BUREAU OF RECLAMATION

Stanislaus Stepped Release Plan – Water Year 2024 Spring Pulse Flows Final Operations Plan

This Stanislaus Stepped Release Plan (SRP) – Water Year (WY) 2024 Final Operations Plan details Reclamation's plan for operating the Stanislaus River to meet WY 2024 spring pulse flow (SPF) requirements. This Operations Plan incorporates feedback from the Stanislaus Watershed Team (SWT) who convened March 19 and March 27, 2024 to discuss a WY2024 SPF.

Background

SPFs are a 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 SPF of WY 2024.

Water Volume Accounting

The 60-20-20 San Joaquin Index (the index used to determine the water year type for SRP implementation) was "Below Normal" based on the March 2024 forecast. Assuming the water year type does not change based on future forecasts, the total required instream flow volume pursuant to the SRP for the April 1-June 30, 2024 period is detailed below (Table 1). If the water year type per the 60-20-20 San Joaquin Index changes from Below Normal based on the April, May, or June forecasts, Reclamation will recalculate the volume requirement and seek input from the SWT on an updated flow schedule if needed.

Table 1. Details of SRP for Below Normal water year type per month (water year type is updated mid-month based on snow surveys)

Date range	Water Year Type (Month of forecast)	Total water volume in default schedule in SRP (acre-feet)
4/1/24 - 4/15/24	Below Normal (March)	43,835
4/16/24 - 5/15/24	Below Normal* (April)	92,231
5/16/24 - 6/15/24	Below Normal* (May)	46,909
6/16/24 - 6/30/24	Below Normal* (June)	7,438
	Total	190,413

**Assumes the water year type does not change based on future forecasts.*

Reshaped Flows

For WY 2024, Reclamation intends to implement a reshaped spring pulse flow according to the flow schedule described in Alternative-Below Normal 1 (Alt-BN1).

At the March 27, 2024 SWT meeting, the technical team discussed, reviewed, and provided feedback on the Alt-BN1 option for WY 2024 SPF (Figure 1). The default SRP Below Normal schedule has the same total volume (190,413 AF) for the April 1-June 30 period as the Alt-BN1. Reclamation and the SWT believe that the Alt-BN1 reshaping optimizes biological benefits by providing a pulse that may cue anadromy and improve migratory habitat in both the Stanislaus River and in the mainstem San Joaquin River and southern delta. In the Stanislaus River, higher flows are expected to reduce water temperature (or at least buffer daily maximum water temperature) and inundate some shallow water habitat which may provide juvenile salmonids with short-term growth benefits as well as potential refuge from predation. In the mainstem San Joaquin River and south delta, higher flows from the Stanislaus River (and other San Joaquin tributaries) are expected to convey out-migrating salmonids more rapidly along their migratory pathway, which may improve outmigration success.

Some key features of the Alt-BN1 SPF include:

- As in the default schedule, **higher spring flows** (compared to winter base flows) are intended to cue outmigration and improve migratory habitat downstream.
- Reshaping the two pulses identified in the default SRP schedule into **eight peaks for the** first two-thirds of the pulse period increases flow variability within the season. This variability is expected to provide opportunities for a broader range of salmonid outmigration timing since outmigration may be cued by variability as well as flow magnitude (Zeug et al. 2014).
- The **time frame** of the Alt-BN1 pulse is expected to provide some inundation of shallow-water habitat and temperature buffering from April through early-May; the extent of such benefits will vary with flow throughout the spring pulse period. The timing of Alt-BN1 puts most of the pulse volume in a 31-day window which aligns better with the State Water Resources Control Board D-1641 Vernalis pulse flow period.
- Other considerations for in-basin interests:
    - No flows >2,500 cfs are scheduled in consideration of concerns regarding stability of the weir at Riverbank, as well as attempting to minimize agricultural seepage.

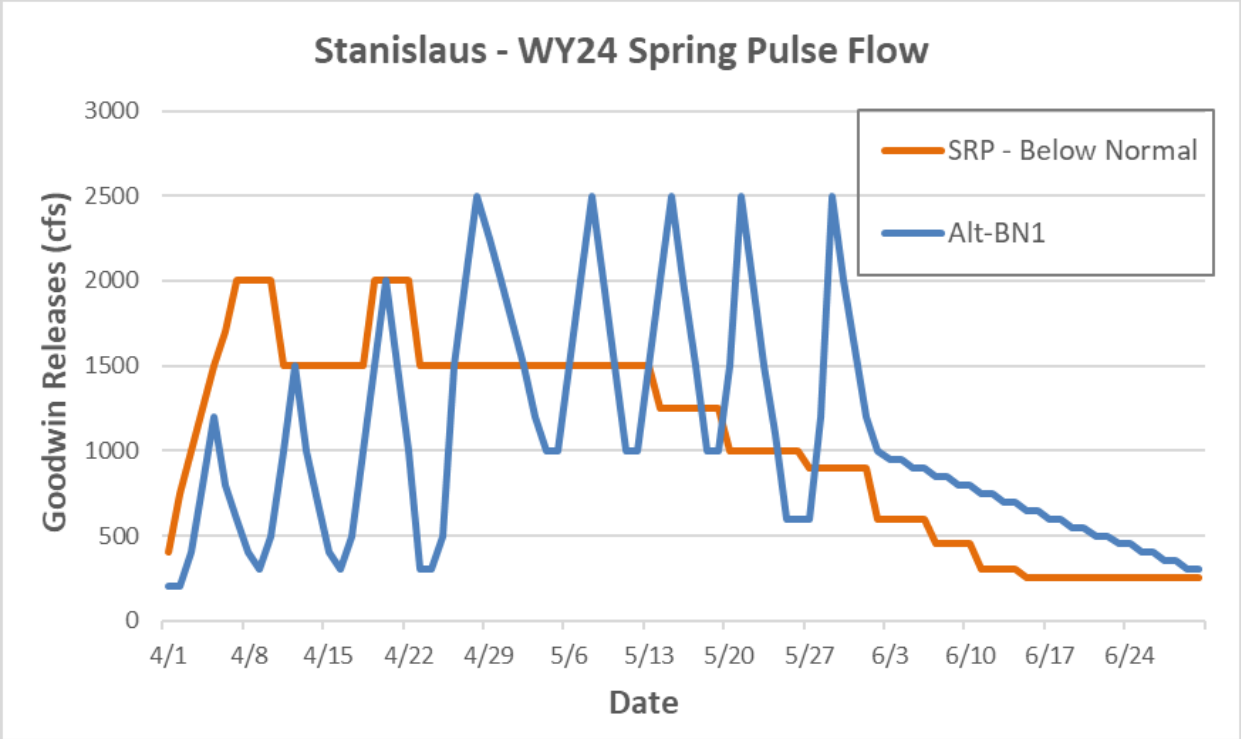

Figure 1. Daily flows in the default SRP and proposed Alt-BN1 schedule for a Below Normal water year type

Table 2. Daily Flow Schedule for the SRP Below Normal (SRP BN) and the shaped Alternate Below Normal (Alt-BN1)

Day	SRP BN	Alt-BN1
4/1/2024	400	200
4/2/2024	750	200
4/3/2024	1,000	400
4/4/2024	1,250	800
4/5/2024	1,500	1,200
4/6/2024	1,700	800
4/7/2024	2,000	600
4/8/2024	2,000	400
4/9/2024	2,000	300
4/10/2024	2,000	500
4/11/2024	1,500	1,000
4/12/2024	1,500	1,500
4/13/2024	1,500	1,000
4/14/2024	1,500	700
4/15/2024	1,500	400
4/16/2024	1,500	300
4/17/2024	1,500	500
4/18/2024	1,500	1,000
4/19/2024	2,000	1,500
4/20/2024	2,000	2,000
4/21/2024	2,000	1,500
4/22/2024	2,000	1,000
4/23/2024	1,500	300
4/24/2024	1,500	300
4/25/2024	1,500	500
4/26/2024	1,500	1,500
4/27/2024	1,500	2,000
4/28/2024	1,500	2,500
4/29/2024	1,500	2,250
4/30/2024	1,500	2,000

Day	SRP BN	Alt-BN1
5/1/2024	1,500	1,750
5/2/2024	1,500	1,500
5/3/2024	1,500	1,200
5/4/2024	1,500	1,000
5/5/2024	1,500	1,000
5/6/2024	1,500	1,500
5/7/2024	1,500	2,000
5/8/2024	1,500	2,500
5/9/2024	1,500	2,000
5/10/2024	1,500	1,500
5/11/2024	1,500	1,000
5/12/2024	1,500	1,000
5/13/2024	1,500	1,500
5/14/2024	1,250	2,000
5/15/2024	1,250	2,500
5/16/2024	1,250	2,000
5/17/2024	1,250	1,500
5/18/2024	1,250	1,000
5/19/2024	1,250	1,000
5/20/2024	1,000	1,500
5/21/2024	1,000	2,500
5/22/2024	1,000	2,000
5/23/2024	1,000	1,500
5/24/2024	1,000	1,100
5/25/2024	1,000	600
5/26/2024	1,000	600
5/27/2024	900	600
5/28/2024	900	1,200
5/29/2024	900	2,500
5/30/2024	900	2,000
5/31/2024	900	1,600

Day	SRP BN	Alt-BN1
6/1/2024	900	1,200
6/2/2024	600	1,000
6/3/2024	600	950
6/4/2024	600	950
6/5/2024	600	900
6/6/2024	600	900
6/7/2024	450	850
6/8/2024	450	850
6/9/2024	450	800
6/10/2024	450	800
6/11/2024	300	750
6/12/2024	300	750
6/13/2024	300	700
6/14/2024	300	700
6/15/2024	250	650
6/16/2024	250	650
6/17/2024	250	600
6/18/2024	250	600
6/19/2024	250	550
6/20/2024	250	550
6/21/2024	250	500
6/22/2024	250	500
6/23/2024	250	450
6/24/2024	250	450
6/25/2024	250	400
6/26/2024	250	400
6/27/2024	250	350
6/28/2024	250	350
6/29/2024	250	300
6/30/2024	250	300