# Smelt Monitoring Team – Tuesday, February 22nd, 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 confirm with management that photos of Delta Smelt (DS) ovary staging from Spring Kodiak Trawl (SKT) sampling can be shared with 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. Turbidity Bridge Avoidance is in effect to maintain average daily turbidity in Old River at Bacon Island (OBI) at a level of no more than 12 FNU to minimize risk to adult DS in the OMR corridor where they are subject to higher entrainment risk. CDFW reported on the Incidental Take Permit (ITP) Conditions of Approval (COA) that are in effect (COA 8.4.2 Larval and Juvenile Longfin Smelt Entrainment Protection, 8.5.1 Turbidity Bridge Avoidance, 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 three-day average of daily flows at Freeport >25,000 cfs; and<br>(2) Running three-day average of daily turbidity at Freeport ≥50 Nephelometric Turbidity Units (NTU[1]); or<br>(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. | In effect as of 1/3/22 |
| 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 | Not active |

[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 | Not active |

ITP Conditions of Approval

| Condition of Approval | Requirement | Time Frame | Trigger | Triggered? |
|---|---|---|---|---|
| 8.1.5.2 (Smelt Monitoring Team Risk Assessment)<br><br>Triggered | Outlines contents for weekly risk assessments of Delta Smelt 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 | | Yes |
| 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 | Three-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 and 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:<br><br>Low risk: OMR between -4,000 cfs to -5,000 cfs<br>Medium risk: OMR between -2,500 cfs to -4,000 cfs<br>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 and 1/31/22 |

| 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 in Old River at Bacon Island (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 |

| 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 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 2/14/22 |

## Current Operations & Outlook

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

- USBR Central Valley Office (CVO) noted a shift in the weather pattern with a storm system producing reduced precipitation at high elevations along the Sierras. A colder patter will follow, bringing freezing temperatures down to the valley floor.
- 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 2,000 cfs and USBR is looking for opportunities to decrease for storage conservation.
- Releases from Goodwin Dam on the Stanislaus River are currently 800 cfs. Flows are anticipated to drop to 300 cfs in accordance with a fishery experiment on February 24th and quickly return to 800 cfs that same day.
- The Sacramento and San Joaquin Rivers are expected to deliver variable inflows into the Delta. Exports will be adjusted accordingly with a target of 11,400 cfs outflow requirement per D-1641.
- Modifications were made over the weekend to Jones Pumping Plant exports with flows decreasing from 1,700 cfs to approximately 950 cfs with a final modification on February 22nd to 800 cfs.
- Delta Cross-channel (DCC) gates are currently closed. No modifications expected.
- DWR reported that Feather River releases are 3,750 cfs, up from 3,500 cfs, with an additional 300 cfs increase expected on February 22nd.
- As of February 21st, Freeport flows were 12,050 cfs.
- Vernalis flows decreased to 1,100 cfs in response to decreases. Flows will remain steady with a minor change on February 26th or 27th due to actions on the Stanislaus River.
- As of February 21st, Clifton Court Forebay (CCF) flows have been between 0 and 200 cfs. Flows have been variable to manage the targeted flows of 11,400 cfs.
- QWEST has been positive with flows last week near 1,500 cfs and reaching around 2,400 cfs yesterday. Flows will remain in the 1,500 to 2,500 cfs range for the upcoming week.
- Rio Vista flows are currently 9,500 cfs.
- The OMR Index was -2,000 to -500 cfs for the last week.
- X2 is approximately 79 km. For the next few days, X2 is expected to move downstream with the tidal cycle, and then climb with the weekend's spring tide.
- Turbidity remains low at OBI.
- No edits were made to the survey status table.

## Review of Environmental Conditions and Survey Updates

CDFW delivered catch updates on relevant surveys to the SMT.

- Smelt Larva Survey (SLS) 3 included significant LFS catches and no DS detections. Stations of interest are below:
    - Station 519: 128 LFS larvae
    - Station 606: 140 LFS larvae
        - The overall distribution is moving in a westward direction with yolk sacs still present on many LFS.
- SLS 4 is on the water and should finish on February 25th.
- SKT 2 started sampling the week of the 14th and will conclude on February 22nd. Results include:
    - Station 609: One stage three female DS (81 mm, adipose fin clipped)
    - Station 606: Four DS and one LFS
        - Three stage three males (67 to 75 mm, adipose fin clipped)
        - One stage one female (61 mm, adipose fin clipped)

        - One LFS (80 mm)
    - USBR inquired if CDFW has photos of ovary staging.
        - CDFW confirmed that such photos do exist, but permission from management is required before images can be shared with the SMT.
    - USFWS inquired if the five DS caught will be transferred to University of California, Davis (UCD) for further investigation.
        - CDFW confirmed that the fish were preserved in liquid nitrogen and sent to UCD.

CDFW shared an update on the Larval Entrainment Pilot Study (LEPS).

- Given that LEPS is a pilot program, CDFW concluded that the reporting structure for results will be provided in an end of year report that will summarize QC'd data. Given the ongoing nature of the sampling, data is arriving sporadically, and thus CDFW does not feel confident in reporting findings on a weekly basis.
- The SMT agreed that LEPS data is still valuable in the absence of data from other monitoring programs. USBR and CDFW agreed that LEPS should remain in the Risk Assessment for this reason, even if data is only used qualitatively.

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

- EDSM sampled from February 14th to February 18th, completing 36 sites. Results are as follows:
    - Suisun Marsh
        - DS: One (61 mm, adipose clipped)
        - LFS: Five (64 to 74 mm)
- Wind may delay sampling for the week of February 21st.
- 25 DS have been detected since phase one, including 24 marked and one unmarked DS that should be verified in the next couple of weeks. All cultured/marked fish are considered adults by the Interagency Ecological Program (IEP) for take purposes.
- Chipps Island crews caught an 86 mm adipose clipped DS, and 11 LFS between 65 and 85 mm.
    - Sampling for the week of February 21st will occur Tuesday through Saturday due to staffing issues.

CDFW provided a salvage and larval facilities update (February 9th to February 22nd).

- No salvage of DS or LFS at either facility.
- No osmerid larval detections have been reported.

DWR provided updates on the DS experimental release program.

- The last release of 10,933 fish took place in the Sacramento Deepwater Shipping Channel (SDWSC) near mile marker 53 the week of February 14th.
- The total of released fish for the water year is 55,733.
    - 6,400 of the total fish were soft released.
- Planning for next year has begun. Updates will be shared with the SMT as they become available.

USBR shared environmental data updates as of February 21st.

- Three-station daily average water temperature: 12.00° C.
- Three-day running average turbidity at OBI: 3.73 FNU.
- Current turbidity at OBI: 4.90 FNU.
- X2 is 79 km.

- Weather forecast out of Antioch is a chance of rain amounting to less than one tenth of an inch transitioning to sunny and clear for the rest of the week with frost and North-Northwest winds from three to ten mph.
- Weather forecast out of Stockton is a chance of rain amounting to less than one tenth of an inch transitioning to sunny and clear for the rest of the week with frost and South-Southwest winds from 5 to 11 mph.

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

USBR noted the relatively large catch of DS, with the qualifier that most detections are near the experimental release sites. USBR requested input from the SMT regarding how the recent precipitation event should be captured in the risk assessment and if the amount of forecasted precipitation will be significant.

- The SMT agrees that the precipitation is negligible.
- CDFW highlighted that the DS detected in SKT 2 were not ripe and with 12° C as the three-station average temperature it is unlikely that spawning has begun.

USFWS inquired when the 20 mm Survey will begin.

- CDFW noted that it will begin Monday, March 21st, coinciding with SLS 6.

CDFW noted that adult LFS detections are starting to decrease. Temperatures remain conducive to spawning and the location of larval LFS remain favorable, westward, and surveys continue to detect larvae with yolk sacs. With exports remaining low and QWEST remaining positive, LFS should continue to be at a low risk of entrainment.

## 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:

- The experimental release section was updated to note that the final release was last week.
- Additional text was added to the abiotic conditions section clarifying that the females detected by SKT 2 are categorized as pre-spawn.
- In discussing evaluation question 2, the SMT agreed that precipitation and wind will not result in any changes to turbidity during the upcoming week. Text was also revised to note temperatures are currently conducive to spawning.
- Evaluation question 3 was updated to note the two pre-spawn females.
- The executive summary was modified to reflect the six marked individuals that have been collected since 2/15/22 and remove references to wind-driven turbidity.

### ITP Longfin Smelt Risk Assessment

The SMT reviewed and discussed updates to the ITP Risk Assessment.

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. No changes since last week.
    - LFS: Remains low. No changes since last week.
- Routing Risk (behavior and life history)
    - DS: Remains low. Language referencing wind-driven turbidity was removed. New text discusses the sustained low turbidity in the lower San Joaquin River, Franks Tract, and OMR corridor area.
    - LFS: Risk remains low. No changes since last week.
- Overall entrainment risk for DS or LFS.
    - DS: Remains low. No changes since last week.
    - LFS: Remains low. Text on adult salvage was moved to section 1-B.

Section 1-B: Risk of entrainment into the export facilities for DS and LFS in the central Delta

- Exposure Risk
    - DS: Remains low. Updated text to reflect that DS "have been detected" rather than "are present" in the south Delta.
        - The SMT discussed if spawning will continue as long as temperatures are conducive. USBR and CDFW agreed that spawning will build up and taper off while temperatures are within the appropriate range much like a bell curve.
    - LFS: Overall risk remains low. This section was updated to reflect the latest X2 value. Text describing LEPS detections was updated to reflect the most recent catch data (from February 9$^{th}$) and to note final data may be pending until the end of the season. Lastly, language was added referencing the rarity of adult salvage in recent years.
        - USFWS suggested it could be useful to consider relative salvage of adult LFS (i.e., salvage divided by the FMWT Index) since the Pelagic Organism Decline to better compare salvage in recent years.
- Change in exposure from last week
    - DS: Remains low. Language has been modified to reflect the downstream shift of X2 by about 4 km.
    - LFS: Remains low. No changes since last week.

The LFS executive summary was revised to reflect the most recent OMR Index, X2 location, and survey information.

## Part 4: Additional Considerations/Discussion

Agencies reported no items for elevation to WOMT.