# Smelt Monitoring Team – Tuesday, December 7th, 2021

## 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 (KW)

## ACTION ITEMS

- CDFW to request clarification on size threshold for salvage trigger in ITP Condition of Approval 8.3.3 with management.
- CDFW to connect with USBR on OMR Index issue on SacPAS.

## MEETING SUMMARY

- The discussion on the increase in proportion of Longfin Smelt (LFS) detections in the November and December Fall Midwater Trawl (FMWT) will be held during the December 14th SMT meeting.
- CDFW noted that the 5-day and 14-day OMR Index is absent from the CSV file on SacPAS, while appearing sporadically on the graph. USBR will coordinate to resolve the issue.

## PART 1: Updates on Water Operations and Biological Updates

### Relevant Actions & Triggers

USBR reported on Old and Middle River (OMR) management measures. At this point the Integrated Early Winter Pulse Protection action is active as an operational protection. The purpose is to minimize project influence on migration or dispersal of Delta Smelt (DS). CDFW reported on the Incidental Take Permit (ITP) Conditions of Approval that are in effect. Currently 8.1.5.2 is in effect requiring SMT to conduct a risk assessment. The Integrated Early Winter Pulse Protection (8.3.1), and Adult Longfin Smelt Entrainment Protection (8.3.3) were initiated as of December 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 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. | Active, not triggered |
| OMR Management | Manage to a more positive OMR than -5,000 cfs | From the onset of OMR management to the end | | Not active |
| 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. | Not active |
| 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. | Active, not triggered |

| 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 FMWT Index divided by 10, or SMT determines that there is a high risk of entrainment. | Dec 1 through Feb 28th | Salvage threshold for WY 2022 is one. | Active, not triggered |
| 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 | Not active |

| Condition of Approval | Requirement | Time Frame | Trigger | Triggered? |
|---|---|---|---|---|
| 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 Smelt Larval Survey (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 | Not active |
| 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. | Not active |
| 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 | Not active |

| 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 is not yet available. | 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 | Not active |

CDFW noted that the release of the November FMWT Index has been delayed due to a special study conducted by the FMWT crew, but it could be available by the end of the week. As a result, 8.3.3 will use the September and October indices (13), which places the salvage threshold at one LFS. Thus, any salvage of LFS could initiate

OMR management.. Any LFS greater than or equal to 60 mm caught in the Chipps Island Trawl can be considered an early warning indicator of LFS migration under 8.3.3.

CDFW and DWR discussed the salvage threshold language in Condition of Approval 8.3.3.

- DWR suggested clarifying if the salvage threshold applies only to certain life stages (i.e., adults, per the title of the COA "Adult Longfin Smelt Entrainment Protection") to avoid confusion in the future. While a fork length greater than or equal to 60 mm caught in the Chipps Island Trawl is referenced in 8.3.3 as an early warning indicator, using 60 mm as a salvage threshold would not effectively parse out juveniles and adults as there is overlap at this specific size.
- CDFW noted 8.3.3 references total combined salvage and does not include a size threshold, which indicates all LFS salvage from any life stage contributes to the trigger.
- CDFW remarked that they have observed ripe female LFS smaller than the adult size threshold of 84 mm, therefore a salvage threshold tied to the standard adult size cutoff may not be sufficiently protective of adult LFS.
- CDFW agreed to elevate this issue to their management in an effort to provide concrete guidance by the week of December 13th.

## Current Operations & Outlook

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

- USBR Central Valley Office (CVO) reported on recent storm events starting on December 5th and producing no more than a tenth of an inch in precipitation. The recent rainfall marks a shift in weather conditions leading to the possibility of more active storms in the coming week.
- 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 550 cfs. No modifications expected.
- Releases from Goodwin Dam on the Stanislaus River are currently 200 cfs. No modifications expected.
- Jones Pumping Plant exports were reduced to 800 cfs on December 6th in response to drier conditions.
- Delta Cross-channel (DCC) gates closed on November 30th and will remain closed until further notice.
- DWR reported that Feather River releases are currently at 1,500 cfs. No modifications expected until the week of December 13th.
- Freeport flows were near 5,800 cfs on December 6th and are expected remain steady into next week. Incoming precipitation events could alter flows by December 13th.
- San Joaquin River flows at Vernalis were 550 cfs on December 6th with no anticipated changes.
- Delta outflows as of December 6th were 3,700 cfs and will remain close to 3,500 cfs.
- Clifton Court Forebay inflows are 300 cfs and will remain steady for the next seven days.
- The OMR Index is about -1,200 cfs. No modifications expected.
- As of December 6th, QWEST was -200 cfs with no modification expected.
- Rio Vista flows are 3,800 cfs.
- X2 is upstream of the confluence and likely farther upstream than last week.
- There were no updates to the survey status table.
- USBR noted that language was added to the outlook indicating that a sensor at Freeport had malfunctioned for a few hours during December 5th and 6th resulting in a data gap for the three-day average.
- DWR suggested updating the LFS table to include the temporary salvage trigger of one LFS for Condition of Approval 8.3.3 based on the September to October FMWT Index.

### Review of Environmental Conditions and Survey Updates

CDFW shared the following updates:

- The FMWT November Index is still forthcoming.
- Preliminary Bay Study data included LFS detections.
    - One adult was caught near Rio Vista, and three more adults were found in Suisun Bay.
    - In total, 21 juveniles were detected with one in the lower Sacramento River and 20 in Suisun Bay. Fork lengths ranged from 57 mm to 106 mm indicating that adult LFS are starting to stage and migrate upriver.
    - CDFW distributed more detailed information to the SMT via email.
- Smelt Larva Survey (SLS) and DS experimental releases will begin the week of December 13th.

USFWS reported on Enhanced Delta Smelt Monitoring (EDSM) and Chipps Island Trawl.

- Six LFS were captured in Suisun Marsh yesterday with fork lengths from 65 mm to 83 mm.
- Detailed information for the week of November 29th can be found in the USFWS catch report distributed to the SMT on December 6th.

CDFW provided a salvage update (November 30th to December 6th).

- No salvage to report from federal or state facilities for last week.

USBR shared environmental data updates as of December 6th.

- Three-station daily average water temperature: 12.62° C.
- Three-day running average discharge at Freeport: 5,507 cfs.
- Three-day running average turbidity at Freeport: 3.83 FNU.
    - Note: there was a gap in the data during this period.
- X2 is >81 km.
    - Estimated Sacramento River X2 is 97.1 km.
    - Estimated San Joaquin River X2 is 98.9 km.
- Weather forecast out of Antioch is clear to cloudy with west to southwest winds around 8 mph. Precipitation accumulating to less than one tenth of an inch is possible.
- Weather forecast out of Stockton is clear to cloudy with west/southwest and northwest winds from 5 to 7 mph. Precipitation accumulating to less than one tenth of an inch is possible.

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

USBR requested input from the SMT on two topics:

- Should language in the assessment referencing the association with X2 and the DS population centroid in November be updated now that it's December?
    - CDFW referenced Sommer et. al. 2011 , which indicates there is no statistical evidence for a change in the relationship between X2 and the distribution of DS in December.
- Should precipitation from the next storm system be discussed this week or next?
    - DWR suggested the SMT address the precipitation in the long-range forecast next week since the forecast could change and the pulse would not likely arrive in the Delta until a few days after the initial rainfall.

CDFW noted that LFS catch data at Chipps Island indicates adult LFS are beginning to migrate into the Delta. Migratory behavior in early December is consistent with the Smelt Effects Analysis.

- DWR and CDFW concurred with CDFW's observation.

CDFW recommended the SMT primarily rely on the Chipps Island data since the preliminary Bay Study data has not yet been confirmed.

## PART 3: Live-edit Assessments

### ITP Longfin Smelt Risk Assessment

- CDFW updated the LFS summary:
    - Added language noting LFS adults are moving into Delta based on Chipps Island and preliminary Bay Study catch data.
    - Removed language stating the probability that LFS will initiate a spawning migration increases as the season progresses.
    - Stated that the risk of entrainment remains low due to continued low exports.
    - Removed references to the FMWT Memo.
    - CDFW pointed out that Appendix 1 in the Effects Analysis indicates that the average spawning migration start date is December 13$^{th}$ which is defined when 5% of the cumulative catch at Chipps Island began.
        - Given that there is no evidence implying the onset of spawning, DWR recommended that language in the assessment be modified to: "There is evidence that the spawning migration has begun, but no indication that spawning has commenced."
    - USBR inquired if fish found in Rio Vista qualify as originating from the central Delta.
        - CDFW clarified that the Central Delta is defined as being between Jersey Point on the San Joaquin River and Bacon Island, so Rio Vista is not considered within the central Delta.
        - CDFW suggested replacing central Delta with "lower San Joaquin River" when discussing the lack of recent detections.
    - CDFW changed the last sentence of the summary to: "Adults are at low risk of entrainment, though the X2 position indicates that spawning my occur further upstream than during wet years."
- DWR requested clarification if any monitoring programs which collect LFS look for the expression of gametes.
    - CDFW noted that Chipps Island does, but any LFS that are transferred to the Fish Conservation and Culture Laboratory (FCCL) are not checked for expression.
- CDFW pointed out that the risk of entrainment may change as the LFS begin to migrate, though exports remain low and the current OMR Index (-1,200 cfs) is more positive than the lowest OMR Index the SMT can recommend. CDFW also noted that the estimated position of X2 is higher this week and LFS have been detected upstream of X2, which indicates the risk of entrainment is starting to change.
    - To reflect the changing conditions, Routing Risk for LFS was modified to, "Moderate. Spawning Migration has begun and X2 is farther upstream than last week."
    - The SMT agreed the overall entrainment risk for LFS remains low and noted that, "Exports are projected to remain low resulting in an OMR index between -1,000 cfs and -2,000 cfs."
- Life stages present was changed to note that adults were detected by Chipps Island Trawl.

### Proposed Action Weekly Evaluation of Delta Smelt, including Distribution, Abiotic Conditions, Risk Assessment Questions, and Executive Summary

- USBR reviewed updates reflecting the latest dates and data, including X2 position, turbidity, OMR Index, and anticipated precipitation.
    - USBR included a caveat highlighting the missing data from December 5th and 6th.
- The first Turbidity Report of the season was included as an attachment.
- USBR updated the relevant assessment questions:
    - Question 1 was edited to reflect forecasted precipitation in the next seven days.
    - DWR suggested noting that first flush conditions are not expected in the next seven days.
    - Questions 2 and 5 were edited to reflect the latest estimated X2 and turbidity data, respectively.
- USBR modified the Executive Summary to highlight the Integrated Early Winter Pulse Protection action went into effect on December 1st.

## Part 4: Additional Considerations/Discussion

Agencies reported no items for elevation to WOMT.