

FINAL State Water Project Incidental Take Permit Risk Assessment for Winter-run and Spring-run Chinook Salmon

Section 1: Overview

Date: 2/13/2024

Life Stages Present:

Winter-run Chinook salmon (juveniles)

Winter-run Chinook salmon (adults)

Spring-run Chinook salmon (juveniles)

Spring-run Chinook salmon (adults)

Advice to the Water Operations Management Team (WOMT):

No advice is warranted.

For the week beginning 2/13/24, the SWP ITP's COA 8.5.2 Larval and Juvenile Delta Smelt Protection restricts Old and Middle River Index (OMRI) to -3,500 cfs and is controlling exports at the State Water Project (SWP) and Central Valley Project (CVP). OMRI is also restricted to a 14-day average OMRI no more negative than -3,500 cfs due to an exceedance of the 50% steelhead loss threshold, effective 2/13 through 3/31 (PA Section 4.10.5.10.2). Combined exports on 2/13/24 are 6,800 cfs resulting in an Old and Middle River Index (OMRI) of -2,900 cfs and 10.2% of inflow diverted (14-day average). The Delta Cross Channel (DCC) gates closed on 11/27/23 and will remain closed for the OMR season. The SWP is exporting this week and no outages are planned.

SaMT estimates an overall medium risk of entrainment into the central Delta for juvenile natural-origin winter-run Chinook salmon (WR). Georgiana Slough is estimating low entrainment risk this week. However, due to the hydrological events predicted in the upcoming week, 65-80% of WR estimated in the Delta and alternative entrainment routes such as Threemile Slough and Georgiana Slough, SaMT estimates WR entrainment into the central Delta at medium risk this week. SaMT estimates an overall medium risk of juvenile natural-origin young-of-year spring-run Chinook salmon (SR) entrainment into the central Delta. SR juveniles are migrating downstream and although current hydrology is expected to decrease entrainment into Georgiana Slough, there are still other alternative routes, including Threemile Slough, that SR may be entrained into. Therefore, SaMT estimates SR entrainment into the central Delta at medium risk this week due to SR anticipated movement from the storm events that have occurred.

SaMT estimates an overall high risk of entrainment of juvenile WR into the export facilities this week. Salvage of WR is likely due to WR movement into the Delta and hydrology this week. LAD WR have been observed in salvage in high numbers throughout the week; therefore, SaMT estimates that more LAD WR are near the export facilities. High salvage events and seasonal timing are contributing factors for the high entrainment risk this week. SaMT estimates an overall high risk of entrainment for SR into the export facilities. Young-of-year SR have not been observed in salvage this season; however, yearling SR have been genetically confirmed in the salvage facilities in high numbers over the past week. SaMT estimates that it is likely to see additional yearling SR and potentially YOY SR in salvage in the upcoming week; therefore, entrainment risk is estimated as high this week.

Length-at-date (LAD) older juvenile Chinook salmon have been salvaged in high numbers at the SWP and CVP salvage facilities over the previous week. COA 8.6.3 was initially triggered 5 times in the previous week;

however, genetics confirmed that the older juveniles were not WR and therefore COA 8.6.3 was offramped. Due to both SWP and CVP already operating to COA 8.5.2 Larval and Juvenile Delta Smelt Protection through 2/20/24, no further action was required. SaMT estimates that it is likely that COA 8.6.3 Mid- and Late-season Natural Winter-run Chinook Salmon Daily Loss Threshold will be triggered this upcoming week.

Section 2: Risk Assessment

Section 2-A: Operations and Fish Distribution Table

The WY 2023 Interim Operations Agreement (IOP) was extended into WY 2024 until the WY 2024 IOP is finalized. Due to the ITP amendment on 12/22/23 of COA 8.6.3 Mid- and Late-season Natural Winter-run Chinook Salmon Daily Loss Threshold, Reclamation will not be adhering to the WY 2024 COA 8.6.3 SWP ITP amendment but rather will operate to the WY 2023 COA 8.6.3 SWP ITP amendment.

Table 1. *Current Juvenile Fish Distribution. The SaMT group agreed to provide distribution estimates in five percent increments when feasible.*

Location	Yet to Enter Delta	In the Delta	Exited the Delta
Young-of-year winter-run Chinook salmon	Current 10-34% Last week 25-39%	Current 65-80% Last Week 60-70%	Current 1-10% Last Week 1-5%
Young-of-year spring-run Chinook salmon	Current 55-70% Last week 60-75%	Current 30-45% Last Week 25-40%	Current 0% Last Week 0%
Hatchery origin winter-run Chinook salmon	Current 100% Last week 100%	Current 0% Last Week 0%	Current 0% Last Week 0%

Section 2-B: Sacramento River and Confluence

Assessment of risk of entrainment into the central Delta for WR and SR in the Sacramento River: (8.1.5.1 C ii, iii, iv and 8.1.5.1 B iii)

- Exposure Risk:
 - WR: High
 - SR: Medium
- Routing Risk:
 - WR: Low
 - SR: Low
- Overall Entrainment Risk:
 - WR: Medium
 - SR: Medium
- Change in risk of entrainment into the central Delta (increased/decreased risk compared to last week):
 - WR: Similar to previous week
 - Exposure Risk is estimated as high this week. SaMT estimates WR presence in the Delta is medium (65-80%). WR are actively migrating downstream and being observed in real-time monitoring sites in the Delta. Routing Risk is estimated as low for WR this week. Freeport flows are at 57,000 cfs, the DCC gates are closed for the season and although routing is estimated at 18% through Georgiana Slough, the Georgiana BAFF is assumed to decrease entrainment for juveniles. However, due to increased presence of WR in the Delta and expected increase in presence this upcoming week due to hydrology, the overall entrainment risk into the central Delta is estimated to remain at medium this week.

- SR: Similar to previous week
 - Exposure Risk is estimated as medium this week. SR are beginning to actively migrate into the Delta according to real-time monitoring stations (30-45%). Routing Risk is estimated as low this week. Freeport flows are at 57,000 cfs and DCC gates are closed. Although the STARS model predicts routing at 18% through Georgiana Slough, the Georgiana BAFF is assumed to decrease routing into Georgiana Slough. However, due to SR presence in the Delta this week based on real-time monitoring estimates, the overall entrainment into the central Delta is estimated remain at medium this week.

Section 2-C: Facilities Risk

Central Valley Project/State Water Project (CVP/SWP) facilities entrainment risk for WR and SR in the central Delta over the next week (8.1.5.1 D iii, iv, v)

- Exposure Risk:
 - WR: High
 - SR: High
- Reporting OMRI/Export Risk:
 - Baseline OMRI (-2,900 cfs)
 - WR: Low
 - SR: Low
 - Scenario 1 OMRI: (-2,000 cfs)
 - WR: Low
 - SR: Low
 - Scenario 2 OMRI: (-3,500 cfs)
 - WR: Medium
 - SR: Medium
- Overall Entrainment Risk:
 - WR: High
 - SR: High
- Change in risk of entrainment into the facilities (increased/decreased risk compared to last week):
 - WR: Increase from previous week
 - Exposure Risk is high this week due to high numbers of LAD WR being observed in salvage over the previous week. Although some of these LAD WR have been genetically confirmed as not WR, the likelihood to see additional LAD and/or genetic WR in the upcoming week is high due to seasonal timing and recent salvage events. Reporting OMRI/Export Risk this week is medium. Although OMRI of -3,500 cfs is more protective than OMRI of -5,000 cfs, SaMT still expects salvage of LAD WR to continue in the upcoming week. Last week, when OMRI decreased to -5,000 cfs on 2/7/24, there was a dramatic increase in LAD WR entrainment a couple days after, which further confirms that a more positive OMRI (i.e. -3,500 cfs) does lead to lower entrainment than what SaMT would see at a more negative OMRI (i.e -5,000 cfs). However, due to salvage events in the previous week at an OMRI of -3,500 cfs, the overall entrainment risk is estimated as high this week for WR.
 - SR: Increased from previous week
 - Exposure Risk is high this week. No young-of-year SR were observed in salvage over the previous week; however, many yearling SR have been observed in salvage over the previous week and SaMT estimates more may be observed in salvage in the upcoming week. Reporting OMRI/Export Risk this week is medium. Although OMRI of -3,500 cfs is

more protective than OMRI of -5,000 cfs, SaMT still expects salvage of LAD WR to continue in the upcoming week. Last week, when OMRI decreased to -5,000 cfs on 2/7/24, there was a dramatic increase in LAD WR entrainment a couple days after, which further confirms that a more positive OMRI (i.e. -3,500 cfs) does lead to lower entrainment than what SaMT would see at a more negative OMRI (i.e. -5,000 cfs). Real-time monitoring stations in the Delta have observed high numbers of young-of-year SR, which increases the likelihood that YOY SR entrainment could also occur at the export facilities this week. Therefore, the overall entrainment risk into the facilities is estimated as high this week.

Section 2-D: Annual Loss Threshold Risk

- Annual loss threshold risk and Alternative Actions (8.1.5.1. E I, ii, iii and 8.1.5.1 F I, ii)
 - Loss at the SWP and CVP facilities compared to the estimated remaining population in the Delta and upstream of the Delta: Salvage of California Endangered Species Act (CESA)-listed Chinook salmon has not occurred.
 - Define risk of hitting a threshold, 50%, or 75%, or 100%, and likelihood of exceeding a threshold:
 - Natural-origin WR: 2,748.28 [1.17% of the natural-origin WR Juvenile Production Estimate (JPE)]
 - Current Annual Loss: 594.12
 - 50% Threshold based on natural-origin WR JPE: 1,374.14
 - Risk of exceeding threshold: Low
 - 75% Threshold based on natural-origin WR JPE: 2,061.21
 - Risk of exceeding threshold: Low
 - 100% Threshold based on natural-origin WR JPE: 2,748.28
 - Risk of exceeding threshold: Low
 - Hatchery WR: 232.30 [0.12% of the Livingston Stone National Fish Hatchery (LSNFH) hatchery release JPE]
 - Current Annual Loss: 0
 - 50% Threshold based on hatchery WR JPE: 116.15
 - Risk of exceeding threshold: Low
 - 75% Threshold based on hatchery WR JPE: 174.23
 - Risk of exceeding threshold: Low
 - 100% Threshold based on hatchery WR JPE: 232.30
 - Risk of exceeding threshold: Low

Section 2-E: Daily Loss Threshold Risk

- Daily loss threshold risk and Alternative Actions
 - Loss at the SWP and CVP facilities compared to estimated remaining population in Delta and upstream of the Delta:
 - Daily loss thresholds and subsequent loss and associated operations:
 - COA 8.6.3 Mid- and Late-season Natural Winter-run Chinook Salmon Daily Loss Threshold:
 - January 1 – January 31: $0.0000124 * 234,896 = 2.91$
 - February 1 – February 28: $0.0000231 * 234,896 = 5.43$
 - March 1 – March 31: $0.000372 * 234,896 = 8.74$
 - April 1 – April 30: $0.0000226 * 234,896 = 5.31$

- May 1 – May 31: $0.0000226 * 0 = 0$
- Highest LAD Older Juvenile Daily Loss for February: 150.57
- Highest Genetic WR Daily Loss for February: 0
 - Risk of exceeding threshold: High

Section 3: Basis for Advice

The 2020 [Incidental Take Permit for Long-Term Operation of the State Water Project in the Sacramento-San Joaquin Delta 2081-2019-066-00](#) (SWP ITP) states that advice to Water Operations Management Team (WOMT) shall be consistent with the Project Description, COA in the ITP, and the applicable ESA authorizations. This week's advice is based on the following COAs which are currently applicable:

List relevant COA number and title based on species/life stage, time of year, etc.:

8.1.4 Collaborative Approach to Real-time Risk Assessment. Beginning no later than October 1 through the end of OMR Management (see Condition of Approval 8.8) the Smelt and Salmon Monitoring Teams shall meet weekly, or more often as required, to consider survey data, salvage data, and other pertinent biotic and abiotic factors and prepare risk assessments as described in Conditions of Approval 8.1.1, 8.1.2, 8.1.5.1 and 8.1.5.2.

The Smelt and Salmon Monitoring Teams shall prepare operations advice for the WOMT as required by Conditions of Approval 8.3.1, 8.3.3, 8.4.1, 8.4.2, 8.5.1, 8.5.2, 8.6.1, 8.6.2, 8.6.3, 8.6.4, 8.7, and 8.8, including advice on operations. The Smelt and Salmon Monitoring Teams shall each prepare risk assessments and operations advice. Within each team, staff jointly develop the risk assessment and supporting documentation to accompany operations advice (see Conditions of Approval 8.1.5.1 and 8.1.5.2). DWR and CDFW Smelt and Salmon Monitoring Team staff may conclude different operations advice is warranted, in which case the difference shall be noted and elevated as described in this Condition of Approval.

The Smelt and Salmon Monitoring Teams shall communicate their advice to WOMT. The WOMT shall then confer and attempt to reach a resolution and agreed-upon Project operations. If a resolution is reached, Permittee shall operate consistent with the decision regarding Project operations from WOMT. If the WOMT does not reach a resolution, the CDFW Director may require Permittee to implement an operational recommendation provided by CDFW. CDFW will provide its operational decision to Permittee in writing. Permittee shall implement the operational decision required by CDFW. Permittee shall ensure that its proportional share (see Condition of Approval 8.10) of the OMR flow requirement as a part of the operational decision is satisfied.

8.1.5 Real-time Risk Assessments. The Smelt and Salmon Monitoring Teams (Conditions of Approval 8.1.1 and 8.1.2) shall prepare weekly risk assessments, or more often as required, and operations advice (as required by Conditions of Approval 8.3.1, 8.3.3, 8.4.1, 8.4.2, 8.5.1, 8.5.2, 8.6.1, 8.6.2, 8.6.3, 8.6.4, and 8.7) during their discussions and analyses. The Smelt and Salmon Monitoring Teams shall provide the risk assessments and pertinent supporting information to the WOMT (Condition of Approval 8.1.3) within one business day of each meeting.

8.6.1 Winter-run Single-year Loss Threshold. In each year, Permittee shall, in coordination with Reclamation, operate the Project to avoid exceeding the following single-year loss thresholds:

- *Natural WR (loss = 1.17% of natural WR JPE)*
- *Hatchery WR (loss = 0.12% of hatchery WR JPE)*

The loss threshold and loss tracking for hatchery WR does not include releases into Battle Creek.

Loss of WR at the CVP and SWP salvage facilities shall be calculated based on LAD criteria for run assignment.

Annual loss of natural and hatchery WR at the CVP and SWP salvage facilities shall be counted cumulatively beginning November 1 each calendar year through June 30 the following calendar year.

WR shall be identified based on the Delta Model LAD criteria. Loss shall be calculated for the South Delta Export Facilities using the 2018 CDFW loss equation (Attachment 6).

During the water year, if cumulative loss of natural or hatchery WR exceeds 50% of the annual loss threshold, Permittee shall restrict south Delta exports to maintain a 14-day average OMR index no more negative than -3,500 cfs through the end of OMR Management (see Condition of Approval 8.8). After 14 days of operations to maintain an OMR index no more negative than -3,500 cfs, Permittee may convene the Salmon Monitoring Team to conduct a risk assessment (Condition of Approval 8.1.5.1) and determine whether the risk of entrainment and loss of natural and hatchery WR is no longer present. Risks shall be measured against the potential to exceed the next single-year loss threshold. The results of this risk assessment and associated OMR advice shall be provided to WOMT according to Condition of Approval 8.1.3 and the decision-making process shall follow the process described in Condition of Approval 8.1.4.

The -3,500 cfs OMR flow operational criteria, adjusted and informed by this risk assessment, shall remain in effect until the end of OMR Management (Condition of Approval 8.8).

During the water year, if cumulative loss of natural or hatchery WR at the CVP and SWP salvage facilities exceeds 75% of the single-year loss threshold, Permittee shall restrict OMR to a 14-day moving average OMR flow index that is no more negative than -2,500 cfs through the end of OMR Management (Condition of Approval 8.7). After 14 days Permittee may convene the Salmon Monitoring Team to conduct a risk assessment (Condition of Approval 8.1.5.1) and determine whether the risk of entrainment and take of natural and hatchery WR is no longer present. The results of this risk assessment and associated OMR advice shall be provided to WOMT according to Condition of Approval 8.1.3 and the decision-making process shall follow the process described in Condition of Approval 8.1.4.

The -2,500 cfs OMR flow operational criteria adjusted and informed by this risk assessment shall remain in effect until the end of OMR Management (Condition of Approval 8.8).

During the water year, if natural or hatchery WR cumulative loss at the CVP and SWP salvage facilities exceeds the single-year loss threshold, Permittee shall immediately convene the Salmon Monitoring Team to review recent fish distribution information and operations and provide advice regarding future planned Project operations to minimize subsequent loss during that year. The Salmon Monitoring Team shall report the results of this review and advice to the WOMT (see Condition of Approval 8.1.3). Operational decisions shall be made following the process described in Condition of Approval 8.1.4 (Collaborative Real Time Risk Assessment).

If the single-year loss threshold is exceeded, Permittee and Reclamation shall also convene an independent panel to review Project operations and the single-year loss threshold prior to November 1, as described in Condition of Approval 8.2. The purpose of the independent panel is to review the actions and decisions contributing to the loss trajectory that lead to an exceedance of the single-year loss threshold, and make recommendations on modifications to Project implementation, or additional actions to be conducted to stay within the single-year loss threshold in subsequent years.

Permittee shall, in coordination with Reclamation, continue monitoring and reporting salvage at the CVP and SWP salvage facilities. Permittee and Reclamation shall continue the release and monitoring of yearling Coleman National Fish Hatchery (NFH) late fall-run and yearling SR surrogates. The Salmon Monitoring Team

shall use reported real-time salvage counts along with qualitative and quantitative tools to inform risk assessments (see Condition of Approval 8.1.5.1).

8.3.2 Salmonid Presence. After January 1 each year, if Conditions of Approval 8.3.1 or 8.3.3 have not already been triggered, the OMR Management season shall begin when the Salmon Monitoring Team first estimates that 5% of the CHNWR or CHNSR population is in the Delta whichever is sooner. Upon initiation of the OMR Management season, Permittee shall reduce exports to achieve, and shall maintain a 14-day average OMR index no more negative than -5,000 cfs, until the OMR Management season ends (see Condition of Approval 8.8). In the event that a salmon daily or single-year loss threshold is exceeded (Conditions of Approval 8.6.1, 8.6.2, 8.6.3, or 8.6.4) prior to the start of OMR Management season the requirements in those Conditions shall control operations.

8.6.3 Mid- and Late-season Natural Winter-run Chinook Salmon Daily Loss Threshold. The ITP is amended as follows (amended language in bold italics; deleted language in strikethrough): To minimize entrainment, salvage, and take of natural CHNWR during the peak and end of their migration through the Delta. Permittee shall restrict south Delta exports for five days to achieve a five-day average OMR index no more negative than -3,500 cfs when daily loss of natural older juveniles at the SWP and CVP salvage facilities exceeds the following thresholds based on the JPE reported in January of the same calendar year:

- January 1 – January 31: ~~0.00635~~ **0.00124%** of the CHNWR JPE
- February 1 – February 28: ~~0.00991~~ **0.00231%** of the CHNWR JPE
- March 1 – March 31: ~~0.0146~~ **0.00372%** of the CHNWR JPE
- April 1 – April 30: ~~0.00507~~ **0.00226%** of the CHNWR JPE
- May 1 – May 31: ~~0.0077~~ **>0%** of the CHNWR JPE

All natural older juvenile Chinook salmon juveniles shall be identified based on the Delta Model length-at-date criteria. Loss shall be calculated for the South Delta Export Facilities using the equation provided in CDFW 2018 (Attachment 6). This Condition of Approval may be modified through the process described in Condition of Approval 8.6.6 and an amendment to this ITP.

For the time this Amendment is in effect, Permittee shall restrict exports in response to the initial length-at-date identification of natural older juvenile Chinook salmon and the thresholds described above. If genetic analysis of an individual natural older juvenile Chinook salmon observed in salvage at the SWP or CVP indicates that it is not CHNWR, that individual shall not count toward the daily loss threshold and continued export restrictions under this Condition of Approval are not required if the daily loss threshold has consequently not been met. All genetic analyses shall be conducted using CDFW-approved genetic methods.

8.7 OMR Flexibility During Delta Excess Conditions. Permittee may increase exports to capture peak flows in the Delta during storm-related events (hereafter OMR flex) when:

- The Delta is in excess conditions,²² AND
- QWEST is greater than 0, AND
- A measurable precipitation event has occurred in the Central Valley, AND
- Permittee, in coordination with Reclamation, determines that the Delta outflow index

- indicates a higher level of outflow available for diversion due to peakstorm flows, AND*

 - None of the following Conditions of Approval are controlling Project operations: 8.3.1, 8.3.3, 8.4.1, 8.4.2, 8.5.1, 8.5.2, 8.6.1, 8.6.2, 8.6.3, and 8.6.4, AND*

Risk assessments conducted by the Salmon and Smelt Monitoring Teams (Conditions of Approval 8.1.5.1 and 8.1.5.2) indicate that an OMR more negative than -5,000 cfs is not likely to trigger an additional real-time OMR restriction (Conditions of Approval 8.3.1, 8.3.3, 8.4.1, 8.4.2, 8.5.1, 8.5.2, 8.6.1, 8.6.2, 8.6.3, and 8.6.4), AND
 - Cumulative salvage at the CVP and SWP facilities of yearling Coleman NFH late fall-run Chinook salmon (as yearling CHNSR surrogates) is less than 0.5% within any of the release groups, AND*
 - Risk assessments conducted by the Salmon and Smelt Monitoring Teams determines that no changes in spawning, rearing, foraging, sheltering, or migration behavior as a result of OMR Flex operations beyond those anticipated to occur through operations described in Conditions of Approval 8.3.1, 8.3.3, 8.4.1, 8.4.2, 8.5.1, 8.5.2, 8.6.1, 8.6.2, 8.6.3, and 8.6.4 are likely to occur.*

If none of the restrictions listed above apply, Permittee may increase south Delta exports but shall manage Project operations to achieve a five-day average OMR index no more negative than -6,250 cfs. The decision to operate under this Condition of Approval shall be made following the process described in Condition of Approval 8.1.4 (Collaborative Real Time Risk Assessment), and SWP OMR flex is subject to approval by CDFW.

If, during OMR flex operations, any of the following conditions occurs, Permittee shall reduce south Delta exports to achieve a 14-day average OMR index no more negative than -5,000 cfs, unless a further reduction in exports is required by another Condition of Approval. The more positive OMR index shall be achieved within 48 hours of the occurrence of the condition, and the 14-day moving average shall apply from that point forward.

- Risk assessments conducted by the Salmon and Smelt Monitoring Teams (Conditions of Approval 8.1.5.1 and 8.5.1.2) indicate that an OMR more negative than -5,000 cfs is likely to trigger an additional real-time OMR restriction (Conditions of Approval 8.3.1, 8.3.3, 8.4.1, 8.4.2, 8.5.1, 8.5.2, 8.6.1, 8.6.2, 8.6.3, and 8.6.4), OR*
- Cumulative salvage at the CVP and SWP facilities of yearling Coleman NFH late fall-run Chinook salmon (as yearling CHNSR surrogates) exceeds 0.5% within any of the release groups, OR*
- A risk assessment conducted by the Salmon or Smelt Monitoring Teams identifies changes in spawning, rearing, foraging, sheltering, or migration behavior as a result of OMR Flex operations beyond those anticipated to occur through operations described in Conditions of Approval 8.3.1, 8.3.3, 8.4.1, 8.4.2, 8.5.1, 8.5.2, 8.6.1, 8.6.2, 8.6.3, and 8.6.4, OR*
- Operational restrictions described in Conditions of Approval 8.3.1, 8.3.3, 8.4.1, 8.4.2, 8.5.1, 8.5.2, 8.6.1, 8.6.2, 8.6.3, 8.6.4, and 8.17 are required.*

Section 4: Hydrology and Operations

Assessment of hydrologic, operational, and meteorological information. 8.1.5.1 A

Section 4-A: Water Operations, Water Operations Outlook, and Projected Conditions C 8.1.5.1 A. i, iii, iii:

- Antecedent Actions: (e.g., Actions such as integrated early winter pulse protection, etc.)
 - COA 8.5.2 Larval and Juvenile Delta Smelt Protection triggered on 2/5/24, which limits OMRI to no more negative than -3,500 cfs on a 7-day average, starting on 2/7/24, until the subsequent SLS survey indicates an average Secchi depth greater than 1 meter in the Central and South Delta. The subsequent SLS survey will be on the water on 2/20/24.
 - Proposed Action Section 4.10.5.10.2 Steelhead 50% Annual Loss Threshold was exceeded on 2/11/24, with operations targeting an OMRI 14-day average of no more negative than -3,500 cfs beginning 2/13/24.
- Water Temperature (ITP COA 8.8 threshold: daily average water temperature exceeds 22.2°C for 7 non-consecutive days in June):
 - Mossdale (MSD): [Mossdale - CDEC](#)
 - Number of days threshold exceeded: Not applicable until June.
 - Days exceeded: N/A
 - Prisoners Point (PPT): [Prisoners Point - CDEC](#)
 - Number of days threshold exceeded: Not applicable until June.
 - Days exceeded: N/A
- Tidal Cycle: *(Spring/Neap. Note if tidal cycle has potential to affect south Delta hydrology or X2)*
 - Exiting a neap cycle on 2/16/24 and entering into a spring cycle on 2/24/24.
- Turbidity: Not discussed
- Salinity (X2): 56 km on 2/13/24
- Outages:
 - SWP: None projected
 - CVP: None projected
- Exports: 2/13/24 – 2/19/24
 - SWP: 800 to 4,000 cfs
 - CVP: 3,600 to 4,200 cfs
- Meteorological Forecast:
 - *“Dry weather persists today. Rain chances return Wednesday with a wetter pattern developing this weekend with rain, high-elevation snow and gusty wind expected.”*
 - [NOAA - National Weather Service Forecast](#)
- Weather/Storm Event Projection:
 - These rain events are not likely to trigger COA 8.7 OMR Flexibility During Delta Conditions.
 - Under OMR flows more negative than -5,000 cfs, SaMT expects impacts to rearing, foraging, sheltering, or migration of salmonids present in the south Delta.
- DCC Gates position:
 - DCC gates closed on 11/27/23 and will remain closed for the OMR management season.
- Sacramento River flow at Freeport: 57,700 cfs
 - [Sacramento River Flows - CDEC](#)
- San Joaquin River flow at Vernalis: 7,400 cfs
 - Vernalis flows are expected to decrease this week.
 - [San Joaquin River Flows - CDEC](#)
 - [San Joaquin River Guidance Plots - CDEC](#)

- QWEST: +11,000 cfs
- Future export modifications: *Describe anticipated or potential changes to exports:*
 - Exports are anticipated to increase this week. However, the SWP and CVP will operate to a 7-day average OMRI of -3,500 cfs for the SWP's ITP COA 8.5.2 through 2/20/24 as well as the PA's Section 4.10.5.10.2 for the 50% annual loss threshold exceedance of steelhead that requires a 14-day average OMRI of -3,500 cfs through 3/31/24 unless Reclamation and DWR determine that further OMR restrictions are not required to benefit fish movement because a risk assessment shows that the risk is no longer present based on real-time information.

Table 2. Comparison of USGS Tidally Filtered OMR and OMR Index data.

Date	Averaging Period	USGS gauges (cfs)	OMR Index (cfs)
2/10/24	Daily	-3,600	-3,600
2/10/24	5-day	-3,500	-3,800
2/10/24	14-day	-3,200	-2,600
2/12/24	Daily	Not Applicable	-3,300
2/12/24	5-day	Not Applicable	-3,500
2/12/24	14-day	Not Applicable	-2,900

Section 5: Distribution and Biology

8.1.5.1.B Assessment of biological information for WR and SR.

Section 5-A: WR Population Status 8.1.5.1.B i

- Adult escapement estimate:
 - Final spawning escapement for WR adults contributing to brood year (BY) 2023 is 2,427 adults.
 - Escapement estimate for adults contributing to BY 2023 was low at only 41% of the previous 20-year average.
- Redd distribution and fry emergence timing:
 - Juvenile WR are migrating downstream into the Delta.
 - Estimated juvenile WR passage at Red Bluff Diversion Dam for 2/11/24 is 1,094,216 fish, which represents 98.8% of historical passage. Average historic passage (7/1/2002-6/30/2023) as of 2/11/24 indicates 98.8% with one standard deviation of 1.4% have passed Red Bluff Diversion Dam.
- Juvenile Production Estimate (JPE):
 - WR JPE PWT distributed the Final JPE letter on 1/12/24.
- Livingston Stone National Fish Hatchery (LSNFH) releases:
 - On 12/28/23, LSNFH released 150,654 winter-run Chinook salmon into the Sacramento River.
 - On 1/19/24, LSNFH released 227,527 winter-run Chinook salmon into the Sacramento River.
 - See Appendix 4
- Distribution of natural WR:
 - See Table 1
- Distribution of LSNFH Sacramento River WR and Battle Creek WR:
 - The fish released on 12/28/23 were not acoustically tagged; therefore, will not be found on CalFishTrack. LSNFH made an early release this year due to excess winter-run juveniles; therefore, the WR released on 12/28/23 and 1/19/24 were released prior to being acoustically tagged.
 - [CalFishTrack - Central Valley Enhanced Acoustic Tagging Project](#)

Section 5-B: SR Population Status 8.1.5.1.B ii

- Adult escapement estimate:
 - SR carcass counts not available.
 - Adult SR contributing to BY 2024 are being seen upstream at the VAKI Riverwatcher at Butte Creek.
- Redd distribution and fry emergence timing:
 - Based on the real-time monitoring stations in the Delta and at RBDD RST, fry are emerging and migrating into the Delta. Yearling SR are also migrating into the Delta according to genetic confirmation in salvage of larger SR.
- Hatchery release (in-river and downstream):
 - Coleman National Fish Hatchery (CNFH) began releasing yearling spring-run Chinook salmon surrogates (late fall-run Chinook salmon) for COA 8.7 OMR Flexibility During Delta Excess Conditions. The first release occurred on 12/22/23, 4 days after the late fall-run production release. The second release occurred on 12/29/23. The third release occurred on 1/11/24.
 - Loss from the first, second, and third release groups has occurred with loss for release group 1 totaling 36.83 fish, loss for release group 2 totaling 17.30 fish, and loss for release group three totaling 69.88 fish.
 - See Appendix 2 and Appendix 3
- Distribution of natural SR:
 - See Table 1

- Distribution of Feather River Fish Hatchery SR:
 - Not applicable at this time.

Section 5-C: Additional Data Sources to Assess Sensitivity to Entrainment into the Central and South Delta 8.1.5.1.C & D

- Acoustic telemetry: *Summary of acoustic telemetry tracking*
 - DWR acoustically tagged LFR for a study on the newly installed Georgiana BAFF. These fish are currently being tracked on CalFishTrack but additional data and information will be distributed to SaMT once the data becomes available.
 - [CalFishTrack \(noaa.gov\)](https://www.noaa.gov/)
- Trawls: See Appendix 1
 - Sacramento Trawl: WR and SR were caught between 2/5/24 – 2/9/24.
 - Mossdale Trawl: WR were caught between 2/5/24 – 2/9/24.
 - Chipps Island Trawl: WR were caught between 2/5/24 – 2/9/24.
- Rotary Screw Traps:
 - Knights Landing RST Data: WR and SR were caught between 2/9/24 – 2/11/24.
 - [Middle Sacramento River Salmon and Steelhead Monitoring](#)
 - Tisdale RST Data: WR and SR were caught between 2/9/24 – 2/12/24.
 - [Middle Sacramento River Salmon and Steelhead Monitoring](#)
 - Lower Sacramento RST Data: WR and SR were caught between 2/6/24 – 2/10/24.
 - [Middle Sacramento River Salmon and Steelhead Monitoring](#)
 - Lower Feather RST Data: WR and SR were caught between 2/6/24 – 2/9/24.
 - Yuba River RST Data: SR were caught between 2/5/24 – 2/11/24.
 - Red Bluff Diversion Dam RST Data: Total passage estimates 1,094,216 juvenile WR have passed RBDD. Last updated on 2/11/24.
 - Butte Creek RST Data: SR were caught between 1/7/24 – 2/12/24.
 - [Butte Creek Monitoring Programs](#)
- Seines:
 - Sacramento River Beach Seines: WR and SR were caught between 2/5/24 – 2/9/24.
- Carcass Survey Data:
 - Lower American River Carcass Survey Data:
 - The American River Power Bypass proposal decreased river temperatures down to a weekly average below 56°F. The power bypass officially ended on 12/10/23.
 - Fall-run Carcass Surveys began on 10/16/23 on the Lower American River and concluded on 1/24/24. Total number of fish observed was roughly 18,000 fish which is the highest carcass survey numbers since 2013.
- Additional hatchery release notifications: *List all relevant hatchery release notifications.*
 - Coleman National Fish Hatchery (CNFH) released the first SR surrogates (late fall-run Chinook salmon) on 12/22/23. CNFH released the second SR surrogates (late fall-run Chinook salmon) on 12/29/23. CNFH released the third and final SR surrogates (late fall-run Chinook salmon) on 1/11/24. All of these releases will be tracked for COA 8.7 OMR Flexibility During Delta Excess Conditions.
 - Loss from the first, second, and third release groups has occurred with loss for release group 1 totaling 36.83 fish, loss for release group 2 totaling 17.30 fish, and loss for release group 3 totaling 66.88 fish.
 - See Appendix 4

- New monitoring (as required by Condition of Approval 7.5.1, 7.5.2, and 7.5.3): *Upstream monitoring results during transfer window, additional rotary screw trap monitoring updates, additional acoustic tag study results, genetic identification results, trap capture efficiency trial results, and pathology results if available and relevant.*
 - An acoustic tag study is being conducted near Georgiana Slough for the newly installed Georgiana BAFF. Late fall-run Chinook salmon have been tagged and released and can be tracked on CalFishTrack (link below). DWR will provide updates once data is collected.
 - [CalFishTrack \(noaa.gov\)](https://www.noaa.gov/calfishtrack)
- Anticipated emigration to continue into the Delta:
 - WR are moving into the Delta in high numbers according to real-time monitoring stations and observations in salvage, which is likely due to current hydrology in the Sacramento River and seasonal timing.
 - Young-of-year SR have also begun emigrating into the Delta according to young-of-year SR observations in the real-time monitoring sites. Yearling SR have also begun migrating downstream and into the Delta based on genetically confirmed salvage data. Both WR and SR are likely to have increased movement throughout this week due to the rain events that have occurred.
 - [SacPAS - Migration Timing and Conditions by Cohort](#)
 - [SacPAS - Salvage Timing](#)
- Routing and Survival Analysis:
 - Delta STARS Model: See Table 6 in Appendix 1
 - [STARS Model](#)
- Tillotson entrainment model or other entrainment models as they become available:
 - The entrainment tool estimates a median of 72 WR and a maximum loss of 303 WR this week (SacPAS last updated on 2/13/24).
 - [SacPAS - Loss and Salvage Predictor](#)
- Salvage trends in relation to OMRI: *Provide overview of salvage data and insert salvage table as attachment at end of document:*
 - LAD WR have been observed in salvage in high numbers over the previous week. Many of these LAD WR have been genetically confirmed as yearling SR. SaMT expects continued high salvage over the upcoming week due to the previous weeks salvage events.
 - [USFWS - Fish Salvage Monitoring](#)

Appendix 1: SaMT Monitoring and Modeling Data

Table 3. Fish monitoring data for the 2/13/24 SaMT meeting. The following table presents fish monitoring data summarized over the past week. Unless otherwise noted, reported sizes are fork length. FR = fall-run, WR = winter-run, SR = spring-run, LFR = late-fall-run.

Location	Butte Creek RST	Tisdale RST ¹	Knights Landing RST	Lower Sac RST ²	Beach Seines	Sacramento Trawl
Sample Date	2/7/24-2/12/24	2/6/24, 2/9/24-2/12/24	2/9/24-2/11/24	2/6/24-2/10/24	2/5/24-2/9/24	2/5/24-2/6/24, 2/8/24-2/9/24
Chinook Adults	0	0	0	0	0	0
FR Chinook	0	33	51	1,002	147	143
SR Chinook	4	1	2	12	3	3
WR Chinook	0	3	1	2	0	2
LFR Chinook	0	0	0	0	0	0
Chinook (ad-clip)	0	2 WR	3 WR	3 WR	3	0
Steelhead (wild)	1	0	0	0	0	3
Steelhead (ad-clip)	0	1	0	3	1	16
Green Sturgeon	0	0	0	0	0	0
Flows (avg. cfs)	732	34,364	25,284	58,093	-	-
W. Temp. (avg. °C)	7.0	9.4	9.3	10.2	10.9	10.2
Turbidity (avg. NTU)	2.2	56.7	73.9	64.6	94.1	173.8

¹ Tisdale river anchor pulled loose on 2/7/24. Traps were reset on 2/9/24.

² Lower Sac RST raised cones on 1/31/24 for spike in river flows. On 2/6/24, trapped during the day to keep an eye on traps. Cones raised for night. On 2/12/24, Began full 24-hour trapping.

Table 3 Continued. Fish monitoring data for the 2/13/24 SaMT meeting. The following table presents fish monitoring data summarized over the past week. Unless otherwise noted, reported sizes are fork length. FR = fall-run, WR = winter-run, SR = spring-run, LFR = late-fall-run.

Location	Chippis Is. Midwater Trawl	Mossdale Kodiak Trawl	EDSM	Feather at Herringer RST	Feather at Eye-Side RST	Lower Feather River RST ¹	Yuba River RST
Sample Date	2/5/24- 2/6/24, 2/8/24- 2/9/24	2/5/24, 2/7/24, 2/9/24	2/5/24- 2/8/24	2/5/24- 2/11/24	2/6/24- 2/11/24	2/6/24- 2/9/24	2/5/24- 2/11/24
Chinook Adults	0	0	0	0	0	0	0
FR Chinook	0	6	31	2,676	51,171	417	28,070
SR Chinook	0	0	0	22	5	5	328
WR Chinook	5	1	2	0	0	1	0
LFR Chinook	0	0	0	0	0	0	0
Chinook (ad-clip)	2	0	0	0	0	0	0
Steelhead (wild)	0	1	2	0	0	0	11
Steelhead (ad-clip)	25	0	20	0	0	2	0
Green Sturgeon	0	0	0	0	0	52	0
Flows (avg. cfs)	-	-	-	6,000	650	13,692	2,200
W. Temp. (avg. °F/C)	11.3	11.5	-	9.8	9.6	10.2	10.3
Turbidity (avg. NTU)	68.5	129.3	-	3.0	2.5	17.1	9.5

Table 4. Delta sturgeon tagging and monitoring.

Date	Comments
2/6/24	<ul style="list-style-type: none"> 1 juvenile white sturgeon located/ tagged near Sacramento River north of Marsh Island on 10/24/23

¹ Lower Feather River traps set to half cone for FRFH steelhead release on 2/5/24.

Table 5. CDFW adult monitoring surveys. N/A means Not Available due to Carcass Survey ending on 1/24/24.

Location	American River Carcass Survey	Stanislaus River Carcass Survey
Sample Dates	Not Sampling	Not Sampling
Live Fish	Not Available	N/A
Redds	N/A	N/A
Total Carcasses	N/A	N/A
Ad-clipped	N/A	N/A
Spawn Condition	Prespawn Mortality: N/A	Not Available
Flows (avg. cfs)	N/A	N/A
Water Temp (avg. °F)	N/A	Not Available

Table 6. STARS Modeling

<u>Date:</u> (2/12/24)	<u>DCC</u>	<u>Georgiana</u> <u>Slough</u>	<u>Sacramento</u> <u>River</u>	<u>Sutter and</u> <u>Steamboat</u> <u>Slough</u>	<u>Yolo</u> <u>Bypass</u>
Late Fall-Run Routing Probabilities	N/A	0.18	0.47	0.35	N/A
Late Fall-Run Route Specific Survival	N/A	0.37	0.72	0.71	N/A
Winter-Run Routing Probabilities	N/A	0.11	0.66	0.13/0.10	0
Winter-Run Route Specific Survival	N/A	0.50	0.76	0.63/0.76	0.66

Appendix 2: Relevant Actions

Table 7. *Relevant WY 2024 Criteria and Status for Listed Chinook Salmon under the SWP Long-Term Incidental Take Permit.*

<u>Action</u>	<u>Timeframe</u>	<u>Current Action Status</u>	<u>Threshold(s)</u>	<u>Current Relevant Data</u>	<u>Weekly Trend</u>	<u>Last Updated</u>	<u>Comments</u>
Onset of OMR Mgmt. Salmonid Presence (8.3.2)	Jan. 1 - Jun. 30 <i>(when ≥ 5% of winter-run or spring-run are in the Delta)</i>	In effect	≥ 5% of the winter-run or spring-run population are present in the Delta	Winter-run = 65-80% estimated in the Delta Spring-run = 30-45% estimated in the Delta	N/A	2/13/24	N/A
Winter-run yearly loss (8.6.1)	Nov. 1 - Jun. 30	In effect	Natural CHNWR (loss = 1.17% of JPE) 50% of 1.17% of JPE = 2,748.28 Hatchery CHNWR (loss = 0.12% of JPE) 50% of 0.12% of JPE = 232.30	Current yearly WR loss (natural LAD) = 594.12 Current yearly WR loss (hatchery) = 0	LAD natural-origin WR are likely to be observed in salvage in the upcoming week.	2/13/24	LAD natural-origin WR have been observed in salvage over the previous week in high numbers.
Winter-run discrete daily loss (8.6.2)	Nov. 1 - Dec. 31	Not in effect	11/1 – 11/30: loss of 6/day unclipped older juvenile Chinook salmon 12/1 – 12/31: loss of 26/day unclipped older juvenile Chinook salmon	N/A	N/A	2/13/24	N/A

<u>Action</u>	<u>Timeframe</u>	<u>Current Action Status</u>	<u>Threshold(s)</u>	<u>Current Relevant Data</u>	<u>Weekly Trend</u>	<u>Last Updated</u>	<u>Comments</u>
Mid- and Late-season Natural WR Daily Loss Threshold defined as natural origin juvenile Chinook salmon (8.6.3)	Jan 1 – May 31	In effect	<p>January 1 – 31: 0.00124% of the CHNWR JPE</p> <p>February 1 – 28: 0.00231% of the CHNWR JPE</p> <p>March 1 – 31: 0.00372% of the CHNWR JPE</p> <p>April 1 – 30: 0.00226% of the CHNWR JPE</p> <p>May 1 – 31: 0% of the CHNWR JPE</p>	<p>January: 0.0000124*234,896 = 2.9127104 (2.91)</p> <p><u>February:</u> <u>0.0000231 *</u> <u>234,896 =</u> <u>5.4260976 (5.43)</u></p> <p>March: 0.0000372 * 234,896 = 8.7381312 (8.74)</p> <p>April: 0.0000226 * 234,896 = 5.3086496 (5.31)</p> <p>May: 0 * 234,896 = 0 (0)</p>	Salvage of older juvenile Chinook salmon/genetic WR is likely to occur this upcoming week.	2/13/24	LAD WR have been observed in salvage in high numbers over the previous week.

<u>Action</u>	<u>Timeframe</u>	<u>Current Action Status</u>	<u>Threshold(s)</u>	<u>Current Relevant Data</u>	<u>Weekly Trend</u>	<u>Last Updated</u>	<u>Comments</u>
Spring-run surrogate protection (8.6.4)	Feb. 1 - Jun. 30	In effect	<p>Coleman National Fish Hatchery (CNFH) Group 1: 0.25% of total in-river CWT fall-run release</p> <p>Feather River Fish Hatchery (FRFH) Group 1: 0.25% of total in-river CWT spring-run release</p> <p>Nimbus Fish Hatchery (NIM) Group 1: 0.25% of total in-river CWT fall-run release</p>	N/A	N/A	2/13/24	N/A

OMR Flexibility During Delta Excess Conditions (8.7)	Nov. 1 - Jun. 30	Not in effect	<ul style="list-style-type: none"> •The Delta is in excess conditions, AND •QWEST is >0, AND •A measurable precipitation event has occurred, AND •DWR and Reclamation determines that the Delta outflow index indicates a higher level of outflow available for diversion due to peak storm flows, AND •None of the following COA's are controlling Project operations: 8.3.1, 8.3.3, 8.4.1, 8.4.2, 8.5.1, 8.5.2, 8.6.1, 8.6.2, 8.6.3, and 8.6.4, AND •Risk assessments indicate that an OMR more negative than -5,000 cfs is unlikely to trigger an additional real-time OMR restriction •Cumulative salvage at the CVP and SWP facilities of yearling CNFH LFR (as yearling CHNSR surrogates) is 	<p>COA 8.7 will not trigger this week due to the following:</p> <ul style="list-style-type: none"> •The Delta is in excess conditions <u>with restrictions</u>. •There has not been a measurable precipitation event •Risk assessments indicate that an OMR more negative than -5,000 cfs is likely to trigger an additional real-time OMR restriction •Risk assessments determine that changes in spawning, rearing, foraging, sheltering, or migration behavior as a result of OMR Flex operations will occur. 	Current storm events are being monitored for COA 8.7.	2/13/24	N/A
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<u>Action</u>	<u>Timeframe</u>	<u>Current Action Status</u>	<u>Threshold(s)</u>	<u>Current Relevant Data</u>	<u>Weekly Trend</u>	<u>Last Updated</u>	<u>Comments</u>
			less than 0.5% within any of the release groups, AND •Risk assessments determine that no changes in spawning, rearing, foraging, sheltering, or migration behavior as a result of OMR Flex operations				
End of OMR Management (8.8)	Jan – Jun. 30	Not in effect	More than 95% of WR and SR have migrated past Chipps Island as determined by SaMT, AND Daily average water temperature at Mossdale exceeds 22.2°C (71.96°F) for 7 non-consecutive days in June, AND Daily average water temperature at Prisoner’s Point exceeds 22.2°C (71.96°F) for 7 non-consecutive days in June	N/A	N/A	2/13/24	N/A

Appendix 3: Hatchery Releases

Table 8. Hatchery salmon release data for BY 2023 and WY 2024.

Release Date	Hatchery	Race	CWT	Marked Release Number	Total Release	Percent Marked	Release Location	Mark	Agency	Release Type
12/6/2023	SCARF	Spring	06-29-45	2,477	2,477	100%	San Joaquin River at Highway 140	PIT, CWT, and Ad-Clip	CDFW	SJRRP
12/6/2023	SCARF	Spring	06-29-46	1,060	1,060	100%	San Joaquin River at Highway 140	PIT, CWT, and Ad-Clip	CDFW	SJRRP
12/18/2023	CNFH	Late Fall	05-67-28	66,574	66,574	100%	Battle Creek at CNFH	CWT and Ad-clip	USFWS	Production
12/18/2023	CNFH	Late Fall	05-67-29	68,204	68,204	100%	Battle Creek at CNFH	CWT and Ad-clip	USFWS	Production
12/18/2023	CNFH	Late Fall	05-67-30	73,473	73,473	100%	Battle Creek at CNFH	CWT and Ad-clip	USFWS	Production
12/18/2023	CNFH	Late Fall	05-67-31	74,938	74,938	100%	Battle Creek at CNFH	CWT and Ad-clip	USFWS	Production
12/18/2023	CNFH	Late Fall	05-67-32	67,155	67,155	100%	Battle Creek at CNFH	CWT and Ad-clip	USFWS	Production
12/18/2023	CNFH	Late Fall	05-67-33	70,038	70,038	100%	Battle Creek at CNFH	CWT and Ad-clip	USFWS	Production
12/18/2023	CNFH	Late Fall	05-67-34	61,405	61,405	100%	Battle Creek at CNFH	CWT and Ad-clip	USFWS	Production
12/18/2023	CNFH	Late Fall	05-67-35	69,674	69,674	100%	Battle Creek at CNFH	CWT and Ad-clip	USFWS	Production
12/18/2023	CNFH	Late Fall	05-67-36	71,048	71,048	100%	Battle Creek at CNFH	CWT and Ad-clip	USFWS	Production
12/18/2023	CNFH	Late Fall	05-66-87	74,745	74,745	100%	Battle Creek at CNFH	CWT and Ad-clip	USFWS	Production
12/18/2023	CNFH	Late Fall	05-66-88	35,387	35,387	100%	Battle Creek at CNFH	CWT and Ad-clip	USFWS	Production
12/18/2023	CNFH	Late Fall	05-00-45	70,552	70,552	100%	Battle Creek at CNFH	CWT and Ad-clip	USFWS	Production
12/18/2023	CNFH	Late Fall	05-00-46	72,539	72,539	100%	Battle Creek at CNFH	CWT and Ad-clip	USFWS	Production
12/18/2023	CNFH	Late Fall	05-00-47	66,946	66,946	100%	Battle Creek at CNFH	CWT and Ad-clip	USFWS	Production
12/22/2023	CNFH	Late Fall	05-66-89	60,764	60,764	100%	Battle Creek at CNFH	CWT and Ad-clip	USFWS	Experimental
12/28/2023	LSNFH	Winter	05-00-31	74,940	74,940	100%	Sacramento River at John F. Reginato River Access	CWT and Ad-clip	USFWS	Production
12/28/2023	LSNFH	Winter	05-00-32	75,714	75,714	100%	Sacramento River at John F. Reginato River Access	CWT and Ad-clip	USFWS	Production
12/29/2023	CNFH	Late Fall	05-66-90	71,049	71,049	100%	Sacramento River at John F. Reginato River Access	CWT and Ad-clip	USFWS	Experimental
1/11/2024	CNFH	Late Fall	05-66-91	67,018	67,018	100%	Battle Creek at CNFH	CWT and Ad-clip	USFWS	Experimental
1/19/2024	LSNFH	Winter	05-00-33	71,101	71,101	100%	Sacramento River at John F. Reginato River Access	CWT and Ad-clip	USFWS	Production

Release Date	Hatchery	Race	CWT	Marked Release Number	Total Release	Percent Marked	Release Location	Mark	Agency	Release Type
1/19/2024	LSNFH	Winter	05-00-34	77,433	77,433	100%	Sacramento River at John F. Reginato River Access	CWT and Ad-clip	USFWS	Production
1/19/2024	LSNFH	Winter	05-00-35	78,993	78,993	100%	Sacramento River at John F. Reginato River Access	CWT and Ad-clip	USFWS	Production
2/5/24-2/6/24	MOK	Steelhead	06-19-43	63,260	63,260	100%	New Hope Landing	Ad-clip	CDFW	Production
2/12/24	NIM	Fall	N/A	0	1,198,682	0%	Lower American River and Nimbus Fish Hatchery	None	CDFW	Experimental

Table 9. Hatchery steelhead release data for BY 2023 and WY 2024.

Release Date	Hatchery	CWT	Marked Release Number	Total Release	Percent Marked	Release Location	Mark	Agency	Release Type
12/19/23 - 12/21/23	CNFH	N/A	142,402	142,402	100%	Sacramento River at Sycamore Grove	Ad-clip	USFWS	Production
12/29/23-1/5/24	CNFH	N/A	276,336	276,336	100%	Sacramento River at Sycamore Grove	Ad-clip	USFWS	Production
1/31/2024	NIM	N/A	168,000	168,000	100%	Lower American River at Sunrise Boat Ramp	Ad-clip	CDFW	Production
2/1/2024	NIM	N/A	173,000	173,000	100%	Lower American River at Sunrise Boat Ramp	Ad-clip	CDFW	Production
2/2/2024	NIM	N/A	175,000	175,000	100%	Lower American River at Sunrise Boat Ramp	Ad-clip	CDFW	Production
2/5/24-2/6/24	MOK	06-19-43	63,260	63,260	100%	New Hope Landing	CWT and Ad-clip	CDFW	Production
2/5/24-2/9/24 and 2/12/24-2/16/24	FRFH	N/A	445,000	445,000	100%	Feather River at Boyd's Pumping Boat Ramp	Ad-clip	CDFW	Production

Table 10. COA 8.6.4 Young-of-Year Spring-run Chinook Salmon Hatchery Surrogate Summary Table, WY 2024.

Hatchery	Release Group	Date	Race	Total Fish Released	CWT Fish	Tag Codes	Loss Threshold
Coleman National Fish Hatchery	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Feather River Fish Hatchery	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Nimbus Fish Hatchery	N/A	N/A	N/A	N/A	N/A	N/A	N/A