

Smelt Monitoring Team – Tuesday, April 19th, 2022

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

- CDFW to follow up on email with Randy Baxter and Pat Coulston regarding past salvage of Wakasagi and Delta Smelt (DS).
- CDFW to follow up with USFWS on concerns regarding no adjustment to daily salvage with continued exports.
- DWR to perform Particle Tracking Model (PTM) run as requested prior to the next Smelt Monitoring Team (SMT) meeting, if appropriate.

MEETING SUMMARY

PART 1: Updates on Water Operations and Biological Updates

Relevant Actions & Triggers

USBR reported on Old and Middle River (OMR) management measures. Under the end of OMR Management action, OMR criteria may control operations until June 30th or until the daily mean water temperature at Clifton Court Forebay (CCF) reaches 77° F for three consecutive days. CDFW reported on the Incidental Take Permit (ITP) Conditions of Approval (COA) that are in effect including 8.4.2 Larval and Juvenile Longfin Smelt (LFS) Entrainment Protection which was triggered on April 11th by 20 mm Survey 2, 8.5.2 Larval and Juvenile DS Protection, and 8.12 Barker Slough Pumping Plant Longfin and Delta Smelt Protection.

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 3-day average of daily flows at Freeport >25,000 cfs; and (2) Running 3-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 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.	Triggered on 1/3/22; Off-ramped by SKT 3 on 3/17/22
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 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	In effect

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 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 CCF reaches 77°F for 3 consecutive days	In effect

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 LFS required under 8.1.5 and 8.1.1	Nov 1 st through June 30 th or until off-ramped by 8.8		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 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.	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 Fall Midwater Trawl (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 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: 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 Smelt Larval Survey (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 1 st through June 30 th or until the temperature offramp occurs	(1) LFS 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) 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	Triggered 1/20/22, 1/31/22, 2/28/22, 3/11/22, 3/29/22, and 4/11/22

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 at 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 agrees that the action may be ended or modified.	Turbidity at OBI > 12 FNU	In effect as of 1/3/22; off-ramped April 1 st .

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 DS 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 DS is greater than or equal to one plus the average prior three years' FMWT index (rounded down). The 2021 FMWT index for DS was zero.	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 30 th	Daily mean water temperature at CCF 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 LFS, and from March 1 st through June 30 th for DS	Larval Smelt are detected at SLS Station 716 during the period identified for each species, and/or when recommended by the SMT	Active, Triggered for LFS 2/14/22, 3/11/22, and DS on 3/23/22

Current Operations & Outlook

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

- USBR reported on weather conditions noting unstable weather bringing periodic precipitation which will dry out by the end of the weekend.
- 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 1,000 cfs. No modifications expected.
- Releases from Goodwin Dam on the Stanislaus River are currently averaging 465 cfs. Pulse flows have been initiated with three peaks anticipated between April 18th and May 18th.
- Federal Facility exports are targeting 900 cfs with no changes expected for the week ahead.
- Delta Cross Channel gates are closed and will remain closed until the weekend of May 28th.
- DWR reported that Oroville releases are 800 cfs.
- Freeport flows were around 7,900 cfs and may increase later in the week given precipitation from the storm system.
- As of April 18th, San Joaquin flows at Vernalis were slightly below 1,300 cfs and will fluctuate with pulses from the Stanislaus River.
- State facility exports are 600 cfs and will remain constant for the week.
- On April 18th, Delta outflow was 7,900 cfs and will trend upwards through the week with increased flows from the Sacramento River and any potential precipitation in the Delta.
- QWEST increased last week from 500 to 2,000 cfs as a result of precipitation and will be variable in the coming week depending on precipitation from anticipated storm events.
- The daily OMR Index is -1,400 cfs and will fluctuate between -1,100 and -1,500 cfs as Vernalis flows change.
- The next two days represents a peak in spring tidal cycle.
- X2 is upstream of 81 km.
- Windy conditions slightly increased turbidity in Franks Tract.
- The survey status table was updated to reflect that Mossdale is active.

Review of Environmental Conditions and Survey Updates

CDFW delivered catch updates on relevant surveys to the SMT.

- The week of April 11th there was a Wakasagi misidentified as a DS at station 812. Furthermore, there was a DS larvae misidentified as a LFS at station 902.
- Processing is ongoing for 20 mm Surveys 1 and 2 with large quantities of LFS larvae in the lower Sacramento River and Confluence detected. Survey 2 results include:
 - LFS
 - Station 703: 256 larvae
 - Station 704: 177 larvae
 - Station 520: 161 larvae
- SLS 6 processing is complete with no changes to reported results.
- 20 mm Survey 3 will run from April 18th to the 21st.
- A total of 30 larval DS have been detected by the 20 mm Survey to date.
- Anecdotally there appeared to be yolk sacs present in some fish detected in the 20 mm Survey, but that data is not confirmed.
- The Spring Kodiak Trawl (SKT) was on the water from April 11th to the 14th. Results are as follows:
 - DS
 - April 13th station 719: One 75 mm adipose fin clipped pre-spawn male
 - April 14th station 606: One 68 mm adipose fin clipped pre-spawn male
 - LFS
 - Suisun Bay and West: 153 larvae and juveniles
 - Station 804 in confluence: Two juveniles

- The next SKT goes on the water May 9th.

USFWS provided catch updates on EDSM and Chipps Island Trawl.

- EDSM
 - DS
 - Week of April 4th Suisun Bay: Two
 - Week of April 11th Lower Sacramento River: Two
 - LFS
 - Suisun Bay: 200+
 - One yolk sac individual noted on April 5th
 - Suisun Marsh: Approximately 100
 - Sacramento River: 200+
- Chipps Island Trawl detected 20 LFS with four being juveniles. All juveniles were brought back to the Lodi FWO lab for ID verification as well as one adult brought in due to being dead upon capture.

USBR updated table nine in the PA Assessment to include the April 13th and 14th detections in Montezuma Slough and the Sacramento Deepwater Ship Channel. DWR also relayed results from the Fish Restoration Program (FRP) which sampled at lower Yolo Ranch with three DS detections (two on April 5th and one on the 6th; 20 to 23 mm).

CDFW provided a salvage and qualitative larval sampling update (April 11th to April 17th).

- There were no DS salvaged at either facility.
- Four LFS were detected in qualitative larval sampling.
- LFS salvage occurred nearly every day this week with juvenile LFS salvage values (>20 mm) below:
 - State Facility: 351
 - Federal Facility: 276
 - 627 total salvage for the week
- The total juvenile LFS salvage for the season is 3,259.
- CDFW noted a small pulse of Wakasagi in facility salvage. While Wakasagi are not a protected species, detections of four to five is unusual. All Wakasagi were >20 mm.
- USBR noted the CVP detected a larval fish which morphologically looked like a DS but was confirmed later to be a Wakasagi through genetic analysis.
- CDFW clarified that there was no expansion factor used to estimate LFS entrainment during the April 13th to 14th outage.

USBR shared environmental data updates as of April 18th.

- Three-station daily average water temperature: 16.96° C.
- CCF daily average temperature: 17.47° C.
- Three-day running average turbidity at OBI: 6.88 FNU.
- Current turbidity at OBI: 6.00 FNU.
- X2 is > 81 km.
 - Estimated Sacramento River X2 is 87.7 km.
 - Estimated San Joaquin River X2 is 86.9 km.
- Weather forecast out of Antioch is clear to rainy with west to west southwest winds from seven to 18 mph and gusts has high as 25 mph. Precipitation amounting to one tenth to one quarter of an inch is possible.

- Weather forecast out of Stockton is clear to rainy with west to southwest winds from five to 11 mph and gusts has high as 25 mph. Precipitation amounting to one tenth to one quarter of an inch is possible.

The outlook was amended to reflect the latest distribution patterns, including capturing larval DS detections in the Old River, removing the lower San Joaquin River and the south Delta for adult DS, and noting Adult and subadult LFS are present in the lower Sacramento River and Confluence.

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

USBR noted that conditions have been fairly consistent the past few weeks with turbidity in Franks Tract mildly increasing due to weather events. CDFW agreed with USBR and believes that the presence of DS in an area of high export (i.e., station 902) is a cause for concern.

CDFW inquired if there is any correlation between Wakasagi and DS salvage. The SMT offered explanations for the recent increase in Wagasaki salvage including increase population at this time and migration from San Joaquin reservoirs, but USFWS noted that previous research indicated no proxy species for DS salvage.

CDFW requested input regarding the validity of using the most recent Particle Tracking Model (PTM) run to assess risk to DS in the OMR corridor. CDFW pointed out that any fish past station 902 are in the zone of influence and at elevated risk which should be reflected in the SMT's assessment. USFWS highlighted that while advice may be warranted given the increase in risk to DS, there may not be a mechanism for the SMT to provide a recommendation. USBR confirmed there is not currently a mechanism for providing advice, as the turbidity bridge avoidance action was off-ramped and COA 8.5.2 has a salvage trigger which has not be met. Furthermore, it may be difficult to justify a recommendation for exports lower than the current minimum operations. DWR agreed and noted a recommendation for DS may be superfluous given the current health and safety limits on exports and the ongoing LFS advice. Ultimately, DWR concluded that the previous PTM was not reliable to assess risk at this time. Operations are currently being controlled by several layers of regulations.

CDFW asked for clarification regarding how the lifecycle model could be used for estimating entrainment of DS. USBR recalled how the lifecycle model results were generated by USFWS in order to develop a policy for larval entrainment protection (i.e., an OMR Index of -3,500 cfs would minimize entrainment). USBR and USFWS confirmed that the lifecycle model cannot be run on a weekly timescale to provide new information to support real-time decisions.

USFWS questioned if the OMR Index ranges associated with varying levels of risk provided the SMT with sufficient flexibility to make protective recommendations. USFWS also suggested that the presence of fish in areas of high risk should be sufficient for the SMT to consider making a recommendation, even without a turbidity-based trigger, as fish will be advected and unable to avoid entrainment once in the OMR corridor. CDFW emphasized the importance of being proactive in moments where DS are at high risk and exports are subject to possible change.

The SMT agreed that there is increased risk for DS in the OMR corridor, but there is no mechanism to trigger a recommendation. Exports will be closely monitored and in the event of any changes the SMT will be notified and a PTM run will be conducted to evaluate scenarios of interest.

USFWS expressed concern about discontinuing salvage at the Tracy Fish facility while exports continued and will continue discussion with CDFW regarding the outage outside of the SMT meeting.

USFWS supports integrating more flexibility for recommendations into future biological opinions so the SMT does not have to face a dilemma where advice can only be issued based on regulations, but the SMT believes that action should be taken.

CDFW noted that conditions for LFS have not changed dramatically since last week with the fish in the OMR corridor remaining at high risk. The SMT agreed a recommendation is still warranted. DWR pointed out that although salvage of LFS is ongoing, it has decreased since last week. USFWS observed that the salvage pattern from 2020 was bimodal and the numbers from this week could be a temporary reprieve.

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, which include the latest dates, detections, and data as well as:

- Sub-adult was removed from Life Stages.
- Question three was updated to note the two pre-spawn males observed by SKT 4.
- Questions four, five, and eight acknowledge changes in south Delta turbidity due to storm systems.
- Questions eight and nine identify increased likelihood of entrainment for DS in the OMR corridor based on the fish observed at station 902.
- The executive summary was updated to reflect the presence of DS in the OMR corridor and the related increased likelihood of entrainment.

ITP Longfin Smelt Risk Assessment

The SMT reviewed and discussed updates to the ITP Risk Assessment for LFS, which include the latest dates, detections, and data as well as:

The SMT maintains its advice to WOMT and acknowledges that while there is no trigger met to offer advice for DS there is risk to larval DS in the OMR corridor which would otherwise merit a recommendation.

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: No changes since last week.
 - LFS: No changes since last week.
- Routing Risk (behavior and life history)
 - DS: No changes since last week.
 - LFS: No changes since last week.
- Overall entrainment risk for DS or LFS.
 - DS: No changes since last week.
 - LFS: 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:
 - Adults and sub-adults: No changes to risk since last week.
 - Larvae: Changed to high risk of entrainment given DS presence in OMR corridor. DS in the lower San Joaquin River remain at low risk. Given continued precipitation for the remainder of the week, risk is contingent on precipitation and associated exports.
 - LFS:

- No changes to adult risk since last week.
- No changes since last week for larvae and juveniles in the lower San Joaquin River.
- No changes since last week for larvae and juveniles in the OMR corridor. Elevated salvage was highlighted; 2022 salvage is already higher than 2020 and 2021.
- Change in exposure from last week
 - DS: Remains low in lower San Joaquin River. However, larval DS detected at 902 in the OMR corridor indicates high risk of entrainment for fish in the region.
 - LFS: No changes since last week.
- Reporting OMR Index
 - Noted that despite the less negative OMR Index expected this week, larval DS in the OMR corridor are at high risk of entrainment.

Executive Summary:

- Language was added to reflect that although no triggers were met for DS and therefore the SMT is not making a recommendation for DS this week, the SMT is concerned about increased risk for DS.

Part 4: Additional Considerations/Discussion

Agencies reported no items for elevation to WOMT other than maintaining a recommendation under COA 8.4.2 to manage the seven-day average OMR Index to be no more negative than -1,250 cfs for the protection of larval and juvenile LFS.