BUREAU OF RECLAMATION

Assessment for CVP and SWP Delta Operations on ESA and CESA-listed Species

June 2, 2025

CVP and SWP export modifications more positive than -5,000 and changes in proposed operations of the DCC gates are unlikely to reduce loss or change the population level effect of exports on Central Valley steelhead.

Executive Summary

Operational Conditions

Section 3.13.3.4.1 of the Proposed Action and Section 8.1.4. of the Incidental Take Permit provide that during Old and Middle River (OMR) Management, the California Department of Water Resources, in coordination with Reclamation, shall provide State Water Project (SWP) and Central Valley Project (CVP) operational outlooks and assessments on a weekly basis to Water Operations Management Team (WOMT).

- The steelhead annual and weekly distributed loss thresholds have not been exceeded.
- As of June 1, 7-day average Qwest was 2,073 cfs. Modeling shows the zone of influence by exports of -5,000 is restricted to the South Delta.

Section 3.7.2.5 of the Proposed Action provide that from May 21 – June 15 DCC gates will close for a total of 14 days. If opened, Reclamation and DWR, through SaMT, will prepare a plan that considers relevant information.

- DCC gates are closed but may open again on June 7 and closed again on June 9.
- Current and historic rotary screw trap and delta fish monitoring information indicate that all winter-run and most CCV steelhead have exited the delta past Chipps Island
- Telemetry data of steelhead indicate that none have recently routed towards the DCC gates.
- Overall, entrainment risk for steelhead into the Interior Delta through the DCC gates is low.

Section 3.7.4.7 of the Proposed Action provide that Reclamation and DWR will conclude the management of OMR for salmonids on June 30 or when mean water temperatures at Mossdale and Prisoner's Point have exceeded 71.96°F (22.2°C) for 7 non-consecutive days.

- As of June 2, Daily mean water temperature at Mossdale has exceeded temperature criteria on 0 days and water temperature at Prisoner's Point has exceeded temperature criteria on 2 days (Figure 1).

Central Valley Steelhead

Loss of natural-origin steelhead has not occurred in the past week. Over the next week, loss of limited steelhead is possible but unlikely, based on historical data, and will not exceed the annual or weekly distributed loss threshold. The steelhead incidental take limit will not be exceeded by any loss that may occur.

Operational and Regulatory Conditions

See current Weekly Fish and Water Operation Outlook document.

Biology, Distribution, and Evaluation of Winter-run Chinook Salmon

- Delta Life Stages
    - Juveniles, Adults
- Brood Year 2025 Information
    - Adult steelhead are migrating through the Bay-Delta
- Brood Year 2024 Information
    - Catch of steelhead at Red Bluff Diversion Dam has slowed. Mean cumulative weekly passage of steelhead during calendar year 2025 through April 20 at Red Bluff Diversion Dam (RBDD) for the last 20 years of passage data is 32%. Most of this brood year passed RBDD in 2024.
    - Delta entry sampling (i.e. Knights Landing RST, Sacramento Trawl) have observed no steelhead in the past week suggesting that few steelhead are still migrating into the Delta. Historically, on average 97% of steelhead have been captured at the delta entry Sacramento Trawl and 95%, on average, have been captured exiting the delta at Chipps Island as of May 27 (see Table 1).
    - Historically, on average 97% of steelhead have been lost at the facilities by May 27 (Table 1). If historical loss trends continue during water year 2025, cumulative loss of juvenile steelhead is expected to continue at a low rate, but not reach the weekly or annual loss threshold (Figure 2).

- Cumulative loss of juvenile steelhead has peaked, based on historical trends, and has been low this water year (Figures 3). Overall, seasonal loss (n=600) has been less than predicted for steelhead (Figure 4) and is 20% of the steelhead annual loss threshold. In the last 7 days, 0 steelhead have been salvaged leading to a weekly 7-day running loss of 0 as of June 2 (Table 2).

Delta Hydrodynamics

Based on forecasted Sacramento and San Joaquin River inflows in the weekly fish and water operations outlook, the Delta hydrodynamics continues to approximate those in a MedMed and MedLo category (USBR 2024). In the MedMed condition, when the modeled proportion of the total DSM2 channel length experiencing medium hydrologic influence at -5,000 and -3,500 is measured, we see the proportion of channel length experiencing hydrologic influence is approximately twice as large at -5,000 from 164,174 feet to 337,165 feet. (USBR 2024 Figure I.3-121). In the MedLo condition, when the modeled proportion of the total DSM2 channel length experiencing medium hydrologic influence at -5,000 and -3,500 is measured, we see the proportion of channel length experiencing hydrologic influence is approximately twice as large at -5,000 from 138,590 feet to 337,919 feet. (USBR 2024 Figure I.3-121).

When considered spatially under the MedMed and MedLo conditions, areas that reflect medium and high hydrologic alteration (0.0-0.75 proportional overlap of estimated velocities) at DSM2 nodes are similar, stable and remain close to Railroad Cut at -5,000 and -3,500 OMR flows (USBR 2024 Figure I.3-107). At OMR values of -5,000 this zone of influence is similar under both hydrodynamic conditions and extends past the Head of Middle River compared to not including Grant Line Canal at -3,500. This zone of influence does not reach Head of Older River under OMR conditions of -3,500 or -5,000.

Evaluation

In the past week, no natural-origin steelhead loss was observed. Natural-origin steelhead loss may continue at a much-reduced rate based on historic trends, modeling, and this year's observations (Table 1, Figures 2, 3, 4, 5). Median predicted loss is expected to occur at similar rates in the –5000 OMRI scenario than the more positive OMRI scenarios (Figure 6) using the Tillotson et. al. model (2022) with a high amount of uncertainty in the predictions.

Hydrodynamics in the Delta suggest the export footprint does not extend into the Interior Delta and remains south of Frank's Tract. These conditions suggest a small risk on entrainment for migrating juvenile steelhead from the Sacramento River and San Joaquin rivers.

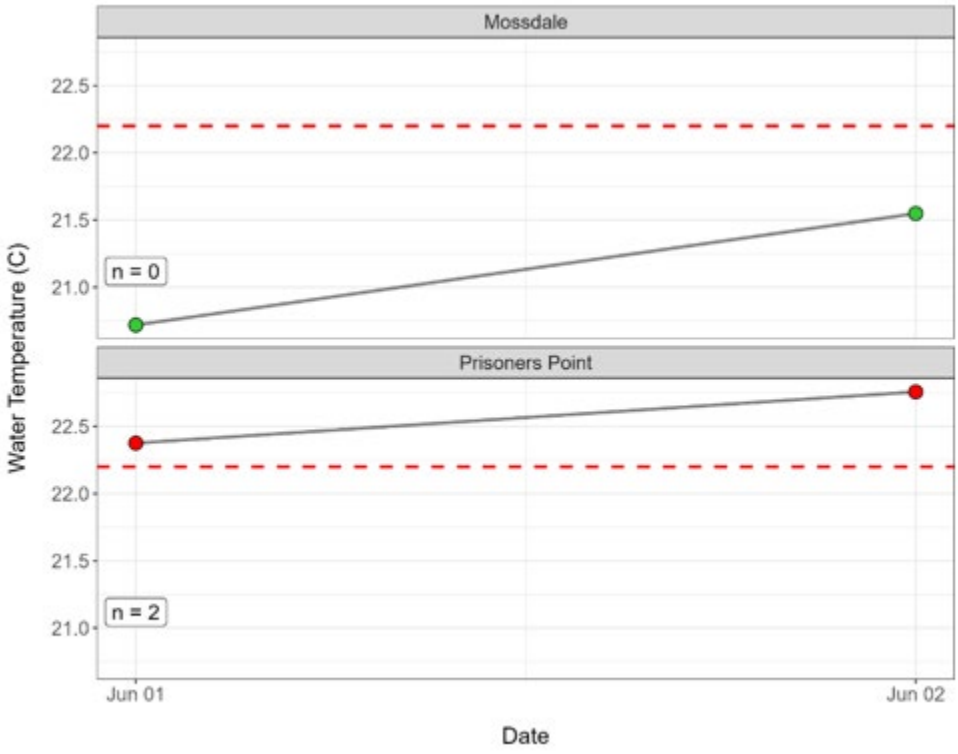

Figure 1. Mean Daily Water Temperature Measurements (in degrees Celsius) at Mossdale and Prisoners Point

Figure 1 is two line graphs showing water temperature (21.0-22.5 degrees Celsius) over dates June 01 to June 02. A dashed horizontal red line indicates water temperatures that have not exceeded and have exceeded that threshold respectively, and text indicates the number of days that water temperatures have exceeded that threshold.

Table 1. Historic migration and salvage patterns for salmon and steelhead. Average percentage and 95% confidence intervals in parentheses. Last updated 6/2/2025.

Species	Red Bluff RST	Knights Landing RST	Sac Trawl Catch	Chipps Island Trawl	Salvage
Steelhead, Unclipped (January-December)	34% (17%,52%) BY: 2015 - 2024	82% (65%,99%) BY: 2015 - 2024	97% (92%,100%) BY: 2015 - 2024	95% (90%,100%) BY: 2015 - 2024	N/A
Steelhead, Unclipped (Water Year)	N/A	N/A	N/A	N/A	97% (93%,100%) WY: 2015 - 2024

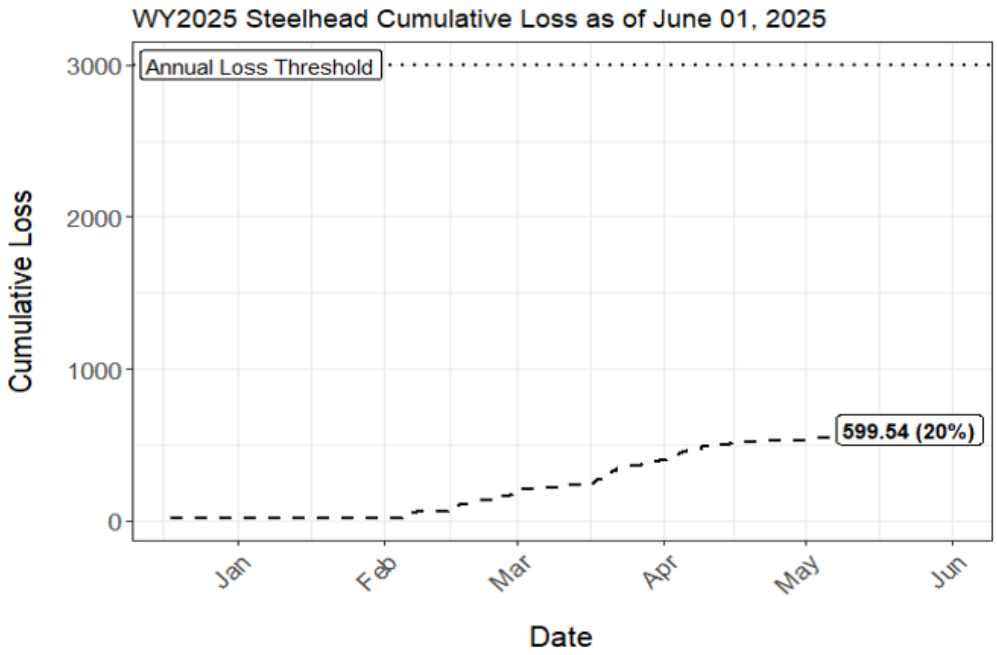

Figure 2. WY 2025 Steelhead Cumulative Loss as of June 01, 2025

Figure 2 is a line graph showing Cumulative Loss (0-3000) over Dates (months January to June). A peak of 599.54 (20%) is reached in early May.

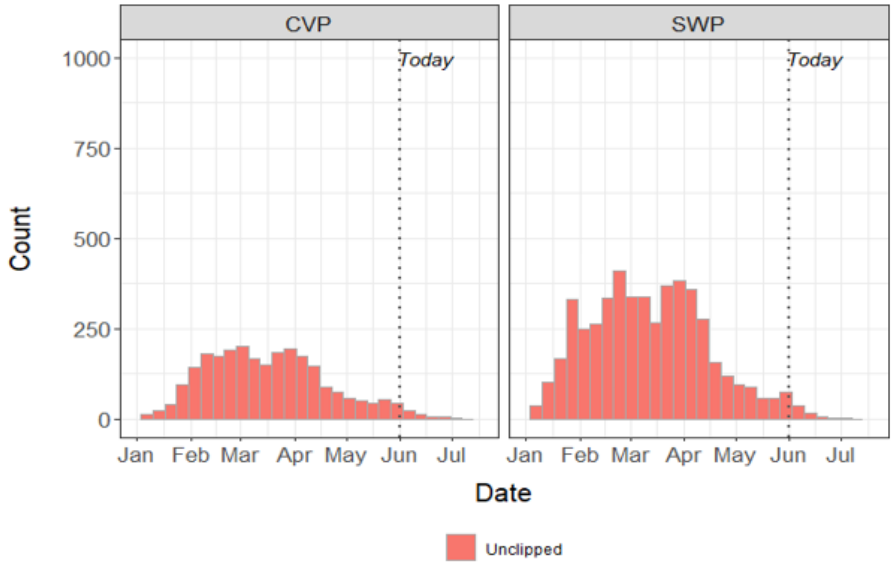

Figure 3. Distribution of Natural Steelhead at the Central Valley Project (CVP) and State Water Project (SWP)

Figure 3 is two bar graphs depicting count of unclipped Steelhead (0-1000) over date (months January-July). A vertical dotted line represents the most current date (June 2).

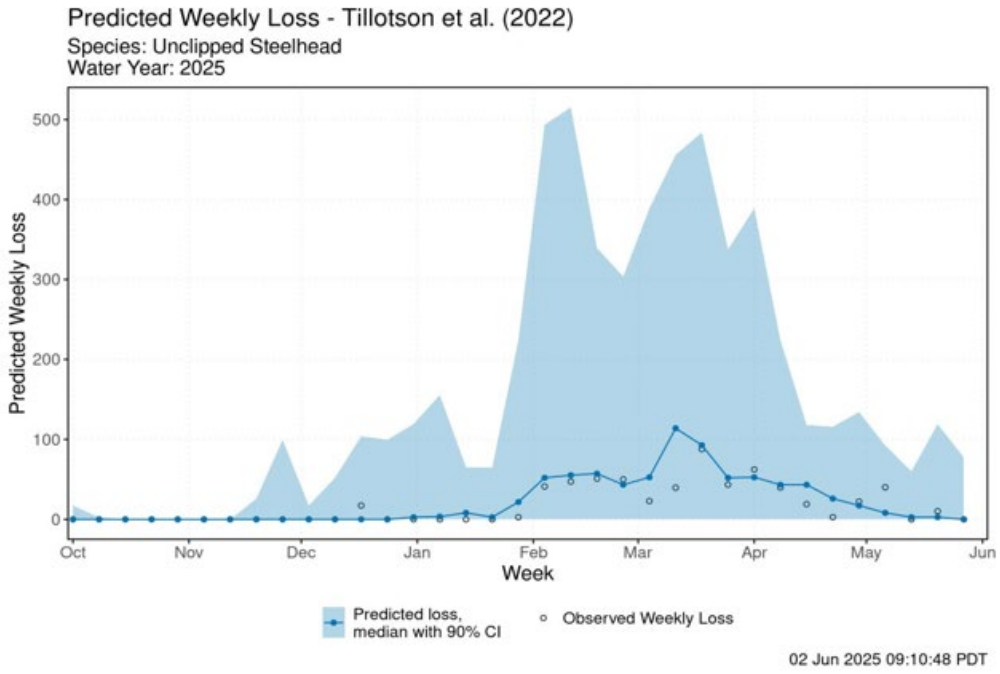

Figure 4. Predicted Weekly Loss – Tillotson et al. (2022)

Figure 4 is a line graph depicting predicted Unclipped Steelhead loss through the OMR management period using the Tillotson et al. (2022) model. A blue shaded area depicts predicted median loss with 90% CI.

Table 2. Summary of daily loss of steelhead to inform weekly distributed loss thresholds. Steelhead weekly distributed loss thresholds are triggered when 7-day rolling sum of estimated loss 120 fish.

Date	Steelhead Daily Salvage	Steelhead 7-day rolling sum loss	Steelhead Daily Trigger
May 27	0	10	No
May 28	0	10	No
May 29	0	8	No
May 30	0	8	No
May 31	0	5	No
Jun 01	0	3	No
Jun 02	0	0	No

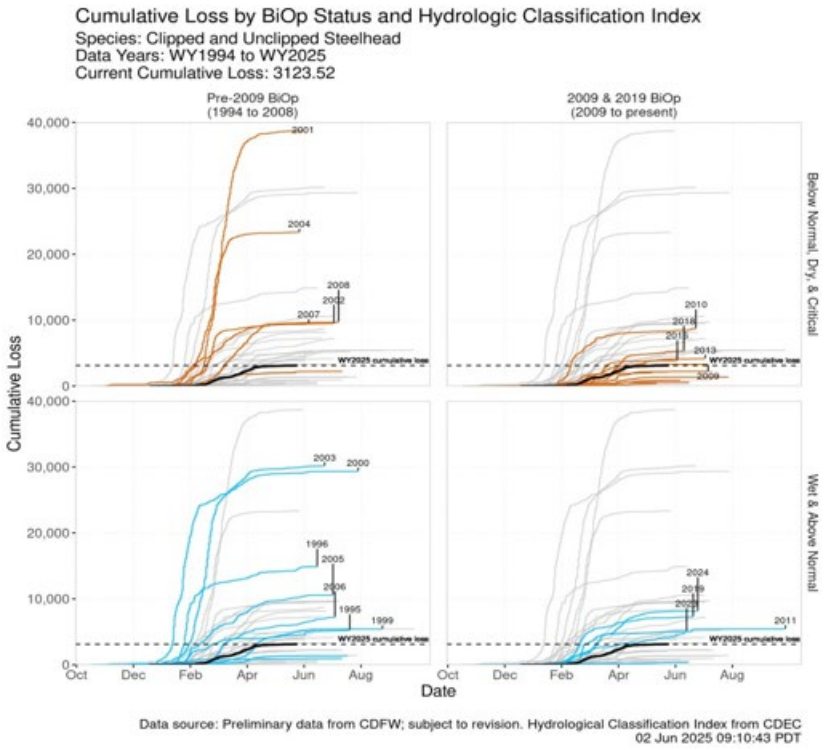

Figure 5. Cumulative Loss by BiOp Status and Hydrologic Classification Index

Figure 5 depicts four line graphs. Each quadrant of the faceted plot includes grey lines for historical years, colored lines (blue for wet years, red for dry years) for years within the BiOp status and HCI type, a black line for the current year, and a dashed horizontal line indicating the current cumulative loss maximum.

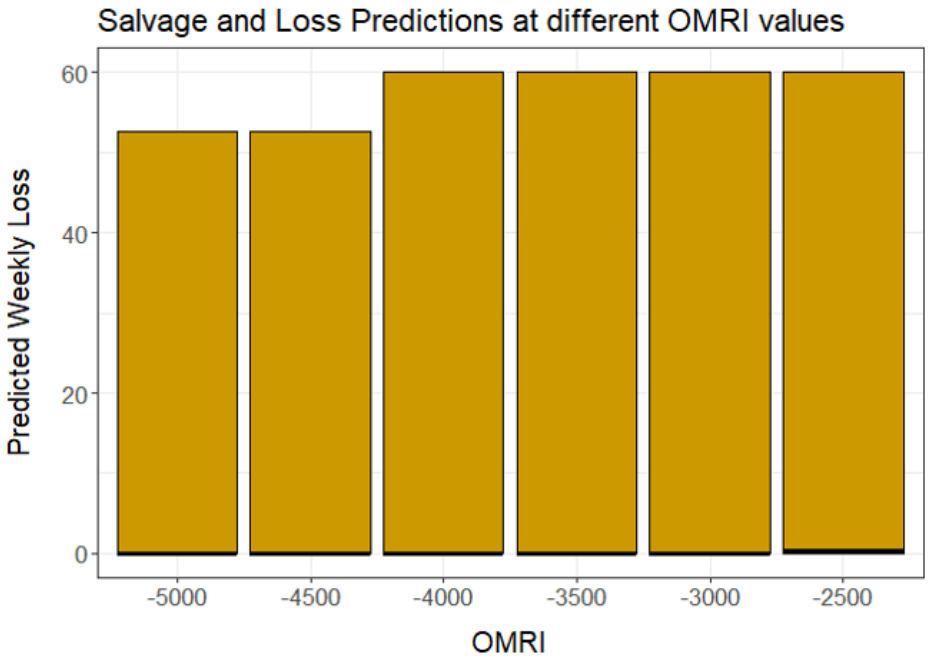

Figure 6. Salvage and Loss Predictions at Different OMRI Values

Figure 6 is a bar graph depicting predicted weekly loss of Central Valley steelhead at different OMRI values using the Tillotson et al model (2022). Bar extents represent 25th and 75th percentile of predicted weekly loss and a horizontal solid line represents median predicted weekly loss. Updated 06/02/25.

References

U.S. Bureau of Reclamation. 2024. Attachment 1.5 Survival, Travel Time, and Routing Simulation Model. Environmental Impact Statement for the Long-term Operation of Central Valley Project and State Water Project. 33 p.

Attachment A: Relevant Proposed Action and Incidental Take Permit Sections

3.7.4.5.5 Steelhead Annual Threshold

In each year, Reclamation and DWR will manage exports to reduce loss at the CVP and SWP salvage facilities. To support survival and decrease entrainment loss, Reclamation and DWR will manage OMR to avoid exceeding the following annual loss threshold at CVP and SWP salvage facilities through the weekly distributed loss threshold described below.

- Unclipped juvenile California Central Valley steelhead loss = 3,000

Annual loss of unclipped juvenile CCV steelhead at the CVP and SWP salvage facilities will be counted cumulatively for each Brood Year, starting July 1st of the calendar year through June 30th of the following calendar year. Loss will be calculated for the South Delta Export Facilities using CDFW's steelhead loss multiplier until a loss method for steelhead (see Section 3.11.1 is approved by CDFW and NMFS. This loss threshold will be used until a new loss threshold is developed through the steelhead JPE Special Study (See Section 3.11.1).

3.7.4.5.6 Steelhead Weekly Distributed Loss Threshold

To minimize the potential for a disproportionate impact of entrainment of steelhead present in the Delta on any single week, Reclamation and DWR will manage OMR based on a weekly distributed loss threshold. The weekly loss threshold is the annual loss threshold distributed over the period of observed steelhead salvage between January 1 and June 30 using the 7-day weekly periods identified in the weekly distributed loss table for winter-run Chinook salmon, extended through June 30. DWR and Reclamation will reduce exports to achieve a 7-day average OMR value no more negative than -3,500 cfs for seven consecutive days when the 7-day rolling sum of steelhead salvage, calculated daily, exceeds the weekly loss threshold of 120 fish.