

PARTICIPANTS

- California Department of Fish and Wildlife (CDFW)
- California Department of Water Resources (DWR)
- National Marine Fisheries Service (NMFS)
- U.S. Bureau of Reclamation (USBR)
- U.S. Fish and Wildlife Service (USFWS)
- Kearns & West

ACTION ITEMS

- CDFW will confirm via email that 20-mm Survey 2 processing is complete. [CONFIRMED]
- CDFW will provide fork length size range for Longfin Smelt (LFS) salvaged at the State Water Project (SWP) and Central Valley Project (CVP) last week via email. [COMPLETED, included in notes]
- USFWS will inquire about the 56mm Delta Smelt (DS) and whether or not it will contribute to this week’s abundance estimate, and if adults and young of the year fish are treated the same when calculating the abundance estimate.

MEETING SUMMARY

PART 1: Updates on Water Operations and Biological Updates

Relevant Actions & Triggers

USBR reported on the Old and Middle River (OMR) management measures currently in effect and whether they have been triggered; CDFW reported on the Incidental Take Permit (ITP) Conditions of Approval that are currently in effect and whether they have been triggered. 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 OMR guidance document or ITP as relevant.

Proposed Action

OMR Management Measures	Requirement	Time Frame	Trigger	Active? 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	Not active; Not triggered

¹ The current instrumentation measures turbidity in Formazin Nephelometric Units (FNU).

OMR Management Measures	Requirement	Time Frame	Trigger	Active? Triggered?
			future entrainment or a spent Delta Smelt (DS) has been collected in monitoring surveys.	
OMR Management	Manage to a more positive OMR than -5,000 cfs	From the onset of OMR management to the end		Yes (initiated on 1/1/2021 for salmon)
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.	Off-ramped; not triggered
Larval and Juvenile DS	Run hydrodynamic models and forecasts of entrainment, informed by the 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	Active; not triggered

ITP Conditions of Approval

Condition of Approval	Requirement	Time Frame	Trigger	Active? Triggered?
8.1.5.2 (Smelt Monitoring Team Risk Assessment)	Outlines contents for weekly risk assessments of DS and 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)	Reduce south Delta exports for 14 consecutive days to maintain a 14-day average OMR index no more	Dec 1 to Jan 31	Three day running average daily flows at Freeport greater than, or equal to,	Not active

Condition of Approval	Requirement	Time Frame	Trigger	Active? Triggered?
Pulse Protection)	negative than -2,000 cfs, and convene the Smelt Monitoring Team (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.		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.	
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 is three LFS for WY 2021.	Not active
8.4.1 (OMR Management for Adult Longfin Smelt)				Off-ramped due to detection of Longfin Smelt larvae on December 28 th
8.4.2 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) LFS 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) 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,	Triggered on 1/26, 2/2, 2/23, 3/9, 3/16, 3/30

² CDFW confirmed that the “average catch per tow > 5 larvae or juveniles” referred to by Condition 8.4.2 should be calculated as the average of the three tows done at each station, i.e., the total LFS reported at each station in the 20-mm Survey is divided by three to calculate average catch per tow. Also, the SMT should always use the most recent survey data to determine whether the Condition is triggered; if only partial data is available, they refer to the previous survey available.

Condition of Approval	Requirement	Time Frame	Trigger	Active? Triggered?
			901, 902, 906, 910, 912, 914, 915, 918 and 919	
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.	No
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 April 1st	Turbidity at OBI > 12 FNU	Off-ramped; not 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 DS 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 DS 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

Condition of Approval	Requirement	Time Frame	Trigger	Active? 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 1 st through June 30 th of dry and critical water years for DS	Larval Smelt are detected at SLS Station 716 during the period identified for each species, and/or when recommended by the SMT	Off-ramped for LFS; Active but not triggered for DS

Current Operations & Outlook

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

- USBR Central Valley Office (CVO) reported that last week's precipitation was very minimal and is not expected to result in a sizeable response in the rivers. Forecasted conditions continue to be dry and warming; there is no precipitation anticipated in the next seven days.
- Releases from Whiskeytown Dam on Clear Creek are currently 200 cfs, with the gage at Igo measuring 225 cfs.
- Releases on the Sacramento River from Keswick Dam are currently at 7,500 cfs and will potentially increase depending on American River flows.
- American River releases from Nimbus Dam are currently 1,000 cfs and could go up or down.
- Releases from Goodwin Dam on the Stanislaus River will range from 1,200 cfs to 325 cfs as they implement the last leg of the spring pulse flow.
- Conditions in the Delta continue to be challenging given low inflows. Beginning May 1st there will be a relaxation of the Delta outflow requirement under D-1641. Jones Pumping Plant exports will be between 800 and 1,000 cfs this week.
- The Delta Cross-channel Gates are currently closed, but the gates will be tested the first week of May in preparation for regular operations in mid to late May per the PA and D-1641 requirements. The testing is anticipated to take one day but could be longer.
- DWR reported that Feather River releases from Oroville are 1,100 cfs and will decrease to 800 cfs later this week.
- Sacramento River flows at Freeport are 6,000 cfs; DWR hopes they will remain steady even as upstream demands increase. San Joaquin flows at Vernalis are 1,300 cfs and will decrease to 600-700 cfs in coming days in response to the decreasing releases from Goodwin Dam for the Stanislaus River spring pulse flow.
- Clifton Court exports are targeting 400 cfs. Delta outflow is ranging between 5,600 and 5,700 cfs; DWR hopes it will remain stable at that level.
- The OMRI is around -1,000 cfs and will become more negative, nearing -1,500 cfs depending on San Joaquin River flows.
- QWEST is currently 1,000 cfs; but as San Joaquin River flows decrease, QWEST will be near zero or become slightly negative.

- X2 is currently upstream of Collinsville (81 km).
- South Delta temporary agricultural barriers will begin to be installed on May 1st, with closures occurring in mid-May to late May. The first barriers installed will be at Grant Line and Middle River, followed by Old River near Tracy.

NMFS asked whether pumping will still be in a 1:1 ratio with San Joaquin flows until early May. DWR confirmed 1:1 is the standard but the projects are actually pumping significantly less than that.

CDFW asked about the NDOI; DWR stated that it is 8,500 cfs and will decrease over the next week.

Review of Environmental Conditions and Survey Updates

CDFW shared survey updates.

- Spring Kodiak Trawl (SKT) 5 is currently sampling (April 26th to 29th). This will be the final SKT survey of the season.
- *After meeting CDFW confirmed 20-mm Survey 2 processing is complete with no Delta Smelt detected.*
- 20-mm Survey 3 (April 19th to 22nd) has been 49 percent processed so far. CDFW distributed an email update yesterday (April 26) with details and shared highlights on the call:
 - No DS have been detected.
 - 52 LFS have been detected so far.
 - All stations in the south and central Delta have been processed: 10 LFS (11-20mm) were detected at Station 809.
 - No LFS were detected at Station 716.
- 20-mm Survey 4 will start next week (May 3rd to 6th). The closure of the Old River Bridge will prevent easy sampling of Station 918, so a separate crew will sample there Thursday rather than earlier in the week with the rest of the central and south Delta stations.
 - CDFW did not have concerns about the delayed sampling since, if LFS are detected at Station 918, the SMT generally assumes they are about to be entrained and there is no meaningful action that can be taken by the SMT.

USFWS reported on the Enhanced Delta Smelt Monitoring (EDSM) Program.

- Based on sampling completed April 12th to 16th, the abundance estimate was 49,733 Delta Smelt.
- EDSM Phase 2 (20-mm) sampled in all six strata Monday through Friday last week (April 19th to 23rd). Friday was a makeup day due to COVID-mitigation. Those samples have all been sorted and the first round of IDs completed except for one tow. 815 larval LFS were detected.
 - One LFS (9.4 mm) on April 20th in the Sacramento Deep Water Ship Channel
 - 814 LFS (11.4-28.3 mm) on April 23rd in Suisun Marsh
- EDSM Phase 2 (20-mm) will continue its sampling this week (April 26th to 29th). Today, it sampled in the Sacramento Deep Water Ship Channel and Suisun Bay.
 - One DS (56mm) was captured today (April 27) in the Sacramento Deep Water Ship Channel. The fish recovered well and was released. Pictures are being reviewed by the Quality Control biologist. There was no genetic sample taken in accordance with EDSM protocol. DWR encouraged EDSM to consider taking genetics in the future.
 - DWR explained that Jeff Jenkins, DWR, developed a photometrics tool using image J software to help differentiate between DS, hybrids, and wakasagi based on their body depth:fork length ratio. The tool can be used as long as photos were taken on a measuring board. DWR offered to use photos of the fish to assess the validity of the ID. By the end of the meeting, they had used the tool to make an assessment and reported

that the fish landed within the body depth:fork length ratio parameters for DS identification. The tool was described in a contributed paper titled “Exploring Secondary Field Identification of Delta Smelt and Wakasagi Using Image Software” in the 2020 Spring IEP Newsletter Volume 39.

- This brings total DS detections in Water Year 2021 by EDSM to six.
 - 1,290 LFS were collected so far over the duration of EDSM Phase 2 sampling.
- The Chipps Island Trawl caught zero DS and four LFS in the last week. The LFS were caught on April 20th (two at 80 and 86mm, no expression), April 25th (one at 93 mm, no expression), and April 26th (one at 33mm, no expression).
- The Chipps Island Trawl is scheduled to sample five days this week.

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

- No adult or larval DS were salvaged at either facility.
- 76 LFS were salvaged at the SWP, bringing the expanded salvage season total to 361 LFS. Larvae under 20 mm were detected every day except April 21st and 22nd.
- 16 LFS were salvaged at the CVP, bringing the expanded salvage season total to 176 LFS. Detections of larvae under 20mm were unknown at the time of the meeting.
- The salvage database was down, so the length data for the LFS were not available at the time of the SMT meeting.
 - *Post meeting update: Fork length size range for LFS salvaged at the SWP was 23-39mm and CVP was 20-27mm.*

USBR shared water quality data (three-station average daily water temperature as of April 26th was 16.87° C; daily average turbidity at Old River at Bacon Island (OBI) was 2.95 FNU and is currently 2.20 FNU). The seven-day weather forecast for Antioch is clear to mostly cloudy with WNW/WSW winds from 7 to 14 mph and gusts up to 23 mph; the seven-day weather forecast for Stockton is clear to partly cloudy with NW winds from 9 to 17 mph and gusts up to 24 mph. X2 is >81 km; the estimated Sacramento River X2 is 87.6 km; the estimated San Joaquin River X2 was 86.8 km.

USBR confirmed that Table 8 in the PA Assessment includes fish confirmed from the previous Tuesday (April 20th) to the current Tuesday (April 27th). Today’s table includes the DS detected on 4/13 that was confirmed after the April 20th SMT meeting and therefore, did not appear in last week’s PA Assessment as well as the DS confirmed today (April 27th). USBR clarified which fish were being reported in the population status section of the text. This documentation addressed SMT concerns about double counting.

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

CDFW shared several observations to inform the risk assessment for LFS:

- Water temperatures are above 15.5° C, at which LFS spawning is unlikely.
- Based on Ken Jeffries’ (UC Davis) work, temperatures remain in the feasible range for detecting juvenile LFS.
- LFS are still being seen at Chipps but fewer are being detected by EDSM and the 20-mm surveys.

These developments suggest that the spawning window for LFS is past. CDFW suggested modifying the language for adults to say there is low risk of them moving into the central Delta of their own volition based on understanding of their life history.

- DWR agreed, observing that the ITP's Effects Analysis states that 16° C is the upper limit of spawning, and temperatures have been above that for several weeks.

USBR asked whether there is research on the effects of drought on LFS outmigration, e.g., during wet years, do LFS out-migrate further downstream or westward of X2 than they do in drier years?

- CDFW shared Dege and Brown's (2004)* conclusions that used 20 mm catch to correlate movement with X2: as LFS grow, they move into higher salinity and more brackish habitat, the location of which varies based on X2. Therefore, if X2 is upstream due to dry conditions, LFS can be expected to remain in the Delta longer (*Dege M, LR Brown. 2004. Effect of outflow on spring and summertime distribution and abundance of larval and juvenile fishes in the Upper San Francisco Estuary. Am Fish Soc Symp 39:49–65).

CDFW noted that Condition 8.4.2 for LFS has not been triggered by 20-mm Survey 3, and OMRI averages (not daily values) reported on SacPAS over the past week have consistently been more positive than what the SMT can recommend under 8.4.2. As a result, CDFW recommended keeping the language in the ITP Risk Assessment the same as last week, i.e., a statement that the SMT cannot make a recommendation that would change the salvage trajectory.

- DWR agreed with CDFW's approach.
- USFWS asked whether the salvage or qualitative larval detections have changed in the past weeks.
- CDFW noted that the SWP continues to have more salvage than the CVP, likely because the fish are stuck in Clifton Court Forebay. The salvage counts have varied considerably from day to day (e.g., 0, 12, 21).

CDFW also noted that no DS were observed in monitoring at Station 716, so no advice for Barker Slough is warranted.

USBR asked whether the detection of a DS in the Sacramento Deep Water Ship Channel today affected the SMT's assessment of risk for DS.

- DWR concluded that the fish detected today must be a previous year's fish. Particularly given that there has been no floodplain inundation, it is almost impossible to believe a young-of-year experienced good enough conditions to grow that fast. The fish entering the spawning season this winter were small, so a second-year fish this size is plausible, though very small for April.
- USFWS noted that today's DS (56 mm) was similar in size to those detected in January (51 mm and 47 mm), which were definitely adults, so they also assume today's DS was not a young-of-year.
- DWR observed that given the low abundance of DS, spawning this year was in low levels and given the small fish size, there was likely to be low production per fish.
- DWR asked whether there will be an abundance estimate generated from today's DS and if so, if that is calculated different if it is an adult versus a young-of-year. USFWS said they did not know, but would inquire and report back to the group.

PART 3: Live-edit Assessments

ITP Longfin Smelt Risk Assessment

CDFW updated the ITP assessment based on the discussion documented in Part 2 above.

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

USBR reviewed updates to the assessment, which were limited to minor changes in anticipated conditions in the Delta (including OMR Index and QWEST values) as well as adding information on the April 12th (13.3 mm), April

13th (12.7mm) and April 26th (56 mm) DS detections and the newest abundance estimate for April 12th to 16th of 49,733 DS. In the “Biological Conditions” section, the SMT acknowledged that DS larvae have been detected, evidence that spawning has started. In the “Current Distribution” section, the SMT pointed out that all DS detections have occurred in the Sacramento Deep Water Ship Channel, which limits the SMT’s ability to estimate where else they may be distributed.

The group reviewed the relevant assessment questions: (1) Between December 1 and January 31, has any first flush condition been exceeded? (2) Do DS have a high risk of migration and dispersal into areas at high risk of future entrainment? (3) Has a spent female DS been collected? (4) If OMR of -2,000 cfs does not reduce daily average OBI turbidity below 12 NTU/FNU, what OMR target is deemed protective between -2,000 and -5,000 cfs? (5) If daily average OBI turbidity is greater than 12 NTU/FNU, what do other station locations show? (6) If daily average OBI is greater than 12 NTU/FNU, is a turbidity bridge avoidance action not warranted? What is the supporting information? (7) After March 15 and if QWEST is negative, are larval or juvenile DS within the entrainment zone of the CVP and SWP pumps based on surveys? (8) Based on real-time spatial distribution of DS and currently available turbidity information, should OMR be managed to no more negative than -3,500? (9) What do hydrodynamic models, informed by EDSM or other relevant data, suggest the estimated percentage of larval and juvenile DS that could be entrained may be?

- The responses to questions one through eight either did not change at all or were updated to reflect the latest dates, abiotic data, and survey detections.

USBR reviewed the Executive Summary:

- The SMT updated the sentence referencing the April 12th detection to include the detections on April 13th and 27th.

No non-consensus issues were identified.

Additional Considerations/Discussion

Agencies reported no items for elevation to WOMT.

Presentation: how does the size of juvenile LFS salvaged in 2021 compare to historic trends?

CDFW shared some initial analysis of LFS salvaged between 1993 and April 22, 2021. They stressed that the analysis presented today was very rough, and they were looking for suggestions for what areas to refine further. CDFW noted that the salvage data is from the two facilities combined which may mask effects resulting from the Clifton Court Forebay. CDFW assessed the data on a monthly timestep.

In its analysis of LFS fork length distribution on a monthly timestep for the 28-year period, CDFW saw that the fork length mode of salvaged fish shifted right over the months, which was logical since the fish were presumably growing over that time-period. In an analysis of March 2021 data, the modes were further left (i.e., smaller fork lengths) as compared to previous March lengths.

CDFW also looked at the first and last dates of salvage over the 28-year period. They observed that in the mid-1990s, the salvage period was much more condensed. Since then, the date of first salvage has been trending earlier in the year, and since 2002, larger fish have been salvaged earlier in the season. In the 2000s, there were a handful of wet years in which there was no salvage, presumably because X2 and therefore LFS were concentrated downstream.

Salvage this year is still only a quarter of the total salvage last year.

CDFW is most interested in pursuing the results of the first and last salvage date analysis. Questions for further investigation include: are the date of first and last salvage truly getting earlier? And is the salvage season getting longer? What are the impacts of temperature and X2?