

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

None

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, and 8.5.2 Larval and Juvenile DS Protection are active. As of February 14th, COA 8.12 Barker Slough Pumping Plant Longfin and Delta Smelt Protection was triggered when Smelt Larva Survey (SLS) 3 detected three larval Longfin Smelt (LFS) at station 716, and the updated February Sacramento Valley Water Year Forecast qualified as a dry year. Protections are active from January 15th to March 31st and during this time Barker Slough Pumping Plant shall reduce the maximum seven-day average diversion rate to less than 60 cfs. CDFW clarified that COA 8.12 was triggered based on new detections after the change in water year type was confirmed, rather than being based on catch prior to the updated water year forecast.

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 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.	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 (FNU).

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

IIP 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
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 1 st through Feb 28 th , exceeds most recent 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: 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 28 th	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 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 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 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	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) reported on a small storm system bringing some winds early this week with dry conditions continuing through the forecast period.

- 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 Reclamation is looking for opportunities to decrease for storage conservation.
- Releases from Goodwin Dam on the Stanislaus River are currently 900 cfs. Given the updated Critical February San Joaquin Valley Water Year type classification, a change order has been issued reduce flows to 800 cfs on February 17th adjusting for the change in the D-1641 Vernalis flow requirement.
- Jones Pumping Plant exports are currently 1,700 cfs in response to the monthly requirement targeting an outflow of 11,400 cfs. Further export adjustments may occur to maintain the targeted outflow as Delta inflow changes.
- Delta Cross-channel (DCC) gates are currently closed. No modifications expected.
- DWR reported that Feather River releases are 3,500 cfs with possible changes through the week to support outflows.
- As of February 14th, Freeport flows are 12,200 cfs. Flows will fluctuate between 12,000 and 13,000 cfs with the tidal cycles and other factors.
- Vernalis flows are approximately 1,300 cfs, and will likely decrease over the next few days to about 1,000 cfs.
- As of February 7th, Clifton Court Forebay (CCF) flows have been between 300 to 1,000 cfs. As of February 15th, flows were 100 cfs and will remain low to maintain the 11,400 cfs outflow target.
- Delta outflows were 11,800 cfs yesterday and will remain steady.
- Over the last week QWEST was between 1,500 to 2,000 cfs and will remain stable.
- Rio Vista flows are currently in the 9,000 to 10,000 cfs range and expected to hold steady.
- The OMR Index was -1,200 to -1,800 cfs for the last week and will remain stable moving forward.
- X2 is > 81 km. It moved upstream with the spring tide over the last week and is currently east of Collinsville.
- Turbidity is expected to increase in Franks Tract due to the current wind event.
- 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 was active from February 8th to 14th. Processing is complete for all 12 south Delta stations with the remainder still in processing. Station 901 was dropped due to excessive vegetation. Detections so far include:
 - Station 809: Five LFS larvae
 - Station 812: Five LFS larvae
 - Station 804: 41 LFS larvae
 - Station 513: 97 LFS larvae
 - Stations 804 and 513 are located just inside the confluence region.
- Spring Kodiak Trawl (SKT) is active and on the water as of February 15th after mechanical issues on the 14th. Sampling is expected to conclude February 18th.
- Larval Entrainment Pilot Study (LEPS) data is delayed due to continued COVID mitigation measures for lab staff.
- Shift three from the LEPS February 1st 24-hour sampling period (3:00 to 8:00 am) completed 15 tows. Three LFS larvae were detected between 7 to 8 mm and no yolk sac present.

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

- Results for EDSM sampling from February 7th to February 10th are below:
 - Suisun Bay
 - LFS: Five (64 to 88 mm)
 - Suisun Marsh
 - DS: One (61 mm, adipose clipped)
 - Lower Sacramento River
 - DS: One (55 mm, adipose clipped)
- Wind may delay sampling for this week.
- Chipps Island sampling was delayed last week due to COVID related staffing changes. Sampling went from February 7th to the 11th. All 50 tows were completed with six LFS detections marking a sharp decrease in LFS catch. Sampling should resume as usual this week.

CDFW provided a salvage and larval facilities update (February 8th to February 14th).

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

DWR provided updates on the DS experimental release program.

- The week of February 7th, 12,800 fish were hard released over two days at Belden's Landing. With one detected on February 14th at the same location it is unclear to what extent the fish are dispersing from this location.
- The week of February 14th, 8,000 fish are expected to be released over two days in the Sacramento Deepwater Shipping channel (SDWSC) near mile marker 53. This is the last release for the water year. In total, approximately 53,000 fish were released.
- The transport carboys for experimentally released DS had some eggs in them after releases.
- USBR noted there is a record of all release locations on SacPAS for future reference.

DWR also reported on a DS enclosure study at Rio Vista, noting that two days after hatchery fish were put into the cages, about 30% of the fish were expressing gametes. This suggests that spawning may be underway for hatchery origin fish.

USBR shared environmental data updates as of February 14th.

- Three-station daily average water temperature: 12.3° C.
- Three-day running average turbidity at OBI: 3.83 FNU.
- Current turbidity at OBI: 2.10 FNU.
- X2 is > 81 km.
 - Estimated Sacramento River X2 is 85.1 km.
 - Estimated San Joaquin River X2 is 84.8 km.
- Weather forecast out of Antioch is sunny and clear with north northwest winds from 16 to 21 mph and gusts up to 36 mph during the evening. Winds will taper off to 3 to 7 mph for the next few days. The wind event is expected to be brief and not pose any major changes to overall conditions.
- Weather forecast out of Stockton is sunny and clear with north northwest winds 15 to 20 mph and 29 mph gusts possible. North winds will taper off to 6 to 11 mph for next few days.

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

USBR noted similar conditions to last week with the exception of possible, but brief, wind driven turbidity. USBR also suggested that at this point in the season, the assessment may benefit from additional language noting that as the season goes forward the likelihood of DS spawning is expected to increase despite no direct observations via surveys.

- CDFW agreed that such language would be fitting as the SMT has been discussing gamete expression and imminent spawning.

USFWS inquired if there will be any genetic analysis conducted on larval DS detections to determine if there is cross breeding between cultured and wild DS.

- DWR pointed out that SLS, 20 mm Survey, and larval sampling at the facilities place fish in formalin thus precluding genetic analysis. Genetic analysis will have to wait until older DS are caught in the Summer Towntnet Survey. Furthermore, DWR is conducting a study to evaluate nine alternatives to formalin for stability as a preservative while retaining morphological and genetic traits.

CDFW opened a discussion with the SMT about conducting a PTM model run. It was decided that with the less negative OMR Index and LFS larvae detected at the farthest downstream stations, the risk of entrainment is low and overall, the PTM would not be informative. DWR highlighted that while the OMR Index may reach -2,000 cfs, that level is not expected to be sustained. Hence it would be difficult to achieve a few scenarios to conduct multiple PTM runs.

Additionally, CDFW discussed volitional movement of LFS in greater detail noting that based on [Bennett et al. 2002](#), LFS greater than 10 mm were found deeper in the water column, indicating they were capable of vertical migration, and less than 10 mm were found near the surface. In response to the question posed by USFWS at last week's meeting, while at 10 mm it seems like fish can migrate vertically, true swimming capable of overcoming hydrology appears at 20 mm and above.

- USFWS concurred that the swimming behavior of fish larvae up or down in the water column will likely not significantly improve their ability to overcome hydrology.
- CDFW pointed out that due to positive Qwest and less negative OMR, LFS larvae will have a lower likelihood of entrainment. LFS could grow in a few months to a size where swimming ability can counteract flows.

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:

- Updated the abundance estimate to reflect an all-strata abundance estimate from February 2nd to the 7th. The most recent February 14th DS capture was also noted.
- The abiotic conditions section was revised to note that gametes were observed in the DWR enclosure study.
 - The SMT discussed how the expression of gametes in hatchery fish is possibly a stress response, and not necessarily an indication of imminent spawning.
- The evaluation questions were updated to reflect current wind event impacts on turbidity.

- The Executive Summary was modified to reflect the temporary increase in turbidity due to high winds and the most recent DS detection.
- CDFW raised concerns about potential DS movement during and after the shift in X2 with the tide.
 - USBR and CDFW noted that it will likely not impact the likelihood of entrainment.
 - USFWS remarked that while adult DS tend to be located upstream of the confluence at this time of year, the effect of the spring tide on entrainment risk is harder to predict if it is offset by low turbidities and less negative OMR.
- DWR noted the movement of hatchery fish may not follow historical patterns of DS movement and suggested caution when extrapolating wild fish behavior from hatchery fish.

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. Updated to note that temperatures are now conducive to spawning as reported in [Damon et al., 2016](#).
 - LFS: Remains low. No changes since last week.
- Routing Risk (behavior and life history)
 - DS: Remains low. Added a statement that a brief wind event has briefly increased turbidity in Franks Tract but the OMR Corridor has remained clear.
 - LFS: Risk remains low. Updated language on X2 location and noted that adult detections are decreasing.
- Overall entrainment risk for DS or LFS.
 - DS: Remains low. No changes since last week.
 - LFS: Remains low. Highlighted the positive QWEST values.

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

- Exposure Risk
 - DS: Remains low. No changes since last week.
 - LFS: Overall risk remains low. Text was added to note positive QWEST, SLS 3 detecting larvae at two most downstream stations (809 and 812), and X2 moving upstream. Language was also added to acknowledge larval LFS detections in West Canal in early February.
- Change in exposure from last week
 - DS: Remains low. Highlighted X2 shifting upstream from last week and low exports.
 - LFS: Remains low due to low exports. Revised to note that a positive QWEST is expected to help reduce the risk of entrainment.

The LFS executive summary was revised to reflect the following:

- Updated X2 location.
- Positive QWEST.
- Ongoing spawning in the central and south Delta due supported by detections from SLS 2 and 3.
- Removed language referencing SLS 2 triggering COA 8.4.2 and noted SLS 3 did not trigger 8.4.2.

The Risk Assessment was also updated to reflect the triggering of COA 8.12 (Barker Slough) by SLS 3 and the Sacramento Valley Water Year Forecast dry year designation.

Part 4: Additional Considerations/Discussion

Agencies reported no items for elevation to WOMT.