

Smelt Monitoring Team – Tuesday, December 26th, 2023

MEETING OBJECTIVE

To collectively assess how current operations and environmental conditions could be impacting Delta Smelt and Longfin Smelt and to provide information to WOMT on the status of Delta Smelt and Longfin Smelt, their exposure to operations of the CVP and SWP, and their potential sensitivity to environmental and operational changes; i.e., assess changes in risk week-to-week.

PARTICIPANTS

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

ACTION ITEMS

- None

ANNOUNCEMENTS

- Due to salmonid presence (COA 8.3.2, PA 4.10.5.10.1), OMR Management season, during which OMRI is restricted to no more negative than -5,000cfs, will start Jan 1st.

MEETING SUMMARY

PART 1: Updates on Water Operations and Biological Conditions Updates

Relevant Actions & Triggers

USBR reported on anticipated Old and Middle River (OMR) management measures. The Integrated Early Winter Pulse Protection action became active on December 1, 2023 but not triggered. CDFW reported on the Incidental Take Permit (ITP) Conditions of Approval (COA) currently in effect and whether they have been triggered. CDFW noted that starting December 1, 2023, COA 8.3.1 (Integrated Early Winter Pulse Protection) and 8.3.3 (Adult Longfin Smelt Entrainment Protection) can be considered. The descriptions below are intended as summaries

and do not provide all the details related to each action or trigger. For full descriptions, please see the OMR Guidance Document or ITP as needed.

Proposed Action

OMR Management Measures	Requirement	Time Frame	Trigger	Triggered?
Integrated Early Winter Pulse Protection (IEWPP) ("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 cubic feet per second (cfs).	Dec 1 to Jan 31	(1) Running 3-day average of daily flows at Freeport >25,000 cfs; and (2) Running 3-day average of daily turbidity at Freeport \geq 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.	Active, Not Triggered
OMR Management	Manage to a more positive OMR than -5,000 cfs.	From the onset of OMR management to the end.	N/A	Not active—to be activated January 1
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 DS 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.	Not active

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

OMR Management Measures	Requirement	Time Frame	Trigger	Triggered?
Larval and Juvenile Delta Smelt	Run hydrodynamic models and forecasts of entrainment, informed by the Enhanced Delta Smelt Monitoring (EDSM) or other relevant survey data to estimate the percentage of larval and juvenile DS 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 DS are within the entrainment zone of the pumps based on real-time sampling of spawning adults or young of year life stages.	Not active
End of OMR Management	OMR criteria may control operations until June 30 (for DS 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 (CCF) reaches 77°F for 3 consecutive days	Not active

ITP Conditions of Approval

Condition of Approval	Requirement	Time Frame	Trigger	Triggered?
8.1.5.2 (Smelt Monitoring Team Risk Assessment)	Outlines contents for weekly risk assessments of DS and Longfin Smelt (LFS) required under 8.1.5 and 8.1.1.	Nov 1st through June 30th or until off-ramped by 8.8	N/A	Active

Condition of Approval	Requirement	Time Frame	Trigger	Triggered?
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 (SMT) 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	3-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 SMT 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.	Active, Not Triggered
8.3.3 (Adult Longfin Smelt Entrainment Protection)	After December 1, if an Integrated Early Winter Pulse Protection (COA 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 (Condition of Approval 8.3) if: Cumulative combined LFS salvage (total estimated LFS counts at the CVP and SWP salvage facilities beginning December 1 through February 28 exceeds the most recent Fall Midwater Trawl (FMWT) LFS index divided by 10, Real-time monitoring of abiotic and biotic factors indicates a high risk of LFS movement into areas at high risk of future entrainment, as determined by DWR and CDFW SMT staff.	Dec 1 through Feb 28th	Salvage threshold for water year (WY) 2024 is 46.4.	Active, Not Triggered

Condition of Approval	Requirement	Time Frame	Trigger	Triggered?
8.4.1 (OMR Management for Adult Longfin Smelt)	<p>The SMT shall conduct weekly risk assessments and decide whether to recommend an 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:</p> <p>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</p>	Onset of OMR management through Feb 28th	SMT recommendation based on weekly risk assessment.	Off-ramped as of 12/18/23 due to detection of larval LFS by 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) LFS larvae or juveniles are found in four or more of the 12 Smelt Larvae Survey (SLS) or 20 mm stations in the central or south Delta, or (2) LFS 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.	Not active

Condition of Approval	Requirement	Time Frame	Trigger	Triggered?
8.4.3 High flow offramp for Longfin Smelt	If triggered, COA 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.	Not active
8.5.1 Turbidity Bridge Avoidance	Maintain daily average turbidity at OBI at a level of less than 12 FNU. If the daily average turbidity at OBI is greater than 12 FNU, 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 FNU.	After the first flush or Feb 1 until end of OMR management or until CDFW agrees that the action may be ended or modified.	Turbidity at OBI > 12 FNU	Not active

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 trigger (2) or (3) are met, this Condition of Approval will restrict south Delta exports to maintain a seven-day average OMR index no more negative than -3,500 cfs until the average Secchi depth is greater than 1 meter in the south Delta stations in a subsequent SLS or 20 mm survey. If average south Delta Secchi depth continues to be less than or equal to 1 meter in a subsequent SLS or 20mm survey, then Permittee shall continue restrictions and request a risk assessment by the Smelt Monitoring Team to determine if additional advice and subsequent restrictions are warranted and provide advice to WOMT.	Nov 1st through June 30th or until off-ramped by 8.8	(1) When the five-day salvage of juvenile DS is greater than or equal to one plus the average prior three years' FMWT index (rounded down). The 2022 September through November FMWT index for DS was zero. Or (2) when a larval/juvenile DS is detected in SLS/20 mm Or (3) the 3-day average water temperature at Jersey Point is $\geq 12^{\circ}\text{C}$ and Secchi from the most recent SLS/20 mm survey is $\leq 1\text{m}$ averaged across the 12 stations (809, 812, 815, 901, 902, 906, 910, 912, 914, 915, 918, and 919)	Active, Not Triggered
8.8 (End of OMR Management)	If triggered, OMR Management would be off-ramped for LFS and DS.	From the onset of OMR management through June 30th	Daily mean water temperature at CCF is $>25^{\circ}\text{C}$ for three consecutive days.	Not active

Condition of Approval	Requirement	Time Frame	Trigger	Triggered?
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 LFS, and from March 1st through June 30th for DS	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

- Releases from Whiskeytown Dam on Clear Creek are currently 200 cfs with no anticipated changes for the week.
- Releases from Keswick Dam on the Sacramento River are currently 5,000 cfs with no anticipated changes for the week.
- Releases from Oroville Dam on the Feather River are currently 1,750 cfs with no anticipated changes for the week.
- Releases from Nimbus Dam on the American River are 2,000 cfs with no anticipated changes for the week.
- Releases from Goodwin Dam on the Stanislaus River are currently 200 cfs with no anticipated changes for the week.
- Delta Cross Channel (DCC) gates closed on November 27th and are expected to remain closed for the season.
- Jones Pumping Plant is currently exporting 3,600 cfs with a range of 3,600 cfs to 4,200 cfs.
- The State facility is currently exporting 5,500 cfs, with a range of 2,000 cfs to 7,200 cfs.
- Expected Daily OMR Index Values are between -5,000 cfs to -9,000 cfs.
- Sacramento River flows at Freeport range between 12,000 cfs and 20,000 cfs.
- San Joaquin River flows at Vernalis range between 1,000 cfs to 1,750 cfs.
- The Delta Outflow index ranges from 5,000 to 10,000 cfs.
- X2 is greater than 81 km (surface EC of 2.64 estimated to be = 90.9km).
- Tides are currently transitioning from Spring to Neap tide.

Review of Environmental Conditions and Survey Updates

CDFW delivered catch updates on relevant surveys to the SMT.

- FMWT finished sampling last week. Over the course of sampling FMWT detected LFS in San Pablo Bay, Carquinez Strait, Suisun Bay, Montezuma Slough, and the Lower Sacramento River.
 - The index calculation for LFS is 464.
- The San Francisco Bay Study completed their study and detected 98 LFS across all sampled regions.
- SLS 12 sampled all stations two weeks ago and did not detect any additional LFS.
 - SLS 13 is sampling this week.

USFWS provided catch updates on EDSM and Chipps Island Trawl.

- EDSM was on the water Monday-Thursday, sampled all 32 sites and detected 0 DS.
 - The DS abundance estimate for the week of 12/26/2023 is 0. The last non-zero abundance is 1,321, from the week of 12/12/2023.
 - EDSM detected 1 LFS in the lower Sacramento River, 13 in Suisun Bay, 128 in Suisun Marsh.
 - Sampling will continue this week from Tuesday-Friday.
- Chipps Island Trawl sampled all 30 tows, detected 0 DS and 16 LFS.
 - Sampling will continue Tuesday-Thursday.

CDFW provided a Salvage Update

- No osmerids were salvaged and no operational variances were reported.
 - CDFW shared that there was a striped mullet salvaged at the Tracy facility, which is a rare fish whose presence in the Delta is correlated with El Nino years.

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

DS

- Reclamation did not have any items for discussion.
- CDFW did not have any items for discussion.

LFS

- CDFW noted that based on survey data, LFS seem to be moving into the lower Sacramento River and Confluence region with over 70 LFS detected in these regions over the course of December. X2 is still >81km, estimated around 90.9km, the OMR Index will be as negative as -9,000 cfs this week, and QWEST could be as negative as -5,000cfs. Increased detections coupled with unfavorable hydrological conditions suggest increased risk for LFS. CDFW proposes to increase the risk level for all life stages of LFS in the lower Sacramento River and

Confluence region to Moderate. There are no active mechanisms for LFS advice, so CDFW did not propose to give advice to WOMT. CDFW acknowledged the shift in distribution compared to previous weeks.

- Reclamation did not have anything to add.
- DWR asked why the risk level for LFS would be changed without detections in the San Joaquin River, as the central and south Delta regions are typically associated with higher risk of entrainment than the lower Sacramento River and Confluence, where risk is generally seen as lower.
 - CDFW clarified that risk tables are separated by region: one table for Sacramento and Confluence region and one for the Central Delta region. LFS detections at Chipps Island have been spotty but this past week there were 16 LFS detections. There is increasing evidence of LFS movement into the lower Sacramento River and Confluence region.
 - DWR asked if the main reason for the change in risk level was due to OMRI being below -5000 cfs. There is more conversation necessary about hydrological factors affecting entrainment from the lower Sacramento River into the OMR corridor.
 - CDFW confirmed strongly negative OMRI values (-7,900 cfs today and forecast to be potentially as negative as -9,000 cfs this week). CDFW has not previously asked for a PTM run with OMRI this negative, and injection nodes in the lower Sac River, which makes the evaluation of risk subjective.
 - DWR asked whether there is a presumption of LFS in the San Joaquin River based on LFS presence in the lower Sacramento River.
 - CDFW responded that due to lack of detections in the San Joaquin River, it is difficult to provide a sound rationale to change to the risk level for the that region as no detections have occurred in that region this water year. However, LFS could be present in the San Joaquin despite a lack of detections.
- USFWS concurred with CDFW's proposed change to the risk level. The poor hydrological conditions for LFS coupled with current migration behavior and detections supports an increase in risk.
- DWR sought clarification from CDFW about which life-stages were being proposed for a change in risk level.
 - CDFW clarified that the proposed risk level changes apply to sub-adults and adults at this time. Risk level for larvae will likely depend on detections from SLS 13.
 - DWR suggested the proposed change in risk seemed premature due to lack of salvage data supporting increased risk of entrainment. If future

detections find LFS in the San Joaquin River with similar hydrological conditions, that would support elevating the risk of entrainment.

- CDFW asked the SMT about what conditions would necessitate a change in risk?
- DWR noted typically risk of entrainment for adult LFS is lower than for larvae due to their greater mobility. Historically speaking, it is rare to see adult LFS in salvage under any conditions. Generally, adult LFS in the lower Sacramento River do not face a risk of entrainment.
- CDFW acknowledged adult LFS salvage has historically been low, but expressed a desire to be proactive in assessing risk rather than assuming low entrainment based on historical trends.
- DWR suggested articulating the elevated concern in the narrative portion of the assessment without changing the risk level in the assessment table. The description could note that LFS could be present, and at risk, in the San Joaquin despite no detections to date. DWR also suggested the more salient concern in the Sacramento River should be for LFS larvae, which behave more like particles and are more likely to be entrained.
- DWR shared PTM runs that have been used to inform DS experimental releases in the Sacramento River. These runs used WY2013 and WY2016 hydrologies and historical operations, including OMRI values more negative than -5,000cfs, along with injection locations near Decker Island and an injection date of Dec 15. Total particle entrainment into the south Delta after two weeks (the most comparable hydrologic conditions to WY2024) was <1% in both years. DWR noted these results were most relevant for LFS larvae, and would represent a worst-case scenario for LFS adults due to their increased swimming ability.
- CDFW expressed willingness to change the larval LFS risk level to Moderate for the lower Sacramento and Confluence region.
- USFWS shared a study indicating higher upstream distribution of juveniles and larvae with higher X2 position. Further analyses also showed that higher X2 leads to an increased number of adults LFS moving further upstream and potentially spawning in the upper estuary.
- The SMT agreed that the narrative could note increased concern for larval LFS in the lower Sacramento River and Confluence region. The SMT was unable to reach consensus on reflecting such changes in the ITP risk assessment table (Section I-A for Sacramento River and Confluence) and for concern for adult LFS in the lower Sacramento River. DWR opposition to the change in the ITP risk assessment table is described in the corresponding section below.

PART 3: Live-edit Assessments

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

The SMT reviewed and discussed updates to the PA Assessment for DS, which include the latest dates, detections, conditions, data, and reflects the discussion documented in Part 2 above.

- Removed FMWT as a data source.
- FMWT changed from ongoing to complete.
- Release 3 experimental release moved to completed.
- Abiotic conditions updated to indicate precipitation and wind. FNU updated as well.
- USFWS requested that Reclamation include a more specific X2 level in the assessment.
 - Reclamation responded that they decided to stop including the more detailed X2 values based on the calculator previously used but that they could resume using that calculator and including those values if the SMT wanted to. Due to the incongruence between the calculator values and actual X2. The following language in italics was proposed following last week's SMT meeting to clarify the incongruency while offering some more detailed information.
 - The value indicated is representative of the location where the surface salinity electrical conductivity is roughly 2.64 PSU mS/cm and not necessarily where X2 (isohaline line where salinity is 2 PSU) is. While the 2.64 surface EC to 2 PSU bottom salinity has been generally accepted in the deeper waters of the confluence (below 81 km from the Golden Gate Bridge), there has not been such acceptance for the shallower waters upstream.
 - USFWS noted the outflow index could also be used to "check" X2 levels. There are other options for X2 including USGS efforts to install sensors.
 - Reclamation proposed using a shortened format that allows for more detailed X2 information while acknowledging that EC values are not precisely correlated with X2 location. Using this format, information about X2 this week would read: "As of 12/25/2023, X2 is estimated to be >81 km (Surface EC of 2.64 estimated to be = 90.9 km)". This format is proposed for SMT documentation regarding X2 moving forward.

ITP Longfin Smelt and Delta Smelt Risk Assessment

The SMT reviewed and discussed updates to the ITP Risk Assessment for DS and LFS, which include the latest dates, detections, conditions, data, and reflects the discussion documented in Part 2 above.

Advice to WOMT and LFS Executive Summary

- No advice to WOMT.
- Based on increased detection and unfavorable hydrological conditions, the risk of entrainment from the Lower Sacramento River and Confluence region is moderate, though there was a lack of consensus on this change.
- Removed “LFS is distributed throughout the Delta.”

Delta Smelt and Longfin Smelt Risk Assessments

Delta Smelt

- The risk of entrainment remains low for all life stages in all regions.

Longfin Smelt

- Risk to all life stages of LFS has been changed to Moderate in the lower Sacramento River and Confluence region. This change does not represent full SMT consensus.
- The risk of entrainment remains low outside the Sacramento River and Confluence region for all life stages of LFS.
- CDFW asked about the PTM study DWR shared and referenced previously.
 - DWR noted that lots of particles passed Chipps in weeks 1 and 2 of the PTM run. The study seems to indicate lower entrainment risk for those times based on similar hydrological conditions to this current week. There are unresolved particles but that is not uncommon for PTM runs in drier hydrologies and does not necessarily indicate elevated risk of entrainment to those particles.
 - USFWS expressed the opinion that this discussion illustrates elements that need to be defined more clearly rather than this being a true non-consensus issue.
- DWR noted that it could be hard to determine whether particle movement is due to flow events or something else like tides.
 - CDFW sought clarification about the reason there is a lack of particle movement around Three-Mile Slough despite hydrological changes in Week 2 of the PTM.
 - DWR noted that there is no good answer; it is likely a variety of factors.
 - CDFW reiterated the difficulty of using the provided PTM runs from WY 2013 and 2016 as a true parallel to the hydrological conditions today due to the similarities being only present in a short time frame and the conditions changing so drastically beyond that point in the runs.
- CDFW noted that the conversation is looking at this week’s risk alone and there would be no regulatory actions coming from this. CDFW would like to err on the side of caution and change the risk level.

- DWR reiterated they appreciate CDFW's position but are still uncomfortable with elevating the risk level of either life stage, as LFS have yet to be detected this water year in areas typically associated with elevated risk of entrainment (i.e. the lower San Joaquin River) and that PTM results indicate minimal hydrologic draw from the lower Sacramento River towards the export facilities under similar hydrologic conditions.
- Given the difference in federal and state status for LFS, and the lack of an IOP for WY2024, there was some discussion of the role of federal agency perspectives for this species. The group agreed that all SMT members are technical experts and, as such, all views expressed by team members have relevance to team discussions and decisions.
- CDFW offered to note LFS risk as "low/moderate" in the ITP risk assessment table to accommodate DWR concerns. DWR recommended a change to the summary to reflect the nuance and did not support a change in status in the table because previously the SMT has used "low/moderate" or "moderate/high" to denote a middle ground between the two risk levels, not to communicate a lack of consensus.
- There was a suggestion to put the discussion to a vote but that was not supported. Instead, the SMT decided to change the risk level in ITP assessment for LFS and add an asterisk in the table with description below explaining why DWR does not share the same opinion.

Changes in exposure risk from previous week

- Delta Smelt: No changes.
- Longfin Smelt: Moderate risk designation for Larvae, Sub-Adults, and Adults. Overall risk has been changed to Moderate.

Life Stages Present

- Delta Smelt: Sub-Adults and Adults.
- Longfin Smelt: Larvae, Sub-Adults, Adults.

Part 4: Additional Considerations/Discussion

Agencies reported no items for elevation to WOMT.

Next SMT Meeting

The next SMT meeting will be held on Tuesday 1/2/2023 on Microsoft Teams.