BUREAU OF RECLAMATION

Sacramento River Group – Spring Pulse Flow Planning Subgroup Meeting Summary

Tuesday, March 17, 2026, 1:00-2:00 p.m.

Participants

- CDFW: Tracy Grimes, Sheena Holley, Ryan Revnak
- DWR: John Ford, Ryon Kurth
- NMFS: Kyra Fitz
- SWFSC: Cyril Michel, Flora Cordoleani, Jeremy Notch
- SWRCB: Jeff Laird
- SRSC: Thad Bettner, Yuen Lenh, Anne Williams
- USBR: David Ayers, Emily Brenton, Elissa Buttermore, Lisa Elliot, Randi Field, Mechele Pacheco, Tom Patton
- RD108: Lewis Bair
- USFWS: Matt Brown, Brett Gaylean, Robert Null, Bill Poytress
- WAPA: Eric Mork
- Kearns & West: Terra Alpaugh, Chelsea Cullen

Action Items

K&W

- Compile and circulate available seasonal reports and develop a concise lessons-learned summary from prior year's notes.
- Confirm early next week whether a Tuesday meeting will be held or if time will be carved into the Thursday SRG meeting, based on when forecasts and temperature modeling are available.
- Add to next agenda: discuss approach to USFWS request that the group develop talking points explaining the objectives of pulse flows and why they may not always be used to support fall run hatchery releases.

SWFSC

- Share slides and key learnings from the 2024-2025 acoustic tag analysis.
- Coordinate scenario comparisons after receiving forecast inputs.

Reclamation

- Complete and share the March forecast and 90% operations forecast and run temperature modeling for multiple pulse volume scenarios.
- Coordinate with ACID on diversion dam installation constraints and possible flexibility to reach pulse targets.
- Provide timing details for habitat restoration project implementation.

USFWS

- Clarify and formalize hatchery release request, identify storage needs at Coleman, and communicate preferred early-April pulse dates or flexibility to the group.

Key Discussion Topics

Agenda and Objectives Recap

Terra Alpaugh, facilitator, described the intent of this smaller focused meeting, and shared the 2021 Spring Pulse Study Plan for reference:

- To evaluate the timing, magnitude, duration, and frequency of the pulse flows with the following goals and considerations:
    - Maximizing multi-species benefits
    - Coordinating around and incorporating timing/volume with:
        - Natural flow events and potential storage management operations
        - Potential SRSC demands and infrastructure limitations
        - Pulse flows in tributaries
- Provide SHOT/FAWOG with the technical and scientific information they need to make a decision on which pulse flow scenario (volume and schedule) to implement. SHOT/FAWOG should be provided with multiple options, documented in an Operations Plan.
- The following is provided as guidance in this process:
    - SRG members do the technical work to analyze performance metrics (e.g. species benefits, water cost, TDM impact) to evaluate how objectives are achieved (as identified in 1b above).
    - SRG members should not make value judgements about tradeoffs. Discussions and documentation should focus on providing accurate information and articulation of assumptions and uncertainties.

- SRG participants can provide input, informed by their technical expertise, on which scenarios achieve objectives. The participants' agencies and their input will be identified in the notes.

Outcomes from 2025 Pulse Flows

- K&W asked SWFSC about whether there was a final report on last year's pulse flows that could be shared with the group.
    - SWFSC responded that there's no final report but they have a slide presentation.
    - Reclamation responded that they have two seasonal reports that capture this information for Shasta operations, but 2025 reports are still in progress.
        - K&W will circulate prior year's documents.
- SWFSC shared key learnings from last year:
    - 2025 pulse schedule: Three 4-day pulses (plus a fourth April 16–19 bonus; core pulses April 29, May 9, May 20). When implemented, they had difficulty hitting the target flow at Wilkins Slough of 11,000 cfs: pulses 1 and 3 did not reach 11,000 cfs; pulse 2 reached it for only one day.
    - Tagging and survival findings: acoustic-tagged release groups showed improved survival during pulses overall, but diminishing effects during the later season pulse. 2025 showed lower survival than 2024 with only muted pulse benefits by the third pulse.
    - In 2024, pulses increased survival across Middle and Lower River regions; in 2025 significant benefits diminished in the Middle River and downstream regions, indicating there were factors reducing pulse effectiveness in 2025.
    - Overall survival to Sacramento was ~40% in the very wet water year of 2023, ~23% in 2024, and ~10% in 2025; Benicia arrivals were also much lower in 2025.
    - Complicating factors included shorter spacing between pulses in 2025 which resulted in the merging of some control and pulse release groups (and possibly reduced the number of fish ready to initiate migration in the later groups, smaller tagged fish in 2025 (due to a cold winter/hatchery timing), and potentially large striped bass predation overlap in areas with lower survival.
    - Recommended considerations are to better hit lower-river flow targets (11,000 cfs), consider greater spacing between pulses, and reconsider timing of last pulse because late-season pulses were less effective.

Opportunities and Constraints for 2026 Pulse Planning

The facilitator referred participants to the Planning Constraints and Opportunities for 2026 document, in which the SRG has compiled constraints and opportunities for pulse flow planning related to fish survival, operational considerations, timing and magnitude, and other influencing factors since 2022.

Participants asked questions and provided input:

- SWRCB asked whether they anticipate running into similar ACID construction constraints as they did last year?
    - Reclamation responded that ACID diversion dam installation may limit peak release capacity.
- SRSC asked about correlations of temperature, turbidity, or other drivers.
    - SWFSC responded that there's sufficient evidence that the pulses increased turbidity and decreased water temperatures throughout the river in both years. It is not always clear the exact mechanisms that are improving the survival, but it is likely a combination of faster water velocities, lower temperatures, and higher turbidity.
    - SRSC stressed that velocity changes in different areas of the river and suggested working with SWFSC on determining the impacts of velocity on survival.
- SWFSC asked if the pulse flow planning process had ever considered the impacts of spring versus neep tides on survival. Another participant suggested that moon illumination could also be important.
- Reclamation reminded the group that a projected May 1 storage greater than 4 MAF is considered to provide sufficient cold water pool management such that pulses will not impact temperature management; pulses can be planned in years with less than 4 MAF May storage if Reclamation and the SRG determine that there is still sufficient water. If the end of April storage is less than 4 MAF this year, pulses of the maximum total allowed volume of 150,000 acre-feet could impact the seasonal temperature-dependent mortality. In that case, Reclamation suggested, they may have a preference for less costly (smaller volume) or fewer pulses.
- Reclamation reported that trout guides/fishermen in Redding reported potential impacts to trophy trout coincident with pulses.
- USFWS stressed that freshwater guides and ocean harvest interests are sensitive to hatchery coordination and pulse timing and if pulses are not coordinated with hatchery releases, they may need outreach and talking points explaining why.
- SWFSC suggested that given the limited benefit of last year's late season pulse and the desire for earlier pulses to support hatchery fish and spring run, the SRG could consider fewer, earlier pulses that require less magnitude.

Operations Update and Report Out on 2025 Pulse Flows

Reclamation provided an update on current conditions:

- Shasta storage is currently at 4 MAF and snowpack in Sacramento/Trinity basins are at ~30% of normal. Forecasted end of September Shasta storage is 2 MAF in a 90% exceedance forecast, which is low and may constrain pulse volumes.
- Keswick Reservoir flows are now at 4,000 cfs.
- Wilkins Slough flows are just under 11,000 cfs and trending toward 9,000 cfs absent storms. Raising flow at Wilkins Slough to 11,000 cfs will require increased releases and coordination with ACID.
- There's limited capability to use Trinity diversions this year. Spring Creek power plant outages reduce diversion options.
- Reclamation will run temperature impact scenarios for different pulse volumes (e.g., 150k, 100k, 50k AF) to assess Cold Water Pool impacts and TDM; smaller increments may not show model-detectable differences.
- Reclamation acknowledged USFWS interest in near-term pulses to support hatchery releases; they indicated very limited feasibility for pulses this week with the earliest feasible date as April 1 if approvals and coordination occur on/around March 30–31.

USFWS reported spring-run and winter-run juvenile size classes have been moving earlier in March and appear ahead of schedule, supporting consideration of earlier pulses. The Coleman Hatchery spawned many fish in October 2025 and tagging operations are 3 weeks ahead, with hatchery at capacity and needing to release to create space. They requested earlier pulse(s), possibly starting late March/early April to align releases.

Next Steps

- Reclamation to finalize March forecast and run temperature impact scenarios (including testing pulse volumes) and share results at next SRG meeting (planned next Thursday); results will inform pulse feasibility and options.
- K&W will confirm early next week whether a Tuesday meeting will be held or if time will be carved into the Thursday SRG meeting, based on when forecasts and temperature modeling are available.
- K&W will compile and circulate available seasonal reports and develop a concise lessons-learned summary from prior years' notes.