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**Date:** August 12, 2016 at 2:40:41 PM PDT  
**To:** "RMILLIGAN@usbr.gov" <[RMILLIGAN@usbr.gov](mailto:RMILLIGAN@usbr.gov)>  
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**Subject: RE: SWIM Team: RAFT and mortality model results from August 1, 2016 profile**

Ron,

Consistent with the fisheries agencies' concurrence below, State Water Board Shasta Water Interagency Management Team (SWIM) representatives also concur with the U.S. Bureau of Reclamation's (Reclamation) proposal of August 9, 2016, to modify August releases from Shasta Reservoir to provide cooler temperatures on the Sacramento River to benefit winter-run Chinook salmon (pilot study to achieve 55.0 degrees F 7-day average daily maximum (7 DADM) referenced below) and associated higher average releases of 10,500 cubic feet per second (cfs) from Shasta Reservoir. We understand that further requests may be made related to September and October that will be addressed separately.

The modification is consistent with the provisions of the June 27, 2016 final Sacramento River Temperature Management Plan ([2016 Plan](#)) and the State Water Board Executive Director's approval of that plan dated [July 8, 2016](#) which allows for the 2016 Plan to be revised through the SWIM team process with the goal to create a modified temperature compliance metric and location of the 55.0 degree F 7 DADM through the winter-run spawning area if overall conditions related to temperature control are better than forecasted (e.g., greater than anticipated cold water volume). As of the August 1, 2016 Shasta Reservoir temperature profile, the cold water pool in Shasta Reservoir is approximately 325 thousand acre-feet greater than that modeled as part of the 2016 Plan.

This concurrence is subject to the following conditions:

- ? Reclamation continues to operate to the formal temperature compliance point of 56.0°F daily average temperature at Balls Ferry Bridge.
- ? Reclamation manages releases to maintain 55.0°F 7DADM at the confluence of Clear Creek based on the proposed pilot study outlined below.
- ? Reclamation commits to maintaining a Keswick release of at least 5,500 cfs through January.
- ? Reclamation coordinates Keswick releases in September and October with the SWIM team based on further information available in late August.

Reclamation should continue to notify the State Water Board immediately if conditions related to Sacramento River operations or winter-run Chinook salmon protection change substantially this year. Consistent with Order WR 90-5 and the Executive Director's July approval of the 2016 Plan, the State Water Board may require further changes to the 2016 Plan if warranted based on changed conditions, new information, or upon the request of the fisheries agencies or State Water Board staff. The remaining provisions of State Water Board Order 90-5 and the Executive Director's July 8, 2016 approval of the 2016 Plan remain in effect.

Along with the fisheries agencies, the State Water Board also requests information on where Reclamation and the Department of Water Resources anticipate X2 will be located in the next several months with your proposed operations, as well as information on proposed operations for 2017 related to outflows and protection of pelagic species, including Delta smelt.

Thank you for your ongoing coordination.

Diane

**From:** Roberts, Jason@Wildlife

**Sent:** Friday, August 12, 2016 11:31 AM

**To:** [RMILLIGAN@usbr.gov](mailto:RMILLIGAN@usbr.gov); Pablo R Arroyave; Dibble, Chad@Wildlife; Wilcox, Carl@Wildlife; Little, Shannon@Wildlife

**Cc:** Rea, Maria@NOAA; Castleberry, Dan@fws; Riddle, Diane@Waterboards; [ekiteck@usbr.gov](mailto:ekiteck@usbr.gov); Danner, Eric@@[noaa.gov](mailto:noaa.gov); Jeffrey Rieker; Leahigh, John@DWR; [Ryan.Wulff@noaa.gov](mailto:Ryan.Wulff@noaa.gov); Michelle Banonis; Miles Daniels - NOAA Affiliate; Idlof, [Patti@usbr.gov](mailto:Patti@usbr.gov); Allen, Kaylee; Pettit, Tracy@DWR; Howard, Tom@Waterboards; Swart, [Brycen@noaa.gov](mailto:Brycen@noaa.gov); [Craig.Anderson@fws.gov](mailto:Craig.Anderson@fws.gov); [JAIsrael@usbr.gov](mailto:JAIsrael@usbr.gov); [Matt.Nobriga@fws.gov](mailto:Matt.Nobriga@fws.gov); [twashburn@usbr.gov](mailto:twashburn@usbr.gov); [Garwin.Yip@noaa.gov](mailto:Garwin.Yip@noaa.gov); Satkowski, Rich@Waterboards; Christina Durham

**Subject:** RE: SWIM Team: RAFT and mortality model results from August 1, 2016 profile

Ron,

Thank you for the continued coordination throughout the temperature management season. Based on information Reclamation provided to the SWIM team (e.g. a larger than expected cold water pool) the Department concurs with Reclamation's proposed August release schedule given the following.

1. Reclamation continues to operate to the formal temperature compliance point of 56.0°F daily average temperature at Balls Ferry Bridge.
2. Reclamation manages releases to maintain 55.0°F 7DADM at the confluence of Clear Creek based on the proposed pilot study.
3. Reclamation commits to maintaining a Keswick release of at least 5,500 cfs through January.

4. Reclamation coordinates Keswick releases in September and October with the SWIM team based on further information available in late August.

The Department would also like to understand where you anticipate X2 will be located in these months with your proposed operations. Additionally, we would like to start discussions regarding 2017 operations and the outflow called for in the Delta Smelt Resiliency Strategy.

Thanks,  
Jason

**From:** Allen, Kaylee [[mailto:kaylee\\_allen@fws.gov](mailto:kaylee_allen@fws.gov)]

**Sent:** Thursday, August 11, 2016 2:12 PM

**To:** [Ryan.Wulff@noaa.gov](mailto:Ryan.Wulff@noaa.gov)

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**Subject:** Re: SWIM Team: RAFT and mortality model results from August 1, 2016 profile

Hi Ron- We are supportive of your proposal for August and September. We would like to understand where you anticipate X2 will be located in these months with your proposed operation. Do you anticipate that any of the additional release from Keswick in August will be used to increase outflow? Additionally, we would like to start talking in the very near future about an operational plan for 2017 so that we can work with Reclamation and the other agencies to implement the outflow augmentation action called for the Delta Smelt Resiliency Strategy in a way that will provide benefit for delta smelt in the coming water year. Thanks, kaylee

On Wed, Aug 10, 2016 at 9:29 AM, Ryan Wulff - NOAA Federal <[ryan.wulff@noaa.gov](mailto:ryan.wulff@noaa.gov)> wrote:

Ron,

Thank you for the close coordination throughout the current Sacramento River temperature management season to date. As you acknowledged, the cold water pool (volume of water  $\leq 49^{\circ}\text{F}$  in Shasta Reservoir) is considerably greater at this point of the season than that modeled as part of the Sacramento River temperature management plan (Sac R TMP). The Sac R TMP contemplates the scenario of not being able to meet temperature compliance, and also having more cold water than modeled in June. In the latter scenario, NMFS' June 28, 2016, concurrence on the Sac R TMP states that "If overall conditions are better than forecasted (e.g., greater than anticipated cold water volume), then the plan may be revised through the SWIM team process with the goal to create a modified temperature compliance metric and location of  $55.0^{\circ}\text{F}$  7DADM through the winter-run spawning area." As of the August 1, 2016, Shasta Reservoir temperature profile, the cold water pool is approximately 325 thousand acre feet greater than that modeled as part of the Sac R TMP.

NMFS understands that the metric of 7-day average of the daily maximum temperatures (7 DADM) is new to Reclamation's temperature model, and therefore, proposes to maintain the current formal temperature compliance of 56.0°F daily average temperature at Balls Ferry. However, we support Reclamation's proposed pilot study to operate to 55.0°F 7 DADM at the confluence of Clear Creek (where the current monitored downstream most winter-run redd is located). Based on temperature modeling, and supported by the NMFS-Southwest Fisheries Science Center modeling (attached), Reclamation's proposal to maintain the increased Keswick release throughout August (at 10,500 cfs, compared to the monthly average Keswick release of 10,000 cfs in the Sac R TMP) should be able to meet the 55.0°F 7 DADM at the confluence of Clear Creek. Results from this pilot study will be useful in informing the Shasta RPA adjustment process.

NMFS understands the significant operational challenges Reclamation is experiencing as a result of salinity and outflow management in the Delta, low CVP storage in San Luis Reservoir, and balancing system-wide reservoir operations (e.g., Folsom Reservoir). Reclamation's proposed higher Keswick releases would alleviate most, if not all, of these concerns, in addition to providing more suitable water temperature conditions for incubating winter-run eggs and fry.

In addition, Reclamation proposes higher monthly average Keswick releases in September and October. For October, Reclamation commits to maintaining higher releases through the winter-run emergence season, then reduce Keswick releases to 5,500 cfs through January. This operation is important to ensure no winter-run redd dewatering, but also to provide for stable flows to minimize fall-run redd dewatering.

NMFS concurs with Reclamation's proposed maintenance of a monthly average Keswick release schedule for August. However, NMFS will defer the operational decision for monthly average Keswick releases in September and beyond until a true up of real-time and forecasted operations near the end of August.

Regards,

Ryan

Ryan Wulff  
Acting Assistant Regional Administrator  
NOAA Fisheries, West Coast Region, Central Valley Area Office  
[916-930-3733](tel:916-930-3733)

On Tue, Aug 9, 2016 at 5:52 PM, Milligan, Ronald <[rmilligan@usbr.gov](mailto:rmilligan@usbr.gov)> wrote:  
SWIM Team -

Attached are the latest Shasta cold water data. Also as we discussed last week, Reclamation has a request below to the SWIM Team Agency Leads related to Plan adjustments based on the Plan performance to date. Thanks.

Ron

Dear SWIM Team Agency Leads–

In recognition of better than forecasted Shasta Reservoir cold water pool volume, and in accordance with the Sacramento River temperature management plan (TMP), Reclamation proposes to adjust the TMP to provide a monthly average release of 10,500 cfs in August in order to provide both cooler river temperatures and needed system-wide water supplies.

The Temperature Compliance Point and metric will remain to not exceed 56.0° Fahrenheit (F) daily average temperature (DAT) at Balls Ferry. In addition, as a pilot effort, Reclamation will manage releases to maintain river temperatures not to exceed 55.0°F 7-day average of the daily maximums (7DADM) at the confluence of Clear Creek confluence. This pilot effort will help to inform the Shasta RPA adjustment process to be conducted later this year.

Flow releases would continue to be subject to adjustment for real-time conditions based on plan performance with another assessment of the release schedule in late August. If the Shasta Reservoir cold water pool volume continues to be better than expected at the end of August, Reclamation may request additional changes to the Keswick release schedule, as follows:

September – 9,500 cfs monthly average release;

1 – 15 October – 8,000 to 8,500 cfs average release (or until estimated 100% winter-run fry emergence, whichever comes later);

19 – 31 October – 5,500 cfs flow after estimated 3-day period for flow ramp down.

These modifications are consistent with the attached Model Results labeled "Higher Flows" as discussed at last week's SWIM Team call. Reclamation requests concurrence from the various agency leads on the SWIM Team with the proposed TMP modification for August. Please let me know if you have any questions. Thank You.