Restoration Administrator Flow Recommendation

To: Ali Forsythe, Chad Moore, Katrina Harrison, Emily Thomas
CC: Michael Jackson, Rufino Gonzalez, Lui Zaninovich, Peter Vorster, Steve Ottemoeller, TAC
Date: June 16, 2016
From: Tom Johnson, Restoration Administrator
Subject: Recommendations for Balance of 2016 Restoration Flows

The following is an updated recommendation by the Restoration Administrator (RA) for Restoration Flows for the balance of 2016, pursuant to the December 2013 Restoration Flow Guidelines (RFG) and Exhibit B of the Settlement. As always, I reserve the right to change, update and/or modify Flow Recommendations as circumstances change and conditions warrant.

Background

I am in receipt of the May 31, 2016 Restoration Allocation which provides an allocation of 266,932 ac-ft of Restoration Flows as measured at Gravelly Ford. This is reduced from the 276,085 ac-ft from the April 14, 2016 Allocation; additionally, there is potential for further changes or reduction in the allocation going forward.

Considerations for Restoration Flow Releases

From the January 29 Restoration Flow Recommendation, the focus of this year's Restoration Flow releases were identified as:

1. Taking a fundamental step towards implementation of the Settlement by commencing year-round connectivity of the river from Friant Dam to the Merced River confluence.
2. Facilitate outmigration of juveniles and to further refine techniques and methods for juvenile trapping in Reach 1.

The juvenile outmigration studies are completed for 2016, however the objective of full river connectivity is still valid. The May 31, 2016 Allocation identifies specific and continuing challenges for this objective.

The need for environmental sampling for the presence of kangaroo rats downstream of Sack Dam will prevent release of Restoration Flows downstream of Sack Dam until the sampling protocol has been completed and results analyzed. Additionally, the Eastside Bypass sand removal project will further constrain release below Sack Dam from June 1 through at least July, and possibly until August 30.

Maintenance at the canal power plant will occur from approximately June 10 through approximately July 10th. As a result, releases from the dam can be up to 285 cfs, or above 470 cfs, but not between 285 and 470 cfs.

Both holding contract losses and Reach 2B losses are higher than anticipated. While holding contract losses do not impact Restoration Flows, Reach 2B losses will require additional Restoration Flows to achieve flow targets for Sack Dam releases.

Maintenance activities at the Chowchilla Bifurcation Structure and Mendota Pool may impact river flows; details on those maintenance activities are still forthcoming.

Finally, Central Valley Project operations continue to be scrutinized by resource agencies in consideration of delta smelt and winter run Chinook salmon stocks. Additional flow releases from CVP facilities could have impacts on delta operations, and potentially on Millerton operations and therefore on Restoration flows. Details on CVP operations in support of fisheries stocks are still forthcoming.

Recommendation

The RA is recommending the following for the balance of 2016. This Recommendation presumes certain timing for channel constraints and losses, which may prove to be inaccurate. As a result, this Recommendation may be further updated to achieve the objectives of river connectivity.

1. Continue Restoration Flows from Friant Dam above Holding Contract releases as necessary with the target of providing the following Restoration Flows at Gravelly Ford for the balance of the Restoration Year. These recommended Restoration Flow targets at Gravelly Ford may be updated if circumstances change:
    a. 90 cfs of Restoration Flows in June and through July 10. In the event that power plant maintenance constrains release capacity, release at the lower end of the dead band, currently at 285 cfs, during power plant maintenance.
    b. 200 cfs of Restoration Flows from July 11 through August 9
    c. 185 cfs of Restoration Flows from August 10 through August 31
    d. 170 cfs of Restoration Flows in September
    e. 190 cfs of Restoration Flows in October
    f. 340 cfs of Restoration Flows in November (the fall pulse is distributed throughout the month of November)
    g. 230 cfs of Restoration Flows in December
    h. 250 cfs of Restoration Flows in January and February, 2017
2. Upon release of constraints for flows past Sack Dam, commence releases of flows past Sack Dam in the amount of 50 cfs; at that time and based on channel conditions and the results of flow bench evaluations I will provide a recommendation for balance of year releases past Sack Dam.
3. Any Restoration Flows that reach Mendota Pool and are not released past Sack Dam may be recaptured at Mendota Pool.
4. In general, flow changes should occur between 0800 and 1200 on days when they are scheduled to occur. I will work with Program staff to adjust specific time and dates of flow changes as warranted (for example, if a flow change is nominally scheduled to occur on Sunday or a holiday).

This flow recommendation is shown in Table 1, and the volumetric outcome of this flow recommendation is shown in Table 2.

Table 1.

Start Date	End Date	Restoration Flow at GRF	Total Flow at GRF
May 1, 2016	July 10, 2016	90 cfs	95 cfs
July 11, 2016	August 9, 2016	200 cfs	205 cfs
August 10, 2016	August 31, 2016	180 cfs	185 cfs
September 1, 2016	September 30, 2016	170 cfs	175 cfs
October 1, 2016	October 31, 2016	190 cfs	195 cfs
November 1, 2016	November 30, 2016	340 cfs	345 cfs
December 1, 2016	December 31, 2016	230 cfs	235 cfs
January 1, 2017	February 28, 2017	250 cfs	255 cfs

Recommendation for Disposition of URF's, and Other Discussion

This flow schedule will produce a significant volume of Unreleased Restoration Flows (URF's). My recommendation for disposition of URF's is as follows:

1. 85 TAF of URF's were released for sale in "Block 1", with canal losses the total committed to sale is 89,473 ac-ft.
2. 4,461 ac-ft of URF's were released for sale in "Block 2", with canal losses the total committed to sale is 4,696 ac-ft.
3. The allocation uncertainty from earlier this year clearly demonstrate the need for the Restoration Program to have access to water that it can call upon despite uncertainty elsewhere in the CVP, and despite any delays in a Restoration Allocation. Accordingly, I am recommending that 30 TAF of URF's be set aside for banking opportunities, and I will work with Reclamation to identify appropriate banking or exchange opportunities to ensure early season water availability for the Program in future years.
4. Withhold all additional URF's from sale pending an updated Recommendation from me later in the year. This withholding will avoid "overselling" URF's in the event hydrologic conditions turn dry, and will provide additional water to address channel losses.
5. I anticipate that seepage losses in the system may exceed Exhibit B estimates; however it is not clear if this is a unique phenomenon related to the preceding four dry years and lack of connectivity and continuity in river flows, or a condition to be managed in a more sustained fashion.
6. Based on withholding URFs for flows and banking to address uncertainties, I am not planning on utilizing Buffer Flows this Restoration year.

Additional Consultation

I will continue to coordinate with the TAC, Program Office, and technical study leads to monitor release conditions, data collection conditions, juvenile trapping progress and other factors. As necessary, I will be prepared to provide additional Restoration Flow recommendations as necessary. I look forward to the next Allocation, and will make any necessary changes or adjustments at that time.

Table 1

Estimated Flow and Volumes Utilized

Normal-Dry						RECLAMATION DEFAULT FLOW SCHEDULE					RA RECOMMENDED FLOW SCHEDULE					
Schedule Start	Friant Default Flow (cfs)	Friant Capacity Constraint (cfs)	Default Flow Friant Interim Flow (cfs)	Gravelly Ford Flow Targets (cfs)	Exhibit B Riparian Holding Contract Demand (cfs)	Base Flow (acre-ft)	Spring Flexible Flow (acre-ft)	Fall Flexible Flow (ac-ft)	Riparian Recruitment Flow (ac-ft)	RA Flow Recommendation Friant Dam Release (cfs)	RA Recommendation Gravelly Ford Flow Targets (cfs)	Base Flow (acre-ft)	Spring Flexible Flow (acre-ft)	Fall Flexible Flow (ac-ft)	Riparian Recruitment Flow (ac-ft)	URF's from capacity constraints
1-Feb					100					100	5		0			
15-Feb					100					180	85		2,380			
1-Mar	500	1,380	500	375	130		11,008			210	85		2,380			0
16-Mar	1,500	1,380	1,380	1,255	130		39,669			210	85		2,539			3,808
1-Apr	2,500	1,400	1,400	1,255	150		7,438			230	85		476			6,545
4-Apr	2,500	1,400	1,400	1,255	150		4,959			325	180		694			4,364
6-Apr	2,500	1,400	1,400	1,255	150		12,397			230	85		793			10,909
11-Apr	2,500	1,400	1,400	1,255	150		4,959			325	180		694			4,364
13-Apr	2,500	1,400	1,400	1,255	150		7,438			230	85		476			6,545
16-Apr	975.86	1,400	976	831	150		3,276			230	85		317			0
18-Apr	975.86	1,400	976	831	150		3,276			230	85		317			0
20-Apr	975.86	1,400	976	831	150		18,019			230	85		1,745			0
1-May	350	1,440	350	165	190	2,539			0	280	95	1,428			0	
9-May	350	1,440	350	165	190	317			0	480	295	575			0	
10-May	350	1,440	350	165	190	6,030			0	280	95	3,392			0	
29-May	350	1,440	350	165	190	952			0	280	95	536			0	
1-Jun	350	1,440	350	165	190	2,856			0	280	95	1,607			0	
10-Jun	350	1,440	350	165	190	6,664			0	285	100	3,957			0	
1-Jul	350	1,480	350	125	230	2,380			0	285	60	1,091			0	
11-Jul	350	1,480	350	125	230	4,998			0	450	225	9,164			0	
1-Aug	350	1,480	350	125	230	1,904				450	225	3,491				
9-Aug	350	1,480	350	125	230	238				450	225	436				
10-Aug	350	1,480	350	125	230	4,998				430	205	8,331				
31-Aug	350	1,480	350	125	230	238				430	205	397				
1-Sep	350	1,460	350	145	210	8,331				380	175	10,116				
1-Oct	350	1,410	350	195	160			11,683		350	195			11,683		
1-Nov	700	1,380	700	575	130			6,783		470	345			4,046		
7-Nov	700	1,380	700	575	130			4,522		470	345			2,698		
11-Nov	350	1,370	350	235	120			9,124		460	345			13,488		
1-Dec	350	1,370	350	235	120	14,142				350	235	14,142				
1-Jan	350	1,350	350	255	100	15,372				350	255	15,372				
1-Feb	350	1,350	350	255	100	13,884				350	255	13,884				
					TOTAL RELEASE VOLUME (ac-ft):	85,845	112,439	32,112	0		TOTAL RELEASE VOLUME (ac-ft):	87,917	12,813	31,914	0	36,536
											DIFFERENCE (ac-ft):	-2,073	99,626	198	0	
					TOTAL DEFAULT FLOW RELEASE VOLUME (ac-ft):	266,931						132,645	TOTAL RESTORATION FLOW RELEASE VOLUME (ac-ft)			
					TOTAL DEFAULT FLOW RELEASE VOLUME WITH CONVEYANCE CONSTRAINTS (ac-ft):	230,396						97,751	DIFFERENCE WITH CONSTRAINED VOLUME (ac-ft)			
					URF's due to Conveyance Constraints (ac-ft):	36,536						134,287	DIFFERENCE WITH DEFAULT VOLUME (ac-ft)			

Table 1 Notes:

1. *Volumes highlighted have been released at the time of this Recommendation*
2. *All volumes shown are scheduled for release – actual releases may differ as a result of operational considerations or adjustments to the daily flow schedule by the RA, Program and Operations.*