RA INTERIM FLOW PROGRAM RECOMMENDATIONS: Updated April 12, 2013

Background

On April 10 I received a new Allocation and Default Flow Schedule (Allocation) from Reclamation that was based on the April 1 DWR Bulletin 120. The new Allocation is intended to be effective at Noon on April 12, 2013. The April 1 Allocation maintains the Dry Water Year designation but reduces the 90% unimpaired runoff forecast to 750 thousand acre feet (TAF) at Millerton Lake, a decrease of 100 TAF from the 850 TAF runoff forecast in the March 1 Reclamation Allocation. The reduced forecast of unimpaired runoff into Millerton Lake resulted in a Restoration Allocation of 173 TAF, down from the 195 TAF Restoration Allocation provided for in the march 1 Allocation from Restoration. The lower runoff forecast amount does not change the Dry Water Year designation pursuant to Exhibit B of the Settlement; however, it would result in reduction in Friant Dam releases during July/August (see Table 2, also from the updated Allocation). The lower Restoration Allocation would reduce the Interim Flow releases from Friant Dam during July and August to 260 cubic feet per second (cfs), a reduction from the 350 cfs releases provided for the same period in my March 20, 2013, recommended Interim Flow Schedule.

In response to Reclamation's updated April 1 Allocation and consistent with the procedures set forth in the Restoration Flow Guidelines (RFG), I am transmitting the following updated RA Interim Flow Schedule recommendations for review and action by Reclamation.

Factors Considered by the RA in Preparing this Updated Interim Flow Program Recommendation

The April 1 Allocation I received on April 10 is intended to be effective today, April 12. During preparation of my recommendations I consulted with the following persons:

- On Wednesday afternoon (April 10) I participated in the weekly Flow Monitoring and Scheduling conference call, This conference call included agency staff from Reclamation, the three fisheries agencies, and DWR, as well as representatives of the Friant Water Authority (FWA) and the Natural Resource Defense Council (NRDC).

- On Thursday morning (April 11) I participated in the Operations conference call. This conference call included representatives of the Mendota Pool operators, Friant Dam operations staff and other Reclamation staff.

- On Thursday afternoon I also convened a conference call that included five of the six Technical Advisory Committee (TAC) member appointees and two agency fish biologists to discuss the fish management implications of the April 1 Allocation and alternative Interim Flow Schedules based on the Reclamation Default Flow Schedule contained in the April 1 Allocation (see Table 3 below, from the Reclamation Allocation). In preparation for the TAC Scott McBain, the sixth TAC member, did not participate in the afternoon conference call but provided input in the form of alternative

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hydrographs and temperature model information which were the foundation for the substantive discussions during the TAC conference call.

- **Table 1-San Joaquin River Water Year Forecast at Millerton Lake**

Forecast Source	90%	50%	10%
DWR, January 1, 2013	1,020 TAF	1,690 TAF	2,820 TAF
NWS, January 14, 2013	1,017 TAF	1,540 TAF	2,908 TAF
DWR, February 1, 2013	1,060 TAF	1,580 TAF	2,600 TAF
DWR, March 1, 2013	850 TAF	1,190 TAF	1,890 TAF
NWS, March 8, 2013	911 TAF	1,119 TAF	1,871 TAF
DWR, April 1, 2013	**750 TAF**	955 TAF	1,330 TAF
NWS, April 8, 2013	867 TAF	964 TAF	1,187 TAF

Source: April 1 Reclamation Allocation and Default Flow Schedule

- **Table 2—Exhibit B Method 3.1 Hydrograph Volumes**

Flow Period	Default Releases from Friant Dam (cfs)	Flows Targets at Gravelly Ford (cfs)	SJRRP Flows at Gravelly Ford (cfs)	Release Volume from Friant Dam for the SJRRP at Gravelly Ford (af)
Mar 1 - Mar 15	500	375	370	11,008
Mar 16 - Mar 31	1,500	1,375	1,370	43,478
Apr 1 - Apr 15	350	205	200	5,950
Apr 16 - Apr 30	350	205	200	5,950
May 1 - Jun 30	349	164	159	19,270
Jul 1 - Aug 31	260	35	30	3,689
Sept 1 - Sept 30	350	145	140	8,331
Oct 1 - Oct 31	350	195	190	11,683
Nov 1 - Nov 6	700	575	570	6,783
Nov 7 - Nov 10	700	575	570	4,523
Nov 11 - Dec 31	350	235	230	23,266
Jan 1 - Feb 28	350	255	250	29,256
				Total=173,187

Source: April 1 Reclamation Allocation and Default Flow Schedule

The April 10 afternoon Flow Monitoring and Scheduling conference call and the Operations call on Thursday morning April 11 allowed some discussion of the most recent Reclamation Allocation. In particular, the morning Operations call also provided an opportunity for the operators to express their concerns with possible increases in the Friant Dam releases that could occur on Friday, April 12. The morning Operations call today allowed me to stay current on the latest information concerning Mendota Pool operations, expected changes in the coming days and

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operator concerns about the impacts of potential increases in Friant Dam releases on Pool operations. The Flow Scheduling and Operations calls were primarily an opportunity for me to get an understanding of the most recent flow conditions on the river, the status and needs of ongoing fishery studies, and to hear the concerns of participants that I also needed to consider during preparation of an updated Interim Flow schedule recommendation. I had not formulated a response to the April 1 update at that point in time and could not solicit input from the participants on the content of my current recommendations.

Based on the flow scheduling and temperature modeling information that Scott McBain provided for the April 11 afternoon TAC conference call, I was able to have a substantive with the TAC and two agency fish biologists about the most important factors to be considered during formulation of my updated Interim Flow Schedule recommendations. I knew that there were significant concerns about the prospect of increasing Friant Dam releases on the part of both the FWA and the Mendota Pool operators. I also knew that fisheries agencies were concerned about the ability to maintain river flow and temperature conditions that would be compatible with current fish management and monitoring tasks being conducted in reaches 1 and 2 of the river.

The Reclamation Default Flow Schedule (Table 1) included peak Friant Dam releases of 905 cfs. My March 20 Interim Flow Schedule called for maximum Friant Dam releases of 1060 cfs. Based on the discussions during the Flow Scheduling conference call I understood that Reclamation would do what was necessary to find users for increased Friant Dam releases based on my recommended Flow Schedule and avoid the need to put Interim Flows past the Mendota Pool Dam and Sack Dam.

With this information in hand, my discussion with the TAC focused on the fish management benefits and impacts associated with alternative flow schedules that would be consistent with the April 1 Allocation, fish agency study needs, and the terms of the Settlement. Since the capture and relocation of fall run Chinook salmon in November/December of 2012, and continuing with the release of tagged fall run Chinook salmon in March of 2013, the SJRRP has been conducting important fisheries experimentation and modeling activities in reaches 1 and 2 of the river. Managing river flow conditions and temperatures to optimize the ability of the agency fish biologists to monitor and analyze information concerning the recently-released/fall run Chinook salmon and other fish currently found in the river above the Mendota Pool.

The TAC conference call focused on alternative flow schedules consistent with the with the latest Reclamation Allocation and Settlement requirements and the compatibility of the Default Schedule and three flow schedule alternatives with fish management study needs. The TAC consultation conference call included a Reclamation fish biologist and a USFWS fish biologist. During this call I was able to discuss experimental/biological benefits related to each of the three alternative flow schedules discussed in addition to the Default Flow Schedule in Table 3. River temperatures at different flows and different times of the spring were considered to be of critical importance to fish health by the agency fish biologists and TAC members. Based on the comments received during that conference call, I decided to base my current flow release recommendations on management of the flows to achieve/maintain optimal temperatures capable of protecting fish health in a manner that would be consistent with the Settlement. This recommendation was influenced in part by the anticipated release schedule for the remaining tagged juvenile Chinook salmon beginning April 17 and concluding on April 19. Given these release dates for the PIT and acoustically-tagged salmon, enabling a longer period of higher

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releases (1060 cfs) would provide important benefits to already-scheduled monitoring and analysis efforts in the river,

- **Table – Reclamation April 1 Default Flow Schedule**

Date	Flow
Mar 1 – Mar 21	350 cfs
Mar 22 –Mar 27	650 cfs
Mar 28 – Apr 3	600 cfs
Apr 4 – Apr 11	700 cfs
Apr 12 – Apr 30	905 cfs
May 1 – May 6	905 cfs
May 7 – May 7	725 cfs
May 8 – May 8	560 cfs
May 9 – May 9	450 cfs
May 10 –May 28	350 cfs
May 29 – Jun 30	350 cfs
Jul 1 – Aug 31	260 cfs
Sep 1 –Oct 31	350 cfs
Nov 1 – Nov 10	700 cfs
Nov 11 – Dec 31	350 cfs
Jan 1 – Feb 28	350 cfs

Source: April 1 Reclamation Allocation and Default Flow Schedule

assuring at least eleven days of high release volumes and cooler, more favorable water temperatures, for the tagged fish released in mid-April, as well as a prolonged period of cooler water for the Chinook juveniles tagged and released earlier this spring.

RA Flow Schedule Recommendation: April 12, 2013 through February 28, 2014

My updated Interim Flow recommendations are set forth in Table 4 (Recommended Flow Schedule) and Figure 1 (RA Interim Flow Release Recommendations for a Dry Water Year). The recommended flow schedule is designed to manage Friant Dam releases to maintain optimal river temperatures (between 18 and 20 degrees centigrade) for the longest time feasible given the available water allocation and ambient temperatures that will be encountered. My recommendations cover the period starting April 12, 2013, and continuing through February 28, 2014. My recommended flow schedule reflects consultation with those identified in the prior section of this document, including Reclamation staff, agency fish biologists, TAC members, and Mendota Pool operators.

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- **TABLE 4: Updated RA Recommended Interim Flow Schedule: April 12, 2013**

Begin Date	End Date	Recommended Friant Dam Release (cfs)	Exhibit B Riparian Release (cfs)	Gravelly Ford Flow Target (cfs)	Gravelly Ford Flow Allocation (cfs)	Estimated Flows Entering Mendota Pool (cfs)
3/1/13	3/22/13	350	130	225	220	145
3/22/13	3/28/13	650*	130	525	520	425
3/28/13	4/4/13	600*	130	475	470	375
4/4/13	4/12/13	700	150	555	550	455
4/12/13	4/30/13	1,060	150	915	910	806
4/30/13	5/1/13	950	150	805	800	705
5/1/13	5/2/13	760	190	575	570	475
5/2/13	5/3/13	610	190	425	420	325
5/3/13	5/4/13	490	190	305	300	215
5/4/13	5/28/13	350	190	165	160	85
5/28/13	7/1/13	350	190	165	160	85
7/1/13	9/1/13	260	230	35	30	0
9/1/13	10/1/13	350	210	145	140	65
10/1/13	11/1/13	350	160	195	190	115
11/1/13	11/11/13	700	130	575	570	475
11/11/13	1/1/14	350	120	235	230	155
1/1/14	3/1/14	350	100	255	250	175
Totals (TAF):		**290.083**	**116.826**	**176.876**	**173.176**	**122.097**

**RA flow recommendations were 700 cfs, flows lowered by Reclamation due to Mendota Pool water quality*

Recommended Interim Flow Steps (see Table 4 above):

Based on the intent to manage Friant Dam releases to maintain optimal/desirable water temperatures for as long as possible, I recommend the following Interim Flow releases, consistent with the information in Table 4 and Figure 1, and Figure 2 (see Recommended Spring 2013 Interim Flow Releases for a Dry Water Year).

- Interim Flow releases starting March 1, 2013 and continuing through Noon, April 12 are reflected in Table 4 and Figure 1 above. Note that RA flow recommendations between Noon March 22 and Noon April 4 were reduced by Reclamation due to operational considerations at the Mendota Pool.
- Starting at Noon on April 12, 2013, Friant Dam releases should be increased from the current 700 cfs releases to 1060 cfs and continue for eighteen (18) days at 1060 cfs until Noon, April 30.
- At Noon on April 30, Friant Dam releases should be decreased daily at Noon through May 5 at Noon, to 350 cfs in accordance with the following schedule:
    - On April 30 Friant Dam releases should be reduced from 1060 cfs to 950 cfs;

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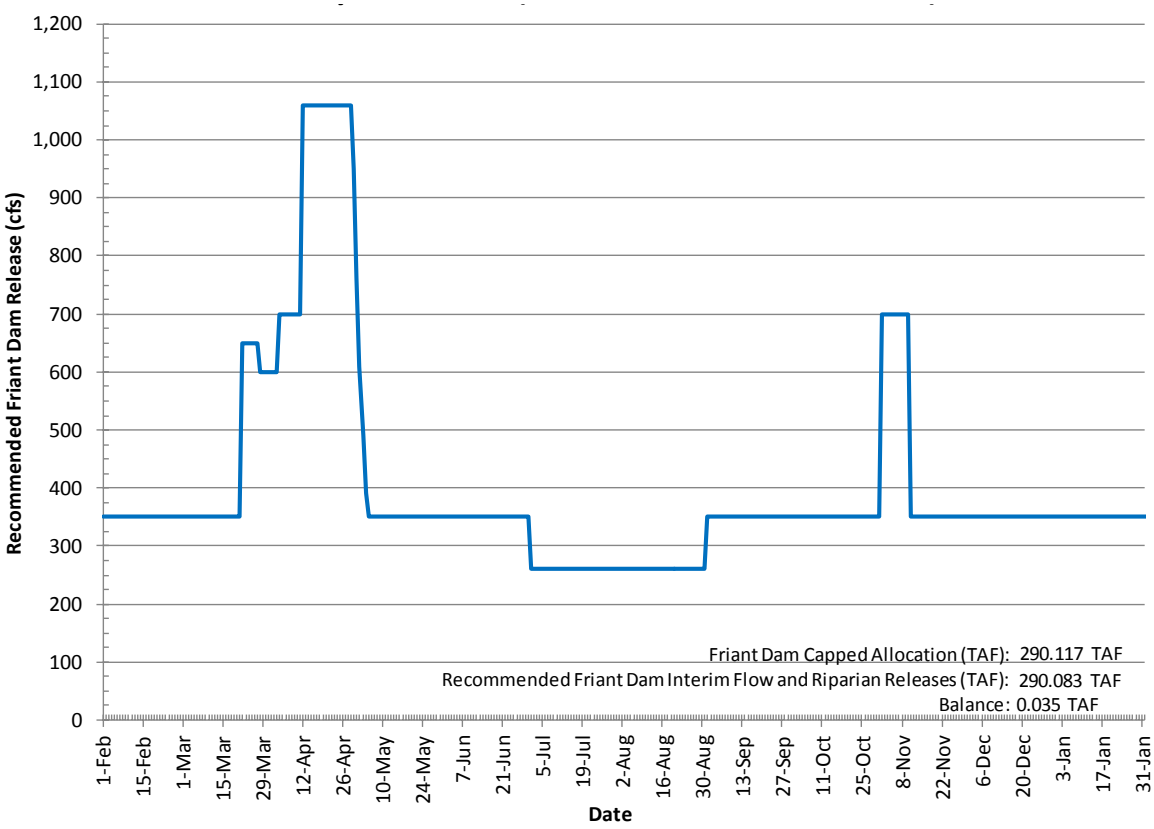
  - On May 1 Friant Dam releases should be reduced from 950 cfs to 760 cfs;
  - On May 2 Friant Dam releases should be reduced from 760 cfs to 610 cfs;
  - On May 3 Friant Dam releases should be reduced from 610 cfs to 490 cfs;
  - On May 4 Friant Dam releases should be reduced from 490 cfs to 350 cfs and maintained at 350 cfs until July 1 at Noon.
- On July 1 at Noon Friant Dam releases should be reduced to 260 cfs and maintained at 260 cfs through September 1 at Noon.
- On September 1 at Noon Friant Dam releases should be increased to 350 cfs and maintained at 350 cfs until November 1 at Noon.
- On November 1 at Noon the Fall Pulse releases of 700 cfs should commence and be continued through November 11 at Noon.
- On November 11 at Noon the Fall Pulse releases should end and releases should be reduced to 350 cfs and maintained at 350 cfs until March 1, 2014 at Noon.

- **Figure 1: RA Interim 2013 Flow Release Recommendations for Dry Water Year**



Implementation of the flow schedule identified in Table 4 and Figure 1 above would result in the release of all but 11 AF of the 173,187 AF allocated for Interim Flows by the Reclamation Allocation (see Table 2 above).

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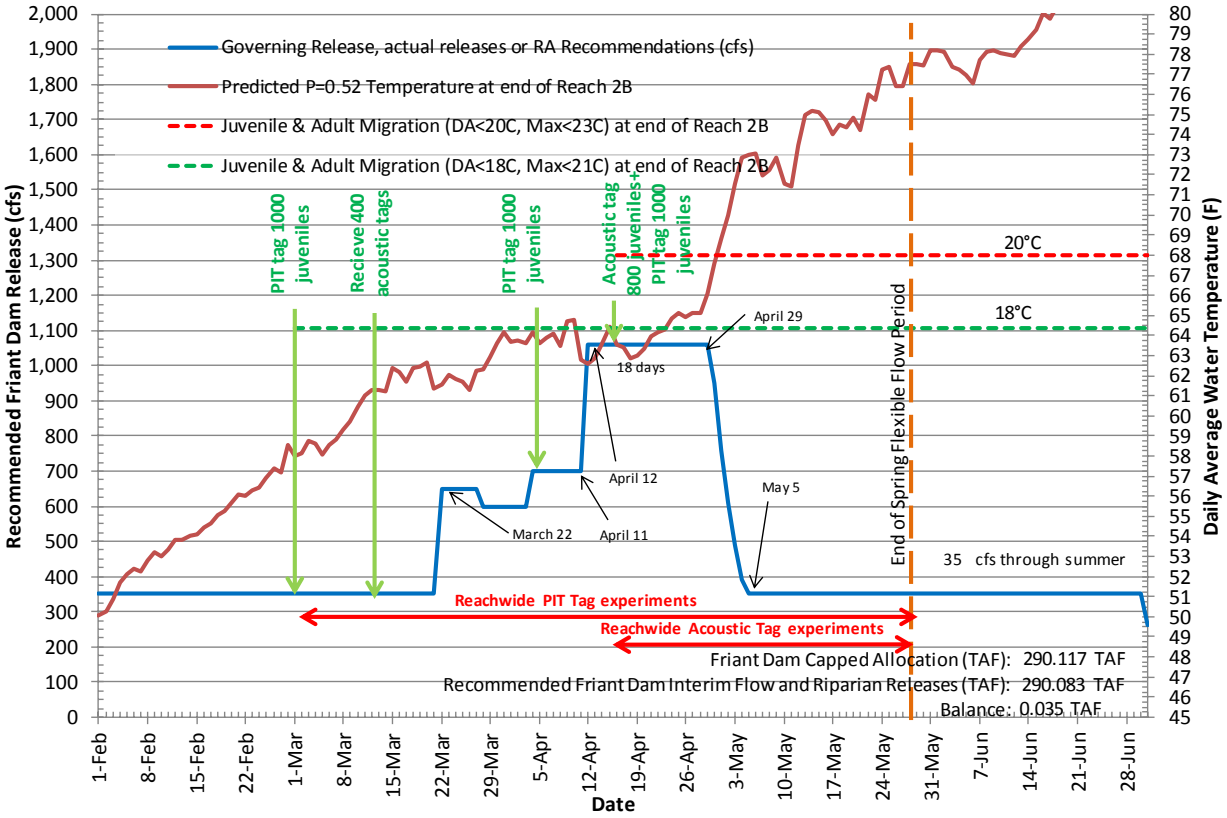
Future Consideration of the Shift to a 50% Forecast

Typically, the water year forecast shifts from a 90% forecast to a 50% forecast on June 1 of each water year. My recommendation anticipates this forecast shift from a 90% forecast to a 50% and assumes that the 260 cfs Friant Dam releases in July and August identified in the Default Flow Schedule submitted by Reclamation (see Table 1) and my current recommendation (see Table 4) may be able to be increased to 350 cfs because the 50% forecast based on the current runoff/precipitation information would yield a 950 TAF flow into Millerton Lake (see Table 5, Additional Flow Schedule, 10th and 50th Percentile, excerpted from the Reclamation Allocation).

- **Figure 2: RA Recommended 2013 Spring Interim Flow Schedule for Dry Water Year**



If the water year allocation gets significantly drier as the year progresses, my recommendation risks limiting the July/August Friant Dam releases to 260 cfs, which would result in only 30 cfs Interim Flows entering Reach 2. Consultation with the TAC and with fisheries staff indicates that the risk of 260 cfs flows in July and August is more than offset by the advantages of releasing 1060 cfs starting April 12 and continuing through April 30.

Updating and Refining the Interim Flow Schedule Recommendation

As the water year progresses I will continue to consult with Reclamation staff and participate in the weekly Interim Flow Monitoring and Scheduling conference calls with agency staff and the non-federal Settling Parties. Each week I will evaluate the latest precipitation data, runoff forecasts, fisheries monitoring updates to determine whether the current recommendation should

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be updated. In addition, Reclamation will be preparing updated Allocation and Default Flow Schedule recommendation for my review based on the latest DWR Bulletin 120 information.

Finally, I understand that my recommendation to increase Friant Dam releases to 1060 presents challenges to Reclamation in terms of finding space/users for the increased Interim Flow releases and I will work with the Reclamation Program Manager to address those challenges in ways that are compatible with the need to establish and maintain optimal conditions for salmon and other fish in the river.

- **Table – Additional Flow Schedule, 10th and 50th Percentile**

Flow Period	Flow Schedule, (10th percentile, 1,330 TAF Unimpaired Inflow, Dry year), cfs	Flow Schedule, (50th percentile, 955 TAF Unimpaired Inflow, Dry year), cfs
Mar 1 - Mar 15	500	500
Mar 16 - Mar 31	1,500	1,500
Apr 1 - Apr 15	1,500	1,438
Apr 16 - Apr 30	985	350
May 1 - Jun 30	350	350
Jul 1 - Aug 31	350	350
Sept 1 - Sept 30	350	350
Oct 1 - Oct 31	350	350
Nov 1 - Nov 6	700	700
Nov 7 - Nov 10	700	700
Nov 11 - Dec 31	350	350
Jan 1 - Feb 28	350	350

Source: April 1 Reclamation Allocation and Default Flow Schedule

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