussion Recap**

The smaller Fisheries Management forum had a meeting on August 28 to learn more about SacPAS, including available spawning data and mortality and egg development models. They have another meeting scheduled for tomorrow afternoon, September 18, to discuss the Water Forum's Chinook lifestage survival paper and different models available to assess salmonid impacts. While the discussion may cover how one or more of those models could be used to assess impacts of a power bypass on survival, USBR stressed that any decisions on a bypass will not be made in these meetings but will be reserved for the next ARG.

## **Meeting Notes 9/24/20**

### **8) Introductions**

- **USBR:** Carolyn Bragg, Levi Johnson, Peggy Manza, Spencer Marshall, Sarah Perrin, Liz Kiteck, John Hannon
- **Water Forum:** Chris Hammersmark, Lilly Allen
- **SMUD:** Ansel Lundberg
- **PCWA:** Ben Barker
- **CDFW:** Mike Healey, Jeannine Phillips, Morgan Kilgour, Tanya Sheya, Duane Linander
- **SWRCB:** Michael Macon, Reza Ghasemizadeh
- **NMFS:** Barb Byrne
- **USFWS:** Craig Anderson
- **EBMUD:** I-Pei Hsiu
- **WAPA:** Michael Prowatzke
- **City of Sacramento:** Anne Sanger
- **Kearns & West:** Terra Alpaugh
- **Independent:** Rod Hall

## 9) Discussion

### **Fisheries Management Discussion Recap**

USBR reported that there was an American River Fisheries Management call last Friday, September 18, on which Water Forum consultants presented on their egg mortality model. The group also discussed specific models within SacPAS that could be useful in assessing a power bypass.

### **Temperature Modeling of Alternative Scenarios**

CVO staff presented the model runs of nine different scenarios (these are included as part of the handout packet, pages 17 – 27) and explained that the differences between the model results are relatively small because they are examining a relatively short period (late September through November). All the scenarios assume the same flows; the changes are in which Temperature Control Device (TCD) gates are open.

CVO noted that the intent of the exercise is to look at the ability to meet certain temperature targets through November; the model does not correctly predict temperatures thereafter because it assumes that all the shutters are immediately put back in once the temperature target is achieved.

During the meeting, CVO staff realized that the dates indicated in the model are for the *end of the week in which a flow change is made*, not the beginning, so all the runs were starting a week earlier than intended. The effect of this shift earlier in time was that scenarios were less likely to meet temperature objectives given higher ambient air temperatures. CVO staff volunteered to rerun all the scenarios with the correct dates. At this meeting, CVO walked through the results in order to describe the intent and the general outcomes of each run.

The dates outlined for each alternative scenario below reflect the dates CVO *intended to run the scenarios for*. The start dates for each temperature target change as modeled were actually a week earlier than indicated below.

None of the alternatives modeled were able to meet the 56<sup>o</sup> F temperature target in early November. Reference the handouts prepared for this meeting for additional detail on the alternatives discussed below. CVO's observations are shared in bullets beneath each alternative.

#### **Alt 1**

Now thru Oct 14: 68 degrees

Oct 14 – Nov 4: 65 degrees

Nov 4 on: 56 degrees

- Alt 1 was the run requested on 9/17 by CDFW and NMFS.

#### **Alt 2**

Now thru Sep 30: 68 degrees

Sep 30 – Nov 4: 65 degrees

Nov 4 on: 56 degrees

- Designed to look at the impact of making all of October cooler; the exceedances over the 56° F temperature target in November became more frequent and higher.

**Alt 3**

Now thru Oct 7: 68 degrees

Oct 7 – Oct 21: 65 degrees

Oct 21 – Nov 4: 63 degrees

Nov 4 on: 56 degrees

- Designed to look at the impact of ramping temperature down more gradually throughout October. There were still large exceedances in November.

**Alt 4**

Now thru Oct 14: 68 degrees

Oct 14 – Nov 4: 63 degrees

Nov 4 on: 56 degrees

- Alt 4 is very similar to Alt 1 except it aims for 63° F in late October in an attempt to cool the river to ward against pre-spawning mortality.

**Alt 5**

Now thru Oct 28: 68 degrees

Oct 28 on: 56 degrees

- Alt 5 looks at whether conserving maximum cold water through the end of October would enable them to meet the 56° F November 1 target. Exceedances remained.
- CVO pointed out a few lessons from this alternative: It is difficult to achieve 56° F before November 1 since the air temperatures will prevent cooling of the water; the model uses median air temperatures and given recent trends, actual air temperatures are likely to be above the median; and it will take a lot of cold water to achieve at 56° F target.

**Alt 6**

Now thru Oct 14: 68 degrees

Oct 14 – Oct 28: 65 degrees

Oct 28 on: 58 degrees

- This scenario targets 58° F in November in an effort to see if the TCD alone (i.e., without a power bypass) could achieve that amount of cooling. There were exceedances, but if the model had been run for the correct period and not a week earlier, temperatures would likely meet the target.

**Alt 7**

Now thru Sep 30: 68 degrees

Sep 30 – Oct 28: 65 degrees

Oct 28 on: 58 degrees

- Again, there were exceedances in November, but if the model had been run for the correct period and not a week earlier, temperatures would likely meet the target.

**Alt 8**

Now thru Oct 28: 65 degrees

Oct 28 on: 58 degrees



- Removes the middle step down.

#### **Alt 9**

Now thru Sep 30: 68 degrees

Sep 30 thru Oct 14: 65 degrees

Oct 14 thru Nov 4: 60 degrees

Nov 4 on: 58 degrees

- This alternative required all the lower gates open by early October, resulting in exceedances throughout October and November.

CVO requested feedback on the alternatives in order to refine them before they are rerun within the correct time periods. ARG feedback on the alternatives included:

- CDFW suggested eliminating Alternatives 6-9 since their department wants to target 56° F as of November 1, not 58° F.
- NMFS asked about the difference between Alt 1 and Alt 2, in which the temperature target is lowered to 65° F two weeks earlier – and whether CDFW has an interest in making early October temperatures cooler.
  - CDFW staff noted that the Alt 1 scenario reminded them of 2001 in which there was high pre-spawn mortality. While CDFW may not expect as high of returns, a preference for Alt 2 was expressed.
  - CDFW would prefer to get to 56° F as soon as possible in November.
  - CVO clarified that this modeling shows that there is NO scenario in which they can achieve 56° F in early November without a power bypass.
  - NMFS noted that 56° F is challenging to achieve into mid-November.
- NMFS asked whether they could use the available cold water to achieve colder temperatures in October and then a power bypass to meet the 56° F November target.
  - CVO said that would be possible and suggested that they also look at the comparative cost of a power bypass between October and November (i.e. which month would lost power be cheaper in?).
  - SMUD shared that they usually prefer a longer duration bypass of smaller volume if that is doable. It may not make much difference in terms of cost but is easier to schedule.
  - CVO explained that there is approximately 30 TAF of cold water that can be accessed by a power bypass at Folsom. They typically release volumes of 250-500 cfs during a bypass; given that the models show temperature exceedances of about two degrees above the target 56° F at the beginning of November, the bypass may need to be closer to 500 cfs to meet the target.

CVO does not want to schedule a shutter pull until they know what temperature the fisheries agencies want to target. If the agencies want to target 65° F at the beginning of October, the change order to pull an additional shutter needs to be placed now.

- Water Forum asked whether fisheries agencies want to go to 65° F the first week of October or wait until mid-month.

- CDFW is concerned about the number of fish holding in the river. While it is possible that staying at 68° F the first two weeks of October will be fine, they also do not want to chance a repeat of the 2001 deaths. If they did keep temperatures up until then, they would need to be able to decrease them rapidly to 65° F and then to 56° F as of November 1.
- The ARG expressed tentative interest in holding 68° F through October 7 and then target 65° F through the end of October. CVO cautioned that USBR cannot guarantee that a power bypass will be approved, so any use of cold water in early October creates a risk that it will not be available for later needs. CVO stated that it would be best to get the power bypass proposal submitted and reviewed as soon as possible, so that there is no ambiguity.
- CVO reminded the ARG that the current ATSP Schedule, Schedule 23 (based on September 90% forecast) does not target temperatures as low as 56° F in November. Schedule 23 can get to 65° F in October because it is not trying to achieve 56° F in November.
- The fisheries agencies agreed to have an offline conversation the following morning, followed by another ARG meeting in the afternoon to share their preferences.

## Meeting Notes 9/25/20

### 10) Introductions

- **USBR:** Zarela Guerrero, Levi Johnson, Peggy Manza, Spencer Marshall, Ian Smith, Liz Kiteck, Thuy Washburn, Bradley Hubbard
- **Water Forum:** Lilly Allen
- **SMUD:** Ansel Lundberg
- **PCWA:** Ben Barker
- **CDFW:** Mike Healey, Jeannine Phillips, Morgan Kilgour, Ken Kundargi, Tanya Sheya, Duane Linander
- **SWRCB:** Michael Macon
- **NMFS:** Barb Byrne
- **USFWS:** Craig Anderson, Paul Cadrett
- **WAPA:** Michael Prowatzke
- **Kearns & West:** Terra Alpaugh
- **Independent:** Rod Hall

### 11) Discussion: Temperature Modeling of Alternative Scenarios

CVO staff reran the Alternatives 1-6 presented at the 9/24 meeting, correcting the time periods to align with those stated below; these model runs are included as part of the handout packet, pages 28 – 35. CVO's observations are shared in bullets beneath each alternative.

**Alt 1\_rev**

Now thru Oct 14: 68 degrees

Oct 14 – Oct 28: 65 degrees

Oct 29 on: 56 degrees

- There are exceedances the first week of November because the model has run out of cold water. The exceedance is likely 1° F to 1.5° F. That exceedance ramps down more sharply and comes into compliance more quickly than some of the alternatives.
- During the weeklong period when temperatures are ramped down from 65° F to 56° F, the temperatures are just meeting compliance; there is no buffer – the model is simply assuming compliance is met.

**Alt 2\_rev**

Now thru Sep 30: 68 degrees

Sep 30 – Oct 28: 65 degrees

Oct 29 on: 56 degrees

- There are larger exceedances (close to 2° F) in November; the temperature comes into compliance around the start of the third week of November.

**Alt 3\_rev**

Now thru Oct 7: 68 degrees

Oct 7 – Oct 21: 65 degrees

Oct 21 – Oct 28: 63 degrees

Oct 29 on: 56 degrees

- Implements a more gradual ramp down, but there are still exceedances in November.

**Alt 4\_rev**

Now thru Oct 14: 68 degrees

Oct 14 – Oct 28: 63 degrees

Oct 29 on: 56 degrees

- Exceedances in November are about the same as Alt 3\_rev.

**Alt 5\_rev**

Now thru Oct 28: 68 degrees

Oct 29 on: 56 degrees

- Because this scenario only requires the middle shutters through October, it comes the closest to achieve the 56° F target in November.
- CVO noted that temperatures in October stayed one to three degrees below the target, so they tested a second version of Alt 5 (below).

**Alt 5\_rev\_a**

Now thru Oct 14: 68 degrees

Oct 15 – Oct 28: 66 degrees

Oct 29 on: 56 degrees

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- 66° F can be safely achieved for the latter half of October with little impact on the model's ability to almost meet the 56° F November target.
- CVO pointed to this scenario as the “baseline condition,” i.e., it gets as close as possible to the target of 56° F on November 1 without using a power bypass.

ARG questions and comments included:

- NMFS asked whether the limit at the end of October is a flow limitation or a cold water limitation. CVO explained that it is a cold water limitation. The model only pulls from cold water available to the power plant; there is 30 TAF below that level still available as of November 1 via power bypass. The end of September cold water pool less than 60° F shown by the model is actually the total of both the accessible and inaccessible amounts.
- CVO confirmed that when a power bypass is executed, the warmer layers of the lake drop lower in the reservoir.
- CVO shared feedback from WAPA that power prices are lower and more stable in November so a power bypass would be somewhat more cost effective at that time.
- Water Forum offered to run two of the alternatives under a power bypass scenario.
  - CDFW asked for Alternative 1 at 100 cfs increments up to 500 cfs with a start date of 10/29 in order to reach 56° F as close to 11/1 as possible.
  - CVO also reminded the group that the release has to be ramped up slowly enough not to shock and kill fish in Lake Natoma with cold water.
  - NMFS asked whether they could model the impacts of warmer-than-median air temperatures. The Water Forum representative agreed that such flexibility would be useful, but they do not have an appropriate temperature series to implement it now.
  - NMFS provided tentative support for Alt 1 but needed to follow-up with management on Monday to confirm (a) whether this adequately meets steelhead needs; and (b) whether the plan to adjust the ATSP schedule to save up some cold water is acceptable or whether they need to stick strictly to the ATSP schedule and then implement a power bypass.

The ARG agreed to postpone the decision on a second alternative.

The ARG recommended that CVO continue to target 68° F at Watt for the first two weeks of October while they are assembling and USBR is evaluating power bypass proposals.

CVO asked that any feedback on the power bypass white paper be sent to Peggy by Friday, October 2. They will share a schedule to finalize that document.

12) **Next ARG Meeting:** Thursday, October 15, 2020 from 1:30 PM – 3:30 PM