Smelt Monitoring Team – Tuesday, April 5th, 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 inquire with DWR regarding a potential Particle Tracking Model (PTM) run to inform advice from the Smelt Monitoring Team (SMT).

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 Entrainment Protection, 8.5.2 Larval and Juvenile DS Protection, and 8.12 Barker Slough Pumping Plant Longfin and Delta Smelt Protection. COA 8.12 off-ramped for Longfin Smelt (LFS) March 31st and DWR submitted a pending amendment to meet and confer with CDFW if this COA is triggered and a pumping rate greater than the current 60 cfs cap is needed. COA 8.5.1 Turbidity Bridge Avoidance was off-ramped as of April 1st.

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 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.	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 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	In effect

[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	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 Delta Smelt and Longfin Smelt required under 8.1.5 and 8.1.1	Nov 1st through June 30th 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 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	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 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 1st through Feb 28th, exceeds most recent Fall Midwater Trawl (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 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 28th	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, 1/31/22, 2/28/22, 3/11/22, and 3/29/22

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

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 1st through June 30th 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 was 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 30th	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 1st through June 30th 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	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:

- 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 decreasing to 1,000 cfs by April 6th.
- Releases from Goodwin Dam on the Stanislaus River are reducing from 300 to 200 cfs by April 6th.
- Reclamation exports are targeting 900 cfs with no changes expected for the week ahead.
- Delta Cross-channel (DCC) gates are currently closed. No modifications expected.
- DWR reported that Feather River releases were 3,500 cfs over the weekend, 2,200 cfs today, and will decrease to approximately 1,700 cfs by the end of the week.
- Freeport flows were around 9,800 cfs and will decrease to about 7,000 cfs over the next few days.
- State facility exports were 600 cfs on April 1st and will remain constant for the week with possible minor adjustments to maintain total exports below 1,500 cfs.
- Vernalis flows are about 900 cfs and will trend downward over the week.
- Delta outflows on April 4th were 8,000 cfs with decreases expected for the next week.
- QWEST has been around 3,000 cfs and will level out to 200 to 300 cfs by the end of the week.
- The OMR Index has been -1,300 cfs since April 1st and may become slightly more negative (-1,400 cfs) with decreasing San Joaquin River flows.
- Today Rio Vista flows are around 8,000 cfs and will decrease to about 5,000 cfs.
- X2 is upstream of Collinsville and is expected to move further upstream over the week with decreased outflow.
- No updates to the survey table.

Review of Environmental Conditions and Survey Updates

CDFW delivered catch updates on relevant surveys to the SMT.

- Processing is still ongoing for Smelt Larval Survey (SLS) 6 and 20 mm Survey 1.
- 20 mm Survey 1 has continued to detect LFS larvae in large numbers and broadly through the region.
    - 20 mm processing is ongoing with preliminary results below:
        - LFS
            - Station 704: 31 LFS larvae
            - Station 705: 106 LFS larvae
            - Station 707: 285 LFS larvae
- SLS 6 results are still processing, but preliminary results are below:
        - LFS
            - Station 606: 133 larvae
            - Station 609: Four larvae
            - Station 610: Six larvae
- CDFW clarified that there were no additional DS detections since last week's SMT meeting.

USFWS provided catch updates on the Enhanced Delta Smelt Monitoring Program (EDSM).

- The previous week was the last week of EDSM's phase one Kodiak Trawling for the season with 35 of 36 sites sampled. One site was not sampled in the lower San Joaquin River stratum due to high winds. Results include:
    - Suisun Bay
        - LFS: Six
    - Suisun Marsh
        - LFS: Seven
        - DS: One (marked)
    - Sacramento Deep Water Shipping Channel (SDWSC)

        - DS: One (marked)
- The EDSM abundance estimate for the week of March 28th was 3,273 based off the two marked DS detected.
- Phase two 20 mm trawling started April 6th.
- USFWS requested input on how to report phase two catch data. The SMT requested that whatever finalized information is available would be valuable to report in addition to any preliminary information ready for distribution prior to SMT meetings. The SMT suggested the lower San Joaquin and lower Sacramento River strata are the most relevant and should be prioritized in processing.
- Chipps Island trawl detected 12 sub-adult and adult LFS.
    - No DS detections
    - Fish Conservation and Culture Laboratory (FCCL) brood stock collection has concluded for the season.

CDFW provided a salvage and qualitative larval sampling update (March 29th to April 3rd).

- There were no DS salvaged at either facility.
- Juvenile LFS salvage (> 20 mm):
    - State Facility: 426
    - Federal Facility: 80
- The total juvenile LFS salvage for the season as of April 3rd is 1,436.

USBR shared environmental data updates as of April 4th.

- Three-station daily average water temperature: 17.5° C.
- Three-day running average turbidity at OBI: 2.68 FNU.
- Current turbidity at OBI: 3.1 FNU.
- X2 is > 81 km.
    - Estimated Sacramento River X2 is 81.7 km.
    - Estimated San Joaquin River X2 is 81.7 km.
- Weather forecast out of Antioch is sunny and clear with north northwest winds from 5 to 13 mph.
- Weather forecast out of Stockton is sunny and clear with north northwest winds 7 to 15 mph and 23 mph gusts possible.

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

USBR and CDFW noted there were no significant updates regarding DS since last week, particularly given the lack of new larval detections. However, CDFW did inquire why the SMT's advice for DS protection last week was not accepted.

- USFWS clarified that the SMT is limited to a recommendation to between -3,500 and -5,000 cfs based on the 2020 Delta Smelt lifecycle memo that is considered part of the PA. Larval entrainment protections in the Interim Operations Plan (IOP) are additive and not in lieu of thus they protect different things.
- If ITP COA 8.5.2 was triggered by salvage, then this action would take precedence.
- Even if the SMT's DS recommendation from last week were accepted, amendments to pumping would not have been enacted in time to result in a meaningful difference for DS juveniles and larvae.
- CDFW heard that some of the feedback provided on the advice indicated that the SMT recommendation did not take into account the full distribution of fish, and the lifecycle model needed to be used to evaluate a sustainable level of take, but there is no sustainable level for DS with such a low population.

- Lastly, USFWS noted that one common assumption made is that salvage efficiency does not change with fish density which should be addressed in future biological opinions.

CDFW noted that SLS 6 and 20 mm 1 produced higher LFS detections indicating a greater density of fish in the central and south Delta, though conditions remain largely the same as last week. However, the topic of greatest concern for CDFW is the salvage trajectory which suggests the current water year could set record entrainment numbers. CDFW shared salvage data from 2021 and 2022. Notably, the onset of salvage at the export facilities is earlier this water year with a greater number of fish detected per month to date.

USBR pointed out that the Fall Midwater Trawl Index was higher this year indicating that there were more spawning fish relative to previous years. CDFW emphasized that the ITP does not consider the proportion of fish at risk; rather, it calls for preventing and minimizing entrainment. DWR highlighted that reduced pumping began in February and there have still been above average salvage numbers. DWR questioned if continued advice would be changing the outcome for fish currently in the OMR corridor. In addition, DWR suggested guidance from CDFW's management regarding more achievable targets for advice would be valuable for the SMT to help deliver more consistent and impactful advice.

CDFW reiterated that LFS are still in areas of high risk and risk has not decreased from last week and suggested the SMT should maintain the recommendation of a -1,250 cfs 7-day average OMR Index.

USBR inquired if a PTM run could produce any valid results with given the potential scenarios may differ by only a few hundred cfs. The necessary DWR expertise was not on the call to offer insight, but the SMT agreed that a PTM could be valuable for informing a recommendation if the results are meaningful. CDFW will coordinate with DWR to determine if a PTM run would be informative.

The SMT agreed to continue the -1,250 cfs OMR Index recommendation under ITP COA 8.4.2 given the team's ongoing concern around increased LFS salvage, but the risk assessment language should acknowledge the SMT does not anticipate that the recommendation will control operations.

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:

- Updates to the biological conditions section removed references to first flush conditions and ripe females and added language indicating spawning is ongoing and larvae have been detected.
- Current distribution was revised to note that there have been only a few detections of larval DS and subsequently the SMT's understanding of distribution is limited.
- A qualification was added to the forecasted distribution section stating that larval, rather than wild adult, distribution is difficult to predict due to infrequent detections.
- Evaluation question six was revised to note the turbidity bridge avoidance action was off-ramped as of April 1st.
- Evaluation questions eight and nine were updated to note that DS are less likely to be entrained under the OMR Index expected this week, than last week at the more negative OMR Index.
- The executive summary added DS detections in the lower San Joaquin River and north Delta while removing language on the turbidity bridge avoidance measure. Language referencing the SMT's recommendation was also removed.

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:

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 given low turbidity and low exports. Removed language referencing ripe females.
    - LFS: Remains low due to low exports.
- Routing Risk (behavior and life history)
    - DS: Low.
    - 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:
        - No changes to adult risk since last week.
        - Reduced risk from medium to low for larvae due to less negative OMR Index this week compared to last.
    - LFS:
        - No changes to adult risk since last week.
        - Medium risk last week changed to low risk for LFS larvae and juveniles in lower San Joaquin River this week due to minimal pumping.
        - No changes for LFS in the OMR Corridor since last week, risk remains high.
- Change in exposure from last week
    - DS: lower risk due to minimum exports for the week and no recent DS detections in salvage or surveys in OMR corridor or lower San Joaquin.
    - LFS: Risk remains high for larvae and juveniles in the OMR corridor given that salvage has doubled since last week.

The executive summary retains the SMT recommendation noting that the SMT expressed concern over juvenile and larval LFS in the central and south Delta with the full understanding that the recommendation may not be controlling.

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.