BUREAU OF RECLAMATION

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

March 20, 2025

Winter-run Chinook salmon have continued to be salvaged for over a week and exceeded the hatchery-origin 50% annual loss threshold and natural-origin weekly loss threshold. Seasonal behavior and timing rather than OMRI are likely driving observed loss at facilities, therefore modifications more positive than -5,000 are unlikely to reduce loss or change the population level effect of exports on winter-run Chinook salmon.

## Executive Summary

Natural-origin and hatchery-origin juvenile winter-run Chinook salmon have been observed at the export facilities. Overall, seasonal loss has been limited for winter-run Chinook salmon. Observations suggest good through-Delta survival and historical trends suggest salvage has peaked and will continue to taper off towards the end of March. Observation and historical trends suggest continuing, but reduced weekly loss; therefore, no modification more positive than -5,000 is proposed under the hatchery- and natural-origin winter-run Chinook salmon criteria until next week's assessment.

### Operational Conditions

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

- A winter-run Chinook salmon Weekly Distributed Loss Threshold was exceeded on 3/19/2025.
- A hatchery-origin winter-run Chinook salmon 50% annual loss threshold was exceeded on 3/19/2025
- The Delta is in excess condition with restrictions for Old and Middle River flow.
- Turbidity is low in the South Delta and moderate in the Lower San Joaquin River.
- As of March 16, 7-day average Qwest was 6,125cfs. For March 17-24, the forecasted average daily QWEST ranges from 3,000 to 8,500 cfs.

### Winter-run Chinook Salmon

Loss of natural- and hatchery-origin winter-run Chinook Salmon has occurred in the past week at the Federal and state fish salvage facility. A majority of winter-run are migrating out of the delta. With a more negative OMRI, loss of natural-origin winter-run may be expected to follow historical trends. Exceedance of the natural winter-run annual threshold is unlikely over the next week, but loss of natural winter-run Chinook Salmon at the Central Valley Project (CVP) and State Water Project (SWP) fish collection facilities is likely over the next week. Daily loss may lead to exceedance of the weekly distributed loss threshold as the threshold gets smaller. Exceedance of the 75% annual threshold for hatchery-origin winter-run Chinook salmon may occur over the next week.

## Operational and Regulatory Conditions

See current Weekly Fish and Water Operation Outlook document.

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

### Winter-run Chinook Salmon

- Delta Life Stages
    - Juveniles, Adults
- Brood Year 2025 Information
    - Adult winter run Chinook salmon are migrating through the Bay-Delta.
    - As February 27, 2025, of Livingston Stone National Fish Hatchery has collected 17 female and 17 male winter-run chinook salmon adults at the Keswick Fish Trap site.10 winter-run chinook salmon adults were collected from Battle Creek for the Jump Start Program and are being held at Livingston Stone NFH.
    - As February 27, 2025, no winter-run adult carcasses have been observed.
- Brood Year 2024 Information
    - Natural winter-run Chinook salmon: The final winter-run Chinook salmon Juvenile Production Estimate, which estimates the abundance of fish entering the Delta, for Brood Year 2024 is 98,893.
    - Catch of juvenile winter-run Chinook Salmon at Red Bluff Diversion Dam has slowed as most fish are presumably in the Delta or the ocean. Mean cumulative weekly passage of winter-run Chinook Salmon through March 16 at Red Bluff Diversion Dam (RBDD) for the last 20 years of passage data is 100%, on average.

The biweekly estimate (90% CI) as of December 31, 2024, was 422,554 (310,893-534,214) compared to an estimate 894,452 on a comparable date in BY 2023.

- Tisdale Weir and Knights Landing rotary screw traps as well as the Sacramento Trawls and Sacramento Seines have observed winter-run Chinook Salmon sized fish which suggests that winter-run Chinook salmon may still be migrating into the Delta. Historically, on average 99% of winter-run have been captured at delta entry rotary screw traps and less than 20%, on average, have been captured exiting the delta at Chipps Island as of March 6 (see Table 1). Based on historical data, the week of March 19-25, is on the tail of winter-run Chinook presence in the Delta.

- The STARS model estimates of winter-run Chinook salmon through-Delta survival across all routes during March of AN water year types was 0.64, respectively, from the LTO Biological Assessment (USBR 2024). From February to March 11, the STARS model estimated overall survival between 0.62 (80% CI: 0.48-0.73) and 0.79 (80% CI: 0.73-0.86). Overall survival is expected to remain fairly constant in the next few days (Figure 1), indicating continued good conditions in the Delta.

- Historically, on average 72% of natural winter-run have been lost at the facilities by March 16 (Table 1). If historical loss trends continue during water year 2025, individual captures of natural winter-run would be expected to be less than 50 individual fish (Figure 2).

- A total of nine genetically confirmed and two unconfirmed winter-run Chinook salmon have been salvaged this season. In the last 7 days, four natural winter-run and two unconfirmed winter-run Chinook salmon have been salvaged leading to a weekly 7-day running loss of 30.1 as of March 19 (Table 2, Figure 3). Cumulative loss of winter-run Chinook salmon has been low this water year and remains far below cumulative loss thresholds (Figures 3 & 4).

- Hatchery-origin winter-run Chinook salmon: Livingston Stone National Fish Hatchery released approximately 240,404 brood year 2024 winter Chinook Salmon into the Sacramento River on February 1, 2025, and 261,222 were released into the Sacramento River on February 13, 2025. Of these 888 were released with telemetry tags. Of the 888 released with telemetry tags, 217 were detected on real-time receivers in the Sacramento River near the city of Sacramento and over 172 were detected exiting the delta at Benicia Bridge. Routing probability into Georgianna Slough and the interior delta was low (17.8%), and only 3 of the telemetry fish were detected at salvage facilities. Through-Delta survival for this hatchery winter-run Chinook salmon acoustically-tagged release groups was estimated to be 54.1%. This real-time data suggests that a significant proportion of fish that survived to delta entry likely exited the Delta at Benicia Bridge and a smaller proportion routed towards the Delta export facilities.

- A total of 27 hatchery winter-run Chinook salmon have been salvaged this year, with 25 of these fish being salvaged in the past 7 days. This has produced a cumulative loss of 89.82 fish, which is 55.3% of the 100% cumulative loss threshold (Figure 3).

### *Delta Hydrodynamics*

Based on forecasted Sacramento and San Joaquin River inflows in the weekly fish and water operations outlook, the Delta hydrodynamics approximate those in a HiMed or HiHi category (USBR 2024). In the HiMed condition, when the modeled proportion of the total DSM2 channel length experiencing medium hydrologic influence at -5,000 and -3,500 is measured, we see the proportion of channel length experiencing hydrologic influence is approximately twice as large at -5,000 from 188,818 feet to 392,039 feet. (USBR 2024 Figure I.3-121). When this is considered spatially, areas that reflect medium and high hydrologic alteration (0.0-0.75 proportional overlap of estimated velocities) at DSM2 nodes retreats from Rock Slough south to Railroad Cut when OMR are modified from -5,000 to -3,500 (USBR 2024 Figure I.3-107). In the HiHi condition, when the modeled proportion of the total DSM2 channel length experiencing medium hydrologic influence at -5,000 and -3,500 is measured, we see the proportion of channel length experiencing hydrologic influence increasing approximately 20% at -5,000 from 330,569 feet to 396,491 feet (USBR 2024 Figure I.3-121). When this is considered spatially, areas that reflect medium and high hydrologic alteration (0.0-0.75 proportional overlap of estimated velocities) at DSM2 nodes are similar and extend north of Rock Slough (USBR 2024 Figure I.3-107).

### *Evaluation*

Four natural winter-run salmon were salvaged in the last seven days at the CVP fish collection facility with an estimated loss of 10.4 fish, which appears to be peak loss based on historic trends, modeling and this year's observations (Figure 4,5). Delta through-Delta survival has been high this winter. Hydrodynamics in the Delta suggest the export footprint does not extend into the Interior Delta and remains south of Frank's Tract. Predicted loss is expected to continue at a higher rate in the –5000 OMRI scenario than the -3500 OMRI scenario (Table 3a, 3b) using the Tillotson et al model (2022). Both scenarios exceed the historical trend. If loss of natural-origin winter-run Chinook salmon continues to decline, based on observations and historical trends, the weekly loss thresholds may be exceeded in future weeks, but the 50% annual loss threshold will not be exceeded for natural-origin winter-run Chinook salmon (Figure 3). For hatchery-origin winter-run Chinook salmon, loss will also decrease, but the 75% annual loss threshold may be exceeded.

Table 1. Historic migration and salvage patterns for winter-run Chinook salmon. Average percentage and 95% confidence intervals in parentheses. Last updated 3/17/2025

| Species | Red Bluff Diversion Dam | Tisdale RST | Knights Landing RST | Sac Trawl | Chipps Island Trawl | Salvage |
|---|---|---|---|---|---|---|
| Chinook, LAD Winter-run, Unclipped | 99.5% (99.2%,99.8%) BY: 2015 - 2023 | 98.6% (97.6%,99.7%) BY: 2015 - 2023 | 98.5% (97.1%,99.8%) BY: 2015 - 2023 | 62.8% (40.8%,84.9%) BY: 2015 - 2023 | 20.4% (9.9%,30.8%) BY: 2015 - 2023 | 67.7% (49.8%,85.7%) WY: 2015 - 2024 |
| Chinook, LAD Spring-run, Unclipped | 28.6% (8.6%,48.5%) BY: 2015 - 2023 | 19.7% (7.6%,31.7%) BY: 2015 - 2023 | 30.3% (10.3%,50.3%) BY: 2015 - 2023 | 7.2% (3.3%,11.1%) BY: 2015 - 2023 | 0.1% (-0.0%,0.2%) BY: 2015 - 2023 | 1.7% (-0.8%,4.1%) WY: 2015 - 2024 |
| Steelhead, Unclipped (January-December) | 2.4% (0.8%,4.0%) BY: 2015 - 2024 | 48.3% (29.9%,66.8%) BY: 2015 - 2024 | 47.8% (28.6%,67.0%) BY: 2015 - 2024 | 55.6% (29.5%,81.6%) BY: 2015 - 2024 | 43.4% (25.5%,61.3%) BY: 2015 - 2024 | N/A |
| Chinook, DNA Winter-run, Unclipped (Water Year) | N/A | N/A | N/A | N/A | N/A | 71.5% (45.6%,97.5%) WY: 2020 - 2024 |
| Steelhead, Unclipped (Water Year) | N/A | N/A | N/A | N/A | N/A | 41.6% (27.2%,55.9%) WY: 2015 - 2024 |

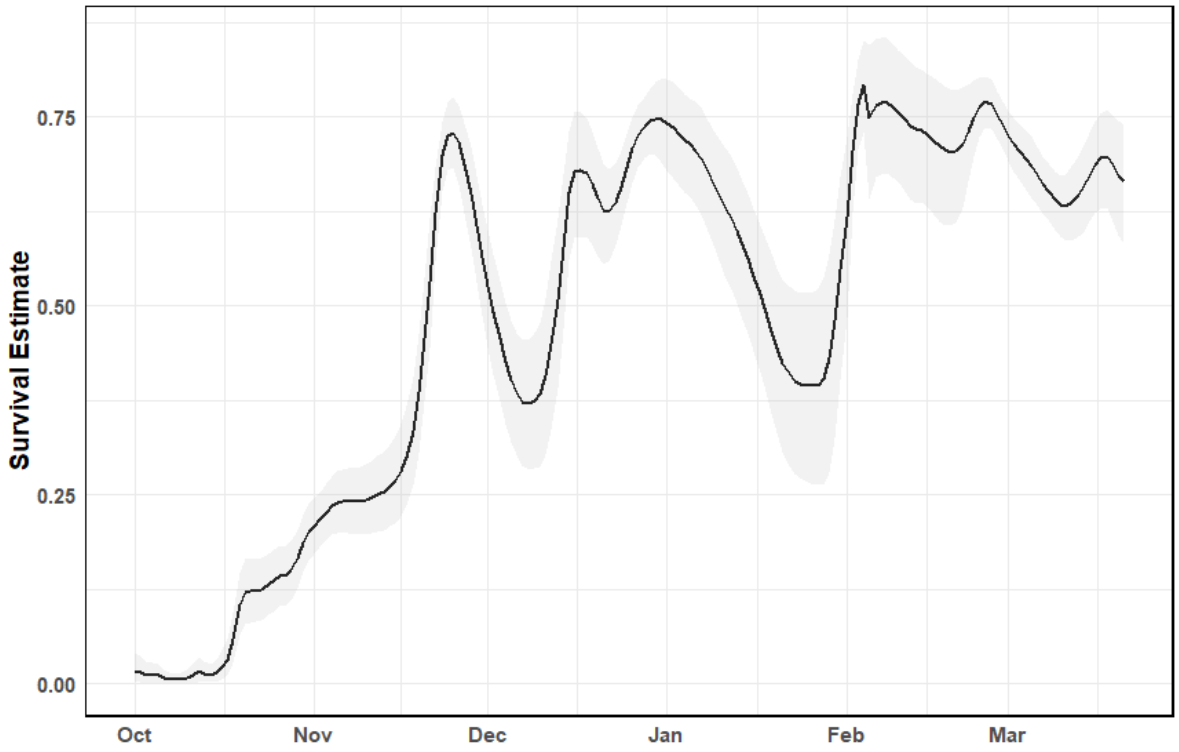


Figure 1. Temporal variation in overall survival estimates for outmigrating juvenile winter-run Chinook Salmon in the Delta with 80% credible intervals (shaded region) from October to March 17.

Figure 1 is a line graph depicting Survival Estimate (from 0%-75%) over the months October to March. The line starts slightly above 0.00% in October, reaches a peak above 75% in early February, and ends at about 63% in late March. There are significant dips in the line to 37.5% in early December, and to slightly above 37.5% at the end of January.

Table 2. Summary of weekly loss of winter-run to inform weekly distributed loss thresholds. Winter-run thresholds are triggered when 7-day rolling sum of loss exceeds the daily threshold based on historic proportion of winter-run present in the delta. *Indicates all or a portion of Winter-run loss has not been genetically confirmed

| Date | Winter-run Daily Loss | Winter-run 7-day rolling sum loss | Winter-run Daily Threshold | Winter-run Daily Trigger |
|---|---|---|---|---|
| Mar 13 | 0 | 2.60 | 38.30 | No |
| Mar 14 | 0 | 2.60 | 38.30 | No |
| Mar 15 | 0 | 0.00 | 38.30 | No |
| Mar 16 | 7.8 | 7.80 | 38.30 | No |

| Date | Winter-run Daily Loss | Winter-run 7-day rolling sum loss | Winter-run Daily Threshold | Winter-run Daily Trigger |
|---|---|---|---|---|
| Mar 17 | 2.6 | 10.40 | 38.30 | No |
| Mar 18 | 19.72* | 30.12 | 38.30 | No |
| Mar 19 | 0 | 30.12 | 19.83 | Yes |

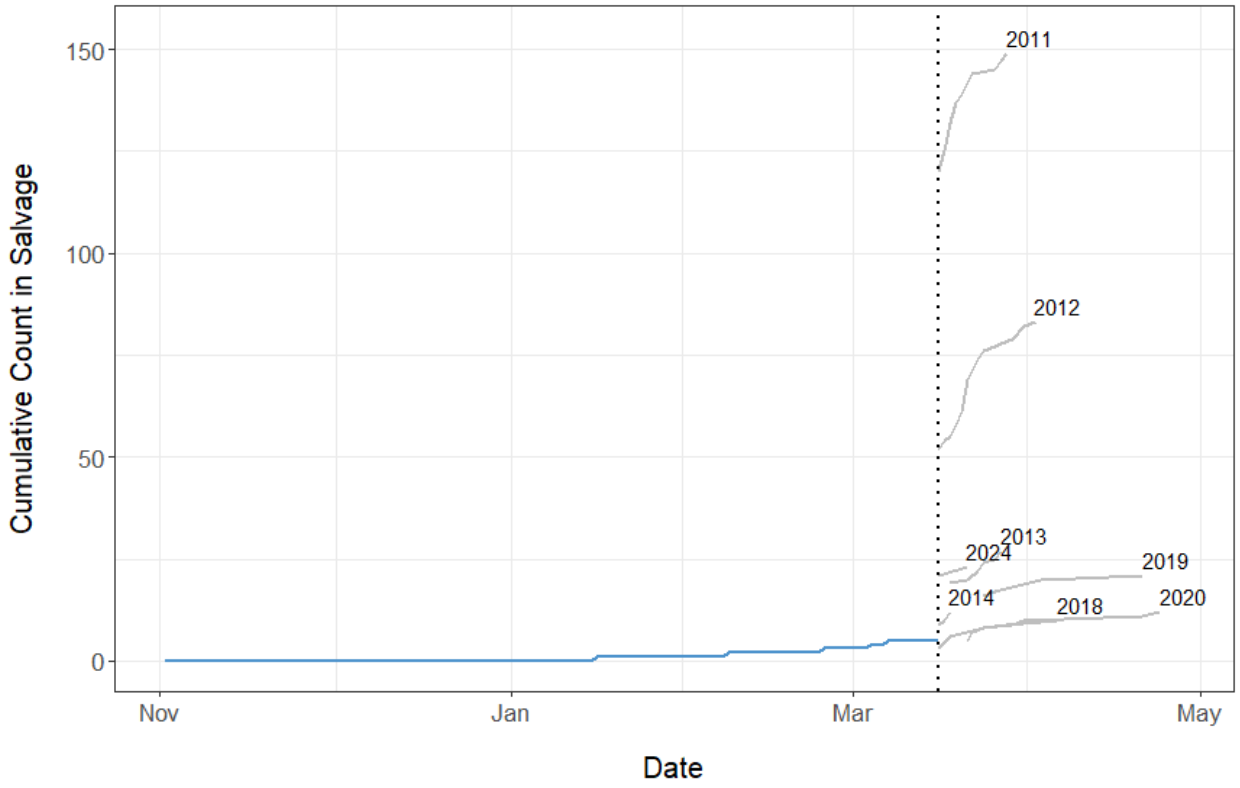


Figure 2. Cumulative catch of genetically confirmed Winter-run Chinook Salmon in salvage in WY2025.

Figure 2 is a line graph depicting the Cumulative Count in Salvage (0-150), over Date (November – May). A blue line depicts the current counts, and a grey line depicts historical counts. Current counts stay at 0 from November to January and increase slightly to below 10 in March. 2011 had the highest counts, which was slightly below 150. Cumulative catch refers to raw count data at the salvage facilities, not expanded salvage or estimated loss.

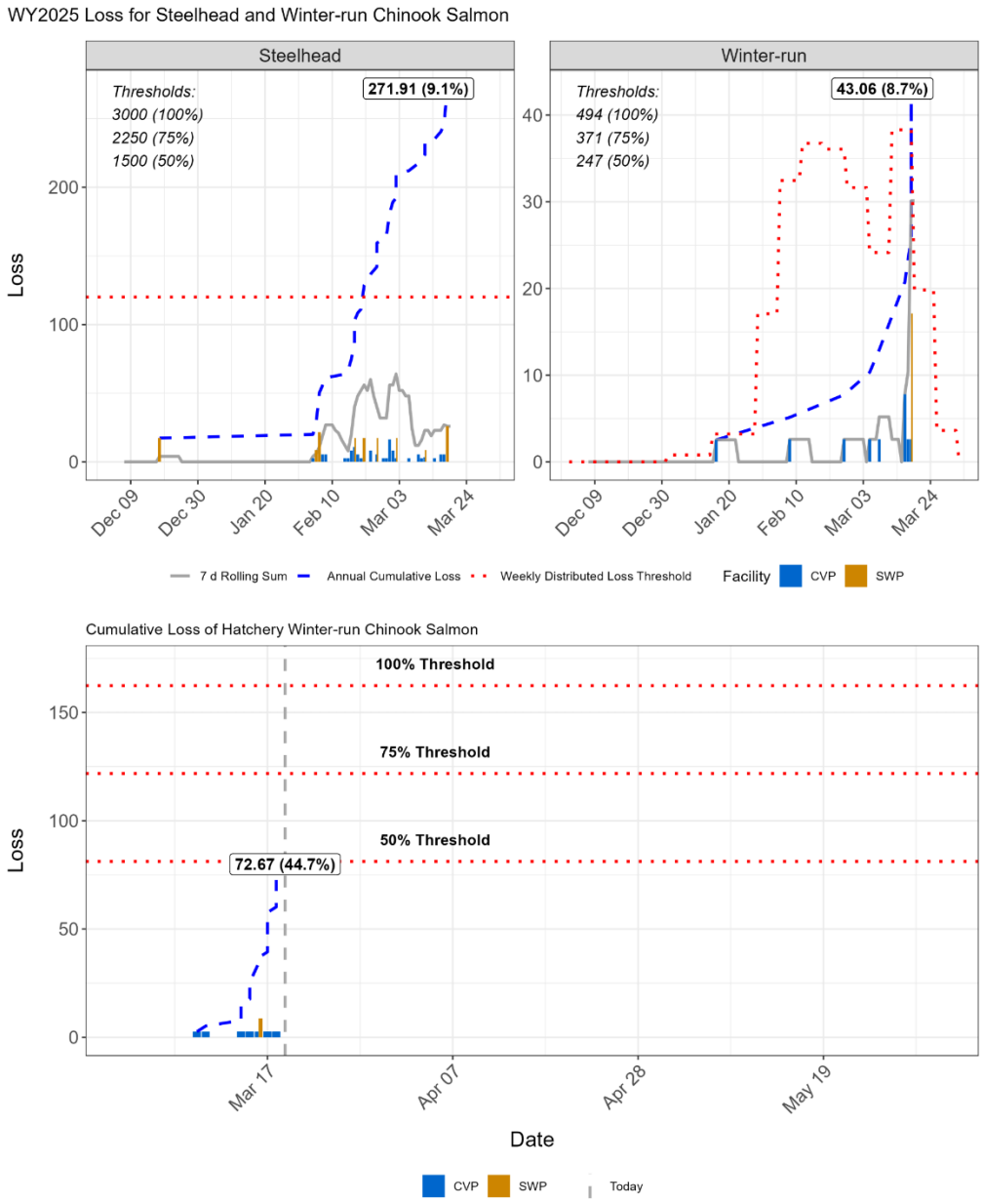


Figure 3. WY2025 Loss for Steelhead and Winter-run Chinook Salmon; Cumulative Loss of Hatchery Winter-run Chinook Salmon

Figure 3 is three line graphs depicting annual cumulative loss (blue dashed line), 7-day rolling sum (grey line), weekly distributed loss threshold (red dotted line), and loss by day at the CVP (blue columns), and SWP (orange columns) for winter-run Chinook salmon and CCV steelhead in the top graph. Cumulative loss of hatchery origin winter-run in bottom graph. Bolded numbers indicate total cumulative loss for both species with percentages in parentheses representing the percentage of annual loss thresholds. NOTE: Hatchery cumulative loss threshold does not reflect most recent threshold exceedance.

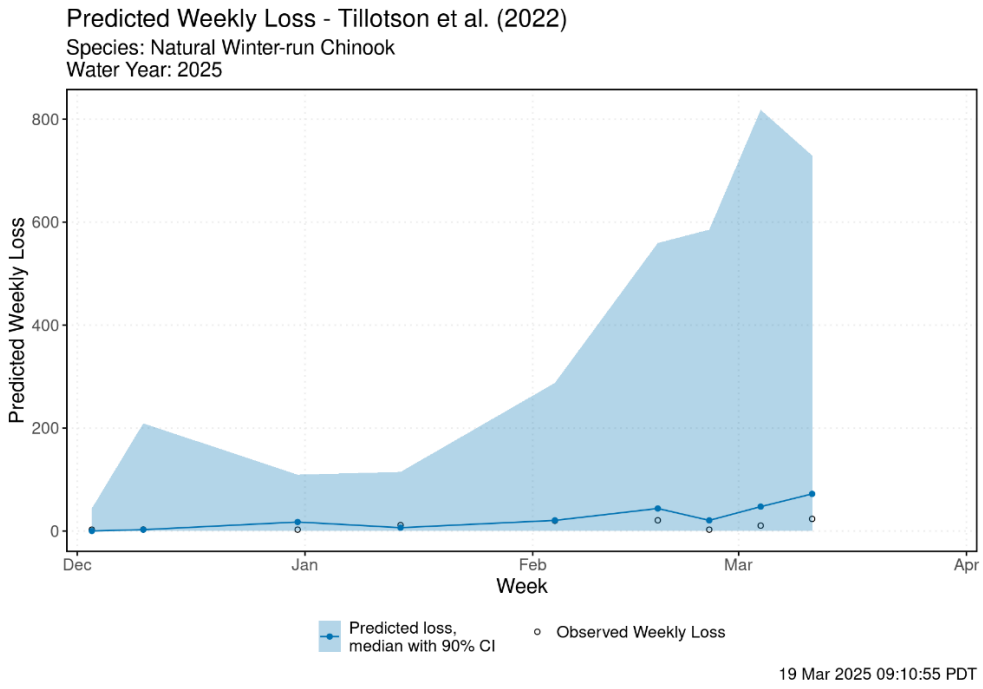


Figure 4. Seasonal predictions of winter-run Chinook salmon weekly loss from the using the Tillotson et al model (2022).

Figure 4 is a line graph depicting Predicted weekly Loss (0-800) over Week (months December to April). A blue shaded area represents predicted loss, and median with 90% CI, and hollow circles depict the observed weekly loss. The observed median loss follows a similar pattern to predicted median loss.

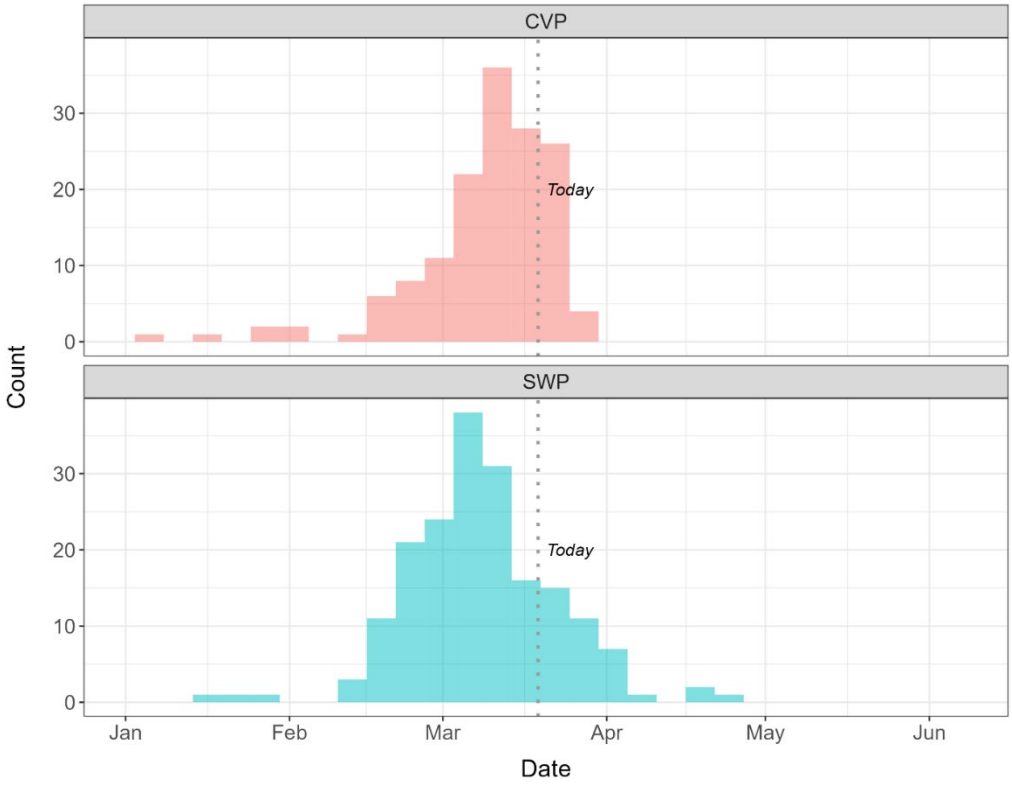


Figure 5. Distribution of genetically confirmed winter-run salvaged at the Central Valley Project (CVP) and State water Project (SWP) from 2011-2024. Vertical dotted line represents the most current date (March 19).

Figure 5 is two bar graphs (CVP and SWP) depicting Count (0-30) over date (January-June). The graphs for CVP and SWP show peaks in early to mid-March.

Table 3a. WY 2025 loss and salvage predictor data: Predicted weekly loss of winter-run Chinook salmon and steelhead at CVP and SWP facilities.

| Output | Modeled Current Week | Projected -5000 OMRI | Projected -3500 OMRI |
|---|---|---|---|
| Predicted Chinook Winter Run, Median % | 22 | 32 | 21 |
| Predicted Chinook Winter Run, High % | 219 | 219 | 219 |

Table 3b. Environmental and operational details for current, projected -5000, and -3500 scenarios. Only OMR flows were changed to evaluate potential changes in loss.

| Parameter | Current Condition | Projected -5000 | Projected -3500 |
|---|---|---|---|
| Temperature (Mallard Island, C) | 12.7 | 12.7 | 12.7 |
| Precipitation (5-d running sum, inches) | 0.29 | 0.29 | 0.29 |
| Old and Middle River Flows (cfs) | -5759 | -5000 | -3500 |
| Sacramento River Flow (Freeport, cfs) | 41068 | 41068 | 41068 |
| DCC Gates | closed | closed | closed |
| San Joaquin River Flow (Vernalis, cfs) | 1773 | 1773 | 1773 |
| Export | 5987 | 5987 | 5987 |

## References

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

# Attachment A: Relevant Proposed Action and Incidental Take Permit Sections

## Incidental Take Permit 8.4.3 & Proposed Action 3.7.4.5.3 Winter-Run Chinook Salmon Annual Loss Threshold

Threshold Reclamation and DWR will manage OMR to avoid exceeding the following annual loss thresholds:

- Natural winter-run Chinook salmon (loss = 0.5% of JPE)
- Hatchery winter-run Chinook salmon (loss = 0.12% of JPE)

JPEs and annual loss thresholds will be calculated for natural winter-run Chinook and for each of the hatchery winter-run Chinook Salmon populations from LSNFH and Battle Creek. The JPE for natural and hatchery winter-run Chinook salmon will be calculated at least annually by the JPE SubTeam, as described in Appendix- Winter-Run Juvenile Production Estimate, and transmitted to WOMT and SHOT. Hatchery releases of winter-run Chinook salmon will be tracked individually, and cumulative loss will be summed across release groups with the same JPE and annual loss threshold. Loss shall be calculated for the export facilities using the 2018 CDFW loss equation (Attachment R).

Annual loss of natural and hatchery winter-run Chinook salmon at the CVP and SWP salvage facilities will be counted for each Brood Year, starting July 1 of the calendar year through June 30 of the following calendar year. If cumulative loss of natural or hatchery winter-run Chinook salmon in a brood year exceeds 50% of the annual loss thresholds, then DWR and Reclamation will adjust south Delta exports to maintain a 7-day average of the OMR value no more negative than -3,500 cfs for 7 consecutive days, to be assess on the seventh day of the averaging period after initiating operational changes in response to the OMR trigger. Once exceeded, each winter-run observed in salvage would trigger another operation to an OMR limit of -3,500 cfs for 7 days.

If the cumulative loss of natural or hatchery winter-run Chinook salmon in a brood year exceeds 75% of the annual loss thresholds, then DWR and Reclamation will adjust south Delta exports to maintain a 7-day average of the OMR value no more negative than the -2,500 cfs for seven consecutive days, to be assess on the seventh day of the averaging period after initiating operational changes in response to the OMR trigger, when the Winter-Run Chinook Salmon Machine Learning Model and associated OMR Conversion Tool predict that the change to -2,500 cfs will shift the model output to a classification of absence with a minimum probability of absence prediction of 0.559 for 1 of 30 sub-models for any of the 7 most recent prediction days. These prediction values are calculated based on length-at-date and will be updated once genetic analysis is fully adopted.

If the cumulative loss of either natural or hatchery-origin winter-run Chinook Salmon in a brood year exceeds 100 percent of the annual loss thresholds, then DWR and Reclamation will

immediately convene the Salmon Monitoring Team (SaMT) to review recent fish distribution information and operations and provide advice regarding future planned SWP and CVP operations to minimize subsequent loss during that year. The SaMT will report the results of this review and advice to the WOMT. Operational decisions will be made following the process described in Section 3.3.18, Governance. If either annual loss threshold is exceeded, DWR and Reclamation will also convene an independent peer review panel to review SWP and CVP operations and the annual loss thresholds prior to November 1. The purpose of the independent peer review is to review the actions and decisions contributing to the loss trajectory that led to an exceedance of an annual loss threshold, and make recommendations on modifications to SWP and CVP operations, or additional actions to be conducted to stay within the annual loss thresholds in subsequent years.

Reclamation and DWR will restrict exports in response to meeting the above thresholds based on the initial length-at-date identification of natural older juvenile Chinook salmon and the thresholds described above. If genetic analysis of natural older juvenile Chinook salmon observed in salvage at the SWP or CVP indicates that any given Chinook salmon is not genetically winter-run Chinook salmon, these fish will not count towards annual the loss threshold exceedance, and continued export adjustments pursuant to the OMR limit may not be required. Given that SHERLOCK is a new methodology currently undergoing peer review and field testing, both methodologies will be used to determine the final identification. In the event that SHERLOCK and GT-seq provide different run assignments, the results from the GT-seq method will be used to determine the final run assignment for the purposes of implementing this early season migration action. If a fish is not genetically identifiable or if genetic identification is pending, then the Delta model length-at-date criteria shall be used to classify the race of the juvenile Chinook Salmon in salvage.

### Incidental Take Permit 8.4.4 & Proposed Action 3.7.4.5.4 Natural-origin Winter-run Chinook Salmon Weekly Distributed Loss Thresholds

To minimize the potential for a disproportionate impact of entrainment and loss on any single week of natural-origin juvenile CHNWR present in the Delta, Permittee shall, in coordination with Reclamation, manage the OMR index based on a natural-origin CHNWR weekly distributed loss threshold. The natural-origin CHNWR weekly loss threshold is a product of the weekly percentage of natural-origin CHNWR present in the Delta, scaled to 100% (Table 4, Column E), and 50% of the natural-origin CHNWR annual loss threshold (Condition of Approval 8.4.3).If the weekly distributed loss threshold is exceeded on any single day by the 7-day rolling sum of natural-origin CHNWR loss, then Permittee shall, in coordination with Reclamation, adjust south Delta exports to achieve a 7-day average of the OMR index no more negative than -3,500 cfs for seven consecutive days until seven days after the most recent exceedance. Permittee shall calculate loss for the south Delta export facilities using the 2018 CDFW loss equation (Attachment 8).

If the natural-origin CHNWR JPE is not available at the start of OMR Management season (Condition of Approval 8.3), then the Red Bluff Diversion Dam brood year total from the most

recent bi-weekly period shall be used and applied as described for early season management (Condition of Approval 8.2.1) to the annual loss threshold until the final natural-origin CHNWR JPE is available. The CHNWR JPE surrogate is calculated using the following formula:

- Natural-origin CHNWR JPE Surrogate = Red Bluff Diversion Dam juvenile CHNWR brood year passage total estimated from the most recent biweekly period x SurvivalFry-to-Smolt x SurvivalSmolt

Permittee shall, in coordination with Reclamation, adjust south Delta exports in response to meeting the below natural-origin CHNWR weekly thresholds based on the initial length-at-date identification of natural-origin older juvenile Chinook Salmon and the thresholds described below. If genetic analysis of natural-origin older juvenile Chinook Salmon observed in salvage at the SWP or CVP subsequently confirms that any given Chinook Salmon is not genetically identified as a CHNWR, that fish will not count towards the loss threshold exceedance, and continued export restrictions pursuant to the OMR index limit may not be required. While the new rapid genetic method, SHERLOCK, undergoes field testing, both it and the current GT-seq method shall be used to determine the final identification. In the event that SHERLOCK and GT-seq provide different run assignments, the results from the GT-seq method shall be used to determine the final run assignment for purposes of implementing Condition of Approval 8.4.4. If a fish is not genetically identifiable or if genetic identification is pending, then the length-at-date identification shall be used to classify the race of the juvenile Chinook Salmon in salvage for the purposes of implementing Condition of Approval 8.4.4.

Weekly thresholds shall be based on historical distribution (Table 4, Column E) of genetically identified CHNWR from water years 2017 through 2021 and will change every week (e.g., January 1-7, January 8-15). After the conclusion of the OMR Management season each summer, Permittee and Reclamation, through SaMT, shall compare weekly Delta entry and exit information to determine if the presence data were distributed similarly to the historical distribution data. The results of this review will be utilized as a part of the AMP to implement the Winter-run Old and Middle River Flows Management Adaptive Management Action (Attachment 4 and Condition of Approval 7.9.2)

To minimize the potential for a disproportionate impact of entrainment on any single week of natural winter-run Chinook salmon present in the Delta, Reclamation and DWR will manage the OMR index based on a weekly distributed loss threshold. There is no weekly distributed loss for hatchery winter-run Chinook salmon as they generally move through the Delta quickly.

The weekly loss threshold is a product of the weekly percentage of natural winter-run Chinook salmon present in the Delta, scaled to 100% (Table 3-10, Column E), and 50% of the natural winter-run annual loss threshold.

If the weekly distributed loss threshold is exceeded on any single day by the 7-day rolling sum of winter-run loss, then DWR and Reclamation will adjust exports to achieve a 7-day average of the OMR no more negative than -3,500 cfs for seven consecutive days. Loss shall be calculated for the export facilities using the 2018 CDFW loss equation (Attachment R).

The averaging period for OMR will begin within 3 days of a criterion being exceeded.

If a JPE is not available at the start of OMR management, then the RBDD Brood Year Total from the most recent bi-weekly period will be used and applied, as described for early season management. If a fish is not genetically identifiable or if genetic identification is pending, then the length-at-date identification will be used to classify the race of the juvenile Chinook salmon in salvage.

DWR and Reclamation, initially, will restrict exports in response to meeting the above thresholds based on the initial length-at-date identification of natural-origin older juvenile Chinook Salmon and the thresholds described above. If genetic analysis of natural-origin older juvenile Chinook Salmon observed in salvage at the SWP or CVP subsequently indicates that any given Chinook Salmon is not genetically identified as a winter-run Chinook Salmon, these fish will not count towards the loss threshold exceedance, and continued export adjustments pursuant to the OMR index limit may not be required. While the new method, SHERLOCK, undergoes field testing, both it and the current GT-seq method will be used to determine the final identification. In the event that SHERLOCK and GT-seq provide different run assignments, the results from the GTseq method will be used to determine the final run assignment. If a fish is not genetically identifiable or if genetic identification is pending, then the Delta model length-at-date criteria shall be used to classify the race of the juvenile Chinook Salmon in salvage.

Table 4. Historical (Water Years 2017–2021) Presence of Winter-run Chinook Salmon Entering the Delta (Column B), Exiting the Delta (Column C), in the Delta (Column D = Column B–Column C) and in the Delta Scaled to 100% (Column E).

| **Week (starting January 1) (A)** | **Historical Cumulative entering the Delta (Sherwood Harbor) (B)** | **Historical Cumulative exiting the Delta (Chipps Island) (C)** | **Historical Present in Delta (D)** | **Historical Present in Delta (Scaled to 100%) (E)** |
|---|---|---|---|---|
| 1/1–1/7 | 2.47% | 1.65% | 0.82% | 0.32% |
| 1/8–1/14 | 2.47% | 1.65% | 0.82% | 0.32% |
| 1/15–1/21 | 4.94 | 1.65% | 3.29% | 1.30% |
| 1/22–1/28 | 4.94% | 1.65% | 3.29% | 1.30% |
| 1/29–2/4 | 19.75% | 2.20% | 17.55% | 6.91% |
| 2/5–2/11 | 38.27% | 4.95% | 33.32% | 13.13% |
| 2/12–2/18 | 43.21% | 5.49% | 37.72% | 14.86% |
| 2/19–2/25 | 46.91% | 9.89% | 37.02% | 14.59% |
| 2/26–3/4* | 50.62% | 18.13% | 32.49% | 12.80% |
| 3/5–3/11 | 55.56% | 30.77% | 24.79% | 9.77% |
| 3/12–3/18 | 77.78% | 38.46% | 39.32% | 15.49% |
| 3/19–3/25 | 85.19% | 64.84% | 20.35% | 8.02% |

| Week (starting January 1) (A) | Historical Cumulative entering the Delta (Sherwood Harbor) (B) | Historical Cumulative exiting the Delta (Chipps Island) (C) | Historical Present in Delta (D) | Historical Present in Delta (Scaled to 100%) (E) |
|---|---|---|---|---|
| 3/26–4/1 | 93.83% | 90.11% | 3.72% | 1.47% |
| 4/2–4/8 | 98.77% | 99.45% | 0% | 0% |
| 4/9–4/15 | 100.00% | 100.00% | 0.00% | 0.00% |
| 4/16-End of Winter–run OMR Season | 100.00% | 100.00% | 0.00% | 0.00% |

Notes: Data from genetically identified winter-run Chinook salmon entering the Delta (Sherwood Harbor Trawl) and exiting the Delta (Chipps Island Trawl) are used to estimate the percentage of winter-run Chinook salmon present in the Delta each week. Presence prior to January 1 each year is included in the first week of presence. OMR = old and middle river. The week of February 26–March 4 includes 8 days during leap years