

**NMFS draft Technical Assistance on measures to minimize the potential effects to listed species of a WIIN Act section 4003 flex
Updated March 21, 2018**

On March 19, 2018, the U.S. Bureau of Reclamation (Reclamation) shared a draft of the WIIN Act Operations Plan and Biological Review with representatives of the California Department of Water Resources, U.S. Fish and Wildlife Service, California Department of Fish and Wildlife, and NOAA's National Marine Fisheries Service (NMFS). NMFS has reviewed the operations plan and biological review, and agrees with the assessments in the summary tables for Sacramento River winter-run Chinook salmon, Central Valley spring-run Chinook salmon, and Central Valley steelhead that the proposed operations plan is expected to result in "Increased" risks of south Delta/central Delta entrainment and facility loss. For example, the narrative summary for Sacramento River winter-run Chinook salmon concludes that:

"hydrodynamic modeling of the Proposed Operational suggest hydraulic alteration that may increase the risk of entrainment into the central Delta. Maintaining a short period of OMR flows more negative than -5,000 cfs may increase the risk of loss at the Central Valley Project (CVP)/State Water Project (SWP) fish collection facilities for any winter-run Chinook Salmon in the south Delta during and after the five days of increases [sic] export."

The Delta Operations for Salmonids and Sturgeon Technical Working Group (DOSS) met on March 20, 2018, and provided the following estimates of current fish distribution:

Location	Yet to Enter Delta (Upstream of Knights Landing)	In the Delta	Exited the Delta (Past Chipps Island)
<i>Young-of-year (YOY) winter-run Chinook salmon</i>	3-11%	47-66%	31-42%
<i>Young-of-year (YOY) spring-run Chinook salmon</i>	15-25%	75-85%	0%
<i>Hatchery Produced BY17 Winter-run Chinook salmon</i>	85-90%	10-15%	0%

DOSS stated that "OMR flows more negative than -5,000 cfs will create conditions that are not protective of listed salmonids in the southern Delta."

NMFS is taking the opportunity to provide technical assistance to Reclamation, and offers the following measures to minimize the potential effects to listed species of the proposed WIIN Act section 4003 flex:

1. Preferential pumping through the CVP

Current (March 20, 2018) and potential exports utilizing preferential pumping through the CVP:

Facility	Current Combined Exports (at OMR of -5,000 cfs)	Potential Combined Exports (at OMR of -5,700 ¹)	Preferential pumping through the CVP to CVP capacity
CVP-Jones Pumping Plant	2,700 cfs	3,400 cfs	4,200 cfs
SWP-Banks Pumping Plant	3,900 cfs	3,900 cfs	3,100 cfs

Assuming that the split of entrainment into the CVP/SWP is similar to the split of exports at the CVP/SWP, preferential pumping through the CVP would reduce the potential risk of salmonid loss at the SWP since the loss associated with a salvage fish is much higher at the SWP than at the CVP. The following is an example of a simplified loss calculation based on the salvage of a single fish at the CVP and SWP.

Facility	# fish observed (30-minute count)	Expanded salvage (to 2 hours)	Multiplication factor used for rough loss estimate	# fish lost
CVP-Tracy Fish Collection Facility	1	4	0.68	2.72
SWP-Skinner Fish Protection Facility	1	4	4.33	17.33

2. Loss-based offramp from WIIN Act Section 4003 flex

NMFS assumes that recent conditions during March are reasonably representative of conditions during the 5-day flex period. The March 2018 loss to date (3/1/18-3/19/18) of non-adipose-clipped winter-run-sized Chinook salmon is 141, or 7.4 non-adipose-clipped winter-run-sized Chinook salmon per day. To minimize the risk of increasing loss rates during a WIIN Act flex, the following offramp could be adopted:

- If cumulative non-adipose-clipped winter-run-sized Chinook salmon loss over the 5-day duration of the flex period exceeds 37 fish (5 days x 7.4 fish/day), exports will be reduced to achieve daily OMR flows no more negative than -5,000 cfs.

3. **Frequency of WIIN Act section 4003 flex:** Any OMR flex pursuant to the WIIN Act section 4003 will be limited to one event per 14 days. If a loss-based offramp is not met during the flex period, NMFS may consider and offer additional technical assistance to Reclamation regarding another WIIN Act section 4003 flex within the 14-day period.

4. **OMR Flow Management RPA Action IV.2.3 – Loss-density triggers:** All action (e.g., loss-density) triggers and associated action responses (i.e., OMR limits of -3,500 cfs or -2,500

¹ For simple calculation, assumption is that the change in OMR is equal to exports

cfs) in RPA Action IV.2.3 should remain in effect throughout the implementation of the WIIN Act section 4003 flex.

NMFS DRAFT