

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

## Section 1: Overview

Date: 6/18/2024

### 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 to WOMT this week.

For the week beginning 6/18/24, the D-1641's Water Quality requirements are controlling exports at the State Water Project (SWP) and Central Valley Project (CVP). Combined exports on 6/18/24 are 5,900 cfs resulting in an OMRI of -3,000 cfs and 25.5% of inflow diverted (3-day average). The Delta Cross Channel (DCC) gates are open for the season. The SWP is exporting this week and no outages are expected.

Due to COA 8.8 (End of OMR Management) being triggered on 6/12/24, the Salmon Monitoring Team (SaMT) estimates an overall low risk of entrainment of juvenile natural-origin winter-run (WR) Chinook salmon and juvenile natural-origin springrun (SR) Chinook salmon into the interior Delta from the Sacramento River. SaMT also estimates the overall entrainment risk of WR and SR into the salvage facilities to remain low this week due to estimating nearly 100% of both WR and SR have exited the system from elevated temperatures and life history strategy.

## Section 2: Risk Assessment

### Section 2-A: Operations and Fish Distribution Table

The COA 8.6.1 (WR Single-year Loss Threshold) natural-origin LAD WR threshold was exceeded this OMR management season as reflected by high cumulative loss of natural origin WR at the export facilities. Total loss of LAD WR for WY 2024 was 4,205.05 fish. Cramer Fish Sciences conducted genetic analyses on observed Chinook salmon in salvage through 6/4/24. Of all the samples analyzed, loss of 130.05 of Chinook salmon that identified as LAD WR were genetically confirmed as winter-run. The hatchery-origin WR threshold was not exceeded this OMR management season. Total loss for hatchery-origin WR for WY 2024 was 4.33 fish.

COA 8.6.4 (Daily SR Hatchery Surrogate Loss Threshold) was not exceeded this OMR season and has ended. Zero SR surrogates were detected in salvage this OMR management season.

COA 8.8 (End of OMR Management) requirements for offramping OMR management prior to the end of OMR management season on 6/30/2022 include:

- 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 for 7 non-consecutive days in June, **and**
- Daily average water temperature at Prisoner’s Point exceeds 22.2° C for 7 non-consecutive days in June.

SaMT has determined that greater than 95% of WR and SR have migrated past Chipps Island. In addition, both the Prisoner’s Point and Mossdale temperature offramp requirements have been exceeded for the requisite number of days in June. Therefore, the salmonid requirements for COA 8.8 were met on 6/12/24.

LAD SR loss totaled 12,779.31, which is the fourth highest loss so far since WY 2010 (Table 2).

Merced Fish Hatchery released untagged (no adipose fin clip and no CWT) fall-run Chinook salmon (FR) for efficiency trials for the Mossdale Trawls on 4/12/24. These fish are being marked on the daily datasheets as natural-origin Chinook at the SWP and CVP salvage facilities; however, they are hatchery-origin fish from the Merced Fish Hatchery. These fish do have a pink dyed fin which is being noted in the daily CVP and SWP data sheets and helping to distinguish them from natural-origin fish. Some of these hatchery-origin fish are being measured and determined as LAD SR according to the Delta Model based on fork length, so in order to separate their loss with the natural-origin SR loss, total loss of these fish have been added together and reported below (Table 1).

**Table 1.** LAD fall-run and LAD spring-run sized fish that were pink dyed that were released from the Merced Hatchery for efficiency trials at Mossdale Trawl. These fish were included in the salvage database as LAD natural-origin fall-run or LAD natural-origin spring-run. These are preliminary results and are subject to change.

Facility	LAD Fall-Run	LAD Spring Run	Total Loss
<b>SWP Loss</b>	95.26	151.94	247.20
<b>CVP Loss</b>	716.46	93.83	810.29
<b>Total Loss</b>	811.72	245.77	1057.49

**Table 2.** Historical loss of LAD natural-origin spring-run from WY 2010 to WY 2023. Wet years were highlighted in yellow. WY 2024 is spring-run loss data through 6/17/24.

Water Year	Total Loss	50% of Total Loss:	75% of Total Loss:	90% of Total Loss:	100% of Total Loss:	Water Year Type
2010	6,082.20	5/4/2010	5/16/2010	5/27/2010	6/5/2010	Below Normal
2011	52,504.32	<b>5/8/2011</b>	<b>5/16/2011</b>	<b>5/30/2011</b>	<b>6/24/2011</b>	<b>Wet</b>
2012	2,394.27	4/17/2012	4/21/2012	5/2/2012	6/8/2012	Below Normal
2013	2,495.92	4/22/2013	5/1/2013	5/11/2013	5/25/2013	Dry
2014	348.72	4/9/2014	4/19/2014	4/23/2014	5/10/2014	Critically Dry
2015	70.02	4/22/2015	4/23/2015	5/4/2015	5/18/2015	Critically Dry
2016	297.79	4/27/2016	5/2/2016	5/14/2016	5/19/2016	Below Normal
2017	72,011.18	<b>5/11/2017</b>	<b>5/15/2017</b>	<b>5/23/2017</b>	<b>6/29/2017</b>	<b>Wet</b>
2018	18,313.05	5/8/2018	5/19/2018	6/3/2018	5/23/2018	Below Normal
2019	6,100.44	<b>5/6/2019</b>	<b>5/19/2019</b>	<b>5/20/2019</b>	<b>6/25/2019</b>	<b>Wet</b>
2020	4,167.11	4/21/2020	4/24/2020	4/30/2020	5/26/2020	Dry
2021	517.99	4/27/2021	5/1/2021	5/4/2021	5/12/2021	Critically Dry
2022	552.55	4/28/2022	5/2/2022	5/12/2022	5/21/2022	Critically Dry
2023	10,191.83	<b>5/20/2023</b>	<b>5/29/2023</b>	<b>6/2/2023</b>	<b>7/1/2023</b>	<b>Wet</b>
2024	12,779.31 (partial)	-	-	-	-	Above Normal
Average Loss in Dry/Critically Dry Years		4/22	4/27	5/5	5/18	-
Average Loss in Below Normal Years		4/29	5/7	5/19	5/29	-
Average Loss in Wet Years		<b>5/11</b>	<b>5/19</b>	<b>5/26</b>	<b>6/27</b>	-

**Table 3.** Percentage of LAD natural-origin spring-run loss per month for WY 2010 to WY 2023.

Water Year	February	March	April	May	June	July	Water Year Type
2010	0%	5.88%	37.82%	53.67%	2.63%	0%	Below Normal
2011	<b>0%</b>	<b>1.42%</b>	<b>30.20%</b>	<b>59.98%</b>	<b>8.35%</b>	<b>0%</b>	<b>Wet</b>
2012	0%	25.23%	63.80%	10.83%	0.13%	0%	Below Normal
2013	0%	13.27%	59.54%	27.19%	0%	0%	Dry
2014	0%	22.02%	74.39%	3.60%	0%	0%	Critically Dry
2015	0%	13.13%	75.14%	11.73%	0%	0%	Critically Dry
2016	3.48%	33.60%	31.50%	31.42%	0%	0%	Below Normal
2017	<b>0.05%</b>	<b>0.52%</b>	<b>22.17%</b>	<b>69.70%</b>	<b>7.57%</b>	<b>0%</b>	<b>Wet</b>
2018	0%	22.18%	63.12%	14.70%	0%	0%	Below Normal
2019	<b>0.27%</b>	<b>2.54%</b>	<b>30.52%</b>	<b>66.20%</b>	<b>0.47%</b>	<b>0%</b>	<b>Wet</b>
2020	0%	3.70%	86.57%	9.73%	0%	0%	Dry
2021	0%	0.63%	59.50%	39.87%	0%	0%	Critically Dry
2022	0%	0%	70.88%	29.12%	0%	0%	Dry
2023	<b>0%</b>	<b>0.25%</b>	<b>10.29%</b>	<b>73.52%</b>	<b>15.88%</b>	<b>0.06%</b>	<b>Wet</b>

**Table 4. 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 0% Last week 0%	Current 0% Last Week 99-100%	Current 100% Last Week 100%
Young-of-year spring-run Chinook salmon	Current 0% Last week 0%	Current 0-1% Last Week 0-1%	Current 99-100% Last Week 99-100%
Hatchery origin winter-run Chinook salmon	Current 0% Last week 0%	Current 0% Last Week 0%	Current 100% Last Week 100%

**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: Low
  - SR: Low
- Routing Risk:
  - WR: Low
  - SR: Low
- Overall Entrainment Risk:
  - WR: Low
  - SR: Low
- 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 low this week due to WR presence in the Delta at 0% and seasonal timing of WR outmigration. Routing Risk is estimated as low for WR this week. Although the DCC gates are open, Freeport flows are at 15,000 cfs, which decreases routing risk this week to low. WR migration into and through the Delta has likely ended due to no observations in the real-time monitoring sites and water temperatures increasing; therefore, the overall entrainment risk into the central Delta is estimated to remain low this week.
  - SR: Similar to previous week
    - Exposure Risk is estimated as low this week. SR migration into and through the Delta has likely ended due to no observations in the real-time monitoring sites and seasonal migration timing. Routing Risk is estimated as low this week. Freeport flows are at 15,000 cfs and the STARS model predicts routing at 23% through Georgiana Slough. Therefore, the overall entrainment into the central Delta remains low 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: Low
  - SR: Low
- Reporting OMRI/Export Risk:
  - Baseline OMRI (-5,100 cfs)

- WR: Low
    - SR: Low
  - Scenario 1 OMRI: (-2,500 cfs)
    - WR: Low
    - SR: Low
  - Scenario 2 OMRI: (-6,000 cfs)
    - WR: Low
    - SR: Low
- Overall Entrainment Risk:
  - WR: Low
  - SR: Low
- Change in risk of entrainment into the facilities (increased/decreased risk compared to last week):
  - WR: Similar to previous week
    - Exposure Risk is low due to no WR being observed in salvage over the previous week. WR loss is not expected to occur over the course of the week due to seasonal timing and low observations of WR loss in the previous week. Reporting OMRI/Export Risk this week is estimated to be low. There was no increase in loss of WR occurred when operations decreased OMRI from -3,500 cfs to -5,000 cfs. Therefore, the overall entrainment risk of WR into the exports facilities is low this week.
  - SR: Decreased from previous week
    - Exposure Risk is low due to no SR being observed in salvage over the previous week. SR loss is not expected to occur over the course of the week due to seasonal timing and low observations of WR loss in the previous week. Reporting OMRI/Export Risk is estimated as low this week. There was no increase in loss of WR occurred when operations decreased OMRI from -3,500 cfs to -5,000 cfs; therefore, the overall entrainment risk into the facilities is estimated as low 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: 4,205.05 (with salvage data up to 6/2/24)
        - 50% Annual Loss Threshold based on natural-origin WR JPE: 1,374.14
          - Risk of exceeding threshold: *Not applicable since threshold has been exceeded.*
          - The 50% Annual Loss Threshold was exceeded on 2/25/24 which restricts OMRI to a 14-day moving average that is no more negative than -3,500 cfs through the end of OMR Management. However, after 14 days Permittee may convene SaMT to conduct a risk assessment and determine whether the risk of entrainment and take of natural and hatchery CHNWR is no longer present.

- 75% Annual Loss Threshold based on natural-origin WR JPE: 2,061.21
  - Risk of exceeding threshold: *Not applicable since threshold has been exceeded.*
  - The 75% Annual Loss Threshold was exceeded on 3/7/24 which restricts OMRI to a 14-day moving average that is no more negative than -2,500 cfs through the end of OMR Management. However, after 14 days Permittee may convene SaMT to conduct a risk assessment and determine whether the risk of entrainment and take of natural and hatchery CHNWR is no longer present.
- 100% Annual Loss Threshold based on natural-origin WR JPE: 2,748.28
  - Risk of exceeding threshold: *Not applicable since threshold has been exceeded.*
  - SaMT will continue to review recent fish distribution information and operations each week and provide advice regarding future planned Project operations to minimize subsequent loss during that year. Entrainment risk will be measured against the potential to exceed the 100% annual loss threshold. **SaMT shall use reported real-time salvage data along with qualitative and quantitative tools to inform risk assessments to determine if entrainment risk of WR is still present and to minimize subsequent loss of WR.**
- Hatchery WR: 232.30 [0.12% of the Livingston Stone National Fish Hatchery (LSNFH) hatchery release JPE]
  - Current Annual Loss: 4.33
  - 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 8.6.4 Daily Spring-run Chinook Salmon Hatchery Surrogate Loss Threshold:
        - Hatchery Origin Young-of-Year SR Surrogates (0.25% of total in-river SR releases for each release group from Feather River Hatchery (FRH):
          - Group 1 Loss Threshold: 1,749.64
            - Highest Daily Loss: 0
            - Risk of Exceeding Threshold: Low
          - Group 2 Loss Threshold: 1,751.57
            - Highest Daily Loss: 0
            - Risk of Exceeding Threshold: Low
          - Group 3 Loss Threshold: 1,400.76
            - Highest Daily Loss: 0

- Risk of Exceeding Threshold: Low
  - Risk of Exceeding Threshold: Low Hatchery Origin Young-of-Year SR Surrogates (0.25% of total in-river FR releases for each release group from Coleman National Fish Hatchery (CNFH):
    - Group 1 Loss Threshold: 1,780.44
      - Highest Daily Loss: 0
      - Risk of Exceeding Threshold: Low
    - Group 2 Loss Threshold: 266.33
      - Highest Daily Loss: 0
      - Risk of Exceeding Threshold: Low
  - Risk of Exceeding Threshold: Low Hatchery Origin Young-of-Year SR Surrogates (0.25% of total in-river FR releases for each release group from Nimbus Fish Hatchery (NIM):
    - Group 1 Loss Threshold: 525.88
      - Highest Daily Loss: 0
      - Risk of Exceeding Threshold: Low
- COA 8.8 End of OMR Management Season:
  - Number of days the daily average water temperature has exceeded 22.2° C for 7 non-consecutive days in June at the following locations:
    - Mossdale (MSD): 7 days
      - Dates in which exceedance of 22.2°C occurred: 6/6/24, 6/7/24, 6/8/24, 6/9/24, 6/10/24, 6/11/24, 6/12/24
    - Prisoners Point (PPT): 7 days
      - Dates in which exceedance of 22.2°C occurred: 6/6/24, 6/7/24, 6/8/24, 6/9/24, 6/10/24, 6/11/24, 6/12/24
  - More than 95% of CHNWR and CHNSR have migrated past Chipps Island:
    - WR distribution exiting the Delta: 100%
    - SR distribution exiting the Delta: 99-100%

### 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.*

*8.6.4 Daily Spring-run Chinook Salmon Hatchery Surrogate Loss Threshold. To minimize entrainment of emigrating natural juvenile CHNSR from the Sacramento River and tributaries, including the Feather and Yuba rivers into the channels of the central Delta, south Delta, CCF, and the Banks Pumping Plant, Permittee shall restrict exports based on the presence of hatchery produced CHNSR surrogate groups at the CVP and SWP salvage facilities. CHNSR surrogate groups shall consist of all in-river fall- and spring-run surrogate release groups of Chinook salmon from the Coleman National Fish Hatchery, Feather River Hatchery, and the Nimbus Fish Hatchery.*

*Each water year between February 1 and June 30 Permittee shall reduce south Delta exports for five consecutive days to achieve a five-day average OMR index no more negative than -3,500 cfs when:*

- Feather River Hatchery coded wire tagged (CWT) CHNSR surrogates (includes both spring- and fall-run hatchery release groups) cumulative loss at the at the CVP and SWP salvage facilities is greater than 0.25% for each release group, OR
- Coleman National Fish Hatchery and Nimbus Fish Hatchery CWT fall-run release groups cumulative loss at the at the CVP and SWP salvage facilities is greater than 0.25% of the total in-river releases for each release group.

*This Condition of Approval may be modified through the process described in Condition of Approval 8.6.6 and an amendment to this ITP.*

**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,<sup>22</sup> 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.*

*8.8 End of OMR Management. Permittee shall operate the Project to meet the requirements included 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 to ensure that entrainment and take of Covered Species is minimized during the OMR Management season through June 30, or until the following species-specific off-ramps occur:*

- *CHNWR and CHNSR:*
  - o *More than 95% of CHNWR and CHNSR have migrated past Chipps Island as determined by the Salmon Monitoring Team, AND*
  - o *Daily average water temperature at Mossdale exceeds 22.2°C for 7 non- consecutive days in June, AND*
  - o *Daily average water temperature at Prisoner’s Point exceeds 22.2°C for 7 non- consecutive days in June.*

## 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.)
  - Steelhead 75% Annual Loss Threshold was exceeded on 4/26/24, which limits OMRI to -2,500 cfs through the end of OMR management season, which would end on June 15 for steelhead. The steelhead 100% Annual Loss Threshold was also exceeded on 4/26/24. However, OMRI of -5,000 cfs has been controlling operations since 6/6/24 due to WOMT decision made on 6/5/24.
- 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: 7
    - Days exceeded: 6/6/24 - 6/12/24
  - Prisoners Point (PPT): [Prisoners Point - CDEC](#)
    - Number of days threshold exceeded: 7
    - Days exceeded: 6/6/24 - 6/12/24
- Tidal Cycle: (*Spring/Neap. Note if tidal cycle has potential to affect south Delta hydrology or X2*)  
Exiting a spring cycle with a full moon on 6/21/24 and entering into a neap cycle.
- Turbidity: Not discussed
- Salinity (X2): 73 km on 6/18/24
- Outages:
  - SWP: None projected.
  - CVP: None projected.
- Exports: 6/18/24 – 6/24/24
  - SWP: 300 to 3,000 cfs
  - CVP: 2,700 to 4,200 cfs
- Meteorological Forecast:
  - *“Critical fire weather conditions from gusty northerly winds and low relative humidity continue through midday today across the Delta, Valley, and adjacent foothills locations below 2000 feet. Dry and generally seasonable weather then persists through midweek, with a warming trend late week into the weekend.”*
  - [NOAA - National Weather Service Forecast](#)
- Weather/Storm Event Projection:
  - There are no rain events in the upcoming week that are 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 are open and will remain open for the season, per D-1641.
- Sacramento River flow at Freeport: 15,400 cfs
  - [Sacramento River Flows - CDEC](#)
- San Joaquin River flow at Vernalis: 2,400 cfs
  - [San Joaquin River Flows - CDEC](#)
  - [San Joaquin River Guidance Plots - CDEC](#)
- QWEST: +1,200 cfs

- Future export modifications: *Describe anticipated or potential changes to exports:*
  - Combined exports will likely to remain similar to the previous week.

**Table 5.** Comparison of USGS Tidally Filtered OMR and OMR Index data.

Date	Averaging Period	USGS gauges (cfs)	OMR Index (cfs)
6/15/24	Daily	-5,800	-4,900
6/15/24	5-day	-5,900	-5,000
6/15/24	14-day	-5,700	-4,500
6/17/24	Daily	Not Applicable	-5,000
6/17/24	5-day	Not Applicable	-4,900
6/17/24	14-day	Not Applicable	-4,800

## 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 3/24/24 is 1,110,528 fish, which represents 99.8% of historical passage. Average historic passage (7/1/2002-6/30/2023) as of 3/24/24 indicates 99.8% with one standard deviation of 0.2% have passed Red Bluff Diversion Dam.
    - Biweekly updates are not being sent due to staffing and also revamping the Red Bluff Diversion Dam RST webpage.
- 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.
  - On 2/16/24, LSNFH released 365,893 winter-run Chinook salmon into the Sacramento River. A subset of these fish were acoustically tagged and will be tracked through CalFishTrack and estimated in the fish distribution table (Table 4).
  - See Appendix 4
- Distribution of natural WR:
  - See Table 4
- 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 were released prior to being acoustically tagged.
  - The fish released on 1/19/24 were also not released prior to being acoustically tagged.
  - CNFH released Battle Creek jumpstarters into North Fork Battle Creek on 3/4/24.
  - One fish from the release made on 12/28/24 was observed in at the SWP on 3/10/24.
  - [CalFishTrack \(noaa.gov\)](https://www.calfishtrack.noaa.gov)

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

- Adult escapement estimate:
  - SR carcass counts not available.
- Redd distribution and fry emergence timing:
  - SR fry and smolts are migrating past Chipps Island. Nearly all SR are assumed to be out of the system due to water temperatures and seasonal timing.
- Hatchery release (in-river and downstream):
  - Coleman National Fish Hatchery (CNFH) released 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 4
- Distribution of Feather River, Coleman, and Nimbus Fish Hatchery SR surrogates (See Table 13):
  - The first release of SR surrogates for COA 8.6.4 were released on 3/15/24 from the Feather River Fish Hatchery. This release was a total of 699,854 CWT and adipose-clipped SR. These fish will be tracked for COA 8.6.4 in the SWP and CVP export facilities.
  - The second release of SR surrogates for COA 8.6.4 were released on 3/21/24 from the Coleman National Fish Hatchery. This release was a total of 712,177 CWT and adipose-clipped fall-run (FR). These fish will be tracked for COA 8.6.4 in the SWP and CVP export facilities.
  - The third release of SR surrogates for COA 8.6.4 were released on 4/23/24 from the Feather River Fish Hatchery on 3/29/24. This release was a total of 699,854 CWT and adipose-clipped SR. These fish will be tracked for COA 8.6.4 in the SWP and CVP export facilities.
  - The fourth release of SR surrogates for COA 8.6.4 were released on 4/19/24 from the Nimbus Fish Hatchery. This release was a total of 210,351 CWT and adipose-clipped FR. These fish will be tracked for COA 8.6.4 in the SWP and CVP export facilities.
  - The fifth release of SR surrogates for COA 8.6.4 were released on 4/23/24 from the Feather River Fish Hatchery. This release was a total of 560,304 CWT and adipose-clipped SR. These fish will be tracked for COA 8.6.4 in the SWP and CVP export facilities.
  - The sixth and final release of SR surrogates for COA 8.6.4 were released on 5/1/24 from the Coleman National Fish Hatchery. This release was a total of 106,531 CWT and adipose-clipped FR. These fish will be tracked for COA 8.6.4 in the SWP and CVP export facilities.

#### 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/calfishtrack)
- Trawls: See Appendix 1
  - Sacramento Trawl: No listed species were caught this week.
  - Mossdale Trawl: No listed species were caught this week.
  - Chipps Island Trawl: No listed species were caught this week.
- Rotary Screw Traps:
  - Knights Landing RST Data: Trapping did not occur this week.
    - [Middle Sacramento River Salmon and Steelhead Monitoring](#)
  - Tisdale RST Data: Trapping did not occur this week.
    - [Middle Sacramento River Salmon and Steelhead Monitoring](#)
  - Lower Sacramento RST Data: Trapping did not occur this week.
    - [Middle Sacramento River Salmon and Steelhead Monitoring](#)
  - Lower Feather RST Data: Trapping did not occur this week.
  - Yuba River RST Data: No listed species were caught this week.
  - Red Bluff Diversion Dam RST Data: Total passage estimates 1,110,528 juvenile WR have passed RBDD. Last updated on 3/24/24.

- Butte Creek RST Data: Trapping did not occur this week.
    - [Butte Creek Monitoring Programs](#)
- Seines:
  - Sacramento River Beach Seines: No listed species were caught this week.
- 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.*
  - 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.
  - An acoustic tag study is being conducted at Lighthouse Resort with steelhead from the Mokelumne Fish Hatchery to observe movements of steelhead at an OMRI of -500 cfs.
  - [CalFishTrack \(noaa.gov\)](#)
- Anticipated emigration to continue into the Delta:
  - WR have likely all out-migrated for this season. WR have not been observed in monitoring sites or in the salvage facilities in the previous month, which likely means they have all exited the system.
  - Young-of-year SR have also all likely exiting the Delta due to warm water temperatures and seasonal timing.
  - [SacPAS - Migration Timing and Conditions by Cohort](#)
  - [SacPAS - Salvage Timing](#)
- Routing and Survival Analysis:
  - Delta STARS Model: See Table 9 in Appendix 1
    - [STARS Model](#)
- Tillotson entrainment model or other entrainment models as they become available:
  - The entrainment tool estimates a median of 0 WR and a maximum loss of 0 WR this week (SacPAS last updated on 6/18/24).
  - [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 not been observed in June in the previous 13 years of historical data so seasonal timing would indicate that they are unlikely to be observed in salvage and real-time monitoring sites in June.
  - [USFWS - Fish Salvage Monitoring](#)



## Appendix 1: SaMT Monitoring and Modeling Data

**Table 6.** Fish monitoring data for the 6/18/24 SaMT meeting. Due to time constraints, average flow, water temperature, and turbidity were not calculated this week for any of the monitoring sites. 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	Knights Landing RST	Lower Sac RST	Beach Seines	Sacramento Trawl
Sample Date	N/A	N/A	N/A	N/A	6/9/24-6/15/24	6/9/24-6/15/24
Chinook Adults	N/A	N/A	N/A	N/A	0	0
FR Chinook	N/A	N/A	N/A	N/A	0	4
SR Chinook	N/A	N/A	N/A	N/A	0	0
WR Chinook	N/A	N/A	N/A	N/A	0	0
LFR Chinook	N/A	N/A	N/A	N/A	0	0
Chinook (ad-clip)	N/A	N/A	N/A	N/A	0	0
Steelhead (wild)	N/A	N/A	N/A	N/A	0	0
Steelhead (ad-clip)	N/A	N/A	N/A	N/A	0	0
Green Sturgeon	N/A	N/A	N/A	N/A	0	0
Flows (avg. cfs)	N/A	N/A	N/A	N/A	N/A	N/A
W. Temp. (avg. °C)	N/A	N/A	N/A	N/A	N/A	N/A
Turbidity (avg. NTU)	N/A	N/A	N/A	N/A	N/A	N/A

**Table 5 Continued.** Fish monitoring data for the 6/18/24 SaMT meeting. Due to time constraints, average flow, water temperature, and turbidity were not calculated this week for any of the monitoring sites. 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	Chipps Is. Midwater Trawl	Mossdale Kodiak Trawl	Feather at Herringer RST	Feather at Eye-Side RST	Lower Feather River RST	Yuba River RST
Sample Date	6/9/24-6/15/24	6/9/24-6/15/24	6/12/24-6/13/24	6/12/24-6/16/24	N/A	6/12/24-6/16/24
Chinook Adults	0	0	0	0	N/A	0
FR Chinook	3	27	0	210	N/A	21
SR Chinook	0	1	0	0	N/A	0
WR Chinook	0	0	0	0	N/A	0
LFR Chinook	0	0	1	1	N/A	4
Chinook (ad-clip)	0	0	0	0	N/A	0
Steelhead (wild)	0	0	0	1	N/A	11
Steelhead (ad-clip)	0	0	0	0	N/A	0
Green Sturgeon	0	0	0	0	N/A	0
Flows (avg. cfs)	N/A	N/A	N/A	N/A	N/A	N/A
W. Temp. (avg. °F/C)	N/A	N/A	N/A	N/A	N/A	N/A
Turbidity (avg. NTU)	N/A	N/A	N/A	N/A	N/A	N/A

**Table 7. Delta sturgeon tagging and monitoring.**

Date	Comments
5/14/24	<ul style="list-style-type: none"> <li>• 2 juvenile white sturgeon were tagged near Sacramento River north of Marsh Island on 10/24/23 and 4/22/24, respectively.</li> <li>• 1 white sturgeon was tagged at Wallace Weir Fish Collection Facility on 4/26/24</li> </ul>

**Table 8. 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 9. STARS Modeling**

Date: (6/16/24)	DCC	Georgiana Slough	Sacramento River	Sutter and Steamboat Slough	Yolo Bypass
Late Fall-Run Routing Probabilities	0	0.25	0.47	0.28	N/A
Late Fall-Run Route Specific Survival	0	0.22	0.57	0.47	N/A
Winter-Run Routing Probabilities	N/A	0.13	0.60	0.14/0.14	0
Winter-Run Route Specific Survival	N/A	0	0	0/0	0

## Appendix 2: Relevant Actions

**Table 10.** *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>	Not in effect	≥ 5% of the winter-run or spring-run population are present in the Delta	Winter-run = 0% estimated in the Delta  Spring-run = 0-1% estimated in the Delta	N/A	<b>6/18/24</b>	N/A
Winter-run yearly loss (8.6.1)	Nov. 1 - Jun. 30	In effect	Natural CHNWR (loss = 1.17% of JPE): <i>50% of 1.17% of JPE = <b>1,374.14</b></i> <i>75% of 1.17% of JPE = <b>2,061.21</b></i>  Hatchery CHNWR (loss = 0.12% of JPE): <i>50% of 0.12% of JPE = <b>116.15</b></i>	Current yearly WR loss (natural LAD) = 4,205.05 (updated with 6/17/24 salvage data)  Current yearly WR loss (hatchery) = 4.33	N/A	<b>6/18/24</b>	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>
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	<b>6/18/24</b>	N/A
Mid- and Late-season Natural WR Daily Loss Threshold defined as natural origin juvenile Chinook salmon (8.6.3)	Jan 1 – May 31	Not in effect	January 1 – 31: 0.00124% of the CHNWR JPE  February 1 – 28: 0.00231% of the CHNWR JPE  March 1 – 31: 0.00372% of the CHNWR JPE  April 1 – 30: 0.00226% of the CHNWR JPE  May 1 – 31: 0% of the CHNWR JPE	January: 0.0000124*234,896 = 2.9127104 <b>(2.91)</b>  February: 0.0000231 * 234,896 = 5.4260976 <b>(5.43)</b>  March: 0.0000372 * 234,896 = 8.7381312 <b>(8.74)</b>  April: 0.0000226 * 234,896 = 5.3086496 <b>(5.31)</b>  May: 0 * 234,896 = 0 <b>(0)</b>	N/A	<b>6/18/24</b>	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>
Spring-run surrogate protection (8.6.4)	Feb. 1 - Jun. 30	Not 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 (FRH) 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>	<p>FRH Group 1: <math>0.0025 * 699,854 = 1,749.64</math></p> <p>FRH Group 2: <math>0.0025 * 700,626 = 1,751.57</math></p> <p>FRH Group 3: <math>0.0025 * 560,304 = 1,400.76</math></p> <p>CNFH Group 1: <math>0.0025 * 712,177 = 1,780.44</math></p> <p>CNFH Group 2: <math>0.0025 * 106,531 = 266.33</math></p> <p>NIM Group 2: <math>0.0025 * 210.351 = 525.88</math></p>	<p>FRH Group 1 release occurred on 3/15/24</p> <p>FRH Group 2 release occurred on 3/29/24</p> <p>FRH Group 3 release occurred on 4/23/24</p> <p>CNFH Group 1 release occurred on 3/21/24</p> <p>CNFH Group 2 release occurred on 5/1/24</p> <p>NIM Group 1 release occurred on 4/19/24</p>	<b>6/18/24</b>	None have been observed in salvage so far this WY.

<p>OMR Flexibility During Delta Excess Conditions (8.7)</p>	<p>Nov. 1 - Jun. 30</p>	<p>Not in effect</p>	<ul style="list-style-type: none"> <li>•The Delta is in excess conditions, AND</li> <li>•QWEST is &gt;0, AND</li> <li>•A measurable precipitation event has occurred, AND</li> <li>•DWR and Reclamation determines that the Delta outflow index indicates a higher level of outflow available for diversion due to peak storm flows, AND</li> <li>•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</li> <li>•Risk assessments indicate that an OMR more negative than - 5,000 cfs is unlikely to trigger an additional real-time OMR restriction</li> <li>•Cumulative salvage at the CVP and SWP facilities of yearling CNFH LFR (as yearling CHNSR surrogates) is</li> </ul>	<p>COA 8.7 will not trigger this week due to the following:</p> <ul style="list-style-type: none"> <li>•The Delta is not in excess conditions.</li> <li>•There has not been a measurable precipitation event</li> <li>•Risk assessments indicate that an OMR more negative than - 5,000 cfs is likely to trigger an additional real-time OMR restriction</li> <li>•Risk assessments determine that changes in spawning, rearing, foraging, sheltering, or migration behavior as a result of OMR Flex operations will occur.</li> </ul>	<p>N/A</p>	<p><b>6/18/24</b></p>	<p>N/A</p>
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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 <ul style="list-style-type: none"> <li>•Risk assessments determine that no changes in spawning, rearing, foraging, sheltering, or migration behavior as a result of OMR Flex operations</li> </ul>				
End of OMR Management (8.8)	Jan 1 – Jun. 30	In effect	More than 95% of WR and SR have migrated past Chipps Island as determined by SaMT, <b>AND</b> Daily average water temperature at Mossdale exceeds 22.2°C (71.96°F) for 7 non-consecutive days in June, <b>AND</b> Daily average water temperature at Prisoner’s Point exceeds 22.2°C (71.96°F) for 7 non-consecutive days in June	Days exceeded threshold at Mossdale (MSD): 7  Days exceeded threshold at Prisoners Point (PPT): 7  WR exited past Chipps Island: 100%  SR exited past Chipps Island: 99-100%	N/A	<b>6/18/24</b>	N/A



## Appendix 3: Hatchery Releases

**Table 11.** 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
12/20/23 - 1/12/24	SCARF	Spring	0602010 809	3,006	3,006	100%	San Joaquin River at Friant Bridge	Half CWT and Ad-clip	CDFW	SJRRP
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

Release Date	Hatchery	Race	CWT	Marked Release Number	Total Release	Percent Marked	Release Location	Mark	Agency	Release Type
1/19/2024	LSNFH	Winter	05-00-33	71,101	71,101	100%	Sacramento River at John F. Reginato River Access	CWT and Ad-clip	USFWS	Production
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
1/24/24 - 2/9/24	SCARF	Spring	0602010 901	3,007	3,007	100%	San Joaquin River at Friant Bridge	Half CWT and Ad-clip	CDFW	SJRRP
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 at Nimbus Fish Hatchery	None	CDFW	Experimental
2/14/24	SCARF	Spring	06-19-39	53,446	53,446	100%	San Joaquin River at Highway 140	CWT and Ad-clip	CDFW	SJRRP
2/16/24	LSNFH	Winter	05-00-36	79,092	79,092	100%	Sacramento River at John F. Reginato River Access	CWT and Ad-clip	USFWS	Production
2/16/24	LSNFH	Winter	05-64-99	43,382	43,382	100%	Sacramento River at John F. Reginato River Access	CWT and Ad-clip	USFWS	Production
2/16/24	LSNFH	Winter	05-65-01	51,003	51,003	100%	Sacramento River at John F. Reginato River Access	CWT and Ad-clip	USFWS	Production
2/16/24	LSNFH	Winter	05-65-02	42,670	42,670	100%	Sacramento River at John F. Reginato River Access	CWT and Ad-clip	USFWS	Production
2/16/24	LSNFH	Winter	05-65-03	46,419	46,419	100%	Sacramento River at John F. Reginato River Access	CWT and Ad-clip	USFWS	Production
2/16/24	LSNFH	Winter	05-65-04	43,654	43,654	100%	Sacramento River at John F. Reginato River Access	CWT and Ad-clip	USFWS	Production
2/16/24	LSNFH	Winter	05-67-24	22,605	22,605	100%	Sacramento River at John F. Reginato River Access	CWT and Ad-clip	USFWS	Production
2/16/24	LSNFH	Winter	05-67-25	37,068	37,068	100%	Sacramento River at John F. Reginato River Access	CWT and Ad-clip	USFWS	Production
2/20/24	NIM	Fall	N/A	0	1,192,290	0%	Lower American River at Nimbus Fish Hatchery	100% PBT	CDFW	Experimental
3/4/24	CNFH	Winter	05-66-33	47,937	47,937	100%	North Fork Battle Creek, Manton, CA	CWT, Ad-clip, and left pelvic fin clip	USFWS	Jumpstart

Release Date	Hatchery	Race	CWT	Marked Release Number	Total Release	Percent Marked	Release Location	Mark	Agency	Release Type
3/11/24	CNFH	Winter	05-00-48	84,994	84,994	100%	North Fork Battle Creek, Manton, CA	CWT, Ad-clip, and left pelvic clip	USFWS	Jumpstart
3/13/24	SCARF	Spring	06-30-60	142,864	142,864	100%	San Joaquin River at Highway 140	CWT and Ad-clip	CDFW	SJRRP
3/15/24	FRH	Spring	06-00-78	349,309	349,309	100%	Feather River at Boyd's Pump Boat Ramp	CWT and Ad-clip	CDFW	Production
3/15/24	FRH	Spring	06-00-80	350,545	350,545	100%	Feather River at Gridley Boat Launch	CWT and Ad-clip	CDFW	Production
3/21/2024	CNFH	Fall	05-00-70	94,010	376,040	25%	Battle Creek at CNFH	CWT and Ad-clip	USFWS	Production
3/21/2024	CNFH	Fall	05-00-71	75,992	303,969	25%	Battle Creek at CNFH	CWT and Ad-clip	USFWS	Production
3/21/2024	CNFH	Fall	05-00-72	72,050	288,200	25%	Battle Creek at CNFH	CWT and Ad-clip	USFWS	Production
3/21/2024	CNFH	Fall	05-00-74	97,791	391,164	25%	Battle Creek at CNFH	CWT and Ad-clip	USFWS	Production
3/21/2024	CNFH	Fall	05-00-75	93,138	372,551	25%	Battle Creek at CNFH	CWT and Ad-clip	USFWS	Production
3/21/2024	CNFH	Fall	05-00-76	78,842	315,368	25%	Battle Creek at CNFH	CWT and Ad-clip	USFWS	Production
3/21/2024	CNFH	Fall	05-00-77	106,585	426,338	25%	Battle Creek at CNFH	CWT and Ad-clip	USFWS	Production
3/21/2024	CNFH	Fall	05-00-78	93,769	375,076	25%	Battle Creek at CNFH	CWT and Ad-clip	USFWS	Production
3/23/2024	CNFH	Fall	05-00-73	107,046	428,184	25%	Sacramento River at Butte City Boat Ramp	CWT and Ad-clip	USFWS	Production
3/27/2024	CNFH	Fall	05-00-79	104,552	418,088	25%	Battle Creek at CNFH	CWT and Ad-clip	USFWS	Production
3/27/2024	CNFH	Fall	05-00-80	89,461	357,844	25%	Battle Creek at CNFH	CWT and Ad-clip	USFWS	Production
3/27/2024	CNFH	Fall	05-00-81	99,163	396,652	25%	Battle Creek at CNFH	CWT and Ad-clip	USFWS	Production
3/27/2024	CNFH	Fall	05-00-82	99,225	396,901	25%	Battle Creek at CNFH	CWT and Ad-clip	USFWS	Production
3/27/2024	CNFH	Fall	05-00-83	104,617	418,568	25%	Battle Creek at CNFH	CWT and Ad-clip	USFWS	Production
3/29/2024	FRH	Spring	05-00-81	350,055	350,055	100%	Feather River at Boyd's Pump Boat Ramp	CWT and Ad-clip	USFWS	Production
3/29/2024	FRH	Spring	05-00-79	350,571	350,571	100%	Feather River at Gridley Boat Launch	CWT and Ad-clip	USFWS	Production
4/11/2024	MOK	Fall	06-18-60	130,000	520,000	25%	San Joaquin River at Sherman Island Net Pen	CWT and Ad-clip	CDFW	Production
4/12/2024	MOK	Fall	06-20-00	130,000	520,000	25%	San Joaquin River at Sherman Island Net Pen	CWT and Ad-clip	CDFW	Production
4/12/2024	CNFH	Fall	05-00-83	103,854	415,416	25%	Battle Creek at CNFH	CWT and Ad-clip	USFWS	Production
4/12/2024	CNFH	Fall	05-00-84	90,927	363,709	25%	Battle Creek at CNFH	CWT and Ad-clip	USFWS	Production

Release Date	Hatchery	Race	CWT	Marked Release Number	Total Release	Percent Marked	Release Location	Mark	Agency	Release Type
4/12/2024	CNFH	Fall	05-00-85	100,113	400,450	25%	Battle Creek at CNFH	CWT and Ad-clip	USFWS	Production
4/12/2024	CNFH	Fall	05-00-86	91,994	367,975	25%	Battle Creek at CNFH	CWT and Ad-clip	USFWS	Production
4/12/2024	CNFH	Fall	05-00-87	95,864	383,455	25%	Battle Creek at CNFH	CWT and Ad-clip	USFWS	Production
4/12/2024	CNFH	Fall	05-00-88	101,941	407,765	25%	Battle Creek at CNFH	CWT and Ad-clip	USFWS	Production
4/12/2024	CNFH	Fall	05-00-89	105,748	422,990	25%	Battle Creek at CNFH	CWT and Ad-clip	USFWS	Production
4/19/2024	NIM	Fall	06-15-00	210,351	841,000	25%	Lower American River at Sunrise Boat Ramp	CWT and Ad-clip	CDFW	Production
4/20/2024	MER	Fall	06-15-54	100,365	377,000	25%	San Joaquin River at Sherman Island Net Pen	CWT and Ad-clip	CDFW	Production
4/23/2024	FRH	Spring	06-06-79	98,880	98,880	100%	Feather River at Gridley Boat Launch	CWT and Ad-clip	CDFW	Production
4/23/2024	FRH	Spring	06-30-55	88,788	88,788	100%	Feather River at Gridley Boat Launch	CWT and Ad-clip	CDFW	Production
4/23/2024	FRH	Spring	06-30-53	22,329	22,329	100%	Feather River at Gridley Boat Launch	CWT and Ad-clip	CDFW	Production
4/23/2024	FRH	Spring	06-00-82	350,307	350,307	100%	Feather River at Boyd's Pump Boat Ramp	CWT and Ad-clip	CDFW	Production
4/23/2024	FRH	Fall	06-00-84	128,359	513,844	25%	Feather River at Gridley Boat Launch	CWT, Ad-Clip, and PBT	CDFW	Experimental
4/23/2024	FRH	Fall	06-30-46	10,707	42,828	25%	Feather River at Gridley Boat Launch	CWT, Ad-Clip, and PBT	CDFW	Experimental
4/24/2024	FRH	Fall	06-00-99	252,517	1,010,515	25%	Feather River at Boyd's Pump Boat Ramp	CWT and Ad-clip	CDFW	Production
4/25/2024	MOK	Fall	06-21-60	130,000	520,000	25%	San Joaquin River at Sherman Island Net Pen	CWT and Ad-clip	CDFW	Production
4/25/2024	FRH	Fall	06-00-85	132,670	530,680	25%	Feather River at Gridley Boat Launch	CWT and Ad-clip	CDFW	Production
4/25/2024	FRH	Fall	06-30-41	7,005	28,020	25%	Feather River at Gridley Boat Launch	CWT and Ad-clip	CDFW	Production
4/25/2024	FRH	Fall	06-20-83	1,911	7,644	25%	Feather River at Gridley Boat Launch	CWT and Ad-clip	CDFW	Production
4/26/2024	MOK	Fall	05-00-37	42,654	170,615	25%	San Francisco Bay at Marin Rod	CWT and Ad-clip	USFWS	Production
4/26/2024	MOK	Fall	05-66-74	9,544	38,174	25%	San Francisco Bay at Marin Rod	CWT and Ad-clip	USFWS	Production

Release Date	Hatchery	Race	CWT	Marked Release Number	Total Release	Percent Marked	Release Location	Mark	Agency	Release Type
4/27/2024	MOK	Fall	06-21-70	130,000	520,000	25%	San Joaquin River at Sherman Island Net Pen	CWT and Ad-clip	CDFW	Production
4/28/2024	MOK	Fall	06-21-80	130,000	520,000	25%	San Joaquin River at Sherman Island Net Pen	CWT and Ad-clip	CDFW	Production
4/29/2024	FRH	Fall	06-00-86	136,043	544,172	25%	Feather River at Gridley Boat Launch	CWT, Ad-Clip, and PBT	CDFW	Production
4/29/2024	FRH	Fall	06-15-66	11,375	45,500	25%	Feather River at Gridley Boat Launch	CWT, Ad-Clip, and PBT	CDFW	Production
5/1/2024	CNFH	Fall	05-00-90	106,531	426,124	25%	Sacramento River at Butte City Boat Ramp	CWT and Ad-clip	USFWS	Production
5/1/2024	MOK	Fall	06-16-70	125,000	500,000	25%	San Francisco Bay at Fort Baker	CWT and Ad-clip	CDFW	Production
5/1/2024	MOK	Fall	06-16-80	125,000	500,000	25%	San Francisco Bay at Fort Baker	CWT and Ad-clip	CDFW	Production
5/3/2024	NIM	Fall	06-12-00	157,434	636,000	25%	Mare Island at San Pablo Bay	CWT and Ad-clip	CDFW	Production
5/3/2024	NIM	Fall	06-30-48	15,025	56,000	25%	Mare Island at San Pablo Bay	CWT and Ad-clip	CDFW	Production
5/4/2024	MER	Fall	06-30-33	104,888	493,863	25%	San Joaquin River at Sherman Island Net Pen	CWT and Ad-clip	CDFW	Production
5/5/2024	MER	Fall	06-28-98	47,172	356,043	25%	San Joaquin River at Sherman Island Net Pen	CWT and Ad-clip	CDFW	Production
5/7/24 - 5/8/24	FRH	Fall	06-00-01	254,094	1,013,787	25%	Mare Island at San Pablo Bay	CWT and Ad-clip	CDFW	Production
5/7/24 - 5/10/24	CNFH	Fall	05-00-91	105,580	422,318	25%	San Francisco Bay at Richmond Launch Ramp	CWT and Ad-clip	USFWS	Production
5/7/24 - 5/10/24	CNFH	Fall	05-00-92	93,191	372,762	25%	San Francisco Bay at Richmond Launch Ramp	CWT and Ad-clip	USFWS	Production
5/7/24 - 5/10/24	CNFH	Fall	05-00-93	102,622	410,487	25%	San Francisco Bay at Richmond Launch Ramp	CWT and Ad-clip	USFWS	Production
5/7/24 - 5/10/24	CNFH	Fall	05-00-94	99,351	397,402	25%	San Francisco Bay at Richmond Launch Ramp	CWT and Ad-clip	USFWS	Production
5/7/24 - 5/10/24	CNFH	Fall	05-00-95	100,113	400,452	25%	San Francisco Bay at Richmond Launch Ramp	CWT and Ad-clip	USFWS	Production

Release Date	Hatchery	Race	CWT	Marked Release Number	Total Release	Percent Marked	Release Location	Mark	Agency	Release Type
5/7/24 - 5/10/24	CNFH	Fall	05-00-96	98,955	395,819	25%	San Francisco Bay at Richmond Launch Ramp	CWT and Ad-clip	USFWS	Production
5/7/24 - 5/10/24	CNFH	Fall	05-03-00	70,417	281,669	25%	San Francisco Bay at Richmond Launch Ramp	CWT and Ad-clip	USFWS	Production
5/7/24 - 5/10/24	CNFH	Fall	05-04-00	67,885	271,539	25%	San Francisco Bay at Richmond Launch Ramp	CWT and Ad-clip	USFWS	Production
5/7/24 - 5/10/24	CNFH	Fall	05-05-00	41,492	165,969	25%	San Francisco Bay at Richmond Launch Ramp	CWT and Ad-clip	USFWS	Production
5/7/24 - 5/10/24	CNFH	Fall	05-65-90	37,904	151,616	25%	San Francisco Bay at Richmond Launch Ramp	CWT and Ad-clip	USFWS	Production
5/9/2024	MOK	Fall	06-21-90	137,500	550,000	25%	San Joaquin River at Sherman Island Net Pen	CWT and Ad-clip	CDFW	Production
5/9/2024	MOK	Fall	06-18-50	200,000	200,000	100%	Mokelumne River at Feist Ranch	CWT and Ad-clip	CDFW	Production
5/10/2024	CNFH	Fall	05-00-97	114,963	459,851	25%	San Francisco Bay at Richmond Launch Ramp	CWT and Ad-clip	USFWS	Production
5/11/2024	MOK	Fall	06-21-94	137,500	550,000	25%	San Joaquin River at Sherman Island Net Pen	CWT and Ad-clip	CDFW	Production
5/12/2024	MOK	Fall	06-16-30	109,250	437,000	25%	San Joaquin River at Sherman Island Net Pen	CWT and Ad-clip	CDFW	Production
5/12/2024	MOK	Fall	06-04-50	16,500	66,000	25%	San Joaquin River at Sherman Island Net Pen	CWT and Ad-clip	CDFW	Production
5/14/2024	NIM	Fall	06-16-00	210,222	840,000	25%	San Francisco Bay Estuary and Ocean Science Center at Tiburon	CWT and Ad-clip	CDFW	Production
5/15/2024	FRH	Fall	06-02-00	252,779	1,011,116	25%	San Francisco Bay Estuary and Ocean Science Center at Tiburon	CWT and Ad-clip	CDFW	Production
5/17/2024	NIM	Fall	06-12-20	158,603	635,000	25%	Mare Island at San Pablo Bay	CWT and Ad-clip	CDFW	Production
5/17/2024	NIM	Fall	06-30-47	8,921	35,500	25%	Mare Island at San Pablo Bay	CWT and Ad-clip	CDFW	Production
5/19/2024	MOK	Fall	06-18-40	62,500	250,000	25%	Pillar Point Harbor	CWT and Ad-clip	CDFW	Production
5/20/24 - 5/21/24	FRH	Fall	06-03-00	256,538	1,041,151	25%	Mare Island at San Pablo Bay	CWT and Ad-clip	CDFW	Production

Release Date	Hatchery	Race	CWT	Marked Release Number	Total Release	Percent Marked	Release Location	Mark	Agency	Release Type
5/24/2024	MOK	Fall	06-16-40	109,250	437,000	25%	San Joaquin River at Sherman Island	CWT and Ad-clip	CDFW	Production
5/24/2024	MOK	Fall	06-15-24	16,500	66,000	25%	San Joaquin River at Sherman Island	CWT and Ad-clip	CDFW	Production
5/25/2024	MOK	Fall	06-18-40	62,500	250,000	25%	Pillar Point Harbor	CWT and Ad-clip	CDFW	Production
5/28/2024	NIM	Fall	06-16-20	195,000	780,000	25%	Conoco San Pablo Bay	CWT and Ad-clip	CDFW	Production
5/29/2024	MOK	Fall	06-18-00	125,000	500,000	25%	San Francisco Bay at Fort Baker	CWT and Ad-clip	CDFW	Production
5/29/2024	MOK	Fall	06-16-90	125,000	500,000	25%	San Francisco Bay at Fort Baker	CWT and Ad-clip	CDFW	Production
5/31/2024	NIM	Fall	06-12-30	161,545	646,000	25%	Mare Island at San Pablo Bay	CWT and Ad-clip	CDFW	Production
5/31/2024	NIM	Fall	06-30-40	5,175	20,000	25%	Mare Island at San Pablo Bay	CWT and Ad-clip	CDFW	Production
6/1/2024	MOK	Fall	06-18-40	62,500	250,000	25%	Pillar Point Harbor	CWT and Ad-clip	CDFW	Production
6/2/2024	MOK	Fall	06-18-30	160,000	160,000	100%	Monterey Bay at Monterey Wharf	CWT and Ad-clip	CDFW	Production
6/3/2024	MOK	Fall	06-18-20	160,000	160,000	100%	Monterey Bay at Santa Cruz Wharf	CWT and Ad-clip	CDFW	Production
6/3/2024	FRH	Fall	06-00-88	86,561	259,965	25%	Mare Island at San Pablo Bay	CWT and Ad-clip	CDFW	Production
6/3/2024	FRH	Fall	06-00-89	86,136	258,927	25%	Mare Island at San Pablo Bay	CWT and Ad-clip	CDFW	Production
6/4/2024	FRH	Fall	06-00-91	97,131	310,093	25%	Mare Island at San Pablo Bay	CWT and Ad-clip	CDFW	Production
6/4/2024	FRH	Fall	06-00-87	83,219	333,398	25%	Mare Island at San Pablo Bay	CWT and Ad-clip	CDFW	Production
6/7/2024	FRH	Fall	06-00-90	84,082	336,661	25%	Mare Island at San Pablo Bay	CWT and Ad-clip	CDFW	Production
6/7/2024	FRH	Fall	06-00-92	53,863	328,853	25%	Mare Island at San Pablo Bay	CWT and Ad-clip	CDFW	Production
6/10/2024	FRH	Fall	06-00-93	86,842	348,424	25%	San Pablo Bay at CSU Maritime Academy	CWT and Ad-clip	CDFW	Production
6/10/2024	FRH	Fall	06-00-94	87,081	347,483	25%	San Pablo Bay at CSU Maritime Academy	CWT and Ad-clip	CDFW	Production

Release Date	Hatchery	Race	CWT	Marked Release Number	Total Release	Percent Marked	Release Location	Mark	Agency	Release Type
6/10/2024	FRH	Fall	06-28-44	1,600	8,000	25%	San Pablo Bay at CSU Maritime Academy	CWT and Ad-clip	CDFW	Production
6/10/2024	FRH	Fall	06-00-98	83,973	336,411	25%	San Pablo Bay at CSU Maritime Academy	CWT and Ad-clip	CDFW	Production
6/12/2024	MOK	Fall	06-07-95	13,625	54,500	25%	San Francisco Bay at Richmond Launch Ramp	CWT and Ad-clip	CDFW	Production
6/12/2024	MOK	Fall	06-16-50	111,375	445,500	25%	San Francisco Bay at Richmond Launch Ramp	CWT and Ad-clip	CDFW	Production
6/13/2024	MOK	Fall	06-18-50	760	3,040	25%	San Francisco Bay at Point San Quentin	CWT and Ad-clip	CDFW	Production
6/13/2024	MOK	Fall	06-16-60	112,575	450,300	25%	San Francisco Bay at Point San Quentin	CWT and Ad-clip	CDFW	Production
6/13/2024	MOK	Fall	06-23-70	13,550	54,200	25%	San Francisco Bay at Point San Quentin	CWT and Ad-clip	CDFW	Production
6/17/2024	FRH	Fall	06-00-98	82,987	332,773	25%	San Francisco Bay Estuary and Ocean Science Center at Tiburon	CWT and Ad-clip	CDFW	Production
6/17/2024	FRH	Fall	06-00-96	84,277	337,684	25%	San Francisco Bay Estuary and Ocean Science Center at Tiburon	CWT and Ad-clip	CDFW	Production
6/17/2024	FRH	Fall	06-00-97	83,855	335,855	25%	San Francisco Bay Estuary and Ocean Science Center at Tiburon	CWT and Ad-clip	CDFW	Production
6/18/2024	FRH	Fall	06-30-51	28,014	112,134	25%	San Francisco Bay Estuary and Ocean Science Center at Tiburon	CWT and Ad-clip	CDFW	Production
6/18/2024	FRH	Fall	06-30-56	87,141	349,179	25%	San Francisco Bay Estuary and Ocean Science Center at Tiburon	CWT and Ad-clip	CDFW	Production
6/18/2024	FRH	Fall	06-28-82	109,057	435,949	25%	San Francisco Bay Estuary and Ocean Science Center at Tiburon	CWT and Ad-clip	CDFW	Production



**Table 12.** 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
3/5/24- 3/6/24	MOK	N/A	75,000	75,000	100%	Mokelumne River at New Hope Landing	Ad-clip	CDFW	Production
4/9/24- 4/10/24	MOK	N/A	75,000	75,000	100%	Mokelumne River at New Hope Landing	Ad-clip	CDFW	Production

