

Smelt Monitoring Team - Tuesday, December 14th, 2021

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

- USFWS will collect email input from the Smelt Monitoring Team (SMT) on the increase in proportion of Longfin Smelt (LFS) detections in the November and December Fall Midwater Trawl (FMWT).

MEETING SUMMARY

- USBR clarified that the December 15th and 16th Delta Smelt (DS) experimental release will be consolidated and moved to December 15th due to high winds. The location and timing of the release will not impact operations in the south Delta.
- CDFW addressed comments from last week's SMT call regarding the absence of length criteria for Condition of Approval 8.3.3 other than consideration of 60 mm fish in Chipps Island catch. It is CDFW's position that LFS collected during this time would count towards the threshold regardless of size. CDFW noted that input from agency experts supported including Longfin Smelt (LFS) smaller than 85 mm in the trigger. Evidence and data summarized in the ITP Effects Analysis suggest that immature LFS smaller than 85 mm co-occur with larger adults in the estuary, so any actions to protect smaller LFS ultimately benefit adults as well. USFWS pointed out that it is helpful to always refer to the length of a DS or LFS, not just life stage, as there is currently no single convention for determining the life stage of DS or LFS.

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 (2) Running three-day average of daily turbidity at Freeport ≥50 Nephelometric Turbidity Units (NTU); 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.	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

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
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 (2) Running three-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.	Not active
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¹ The current instrumentation measures turbidity in Formazin Nephelometric Units (FNU).

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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) Triggered	Outlines contents for weekly risk assessments of Delta Smelt and Longfin Smelt (LFS) required under 8.1.5 and 8.1.1	Nov 1 st through June 30 th or until off-ramped by 8.8		Yes

Condition of Approval	Requirement	Time Frame	Trigger	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	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.	Not active
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 1 st through Feb 28 th , 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 1 based on the September and October FMWT indices.	Not active

Condition of Approval	Requirement	Time Frame	Trigger	Triggered?
8.4.1 (OMR Management for Adult Longfin Smelt)	<p>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:</p> <p>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</p>	Onset of OMR management through Feb 28 th	SMT recommendation based on weekly risk assessment	Not active
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

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.	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 1 st through June 30 th 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 threshold for this year is one.	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 30 th	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 1 st through June 30 th 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

Current Operations & Outlook

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

- USBR Central Valley Office (CVO) reported heavy rain, wind, and strong winter storm conditions this week with another storm forecast for early next 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. Side flow management may alter releases. A flood management action is in place, although this does not place Shasta under a flood control situation.
- American River releases from Nimbus Dam are holding at 550 cfs. Side flow management may alter releases.
- Releases from Goodwin Dam on the Stanislaus River are currently 200 cfs. Side flow management may alter releases.
- Freeport flows increasing from 7,000 cfs to 27,000 cfs.
- Yesterday, Jones Pumping Plant exports were increased from minimum operations to 1,700 cfs. Today (December 14th) Jones Pumping Plant exports are currently 2,700 cfs with increased flow expected through the week up to maximum exports of 4,200 cfs on Thursday.
- Delta Cross-channel (DCC) gates are currently closed with no anticipated actions to open.
- DWR reported that Feather River releases as of December 13th were 1,500 cfs and will be decreasing to 950 cfs on December 16th.
- San Joaquin River flows at Vernalis are currently 600 cfs and are anticipated to reach 1,600 cfs before declining.
- Clifton Court Forebay inflows increased from 300 cfs to 3,000 cfs on December 13th with an expected maximum of 5,000 cfs by December 18th or 19th.
- As of December 14th, Delta outflows are 11,000 cfs with an anticipated high for the week between 25,000 and 30,000 cfs.
- With recent precipitation QWEST is expected to be fluctuating between 5,000 cfs to 8,000 cfs for the remainder of the week. Exports and expected rainfall will result in a more negative trend.
- Rio Vista flows will be close to 20,000 cfs during the week of December 14th, and may decline due to flows.
- Low pressure has pushed the X2 further upstream. Increased flows are anticipated to move X2 back down stream.
- Turbidity at Freeport is 16 FNU as of December 14th.
- The OMR Index is approximately -5,500 cfs as of December 14th and will trend towards -7,000 cfs for the week if both state and federal projects export ~4,000 cfs.
- The survey status table was updated to reflect the start of the Smelt Larval Survey (SLS).
- CDFW requested clarification on expected OMR values further into the week.
 - DWR estimates an average of -7,000 cfs +/- 1,000 cfs depending on Vernalis flows.

Review of Environmental Conditions and Survey Updates

- CDFW confirmed that SLS sampling began yesterday though only two stations were surveyed due to a weather delay.

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

- No updates for Chipps Island Trawl.
- An additional nine LFS were captured in Suisun Marsh on December 13th with fork lengths ranging from 63 mm to 90 mm.
- USFWS noted that EDSM is no longer monitoring in the western delta due to X2 position and current drought conditions. Efforts have been redistributed to another region in Suisun Bay. The new sampling stratum is located in the middle of Suisun Bay.

CDFW provided a salvage update (December 7th to 13th).

- No salvages at either facility.

USBR shared environmental data updates as of December 13th.

- Three-station daily average water temperature: 11.23° C.
- Three-day running average discharge at Freeport: 6,621 cfs.
- Three-day running average turbidity at Freeport: 3.60 FNU.
- X2 is >81 km.
 - Estimated Sacramento River X2 is 97.2 km.
 - Estimated San Joaquin River X2 was not available.
- Weather forecast out of Antioch is clear to cloudy with west to southeast winds from 5 to 20 mph. Precipitation amounting a quarter of an inch to half inch predicted.
- Weather forecast out of Stockton is clear to cloudy with west to northwest winds from 7 to 20 mph. Precipitation amounting a quarter of an inch to half inch predicted.

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

- USBR requested input from the SMT if first flush should be discussed given the recent precipitation.
 - CDFW noted that the necessary biological conditions could be met to qualify for a first flush, primarily driven by the heavy precipitation in conjunction with increasing Freeport flows. Furthermore, CDFW pointed out that under the ITP if the SMT determines that if conditions indicate that there is a high likelihood of DS migration into areas of possible entrainment the SMT can trigger 8.3.1 which would activate OMR management. A strong case would have to be built to pursue activation of 8.3.1. A point of particular interest is the projected OMR Index suggests the footprint of the pump will extend higher into the Delta, potentially placing fish into areas of higher entrainment likelihood.
 - DWR highlighted historical trends with an emphasis on this year's departure from the norm with abundant October precipitation and an uneventful November. However, with the December set of winter storms there is a greater chance for a traditional first flush arriving the week of December 20th or 27th. The environmental conditions that significantly drive fish behavior is hydrologically driven turbidity and to some extent tidal velocity. There is no need to rush classification of events as a first flush if it fails to meet the necessary trigger criteria.
 - USBR concluded that there is insufficient evidence to recommend changes in management and trigger a first flush based off the collection of conditions the SMT has reviewed (i.e., turbidity in the South and Central Delta).
 - DWR and CDFW agreed.
- CDFW noted 14 LFS caught on December 9th and 10th that fit the threshold for a mature adult. Available data from Chipps Island suggests that migration has begun with LFS moving into the system to spawn. However, there is currently a lack of information on maturation status. Furthermore, Clifton Court Forebay and the three station daily average water temperature have fallen below 12° C which, according to the Effect Analysis, is a variable considered in the onset of LFS spawning.
- CDFW anecdotally reported on a UC Davis Otolith Geochemistry Lab blog post that contained descriptions of ripe adult male LFS present in the South Bay. CDFW emphasized that this is a non-traditional data stream.
- CDFW clarified that there is consistency in reproductive timing between LFS in the South Bay and Delta. The South Bay dataset is limited, so further study may be necessary. USFWS referenced [Lewis et al. 2019](#), which reported LFS larvae in other areas of the Bay Area in wet years.

- CDFW will be conducting a pilot study to evaluate larval density near Clifton Court Forebay in anticipation that current environmental conditions will likely place larvae near facilities later this water year.

PART 3: Live-edit Assessments

ITP Longfin Smelt Risk Assessment and Delta Smelt Assessment

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

- CDFW reiterated that triggering 8.3.3 would require DWR to reduce exports and would initiate OMR management, but any recommendation would be under adult protection and cannot focus on future distribution of LFS.
 - DWR noted that there is a lack of evidence showing LFS in the San Joaquin River at this point, and recommended waiting until next week when the runoff from the current storm has reached the Delta and additional precipitation may occur to consider triggering actions.
- Routing Risk for LFS under Section 1-A is medium due to spawning migration and the upstream location of X2.
- Overall Entrainment Risk for LFS under section 1-A is low due to a lack of detections in the lower San Joaquin River and south Delta and adult salvage being rare.
- Exposure Risk for LFS under section 1-B is medium given that LFS may be present in the lower San Joaquin Delta, however no LFS have been detected by EDSM in that region.
- The change in exposure from the previous week for LFS under section 1-B has increased due to the more negative OMR Index. Overall risk remains low.
- The LFS summary language was edited to note that:
 - Spawning has likely begun but hatching has not been detected.
 - There is increased risk of entrainment due to increased exports, but overall risk of entrainment remains low based on historical salvage trends.
- Exposure Risk for Delta Smelt in section 1-B was described as medium if DS are present, however low turbidity in the region reduces the probability that they are present. This change was made to reflect changes in hydrology associated with increased exports.

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.

- Life stage was modified from subadults to adults to reflect anticipated spawning behavior. The rest of the document was changed to reflect this.
- Language was added to the Biological Conditions section stating that DS would likely be staging to respond to increases in turbidity and flow from potential first flush conditions.
- SLS was added to the list of surveys currently informing distribution of DS.
- Under Abiotic Conditions, the section on Turbidity was updated to reflect increases due to recent precipitation and language was added to clarify that the pulse of turbidity from the San Joaquin River is expected to arrive in the south Delta by December 19th.
- The relevant assessment questions were updated to reflect the latest dates and data and to note that first flush conditions may be met in the upcoming week.
- The executive summary was revised to acknowledge that first flush conditions may occur in the next seven days and that the increase in exports will result in a more negative OMR Index which would increase the likelihood of entrainment if Delta Smelt are in the region.

Part 4: Additional Considerations/Discussion

Agencies reported no items for elevation to WOMT.