



— BUREAU OF —
RECLAMATION

Salmon Monitoring Team (SaMT) Weekly Meeting

Teams call: 3/14/23 at 9:00 a.m.

Objective: Provide information to the Water Operations Management Team (WOMT), the U.S. Bureau of Reclamation (Reclamation) and California Department of Water Resources (DWR) on measures to reduce adverse effects from Delta operations of the Central Valley Project (CVP) and the State Water Project (SWP) on salmonids and green sturgeon. Final versions of the Proposed Action Assessment, and Fish and Water Operations Outlook will be posted to [Reclamation's Delta Monitoring Work Group](#) webpage, while final version of the Meeting Notes will be posted to Reclamation's [Salmon Monitoring Team](#) webpage. Meeting participants include representatives from: California Department of Fish and Wildlife (CDFW), DWR, National Marine Fisheries Service (NMFS), State Water Resources Control Board (SWRCB), Reclamation, and the U.S. Fish and Wildlife Service (USFWS).

Agenda Items:

1. Introductions
2. Updates on Water Operations and Biological Conditions
3. Open Discussion on Species Status
4. Live-edit Assessments (Proposed Action Assessment and ITP Risk Assessment)
5. Additional Considerations/Other Topics
6. Next Meeting

Agenda Item 2. Updates on Water Operations and Biological Conditions

The Central Valley and Sierra Nevada regions are experiencing an active, atmospheric river event through 3/15/23 bringing warmer and wetter conditions. Following dry conditions on 3/16/23, rain showers are expected to resume on 3/17/23 and continue through early next week, however, there is some disagreement among the weather model predictions for the weekend and early next week. Precipitation is expected to favor the Sierra Nevada mountains; the Sacramento Valley may receive 1-2 inches of rain, with precipitation tapering off towards the south.

Clear Creek releases from Whiskeytown Dam are currently at 200 cfs.

Sacramento River releases from Keswick Dam will increase from 3,250 cfs to 4,750 cfs on 3/14/23 for side flow management.

Sacramento River flows at Freeport are approximately 81,000 cfs.

San Joaquin River flows at Vernalis are approximately 21,000 cfs and may increase to around 30,000 cfs due to expected precipitation.

Clifton Court Forebay (CCF) exports are currently at 9,500 cfs, but exports are expected to decrease to a maximum of 6,680 cfs on 3/16/23 per the United States Army Corps of Engineers permits.

Feather River releases from Oroville Dam are currently at 15,000 cfs with potential to increase to 20,000 cfs this week depending on conditions.

American River releases from Nimbus Dam are currently at 30,000 cfs for flood management purposes at Folsom Dam.

Stanislaus River releases from Goodwin Dam are currently at 1,500 cfs for side flow management.

The Delta outflow index is approximately 100,000 cfs with potential to increase through the week.

Jones Pumping Plant exports are currently at 4,200 cfs.

QWEST flow values are approximately +32,000 cfs with the potential to reach up to +55,000 cfs through the week.

Rio Vista flows are approximately 70,000 cfs and may increase as high as 130,000-140,000 cfs this week.

Beginning 3/14/23, the tidal cycle will begin entering a neap tidal cycle before shifting to a spring tide on 3/21/23. Tidal conditions are expected to have minimal impact this week due to current high flows.

For details on salvage that occurred in the past week please refer to the Operations Outlook, PA Assessment, and ITP Risk Assessment documents. Additionally, all salvage information can be found online at <https://filelib.wildlife.ca.gov/Public/salvage/>.

Actions Currently in Effect:

- Delta Cross Channel (DCC) Gate operations (PA 4.10.5.3): Gates closed for the season on 11/28/22 to meet LTO Proposed Action. The gates will remain closed until May unless an opening is needed to meet D-1641 water quality requirements.
- OMR Management Season (PA 4.10.5.10.1, COA 8.3.2): Onset of OMR Management season began on 1/1/23 due to the exceedance of the 5% threshold for the winter-run Chinook salmon population presence within the Delta. Old and Middle River (OMR) flows cannot be more negative than -5,000 cfs on a 14-day average. Additional restrictions and changes to operations may be required per the PA and the CDFW Incidental Take Permit (ITP- COA 8.3.2).
- ITP Winter-run Single-year Loss Threshold (COA 8.6.1): DWR will operate Banks Pumping Plant consistent with Condition of Approval 8.6.1 of the ITP. These values are based on the juvenile production estimate (JPE) of 49,924 fish.

- The ITP natural-origin Winter-run Single-year Loss Threshold for this year is loss of unclipped length-at-date winter-run Chinook salmon from the CVP and SWP greater than or equal to 1.17% of the winter-run Chinook salmon JPE (loss \geq 584.11). If 50% of the threshold is exceeded (loss \geq 292.06), the required response is to reduce SWP exports by its proportional share, according to the coordinated operations agreement (COA), that would be required to reach a 14-day average OMR of -3,500 cfs. If 75% of this threshold is exceeded (loss \geq 438.08), the required response is to reduce SWP exports by its proportional share, according to the COA, that would be required to reach a 14-day average OMR of -2,000 cfs.
- The ITP hatchery-origin Chinook salmon Single-year Loss Threshold for this year is loss of clipped length-at-date winter-run Chinook salmon from the CVP and SWP greater than or equal to 0.12% of the winter-run Chinook salmon hatchery-origin JPE (loss \geq 229.15). If 50% of the threshold is exceeded (loss \geq 114.58), the required response is to reduce SWP exports by its proportional share, according to the coordinated operations agreement (COA), that would be required to reach a 14-day average OMR of -3,500 cfs. If 75% of this threshold is exceeded (loss \geq 171.86), the required response is to reduce SWP exports by its proportional share, according to the COA, that would be required to reach a 14-day average OMR of -2,000 cfs.
- ITP Mid- and Late-season Natural Winter-run Chinook Salmon Daily Loss Threshold (COA 8.6.3): DWR will operate Banks Pumping Plant consistent with Condition of Approval 8.6.3 of the ITP. The ITP Daily Loss Threshold for March is loss of older juvenile Chinook salmon from CVP and SWP greater than 0.0146% of the winter-run Chinook salmon JPE (loss $>$ 7.29). If the loss threshold is exceeded, the required response is to reduce SWP exports by its proportional share, according to the COA, that would be required to reach an OMR of no more negative than -3,500 cfs for five consecutive days.
 - Amendment to COA 8.6.3 in effect as of 1/20/2023: In water year 2023, 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.

Weekly Fish and Water Operations Outlook, Current Operations

SaMT reviewed and updated the Outlook document. The updated Outlook document will be distributed to the SaMT via email by close of business (COB) 3/15/23.

SaMT discussed Fish Monitoring Gear Efficiency/Disruptions as addressed within the Operations Outlook and updated accordingly.

SaMT Estimates of Fish Distribution

SaMT estimates of the current distribution of listed Chinook salmon and CCV steelhead, as a percentage of each population, are based on recent monitoring data and historical migration timing patterns. Estimates this week are based on YOY winter-run and YOY spring-run as well as natural origin steelhead at the real-time monitoring locations. These estimates are reported in the final Assessment document, available on the [Delta Monitoring Workgroup](#) webpage.

Location	Yet to Enter Delta	In the Delta	Exited the Delta
Young-of-year (YOY) winter-run Chinook salmon	Current: 1-5% Last week: 5-10%	Current: 70-89% Last week: 70-90%	Current: 10-25% Last week: 5-20%
YOY spring-run Chinook salmon	Current: 29-45% Last week: 34-50%	Current: 50-70% Last week: 45-65%	Current: 1-5% Last week: 1-5%
YOY hatchery winter-run Chinook salmon	Current: 75-89% Last week: 85-95%	Current: 10-20% Last week: 5-15%	Current: 1-5% Last week: 0%
Natural origin steelhead	Current: 25-65% Last week: 30-70%	Current: 20-50% Last week: 20-50%	Current: 15-25% Last week: 10-20%

Agenda Item 3. Open Discussion on Species Status

Salvage Update:

A wild, older juvenile Chinook salmon was observed on 3/8/23. This was a winter-run-sized fish that was genetically confirmed to be a fall-run.

There have been continuous observations of unclipped Steelhead at both the federal and state facilities, potentially due to high exports.

The federal facility has continually observed smaller, fall-run-sized fish, as well as hatchery spring-run from the San Joaquin River Restoration Program release.

CDFW addressed the slight discrepancy in the salvage and loss calculations. Seasonal loss figures are calculated directly from the CDFW database. When calculated from Geir Aasen’s (CDFW) salmon spreadsheet, the seasonal total is about 0.3 fish higher.

Additional salvage and loss figures can be found in the weekly salmonid salvage report distributed by CDFW.

Operations:

A power outage occurred at the CVP facility on 3/9/23 at 5:40 PM lasting until 2:00 AM on 3/10/23 and resulted in multiple missed fish counts. The facility’s SOP is to continue exports even during outages. Reclamation recommends directing additional questions to the Tracy Fish Facility. Kristin Begun, NMFS, will inquire internally about the possibility of contacting the facility and share any information with SaMT at the 3/21/23 meeting.

Agenda Item 4. Live edit Assessments

Proposed Action Assessment

SaMT reviewed and updated the current week's Proposed Action Assessment document. The updated Proposed Action Assessment will be distributed to the SaMT via email by COB 3/15/23. The final assessment will be posted to [Reclamation's Delta Monitoring Workgroup](#) webpage.

ITP Risk Assessment

SaMT discussed the ITP Risk Assessment document. The updated draft ITP Risk Assessment will be distributed via email by COB 3/14/23 for review by SaMT members with comments due COB Friday 3/17/23. The ITP Risk Assessment will be finalized by COB Monday 3/20/23 and can be found at [CDFW's Water Project Operations](#) webpage.

Agenda Item 5. Additional Considerations/Other Topics

Machine Learning Model Update

Jereme Gaeta, CDFW, IEP, and Trinh Nguyen, CDFW, provided a follow-up to their October 2022 presentation on the machine learning model intended to predict winter-run length-at-date presence in salvage.

Brian Mahardja, Reclamation, shared an update that model outputs will likely be produced on a daily basis to eventually be hosted on SacPass.

The objective of the follow-up presentation is to help determine if the model's real-time prediction tool meets the data needs of SaMT members. The motivation for the machine learning model sprang from the 2020 ITP that stated a tool focused on predicting salmon entrainment events at salvage facilities shall be provided to SaMT and SMT members for real-time assessment.

The modeling team has leveraged a machine-learning framework intended to balance the need to provide water to the state while minimizing entrainment risk to endangered salmon. Their overall research question asked: Is it possible to construct a model to predict salvage a week before salmon are detected at the water projects?

The team used an algorithm called: extreme gradient boosting dropout additive regression tree. The process is decision tree-based, non-parametric, and can handle non-linear data and complex interactions; it can also be thought of as a 'turbocharged regression'. It can predict Absence, Low Presence (>0 & <4.29) or High Presence (>4.29).

The team's method was to provide the model with 80 percent of the data and hold back the remaining 20 percent. For that 20 percent, accuracy ratings were:

- 92 percent accuracy for Absence;
- 82 percent accuracy for Low Presence;
- 90 percent accuracy for High Presence.

Presenters used Water Year (WY) 2020 as an example for demonstrating model predictions versus observed data from WY 2020. Presenters shared that probability outputs were also tested for accuracy. A logistic regression revealed that the uncertainty range is approximately 0.6 – 0.65 and is then applied to subsequent calculations.

Discussion Questions

- How do you incorporate the range of exports (e.g., -2,100 - +1,000) each week?
 - In real-time predictions, we take the most recent data from [the current day]. All data are based on real observations. Data is entered and the model is run through each level of exports based on a historical export range; the multiple outputs are then plotted on a chart. Predictions can then be viewed even as export levels are changing.

SaMT members are invited to reach out to Jereme Gaeta (Jereme.Gaeta@Wildlife.ca.gov) and Trinh Nguyen (Trinh.Nguyen@Wildlife.ca.gov) directly with feedback and questions.

Agenda Item 6. Next Meeting

The next SaMT Meeting is scheduled for Tuesday, 3/21/23, immediately following the Joint Operations & Outlook 9 a.m. meeting.

Action Item: Kearns & West to distribute the presentation slides from today's meeting.

Action Item: Kristin Begun, NMFS, to inquire within NMFS about the possibility of contacting the Tracy Fish Facility regarding missed fish counts during a power outage from 3/9/23 – 3/10/23.