

Charge to the Water Year 2024 and 2025 Winter-run Chinook Salmon Annual Loss Independent Peer Review Panel

November 12, 2025

Objective

The intent of the review is to constructively inform the U.S. Bureau of Reclamation (Reclamation) and California Department of Water Resources (DWR) with recommendations to stay within the annual loss threshold for natural and hatchery winter-run Chinook salmon for the State Water Project (SWP) and Central Valley Project (CVP). Reclamation signed a Record of Decision on December 20, 2024, for the Long-Term Operation of the Central Valley Project (CVP) and State Water Project (SWP). The Decision includes a commitment to convene an independent peer review if salvage loss of hatchery winter-run Chinook salmon exceeds 0.12% of the juvenile production estimate (JPE) entering the Delta. In water year (WY) 2025, measured loss was 242 (0.18% of the JPE). The 2024 Incidental Take Permit for the SWP contains a similar commitment requirement for an independent peer review of actions and conditions related to winter-run Chinook salmon loss for both water years 2024 and 2025.

In 2024, 50% of annual loss threshold for natural-origin winter-run Chinook salmon was exceeded on February 25, 2024, 75% of the annual loss threshold was exceeded on March 7, 2024, and the annual loss threshold was exceeded on March 20, 2024.

In 2025, 50% of the annual loss threshold for hatchery-origin winter-run Chinook salmon was exceeded on March 18, 2025, 75% of the threshold was exceeded on March 19, 2025, and the annual loss threshold was exceeded on March 21, 2025.

A robust peer review will be conducted to review the actions and decisions contributing to the loss trajectory that led to an exceedance of the annual loss threshold, and make recommendations on modifications to SWP and CVP operations, or additional actions to be conducted to stay within the threshold in subsequent years including the use of indicators from in-season monitoring (e.g., existing/new monitoring data) and tools (e.g. modeling tools).

Review Panel Membership

The Panel consists of three members whose expertise includes water project operations, Delta hydrodynamics in relation to salmon movement behavior, salmon biology and behavior. The Panel will address questions based on their expertise and are to provide comments solely based on the scientific information being reviewed. The Panel will submit a single consensus-based report.

Panel Format

The review panel will convene virtually for 1-4 closed teleconference meetings prior to submitting their Panel Letter (see below) to the Delta Science Program (DSP). Reviewers may hold subsequent virtual meetings as needed during the review period. The DSP will coordinate all correspondence between the reviewers, Reclamation, and other members of the Planning Team. The DSP will coordinate an

opportunity for public input to be provided to the panel midway through the review process. All materials provided to the Panel will be posted on the DSP's peer review webpage.

Panel Letter

The deliverables of the final review will include a Panel Letter that is developed by the entire Panel and will address the Review Questions based on their expertise. For the letter format, the Panel shall use a DSP template, and the letter shall contain a concise executive summary and a table of contents if the report exceeds 5 pages.

Peer Review Materials

Materials consistent with the focus of the peer review will be provided to the Peer Review Panel and are listed below in no specific order.

Review Documents

1. Weekly Assessment of CVP and SWP Delta Operations on ESA-listed Species
 - a. February 6, 2024
 - b. February 13, 2024
 - c. February 20, 2024
 - d. February 27, 2024
 - e. March 5, 2024
 - f. March 12, 2024
 - g. March 19, 2024
 - h. March 26, 2024
 - i. March 20, 2025
2. Final State Water Project Incidental Take Permit Risk Assessments for Winter-run and Spring-run Chinook Salmon
 - a. February 20, 2024
 - b. February 27, 2024
 - c. March 5, 2024
 - d. March 12, 2024
 - e. March 19, 2024
 - f. March 26, 2024
 - g. April 2, 2024
 - h. April 9, 2024
 - i. April 16, 2024
3. Long-Term Operation – Biological Assessment. Appendix AB, Chapter 3 – Proposed Action. - 3.7 Delta, pages 3-49 to 3-67
4. 2019 Biological Opinions, Consultation on the Coordinated Long-Term Operation of the Central Valley Project and State Water Project. Chapter 4: Proposed Action. 4.10.5 Delta, 4-54; 4.10.5.1 Seasonal Operations, 4-55; 4.10.5.10 OMR Management, 4-66 to 4-80
5. Biological Opinion for the Reinitiation of Consultation on the Long-Term Operation of the Central Valley Project and State Water Project (2019) - Section 8.6.9.2.1 Sacramento River

- Winter-run Chinook salmon exposure pgs. 486-489; Section 8.6.9.2.2 Juvenile Salvage Estimates using the Salvage-Density Model 489-497; Sections 8.6.9.2.9 - 8.6.9.2.24 pgs. 519-549
6. Effects of Water Project Operations on Juvenile Salmonid Migration and Survival in the South Delta Report, Volume 1 (2017) - Section 3.13 Migration and Survival as a Function of Old and Middle River Flows pages 72-73; Section 3.18 Discussion and Summary of Key Findings pages 80-95
 7. Effects Analysis, State Water Project Effects on Winter-run and Spring-run Chinook Salmon (March 2020) – Section 8.14, pages 119-145
 8. Effects Analysis, State Water Project Effects on Winter-run and Spring-run Chinook Salmon, Attachment 6 (November 2024) – pages 217-227
 9. Winter-run Chinook Salmon Machine Learning Model
 - a. Using Monitoring Data as an Early Warning Indicator of Salvage
 - b. Winter-run Chinook Salmon Machine Learning Model Old and Middle River Scenarios
 10. Winter-run Chinook Salmon Juvenile Production Estimates, Appendix F
 11. Water Operations Management Team Notes
 - a. March 25, 2024 (ad hoc)
 - b. March 27, 2024
 - c. March 19, 2025
 - d. March 25, 2025 (ad hoc)
 - e. March 26, 2025
 - f. April 1, 2025
 - g. April 9, 2025
 12. Incidental Take Permit: Long-term Operations of the State Water Project in the Sacramento-San Joaquin Delta (2020) - pages 66-75; 87- 89
 13. Incidental Take Permit: Long-term Operations of the State Water Project in the Sacramento-San Joaquin Delta (2024) - pages 62-66; 73-75

Supplemental Material (Optional)

1. Salmon Monitoring Team notes
 - a. Items for WOMT Discussion and Direction, April 1, 2025
 - b. Weekly Meeting notes, March 25, 2025
 - c. Weekly Meeting notes, April 1, 2025
2. Water Year 2024 Seasonal Report for Old and Middle River Flow Management
3. Appendix H. Winter-Run Chinook Salmon Cohort Report (Brood Year 2023)
4. Water Year 2025 Seasonal Report for Old and Middle River Flow Management
 - a. Appendix A. Water Year 2025 Old and Middle River Entrainment Seasonal Report Data
 - b. Appendix C. Winter-Run Chinook Salmon Cohort Report (Brood Year 2024)
 - c. Appendix D. Genetic Analysis
5. Effects of Water Project Operations on Juvenile Salmonid Migration and Survival in the South Delta Report (2017)
6. Enhanced Acoustic Tagging, Analysis, and Real-Time Monitoring of Wild and Hatchery Salmonids in the Sacramento San Joaquin Rivers and Delta 2021-2024 Final Report
7. 2024 Salmon Scoping Team Report
8. Brood Year 2024 Juvenile Production Estimate Letter (January 17, 2025)
9. Brood Year 2023 Juvenile Production Estimate Letter (January 12, 2024)

Summary of Charge

Specific questions are identified below to guide the Panel for the review. The Panel is encouraged to review each question carefully and clarify, refine, or otherwise modify questions as appropriate.

Review Questions

1. Were there indicators in the current monitoring data or tools that could have been used proactively to predict an exceedance of the annual loss threshold?
 - a. If so, how can that information or tool be used to change the loss trajectory to not exceed thresholds in the future?
2. What indicators could have been incorporated from WY 2024 and 2025 monitoring data or assessments that could have improved the prediction of winter-run detection trajectories at Central Valley Project (CVP) and State Water Project (SWP) export facilities?
3. Recognizing the different loss trajectories in 2024 and 2025, were there any actions that could have been implemented once the 50% threshold exceedance occurred to have prevented the annual loss threshold being exceeded?
4. Does evidence suggest changes to OMRI or other operations would have resulted in changes to the observed loss trajectories in WY 2024 or WY 2025?
5. What information could have been incorporated into WY 2024 and 2025 monitoring data or assessments that could have informed routing, through-Delta survival, salvage loss, and other effects to the winter-run population from different export levels?
6. Were the conclusions of the assessments regarding export operations supported by the information available at the time the assessment was prepared?
7. What monitoring data and assumptions could have been incorporated into the Water Year (WY) 2024 and 2025 Juvenile Production Estimate (JPE) to improve the establishment of the winter-run threshold?
8. What is the best framework for incorporating relevant sources of information and data into real-time management decisions for the SWP to estimate and manage population impacts to the winter-run population, including but not limited to informing operational decisions to change the loss trajectory and avoid exceeding the annual loss threshold? Specifically, how can prediction tools such as the Winter-run Chinook Salmon Machine Learning (WRCML) Model be modified, adjusted, or used complimentary with relevant real-time data, including but not limited to, the juvenile production estimate (JPE), reach-specific survival, real-time acoustic data, non-physical barrier operations, river inflows, physical conditions, and other relevant information?
9. Are there new or alternate approaches to incorporate into assessments to inform real-time estimates on effects to fish from CVP and SWP export operations?

Schedule

Panel Review: commences November 2025.

Final Panel Report: to be completed January 2026.