Upper Sacramento Scheduling Team - Spring Pulse Flow Planning Subgroup Meeting Summary

Thursday, March 7, 2024, 9:00–10:30 a.m.

Participants

- CDFW: Michael Memeo, Travis Apgar, Crystal Rigby, Tracy Grimes, Erica Meyers
- DWR: N/A
- NMFS: Stephen Maurano, Garwin Yip
- USBR: Karissa Bridges, Derek Rupert, Lisa Elliot, Elissa Buttermore, Tom Patton
- SWFSC: Cyril Michel, Flora Cordoleani, Miles Daniels
- SWRCB: Craig Williams
- Hoopa Tribe: N/A
- SRSC: Yuen Lenh, Anne Williams
- USFWS: Doug Killam, Bill Poytress, Matt Brown
- Kearns & West: Terra Alpaugh, Eva Spiegel

Action Items

Completed:

- Cyril to share the slides from his 2023 Spring Pulse Flow Recap as presented last year to SRSP.
- Cyril to share the link to the Shiny App with telemetry data: Central Valley Enhanced Acoustic Tagging Project
    - Then click on the "Survival" tab,
    - Then in the drop down menu, select "Spring Pulse Flow Fall-run Chinook experimental releases 2023".
    - You can then toggle between the subtabs for "Cumulative Survival", "Reach survival", and "Delta route-specific survival".
- Derek provided the status of the gravel augmentation pile at Keswick: “I stopped by on my way home last night. The gravel pile is fully evacuated and ready to be refilled.”

- Anne shared an update from RD 108's Deputy Manager on the status of gravel augmentation:
    - We'd previously injected 20,000 tons at Keswick in 2022, too. I talked with the Bureau folks there, and it all went downstream this spring, so that's good.
    - Last year, 2023, we injected 6,000 tons at Keswick, 14,000 tons at Salt Creek, and about 3-5,000 tons at Market Street.
    - This year, we were hoping to do Middle Creek Spawning Habitat, which would have added 2500 tons of spawning gravel this spring, but the flows look like they are going to be too high to do until the fall or next spring. We will likely shift Keswick's planned 2025 injection to this late-spring or summer to replace Middle Creek.
    - Then this fall we are planning Redding Riffle, which I don't have an exact number on yet, but maybe 8,000 tons (?). It could slip into the spring like Middle Creek; it all depends on flows in the river.
- Derek shared the proposed dates for the two Clear Creek spring pulse flows:
    - Spring Pulse #1 — May 16–27. Peak flow at 800 cfs on May 17–20.
    - Spring Pulse #2 — June 13–25. Peak flow at 500 cfs on June 14–19.
- KW to update document for tracking co-benefits/other considerations for pulse flows.
- Tom to put together initial flow scenarios by mid-week the week of 3/18.
- Cyril to have run survival estimates for the various potential pulses to share at a meeting the week of March 25.
- KW to schedule weekly Thursday meetings in April.

Outstanding:

- Cyril to follow up with Miles Daniels to see if he has any bandwidth to help develop a better tool to model TDM of the proposed pulse flows.
- KW to investigate who might be able to answer the following question: if adult Chinook are migrating upstream, could they be attracted by pulse flows into areas where they are likely to get stuck (e.g., overflow channels around the Sac Weir, Fremont Weir)? I.e., does the group need to worry about rescues?

Key Discussion Topics with Summary of Perspectives and Outcomes

Meeting Objectives

- Review pre-conditions for considering a spring pulse flow.
- Provide operations update and explore implications for spring pulse flow.

- Review planning process steps and deliverables; develop an approach for the 2024 season planning process.

Reflections on 2023 Pulse Flow Outcomes

Participants asked about the documentation of outcomes from the 2023 pulse flows.

- Reclamation noted that two reports on Shasta operations were produced that include documentation of the pulse flows; they have been shared with LTO members but are not yet finalized and posted online.
- SWFSC staff shared slides of a presentation he gave to SRSP in June 2023 that provided initial results from the pulse flows. He noted that the telemetry data were finalized in late 2023 and that they would be submitting an angler report in the next few months; other next steps included assessing the turbidity and rotary screw trap (RST) data and developing better tools to assess the impacts of pulse flows on total temperature dependent mortality. He reported that the pulse flow seemed to be beneficial to the fish, however it was challenging to differentiate between pulse v. non pulse conditions due to the generally high flows last year.
- USFWS observed that Coleman National Fish Hatchery (CNFH) fall-run Chinook salmon smolts that were tagged as surrogates for wild spring-run Chinook salmon and released during the ascending limb of the first pulse appeared to benefit the most as compared to the other tagged releases groups.
    - SWFSC suggested that the increased survival of that group might be reflective of benefits contributed by the ascending limb of the hydrograph; that group also moved more slowly; it could be that turbidity was higher during the ascending limb. Another theory is that striped bass were in good condition and could have eaten fish in later pulses.
    - USFWS wondered if the higher survival could have been due to an acclimation effect.
- Reclamation observed that it was difficult last year to schedule the optimal pulse because of high flows. It appears that in years when Shasta hits the 4MAF May 1 storage target that allows for implementation of a pulse flow, it is hard to fit those pulse flows in alongside flood management releases happening during the same time period.

Operations Update

Reclamation provided a brief update on the current conditions and operations with a focus on the parameters for planning a pulse flow.

- They will likely implement a pulse flow this year; timing will need to be flexible given high flows.
- Shasta is currently at 3.8-million-acre feet (MAF) and is anticipated to fill to 4.5 MAF in May.
- Keswick is releasing 15,000 cfs. Reclamation is considering increasing flows, as they do not want to fill the reservoir to soon. The March 1 snow course data was collected prior to

the last storm and therefore, may have contributed to an under forecast.

- Flows at Wilkins Slough are in the 20,000 cfs range.

Pulse Flow Considerations

Participants shared opportunities and constraints that should be considered in planning pulse flows for 2024 (potential considerations are bolded below). Perspectives and questions shared by subgroup members included:

Infrastructure-related Considerations

- ACID plans to begin installation of their diversion dam on Monday, March 18, which will require flows of 6,000–8,000 cfs. Flows would need to be in the 3,000–4,000 cfs range to install the flashboards.
    - When the dam is installed, it will handle flows in the 18,000 cfs range. That maximum would be lower if they installed the flashboards.
    - The diversions could begin April 1, 2024.

Floodplain-related Considerations

- In 2023, pulse flows did not provide floodplain access. SWFSC observed that this year, water levels in the Sacramento River are high enough that flood bypasses are connected, and a pulse flow could result in additional floodplain connectivity.
- NMFS reported that there was recently a levee setback in the Yolo Bypass due to an AT&T line that needs to be relocated. This could mean a higher likelihood of stranding.
- CDFW noted that adult Chinook salmon coming upstream have gotten stuck in overflow channels in the past around the Sacramento and Freemont Weirs. They asked whether migrating adults could be attracted by pulse flows into these areas? I.e., does the group need to worry about rescues?

Hatchery Release-related Considerations

- USFWS is interested in understanding how pulse flows can benefit both natural and hatchery fish migration. The natural population of fall-run Chinook salmon emigration is anticipated to be very low this year but also very hard to sample; they estimate they are currently at 67% passage for natural fall-run Chinook salmon. The USST should focus on designing pulses to benefit the hatchery fish.
- USFWS provided an update on Coleman Hatchery releases and expressed a desire to schedule pulses to support those releases if possible. About 3 million fall-run Chinook fish will need to be released in March due to overcrowding and water quality problems. Fall Run Chinook Salmon Coleman hatchery fish will also be released in April; exact timing of releases will depend on temperatures and the resulting growth of the fish, as well as the ability to tag them. Hopefully, releases can coincide with rain events.

Other Considerations

- Reclamation observed that Clear Creek had its highest spring-run Chinook salmon return

in 2021 (2,250), which produced many juveniles, although conditions for the fish reaching the Pacific Ocean were poor. It will be important to track how many of those juveniles, now adults, will return. There are two pulse flows scheduled on Clear Creek and if pulse flows on the Sacramento River could coincide with those, it could help this migration.

    - Reclamation CVO said that the Clear Creek pulses are scheduled but the dates could be modified to coincide with Sacramento pulses.

- NMFS expressed interest in the potential for pulse flows to also provide geomorphic benefits. This is not the expressed purpose of pulse flows, but it could be a co-benefit, though the downstream maximum flows could be a limiting factor since gravel transport starts at 24,000 cfs.

    - CDFW asked if the gravel in the spawning locations has becoming embedded; if so, would those areas benefit from geomorphic flows?

    - Reclamation and SRSC offered to follow up on the status of gravel augmentation at the downstream side of Keswick Dam and Salt Creek.

- SWFSC noted that another benefit of a pulse flow could be the effect of higher flows on water temperatures and the ability to induce lower temperatures downstream.

- USFWS suggested that pulse flows could also impact the distribution of polychaetes.

Next Steps

- Kearns & West will update the Process Plan to include a list of co-benefits and potential considerations for timing.

- Reclamation will put together potential flow scenarios, though they will still be rough at this point.

- SWFSC will produce survival estimates for those scenarios.

- At the next meeting, the group will discuss the scenarios and survival as well as the considerations for timing (e.g., ACID, Coleman Fish Hatchery releases, Clear Creek pulses).

- The group will meet in late March and then weekly through April and early May.