

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

- USBR to clarify how to address the spent female Delta Smelt (DS) off ramp for turbidity bridge avoidance.
- CDFW to confirm the current water year type (i.e., dry, critical, etc.) prior to next week’s meeting.

MEETING SUMMARY

PART 1: Updates on Water Operations and Biological Updates

Relevant Actions & Triggers

USBR reported on Old and Middle River (OMR) management measures. The Integrated Early Winter Pulse Protection action was off ramped on January 2nd and Turbidity Bridge Avoidance went into effect January 3rd 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 8.3.1 has been off ramped at the conclusion of the 14-day pumping action. Furthermore, 8.4.1 is inactive due to the detection of larval Longfin Smelt (LFS). COA 8.4.2 Larval and Juvenile Longfin Smelt (LFS) Entrainment Protection, 8.4.3 High Flow Offramp for LFS, and 8.5.2 Larval and Juvenile DS Protection are active, but not triggered. 8.5.1 Turbidity Bridge Avoidance went into effect on January 3rd.

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 (FNUs).

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

TTP 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 SMT determines that there is a high risk of entrainment.	Dec 1 through Feb 28 th	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

Condition of Approval	Requirement	Time Frame	Trigger	Triggered?
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 Smelt Larval Survey (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	Active, Not 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 slight chances of precipitation with precipitation becoming more likely at the end of the 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 holding at 5,000 cfs due to flood space encroachment at Folsom and sustained inflows.
- Releases from Goodwin Dam on the Stanislaus River are currently 200 cfs. Forecasted precipitation may trigger another round of side flow management at Tulloch.
- Jones Pumping Plant exports are currently at 3,500 cfs and will increase to 4,200 cfs by Thursday.
- Delta Cross-channel (DCC) gates are currently closed.
- DWR reported that Feather River releases are currently at 950 cfs.
- Clifton Court Forebay inflows remained low last week while targeting the -2,000 cfs OMR Index. The targeted OMR Index this week is -5,000 cfs with exports around 2,500 cfs on January 3rd declining to 1,800 cfs on the 4th. Exports will continue to fluctuate from 1,300 to 2,000 through the rest of the upcoming week.
- X2 is 67 km and slightly upstream of Port Chicago.
- QWEST was 1,000 cfs on January 3rd after a seven-day average of 7,400 cfs. As the most recent rain effect dissipates flows will decrease to -1,000 cfs.
- On January 3rd flows at Rio Vista were 22,000 cfs and will decrease through the week.
- 14-day OMR average as of January 2nd was -1,980 cfs, consistent with the first flush pumping action.
- Freeport turbidity is decreasing towards 15 to 19 FNU.
- Antioch turbidity is ranging from 17 to 22 FNU.
- Franks Tract remains steady around 15 to 19 FNU.
- Turbidity in the OMR corridor remains low, near 5 to 6 FNU.
- The following edits were made to the survey status table.
 - Mossdale is now active.
 - Delta Juvenile Fish Monitoring Program (DJFMP) San Joaquin Seines is active with two car accessible sites.
 - Fall Mid-water Trawl (FMWT) is complete and no longer sampling.

Review of Environmental Conditions and Survey Updates

CDFW delivered updates on relevant surveys to the SMT.

- SLS survey 12 (December 13th to December 17th) is complete with data fully processed.
 - DS: Zero
 - LFS: 21
 - Lower San Joaquin River: Four
 - Station 809: Three
 - Station 812: One
 - Station 716 (Barker Slough): One
 - Lower San Joaquin River Stations: Eight
 - West of Confluence: Four
- SLS Survey 13 (December 27th to December 30th) is complete with data pending quality control (QC).
 - Preliminary Data
 - DS: Zero
 - LFS: Four
 - Station 914: One
 - Station 809: Two

- Station 716 Barker Slough: One
 - Official update on final QC'd data to come next meeting.
- Larval Entrainment Pilot Study (LEPS) sampling begun January 3rd with sample processing starting the 4th.
- SLS Survey 1 will run the week of January 10th.

USFWS provided updates on the Enhanced Delta Smelt Monitoring (EDSM) program and Chipps Island Trawl.

- EDSM sampled 31 sites from December 27th to 29th.
 - Three cultured DS were caught in the lower Sacramento River.
 - 14 LFS were caught:
 - Three in Suisun Bay
 - 10 in Suisun Marsh
 - One in the Lower Sacramento River
 - EDSM sampling this week will occur January 3rd to 6th.
- DJFMP sampled from December 26th to January 1st at Chipps Island.
 - One DS was caught
 - 74 LFS were caught
 - Sampling this week will occur January 2nd to 7th.
- Two DS have been transferred to the UC Davis Fish Conservation and Culture Laboratory (FCCL) brood stock collection.
- USFWS clarified that the fish caught by Chipps Island on December 29th was part of the Suisun Bay stratum.

CDFW provided a salvage update (December 27th to January 3rd).

- No salvage of smelt at either facility.

USBR shared environmental data updates as of January 3rd.

- Three-station daily average water temperature: 8.13° C.
- Three-day running average turbidity at OBI: 4.59 FNU.
- Current turbidity at OBI: 5 FNU.
- X2 is 67 km.
- Weather forecast out of Antioch is rain this evening with increasing chance of precipitation on Friday. Southwest to west winds from 3 to 7 mph.
- Weather forecast out of Stockton is partly cloudy to mostly cloudy. Chance of rain on Friday with south to east southeast winds from 5 to 7 mph.

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

USFWS inquired what significance DS expression has for water operations. If fish are not checked for expression, then the measurement of other useful variables such as body weight, clutch size, etc. is more accurate.

- CDFW clarified that Spring Kodiak Trawl (SKT) dissects the fish and a female DS is determined spent if an ovary is absent or possibly if leftover eggs are observed. A spent DS is relevant to water operations as it is an off-ramp in the Proposed Action. CDFW pointed out that LFS were expressed on sampling vessels, but that practice was stopped because it inhibited staff's ability to accurately measure other relevant LFS variables accurately in the lab.
- USFWS concluded that it is a better use of the fish to forgo DS expression and allow the Directed Outflow Project (DOP) to use the fish for other analyses. Furthermore, non-invasive observation of DS

maturation on sampling vessels without dissection can be tracked with the caveat that it is a subjective form of analysis. USFWS will instruct crews to include notes on any relevant observations (e.g., expression without pressure or distended guts).

USFWS also asked for guidance on whether LFS needed to be checked for expression.

- CDFW confirmed that USFWS no longer needs to express LFS this season as the adults have entered the estuary to spawn thus no data is needed on maturation at this time. Larval LFS detections in SLS survey 12 indicate that spawning has commenced and larvae are present.
- CDFW requested that USFWS continue to check LFS for expression early in the season in future years to help inform COA 8.4.1.
 - DWR noted that larval sampling in December may eventually provide sufficient data to eliminate the need to express LFS year-round.

USBR requested feedback on how whether the more negative OMR Index for the next seven days could impact turbidity distribution.

- USFWS suggested reviewing [Grimaldo et al. 2021](#) for information on how environmental variables impact salvage.
- DWR noted that the circumstances this year are novel given that the triggers for first flush action changed in the most recent Biological Opinion and ITP.
- CDFW clarified that the ITP was crafted to make the first flush protective and manage turbidity in the Delta. Based off recent reports on environmental conditions, it appears that it worked with the south and central Delta relatively clear.

CDFW inquired if there is enough data to warrant a Particle Tracking Model (PTM) run.

- CDFW noted that larval LFS densities are not high enough at priority stations to trigger 8.4.2 or to inform what injection points should be used for a PTM run. In the next week preliminary SLS data will be finalized offering additional data for a future PTM.
- DWR agreed that waiting for better LFS population distribution information would benefit the PTM outcomes.
- The SMT will revisit a potential PTM run next week.

DWR inquired if the environmental conditions still qualify as a dry or critical year.

- CDFW will confirm the water year type this week. The SMT typically uses the 50% exceedance probability of the Sacramento River index, which will be discussed during next week's meeting.

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.

- Biological conditions were adjusted to include Suisun Bay due to the DS caught by the Chipps Island Trawl.
- Historical trends was updated to reflect that detections in the Sacramento Deep Water Ship Channel were of wild DS.
- Abiotic conditions updated to capture precipitation trends and forecast.
- Evaluation question 1 was edited to reflect completion of the Integrated Early Winter Pulse Protection.

- CDFW highlighted that the conditions triggering the pulse were measured on December 17th and the initiation was on the 18th.
- Evaluation question 2 accommodates uncertainty around how conditions may shift after completion of the first flush action, noting that, “The Early Winter Integrated Pulse Protection action has not been implemented before and how turbidity may change in the Delta as the OMR Index range becomes more negative after the action is unknown”.
- Evaluation questions 3 and 5 were updated with the latest dates and data.
 - USBR will connect with their management about the implications of a spent female (an offramp for turbidity bridge avoidance), which has never come up before.
 - CDFW noted that in 2019 there was a spent female collected by the Spring Kodiak Trawl, and that was established as a soft trigger.
- Evaluation question 4 was revised to note that turbidity bridge avoidance is not expected to be necessary in the next seven days, but there is uncertainty about how turbidity may change and the SMT will continue to monitor conditions.
- Evaluation question 6 acknowledged that turbidity may change in the next seven days due to precipitation.
- The executive summary was updated to identify recent DS detections. To address turbidity, the executive summary notes that: “if the daily average turbidity at Old River at Bacon Island (OBI) cannot be maintained less than 12 FNU, exports will be managed to achieve an OMR no more negative than - 2,000 cfs until the daily average turbidity at OBI drops below 12 FNU.”

ITP Longfin Smelt Risk Assessment

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

- Section 1-A
 - Overall risk of entrainment for DS is low due to the turbidity bridge avoidance helping to maintain low turbidity conditions in the central and south Delta.
 - Risk for LFS larvae is low due to OMR management being enacted.
 - Routing risk for LFS was modified to note that, “spawning migration has begun, recent wet conditions reduce the likelihood of adults and sub-adults moving into the south and central Delta.”
- Section 1-B
 - Exposure risk for LFS was edited to:
 - Note the low risk for adult and sub-adult LFS entrainment if they are present in the Lower San Joaquin River and South Delta. No LFS have been detected by EDSM in the southern Delta and lower San Joaquin strata.
 - Identify that preliminary SLS 13 results for the 12 central and south Delta stations listen in COA 8.4.2 showed low density of larvae. Detections were insufficient to trigger COA 8.4.2.
- The LFS executive summary was modified to reflect that risk is currently low due to the distribution of LFS rather than low exports.

Part 4: Additional Considerations/Discussion

- DWR noted that the SMT may find the [constituency data on Bay-Delta Live](#) to be a useful tool for monitoring turbidity. Unlike the 15-minute turbidity maps, the constituency tracker maps show the turbidity field at high slack, e.g. the furthest extent of high turbidity during the tidal cycle.

- LEPS data will most likely not be available to inform a PTM run by next week. Although LEPS data would not generate new insertion points for a PTM run, they would inform how far larvae have reached into the central and south Delta. SLS 13 data should be finalized by Thursday. CDFW will request a PTM run if COA 8.4.2 is triggered before the next SMT meeting.

Agencies reported no items for elevation to WOMT.

Literature Cited:

Grimaldo, L. F, Smith, W. E, & Nobriga, M. L. (2021). Re-Examining Factors That Affect Delta Smelt (*Hypomesus transpacificus*) Entrainment at the State Water Project and Central Valley Project in the Sacramento–San Joaquin Delta. *San Francisco Estuary and Watershed Science*, 19(1). doi:<https://doi.org/10.15447/sfews.2021v19iss1art5>