



— BUREAU OF —  
RECLAMATION

# Stanislaus Stepped Release Plan Water Year 2023- Fall Pulse Flow Operations Plan

October 12, 2022

This Stanislaus Stepped Release Plan (SRP) – Water Year (WY) 2023 Final Operations Plan details the U.S. Bureau of Reclamation’s (Reclamation) plan for operating the Stanislaus River to meet WY 2023 fall pulse flow requirements. The Final Operations Plan incorporates feedback from the Stanislaus Watershed Team (SWT) who convened September 21, 2022 to discuss a pulse flow Draft Operations Plan.

## Background

A fall pulse flow is one component of the daily flow schedule in the SRP proposed in Reclamation’s October 2019 Biological Assessment (2019 BA), evaluated in NMFS’s October 2019 Biological Opinion (2019 BiOp), and implemented per the February 2020 Record of Decision. As noted in the 2019 BA (p. 4-81), the “SRP will be implemented similarly to current operations under the 2009 biological opinion with a default daily hydrograph, and the ability to shape monthly and seasonal flow volumes to meet specific biological objectives.” The 2019 BA further notes (p. 4-82) that “The Stanislaus Watershed Team will also provide input on the shaping and timing of monthly or seasonal flow volumes to optimize biological benefits.”

Below, Reclamation summarizes the Operations Plan for implementation of the fall pulse flow of WY 2023.

## Water Volume Accounting

Reclamation intends to use the water accounting framework (which accommodates water year type changes in the winter and spring) used by the Stanislaus Watershed Team to implement the SRP. Once snow surveys and hydrologic forecasting begins, the water year type is generally updated mid-month based on the snow surveys completed early in the month. To accommodate those potential changes in year type, the framework calculates the total required instream flow volume for a given period based on the default flow schedule in the SRP from the 16th of Month A to the 15th of Month B, based on the water year type determined by the Month A forecast. During the summer and fall, the water year type does not change but SWT will account for the SRP volume using this framework for consistency throughout the year.

The 60-20-20 San Joaquin Index (the index used to determine the water year type for SRP implementation) was “Critical” based on the May 2022 forecast. The total required instream flow volume pursuant to the SRP for the October 1-November 15, 2022, period is detailed below:

<b>Date range</b>	<b>Water Year Type</b>	<b>Total water volume in default schedule in SRP (acre-feet)</b>	<b>Total water volume in Alt-1 (acre-feet)</b>
10/1/22-10/15/22	Critical	6,545	11,702
10/16/22-11/15/22	Critical	34,909	29,752
	<b>Total*</b>	41,454	41,454

\*The sub-totals are reported after rounding to the single acre-foot (and happen to be rounded down), but when the volumes are summed, the fractional acre-foot tips the rounding the other way which is why the total reported volume is 1 acre-foot more than the apparent sum of the sub-totals.

## Reshaping

**For WY 2023, Reclamation intends to implement a reshaped fall pulse flow according to the flow schedule described in Alternative 1 (Alt-1) (see details in Figure 1 and Table 1).**

At the September 21, 2022, SWT meeting, the technical team discussed the alternatives for the fall pulse flow schedule. Based on discussion, and in order to accommodate flows needed for important carcass studies, and recreational activities on the Stanislaus River, the SWT provided feedback on this option.

The Alt-1 schedule (Figure 1 and Table 1) has the same total volume (41,454 AF, including base flows) for the October 1-November 15 period as the default SRP Critical schedule, as described in the Water Accounting Section of this plan. Reclamation, and the SWT, believe that the Alt-1 reshaping optimizes biological benefits by improving instream conditions and providing an attraction cue for adult salmonids returning to spawn in the Stanislaus River. Higher flows are expected to reduce water temperature (or at least buffer daily maximum water temperature) to provide conditions suitable for the migration and holding of adult salmonids. By starting the fall pulse flow on October 12 and extending the reshaped fall pulse flow into November, SWT expects the higher-than-base flows will help buffer water temperatures during the seasonal transition to cooler air temperatures. Scheduled flows in Alt-1 are down to base flows by the 1<sup>st</sup> of November, before peak spawning is expected to occur. The higher flows will also inundate some shallow water habitat which may provide rearing juvenile steelhead with short-term growth benefits as well as potential refuge from predation.

Some key features of the Alt-1 fall pulse include:

- As in the default schedule, **higher fall flows** (compared to base flows) are intended to provide an attraction cue for salmonids returning to spawn.
- Reshaping the single pulse identified in the default SRP schedule into a **three-peak** pulse period **increases flow variability** within the season. This variability is expected to deter spawning at the higher flows that will not be sustained through egg incubation and fry emergence.

- The **time frame** of the Alt-1 pulse (which has an earlier start, and it is slightly longer in duration, compared to the default SRP schedule) is expected to provide temperature buffering from mid-October through early November.
- Other considerations for in-basin interests:
  - No flows >1,500 cfs are scheduled in consideration of concerns regarding agricultural seepage<sup>1</sup>.

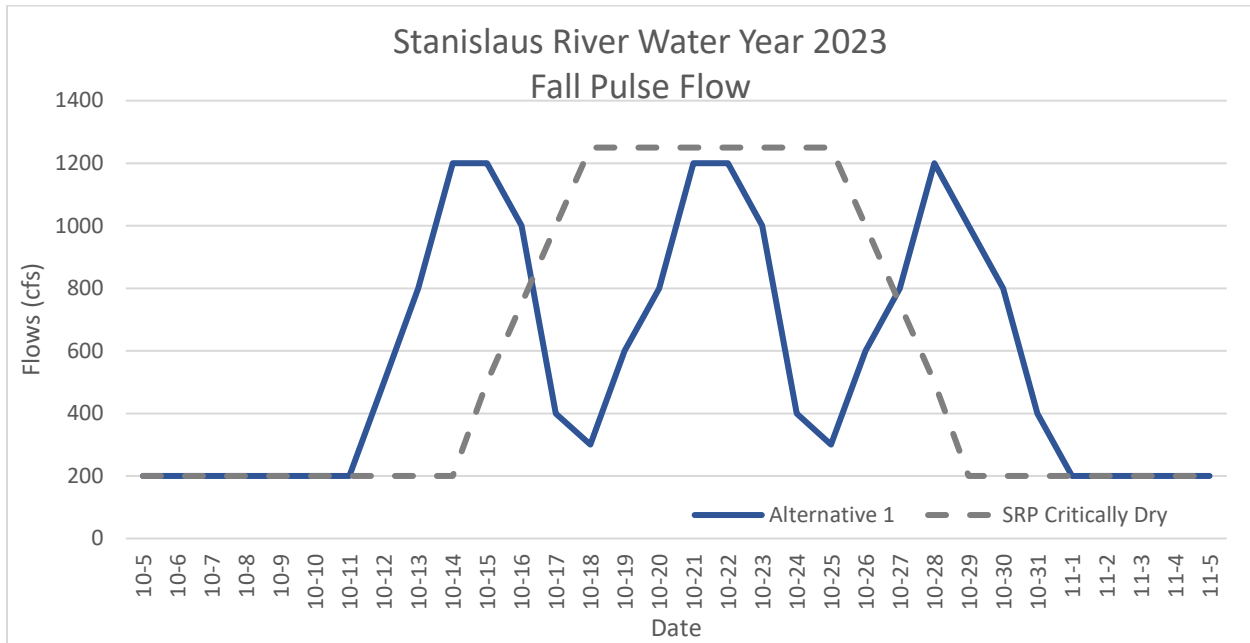


Figure 1. Recommended flows in the default SRP and proposed Alternative schedule for a Critically Dry water year type.

<sup>1</sup> Note that in wetter years, flows >1,500 cfs cannot be avoided entirely, but may be limited in duration.

Table 1. Daily Flow Schedule for the SRP and Alternative 1

<b>Day</b>	<b>SRP Critical</b>	<b>Alt-1</b>
10-1	200	200
10-2	200	200
10-3	200	200
10-4	200	200
10-5	200	200
10-6	200	200
10-7	200	200
10-8	200	200
10-9	200	200
10-10	200	200
10-11	200	200
10-12	200	500
10-13	200	800
10-14	200	1200
10-15	500	1200
10-16	750	1000
10-17	1000	400
10-18	1250	300
10-19	1250	600
10-20	1250	800
10-21	1250	1200
10-22	1250	1200
10-23	1250	1000
10-24	1250	400
10-25	1250	300

10-26	1000	600
10-27	750	800
10-28	500	1200
10-29	200	1000
10-30	200	800
10-31	200	400
11-1	200	200
11-2	200	200
11-3	200	200
11-4	200	200
11-5	200	200
11-6	200	200
11-7	200	200
11-8	200	200
11-9	200	200
11-10	200	200
11-11	200	200
11-12	200	200
11-13	200	200
11-14	200	200
11-15	200	200
<b>Total AF</b>	<b>72,793</b>	<b>72,793</b>