Smelt Monitoring Team – Tuesday, February 7th, 2023

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

- USBR and DWR to inform facilities of request to start larval sampling on March 1st, or as soon as possible thereafter, and note that staff should be prepared for potential Delta Smelt (DS) detections.
- USBR and DWR to discuss logistics of possible genetic testing for larval samples collected at the facilities.
- USBR, DWR, and CDFW to explore options for genetic testing as another tool for larval fish identification.

MEETING SUMMARY

PART 1: Updates on Water Operations and Biological Updates

Relevant Actions & Triggers

Elevated turbidity at Bacon Island triggered the federal Turbidity Bridge Avoidance action and Incidental Take Permit (ITP) Condition of Approval (COA) 8.5.1 (Turbidity Bridge Avoidance) on January 17th. 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 Old and Middle River (OMR) Guidance Document or ITP as needed.

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 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 ≥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.	Off-ramped, triggered 12/31/22 (starting January 3rd through 16th EOD)

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

OMR Management Measures	Requirement	Time Frame	Trigger	Triggered?
OMR Management	Manage to a more positive OMR than -5,000 cfs.	From the onset of OMR management to the end.		Active as of 1/17/23
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.	Triggered 1/17/23, but not controlling
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		Active
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.	Off-ramped, triggered 12/31/22 (starting January 3rd through 16th EOD)
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 if: Cumulative expanded salvage, Dec 1st through Feb 28th, 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 28th	Salvage threshold for water year (WY) 2023 is 40.	Off-ramped with COA 8.3.1 triggering on 12/31/22

Condition of Approval	Requirement	Time Frame	Trigger	Triggered?
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 with detection of LFS larvae 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 1st through June 30th or until the temperature off-ramp 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.	Active, not 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.	Triggered but not controlling

Condition of Approval	Requirement	Time Frame	Trigger	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	Triggered 1/17/23, but not controlling
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 Delta Smelt is greater than or equal to one plus the average prior three years' FMWT index (rounded down). The 2022 FWMT 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 ≥12°C and Secchi from the most recent SLS/20 mm survey is ≤1m averaged across the 12 stations (809, 812, 815, 901, 902, 906, 910, 912, 914, 915, 918, and 919)	Active, not triggered

Condition of Approval	Requirement	Time Frame	Trigger	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° 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 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; water year type is below normal as of 01/01/23

Current Operations & Outlook

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

- USBR reported that releases from Whiskeytown Dam on Clear Creek are currently 200 cfs.
- Releases from Keswick Dam on the Sacramento River are 3,250 cfs.
- Releases from Nimbus Dam on the American River are 4,000 cfs likely decreasing to 3,500 or 3,000 cfs over the next six-day period.
- Releases from Goodwin Dam on the Stanislaus River are 200 cfs with a small instability flow planned for an undetermined February date.
- Delta Cross Channel (DCC) gates remain closed. No changes expected for the next seven-day period.
- The federal facility is exporting three units with an anticipated return to five units the morning of February 8th depending on conditions at Vernalis.
- DWR reported that State facility exports are approximately 5,900 cfs and will decrease with San Joaquin River flows to around 4,000 cfs to maintain an OMR index of -5,000 cfs.
- Feather River releases are holding at 950 cfs.
- As of February 6th, Sacramento River flows at Freeport were approximately 21,000 cfs. A slight increase is expected given recent precipitation, but flows will return to 20,000 to 15,000 cfs next week.
- San Joaquin River flows at Vernalis were 6,200 cfs as of February 6th and will marginally decrease to around 5,500 cfs.
- Delta outflows were 21,200 cfs as of February 6th, and will continue to diminish to 20,000 cfs over the next six-day period.
- As of February 6th, QWEST was around 4,000 cfs.
- Rio Vista flows were 17,000 cfs and will remain in the 20,000 to 15,000 cfs range.
- Turbidity at OBI is slightly above 12 FNU and may dip below in next few days.
- X2 is located at Port Chicago.
- The spring tide concluded over the weekend of February 4th and the system will enter a neap cycle the following weekend.

- The expected daily OMR index values as of February 6th are -4,800 to -5,000 cfs.
    - February 4th OMR at USGS gauge:
        - Daily: -5,900 cfs
        - Five-Day: -5,900 cfs
        - 14-Day: -5,200 cfs
    - February 4th OMR Index:
        - Daily: -5,000 cfs
        - Five-Day: -5,000 cfs
        - 14-Day: -4,100 cfs
    - February 6th OMR Index:
        - Daily: -4,800 cfs
        - Five-Day: -4,900 cfs
        - 14-Day: -4,500 cfs

No updates to the survey table.

Review of Environmental Conditions and Survey Updates

CDFW delivered catch updates on relevant surveys to the SMT.

- SLS 3 was on the water from January 30th to February 1st completing all stations. Processing is ongoing.
    - 74 Preliminary LFS larvae detections thus far:
        - South Delta: Four
        - Lower San Joaquin River (Stations 804 and 801): Three
        - Lower Sacramento River (Stations 707, 706, and 704): 19
        - Montezuma Slough: 48
- Spring Kodiak Trawl (SKT) 2 is on the water from February 6th to the 9th.
- The Bay Study January Survey is complete with the following data:
    - LFS
        - Sub-adult: 44
        - Adult: 6
    - Notable detections
        - One in Lower Sacramento River
        - One in Honker Bay
        - Most detections were San Pablo Bay and Central Bay.

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

- EDSM was on the water from January 30th to February 3rd completing 35 sites. Detections were as follows:
    - DS (60 to 76 mm)
        - Lower San Joaquin River: One (Unmarked/unclipped)
        - Suisun Bay: Two (VIE-tagged, 1 right, orange, posterior; 1 left, red, anterior)
        - Lower Sacramento: Five (VIE-tagged, all were right, green, posterior)
        - Cache Slough/Liberty Island: One (VIE-tagged left, orange, anterior)
        - Sacramento Deep Water Ship Channel (SDWSC): Four (VIE-tagged, all were left, orange, anterior)

    - LFS (70 to 107 mm)
        - Suisun Bay: 22
        - Suisun Marsh: 16
        - Lower Sacramento River: Nine
        - SDWSC: One
- EDSM is scheduled to sample February 6th to the 9th.
- DJFMP sampled Monday, Wednesday, and Friday from January 30th to February 3rd at Chipps Island completing 30 of 30 tows. Results are as follows:
    - LFS
        - 117 (62 – 110 mm)
- Chipps Island Trawl will sample Monday, Wednesday, and Friday this week.
- The DS abundance estimate for the week of February 6th was 20,148.

CDFW provided a salvage update (January 30th to February 5th).

- No smelt were salvaged at the facilities this week.

Relevant Abiotic Conditions

- USBR noted decreasing turbidity across the system with measurements likely dropping below 12 FNU in the six-day period ahead.

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

Delta Smelt

The SMT reviewed the Biological Justifications put forth by USBR and DWR in the Outlook (Biological Justifications are in italics).

- *The Turbidity Bridge Avoidance Action has been in effect from 1/17/2023 – present as warranted by turbidity conditions (OBI Daily Average > 12 FNU). The Projects operated at -2000 cfs for 19 consecutive days (starting 1/3/2023, first flush for 14 days, then turbidity bridge avoidance for 5 days), at OMR no more negative than -3500 cfs for an additional 5 days, through 1/26/2023, and at OMR no more negative than -5000 cfs thereafter.*

- *Turbidity values at OBI remain above 12 FNU (13.3 FNU on 2/5/2023) and may decrease over the next week. A turbidity bridge persists but has started to weaken.*

- *One unmarked adult Delta Smelt was detected in the Lower San Joaquin River near Antioch on 1/31/23 and one unmarked adult Delta Smelt was detected in the South Delta on 1/17/2023 near Franks Tract. Historical data suggests that migration typically lasts 1-4 weeks after first flush conditions and is thus likely ending (Sommer et al. 2011). Once Delta Smelt move upstream, they generally have limited movements (Polansky et al. 2017). However, the extent of, and variability in, migration under the current flow and turbidity conditions is highly uncertain. Additionally, some of the observed distribution of recently detected released fish could be in response to disorientation or stress from release. Fish released in the last few weeks have distributed widely.*

- *Although the possibility exists for Delta Smelt to become entrained into the OMR Corridor from the lower San Joaquin River, turbidity is decreasing across the Delta and Delta Smelt are likely at or near the end of migration and unlikely to be moving greater distances once they have completed their migration. There have been no recent detections of Delta Smelt near the entrance to the OMR Corridor or in the OMR*

Corridor or in salvage. Therefore, risk of additional Delta Smelt getting entrained into the interior Delta or salvage facilities is low.

DWR explained that the language in this week's outlook is largely consistent with the language discussed by the SMT during live-editing at last week's meeting. The primary update was to reflect greater certainty around reaching the end of the DS migration period.

CDFW and USFWS did not propose any modifications to the Biological Justifications. The SMT did not make any recommendations.

Longfin Smelt

CDFW noted a pulse of adult LFS at Chipps Island are moving up through the system. A pulse of larvae may arrive in the next few weeks after this pulse of adults. The SMT agreed overall risk for LFS has not changed in since last week did not make any recommendations.

Facility Larval Sampling Initiation

- DWR and USBR noted that both the state and federal facilities will need two to three weeks of lead time to initiate larval sampling due to staff training.
- DWR suggested that initiating larval sampling as soon as February 27th and no later than March 6th seems reasonable given cool water temperatures.
- CDFW requested that larval sampling begin March 1st or as soon as possible in March.
- DWR noted that the Larval Entrainment Pilot Study will be on the water in late February, so that data will be available to support monitoring in the system prior to the initiation of larval sampling. Furthermore, considering DS detections this year there is a higher chance of larvae being present in the South Delta. Facility staff should be ready to screen for DS and differentiate between DS and Wakasagi. The use of genetic analysis may be required to confirm larval identifications. DWR and USBR will discuss the logistics for obtaining genetic analyses on these fish.

The SMT agreed to request larval sampling at the facilities begin on March 1st or as soon as possible thereafter.

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, conditions, data, and reflects the discussion documented in Part 2 above.

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.

Part 4: Additional Considerations/Discussion

Agencies reported no items for elevation to WOMT.

DWR asked if the SMT was interested in exploring options for verifying larval species identification through genetic analysis.

- CDFW noted that while their staff have a strong identification process in place, it could be valuable to have the option to confirm identifications via genetics during critical periods to provide more certainty around the available data.
- USFWS suggested the SMT may not be able to incorporate new genetic tools into their current process.
- DWR, CDFW, and USBR will explore potential options for genetic testing as an additional tool to support larval fish identification.
- USFWS also suggested the value of testing available eDNA tools to eventually enhance entrainment detection.