Restoration Administrator Flow Recommendation

To: Don Portz, Chad Moore, Emily Thomas, Heather Casillas
CC: Michael Jackson, Rufino Gonzalez, Doug Obegi, Steve Ottemoeller, Ian Buck-Macleod, TAC
Date: May 12, 2021
From: Tom Johnson, Restoration Administrator
Subject: Revised Recommendation for 2021 Restoration Flows

The following is a Restoration Flow Recommendation by the Restoration Administrator (RA) for the 2021 Restoration Year Flows pursuant to the Restoration Flow Guidelines (RFG) Ver. 2.1, as amended, and Exhibit B of the Settlement.

Background

The SJRRP has issued a Restoration Allocation Update (Allocation) dated April 16, 2021, which designates 2021 as a **Critical-High** Water Year Type with an Unimpaired Inflow hybrid forecast of 567 TAF and provides an allocation of Restoration Flows of 70.919 thousand acre-feet (TAF) as measured at Gravelly Ford (GRF). The Allocation also specified certain contractual and operational constraints on Restoration Flow releases for 2021.

Compared to the approved February 22, 2021 Recommendation, this Recommendation makes use of an additional 1,000 acre-feet of URF Exchange water and adjusts some flows up and down slightly (generally be 5 or 10 cfs) to address changes in anticipated or actual seepage estimates in various reaches.

This Recommendation is in accordance with the Settlement[1], including the provisions contained therein regarding Restoration Flows during Critical High years, the use of Unreleased Restoration Flows (URF) exchanges, and the use of Buffer Flows.

Additional Considerations

A primary objective of this Restoration Flow Recommendation is to maintain San Joaquin River connectivity throughout the balance of 2021, in particular focusing on continuous connectivity in Reach 4 and the Middle and Lower East Side Bypass. As of May 1, 2021, the Program had maintained continuous flows throughout the entirety of the Restoration Area (a length of over 149 river miles between Friant Dam and the confluence of the Merced River) for approximately 1,650 days. In addition to maintaining a "live" river year-round to support habitat vital to the success of the Restoration Goal, flow connectivity provides the pathway for migration of adult and juvenile fish into and out of the river.

The 54 miles of river (over 1/3 of the Restoration Area) between Sack Dam and Salt Slough is particularly at risk of drying out due to low flows, due to seepage losses and distance from Friant Dam. Disconnecting and drying out the river in Reaches 4 and 5 would likely result in that dry stretch lasting until at least May of 2022 (based on the need for relatively high flows to achieve re-connection which would not be available

[1] Stipulation of Settlement, NRDC et. al. v. Kirk Rodgers et. al. October 2006.

until Restoration Year 2022, and the data and experience of connecting the river in August through October of 2016). That outcome would have substantial implications for Restoration Year 2022 as well as the current Critical High year.

The current approved Restoration Recommendation is dated March 31, 2021 and included approximately 20,425 acre-feet of Restoration Year 2016 and 2020 URF's, plus 7,131 acre-feet of buffer flows.

Recommendation for Restoration Year 2021

This Recommendation makes slight adjustments to the current Recommendation, to re-prioritize flows based on current field data regarding seepage losses, adjust Buffer Flow levels, and to deploy an additional 1,000 acre-feet of URF exchange returns. Changes from the previous Recommendation are highlighted in ***red***.

For the balance of the 2021 Restoration Year, I recommend Restoration Flows as shown in Table 1. The recommended Friant Release and GRF targets include Restoration Flows, Buffer Flows, and water returned (Returned Exchanges) from 2016 and 2020 URF Exchanges. Tables at the end of this Recommendation provide the relative division between Restoration Flows plus Returned Exchanges and Buffer Flows. The SJRRP is currently working with the URF Exchange contractors to develop more detailed Returned Exchanges schedules.

Table 1. Summary of Restoration Flow Recommendations for May 1, 2021 through February 28, 2022.

Date Range	*Friant Release**	*Buffer Flow Release*	*Restoration Flows at Gravelly Ford***	*Total Flow at Gravelly Ford****	*Target Flow at Sack Dam*
May 1 through May ***14***, 2021	As necessary, est. at 320 cfs	10 cfs	130 cfs	135 cfs	43 cfs
May ***15*** through May 31, 2021	As necessary, est. at ***325*** cfs	***15*** cfs	***135*** cfs	***140*** cfs	***48*** cfs
June 1 through June 30, 2021	As necessary, est. at ***330*** cfs	***15*** cfs	140 cfs	145 cfs	***52*** cfs
July 1 through July 31, 2021	As necessary, est. at ***380*** cfs	***15*** cfs	***150*** cfs	***155*** cfs	***62*** cfs
August 1 through August 31, 2020	As necessary, est. at ***390*** cfs	***15*** cfs	***160*** cfs	***165*** cfs	***71*** cfs
September 1 through September 30, 2021	As necessary, est. at ***360*** cfs	***15*** cfs	***150*** cfs	***155*** cfs	***62*** cfs

Date Range	*Friant Release**	*Buffer Flow Release*	*Restoration Flows at Gravelly Ford***	*Total Flow at Gravelly Ford****	*Target Flow at Sack Dam*
October 1 through October 31, 2021	As necessary, est. at ***315*** cfs	***15*** cfs	***155*** cfs	***160*** cfs	***67*** cfs
November 1 through November ***3***, 2021	As necessary, est. at ***280*** cfs	***15*** cfs	***150*** cfs	***155*** cfs	***62*** cfs
November ***4*** through November 30, 2021	As necessary, est. at ***270*** cfs	***10*** cfs	***150*** cfs	***155*** cfs	***62*** cfs
December 1 through December 31, 2021	As necessary, est. at 260 cfs	***10*** cfs	140 cfs	145 cfs	52 cfs
January 1 through January 31, 2022	As necessary, est. at ***235*** cfs	***10*** cfs	***135*** cfs	***140*** cfs	***48*** cfs
February 1 through February 28, 2021	As necessary, est. at ***225*** cfs	0 cfs	***125*** cfs	***130*** cfs	***38*** cfs

**** Estimated releases at Friant Dam are based upon Exhibit B estimates of Riparian/Holding Contract releases and Reach 1 losses. In recent years those losses have generally been running higher than Exhibit B estimates.***

***** Restoration Flows include Buffer Flows and URF Exchanges (where utilized)***

******Total Flow includes the minimum Holding Contract flows of 5 cfs required at Gravelly Ford***

- This Recommendation uses approximately ***21.425 TAF*** of water that is returned from URF exchanges with Friant Contractors. The returned exchange water is not differentiated from Restoration Flows in Table 1 of this Recommendation. I will coordinate with the Program and the exchanged water returning entities as to the precise timing and accounting for the returned water as a part of this schedule.

- Flow losses throughout the Restoration Area vary substantially above or below anticipated or historic levels. Additionally, losses can vary across seasons and months, or with changes in river or delivery flow volumes. For example, Reach 2A losses may be less or greater than Exhibit B estimates by 25 cfs or more in certain months.

- To address this likelihood of variable flow losses, this Recommendation recommends approximately ***7,131*** acre-feet of Buffer Flows. This is not the full amount of Buffer Flows permitted by the Settlement, as articulated in RFG 2.1, (10.053 TAF for Critical High year, 22.702 TAF for Dry year), and the amount of Buffer Flows identified in this Recommendation may increase or decrease to meet downstream flow targets influenced by actual losses. I will work with the Program and river operators to monitor flows and losses throughout the system over the course of the Restoration Year and, as needed, I will recommend additions or reductions of Buffer Flows to maintain target flow levels, particularly below Sack Dam.

- This Recommendation includes a continuous low flow past Sack Dam to support river connectivity to the Merced River confluence. ***It will be important for the Program to diligently monitor releases below Sack Dam to minimize flow errors and daily variation to maintain connectivity in all reached downstream to the Merced River.*** Substantial flow variations could be enough to cause disconnection of the river and mortality to native warm water fishes and benthic macroinvertebrates.

Figures 1 and 2 below show the anticipated Flow Recommendation for this year at key locations in the Restoration Area.

Additional Consultation

I will continue to coordinate with the TAC, Program Office, and Implementing Agencies to monitor hydrologic conditions, fish population conditions, uncontrolled season releases, operational conditions, and other factors, and will update the Restoration Flow Recommendation as conditions change.

Figure 1. 2021 Restoration Flows, February - June

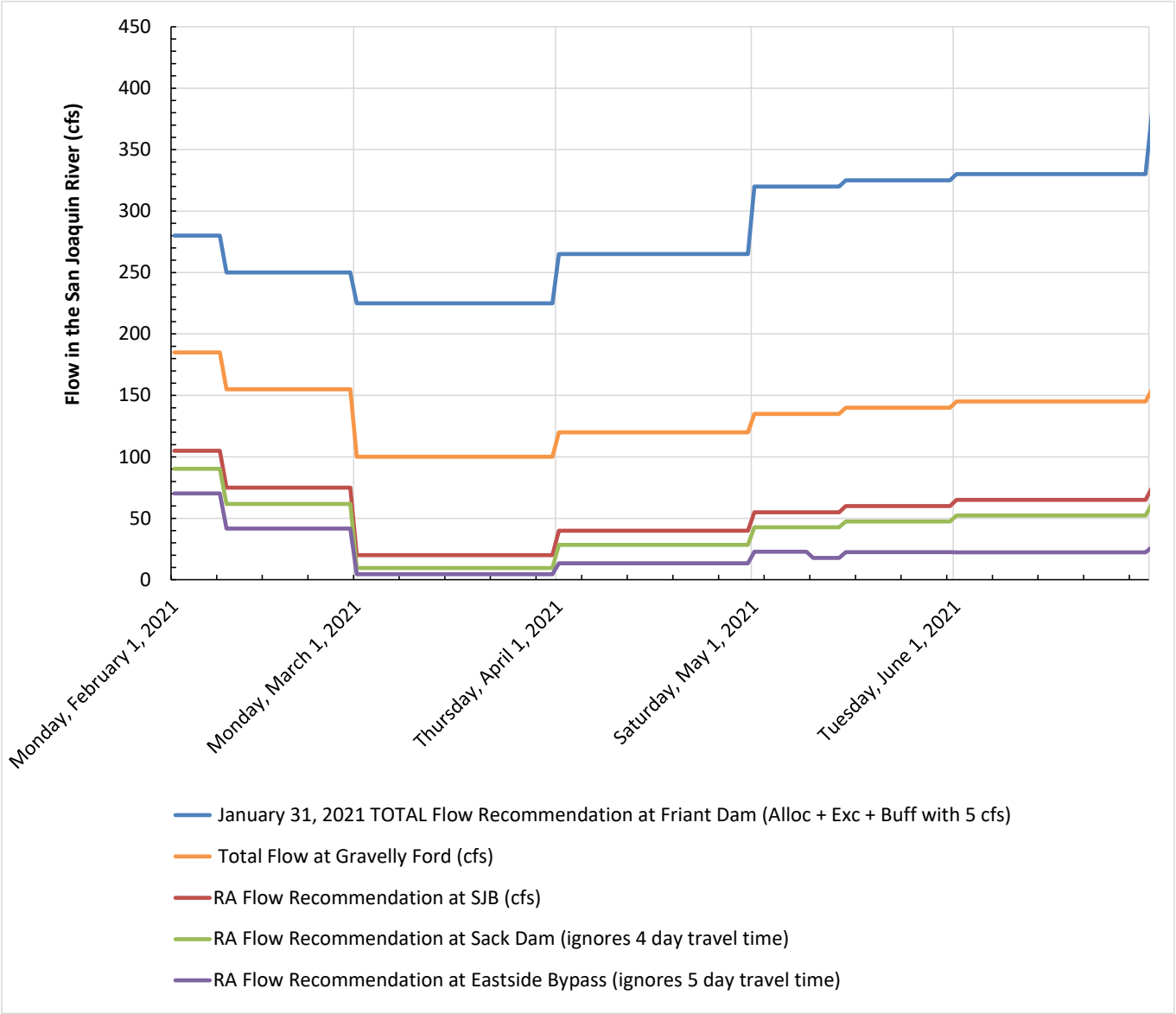
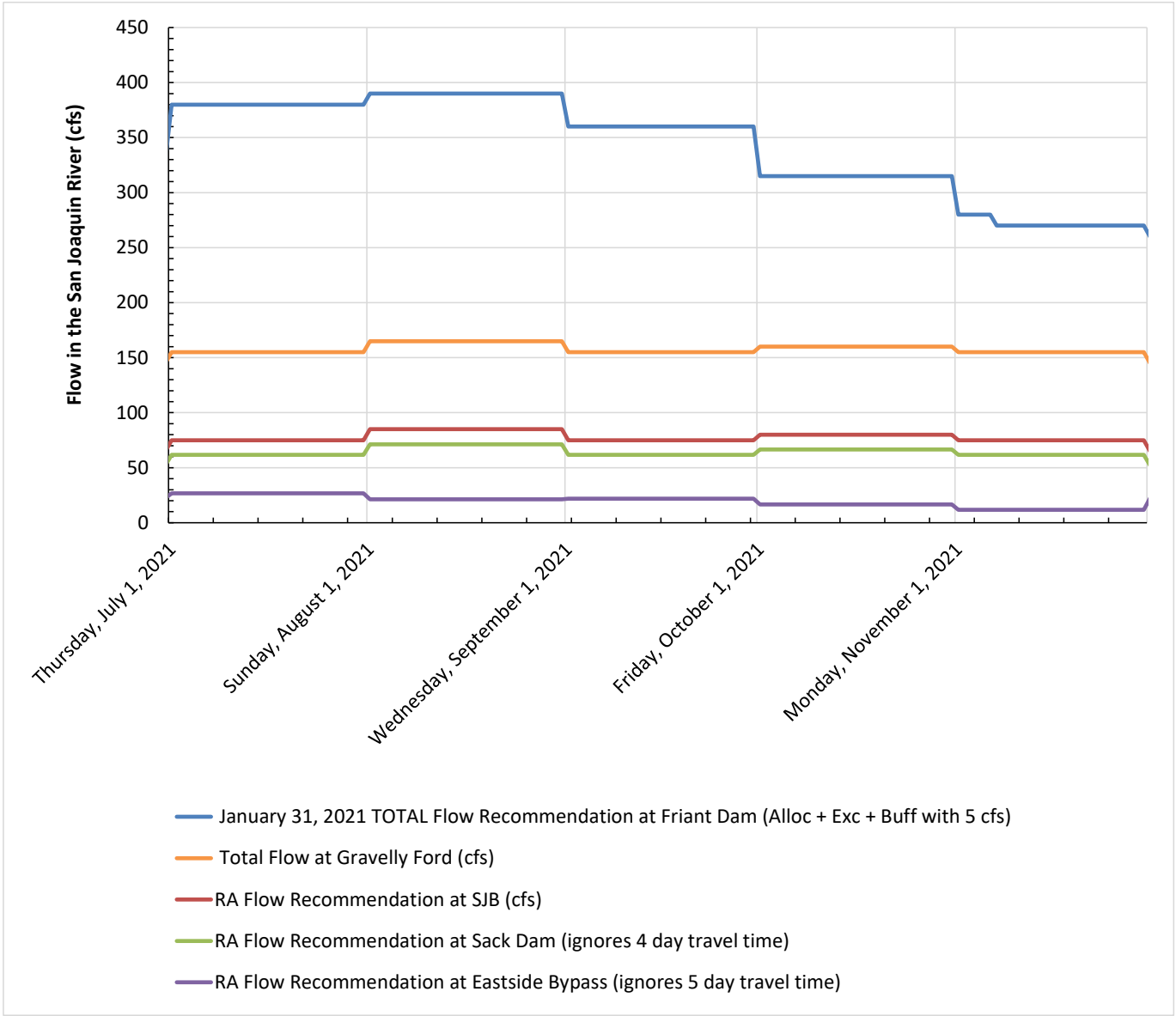


Figure 2 2022 Restoration Flows, July - November



Restoration Flow Tables

Summary Volumes			
GRAVELLY FORD FLOWS AVAILABLE VERSUS RA RECOMMENDATION			
	Available	**Used**	**Balance**
Total GRF River Flow Target without 5 cfs (March 1, 2020 - Feb 28, 2021	**102.417 TAF**	**99.471 TAF**	**2.946 TAF**
Allocation Flow	70.919 TAF	70.919 TAF	**0.000 TAF**
Exchange Flow	21.425 TAF	21.421 TAF	**0.004 TAF**
Buffer Flows	10.073 TAF	7.131 TAF	**2.942 TAF**

BUFFER FLOWS (Volumes per RFG V2.1 Section 9.3)			
	Available	**Used**	**Balance**
Cumulative FLEXIBLE Buffer Flows May 1 - Sept 30 =	3.642 TAF	0.922 TAF	**2.720 TAF**
Cumulative FIXED + FLEXIBLE Buffer Flows May 1 - Sept 30 =	7.284 TAF	5.336 TAF	**1.948 TAF**
Cumulative Buffer Flows Oct 1 - Dec 31 (Flex==>Sept 3-Jan 28) =	2.789 TAF	1.795 TAF	**0.994 TAF**
Total Buffer Flows =	10.073 TAF	7.131 TAF	**2.942 TAF**

ACCOUNTS SUMMARY at Gravelly Ford, this Restoration Year			
	Available	**Used**	**Balance**
Continuity (Baseflows):	29.365 TAF	70.919 TAF	-41.554 TAF
Spring Flexible Flows:	40.959 TAF	0.000 TAF	40.959 TAF
Fall Flexible Flows:	0.595 TAF	0.000 TAF	0.595 TAF
Riparian Recruitment Flows:	0.000 TAF	0.000 TAF	0.000 TAF
Extra Summer Flow (Water Supply	0.000 TAF	0.000 TAF	0.000 TAF
Total:	**70.919 TAF**	**70.919 TAF**	**21.425 TAF**
URF Exchanges Scheduled:	21.425 TAF	21.421 TAF	10.077 TAF
Buffer Flows:	10.073 TAF	7.131 TAF	2.942 TAF
Last Year Feb Flows:	0.000 TAF	0.000 TAF	0.000 TAF