Smelt Monitoring Team – Tuesday, February 28th, 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

- DWR to perform Particle Tracking Model (PTM) run as requested prior to the next Smelt Monitoring Team (SMT) meeting.
- SMT members to share feedback on data tables in Preferred Action (PA) Assessment with USBR.

MEETING SUMMARY

PART 1: Updates on Water Operations and Biological Updates

Relevant Actions & Triggers

Incidental Take Permit (ITP) Condition of Approval (COA) 8.4.2 (Larval and Juvenile Longfin Smelt Entrainment Protection) was triggered by Smelt Larval Survey (SLS) 5. 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 1/17/23; triggered 12/31/22, implemented 1/3/23 to 1/16/23

[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.	Off-ramped by detection of a ripe female by SKT 2; Triggered 1/17/23 to 2/8/23
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 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 1/17/23; triggered 12/31/22, implemented 1/3/23 to 1/16/23
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 12/31/22 with triggering of COA 8.3.1

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.	Triggered by SLS 4 on 2/16/23; by SLS 5 on 2/28/23
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.	Active, not triggered

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 to 2/8/23; 2/15/23 to 2/17/23; 2/21/23 to 2/26/23
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 September through November 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.	Active; not 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; water year type is above normal as of 02/01/23

Current Operations & Outlook

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

- USBR reported on weather conditions noting an active storm pattern with consistent precipitation over the six-day forecast window with a brief break from March 3rd to the 4th. Temperatures are expected to be below average with low elevation freezing levels and heavy precipitation along the north coast, Shasta Basin, and particularly along the spine of the Sierra. Sacramento Valley will see rainfall of approximately 0.3 inches and 0.5inches in the San Joaquin Basin.
- 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.
- Releases from Goodwin Dam on the Stanislaus River are 1,500 cfs with ongoing Tulloch side flow management.
- Delta Cross Channel (DCC) gates remain closed. No changes expected for the next seven-day period.
- As of February 27th, tides are emerging from a first quarter neap cycle with a new moon and strong spring tide on March 7th.
- The federal facility is exporting 3,500 cfs with change order to increase to 4,200 cfs on March 1st.
- DWR reported that State facility exports are approximately 2,800 cfs and may adjust to target an OMR index of -3,500 cfs.
- Feather River releases are holding at 950 cfs with a change order adjusting flows to 1,050 cfs by tomorrow as minimum flow requirements change for March.
- As of February 27th, Sacramento River flows at Freeport were approximately 20,600 cfs. Storm water may increase flows up to 35,000 cfs within the next week.
- San Joaquin River flows at Vernalis were 5,100 cfs as of February 27th and may increase to 11,500 cfs.
- Delta outflows were 22,000 cfs as of February 27th, and will likely increase to approximately 35,000 cfs.
- As of February 27th, QWEST was around 5,700 cfs with flows expected to increase to 10,000 cfs.
- Rio Vista flows were 15,000 cfs as of February 27th and may reach 30,000 cfs with storm flows.
- Turbidity at OBI is below 12 FNU.
- X2 is near Port Chicago (~70 km).

- The expected daily OMR index values as of February 27th are -3,500 to -5,000 cfs.
    - February 25th OMR at USGS gauge:
        - Daily: -2,300 cfs
        - Five-Day: -3,200 cfs
        - 14-Day: -4,200 cfs
    - February 25th OMR Index:
        - Daily: -3,100 cfs
        - Five-Day: -3,500 cfs
        - 14-Day: -4,000 cfs
    - February 27th OMR Index:
        - Daily: -3,500 cfs
        - Five-Day: -3,300 cfs
        - 14-Day: -3,800 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. New results are as follows:
    - Larval LFS
        - Napa River: 10 (Fork Length (FL) = 7-9 mm)
        - Carquinez Strait, Stations 404 and 405: 22 (FL = 7-10 mm)
- SLS 4 was on the water from February 13th to the 15th. New results are as follows:
    - Larval LFS
        - Station 801: Six (FL = 6-7 mm)
        - Station 707: Seven (FL = 6-7 mm)
        - Station 405: Three (FL = 8-9 mm)
        - Sacramento River and Confluence: 172 (FL = 5 -14 mm)
- SLS 5 is on the water from February 27th to March 1st. Eleven of 12 South Delta stations have been sampled with seven of the 11 stations processed. Preliminary results are as follows:
    - Larval LFS
        - Station 901: Two (FL = 6 mm; yolk sac present)
        - Station 915: One (FL = 7 mm; no yolk sac present)
        - Station 902: Three (FL = 6-7 mm; yolk sac present)
        - Station 809: Seven (FL = 5-7 mm)
- Spring Kodiak Trawl is scheduled to be on the water next week from March 6th to the 9th.

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

- EDSM sampled Monday through Friday the week of February 20th, completing 34 sites.
    - DS:
        - Lower Sacramento River: One (VIE tagged; 70 mm)
            - The DS abundance estimate for the week of February 20th is 1,283.
    - LFS: 18 (FL: 58 to 92 mm):
        - Lower Sacramento: One
        - Lower San Joaquin River: Four
        - Suisun Bay: 13

- EDSM is scheduled to sample Monday through Friday the week of February 27th.
- The week of February 20th Chipps Island crews completed 50 tows. This increase in tows is due to trawl efficiency protocol being in place to the end of March.
    - DS: One (VIE tagged; FL = 84 mm)
    - LFS: 37 (FL = 58 to 100 mm)
- This week Chipps Island will sample Sunday, Tuesday, Wednesday, Thursday, and Friday.

CDFW provided a salvage update (February 20th to February 26th).

- State Facility
    - DS Counts
        - February 22nd: Two
            - Clipped (January 18th Rio Vista trailer release)
            - Left, orange anterior tag (female expressing eggs, SDWSC hard release)
- Federal Facility
    - DS Counts
        - February 22nd: One
            - Right, orange, posterior tag (January 19th Rio Vista hard release)
- Operations
    - No reduced sampling frequency reported.
    - Partial interruption at the federal facility on February 23rd for 10 minutes to remove acoustic receivers from the holding tanks.
- Cumulative Seasonal Salvage
    - DS: 44
    - LFS: 24
- Genetic Analysis
    - The previously unidentified fish salvaged on January 30th is a Pond Loach (*Misgurnus anguillicaudatus*). This confirms two loach species have been detected in the Delta: Pond and Large-scale.
- Qualitative larval sampling will begin this week.
    - Federal facility: March 1st at 4 am
    - State facility: March 1st at 9 am

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

Delta Smelt

USBR suggested that DS risk has not changed from last week, noting no significant changes to abiotic conditions. The SMT agreed that there is no rationale to modify DS risk.

DWR clarified that if OBI exceeds 12 FNU in the coming week, then DWR will follow the ITP COA 8.5.1 and within three days of triggering, state operations will target the SWP share of a -2,000 cfs OMR index.

Longfin Smelt

CDFW expressed concern over LFS entrainment risk highlighting larval detections in the OMR corridor and results from the most recent Particle Tracking Model (PTM) run. CDFW highlighted substantial differences between particle entrainment from station 902 at the top of the OMR corridor across the three operational scenarios. After three weeks, there is a 10% difference in particles that make it past Chipps Island between the -2,000 and -5,000 cfs OMR scenarios, which represents an increase in fish moving downstream outside of the

zone of entrainment risk. This is unexpected, as we usually don't see many particles pushed out of the OMR corridor past Chipps. DWR clarified that hydrology used in the PTM run incorporates Vernalis flows forecasted as of Monday February 27th, which is below the forecasted Vernalis flows and QWEST values as of Tuesday February 28th, therefore the PTM results represent a worst-case-scenario. The difference between modeled hydrology from Monday and expected hydrology on Tuesday was estimated to be about +2,000 cfs in the lower San Joaquin River (QWest). Given the change in forecasted hydrology, CDFW and DWR agreed that the week one scenarios are likely more meaningful than week three scenarios.

Both CDFW and DWR agreed that LFS in the OMR corridor are at high risk of entrainment, however DWR suggested that hydrology this week is more substantially protective of LFS in the Lower San Joaquin than the previous week. Specifically, QWEST increased from +2,700 cfs during the week of February 20th, yesterday it was at +5,700 cfs and is expected to reach +10,000 cfs later this week. This anticipated increase in Vernalis flows, which could trigger ITP COA 8.4.3 (High flow offramp for Longfin Smelt) on March 1st, reduces risk for fish in the Lower San Joaquin River. Overall, this week's hydrology seems more favorable in reducing entrainment risk.

CDFW recommended operating to an OMR index no more negative than -2,000 cfs unless COA 8.4.3 is triggered, citing the most recent larval LFS detections and PTM results. Results indicated a 31% difference in particles entrained by the project plus particles in the OMR corridor at station 902 for the -2,000 cfs and -5,000 cfs OMR scenarios after one week (48% and 79%, respectively). Results also showed a 21% difference in entrainment of particles already in the OMR corridor at station 902 after one week between an SWP share of -2,000 cfs OMRI scenario and a -3,500 cfs OMRI scenario. The results showed a 7% difference in particles past Chipps at station 812 in the Lower San Joaquin River after one week between an SWP share of -2,000 cfs OMRI scenario and a -5,000 cfs OMRI scenario. DWR suggested an OMR index of -5,000 cfs, given what appears to be improving hydrologic conditions for LFS in the Lower San Joaquin River with a more positive QWEST and higher Vernalis flows expected.

The SMT agreed that risk remains high for LFS in the OMR corridor but did not reach consensus on a recommendation for ITP COA 8.4.2; the SMT will elevate this to WOMT.

The SMT agreed to request a PTM run to inform discussions at next week's meeting. The insertion points (stations 812, 815, and 902) and operational scenarios (OMR index of -5,000 cfs, -3,500 cfs, and -2,000 cfs) will be the same as the previous PTM run. If COA 8.4.3 is triggered, then the PTM run will be shifted to when 8.4.3 is expected to offramp (Vernalis flows dropping below 5,000 cfs).

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

CDFW and DWR will inform WOMT representatives of non-consensus around an OMR index recommendation under ITP COA 8.4.2 of -2,000 and -5,000 cfs respectively.