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Water Year 2025 Seasonal Report for Old and Middle River Flow Management

Central Valley Project, California

California-Great Basin Region

Cover Photo: Sacramento River near Delta Cross Channel Gates
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Water Year 2025 Seasonal Report for Old and Middle River Flow Management

Central Valley Project, California

California-Great Basin Region

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Appendices

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Appendix B - NMFS Juvenile Production Estimate (JPE) letter for brood year (BY) 2024 expected to enter the Delta during WY 2025

Appendix C - Winter-run Chinook Salmon Cohort Report

Appendix D - Latest genetic analysis results for juvenile Chinook salmon salvage for the WY

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Purpose

This is the Water Year (WY) 2025 Supplement to the WY 2024 Seasonal Report for Old and Middle River (OMR) Flow Management that describes Sacramento–San Joaquin River Delta (Delta) operations and actions.

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Background

No supplemental information for WY2025.

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Seasonal Operations

This section supplements relevant OMR seasonal operations for 2025 and updates key figures and tables. As a supplemental report, figures 1 and 3 and table 10 are not updated for 2025. See 2024 OMR Seasonal Report for these figures and table. Figures 11-14, 22, and 28-31 and tables 6-9 have been deemed unnecessary and removed for this report and future reports. Figures 34-38 are new for this report. The structure of the report was updated in WY2025, so Figure and Table numbers may appear out of sequence in this report to remain consistent with Figure and Table numbers from the WY2024 report.

New in 2025

The 2024 Interim Operation Plan (IOP) began on March 28, 2024, and expired on December 20, 2024, when the Record of Decision (ROD) was signed. Following this date, new OMR seasonal operations were implemented including actions for listed salmonids and smelts.

Operational Background Information

WY 2025 started promising with the Sacramento Valley Water Supply Index (SVI) at Above Normal. December experienced considerable regional differences in precipitation. The Northern part of the state, from Sacramento north, received well above average precipitation with an above average snowpack and runoff while south of this continued to be below average. This disparity of higher precipitation in the north and lower in the south persisted throughout the water year. The San Joaquin Basin received two-thirds of its average precipitation, which exceeded the 75% exceedance for the region. The Sacramento River Unimpaired Runoff was 20.6 MAF (117% of average), which resulted in the final water year type for WY 2025 as Above Normal (9.08) for the Sacramento Valley Index and Below Normal (2.56) for the San Joaquin Valley Index.

Runoff for the North basin peaked in early April resulting in higher-than-expected flows for that month when large portions of the snowpack melted out and resulted in below average May flows. The basins south of Sacramento started with a below average snowpack but April was near-to-above average for the month. The May Water Supply Index (WSI) and Bulletin 120 reported all rivers in the Sacramento Basin above average except the American River which was at 98% of average. For the San Joaquin Basin, the San Joaquin River was flowing at 89% of average, but the Mokelumne and Stanislaus rivers registered at just 70% of average. For the Tulare, both the Tule and Kern were above average at 122 and 106%.

Major project storage facilities from the Sacramento, Feather, American, and San Joaquin River systems experienced reservoir storage fill management operations resulting in elevated reservoir releases. During the winter, Delta conditions reflected these releases, yielding high Delta outflows with peak Net Delta Outflow reaching above 208,942 cfs. WY 2025 started in balanced conditions through November 24, 2024, then conditions shifted to excess conditions on November 25, 2025. Soon after, on December 16, 2024, the conditions went into excess and excess with restrictions through June 8, 2025. Conditions changed to balanced conditions the next day on June 9, 2025.

As of June 2025, all major upstream project reservoir storages were above the 15-year averages of 110% or higher. Both Trinity and New Melones reservoirs experienced a notable full storage condition.

Delta Cross Channel (DCC) Operations

In WY 2025, no Knights Landing Catch Index (KLCI) or Sacramento Catch Index (SCI) exceedances (>3.0 fish per day) occurred that would require action responses of DCC gate closures in October (Figure 4). While there were some Sacramento Catch Indices exceeding 3 in late November (Figure 4), the DCC gates were closed for the season starting on November 18, 2024. Reclamation closed the DCC gate on November 18, 2024, to help meet Rio Vista Flow standards in D-1641. The DCC gates remained closed through May 22, 2025, to reduce entrainment of listed species, protect the facility and avoid scouring inside the DCC, and manage for water quality. Starting May 23, 2025, the DCC was opened on Friday and closed on Tuesday for the Memorial Day weekend and for water quality. This continued on the weekends until the DCC gates remained opened on June 20, 2025, for the summer season, per D-1641.

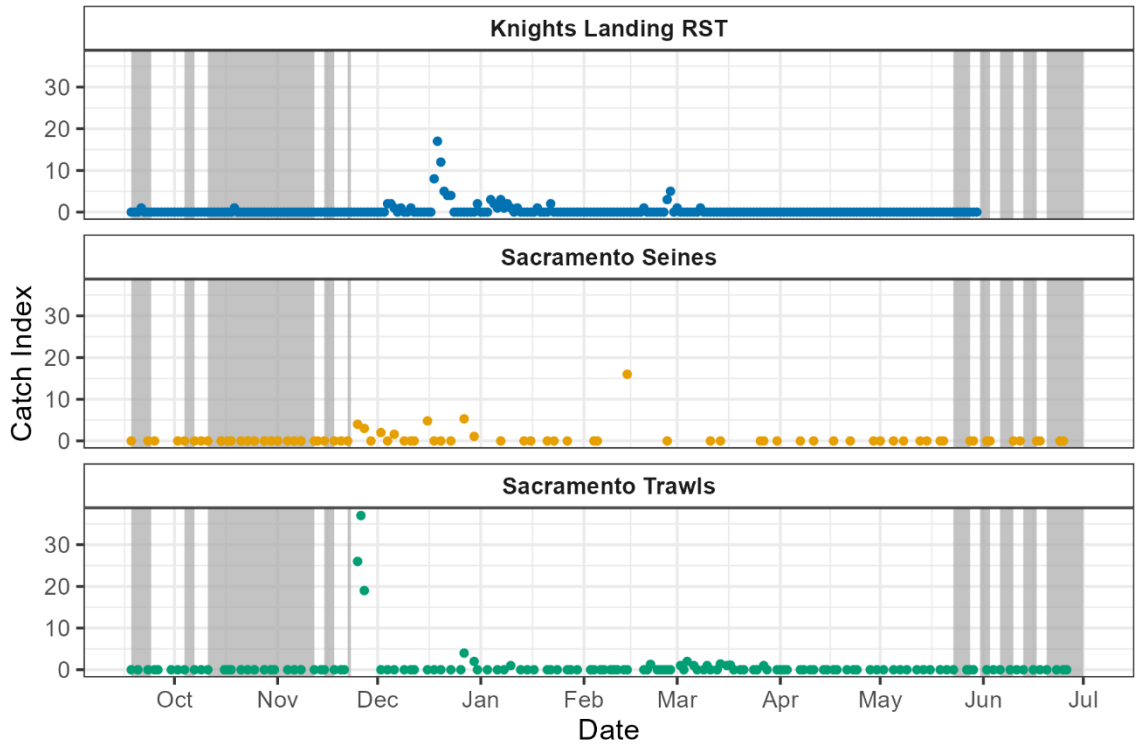

Figure 4. DCC Gate closures (white) and openings (grey), Knights Landing Catch Index (KLCI) at the Knights Landing Rotary Screw Trap (RST) and Sacramento Catch Index (SCI) at both the Sacramento seines and at the Sacramento trawls for natural-origin winter-run Chinook salmon.

The figure shows three different scatter graphs for the Knights Landing RST, Sacramento Seines, and Sacramento Trawls. The y-axis represents the catch index between 0 and 30, and the x-axis represents the months October 2024 through July 2025. Individual dots represent catch index data points for dates. Gray and white bars indicate when DCC Gates were opened or closed.

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Old and Middle River Flow Management

The following section describes the OMR flow management operations and activities for WY 2025.

OMR Flow Management for WY 2025 spanned from January 1, 2025, to June 30, 2025. SWP and CVP operations aligned for the majority of the season with the exception of the Spring Delta Outflow action (ITP 8.12.1), which is described in further detail in the Spring Delta Outflow section. The OMR Index (OMRI) values (1-day, 5-day, and 14-day) for WY 2025 are plotted in Figure 5. For comparison, the measured 1-day OMR value is plotted alongside exports for January-June, the primary OMR management season, in Figure 6. OMR is based on flow measured at gages in Old River and Middle River and while not the compliance measure for OMR Management, is provided to show an alternate measure of hydrodynamic conditions in the south Delta.

The First Flush Action was triggered on December 16, 2024, and implemented from December 19, 2024, through January 1, 2025, targeting an OMRI of –2,000 cfs. From January 2-14, and January 27-31, operations targeted an OMRI of -5,000 cfs. From January 15-16 the Adult Delta Smelt Entrainment Protection Action (formerly Turbidity Bridge Avoidance) limited OMRI to -3,500 cfs. Between January 17-19, California Department of Water Resources (DWR) and Reclamation jointly operated to target QWEST > 1,500 cfs to prevent triggering Larval and Juvenile Longfin Smelt Protection Action, which resulted in OMRI between -3,500 cfs and -5,000 cfs. QWEST dropped below 1,500 cfs on January 19, triggering the Larval and Juvenile Longfin Smelt Protection Action, thus limiting exports to an OMRI of -3,500 cfs between January 20-26. For the month of February, the operations limited exports to -5,000 cfs OMRI between the period of February 1-2 and February 10-28. The Water and Operations Management Team (WOMT) met and agreed to limit exports to an OMRI of –6,250 cfs between February 4 and February 9 for Storm Flex. During Storm Flex, the daily OMRI ranged from -5,964 to -6,141cfs. Between March 1-20, the operations limited exports to -5,000 cfs OMRI and from March 21 to March 31 the operations limited exports to-an OMRI of -3,500 cfs due to Condition of Approval (COA) 8.4.4 (weekly loss threshold). April 1 – April 3 operations targeted an OMRI of -3,500 cfs due to the Directors not reaching a consensus on operations until April 3 for the hatchery-origin Chinook salmon 100% loss threshold exceedance, then Reclamation targeted OMRI of -5,000 cfs between April 4-9 after Directors' discussion of the hatchery-origin Chinook salmon 100% loss threshold exceedance. From April 10 to May 31, the State Water Project (SWP) and Central Valley Project (CVP) were operating to different permit conditions. During this period for SWP, DWR operated to the I/E ratio for spring outflow for the Incidental Take Permit (ITP), which limited exports (SWP's proportional share) to 3:1. For the SWP, that ratio dropped export operations down to health and safety (600 cfs). For the CVP, Reclamation operated to Vernalis E/I ratio for D-1641, which limited exports beginning April 18 and

concluding on May 19. During this period, OMRI ranged from -3,246 cfs to -752 cfs. OMRI from May 20 through May 31 ranged from -3,495 cfs to -820 cfs. During June, operations targeted CVP and SWP exports to achieve 14-day OMRI no more negative than -5,000 cfs.

WY 2025 OMR Flow Management Operations

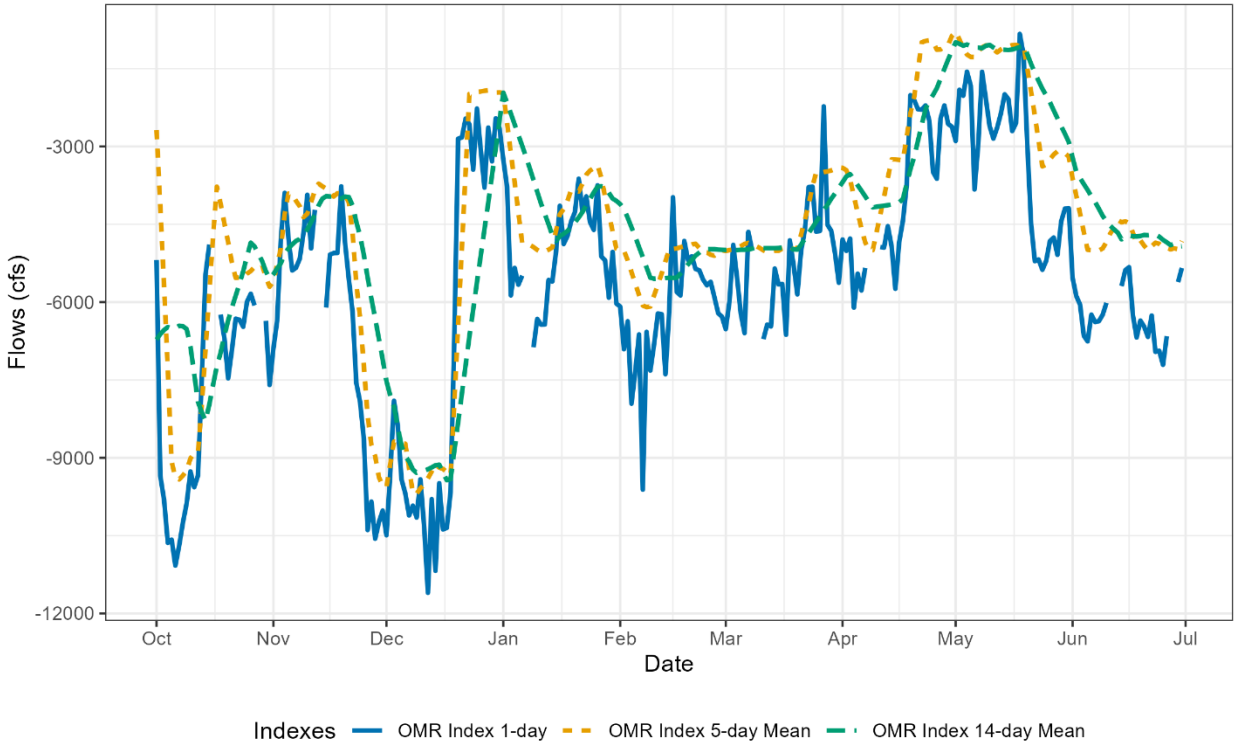


Figure 5. OMR index values measured in cfs (1-day, 5-day, and 14-day) in WY 2025. The OMR 1-day values are queried from CDEC and based on the running average of hourly flow data from Old River at Bacon Island and Middle River at Middle River gages over a 24-hour period. OMR 7- and 14-day values are vetted data provided by California Department of Water Resources.

The figure is a line graph depicting the 1-day, 5-day, and 14-day OMR index values measured in cfs in WY 2025. The y-axis represents the flows in cfs with values between -1200 and -3000 and the x-axis represents the months October 2024 through July 2025. The lines rise and fall with the lowest points being in November and December and the highest points in April and May.

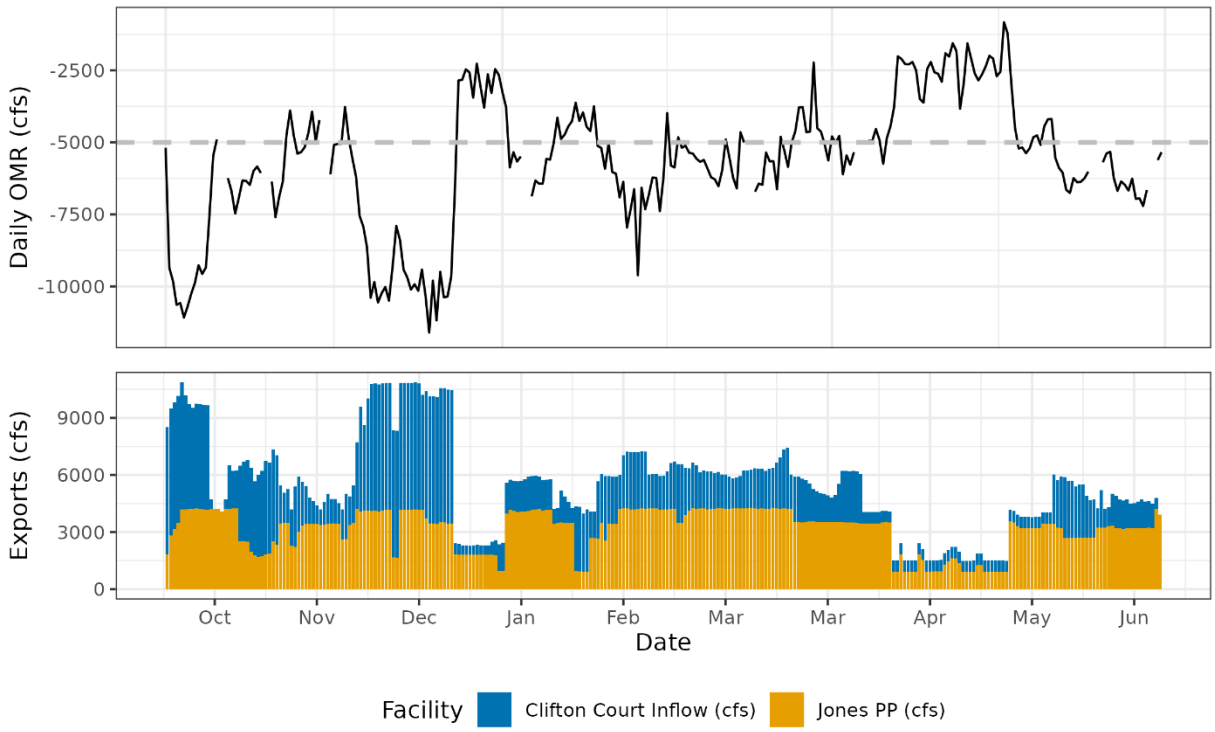


Figure 6. Exports (bottom) from Clifton Court Forebay Inflow (for the SWP) and Jones Pumping Plant (for the CVP) plotted over 1-day OMR measured values (top) for WY 2025. Maximum capacity is the combination of the maximum permitted capacity for both facilities per United States Army Corps of Engineers (CVP: 4,600 cfs; SWP: 6,680 cfs except in mid-December through mid-March when exports can increase to 10,300 cfs in 1/3 proportion to Vernalis flow above 1,000 cfs). The OMR 1-day values are queried from CDEC and calculated as the average of hourly tidally filtered flow at Old River at Bacon Island plusMiddle River at Middle River gages over a 24 hour period (00:00 to 23:59). Grey dashed line represents –5000 OMRI target for the season, but note that 1-day measured OMR may be more negative than –5000.

The figure is a line graph and an area graph. In the line graph, the y-axis represents the daily OMR in cfs with values between -10,000 and -2,500 and the x-axis represents the months October 2024 through June 2025. In the area graph the y-axis represents exports in cfs and the x-axis is also the months October 2024 through June 2025. Two different areas depict the exports from Clifton Court Forebay Inflow and Jones Pumping Plant.

Seasonal changes in controlling factors are summarized in Figure 7. The factors influencing export operations at the start of WY 2025 were generally to meet D-1641 outflow and water quality requirements. Beginning in January the controlling factors changed to OMR

and persisted until early April when ITP export limits (for the SWP) and D-1641 export limits (applicable to both the CVP and SWP but generally controlling in WY 2025 for the CVP) started to control export operations. Starting in mid-May (for the CVP) and in June (for the SWP), OMR controlled both SWP and CVP exports until OMR Management ended at the end of June. Delta hydrologic conditions also changed throughout the season, which can be characterized as either Balanced or Excess conditions, and this could impact management of export operations.

Fall conditions were dry and balanced conditions persisted until winter storm activity sufficiently increased in January. Excess conditions dominated through much of the late winter, spring, and early summer periods as a result of high carryover storage, storm events, spring snowmelt runoff, and flood management releases (Figure 2).

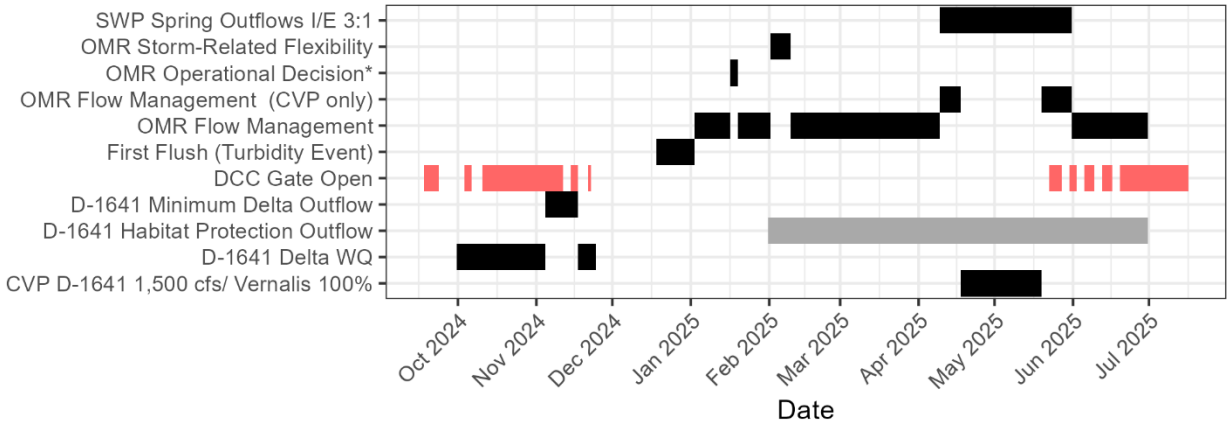


Figure 1. Daily DCC Gate status (light red) and Delta factors (solid black) controlling export operations for October through mid-June of WY 2025. D-1641 Habitat Protection Outflow (grey fill) is a concurrent protective action but may not necessarily be controlling during the OMR management season. **Refers to operations related to OMR Management in which factors outside of the PA, ITP or D-1641 dictated the operational decision. See summary of Old and Middle River Flow Management Operations for more information on this operational decision.*

The figure is a bar chart showing different factors influencing export operations along the y-axis and the x-axis represents the months October 2024 through July 2025. Red fill depicts when the DCC Gates were open, mainly during October-November and June-July. Black fill indicates when export operations were being driven by Delta factors and are present sporadically throughout the year. Gray fill shows when exports were being made for D-1641 Habitat Protection Outflow between February and July.

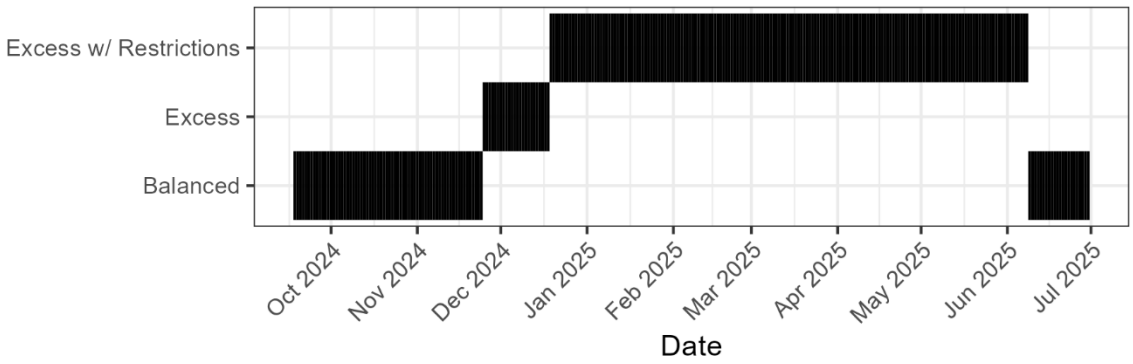


Figure 2. Balanced and Excess conditions in the Delta for October through the end of June of WY 2025.

The figure is a bar chart showing the three conditions: excess with restrictions, excess, and balanced along the y-axis and the months of October 2024 through July 2025 on the x-axis.

Onset of OMR Management

OMR management can occur when: triggering the Adult Longfin Smelt Entrainment Protection Action (with additional conditions described in the Adult Longfin Smelt Entrainment Protection section), implementation of the First Flush Action, or triggering the Adult Delta Smelt Entrainment Protection Action. If none of the actions occur, OMR management season begins automatically on January 1, initiating a 14-day average OMR index no more negative than -5,000 cfs until the end of the OMR management season. In WY 2025, implementation of the First Flush Action triggered the start of OMR management.

(“First Flush” Turbidity Event)

Flow and turbidity conditions for the First Flush Action (formerly the Integrated Early Winter Pulse Protection [IEWPP]) were met on December 16, 2024 (Figure 9). During the WY 2025 First Flush Action, Reclamation and DWR managed exports to minimize entrainment of adult Delta smelt into the central and south Delta. To minimize CVP and SWP influence on Delta smelt migration, the First Flush Action was implemented within three days of the trigger, and the action lasted from December 19, 2024, to January 1, 2025. During this period, Reclamation and DWR reduced exports for 14 consecutive days such that the 14-day averaged OMRI for the period was no more negative than -2,000 cfs.

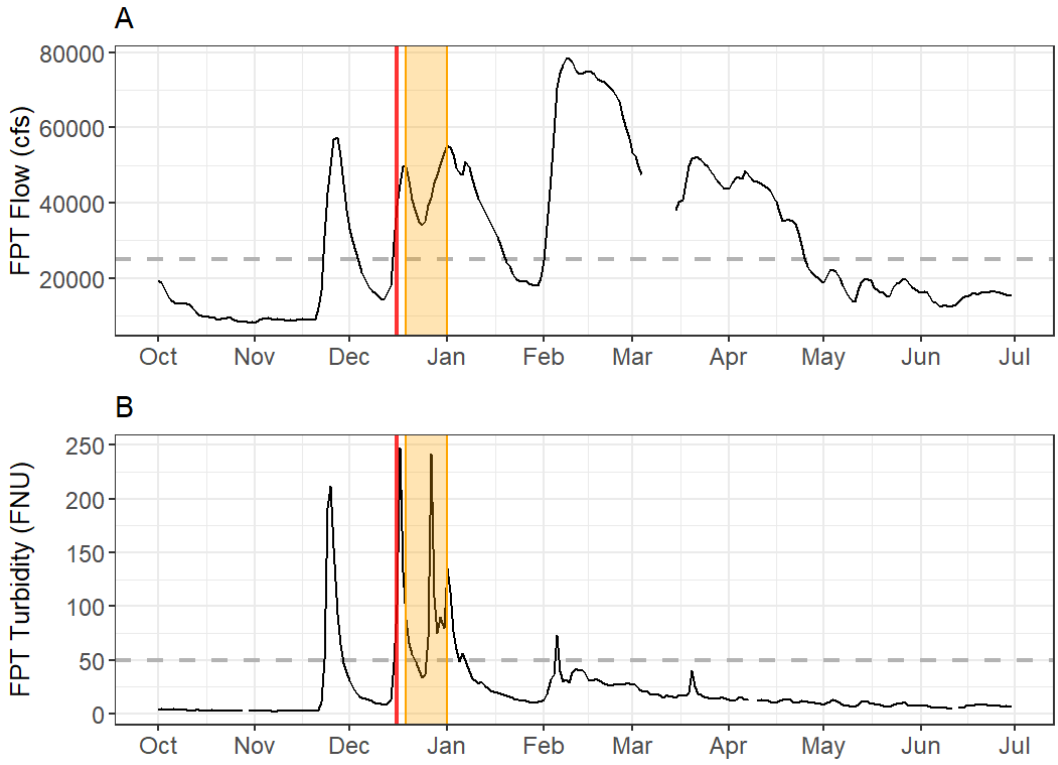


Figure 3. First Flush Action conditions in WY 2025. **A.** 3-day running average flow (cfs) at Freeport (FPT). Dashed line indicates 25,000 cfs threshold. **B.** 3-day running average turbidity (FNU) at Freeport. Dashed line indicates 50 FNU turbidity threshold. For both plots, vertical red line indicates the date the action triggered, and the orange shading indicates the time period the First Flush action was implemented. Data obtained from cdec.water.ca.gov.

The figure shows two line graphs depicting conditions at Freeport. The top graph shows a 3-day running average of flows in cfs on the y-axis the months of October 2024 through July 2025 in the x-axis. The bottom graph has a 3-day running average of turbidity on the y-axis the months of October through July in the x-axis.

Additional Real-time OMR Restrictions and Objectives

Delta Smelt

Adult Delta Smelt Protection Action (Turbidity Bridge Avoidance)

The Adult Delta Smelt Entrainment Protection Action (formerly Turbidity Bridge Avoidance) was active for both the CVP and the SWP from January 1 (after the First Flush Action) through February 24, when the temperature offramp (3-day mean temperature at Rio Vista > 12 °C) was reached. During WY 2025, turbidity at monitoring stations OBI, HOL, and OSJ exceeded the 12 FNU threshold separately on multiple occasions; however, the turbidity at

all three stations exceeded the threshold simultaneously only once, on January 12 (Figure 16). By the time the action response was taken, at least one of the three turbidity sensors was less than 12 FNU for two consecutive days; thus, the Adult Delta Smelt Entrainment Protection Action was implemented and controlling export operations only between January 15 and January 16 (Figure 16).

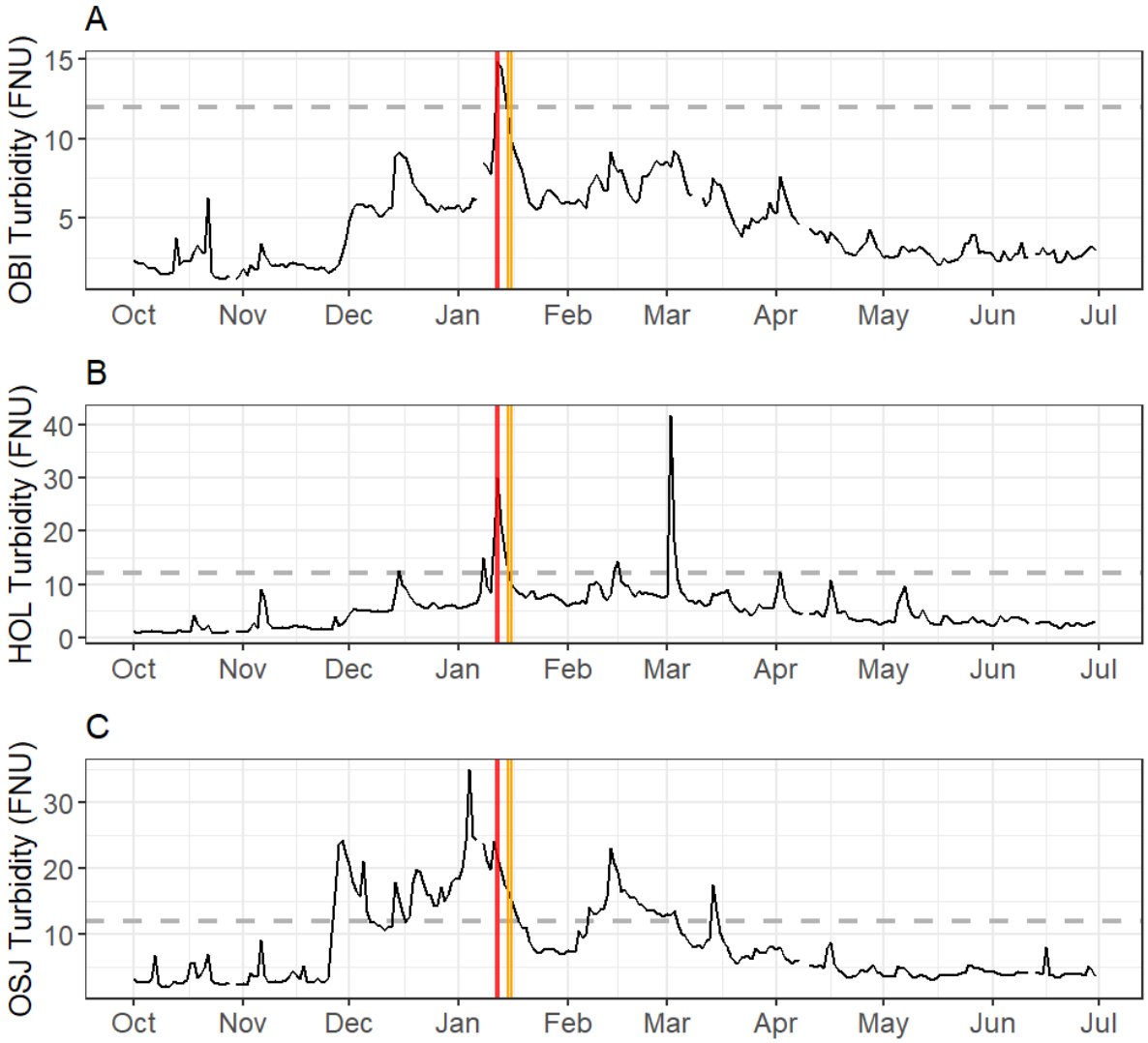


Figure 4. Daily average turbidity (FNU) at (A) Old River at Bacon Island (OBI), (B) San Joaquin River at Holland Cut (HOL; middle), and (C) Old River at Franks Tract (OSJ; bottom) in WY 2025. Dashed line indicates 12 FNU threshold, vertical red line indicates the date the action triggered, and the orange shading indicates the time period the action was implemented.

The figure shows line graphs for turbidity at Old River at Bacon Island (OBI), San Joaquin River at Holland Cut (HOL; middle), and Old River at Franks Tract (OSJ). Daily average turbidity between 0 and 40 FNU are depicted on the y-axis and the months of October 2024 through July 2025 on the x-axis.

Larval and Juvenile Delta Smelt Protection Action

The Larval and Juvenile Delta Smelt Protection Action became active on February 25, 2025, after the temperature offramp for the Adult Delta Smelt Protection Action was reached (3-day mean temperature at Rio Vista > 12 °C) on February 24, 2025, and remained active until June 30, 2025. When average Secchi disk depth is >100 cm, the SWP and CVP operate to meet an OMRI no more negative than -5,000 cfs. When average Secchi disk depth is <100 cm, the SWP and CVP operate to meet an OMRI no more negative than -3,500 cfs. During the active period of this action, the Smelt Larva Survey (SLS)/20-mm Survey South Delta average Secchi depth was < 100 cm only once, on the week of February 25, 2025 (92 cm; Figure 35). However, high flows at Rio Vista (> 55,000 cfs) temporarily off-ramped this action, so no action was implemented at that time. On March 7, Rio Vista flows dropped below the high flow offramp threshold, making the action active again, and SWP and CVP planned to operate to -3,500 cfs OMRI starting on March 10, 2025. However, the action was then off-ramped by the Secchi depth in the subsequent survey on March 10, 2025. Secchi depth then remained greater than 100 cm for the remainder of the season. Therefore, in 2025, no action targeting an OMRI of ≥-3,500 cfs was implemented.

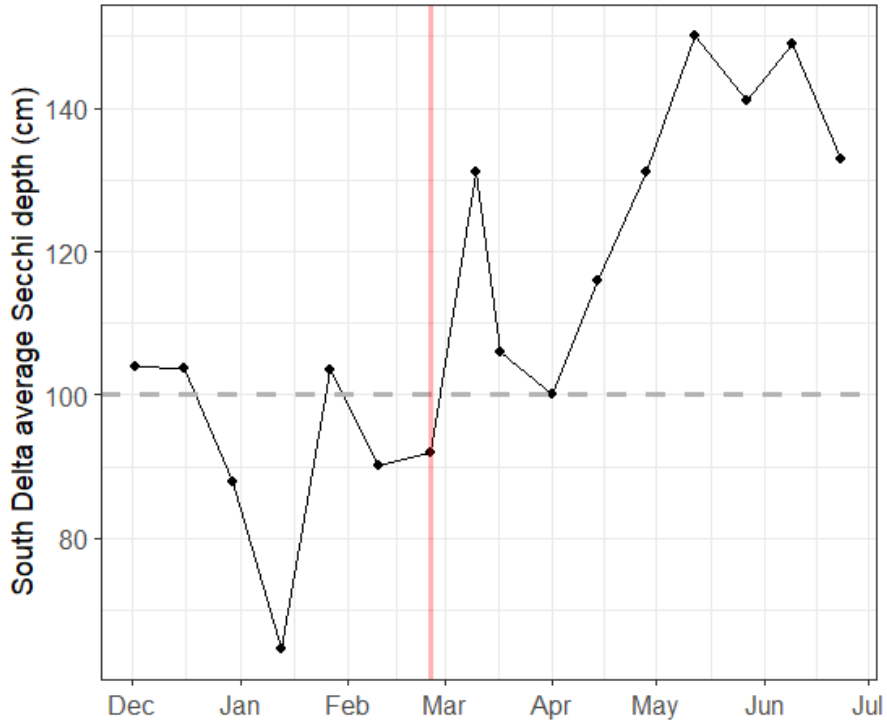


Figure 35. South Delta average Secchi depth (cm) calculated from surveys at 12 South Delta stations. Data are collected at 2-week intervals (points). Horizontal dashed line indicates the Larval and Juvenile Delta Smelt Protection Action threshold of Secchi depth < 100 cm. Red vertical line indicates the date when the action period became active (February 25, 2025).

The figure is a line graph depicting South Delta average Secchi depth ranging from 60 to 160 centimeters on the y-axis and the months of December 2024 through July 2025 on the x-axis. A line is drawn between data points representing the data value collected in 2-week intervals.

Delta Smelt Experimental Release

In WY 2025, U.S. Fish and Wildlife Service (USFWS), Reclamation, DWR, California Department of Fish and Wildlife (CDFW), U.S. Geological Survey (USGS), and University of California, Davis, conducted the fourth Experimental Release of ≥ 200 days post hatch captively cultured Delta smelt. Seven large-scale release events occurred between mid-November 2024 and February 2025, in which thousands of fish were hauled by fish transport truck and released directly into open water (Table 1). A total of 124,946 fish, either adipose fin-clipped or Visible Implant Elastomer (VIE) tagged, were released at either Rio Vista or Lookout Slough (Table 1).

Table 1. WY 2025 Delta smelt Experimental Release events.

Release event	Release date	Release site	Release methods	Release tag	Final number released
1	11/18/2024	Lookout Slough (Cache Slough)	Fish Truck (large-scale, hard release)	Left/ blue/ AD	13,573
2	12/09/2024	Lookout Slough (Cache Slough)	Fish Truck (large-scale, hard release)	Left/ orange/ AD	14,880
3	12/18/2024	Rio Vista	Fish Truck (large-scale, hard release)	Adipose clip	20,219
4	01/08/2025	Lookout Slough (Cache Slough)	Fish Truck (large-scale, hard release)	Right/ blue/ PD	10,024
5	01/22/2025	Lookout Slough (Cache Slough)	Fish Truck (large-scale, hard release)	Right/ red/ PD	25,226
6	01/27/2025	Rio Vista	Fish Truck (large-scale, hard release)	Right/ green/ PD	24,504
7	02/03/2025	Rio Vista	Fish Truck (large-scale, hard release)	Left/ red/ AD	16,520
Total	N/A	N/A	N/A	N/A	124,946

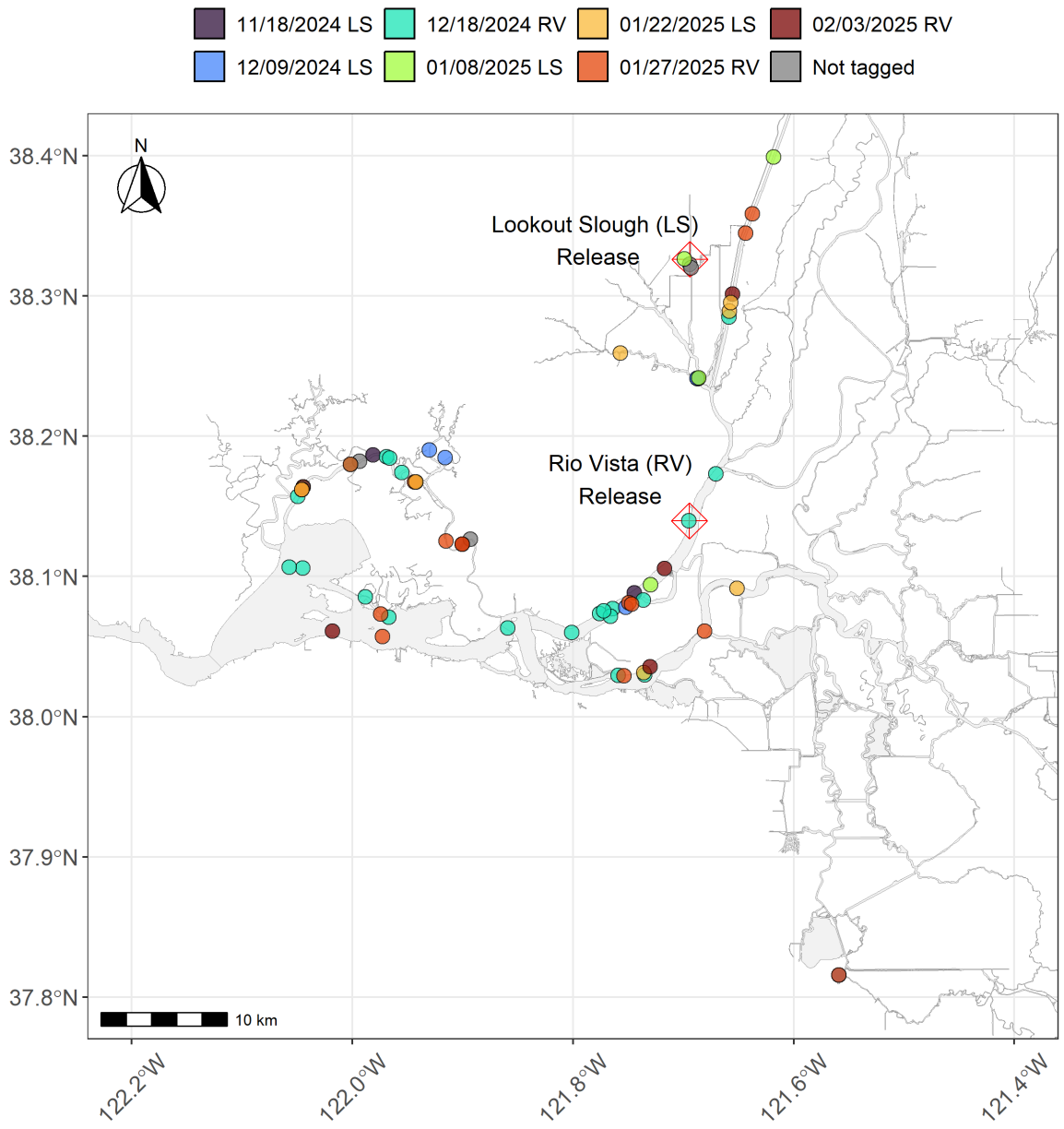


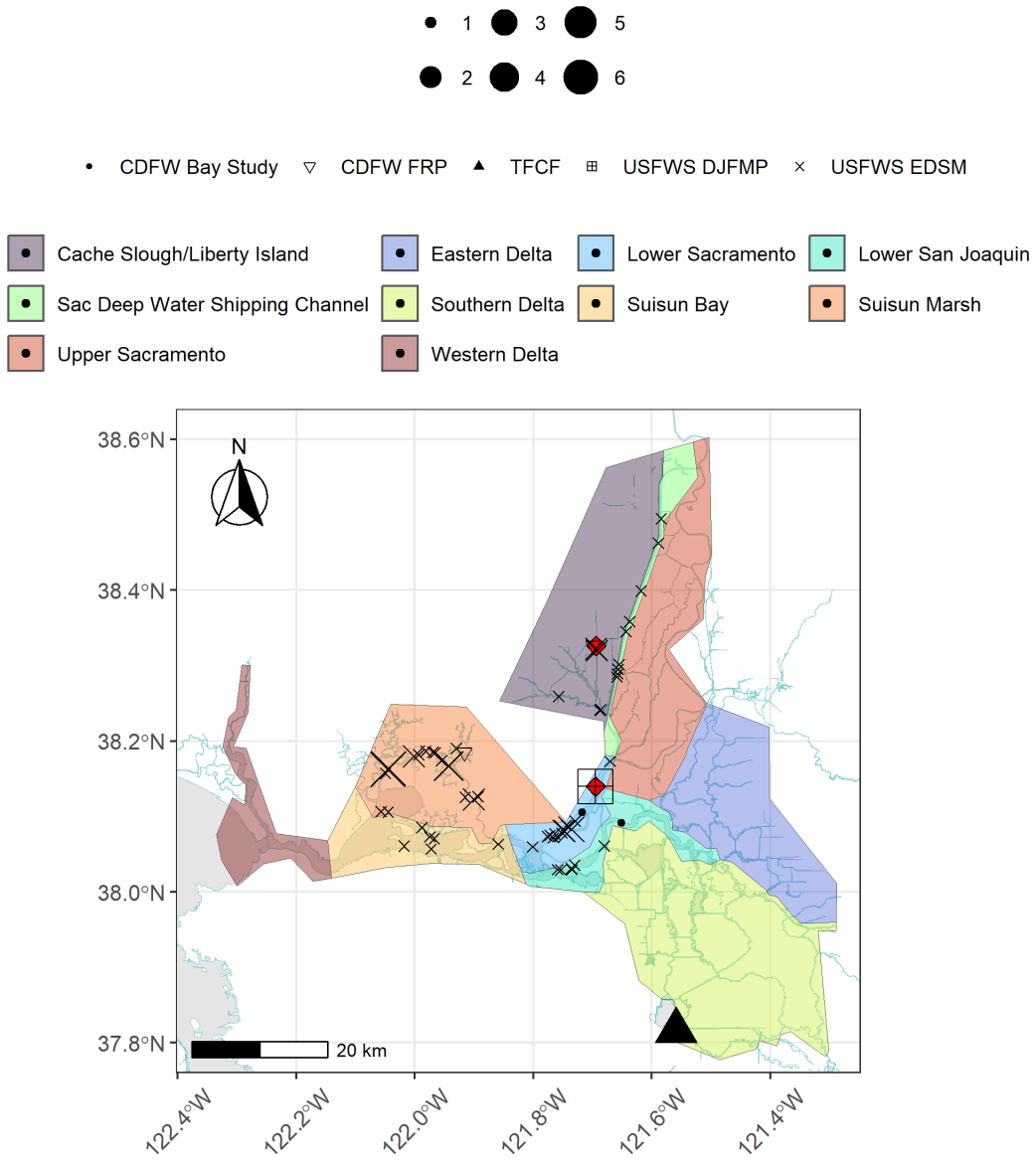
Figure 5. Map of WY 2025 Experimental Release site and subsequent detections of Delta smelt in regular monitoring. Red diamond indicates release sites and circles indicate subsequent detections. Points may be occluding detections from other releases as some sites had multiple detections. Full data used to create this plot may be accessed in Appendix A.

The figure is a map depicting Experimental Release site and subsequent detections of Delta smelt in regular monitoring. The map shows two release sites and numerous dots indicating where Delta smelt were detected on dates ranging from October 11, 2024, to January 27, 2025.

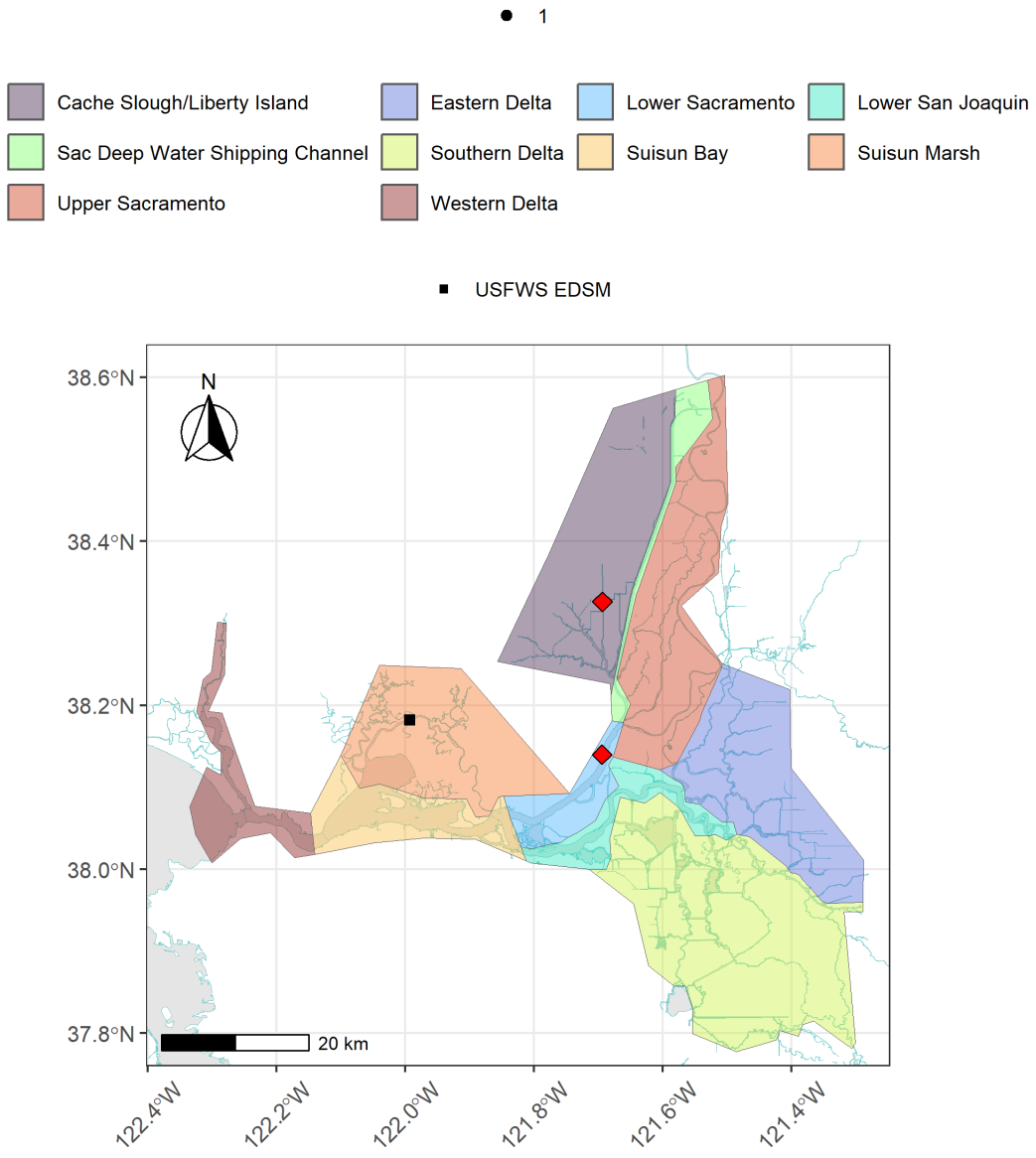
Delta Smelt Monitoring Detections

Between October 1, 2024 – March 17, 2025, 81 adult and sub-adult Delta smelt were detected. Eighty of the 81 adult fish were of hatchery origin (Figure 2). One of the hatchery origin fish did not appear to be marked but was genetically confirmed as hatchery origin. For the purposes of OMR management for both the CVP and SWP, there is no difference between a wild Delta smelt and a cultured Delta smelt. Adult Delta smelt were caught in the Lower Sacramento, Suisun Marsh, Suisun Bay, Cache Slough Liberty Island, Sacramento Deepwater Ship Channel, Lower San Joaquin, and Southern Delta strata (salvage included in the Southern Delta strata) (Figure 18a). See Figure 26 for additional details on salvaged Delta smelt.

Four larval fish were morphologically identified as larval Delta smelt in the 20-mm Survey and Qualitative Larval Sampling between April 4, 2025, and April 16, 2025. Subsequent genetic analyses determined three of the fish were Wakasagi (Hypomesus nipponensis), with the fourth fish (detected in the Lower San Joaquin) failing to amplify sufficiently to run the test. One juvenile Delta smelt was detected in Suisun Marsh on June 20, which was genetically verified to have maternal Delta smelt lineage using the SHERLOCK assay. Delta smelt caught outside of OMR season are not reported here.



A. Adult Catch



B. Juvenile Catch

Figure 7. Delta smelt seasonal catch locations in WY 2025 (all reported between October 1, 2024 – June 30, 2025). Enhanced Delta Smelt Monitoring (EDSM) Stratum shown as colored polygons. Red diamonds indicate release location for cultured Delta smelt. Larger points indicate greater number of detections at a particular location. A. Adult catch from CDFW Bay Study, CDFW Fish Restoration Program (FRP), Tracy Fish Collection Facility (TFCF), USFWS Delta Juvenile Fish Monitoring Program (DJFMP), and USFWS EDSM. B. Juvenile catch from USFWS EDSM. Morphologically identified larval Delta Smelt not included in this due to genetic results.

The figure is two maps depicting Delta smelt seasonal catch locations. The first shows adult catch locations from CDFW Bay Study, CDFW Fish Restoration Program (FRP), Tracy Fish Collection Facility (TFCF), USFWS Delta Juvenile Fish Monitoring Program (DJFMP), and USFWS EDSM. The second map shows juvenile catch from USFWS EDSM.

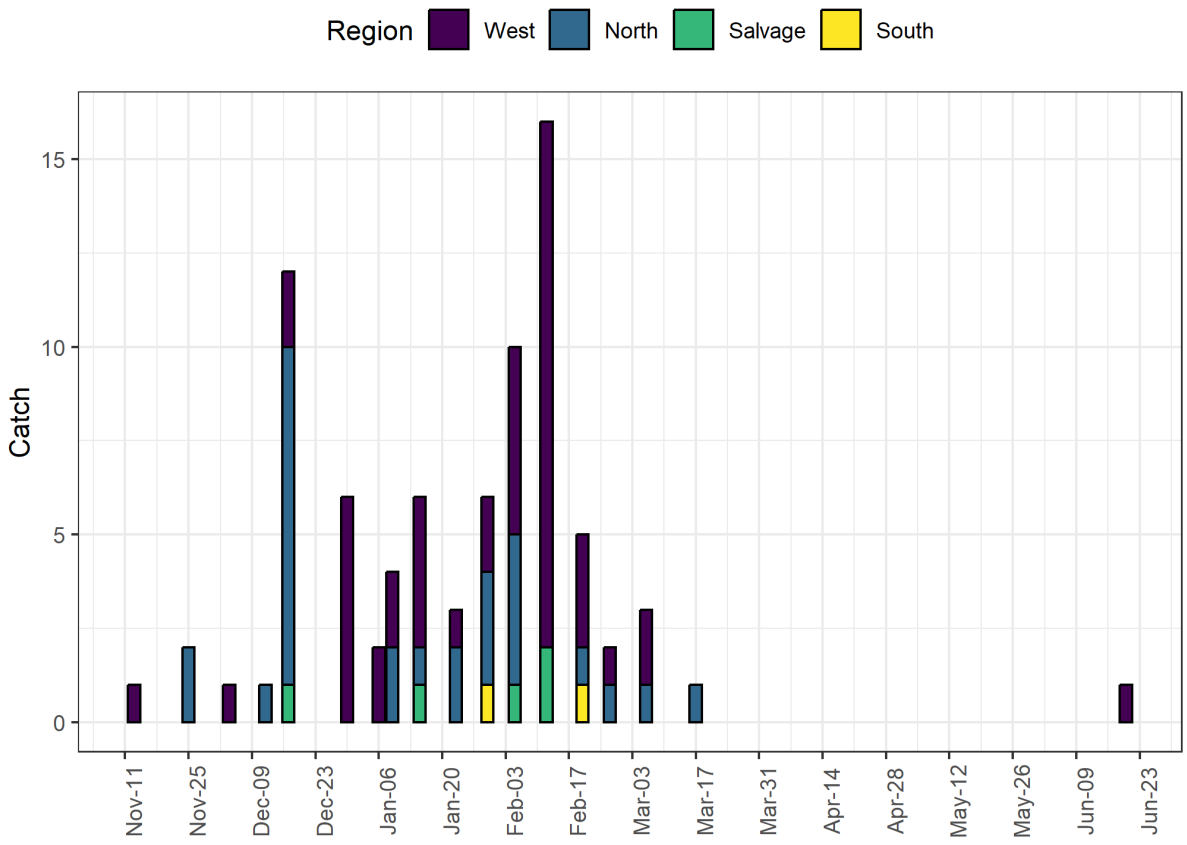


Figure 8. Juvenile and adult Delta smelt catch by week and region in WY 2025 (between October 1, 2024 – June 30, 2025). Enhanced Delta Smelt Monitoring (EDSM) Region was used as regional designation for all catch. Salvage represents pre-expansion counts. Morphologically identified larval Delta Smelt not included in this figure due to genetic results.

The figure is a bar graph showing Juvenile and adult Delta smelt catch by week and region between November 11, 2024 and June 23, 2025. The four regions are West, North, Salvage, and South. The y-axis shows catch ranges between 0 and 15.

Delta Smelt Salvage

Five marked adult Delta smelt were salvaged between December 17, 2024, and February 13, 2025. One of the fish was collected from CO2 predator removal; thus, expanded cumulative seasonal salvage was seventeen (Figure 19). All adult Delta smelt salvaged were

from December and January supplemental releases and were collected at the CVP Tracy Fish Collection Facility (TFCF). No juvenile Delta smelt were detected in salvage.

Qualitative Larval Sampling for larval Delta smelt began at the CVP and SWP on March 24, 2025, and ended on May 30, 2025. One morphological Delta smelt was detected at the TFCF on April 16, 2025, but was later genetically verified as Wakasagi.

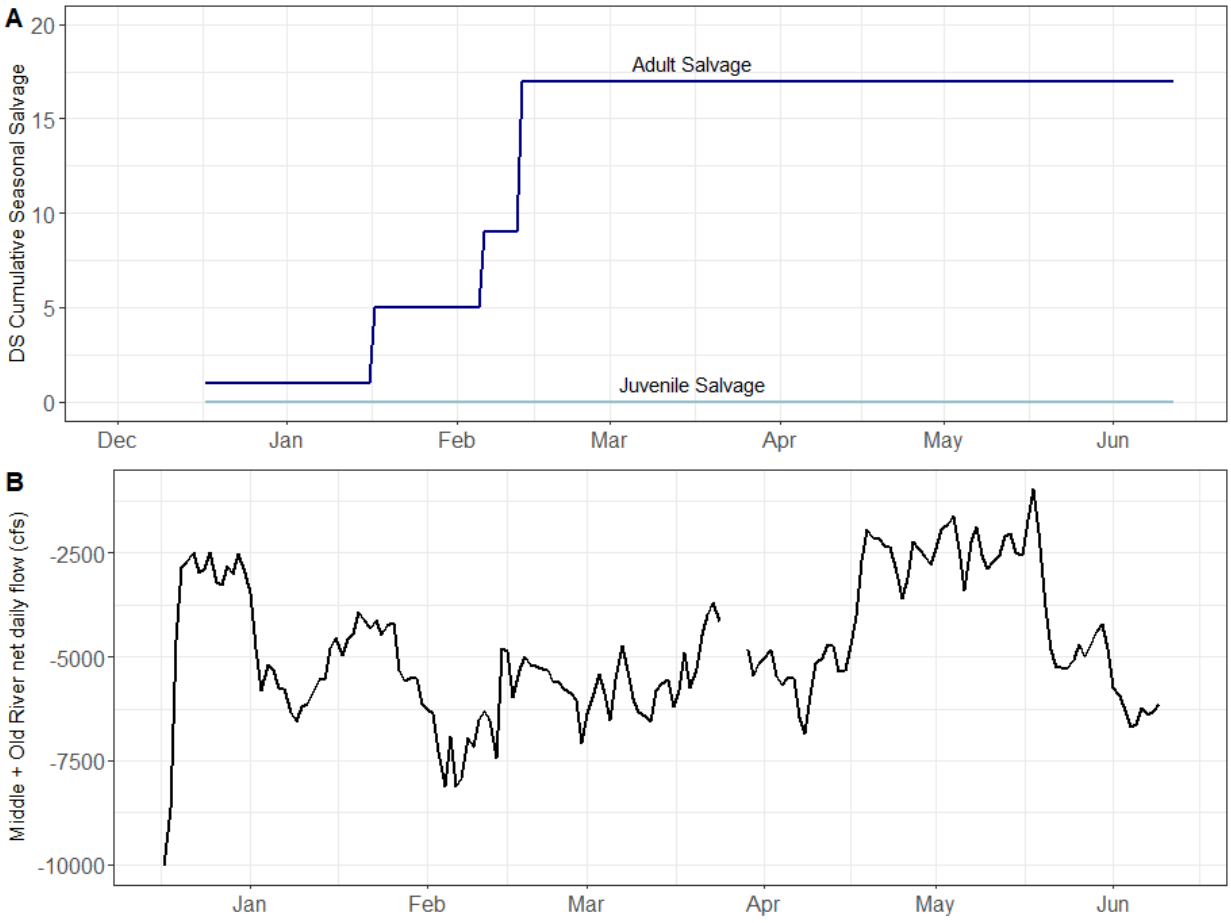


Figure 26. A) Cumulative Delta smelt seasonal salvage in WY 2025. B) Corresponding Middle plus Old River net daily flow (USGS). All salvage in WY 2025 came from the federal facility (TFCF).

The figure is two line graphs, the first cumulative adult and juvenile Delta smelt seasonal salvage in WY 2025. The y-axis shows salvage values between 0 and 20. The second line graph shows Middle plus Old River net daily flow throughout the WY 2025 with the y-axis depicting flows between -10,000 and -2,500 fs.

Longfin Smelt

Adult Longfin Smelt Entrainment Protection

The Proposed Action (PA) and ITP include a third potential action to trigger the onset of OMR management between December 1 and the start of OMR management season. OMR management may begin if the salvage threshold for adult longfin is exceeded. The salvage threshold is calculated using the most recent San Francisco Bay Study (SFBS) Age 1+ longfin smelt catch data from August to December, and only longfin smelt with a fork length (FL) of 60mm or greater detected in salvage are considered as adults. For WY 2025, the salvage threshold was 181 adult longfin smelt, based on the Age 1+ longfin smelt Index of 3604. A cumulative total of eight adult longfin smelt were salvaged in WY 2025 from two individuals salvaged at the Tracy Fish Collection Facility prior to the start of OMR management. In WY 2025, the Adult Longfin Smelt Entrainment Protection Action was not triggered prior to OMR management season.

From the start of OMR management season to February 28, 2025, the Adult Longfin Smelt Entrainment Protection Action can also trigger if the salvage threshold is exceeded. No additional adults were salvaged after the start of OMR management season; thus this action was not triggered in WY2025 and was off-ramped at the end of February 2025. The Smelt Monitoring Team (SMT) did not make any recommendations to WOMT regarding the need for adult longfin smelt protections during the period that the Adult Longfin Smelt Entrainment Protection Action was active between December 1, 2024, and February 28, 2025.

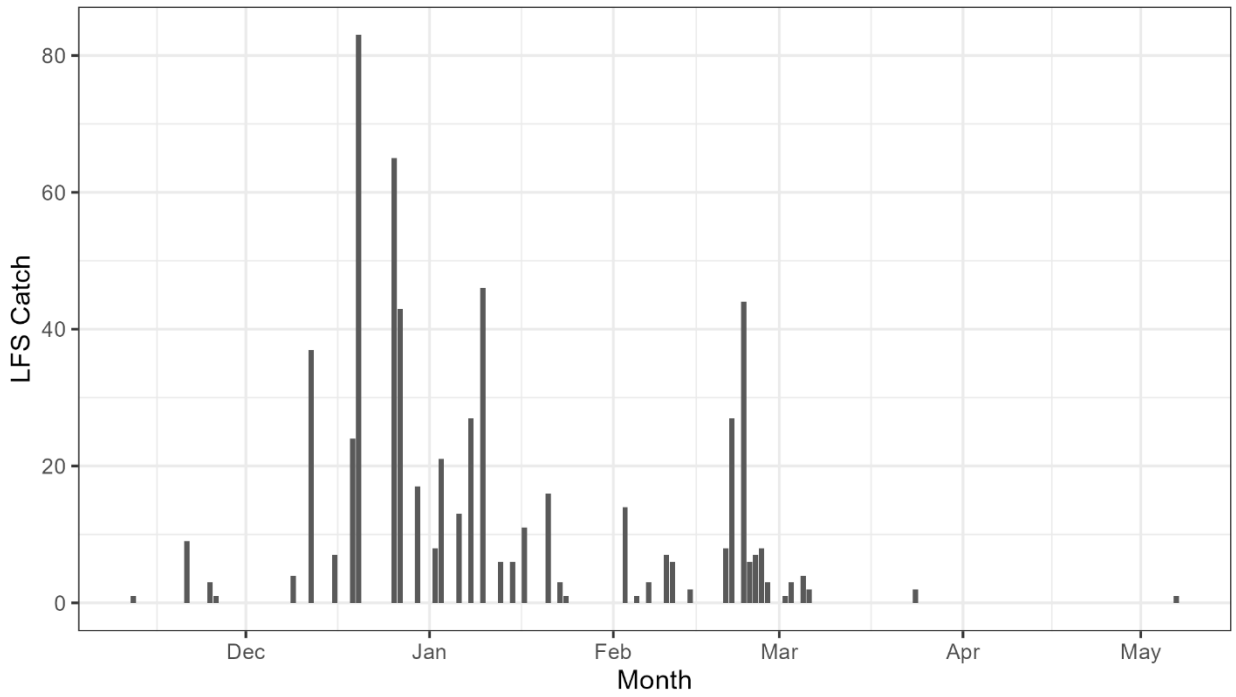


Figure 15. Age 1+ longfin smelt (LFS, fork length fork length ≥60mm) catch from the Chipps Island Trawl from October 2024 through June 2025. May 7 was the last day an adult longfin smelt was detected during the WY 2025 OMR management season.

The figure is a bar graph showing longfin smelt catch from October 2024 through June 2025. The y-axis ranges between 0 and 80 catch values.

Larval and Juvenile Longfin Smelt Protections

Larval and Juvenile Longfin Smelt Protection Action was active January 1 – June 30, triggered twice, and implemented once. The action is triggered when both the 7-day average QWEST is less than +1,500 cfs and larval and juvenile longfin smelt catch in the most recent Smelt Larva Survey (SLS) or 20-mm Survey (20mm) at lower San Joaquin River stations 809 and 812 exceeds the threshold set by the Age 1+ LFS Index. That threshold was 50 in WY 2025. Flows dropped in January (Figure 17), triggering the Larval and Juvenile Longfin Smelt Protection Action on January 19 in combination with larval longfin catch in SLS Survey 2 (Figure 20B), and the action was implemented January 20 – 26. On the off week between SLS Survey 2 and SLS Survey 3, special sampling was conducted at stations 809 and 812 with SLS gear. The survey caught sufficient larval longfin smelt to verify the high density of larval longfin smelt in this region. The Larval and Juvenile Longfin Smelt Protection Action was triggered again on January 28 by continued low outflows and high catch in SLS Survey 3, but was off-ramped on January 29 due to the Directors' Decision. A major storm event at the end of January resulted in high flows that temporarily off-ramped Larval and Juvenile Longfin Smelt Protections between February 5 – March 7, 2025. The action was not triggered again in WY 2025.

The Larval and Juvenile Longfin Smelt Protection Action also includes a salvage backstop, wherein exports are reduced if cumulative salvage at the CVP and SWP exceeds 50% of the average annual cumulative salvage since WY 2009. Additional export reductions apply if cumulative salvage exceeds 75% of annual average cumulative salvage. The salvage backstops were not triggered in WY 2025.

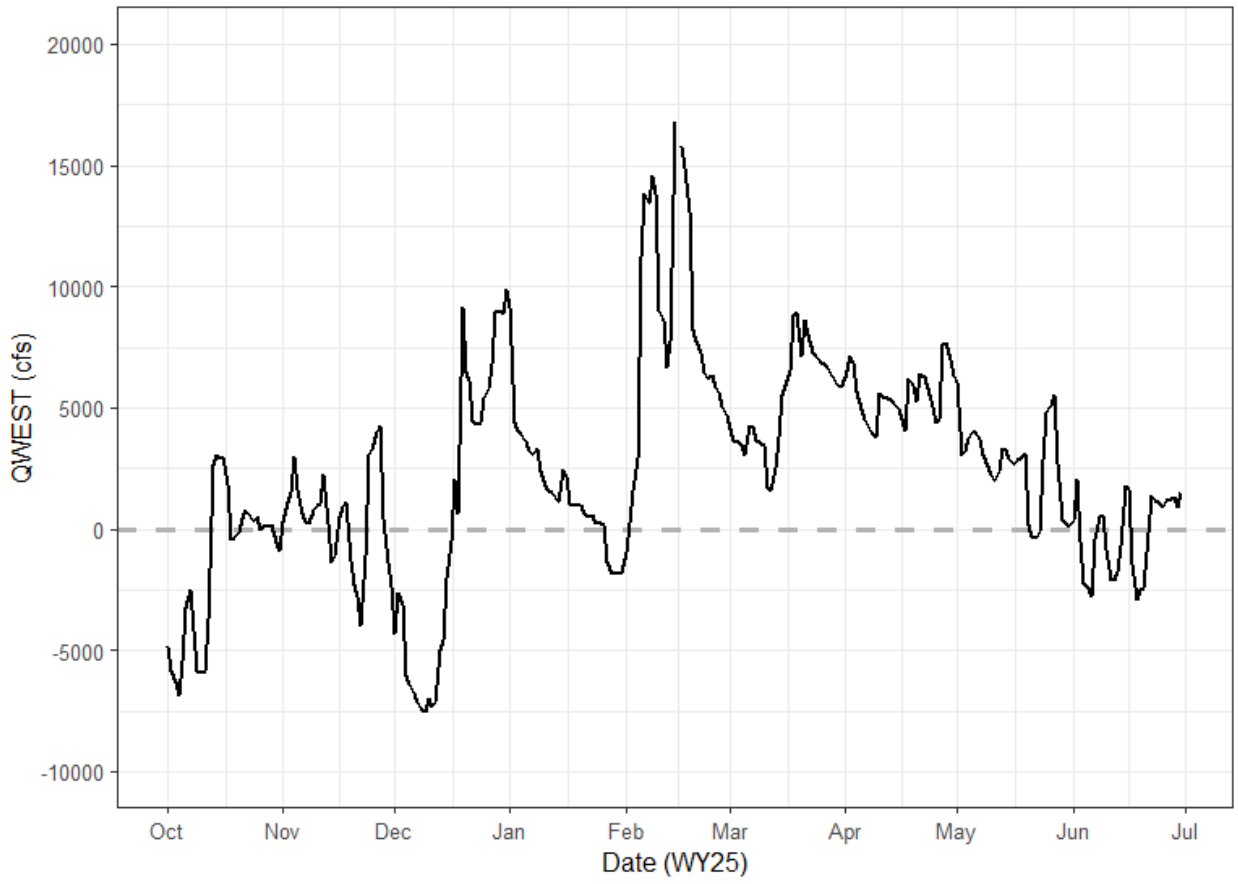


Figure 10. QWEST (cfs) in WY 2025.

The figure a line graph showing QWEST in cfs from October 2024 through July 2025. The y-axis ranges in values from -10,000 to 20,000 cfs.

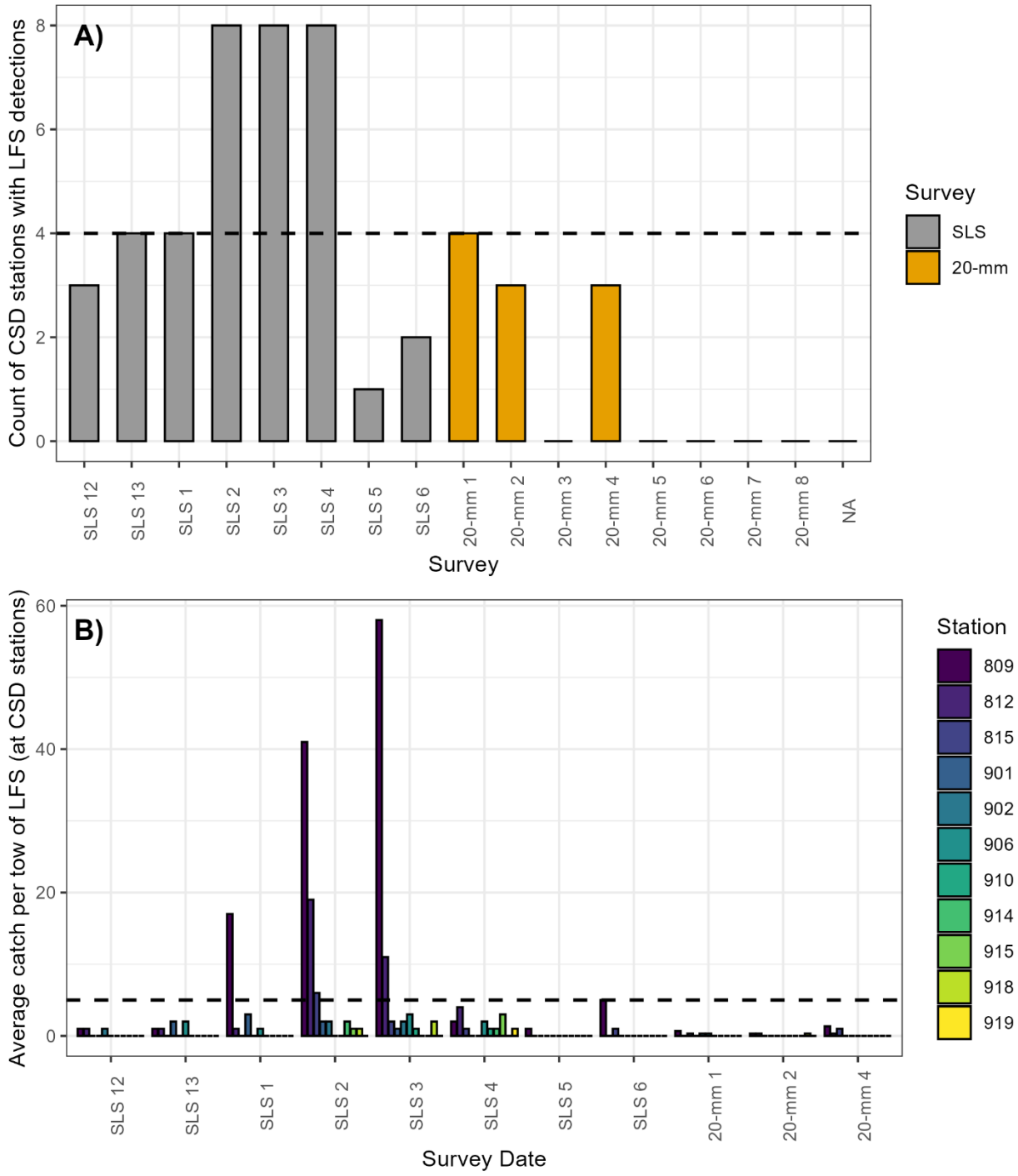


Figure 2011. A. Number of Central and South Delta (CSD) stations with longfin smelt (LFS) detections from the Smelt Larva Survey (SLS) and 20-mm Survey (20-mm), and B. catch per tow of longfin smelt at the 12 CSD stations (809, 812, 815, 901, 902, 906, 910, 912, 914, 915, 918, and 919; only surveys and stations with catch > 0 are visualized here). The black dashed lines indicate thresholds (ITP COA 8.4.2) of A: longfin smelt larvae or juveniles at ≥ 4 SLS or 20mm CSD stations or B: catch per

tow of >5 longfin smelt larvae or juveniles in ≥ 2 CSD stations (as the average of three tows for 20-mm). SLS includes completed end-of-year QAQC data. 20-mm samples are still being processed and end-of-year data validation is pending. 20mm data displayed here are the most up-to-date available as of September 26, 2025.

The figure a two bar graphs. The first shows the number of Central and South Delta (CSD) stations with longfin smelt (LFS) detections, ranging from 0 to 8, from the Smelt Larva Survey (SLS) and 20-mm Survey (20-mm). The second bar graph shows catch per tow, ranging from 0 to 60, of longfin smelt at the 12 CSD stations.

Larval and Juvenile Longfin Smelt Detections

In WY 2025, larval longfin smelt sampling began on December 2, 2024, in compliance with ITP COA 7.6.1, which directed DWR to fund additional SLS in Central and South Delta in December. This additional sampling is meant to more completely cover the period of larval longfin smelt presence, as SLS previously did not begin until the first week in January. Starting in WY 2022, these December SLS surveys were extended to the full suite of 35 regular SLS stations, per coordination with the Longfin Smelt Technical Team (ITP COA 7.6.3). Starting in WY 2023, 16 stations were added to SLS and 20-mm Survey to better sample larval longfin smelt in Carquinez Strait and San Pablo Bay.

The WY 2025 sampling detected their first larval longfin smelt of the season on the first day of sampling, December 2, 2024. Throughout the longfin smelt spawning season in WY 2025, the majority of larvae and juveniles detected in regular monitoring were at downstream stations, predominantly in the Napa River, and the Suisun Bay and West stratum (Figure 21). SLS and 20-mm surveys detected the lowest larval longfin catch in the central and south Delta, compared with other regions of the estuary (Figure 21). January saw the highest catches of larval longfin smelt in regular monitoring (n=9,654), with April (n=8,941) and March (n=7,417) having the second and third highest catch, respectively. Sample processing is complete for SLS and ongoing for the 20-mm Survey; this represents totals as of September 26,2025.

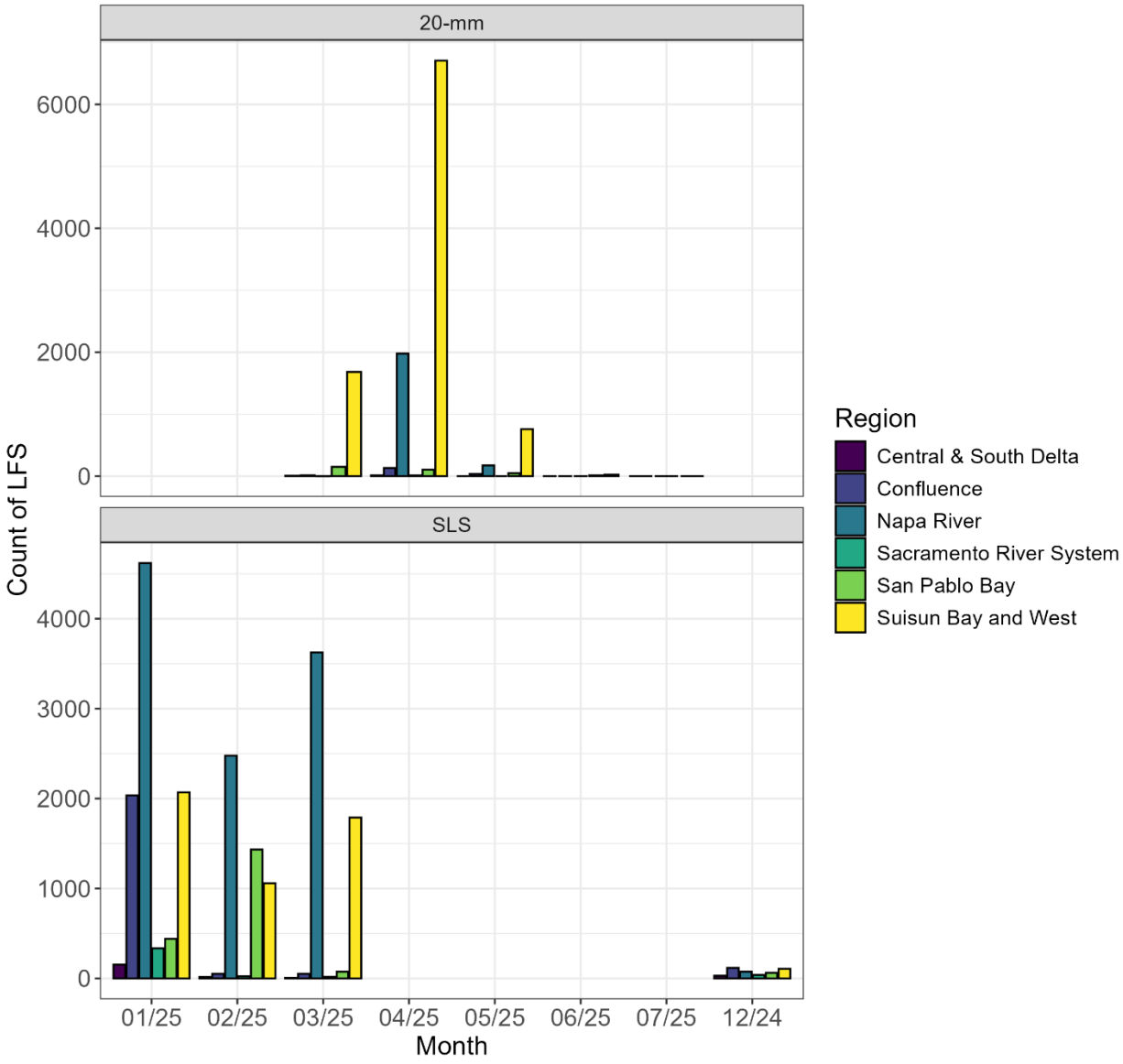


Figure 21. Catch of larval longfin smelt in the Smelt Larva Survey and 20-mm Survey during WY 2025 sampling; note the y axis scale differs by survey. SLS includes completed end-of-year QAQC data. 20-mm samples are still being processed, and end-of-year data validation is pending. 20mm displayed here are the most up-to-date available as of September 26, 2025.

The figure a two bar graphs. The first shows the number catch of larval longfin smelt in the 20-mm Survey during WY 2025 sampling by month. The y axis ranges from 0 to 8,000 count of longfin smelt. The second bar graph shows the number catch of larval longfin smelt in the Smelt Larva Survey during WY 2025 sampling by month. The y axis ranges from 0 to 5,000 count of longfin smelt.

Longfin Smelt Salvage

A total of 2 (n=8 expanded salvage) adult longfin smelt were detected in salvage in WY 2025 (Figure 27A). The two adult longfin smelt were salvaged at the CVP on December 18 and December 20, 2024. Additionally, a total of 55 juveniles (n = 204 expanded salvage) were detected at the CVP and SWP fish salvage facilities from March 13 – May 22, 2025 (Figure 27A).

The TFCF (CVP) and the Skinner Delta Fish Protection Facility (SWP) conducted qualitative smelt larval sampling from March 24 – May 30, 2025. All larval longfin detections occurred in April. The sampling effort is not designed for quantitative data, but 13 larval longfin smelt were detected at the CVP from April 4 – April 17, 2025. At the SWP, one larval longfin smelt was detected on April 27, 2025.

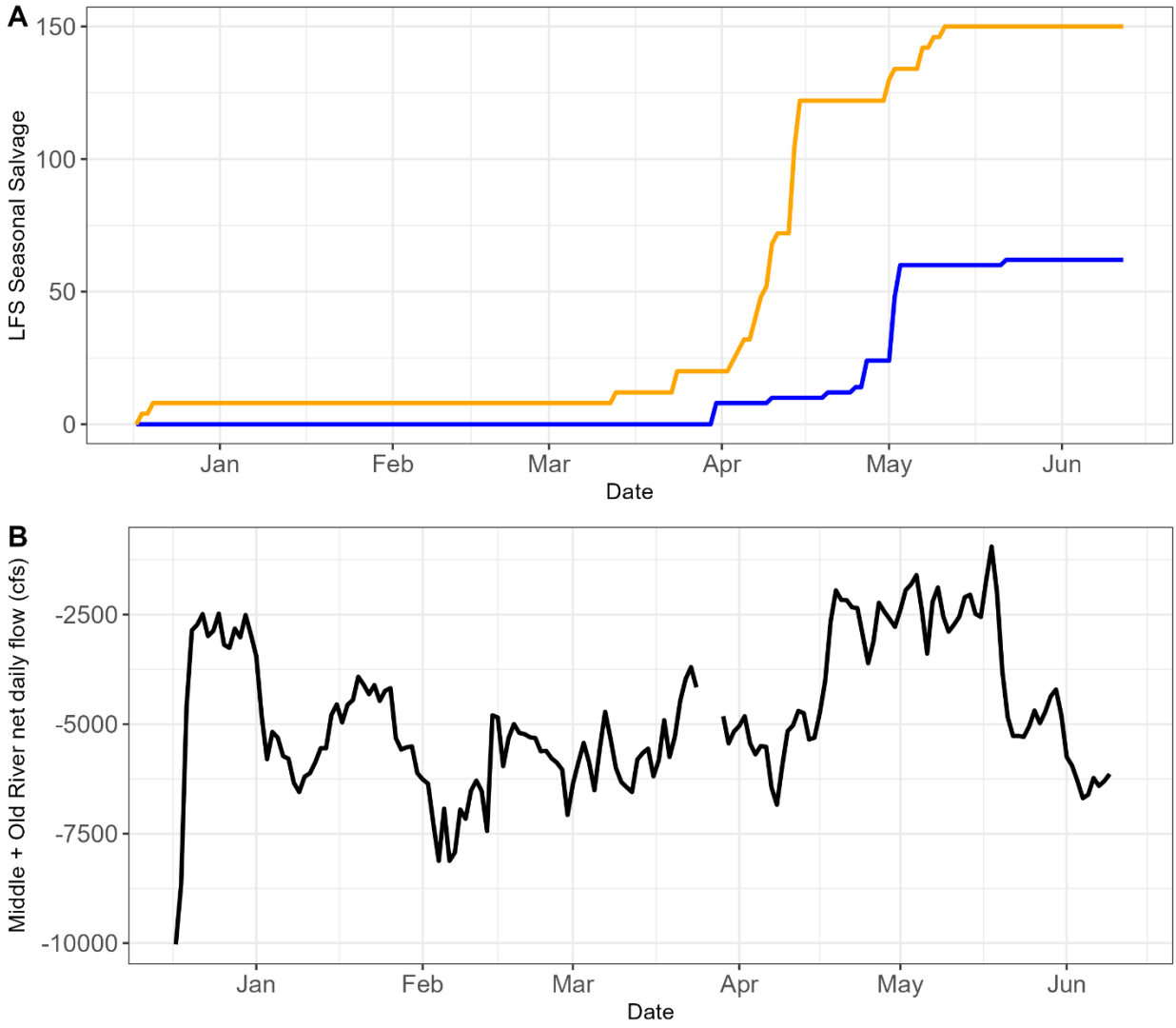


Figure 27. A) Cumulative adult and juvenile longfin smelt (LFS) seasonal salvage for SWP (blue line) and CVP (orange line). B) Corresponding Middle plus Old River net daily flow (USGS).

The figure is two line graphs. The first shows two lines for cumulative adult and juvenile longfin smelt seasonal salvage for and CVP between the months of January and June 2025. The y-axis ranges from 0 to 150 longfin smelt seasonal salvage. The second line graph shows the corresponding Middle plus Old River net daily flow in cfs. Ranging between -10,000 and -2,000 cfs.

Winter-run Chinook Salmon

Early Season Migration Loss

The 2020 SWP ITP COA 8.6.2 Early Season Daily Loss Threshold was in effect from November 1 – December 20, 2024. The 2024 SWP ITP was signed on November 4, 2024, but the thresholds from COA 8.6.2 in the 2020 SWP ITP continued to be applied in COA 8.17 of

the 2024 SWP ITP until the ROD was signed on December 20, 2024, to align the 2024 SWP ITP with the IOP. From December 20, 2024, through December 31, 2024, the SWP ITP COA 8.2.1 and 2024 ROD were in effect for both projects.

The 2024 Early Season Natural Winter-run Chinook Salmon Discrete Daily Loss Threshold (2024 ITP COA 8.17 and ROD) which was operated to from November 1 – December 20 was not exceeded in WY 2025. The newly implemented Winter-run Early Season Migration thresholds (2024 ITP COA 8.2.1) were also not exceeded in December of 2024.

Weekly Distributed Loss Threshold

In WY 2025, both the ROD and ITP (COA 8.4.4) tracked daily loss of genetic winter-run Chinook salmon towards the weekly distributed loss threshold. The threshold is a product of the weekly percentage of natural winter-run Chinook salmon predicted to be present in the Delta and 50% of the natural winter-run annual loss threshold over the approximate 25-week OMR management season and loss relevant to the threshold is calculated as a 7-day rolling sum of daily combined loss at both facilities (Figure 36; See PA for detailed information on the weekly distributed loss threshold).

The weekly loss criteria were exceeded twice, specifically on March 19 and March 24, resulting in operations targeting an OMRI no more negative than -3,500 cfs for 7 days. A portion of the fish causing exceedance on March 19 were determined not to be genetically confirmed winter-run Chinook salmon; however, genetic confirmation did not occur until after the -3,500 cfs OMRI action had already been implemented (genetics were eventually received in late May). The fishes causing the March 24 exceedance were genetically confirmed, resulting in operations targeting an OMRI no more negative than -3,500 cfs, which overlapped with a similar action for the exceedance of the hatchery winter-run Chinook salmon 50% annual loss threshold just a few days earlier (see next section). This first exceedance on March 19 controlled operations for OMRI beginning March 21, and the second exceedance was March 25. Due to the second exceedance occurring in the middle of operating to the first exceedance, operational changes targeting OMRI no more negative than -3,500 cfs occurred from March 21 – March 31.

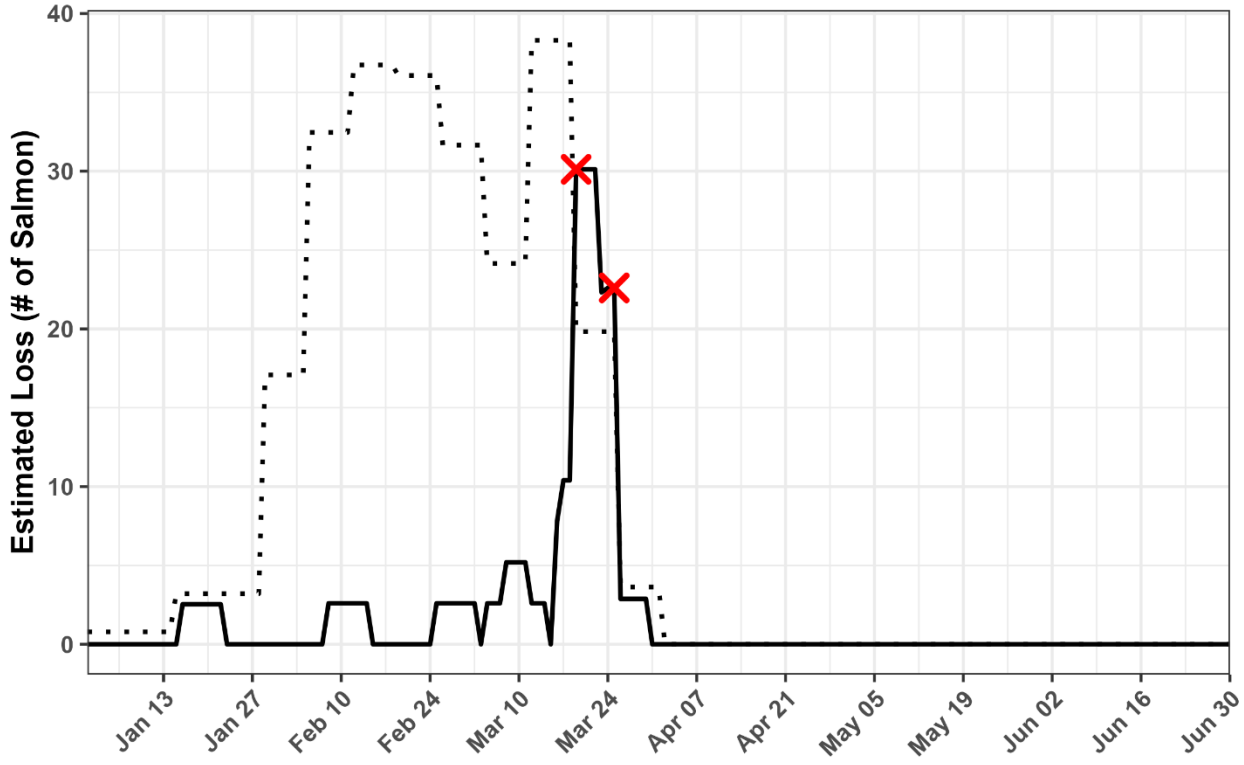


Figure 36. Seven-day rolling sum of loss of natural winter-run salmon (solid line) and associated weekly distributed loss threshold for natural winter-run Chinook salmon (dotted line). Red x's represent dates in which the weekly distributed loss threshold was exceeded. *Note that although the weekly distributed loss threshold was exceeded on March 19, a single fish equal to a loss of 17.12 at the SWP was later confirmed to be a non-winter-run Chinook salmon after the OMRI response to this exceedance had already been implemented. This fish is included here as it is important to this relevant action but is not included in final natural-origin genetically confirmed winter-run Chinook salmon annual loss numbers.

The figure is a line graph with two lines depicting the seven-day rolling sum of loss of natural winter-run salmon and associated weekly distributed loss threshold for natural winter-run Chinook salmon between January and June 2025. The estimated loss of salmon on the y-axis ranges from 0 to 40.

Annual Loss Threshold

The ROD and ITP (COA 8.4.3) set annual threshold loss values for natural- and hatchery-origin winter-run Chinook salmon as 0.5% of the juvenile production estimate (JPE) for natural origin and 0.12% of the JPE for hatchery-origin. In WY 2025, JPEs were 98,893, 135,342, and 2,868 resulting in annual loss thresholds of 494.47, 162.41, and 3.44 for natural-origin, Livingston Stone National Fish Hatchery (LSNFH) hatchery-origin, and Battle Creek hatchery-origin winter-run Chinook salmon releases, respectively. The JPE subteam

submitted the winter-run Chinook salmon juvenile production estimates to NMFS and CDFW on January 10, 2025 (Appendix B).

In WY 2025, loss of natural and hatchery-origin winter-run Chinook salmon salvage occurred between January 16, 2025, and April 4, 2025. Total genetic natural-origin winter-run Chinook salmon loss for WY 2025 (July 1, 2024, through June 30, 2025) was 28.8 fish which represents 5.8% of the annual loss threshold (494.5 fish; Figure 23). No hatchery-origin winter-run released in Battle Creek were observed in salvage. Neither natural-origin winter-run Chinook salmon or Battle Creek hatchery-origin winter-run annual loss threshold was exceeded in WY 2025.

Loss for LSNFH hatchery-origin winter-run Chinook salmon in WY 2025 was 216.6 which represents 133.7% of the annual loss threshold (162.4 fish; Figure 37). The 50% loss threshold was exceeded on March 18, 2025, triggering a 7-day action of -3,500 cfs beginning March 21, 2025. The 75% and 100% loss thresholds for LSNFH hatchery-origin winter-run Chinook salmon were exceeded on March 19, 2025, and March 21, 2025. The 50% threshold-controlled operations for eight days from March 21, 2025 – March 28, 2025. An additional hatchery-origin CHNWR was observed in salvage on March 22, 2025, after all thresholds were exceeded, that extended the action for another 7 days per SWP ITP COA 8.4.3 and the ROD. This overlapped with a similar action response triggered by exceedance of the weekly distributed loss threshold for natural-origin winter-run Chinook salmon on March 24 of a 7-day average OMRI no more negative than -3,500 cfs through March 30.

Due to the 75 % threshold exceedances per the SWP ITP and ROD requirements, the WRCML model was used to determine if a 7-day OMRI of -2,500 cfs action was needed. On March 20, 2025, the WRCML model results showed a classification below 0.559, so no action was required (provisional model runs provided by DWR at a subsequent March 25, 2025, SaMT meeting, but it is not reflected in publicly available notes). Due to subsequent losses between March 21, 2025, and April 4, 2025 (i.e., on 3/24, 4/1, 4/2, and 4/7), the WRCML model was re-run on March 24, April 1, April 2, and April 7, 2025. Model runs were delayed because SaMT receives loss data the first business day after it occurs. Only an April 4, 2025, loss event produced a model classification above 0.559, warranting an OMRI limit of -2,500 cfs from April 10, 2025 – April 16, 2025. However, ITP COA 8.12.1 was controlling operations and DWR was already at health and safety minimums; concurrently, CVP was operating to –5,000 cfs. Despite the annual loss threshold exceedances of the ROD, the total loss was below the Biological Opinion's Incidental Take Limit of 1,353.4 fish in WY 2025 for LSNFH winter-run Chinook salmon at the CVP and SWP pumping facilities (NMFS 2024).

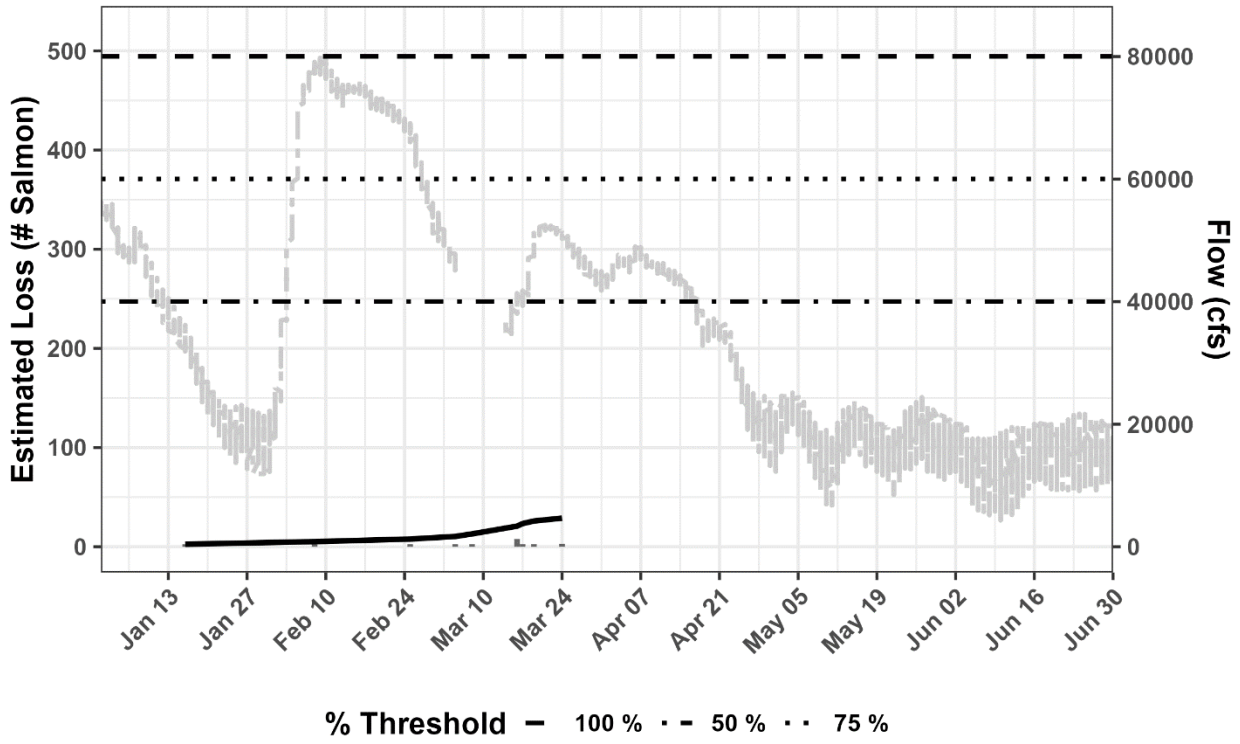


Figure 23. Daily and cumulative estimated loss of natural-origin winter-run Chinook salmon (adipose-unclipped, genetically-confirmed race = winter) at the salvage facilities from October 1, 2024 – June 30, 2025. Gray bars show the daily loss estimates, and the solid black line shows the running cumulative loss. The gray two-dash vertical line represents Sacramento River at Freeport flow (cfs; right-hand axis), scaled to align with the salmon loss (left axis). Horizontal lines denote annual loss thresholds based on the Juvenile Production Estimate (JPE): the dashed line is 100%, the dotted line is 75%, and the dot-dash line is 50% of the annual loss thresholds.

The figure is a graph showing daily and cumulative estimated loss of natural-origin winter-run Chinook salmon at the salvage facilities and the flow in cfs from January 1, 2025 – June 30, 2025.

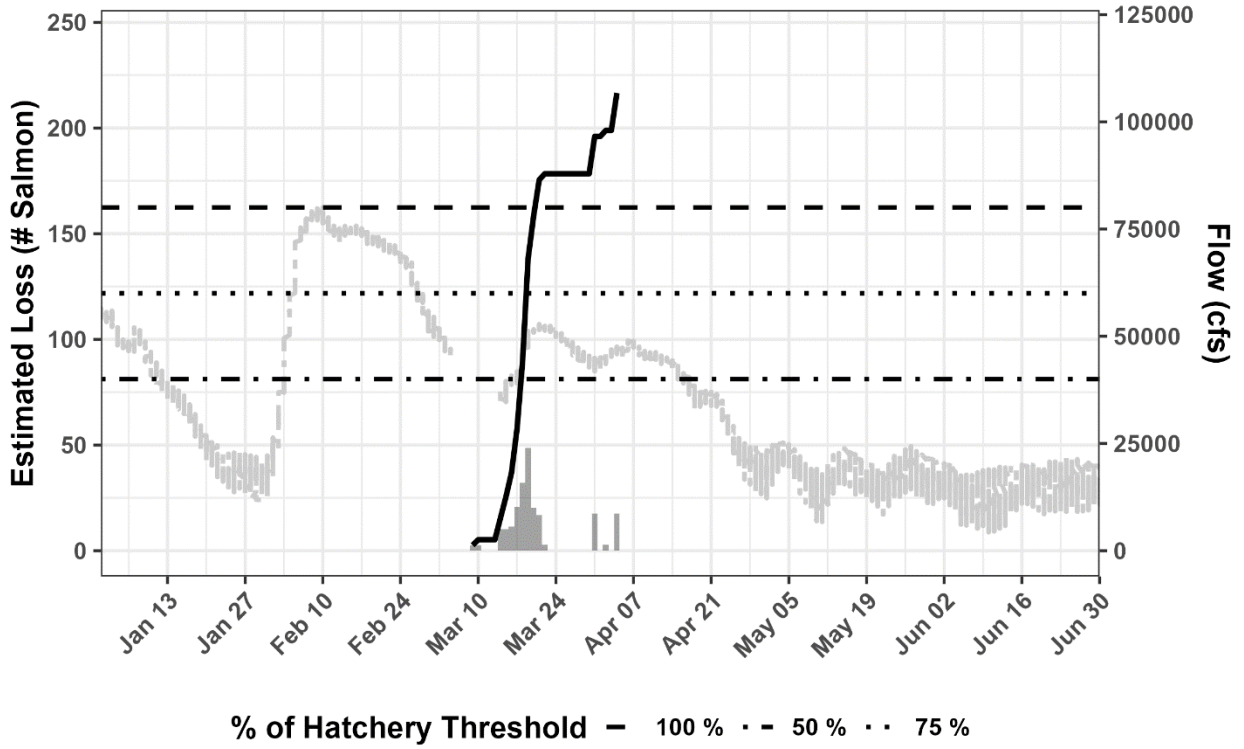


Figure 37. Daily and cumulative estimated loss of hatchery-origin winter-run Chinook salmon (confirmed by CWT) from Livingston Stone National Fish Hatchery at the salvage facilities from October 1 – June 30. Gray bars show the daily loss estimates, and the solid black line shows the running cumulative loss. The gray two-dash line represents Sacramento River at Freeport flow (cfs; right-hand axis), scaled to align with the salmon loss (left axis). Horizontal lines denote annual loss thresholds based on the JPE: the dashed line is 100 % of JPE, the dotted line is 75 %, and the dot-dash line is 50 %.

The figure is a graph showing daily and cumulative estimated loss of natural-origin winter-run Chinook salmon from Livingston Stone National Fish Hatchery at the salvage facilities and the flow in cfs from January 1, 2025 – June 30, 2025.

Additional Information

Additional information comparing the WY 2025 winter-run cohort to previous water year cohorts is included in Appendix C.

Spring-Run Chinook Salmon

The ROD and ITP (PA 3.7.4.5.7 and COA 8.4.5) requires modifying OMRI based on the CVP and SWP fish facility loss of hatchery surrogates, representing both yearling and young-of-year spring-run Chinook based on exceedance of a threshold equal to 0.25% of the number of CWT tagged fish released for each hatchery surrogate release group. There were no

spring-run Chinook salmon surrogate threshold exceedances in WY 2025. Detailed information on release groups and performance metrics are included below.

Yearling Spring-Run Chinook Salmon Surrogates

A total of three yearling spring-run Chinook salmon surrogate release groups were released in-river during WY 2025 between November 20 and January 17 with release numbers ranging between 74,425 and 698,892. Loss for individual groups ranged between 43.3 and 1,051.2 fish. Release group, release date, hatchery origin, location, release number, loss limit, and total season loss are detailed in Table 6.

Table 2. Hatchery-origin (adipose-fin clipped and marked with CWT) spring-run yearling surrogate Chinook salmon releases and loss at the SWP and CVP export facilities for WY 2025. Loss numbers may slightly differ from other reporting agencies due to minor differences in methodology for calculating loss.

Release Date	Type	Race	Hatchery	Total # of Fish Released	# of CWT Fish Released	Loss Threshold (0.25% of CWT Released)	Confirmed Loss	Percent of Threshold
11/20/2024	Yearling	Late-Fall	Coleman NFH	698,892	698,892	1747.2	1050.6	60.1%
12/13/2024	Yearling	Late-Fall	Coleman NFH	77,355	77,355	193.4	72.5	37.5%
1/17/2025	Yearling	Late-Fall	Coleman NFH	74,425	74,425	186.1	43.3	23.3%

Young of Year (YOY) Spring-Run Chinook Salmon Surrogates

A total of 6 YOY spring-run Chinook salmon surrogate release groups were released in-river during WY 2025 between March 14 and April 30. Release numbers of CWT fish ranged from 476,741 to 695,170 and loss for individual groups ranged from 0 to 110.13 fish. Release group, release date, hatchery origin, location, release number, loss limit, and total season loss are detailed in Table 7.

Table 3. SWP and CVP Spring-run Chinook salmon YOY surrogate releases and loss for WY 2025.

Release Date	Type	Race	Hatchery	Total # of Fish Released	# of CWT Fish Released	Loss Threshold (0.25% of CWT Released)	Confirmed Loss	Percent of Threshold
3/14/2025	Young-of-year	Spring	Feather River Hatchery	961,411	476,741	1191.9	16.56	1.4%
3/21/2025	Young-of-year	Spring	Feather River Hatchery	962,741	475,831	1189.6	110.13	9.3%
4/9/2025	Young-of-year	Spring	Feather River Hatchery	1,012,800	504,304	1260.8	0	0%
4/23/2025 - 4/24/2025	Young-of-year	Fall	Feather River Hatchery	1,505,055	376,122	940.3	0	0%
4/15/2025	Young-of-year	Fall	Coleman NFH	2,122,103	695,170	1737.9	0	0%
4/28/2025 - 4/30/2025	Young-of-year	Fall	Coleman NFH	1,472,338	368,085	920.2	0	0%

Steelhead

Weekly distributed loss thresholds

In WY 2025, the ROD began tracking the weekly distributed loss threshold for natural-origin steelhead. The threshold is equal to the annual threshold of 3,000 fish divided equally over the 25-week OMR management season (Figure 38; See PA for detailed information on the weekly distributed loss threshold) resulting in a weekly threshold of 120 fish. The loss metric for exceedance is the 7-day rolling sum of steelhead loss. The weekly distributed loss threshold for steelhead was not exceeded in WY 2025.

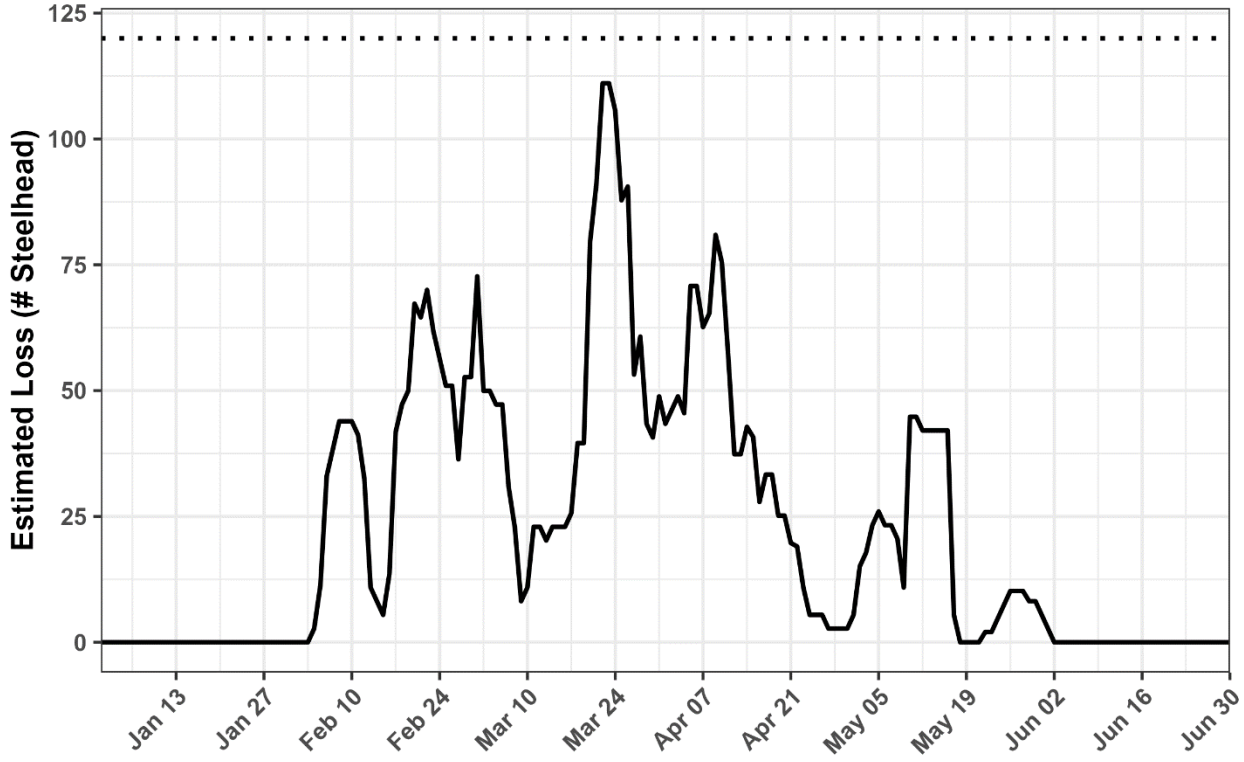


Figure 38. Weekly steelhead loss, October 1 – June 30. The solid line shows the 7-day rolling sum of estimated steelhead loss at the CVP and SWP facilities, and the dotted line shows the evenly distributed "weekly threshold" (120 fish = 3000 fish / 25 weeks).

The figure is a line graph showing estimated weekly steelhead loss ranging from 0 to 125 from January to June 2025.

Annual Loss Threshold

The annual loss thresholds for natural-origin steelhead remains the same every year and is 3,000 fish between July 1 of the previous WY through June 30 of the current WY. There were no annual threshold exceedances for California Central Valley (CCV) steelhead in WY 2025.

Combined loss of natural-origin steelhead was 606.5 fish between July 1, 2024 – June 30, 2025, representing 20.2% of the annual loss threshold with 43% of observed loss occurring at the CVP and 57% of the loss occurring at the SWP (Figure 24).

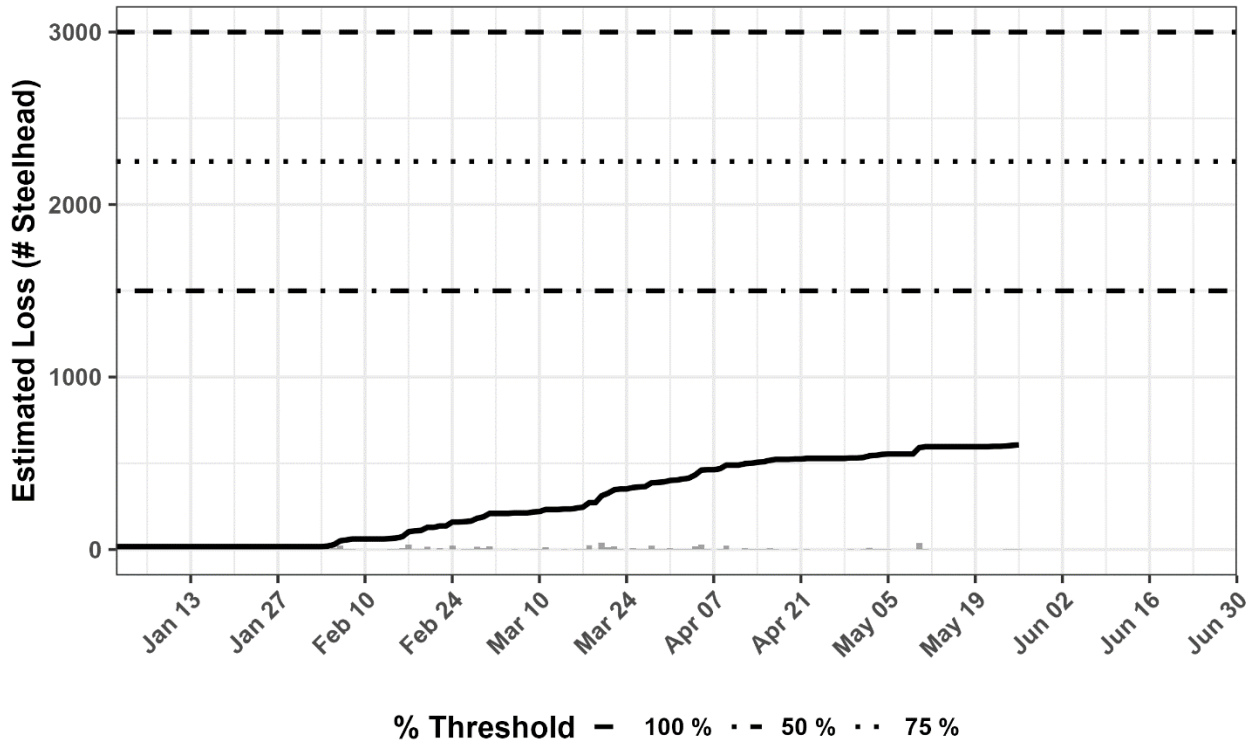


Figure 2144. Daily and cumulative steelhead loss, October 1 – June 30. Gray bars represent the estimated daily loss; the black line is the running cumulative loss over the season. Horizontal lines mark 100 %, 75 %, and 50 % of the annual threshold (3,000 fish · water year^{-1}), drawn respectively as dashed, dotted, and dot-dash lines.

The figure is a line graph showing estimated weekly steelhead loss ranging from 0 to 3,000 from January to June 2025.

Storm-Flex

The CVP and SWP can increase exports during the OMR flow management season to capture peak flows in the Delta during storm-related events. In WY 2025 Reclamation and DWR requested the use of this flexibility and operated to an OMRI no more negative than -6,250 cfs between February 4 and February 10, 2025. Storm Flex off-ramped due to turbidity at OSJ exceeding 12 FNU.

End of OMR Management

The end of OMR management can be triggered by exceedance of temperature thresholds or by date.

For both smelt and salmonids, OMR management season ended on the date criteria of June 30. For Delta smelt and longfin smelt, the Clifton Court Forebay monitoring station (CLC) temperature criterion was met on June 30 (temperature exceedances on June 28–30), which was the third consecutive day exceeding the daily average water temperature threshold of 25°C (77°F) and also the calendar cutoff date (Figure 25). For salmonids, the daily average water temperatures exceeding the temperature threshold (7 days ≥ 22.2°C; days need not be consecutive) was met for Prisoner's Point (PPT) but not for San Joaquin River at Mossdale Bridge (MSD). Prisoner's Point exceeded the temperature threshold seven or more days (June 1–5, and June 14–15), but Mossdale only exceeded the temperature threshold for six days (June 18, June 25–26, and June 28–30; Figure 25).

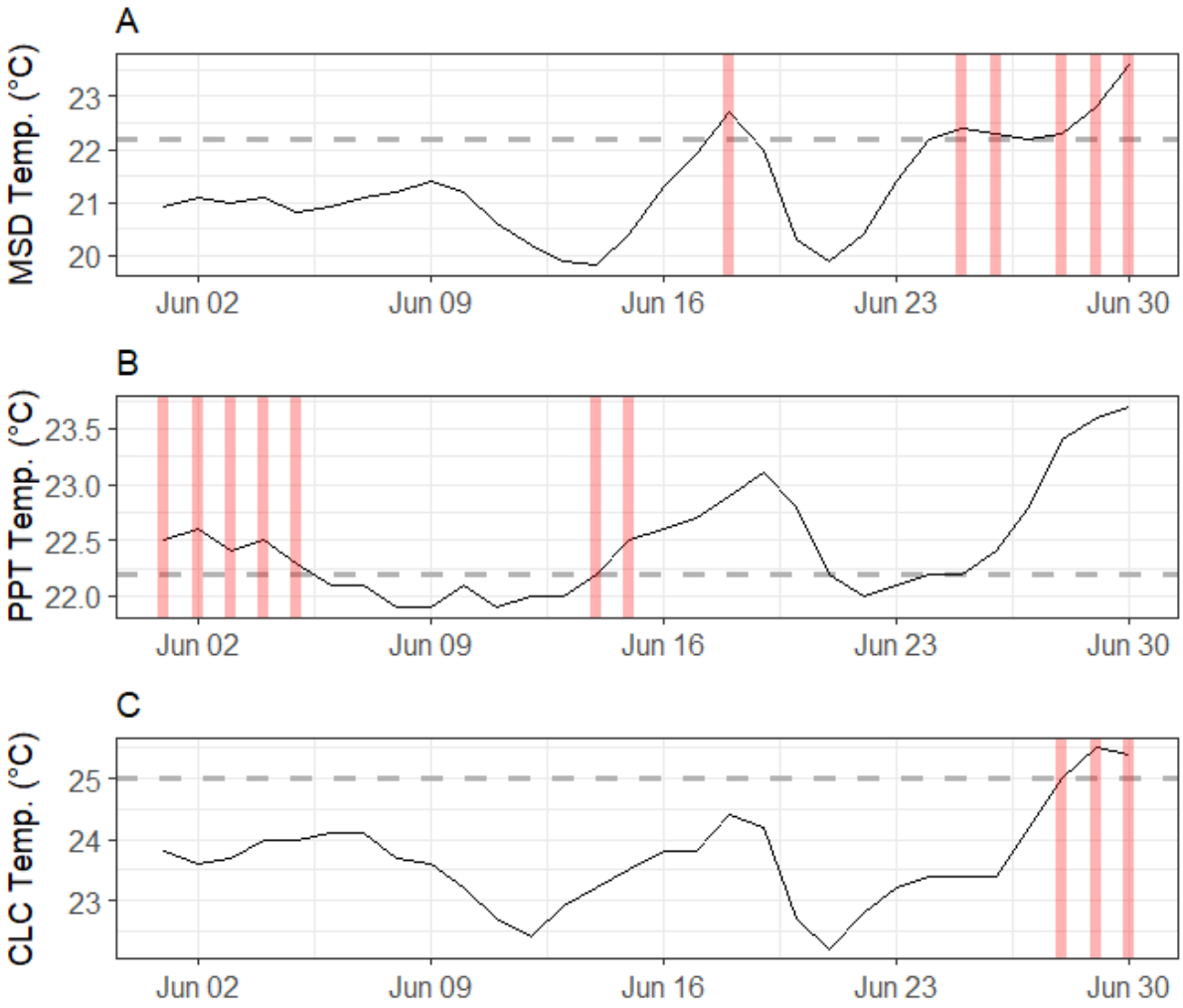


Figure 15. Average daily temperatures (°C) at stations: (A) San Joaquin River at Mossdale Bridge (MSD), (B) Prisoners Point (PPT), and (C) Clifton Court Forebay (CLC) in June 2025. Dashed lines indicate the 22.2°C (71.96°F) thresholds for salmonids at MSD and PPT and the 25°C (77°F) threshold for smelts at CLC. In all figures, red shaded lines indicate days of temperature exceedance.

The figure is three line graphs showing average daily temperatures in Celsius at San Joaquin River at Mossdale Bridge, Prisoners Point, and Clifton Court Forebay stations in June 2025.

Spring Delta Outflow

For WY 2025, DWR operated to the SWP ITP COA 8.12.1. The SWP ITP COA 8.12.1 specifies that from April 1 to May 31 in dry water year types, the ratio of Vernalis flow to CVP and SWP combined exports shall be 2 to 1. In a below normal water year type, the ratio of Vernalis flow to CVP and SWP combined exports shall be 3 to 1. In addition, the SWP ITP

would not require SWP exports to be less than minimum health and safety exports of 600 cfs.

On April 1, 2025, the San Joaquin Valley water year type was classified as dry based on the 75% Exceedance Forecast of the San Joaquin Valley 60-20-20 Index, which required a Vernalis flow to export ratio of 2:1. However, the three-day average NDOI did not go below 44,500 cfs until April 10, 2025. On April 8, 2025, the San Joaquin Valley water year type was updated to below normal, which would require a Vernalis flow to export ratio of 3:1. Beginning April 10, 2025, SWP exports remained at 600 cfs for the remainder of April and all of May.

The Voluntary Agreements (VA) as substantially proposed by the VA Parties in the Memorandum of Understanding signed by the VA parties in March 2022, was not approved by the SWRCB and agreements executed by VA Parties. Neither Reclamation nor DWR operated to the early implementation provisions. This recognized the: (1) delayed status and uncertainty caused by the State Water Resources Control Board (Board) in updating the Bay-Delta Water Quality Control Plan; (2) lack of consistency by the State of California in its Incidental Take Permit; and (3) operation of the CVP to deliver more water and produce additional hydropower as provided in Section 2 of Executive Order 14181, Emergency Measures to Provide Water Resources in California and Improve Disaster Response in Certain Areas, dated January 24, 2025 (E.O. 14181).The CVP exports were operated between April 18 and May 19 to meet the required Vernalis flow to export ratio (E/I ratio) in D-1641 and then operated to an OMRI no more negative than -5,000 for the remainder of May.

Issues Elevated in WY 2025

The SMT did not elevate any issues to WOMT during WY 2025, as the SMT ceased regular meetings in February 2025. Agency representatives made recommendations directly to WOMT under ITP COA 8.4.2, as discussed in “Additional Real-time OMR Restrictions and Performance Objectives.”

The SaMT elevated issues to WOMT several times during WY 2025. Recommendations to WOMT made under ITP COA 8.5.1 are also discussed in “Additional Real-time OMR Restrictions and Performance Objectives.” The following were items elevated to WOMT from SaMT:

- SaMT elevated a recommendation to switch genetic panels for genetic run-type assignment. This change was updated in the SOP for genetic analysis and adopted.
- SaMT recommendations on all yearling and young-of-year spring-run surrogate hatchery releases for consideration. All recommendations were adopted.

- SaMT sought guidance on meeting frequency of SaMT under the new ROD and ITP. SaMT meetings continued on a weekly basis with altered start times and durations.
- In March, both CDFW and NMFS elevated recommendations for OMRI actions in response to exceeding the hatchery-origin winter-run annual loss threshold. CDFW and NMFS recommended OMRI more positive than -3,500 cfs, but CDFW recommended ideally an OMRI of -2,500 cfs and continued to recommend OMRI of -2,500 cfs in subsequent weeks.
- SaMT sought guidance on tracking salvage vs loss for steelhead weekly distributed loss threshold based on unclear language in the PA. WOMT clarified that loss was intended to be tracked, and 'salvage' language was likely a minor oversight during the drafting of the PA language. Language will be amended to reflect 'loss' instead of 'salvage'.

WOMT members elevated OMR flow management concerns to the Directors between January and April in WY 2025 (See link to WOMT notes in the Supporting Links Section):

- WOMT did not have an opportunity to discuss the Larval and Juvenile Longfin Smelt Protection when it was triggered the second time during the season, and Reclamation operated OMRI to –5,000 cfs after discussion among Directors.
- WOMT met and discussed the appropriate operations after exceeding the 100% annual loss threshold for hatchery-origin winter-run, but did not reach consensus, and it was elevated to the Directors. Reclamation operated OMRI to –5,000 cfs after discussion among Directors.

Discussion of WY 2025 OMR Management Actions

Delta Cross Channel Gate Operations

Throughout WY 2025, OMR flow management season, the DCC gates remained closed per the ROD during time periods of risk for juvenile salmonids. Historic migration patterns at Knights Landing RST show an average of 50% of LAD natural-origin winter-run Chinook salmon have migrated past Knights Landing by December 23 and an average of 75% of LAD natural-origin winter-run Chinook salmon have migrated past Knights Landing by January 4th (2009 – 2024). In WY 2025, the first LAD natural-origin winter-run Chinook salmon was observed at Knights Landing on September 21, 2024, and the last was observed on March 8, 2025. While there were some KLCI and SCI triggers in late November (Figure 4), the DCC gates had already been closed for the season due to high Sacramento River flows. The seasonal closure starting November 18, 2024, provided conditions that made juvenile salmonids out-migrating down the Sacramento River less vulnerable to entrainment into the interior Delta. Relationships derived from tagged fish studies show that fish that remain in the mainstem Sacramento River have higher survival through the Delta. During

WY 2025, the DCC gate closures (in combination with a non-physical barrier at Georgianna Slough), likely helped to keep juvenile salmonids in higher-survival routes.

Delta Smelt Protections

During the First Flush Action, turbidity increased slightly in the central Delta, but elevated turbidity did not extend to the south Delta (Figure 9, Figure 16). High flow conditions continued past the First Flush Action, with 3-day average Freeport flows persisting above 25,000 cfs through February. The 3-day average Freeport turbidity decreased below 50 FNU for only a short period during the First Flush Action. With turbidity remaining low in the south Delta during WY 2025 First Flush implementation, adult Delta smelt were less likely to move into the south Delta channels and become entrained (Grimaldo et al. 2009). One marked Delta smelt was salvaged at the TFCF between when the action was triggered and when the action was implemented. No Delta smelt were salvaged during implementation of the First Flush Action.

The turbidity threshold of 12 FNU at OBI, HOL, and OSJ was exceeded once during the Adult Delta Smelt Protection period (January 1 – February 25). The action was triggered on January 12, 2025, and implemented January 15-16, 2025 (Figure 16). During the Adult Delta Smelt Protection period, four adult Delta smelt were salvaged (expanded salvage count: 16), all of hatchery origin.

During the period of Larval and Juvenile Delta Smelt Protection (LJDSP), the SMT received data on salvage, survey detections, and Secchi depth to assess the likelihood of larval and juvenile entrainment. LJDSP was triggered on February 25, 2025 (Figure 35) and was immediately off-ramped due to high Rio Vista flows (> 55,000 cfs). Secchi depth increased to greater than 100 cm for the remainder of the active period, so the more restrictive (-3,500 cfs OMRI) LJDSP action was not implemented in WY 2025. While adult Delta smelt were salvaged this season (Figure 26) and larvae were expected to be in the south Delta and appear at the fish salvage facilities, no genetically confirmed larval or juvenile Delta smelt were salvaged or observed in the south Delta.

Longfin Smelt Protections

Two adult longfin smelt (expanded salvage = 8) observed in salvage in WY 2025. OMR Management for Adult Longfin Smelt (ITP COA 8.3.3) was active from December 1, 2024 – February 28, 2025; it was not triggered in WY2025. A total of 55 juvenile longfin smelt (expanded salvage = 204) were salvaged at the CVP and SWP from March 13 – May 22, 2025. Further analysis and modeling will be helpful to understand patterns in longfin smelt entrainment during wet and above normal years. Additional years of data will be necessary to analyze the full effectiveness of ITP actions over a broad range of OMR flows and hydrology.

In WY 2025, qualitative larval sampling detected 13 larval longfin smelt at the CVP, and one larval longfin at the SWP. The south Delta larval smelt entrainment monitoring program (Larval Entrainment Study, LES) entered its fourth year of sampling. In the first two years of

LES, sampling was conducted in West Canal, adjacent to Clifton Court Forebay. Starting in WY 2024, annual sampling took place along a transect of central and south Delta SLS/20-mm Survey stations: 809, 812, 902, 915, and 918. Additional sampling was conducted at stations 809 and 812 in the lower San Joaquin River, as these are indicator stations for young of the year longfin smelt catch under ITP COA 8.4.2. LES data from this year are still being processed. In WY 2024, the most recent year for which data is available, 361 larval longfin smelt were detected (Figure 34). This is a substantial increase from the first two years, when sampling was conducted in West Canal. A total of 85 larval longfin were detected in West Canal in WY 2022 and 23 larval longfin were detected in West Canal in WY 2023.

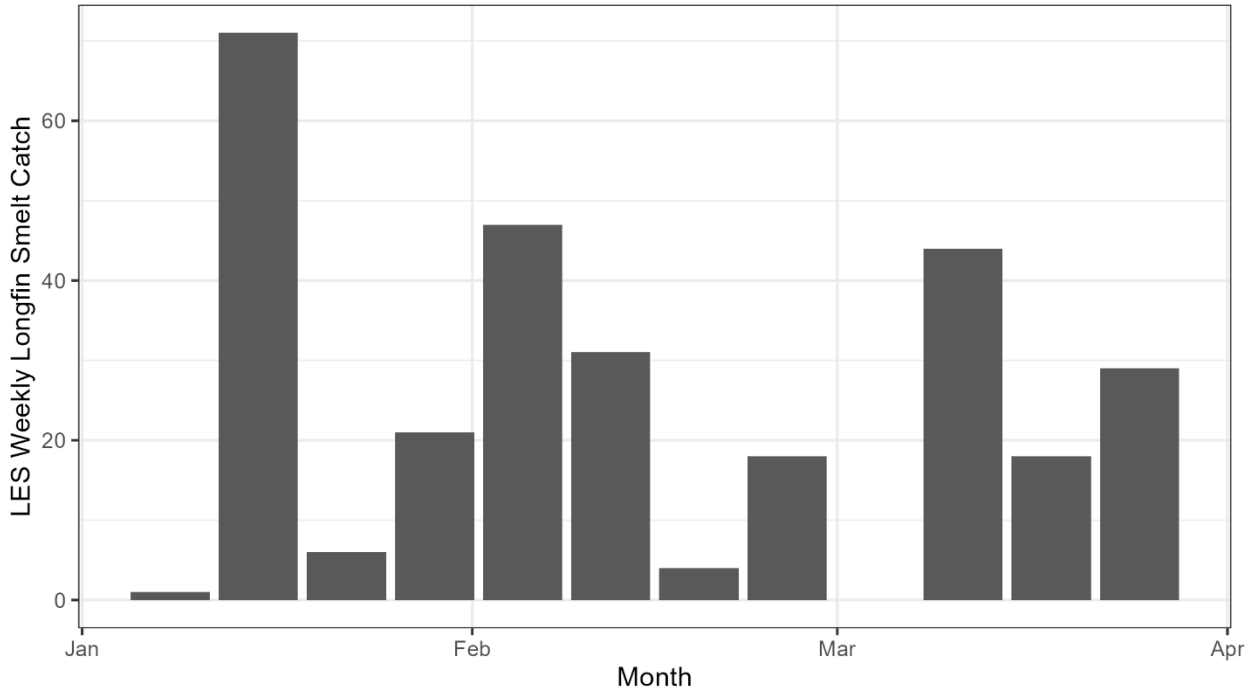


Figure 34. Weekly catch of larval longfin smelt (LFS) in WY 2024 in the Larval Entrainment Study (LES) across all stations. Data from 2025 are being processed and will be made available on EDI once finalized.

The figure is a bar graph showing weekly catch of larval longfin smelt ranging from 0 to 60 for the Larval Entrainment Study across all stations between January and April 2025.

Together, CDFW and DWR will continue refining the LES study design, as part of adaptive management. Concurrently, DWR is evaluating eDNA sampling as a complementary methodology for understanding of larval smelt entrainment into Clifton Court Forebay. In WY 2025, pilot eDNA sampling shifted to sampling for longfin smelt in the lower San Joaquin River. Experiments focused on comparing LES and eDNA methods for detecting longfin smelt presence. From March – May 2025, DWR and CDFW conducted coordinated tows at stations 809 and 812 using three methods: LES larval smelt sampling via bongo net,

tow net eDNA sampling, and passive eDNA sampler. The passive eDNA sampler was most successful and will be used in the coming year to compliment LES sampling.

Salmonid Loss at SWP and CVP Facilities

During the January–June OMR Management season (when the majority of salmonids were expected to be present in the Central and South Delta regions), OMRI 5-day and 14-day running averages remained above -5,000 cfs, except during part of February during storm-flex operations (Figure 5 and 7). While daily OMRI occasionally dipped below -5,000 cfs, compliance is based on the multi-day averages rather than daily values (Figure 5). The last genetically- confirmed natural-origin winter-run Chinook salmon was salvaged on March 24, 2025, and the last hatchery-origin winter-run Chinook salmon was salvaged on April 4, 2025. Loss occurrences for genetic winter-run Chinook salmon occurred predominantly in March with some loss occurring in late January and February and all of the detections occurring at the CVP facility. Loss of hatchery-origin winter-run occurred predominantly in March with some loss in early April, with 61% of loss occurring at the SWP facility. The last natural-origin steelhead was salvaged on May 26, 2025. Loss of most salmonid species and runs stayed below annual thresholds described in the ROD and the Incidental Take Limits (ITL) described in the Incidental Take Statement (ITS) section of the NMFS Biological Opinion. However, loss of LSNFH hatchery-origin winter-run Chinook salmon exceeded the annual loss thresholds, resulting in OMRI actions (see Winter-run Chinook Salmon Annual Loss Threshold section above for more details). Per the ROD and ITP, the exceedance of this annual loss threshold triggered an independent review panel to review SWP and CVP operations and the annual loss thresholds prior to November 1, 2025, and make recommendations on the current or additional actions to stay within annual loss thresholds in subsequent years. The exceedance of the hatchery-origin threshold is discussed in further detail below in the Hatchery winter-run annual loss exceedance section.

Modeling

The SaMT and SMT utilize real-time data and various modeling tools to inform OMR flow management. During WY 2025 before the DCC gate closures on November 18, 2024, weekly reports of KLCI and SCI values were received from CDFW, USFWS, and Reclamation (Figure 4). The Delta STARS model (survival, travel time, and routing simulation) accounts for DCC gates opening and closings and Delta inflow at Freeport and produces estimates of route specific survival through the Delta. A similar tool is in development for steelhead in both the San Joaquin and Sacramento basins with the intention of informing SaMT on steelhead outmigration survival and routing. A hindcast of daily survival for winter-run Chinook salmon is presented in Appendix C.

Two machine learning tools were utilized to assess salmon and steelhead loss throughout the season, the Tillotson model and the Winter-Run Chinook Salmon Machine Learning (WRCML) model. The Tillotson et al. (2022) tool proved useful with predicting and assessing loss in the face of different OMRI scenarios, particularly with steelhead, and was valuable

for making management decisions in 2025. The model performs better for steelhead because OMR flows are stronger predictors of their loss, while other covariates better predict winter-run Chinook salmon loss. The WRCML model with an OMR Conversion Tool is a useful tool to predict probability of presence and absence of LAD winter-run Chinook salmon at different OMR levels and is used in the ROD and ITP to assess OMR adjustments if winter-run Chinook salmon annual thresholds are exceeded. More information on the WRCML is included in the Hatchery winter-run annual loss exceedance and Improvements sections below. The WRCML model is not peer reviewed nor has the code been made available for use in federal decision-making processes; however, this report also supports State ITP efforts.

Steelhead/Salmonid Telemetry Studies

Acoustically tagged salmonids were tracked throughout the Delta in WY 2025 (https://calfishtrack.github.io/real-time/index.html; Table 8; Table 9). The SaMT used tagged project data, along with other datasets (salvage, RST monitoring locations, etc.), to understand survival and routing of salmon and steelhead as they relate to salvage and loss trends.

In WY 2025, 888 acoustic tagged hatchery winter-run Chinook salmon and 797 spring-run Chinook were released into the Sacramento and Feather Rivers, respectively (Table 8). Hatchery winter-run Chinook salmon had a total survival from stocking to outmigration at Benicia Bridge of 26.7 (23.8 – 29.7; Table 9). Hatchery spring-run had a total survival from stocking to outmigration of 11.9 (9.8 - 14.4; Table 9). Winter-run hatchery telemetry efforts are further detailed in Appendix C.

Wild acoustic tagged wild O. mykiss were released in Deer and Mill Creek, the Sacramento Basin, and the Stanislaus River in the San Joaquin Basins in fall and spring. Deer and Mill Creek fish had a total survival of 37.1% from stocking to outmigration at Benicia Bridge, and Stanislaus River fish had survival ranging from 0.5-0.8% (Table 9). In addition to wild releases, acoustic tagged hatchery O. mykiss were released in the Sacramento Basin. Overall survival of the hatchery release to outmigration at Benicia Bridge was estimated to be 2.1%. Other studies have recently released acoustically tagged wild O. mykiss into the Stanislaus and Sacramento rivers, but these efforts are too recent to have yielded significant results for reporting. It should be noted that while smolt sized individuals were targeted for tagging in these studies, survival estimates assume only fish that out migrate survived, but in reality, at least some of the fish likely remained as freshwater residents and could have biased the survival estimates.

Table 4. WY 2025 Acoustic Tagging: CVP/SWP details. *Ongoing study with provisional data. Estimates of Delta survival are not available for Table 9.

Project	Release Date(s)	# of Fish Tagged	Groups (n)	Hatchery	Release Location(s)
Hatchery-origin winter-run Chinook salmon	02/01/2025-02/13/2025	888	n = 2	LSNFH	Bonnyview, Posse Grounds
Stanislaus River wild steelhead (Fall Release)	11/18/2024-02/11/2025	130	n = 16	N/A	Goodwin Dam, Two Mile, Below Russian Rapids, Lovers Leap, Orange Blossom, Russian Rapids, Wildcat, Below Honolulu Bar, Above Buttonbush, Above Orange Blossom, Honolulu Bar, Below Orange Blossom, The Hole, Valley Oak, Above Horseshoe, Horseshoe
Stanislaus River wild steelhead (Fall and Winter USFWS Release)	11/18/2024 – 2/11/2025	130	n = 16	N/A	Goodwin Dam, Below Russian Rapids, Above Horseshoe, Horseshoe, Honolulu Bar, Two Mile Bar, Below Honolulu Bar, Orange Blossom
Stanislaus River wild steelhead (Spring USFWS Release)*	04/29/2025-05/29/2025	103	n = 8	N/A	Goodwin Dam, Below Russian Rapids, Above Horseshoe, Horseshoe, Honolulu Bar, Two Mile Bar, Below Honolulu Bar, Orange Blossom
Mill and Deer Creek wild steelhead, Spring Releases	11/04/2024-05/27/2025	35	n = 2	N/A	Mill Creek, Deer Creek

Project	Release Date(s)	# of Fish Tagged	Groups (n)	Hatchery	Release Location(s)
Sacramento River Hatchery Steelhead Releases	12/13/2024	291	n = 1	Coleman National Fish Hatchery	Red Bluff Diversion Dam
Natural-origin Red Bluff RST captured Steelhead*	05/12/2025 – 05/23/2025	3	n = 1	N/A	Altube Island
Natural-origin Upper Sacramento River Steelhead*	06/03/2025 – 07/03/2025	52	n = 18	N/A	Several locations in the Sacramento River between Keswick and RBDD
Feather River hatchery spring-run Chinook salmon	4/09/2025	797	n = 2	Feather River	Gridley Boat Launch (Separate Early and Late Release)

Table 5. WY 2025 Acoustic Tagging: minimum survival, SE, 95% confidence intervals (CI) to Benicia Bridge East Span and minimum through-Delta survival (City of Sacramento to Benicia) estimated using a Cormack-Jolly-Seber (CJS) survival model. Updated July 11, 2025. Through-Delta survival estimates, only overall survival, are not calculated for telemetry fish released in the San Joaquin River and are listed as NA in the table. *Wild steelhead survival numbers may be biased as survival estimates do not account for individuals remaining freshwater residents.

Project	Benicia Bridge Survival (%)	Benicia Bridge SE	Benicia Bridge 95% lower CI	Benicia Bridge 95% upper CI	Through-Delta Survival (%)	Through-Delta SE	Through-Delta 95% lower CI	Through-Delta 95% upper CI
Hatchery-origin winter-run Chinook salmon	26.7	1.5	23.8	29.7	64.1	2.8	58.5	69.3
Stanislaus River wild steelhead (Fall Release)	0.5	0	0.5	0.5	NA	NA	NA	NA
Stanislaus River wild steelhead (Fall and Winter USFWS Release)	0.8	0.8	0.1	5.3	NA	NA	NA	NA

Project	Benicia Bridge Survival (%)	Benicia Bridge SE	Benicia Bridge 95% lower CI	Benicia Bridge 95% upper CI	Through-Delta Survival (%)	Through-Delta SE	Through-Delta 95% lower CI	Through-Delta 95% upper CI
Mill and Deer Creek wild steelhead, Spring Releases	37.1	8.2	22.9	54.0	100	0	100	100
Sacramento River Hatchery Steelhead Releases	2.1	0.8	0.9	4.5	83.3	15.2	36.9	97.7
Feather River hatchery spring-run Chinook salmon	11.9	1.2	9.8	14.4	27.7	2.7	22.7	33.2

Hatchery Winter-Run Chinook Salmon Annual Loss Exceedance

The exceedance of the hatchery winter-run annual loss threshold at the facilities is a complex issue with multiple contributing factors, including the survival and routing of fish as they migrate, as well as operational decisions. While no single predictive tool can perfectly account for this, two analytical tools may help to provide some additional context regarding the hatchery winter-run Chinook salmon exceedance.

First, migration survival of winter-run Chinook salmon was higher than average in WY 2025. Observed survival of for hatchery winter-run Chinook salmon released into the mainstem Sacramento River to Delta entry averaged (95% confidence interval 34.4–41.6%), breaking down to 32.6% (28–37%) and 43.5% (38.4–48.7%) for the first and second release groups, respectively. While this difference in survival between groups appeared significant, it's unclear whether it influenced entrainment patterns, as Georgianna Slough routing and facility entrainment rates were roughly comparable between the two groups.

The observed overall survival exceeded the 26.3% rate (a variance-weighted mean of 2013-2024 survival rates) that had been used in developing the 2025 JPE for hatchery-origin winter-run Chinook salmon (see Appendix B, Appendix C). The variance-weighted mean over the period of 2013-2024 is used by the JPE Subteam because annual survival cannot be predicted and relying on an average over time better captures survival differences among years. Had this higher survival rate been known at the time, a revised hindcasted JPE of 195,700 would have corresponded to an updated annual threshold value of 234.84 (rather than the 162.41 value in effect during WY 2025). This suggests that the total estimated loss in WY 2025 (216.6) likely would not have triggered the 100% threshold under those real-time survival conditions and operations, though the 50% and 75% thresholds would still have been exceeded. Of course, this represents a hindcast scenario, actual survival estimates remain unknown during JPE development, and the JPE Sub-team works with the best available information at the time. Additionally, in-season adjustments to survival to delta entry is not possible as survival data is not known until all fish have migrated through the Delta,

The second tool, the Winter-Run Chinook Salmon Machine Learning (WRCML) model, which was applied to hatchery-origin Chinook salmon 75% loss thresholds in WY 2025 per the ROD and ITP, may provide operational insights. Although the WRCML model was trained on natural-origin Chinook salmon data, it is the only predictive tool available to SaMT for forecasting winter-run salvage, and by proxy, loss, under a suite of environmental conditions, most notably OMRI as it relates to exports, prior to detection of fish at the SWP and CVP export facilities. Model runs on March 13, before the 75% exceedance, predicted high presence for the following week (when the majority of hatchery winter-run loss occurred) under continued operational conditions. The model predicted a high probability of absence at an OMRI of -2,500 cfs or more positive, indicating that more positive OMRI than was operated to may have minimized loss and avoided threshold exceedances.

Genetic Information

Due to the inaccuracy of the LAD criteria, genetic information is used to validate loss of genetically confirmed winter-run and spring-run Chinook salmon at the SWP and CVP salvage facilities (Appendix D). For winter-run, LAD criteria is initially used as an on-ramp for an OMR action pending genetic confirmation. Genetic identification for individual fish is usually completed within the 3-day implementation period of on-ramping an action. Typically, genetic identification occurs between 1-4 days of salvage; however, there are some exceptions. For WY 2025, genetic identification of older juvenile Chinook salmon occurred within the 3-day implementation period, with the exception of 1 LAD winter-run Chinook salmon observed at the SWP on 3/18/25. This fish was ran for genetics multiple times but failed; therefore, on-ramping an action. Genetics finally was determined after the action was initiated and completed.

High flows in WY 2025 also provided access to flood bypasses on the Sacramento River which may have led to LAD criteria performed poorly with riverine juvenile salmonids entering the Delta and being present at the CVP and SWP facilities, due to fish being larger in size from increased food productivity and availability from the flood bypasses. Many of the LAD fish that went through rapid genetics (per COA 8.2.1, 8.4.4, and 8.17) were confirmed as spring-run or fall-run (66%) Chinook salmon. The lower accuracy of LAD criteria for winter-run Chinook salmon in WY 2025 may be due to floodplain inundation and other favorable conditions that could lead to higher growth rates for spring-run and fall-run Chinook salmon.

Salmonid Presence: Distribution Estimates

Distribution estimates for WY 2025 were made from October 1, 2024, until the signing of the new ROD on December 19, 2024, after which they were no longer estimated by SaMT as a requirement for the OMR season. Historical and observed distribution estimates continue to be available on SacPAS: WY 2025 Current Conditions for the Salmon Monitoring Team SaMT: SacPAS Sacramento Prediction and Assessment of Salmon and other fishes. As of December 17, 2024, SaMT estimated there to be approximately 30-35% of winter-run Chinook salmon in the Delta and 65-70% had yet to enter the Delta based on current monitoring trends.

Some monitoring surveys were disrupted during periods in WY 2024, due to weather, flow conditions, or technical/operational issues (Figure 10).

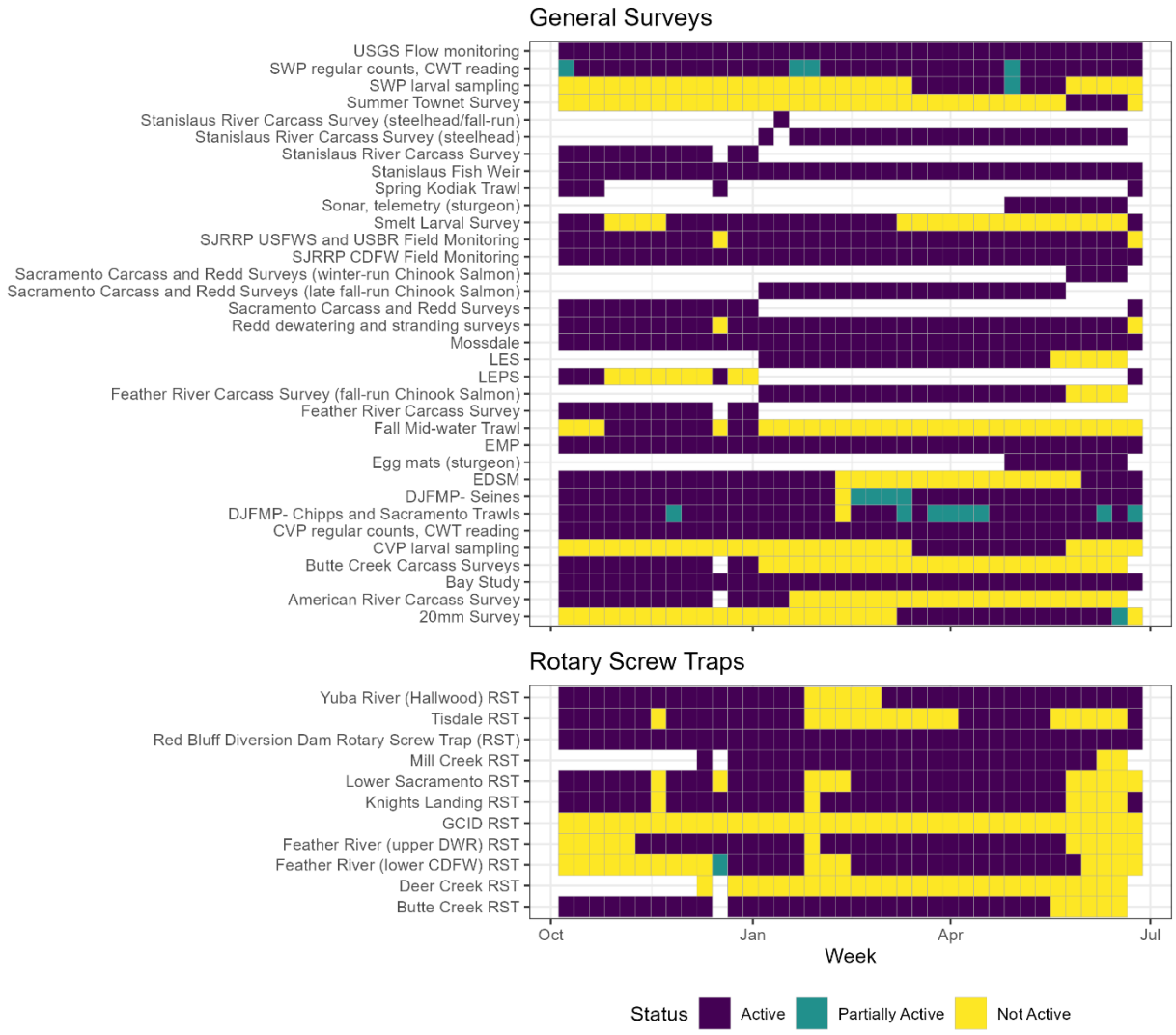


Figure 16. WY 2025 sampling disruptions for Delta monitoring (top) and rotary screw traps (bottom). These data reflect the information captured in each weekly outlook during the season. See Appendix A for weekly tables of sampling interruptions and cancellations.

The figure is two graphs showing sampling disruptions for Delta monitoring and rotary screw traps between October and July 2025. The surveys display three different statuses which are active, partially active, and not active.

Salmonids and Historical Performance

Historical combined CVP and SWP loss of genetically confirmed natural-origin winter-run Chinook salmon is shown in Figure 32. Data was combined for historical genetic winter-run Chinook salmon loss data (2010-2024) and compared to WY 2025 with monthly loss shown as a percentage of total winter-run loss. Based on historical data, the highest percentage of

loss for natural-origin winter-run typically occurs in March with a moderate proportion occurring in February with WY 2025 following a similar trend.

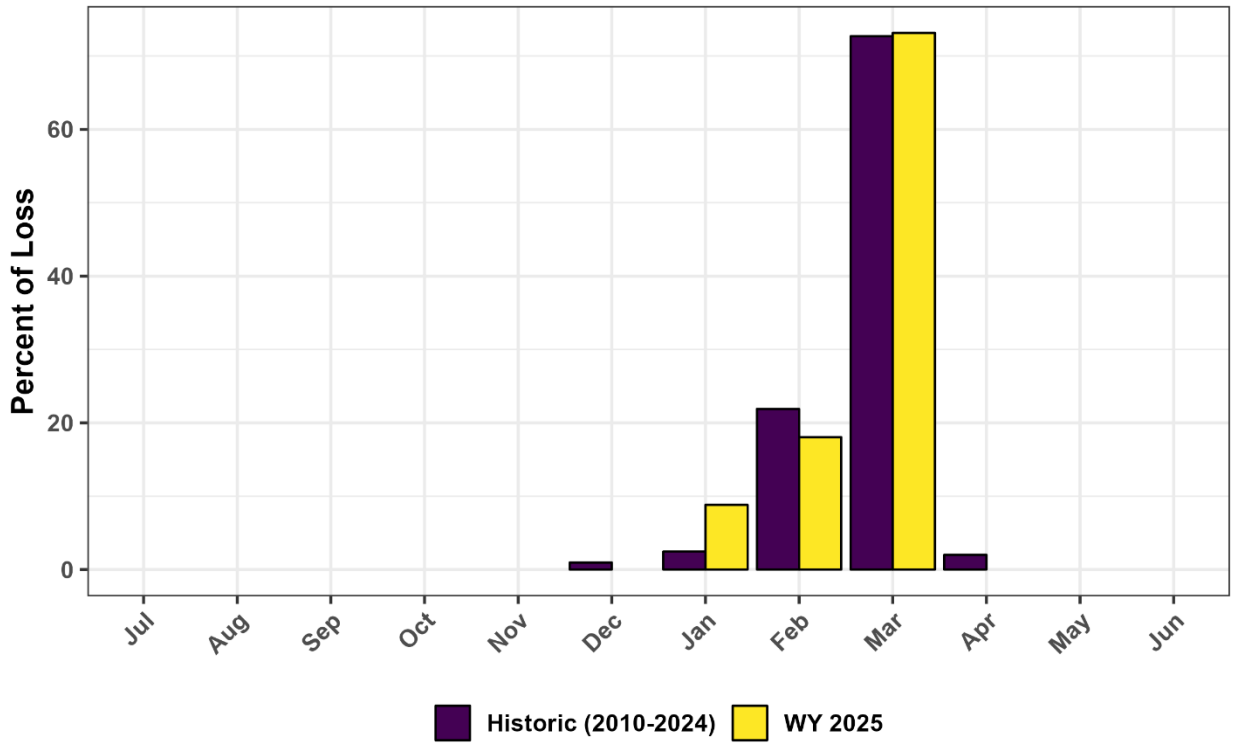


Figure 32. Genetically confirmed natural-origin winter-run Chinook salmon loss by month, for WY 2010-2024 combined, compared to WY 2025. Monthly loss is shown as percentage of cumulative loss per water year.

The figure is a bar graph showing genetically confirmed natural-origin winter-run Chinook salmon loss by month for the historic WY 2010-2024 combined compared to WY 2025. The percent loss on the y-axis ranges from 0 to 70.

Loss of hatchery winter-run Chinook salmon is shown in Figure 39, with monthly loss shown as percentage of cumulative annual loss, for WY 1999-2024, and current WY 2025. Historically, loss occurred most frequently in March and April and WY 2025 loss followed similar trends.

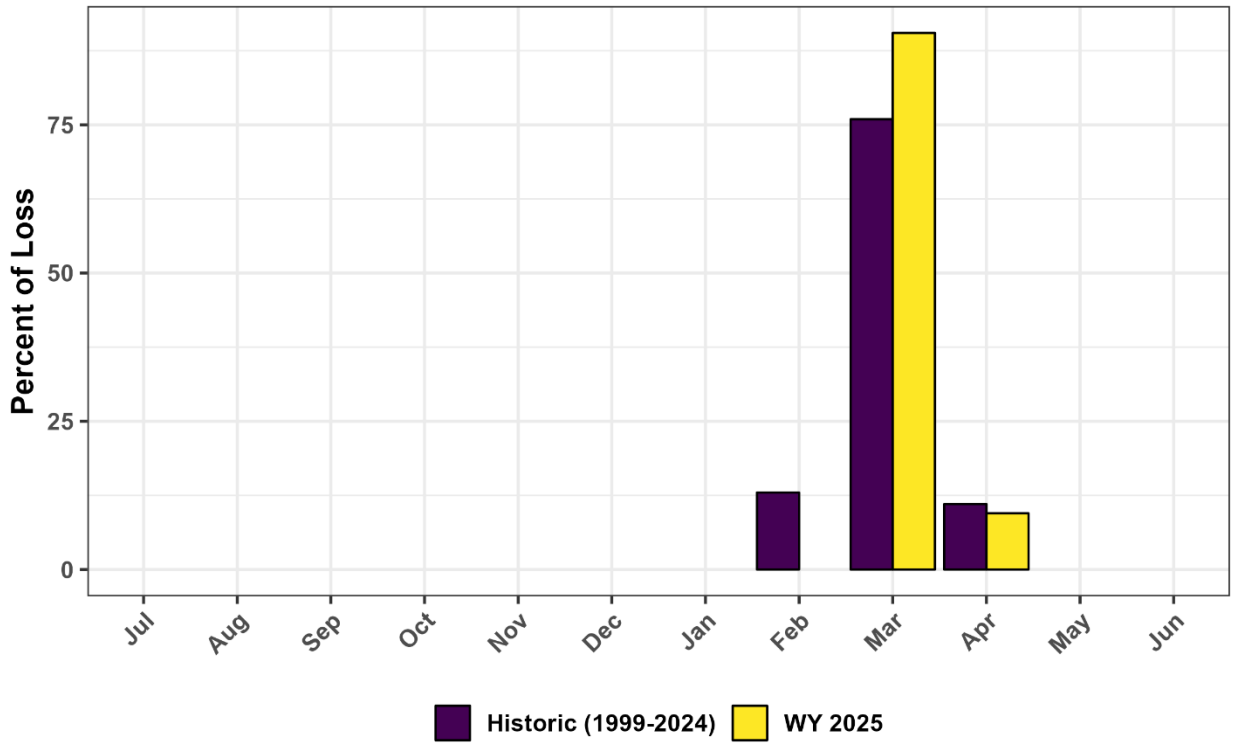


Figure 39. Hatchery-origin winter-run Chinook salmon loss by month for WY 1999-2024 combined, compared to WY 2025. Monthly loss is shown as percentage of cumulative loss per water year.

The figure is a bar graph showing hatchery-origin winter-run Chinook salmon loss by month for WY 1999-2024 combined compared to WY 2025. The percent loss on the y-axis ranges from 0 to 80.

Historical natural-origin CCV steelhead loss by month and water year is shown in Figure 33, with loss shown as percentage of total water year loss and compared between historical water years (2009-2024) and current WY 2025. Historical loss occurred most frequently in March and April with WY 2025 loss following similar trends.

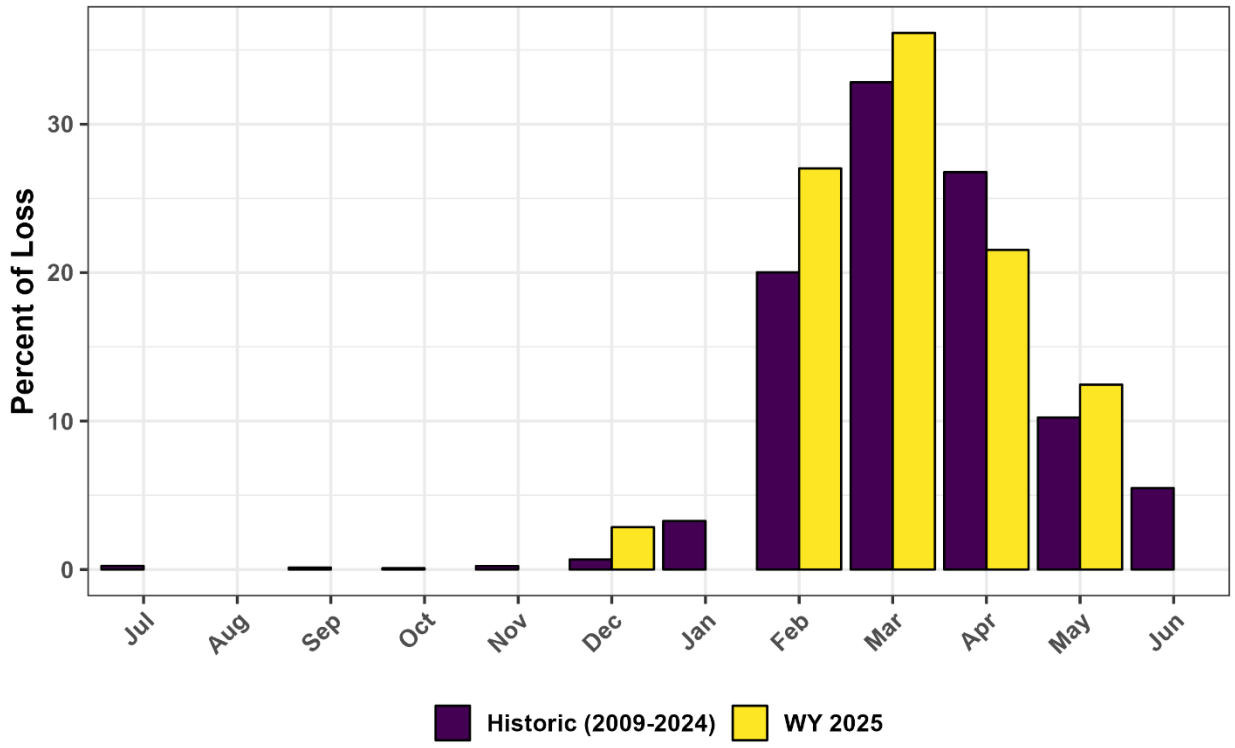


Figure 17. Historical natural steelhead loss by month historically (2009-2024 combined) compared to WY 2025 loss. Monthly loss shown as percentage of cumulative loss per water year.

The figure is a bar graph showing historical natural steelhead loss by month for 2009-2024 combined compared to WY 2025. The percent loss on the y-axis ranges from 0 to 40.

Improvements

WY 2025 improvements listed in this section may be evaluated as potential future updates to OMR flow management, and subsequent guidance documents, which could assist operations in upcoming OMR flow management seasons. Improvements may also be considered or evaluated through projects described in the adaptive management program of the 2024 ITP and ROD.

SHERLOCK Rapid Genetic Testing

Chinook salmon entering the CVP and SWP salvage facilities in the Delta are assigned to a run type for incidental take reporting and loss threshold triggers. Since 1997, run type at salvage has been determined using the Delta model LAD criteria. Inaccurate assumptions underlying the model combined with overlapping juvenile length distributions across runs have prompted increasing use of genetic approaches for run assignment (Harvey et al. 2014, Brandes et al. 2021). Currently, most genetic approaches use many neutral markers to assign run type based on population structure (e.g., Clemento et al. 2014, Meek et al. 2016). An alternative approach is to use a small number of diagnostic markers (e.g., region associated with adult migration timing (Prince et al. 2017, Thompson et al. 2020)) in combination with CRISPR-based technology (SHERLOCK; Baerwald et al. 2023). A migration-associated marker/SHERLOCK approach has advantages, including the potential to obtain results within a few hours after fish are collected at salvage facilities.

The SHERLOCK pilot study at salvage showed a >98% concordance rate with established GT-seq methods across 1,654 salvaged Chinook salmon samples from WY 2023 and WY 2024, including 641 winter-run LAD fish at the SWP and CVP facilities. SHERLOCK was able to identify all homozygous genetic winter-run Chinook salmon with a 100% concordance rate.

Adopting SHERLOCK at-facility genotyping can produce results as quickly as within two hours of fish collection and fin clip preparation, allowing for rapid decision-making at the facilities. However, individuals heterozygous at SHERLOCK assay loci cannot be resolved to a run type with SHERLOCK alone. Other genetic tools are required to assign run types for these fish (~10% of total samples).

Georgiana Slough Salmonid Migratory Barrier (GSSMB)

The first year of the Georgiana Slough Salmonid Migratory Barrier Project (GSSMB; project) installation and operation occurred the previous year in WY 2024. The project includes the installation and operation of a non-physical barrier using BAFF technology at the divergence of Georgiana Slough and the Sacramento River each year through the juvenile Chinook salmon migration season in 2030. Operations begin following the closure of the Delta Cross Channel gates in the winter, or no later than January 1, through April 30. BAFF operations in additional months, November, December, and May, will be adaptively managed each Project year by DWR in coordination with CDFW, NMFS, and USFWS.

The BAFF is used as a behavioral deterrent for juvenile listed salmonids from entering Georgiana Slough and, ultimately, the interior Delta during outmigration and its effectiveness is monitored by acoustically tagging and releasing hatchery-reared juvenile Chinook salmon and/or steelhead each year in the Delta Survival Study.

Modeling results of routing at Georgiana Slough with flow and the BAFF, from real-time detections of acoustic tagged fish in 2024 using hatchery-reared late-fall Chinook salmon, show that the BAFF reduced the predicted probability of routing into Georgiana Slough from approximately 13% to 26%. In WY 2025, the Georgiana BAFF was operational without bubbles due to issues with the facility. Preliminary data from WY 2025, using hatchery-reared late-fall Chinook salmon releases in December, January, February, April and May indicate the probability of fish staying in the mainstem Sacramento River was between 74.3% - 85.6%. Final modeling of routing of Georgiana Slough for WY 2025 is on-going.

Winter-run Chinook Salmon Machine Learning Model

The WRCML model served as an analytical tool in WY 2025 under the State ITP. On one occasion, the WRCML output was included in the fishery assessment shared with WOMT. This model is only anticipated to be used under specific threshold conditions but could be a useful piece of information for greater consideration if shared and made accessible to SaMT, DMWG, and WOMT on a regular basis. If appropriate, the model could be further developed using both hatchery and genetically confirmed winter-run Chinook salmon and related to other Delta performance metrics such as winter-run Chinook salmon Delta migration timing and through-Delta survival.

Conclusion

SaMT did not meet at the close of the WY 2025 OMR Management Season to discuss items for consideration for subsequent years; however, there were some things to note from the season:

- SaMT procedures remained the same throughout the first half of the season until the signing of the new ROD signed in December 2024. Afterwards SaMT no longer drafted Proposed Action Assessments as a group.
- Per the new ROD and ITP, DWR took on the role of drafting weekly Spring-run Risk Assessments.

SMT stopped meeting regularly based on guidance from the new ROD and ITP starting in February 2025 and did not meet at the close of the WY 2025 OMR Management Season to discuss items for consideration for subsequent years.

Reclamation and DWR continued to draft assessments as specified by the ROD and ITP, or as deemed appropriate, for the remainder of WY 2025.

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Supporting Links

- Salmon Monitoring Team Notes and Proposed Action Assessments: https://www.usbr.gov/mp/bdo/salmon-monitoring-team.html
- Salmon Monitoring Team webpage: http://www.cbr.washington.edu/sacramento/workgroups/salmon_monitoring.html
- Smelt Monitoring Team Notes: https://www.usbr.gov/mp/bdo/smelt-monitoring-team.html
- Smelt Monitoring Team webpage: http://www.cbr.washington.edu/sacramento/workgroups/delta_smelt.html
- Smelt and Salmon Monitoring Teams ITP Risk Assessments: https://wildlife.ca.gov/Conservation/Watersheds/Water-Operations
- Water Operations Management Team Notes: https://www.usbr.gov/mp/bdo/water-operations-management.html
- Bay Delta Live webpage: https://www.baydeltalive.com/current_conditions/turbidityReferences
- CalFishTrack Central Valley Enhanced Acoustic Tagging Project webpage: https://oceanview.pfeg.noaa.gov/CalFishTrack/index.html#Acoustic_Tagging_Project