BUREAU OF RECLAMATION

Sacramento River Temperature Task Group

Spring Pulse Flow Planning Subgroup Meeting Summary

April 5, 2023

Participants

Agency	Attendees
CDFW	Crystal Rigby, Tracy Grimes
DWR	Kevin Reece
NMFS	Stephen Maurano
Reclamation	Elissa Buttermore, Tom Patton , Emily Van Seeters, Lisa Elliott, Emelia Barnum
SWFSC	Flora Cordoleani
Hoopa Tribe	N/A
SRSC	Yuen Lenh, Anne Williams
USFWS	Jim Earley, Matt Brown
Kearns & West	Mia Schiappi, Terra Alpaugh, Eric Holmes

Action Items

- **Tom Patton** to send updated Spring Pulse Flow Spreadsheet to Cyril Michel.
- **Cyril Michel** to run survival modeling using Tom's latest numbers.
- **Jim Earley** to follow up with the contacts regarding fish/data observations at Red Bluff Diversion Dam.
- **Science Center/Cyril** to think about how to do the tagging for monitoring (especially in a multiple flow scenario) and make a plan based on the pulse flow scenario.
- **K&W** to send original Pulse Flow Study Plan - Monitoring Plan begins on page 13
- **K&W** to schedule a meeting to review updated scenarios early week of 5/10.

Key Discussion Topics with Summary of Perspectives, Outcomes, and Agreements

Meeting Objectives

1. Review Operations Update and May storage projections.

2. Review pulse scenarios
3. Review Pulse Flow Operations Plan
4. Review past TDM analysis
5. Determine next step needed to make recommendation to SRTTG.

Operations Update

Tom Patton, Reclamation, provided an operations update.

- The April B-120 forecast will be available on April 10th.
- Releases at Keswick are 3,250 cfs.
- ACID began the dam installation on Monday, April 3rd; flashboards will be installed early the week of April 10th and work is planned to conclude by April 15th.
- Shasta reservoir storage is 3.8 MAF, and storage will likely exceed 4 MAF by the week of April 10th.
- Filling of Whiskeytown reservoir is ongoing.
- The Clear Creek pulse flow peaked at 840 cfs, with the downstream pulse measuring 1,500 cfs.

Questions

- (Q)(NMFS): The last forecast projected 4,000 cfs for April Keswick flows. When will we see a departure from 3,250 cfs?
    - Reclamation responded that it will likely be mid to late April assuming no precipitation events.

Potential Pulse Scenarios

Tom and Flora Cordoleani, SWFSC, reviewed possible pulse flow scenarios.

Perspectives and questions shared by subgroup members included:

- (Q)(K&W): How do the M1, M2, and M3 options compare to the M5 and M6 that Cyril recommended at the prior meeting?
    - (USBR): The file Cyril used was from the previous year. All the old information can be discarded, and the options were renamed starting with M1. This is starting with a clean slate; as a result, all scenarios will look different from the previous analysis.
- (C)(USBR): The scenarios are plastic and can be changed. Fundamentally, each scenario focuses on maintaining 11,000 cfs at Wilkins for three to four days. The dates can be modified.

Red Bluff Diversion Dam

- (C)(SWFSC): It would be valuable to know how many fish have already passed through the Red Bluff area.
    - (USFWS): Pacific States Marine Fisheries Commission noted that turbidity has precluded the successful observation of fish above Clear Creek. Unfortunately, there is not much information.

Survival vs Water Cost

- (C)(SWFSC): Survival increases more with the multiple pulse flow scenario opposed to a single pulse flow. M2 has the best survival rate but has an increased water cost. The best scenario is M3 for multiple pulses and S3 for a single pulse.
- (C)(SRSC): Previous data suggested that the peak outmigration is around April 15th, but the S3 and M3 pulses are in mid-May.
    - (SWFSC): Correct, fish move more in May. It would be valuable to have preliminary data for the current water year to predict near future fish behavior.
- (Q)(K&W): To what extent would the new data for the year impact the scenarios which are forecasted to be best?
    - (USBR): It is hard to say without running the numbers to see what happens. When it comes to comparing volume cost, the single pulse scenarios with the new estimates do not significantly change with values remaining around 50,000 to 60,000 AF. Multiple pulses have come down in total volume to just below 100,000 AF.
- (Q)(K&W): Does SWFSC, USBR, and NMFS have a scenario recommendation?
    - (SWFSC): Scenario M3 should be our recommendation. That is one pulse in early May, and one pulse in mid-May.
    - (NMFS): Agreed, M3 falls short of the 150,000 AF limit allocated for a spring pulse. It might be worth setting aside single pulse flow scenarios given the wet year.
- (Q)(NMFS): Can single pulse scenarios be set aside for this year?
    - (DWR): Agreed. Multiple long duration pulses are preferred.
    - (USBR): Multi pulse is preferred, but one single pulse scenario should be retained in the event there are issues with allocating more than 100,000 AF or there are impacts with ACID. Furthermore, temperature impacts need to be considered when selecting pulses that require more than 100,000 AF.
- (C)(SWFSC): A single pulse may not produce the desired signal in the system to optimize fish survival. This year offers the best chance to test hypothesis on how pulse flow can support survival.
- (C)(NMFS): If there is concern around total water cost, then scenarios M7, M8, M9 with water in April and May may be preferrable in that the April flows are based off lower

base flows. Additionally, there is concern that ACID's needs will truncate top flows. It seems that April would be less effective biologically but would cost less water.

    - (USBR): We can run scenarios M7 through M9 again and evaluate the results. It could be a wash in terms of cost due to lower baseline release. If ACID is a concern, then earlier is better.

    - (NMFS): It would be best to pursue two pulse flows in early and mid-May, and if that is not possible, water efficiency should be the next priority.

- (C)(Reclamation): The only timeline issue to consider is that the Shasta Planning Group is meeting on March 18th, so the pulse will have to happen after that. The last week of April would be the earliest the first pulse could begin.

- (C)(Reclamation): SWFSC will be doing a seasonal effects study with acoustic tagging on hatchery juveniles.