

PARTICIPANTS

- California Department of Fish and Wildlife (CDFW)
- California Department of Water Resources (DWR)
- National Marine Fisheries Service (NMFS)
- State Water Resources Control Board (SWRCB)
- U.S. Bureau of Reclamation (USBR)
- U.S. Fish and Wildlife Service (USFWS)
- Kearns & West (KW)

ACTION ITEMS

- USFWS to add CDFW staff to email list for Enhanced Delta Smelt Monitoring (EDSM) updates.
- DWR and USBR to request initiation of larval sampling from the state and federal facilities, respectively.

MEETING SUMMARY

USFWS noted that their survey data hosting webpage will be down for maintenance which could impact data retrieval for DWR and CDFW.

PART 1: Updates on Water Operations and Biological Updates

Relevant Actions & Triggers

USBR reported on Old and Middle River (OMR) management measures. Turbidity Bridge Avoidance is in effect to maintain average daily turbidity in Old River at Bacon Island (OBI) at a level of no more than 12 NTU to minimize risk to adult DS in the OMR corridor where they are subject to higher entrainment risk. CDFW reported on the Incidental Take Permit (ITP) Conditions of Approval (COA) that are in effect. COA 8.4.2 Larval and Juvenile Longfin Smelt (LFS) Entrainment Protection was triggered on January 20th for the South and Central Delta. 8.5.1 Turbidity Bridge Avoidance is in effect with 8.5.2 Larval and Juvenile DS Protection being active. CDFW also noted that COA 8.12 Barker Slough Pumping Plant Longfin and Delta Smelt Protection will not be active in January based on the Sacramento Valley Water Year Type Index (SVI) forecast for January, which is below normal.

Proposed Action

OMR Management Measures	Requirement	Time Frame	Trigger	Triggered?
Integrated Early Winter Pulse Protection (“First Flush” Turbidity Event)	Reduce exports for 14 consecutive days so that the 14-day averaged OMR index for the period shall not be more negative than -2,000 cfs	Dec 1 to Jan 31	(1) Running three-day average of daily flows at Freeport >25,000 cfs; and (2) Running three-day average of daily turbidity at Freeport ≥50 Nephelometric Turbidity Units (NTU ¹); or (3) Real-time monitoring indicates a high risk of migration and dispersal into areas at high risk of future entrainment or a spent delta smelt (DS) has been collected in monitoring surveys.	Triggered 12/18/21; last day of action was 1/2/22
OMR Management	Manage to a more positive OMR than -5,000 cfs	From the onset of OMR management to the end		In effect
Turbidity Bridge Avoidance (“South Delta Turbidity”)	If the daily average turbidity at Bacon Island cannot be maintained less than 12 NTU, manage exports to achieve an OMR no more negative than -2,000 cfs until the daily average turbidity at Bacon Island drops below 12 NTU.	After the first flush or Feb 1 (whichever comes first) and until a ripe or spent female is detected or April 1 (whichever is first)	Average daily turbidity in Old River at Bacon Island (OBI) at a level of more than 12 NTU.	In effect as of 1/3/22
Larval and Juvenile Delta Smelt	Run hydrodynamic models and forecasts of entrainment, informed by the EDSM or other relevant survey data to estimate the percentage of larval and juvenile delta smelt that could be entrained. If necessary, manage exports to limit entrainment to be protective based on the modeled recruitment levels.	On or after March 15 of each year until off-ramp criteria are met	If QWEST is negative AND larval or juvenile delta smelt are within the entrainment zone of the pumps based on real-time sampling of spawning adults or young of year life stages	Not active

¹ The current instrumentation measures turbidity in Formazin Nephelometric Units (FNU).

OMR Management Measures	Requirement	Time Frame	Trigger	Triggered?
End of OMR Management	OMR criteria may control operations until June 30 (for Delta Smelt and Chinook salmon), until June 15 (for steelhead/rainbow trout), or when the species-specific off ramps have occurred, whichever is earlier.	During OMR management to June 30, or when the DS temperature off ramp has been reached.	DS: when the daily mean water temperature at Clifton Court Forebay reaches 77°F for 3 consecutive days	Not active

IIP Conditions of Approval

Condition of Approval	Requirement	Time Frame	Trigger	Triggered?
8.1.5.2 (Smelt Monitoring Team Risk Assessment) Triggered	Outlines contents for weekly risk assessments of Delta Smelt and Longfin Smelt (LFS) required under 8.1.5 and 8.1.1	Nov 1 st through June 30 th or until off-ramped by 8.8		Yes
8.3.1 (Integrated Early Winter Pulse Protection)	Reduce south Delta exports for 14 consecutive days to maintain a 14-day average OMR index no more negative than -2,000 cfs, and convene the Smelt Monitoring Team within one day of triggering. After maintaining a 14-day average OMR index no more negative than -2,000 cfs for 14 days, Permittee shall maintain a 14-day average OMR index no more negative than -5,000 cfs, initiating the OMR Management season.	Dec 1 to Jan 31	Three-day running average daily flows at Freeport greater than, or equal to, 25,000 cfs, AND Three-day running average of daily turbidity at Freeport is greater than, or equal to, 50 FNU OR The Smelt Monitoring Team determines that real-time monitoring of abiotic and biotic factors indicates a high risk of DS migration and dispersal into areas at high risk of future entrainment.	Triggered 12/18/21; last day of action was 1/2/22

Condition of Approval	Requirement	Time Frame	Trigger	Triggered?
8.3.3 (Adult Longfin Smelt Entrainment Protection)	After December 1, if an Integrated Early Winter Pulse Protection (Condition of Approval 8.3.1) has not yet initiated, Permittee shall reduce south Delta exports to maintain a 14-day average OMR index no more negative than -5,000 cfs and initiate OMR Management if: Cumulative expanded salvage, Dec 1 st through Feb 28 th , exceeds most recent FMWT Index divided by 10, or Smelt Monitoring Team (SMT) determines that there is a high risk of entrainment.	Dec 1 through Feb 28th	Salvage threshold for WY 2022 is one.	Off-ramped due to trigger of 8.3.1
8.4.1 (OMR Management for Adult Longfin Smelt)	The SMT shall conduct weekly risk assessments and decide whether to recommend and OMR flow requirement to minimize entrainment of adult LFS. The SMT may provide advice to restrict south Delta exports for seven consecutive days to achieve a seven day-average OMR index within three risk categories: Low risk: OMR between -4,000 cfs to -5,000 cfs Medium risk: OMR between -2,500 cfs to -4,000 cfs High risk: OMR between -1,250 cfs to -2,500 cfs	Onset of OMR management through Feb 28 th	SMT recommendation based on weekly risk assessment	Off-ramped by larval detections in SLS 12
8.4.2 (Larval and Juvenile Longfin Smelt Entrainment Protection)	If triggered, it will restrict south Delta exports for seven consecutive days in order to maintain a seven-day average OMR index no more negative than -5,000 cfs and convene the SMT to recommend an OMR flow limit between -1,250 and -5,000 cfs.	January 1st through June 30th or until the temperature offramp occurs	(1) Longfin Smelt larvae or juveniles are found in four or more of the 12 SLS or 20 mm stations in the central or south Delta, Or (2) Longfin Smelt catch per tow exceeds five larvae or juveniles in two or more of the 12 stations in the central or south Delta. The relevant stations are: 809, 812, 815, 901, 902, 906, 910, 912, 914, 915, 918 and 919	Triggered 1/20/22

Condition of Approval	Requirement	Time Frame	Trigger	Triggered?
8.4.3 High flow offramp for Longfin Smelt	If triggered, Conditions of Approval 8.4.1 and 8.4.2 are not required or would cease if previously required.	Throughout OMR management	When river flows are (a) greater than 55,000 cfs in the Sacramento River at Rio Vista or (b) greater than 8,000 cfs in the San Joaquin River at Vernalis. If flows subsequently drop below 40,000 cfs in the Sacramento River at Rio Vista or below 5,000 cfs in the San Joaquin River at Vernalis, the OMR limit previously required as a part of Conditions of Approval 8.4.1 and 8.4.2 shall resume.	Active, Not Triggered
8.5.1 Turbidity Bridge Avoidance	maintain daily average turbidity in Old River at Bacon Island (OBI) at a level of less than 12 NTU. If the daily average turbidity at OBI is greater than 12 NTU, Permittee shall restrict south Delta exports to achieve an OMR flow that is no more negative than -2,000 cfs until the daily average turbidity at OBI is less than 12 NTU.	After the first flush or Feb 1 until end of OMR management or until CDFW is in agreement that the action may be ended or modified.	Turbidity at OBI > 12 FNU	In effect as of 1/3/22

Condition of Approval	Requirement	Time Frame	Trigger	Triggered?
8.5.2 (Larval and Juvenile Delta Smelt Protection)	If triggered, this Condition of Approval will restrict south Delta exports for seven consecutive days in order to maintain a seven-day average OMR index no more negative than -5,000 cfs and SMT members will meet to assess the risk of entrainment. The SMT may provide further advice to restrict exports in order to maintain an OMR index more positive than -5,000 cfs. In their assessment, SMT members will determine if risk of entrainment is low, medium, or high; subsequent OMR restrictions will be based on level of risk. Furthermore, if salvage of Delta Smelt exceeds 11 in three days, this Condition of Approval will restrict south Delta exports for seven consecutive days in order to maintain a seven-day average OMR index no more negative than -3,500 cfs.	Nov 1 st through June 30 th or until off-ramped by 8.8	When the five-day salvage of juvenile Delta Smelt is greater than or equal to one plus the average prior three years' FMWT index (rounded down). The 2021 FMWT index for Delta Smelt zero.	Active, not triggered
8.8 (End of OMR Management)	If triggered, OMR Management would be off-ramped for Longfin and Delta Smelt.	From the onset of OMR management through June 30 th	Daily mean water temperature at Clifton Court Forebay is >25° C for three consecutive days.	Not active
8.12 (Barker Slough Pumping Plant Longfin and Delta Smelt Protection)	Barker Slough Pumping Plant will reduce exports so the maximum 7-day average is <60 cfs.	From January 15 through March 31 in dry and critical water years for Longfin Smelt, and from March 1 st through June 30 th for Delta Smelt	Larval Smelt are detected at SLS Station 716 during the period identified for each species, and/or when recommended by the SMT	Not active

Current Operations & Outlook

USBR and DWR shared operations updates from the Outlook. Their observations included:

- USBR Central Valley Office (CVO) reported mild and dry weather conditions with possible precipitation next week.

- Releases from Whiskeytown Dam on Clear Creek are currently 200 cfs. No modifications expected.
- Releases on the Sacramento River from Keswick Dam are currently 3,250 cfs. No modifications expected.
- American River releases from Nimbus Dam are currently at 2,500 cfs in response to manage flood encroachment at Folsom with flows decreasing to 2,000 cfs on January 26th. Temporary flow variability is possible next week as there is an issue with a rotary screw trap.
- Releases from Goodwin Dam on the Stanislaus River are currently 200 cfs. Winter instability flows are possible at the end of January with increases in flows expected to meet D-1641 requirements.
- The OMR Index is holding at -5,000 cfs.
- Jones Pumping Plant exports are currently targeting 4,200 cfs, but actual flows are slightly below.
- Delta Cross-channel (DCC) gates are currently closed. No modifications expected.
- DWR reported that Feather River releases are currently at 950 cfs with possible increases towards the end of the week to support 11,400 cfs outflow in the Delta starting February 1st.
- As of January 24th, Freeport flows decreased to 12,600 cfs.
- Vernalis decreased to 900 cfs by January 24th.
- Clifton Court Forebay (CCF) flows as of January 25th are 1,600 cfs with values ranging from 1,400 to 1,800 cfs for the rest of the week.
- Delta outflows are 7,900 cfs and will decline as flows upstream decrease.
- QWEST yesterday was -2,300 cfs, and will likely trend negative through the week.
- Rio Vista flows are currently in the 12,000 cfs range with sustained decreases expected.
- OMR Index:
 - January 24th: -4,900 cfs
 - 7-day average: -4,900 cfs
 - 14-day average: -5,000 cfs
- X2 is 74 km.
- January 21st there was a spike in turbidity in Frank's Tract due to a wind event.
- No edits were made to the survey status table.
 - CDFW explained that even though the survey table says SWP Regular Counts, coded wire tagging (CWT) Reading, and Larval Sampling at the facilities is noted as active; the larval sampling is in fact not a continuous weekly event. However, the other two actions are active.
- USBR clarified that February 1st federal exports will be one to two units (800 to 1,800 cfs).
- DWR confirmed that the anticipated increase in QWEST next week is the product of decreasing exports to meet Chippis Island Days requirements in February.

Review of Environmental Conditions and Survey Updates

CDFW delivered catch updates on relevant surveys to the SMT.

- On January 18th the 12 south and central Delta stations were surveyed to make-up for Smelt Larva Survey (SLS) 1.
 - LFS results for the stations are below:
 - Station 809: 22 (6 to 8 mm)
 - Station 812: 25 (5 to 8 mm)
 - Station 815: Two (7 to 8 mm)
 - Station 901: One (4 mm)
 - Station 906: Two (7 mm)
 - Station 910: One (8 mm)

- SLS 2 started sampling January 24th but was pulled off the water due to mechanical issues with the boat. Sampling will resume the 26th and run to the 28th.
- Processing for SLS 2 has started and so far two LFS were detected at station 815 on January 24th with lengths of 6 and 8 mm. One fish had a yolk sac.
- One 8 mm LFS was detected at station 906 with no yolk sac on January 24th.
- One additional larvae was detected at station 812 with a yolk sac, length was not reported.
- The Larval Entrainment Pilot Study (LEPS) detected one 8 mm LFS (no yolk sac) on January 18 near Clifton Court Forebay. The LEPS team is still working on processing remaining data.
 - The 24-hour sampling session is planned for January 31st, but COVID and mechanical issues with the boat pose challenges and possible delays.
- Spring Kodiak Trawl (SKT) sampled from January 18th to the 21st. All stations except the 600's (Montezuma Slough and Suisun Bay) were sampled.
 - Results:
 - Station 719: Three Wakasagi (81 to 88 mm)
 - No LFS
 - No DS

USFWS provided catch updates on EDSM.

- Results for EDSM sampling between January 18th and 24th are below:
 - Suisun Marsh
 - LFS: 21 (60 to 85 mm)
 - DS: One (Ad Clipped 85 mm)
 - Lower Sacramento River
 - LFS: One (75 mm)
 - DS: One (Ad Clipped 65 mm)

CDFW provided a salvage update (January 18th to January 24th).

- No salvage of DS or LFS at either facility.

DWR provided updates on the DS experimental release program.

- The release scheduled for the week of January 24th was cancelled at the request of agency directors. Releases are rescheduled for February 2nd and 3rd near station 719 in the Sacramento Deep Water Shipping Channel (SDWSC) to move releases further from the entrainment zone and avoid future salvage of cultured fish. The hard release will consist of 16,000 fish. In the following weeks there will be consecutive releases until late February in Montezuma Slough and the SDWSC.

USBR shared environmental data updates as of January 24th.

- Three-station daily average water temperature: 10.24° C.
- Three-day running average turbidity at OBI: 7.43 FNU.
- Current turbidity at OBI: 7.6 FNU.
- X2 is 74 km.
- Weather forecast out of Antioch is mostly sunny to partly cloudy with north to northeast winds from 2 to 6 mph.
- Weather forecast out of Stockton is mostly sunny to partly cloudy with northwest winds reaching up to 5 mph.

PART 2: Open Discussion on Species Status (Structured-Unstructured Time)

USBR noted the wind event that elevated turbidity levels to 11.67 FNU at OBI on January 22nd and 23rd and suggested higher turbidity could have increased the likelihood of entrainment for DS.

- CDFW confirmed that data do not show high turbidity reaching into Old River at Highway 4, Middle River at the south end of Bacon Island, or Victoria Canal suggesting that it was a pulse. While a brief bridge did exist from the lower San Joaquin River through Franks Tract and into the OMR corridor it likely did not persist long enough to have drawn fish near the facilities.

The SMT discussed the [Damon et al., 2016](#) paper on DS fecundity to help anticipate spawning behavior.

- CDFW referred to figure 8 indicating the number of ripe and post-spawn DS caught at specific temperatures ranging from 8° C to 20° C at 1° intervals. Post-spawn fish are present at all sampled temperatures and ripe fish are seen from 8° C to 18° C. Hence, it seems possible that fish could be spawning given that current water temperatures are between 10° C to 11° C.
- CDFW suggested reviewing SLS data to see when DS larva were first detected and at what temperatures to inform SMT advice and discussions moving forward.
- CDFW noted that in the absence of a first flush the likelihood of DS spawning behavior increases as the season advances.
- The SMT agreed to note in this week's assessments that current temperatures are consistent with the onset of DS spawning.

DWR provided an update on the two unmarked DS caught in December indicating that there are no genetic results on the fish yet, but after careful inspection by staff at the Fish Conservation and Culture Laboratory it is believed they are improperly clipped hatchery released fish. Additionally, during late December brood stock collections another unmarked fish was collected which is now believed to be a Wakasagi or hybrid. These findings suggest that previously reported unmarked fish may not be wild fish.

Additionally, based on the detection of one marked DS at the Tracy Fish Facility on the week of January 17th, the SMT discussed whether the relationship between turbidity and distribution may be inconsistent between wild and cultured fish. This could also bring into question the temperature/spawning linkage with hatchery DS. There could be effects from the lack of temperature variability in a hatchery versus in the wild. However, temperature is more likely to have a biological effect whereas the affinity for turbidity may be a behavioral mechanism.

- USFWS noted that the spring tides may have a role in spawning for wild DS as reported for cultured DS by Bennett (2005).

The SMT reviewed the Particle Tracking Model (PTM) results:

- DWR shared the following highlights:
 - The base case assumes no recommendation.
 - The -4,000 cfs OMR scenario would be implemented on January 28th and would control operations for three days. On February 1st, operations transition to be controlled by the Chippis Days requirements.
 - The -2,500 cfs OMR scenario could be altered by early February precipitation, which would introduce additional flows to the system resulting in an OMR Index of -3,000 cfs with day-to-day variation. Therefore, this scenario would control operations into February.
 - The -4,000 cfs OMR scenario and the base case produce similar entrainment risk, but there are some differences in the -2,500 cfs scenario.

- CDFW noted that the particles that are modeled passing by Chipps Island are considered to have a low entrainment risk, but there are few particles that make it out to that part of the system under these scenarios.
 - From the lower San Joaquin River (injection point 812) although very few particles are entrained into the OMR corridor and the export facilities, very few make it past Chipps either and therefore are retained in lower quality habitat. For particles in Frank's Tract and south (injection points 901 and 902) many of the particles are entrained into the OMR corridor and the projects (~50-90%) by weeks two and three in all scenarios modeled. Therefore, CDFW suggested this could mean none of the modeled scenarios would be sufficiently protective.

The SMT considered which stations should be standardized for future PTM Runs.

- Comparing Stations 901 and 902 was valuable in assessing the hydrodynamic effects of Franks Tract. The SMT decided that 902 was more informative for determining if fish in the corridor are likely to end up at the facilities.
- DWR noted that lower San Joaquin River stations represent an area where the SMT has greater management influence through OMR recommendations.
- CDFW commented that lower San Joaquin River stations also represent where high densities of LFS are typically detected.
- Ultimately, the SMT selected stations 812, 815, and 902 as standard injection points for future PTM runs with the option to modify the selection in the future if the team feels it would be necessary.

The SMT decided to postpone a request for another PTM run until new information from SLS 2 is available for review. Furthermore, DWR stated its intent to automatically conduct a new PTM run if the weather patterns significantly depart from the assumptions first incorporated into the model.

Finally, the SMT discussed submitting a request for larval sampling at federal facilities. USFWS felt the sampling would provide a needed supplemental data source as LEPS has been interrupted. The SMT agreed that initiating the sampling is a good idea. Furthermore, CDFW pointed out that since the facilities require a two-week lead time to begin sampling the fish will be at a more appropriate size for detection by that time (>20 mm).

PART 3: Live-edit Assessments

Proposed Action Weekly Evaluation of Delta Smelt, including Distribution, Abiotic Conditions, Risk Assessment Questions, and Executive Summary

USBR reviewed proposed changes to the PA assessment.

- Subadult was added to the DS life stages.
- The abundance estimate was updated to specifically describe Suisun Marsh since not all strata had been sampled this week.
- Biological conditions was updated to include language that reflects earlier discussions on the [Damon et al., 2016](#) paper acknowledging that spawning could already be underway given current water temperatures.
- The abiotic conditions section was revised to describe turbidity declining after the wind event and to note temperatures are within the range of DS spawning.
- Evaluation question two was updated to reflect the wind-related turbidity event and the relative rise of entrainment likelihood in the OMR corridor while overall entrainment remains low due to water close to the facilities remaining clear through the wind event.
- Evaluation Question three was updated to reflect SKT as the relevant survey.

- Evaluation Questions four through six were revised to reflect the latest dates and data.
- The executive summary was updated to note the following:
 - The latest DS detection in the Lower Sacramento River.
 - The high winds elevated turbidity at OBI on 1/22 and 1/23, but measurements never reached 12 FNU and are currently decreasing.
 - The likelihood of DS adult entrainment is elevated due to the turbidity in the OMR corridor, but overall entrainment likelihood is low over the next seven days.
 - Water temperatures could be conducive to spawning.

ITP Longfin Smelt Risk Assessment

The SMT reviewed and discussed updates to the ITP Risk Assessment.

Section 1-A: Risk of entrainment into the central Delta and export facilities for DS and LFS in the Sacramento River and Confluence

- Exposure Risk (hydrology)
 - DS: Remains low. Language was added to note temperatures are within the range conducive to DS spawning as reported by [Damon et al., 2016](#). Language referencing DS having a lower likelihood of moving into areas with higher risk of entrainment was deleted.
 - LFS: Low. No changes since last week.
- Routing Risk (behavior and life history)
 - DS: Updated to low to medium risk to reflect the wind-driven turbidity event between the lower San Joaquin River and Franks Tract.
 - LFS: Risk remains low. Language was added to note X2 has remained stable over the last week and was insufficient to increase the likelihood for adult and subadult movement into the south and central Delta.
- Overall entrainment risk for DS or LFS.
 - DS: Low. No changes since last week.
 - LFS: Low. No changes since last week.

Section 1-B: Risk of entrainment into the export facilities for DS and LFS in the central Delta

- Exposure risk
 - DS: Low. No changes since last week.
 - LFS: Overall risk remains low. Language was added to reflect the results of the PTM run, including:
 - There is a high residence time in the lower San Joaquin River (Station 812) over the forecasted period.
 - Risk is high for larvae already present in the south and central Delta (Stations 901 and 902).
 - An OMR recommendation would not result in substantial change in particle fate.
- Change in exposure from last week
 - DS: No change from last week.
 - LFS: Language was added to note LFS larvae have been detected in the south and central Delta and that scenarios modeled in the PTM run suggest a recommendation would not benefit larval LFS in this region.
- Reporting OMR Index

- This section was updated to note the insertion points and hydrologic scenarios used in the PTM run.
- The executive summary was revised to reflect the following:
 - PTM results
 - Outcomes of the recent turbidity event
 - Clarifying that the overall risk for larvae is low based on PTM runs and observed distribution, however, risk of entrainment for larvae in the south Delta is high.
 - An OMR recommendation would not affect the fate of modeled LFS larvae.
 - Reference COA 8.4.2 triggering and the proceedings of the January 21st SMT meeting to address COA requirements.

Part 4: Additional Considerations/Discussion

Agencies reported no items for elevation to WOMT.