



Upper Sacramento Scheduling Team

Spring Pulse Flow Planning

Thursday, March 28, 2024, 12:30-1:00 p.m.

Members Attending

- CDFW: Travis Apgar, Tracy Grimes, Crystal Rigby, Michael Memeo
- DWR:
- NMFS: Evan Sawyer
- Reclamation: Karissa Bridges, Elissa Buttermore, Lisa Elliot, Tom Patton, Shay Richardson
- SWFSC: Cyril Michel
- SWRCB:
- Hoopa Tribe:
- SRSC: Anne Williams, Yuen Lenh
- USFWS: Matt Brown, Craig Flemming, Doug Killam, Brett Galyean
- Kearns & West: Terra Alpaugh, Marlys Jeane

Welcome, Agenda Review, and Purpose

- To determine whether to recommend a specific (or several) pulse flow scenarios to the SRTTG at this time

The facilitator provided some framing questions for discussion:

- Which scenarios look the most promising for survival and water cost? Do we have any additional info on TDM?
- What would be the preferred timing for a Coleman release based on the latest info?
- Are the potential benefits of coordinating the Coleman release and the first pulse flow greater than implementing a later first pulse flow with greater modeled survival benefits?
- Optional, i.e., if the group decides they want to implement a pulse in the first three weeks of April:
 - Do they recommend a single scenario or a handful of potential scenarios to the SRTTG (and subsequently SPG) for their recommendation to Reclamation?

What are the other considerations that need to be incorporated into this decision?
What is the group's recommendation?

- What is the process by which the USST would ultimately select a scenario if they asked for pre-approval of several options?
- What is the necessary documentation and timeline for the SRTTG, SPG, Reclamation decision-making, and CVO scheduling steps?

Review Flow Scenario Options

Reclamation provided updated flow scenarios based on the assumption that the Delta will need additional flow in April. Because late March/early April conditions were slightly wetter than anticipated, they simulated ramping up flows on April 9th. Reclamation noted that ramp up for Delta needs will simulate a pulse. The flows in the spreadsheet also reflect an assumption that by late April the net daily accretion-depletion balance will be negative.

SWFSC used those flow scenarios to model the survival and water cost of potential pulse flow scenarios. SWFSC highlighted the following aspects of their analysis:

- All scenarios are simulated using two datasets: all years of data (2006-2019), and above normal and wet hydrologic years only (2006, 2011, 2017, 2019). Both datasets were used for the analysis, because it is uncertain which is a better match for simulating this year's conditions.
- SWFSC analyzed all possible combinations of single or double pulses, with the pulses being either 2,3,4 days in length, always starting on Tuesdays, and for all the weeks of April and the first 3 weeks of May. In total there were ~275 scenarios.
- In situations when flows were already forecast to be above 11,000 cfs (such as the majority of April), SWFSC instead set Keswick releases as high as possible, with the constraints that Keswick can't exceed 15,000 cfs (due to ACID dam), and Wilkins can't exceed 18,000 cfs (due to seepage concerns).
- Given the number of scenarios, SWFSC used a new naming convention to describe the pulse scenarios. As an example: X5.4o8.4 is a scenario, where 5.4 is the first pulse (5th week of the April/May period, 4 days long), and 8.4 is the second pulse (8th week of the April/May period, 4 days long).
- The analysis relies on the historic (2006-2019) mean daily passage of wild fish at Red Bluff Diversion Dam screw traps; hatchery fish are removed from the data to the extent possible.

SWFSC highlighted the following results from the analysis:

- Because April flows at Wilkins are already above the 11,000 cfs survival threshold, pulse flows during the first three weeks do not show increased survival over the baseline. However, there could still be additional benefits from increased flows not captured in this analysis that could be considered.
- In looking across the scenario, there is a strong correlation between increased flows and increased survival.

- The top 10 performing pulse flow scenarios using all years of fish passage data all cost slightly below 100 TAF. The top 10 performing pulse flow scenarios using above normal & wet years passage data all cost below 85 TAF.
- Assuming that a pulse occurs in a given week, the analysis then provides the best time to implement the second pulse. The results indicate that two 4-day pulses, one in week 4 and one in 5 might be the best option from a survival perspective. However, the model does not incorporate any analysis of how many new fish would actually be ready to migrate if pulses were implemented just one week apart (and likely only days apart if you account for the ramping period).

Discussion of Flow Scenario Options Presented

Participants provided perspectives and considerations associated with the pulse flows options presented:

- There are 3 million fish that need to be tagged at the Coleman Hatchery. Based on projections of fish sizes, the next release will be between April 8 and 12; they will attempt to coordinate with an operational or natural flow event.
- As previously mentioned, there will be a pulse flow in April regardless of what the USST recommends. Reclamation is willing to coordinate those flows for Delta needs with Coleman Hatchery's release. That coordination should give them the flexibility to adjust the exact timing during the week of April 8 based on real-time conditions.
- Since the initial pulse won't be a formally recommended USST pulse flow, there will still be an opportunity for one or more later spring pulse flows. Uncertain weather forecasts could impact the plan, but drier conditions overall mean less pressure on reservoir levels/flood operations.
- Looking forward, the team will reference a past report by the SWFSC to estimate the possible TDM of a pulse flow based on the projected water costs and current storage.

USST members agreed that they will not recommend any specific pulse flow scenarios to the SRTTG at this time, since the operational Delta-driven pulse will support the Coleman fish. They will meet next week to further discuss a later April or May recommendation.

Addressing Prior Action Items

At the first USST meeting, there was a question about whether the Team should be concerned about pulse flows contributing to the stranding of adults who are attracted into areas where they are likely to get stuck (e.g., the Fremont Weir, Sacramento Weir). CDFW folks working around the Yolo Bypass provided some thoughts in writing for the USST:

- I think the best way to look at this is from a perspective of “any discharge point within or into the bypass can attract fish”. We have essentially created a labyrinth for fish to navigate with a multitude of diversions and discharges that at any point in time can provide the strongest attraction flow for fish. Hence, from a fisheries perspective, and especially for adult salmon and sturgeon, it is desirable to simplify the migratory corridor to the extent possible. That pretty much means that the strongest attraction flows should come from river connections and attraction flows from managed wetlands etc. should be

avoided to extent possible. Similarly, any kind of water control infrastructure is likely to complicate fish migration. We have quite a few examples of both juvenile and adult salmon ending up in rice fields/managed wetlands in both bypasses – including our own Yolo Bypass Wildlife Area and I suspect that this is an underreported problem. Currently we are conducting fish rescues at most of the flood control weirs in the bypasses after they stop overtopping.

- We have rescued a few adult white sturgeon from Fremont this season, four from the east stilling basin and one from the west. Three of the four from the east side were rescued on Feb. 12 and the fourth on Feb. 14. The one on the west side was captured on Mar. 18. So far there has only been one adult Chinook salmon that was stranded behind the weir that we recovered on Mar. 8. Outside of salmon and sturgeon, we haven't seen too many other large bodied adult fish on the east side this season, aside from some Sacramento suckers. There are definitely adult fish still getting stranded behind the weir after overtopping events, though its hard to say how many (if any) passed through AFP since the ARIS camera was not in place while the structure was operating. Either way, its definitely not functioning perfectly. And without the sonar imagery, its impossible to say if there was more fish passing through the structure than stranded.
- Even if those pulse flows are large enough to spill over the weirs, I think pulse flows are still a net positive and they do improve connectivity between the bypasses and the river which is a good thing. It is really more water operations within the bypasses that are causing issues. As you know we are working on improving fish passage at both Fremont and Tisdale weir which will further reduce these issues. I do think it is worth considering how to ramp down those pulse flows though to alleviate stranding of fish, but I am guessing that this is already being discussed in the group?