BUREAU OF RECLAMATION

Upper Sacramento Scheduling Team, Flow Smoothing Coordination

Tuesday, September 12, 2023, 10–11 a.m.

Meeting Summary

Members Attending

- CDFW: Doug Killam, Erica Meyers, Tracy Grimes, Crystal Rigby
- DWR: Kevin Reece, Mike Ford
- Kearns & West: Eva Spiegel, Terra Alpaugh
- Reclamation: Elissa Buttermore, Emelia Barnum, Chase Ehlo, Lisa Elliot, Tom Patton,
- Derek Rupert, Emily Van Seeters
- NMFS: Evan Sawyer, Garwin Yip, Stephen Maurano
- NMFS, SWFSC: Eric Danner
- SWRCB: Claudia Bucheli, Craig Williams, Jeff Laird, Michael Macon
- SRSC: Anne Williams, Lewis Bair, Mike Deas, Thad Bettner, Yuen Lenh
- USFWS: Bill Poytress, Craig Flemming, Jeff Beauchamp, Jim Earley, Matt Brown,
- Michael Derrico, Patricia Bratcher
- Yurok Tribe: Chris Laskodi

Action Items

- Reclamation (Tom Patton) will schedule flow changes on the nights of Friday, Saturday, and Sunday (9/15-9/17): 200 cfs each for a total flow reduction of 600 cfs, down to 7,100 cfs.
- Pacific State Marine Fisheries Commission (PSMFC) will monitor the impacts of those flow changes on Monday morning (9/18) and share an updated redd spreadsheet no later than 4pm on Monday afternoon.
- Reclamation staff will consider whether there is an additional scenario that could reduce flows down to base winter flows faster than the #3 scenarios in the alternatives

spreadsheet (with the intention of dewatering a lower percentage of fall-run Chinook salmon redds) while still minimizing winter-run Chinook salmon redd dewatering.

- Reclamation (Tom Patton) to check if the KES gage hourly data reported on CDEC are an average of the 15-minute interval data collected during that hour period, AND find out the date of installation on flow meters at the KES gage.
- Kearns & West to schedule meeting for next Tuesday, 9/19, and add item to agenda to discuss which expansion factor is most appropriate to use this year

Update on 9/5 discussion regarding discrepancies between the KES & KWK Gages

- Tom Patton, Reclamation, and Doug Killam, CDFW, reported that on 9/5 (after the meeting) USGS recalibrated the KWK gage, such that it was measuring just slightly lower flow rates than the KES gage. This made the comparison of the two gages discussed at the 9/5 meeting no longer relevant to the group's needs. Doug mentioned that the KWK gage had been offline for a couple of days so he is waiting to see how the output looks on an ongoing basis. In the meantime, CDFW is switching the flows used in the redd spreadsheet to reflect flows at the KES gage.
- The KES gage measurement is generated by flow meters in the powerhouse at Keswick Dam; in contrast, the KWK gage measurement is generated via stage-discharge calculations about ¾ of a mile downstream. Tom mentioned that the USGS KWK gage location also houses Reclamation measuring devices for temperature data.
- The KES gage only reports hourly on CDEC, unlike the KWK gage which delivers data at 15-minute intervals, but Tom Patton will check if that hourly data is actually an average of 15-minute interval data taken over that hour period. He will also find out the date of installation of flow meters at the KES gage; prior to that time, Reclamation relied on the KWK gage.
- Tom reported that Reclamation is confident that the KES gage is accurate, though there can be fluctuations in readings if debris build up. They do not recalibrate the KES flow gage much because the characteristics do not change much.

Operations Update

- Reclamation reported that over the weekend they reduced flows by 100 cfs/night on Friday, Saturday and Sunday.
- The KES gage measurement showed that flows are currently 7,700 cfs and holding. Downstream at Wilkins Slough, flows are 6,700.
- Irrigators are reducing diversions off the Sacramento River as they move into harvest mode. Reclamation expects this to continue throughout September and then diversions should level off before picking up in October for rice decomposition.
- Shasta Reservoir is being drawn down from its current 3.4-million-acre feet to 3.2 million-acre-feet by December 1.
- Minimum releases from Keswick this winter will likely be 5,000 cfs, though if it were very dry this winter, Reclamation could decide to reduce to 4,500 cfs.

- Reclamation's general interest is to continue to reduce flows but is interested in how reductions may impact the shallow winter-run Chinook salmon redds being tracked.

Fishery Monitoring Update

- CDFW reported that even with the drop from 8,000 to 7,700 cfs over the weekend, the one winter-run Chinook salmon redd in danger of being dewatered was not dewatered; it is now at surface level.
- CDFW expects dewatering of two total winter-run Chinook salmon redds (when flows drop to 7,500 cfs.
- CDFW reported that the winter-run Chinook salmon carcass survey will be wrapping up next Wednesday; at that point, they will begin putting together the final total carcass estimate.
- The Expansion Value Spreadsheet sent to the group is a tool to help estimate the total number of redds in the river based on current carcass counts. The expansion number does not change the 1% incidental take limit at all, but just provides an estimate of what 1% of the redds will be. The average expansion value for years 2005-2022 was 1.98. This means that in an average year if you multiply the spawned female carcass count by 1.98 you would get an estimate of the number of total redds. If you do this in late August, it provides an early estimate of the incidental take limit (carcass count * 1.98 = total redds * .001 = 1% of total redds), and helps the team recommend flow schedules to avoid dewatering too many shallow redds. Other refinements CDFW has made this year in their expansion factor analysis include adding recapture rates to assist users in selecting a similar year type, along with visibility and flow data for each year. This was an effort to give the group more information for predicting what the current year's expansion may be. This year, the information points towards an expansion of around 3 instead of the 1.98 average due to low female recaptures of the 2023 tagged spawners, but we will know for sure in a month or so once all the data is available and analyzed and a final estimate is complete.
- In thinking about the expansion factors, CDFW reminded the group that they should make a technical recommendation for operations and flow reductions. While the number of winter-run Chinook salmon redds dewatered and the estimated proportion of the population is important biological context for that recommendation, the incidental take of winter-run Chinook salmon redds by dewatering is a regulatory consideration not within the purview of the group. The USST should discuss whether to make a technical recommendation regarding which expansion factor to use this year.
- NMFS asked why Reclamation had selected expansion factors of 0.7 and 0.3 in their real-time redd dewatering reporting. Reclamation explained that these were selected prior to CDFW's most recent analysis suggesting 2 or 3 might be a more appropriate expansion factor for this year. In the original analysis of 2018-2021, CDFW had reported that 0.7 was the average expansion factor across those years and 0.3 was the minimum; therefore, they included 0.3 as a conservative estimate of the total carcass count. (Note, that 0.7 is shorthand for a 70% increase and 0.3 is shorthand for a 30% increase, so the spawned out female carcasses value would need to be multiplied by a 1.7 or a 1.3 expansion factor respectively to get the total redd estimate).

- Data show that 5% of the total winter-run Chinook salmon spawning population should have emerged from the redds by now. This means that there are still 95% of the winter-run Chinook salmon remaining to emerge from their redds. The lateness of emergence is due to the lower water temperatures, because cooler water causes development and emergence to take longer.
    - Based on Keswick water temperatures and the SAC gauge, CDFW estimates it will take 92 to 99 days for emergence from redds. Therefore, many redds will not emerge until October, and eggs laid in August will emerge in November. Those late redds are largely in deeper water however, so they are unlikely to be dewatered.

Adaptive Management

- Reclamation reported that the alternatives table is updated to include a new flow alternative, 3G. The 3G alternative is more protective of winter-run Chinook salmon redds than previously proposed alternatives, while also aiming to reduce flows in 100 cfs increments and to avoid making reductions when PSMFC staff are not available to monitor. 3G is anticipated to dewater 3 total winter-run Chinook salmon redds based on shallow redd data from 9/6/2023.
- SRSC asked if there is a target for maximum dewatering of fall-run Chinook salmon.
    - Reclamation and CDFW explained that fall-run Chinook salmon are not a listed species so there is no set regulatory target. Fall-run Chinook salmon are also a prey species for killer whales. CDFW emphasized that this group is trying to balance and understand tradeoffs between species. For instance, from CDFW's perspective, the fishery was closed this year which is something that needs to be considered; however, winter-run Chinook salmon returns this year were very low so the agency is trying to balance the needs of both species and understand the tradeoffs to both Chinook salmon runs.
    - NMFS agreed with CDFW's characterization. They also noted that NMFS does have some regulatory interest in fall-run Chinook salmon through the Pacific Fisheries Management Council (PFMC) and through the Essential Fish Habitat conservation recommendations that were included in the 2019 BiOp, though they noted that those were recommendations not requirements. Given the closure of the fall-run Chinook salmon fishery this year, and the request to considerably increase fall-run Chinook salmon hatchery production, there is additional interest in how to reduce fall-run Chinook salmon redds dewatering risk exposure.
- Reclamation is comfortable reducing by 100 cfs increments going forward to reduce risk of dewatering.
- CDFW stated that getting to a Keswick Dam release of 5,000 cfs seems ambitious with 100 cfs reduction increments. To protect fall-run Chinook salmon redds from dewatering, they need to reduce flows to base flows as soon as possible.
- USFWS asked whether there is the possibility of developing a scenario that prioritizes fall-run Chinook salmon more than Alternative 3G, but still protects winter-run Chinook salmon redds as well. Alternative 3G is estimated to dewater a high percentage of the

fall-run Chinook salmon redds (10.5%), which is very concerning. They also suggested looking at the historical percentage of fall-run Chinook salmon redds dewatered as a comparison.

- CDFW noted that in the USST's late August recommendation to the Shasta Planning Group (SPG), five winter-run Chinook salmon redds were expected to be dewatered, and none have been dewatered to date.
    - Other CDFW staff explained that the prediction that 5 winter-run redds would be dewatered at 8,000 cfs was based on the older KWK calibration and the fact that some of the redds are in highly trafficked areas where trampling has pushed them deeper. Looking forward, CDFW now predicts that 2 winter-run redds will dewater at 7,500 cfs and 2 at 7,000 cfs for a total of 4.
- CDFW reminded the USST that the original recommendation to the SPG was to drop flows to 8,000 cfs and then adaptively manage; they asked if the group should consider that adjusted to 7,000 cfs given the calibration discrepancies and then begin the adaptive management approach.
- USST members agreed to reduce flows by 200 cfs/night this upcoming Friday, Saturday and Sunday night to reduce flows to 7,100 cfs by Monday.
    - This plan is anticipated to dewater 2 redds, below the threshold of 5 redds they initially predicted to the SPG, so an update to the SPG is not needed at this time.
- They will receive results on shallow redd impacts on Monday afternoon and meet again to discuss on Tuesday.

Meeting Schedule

- The next meeting is September 19, 2023, 10 to 11 a.m.