Smelt Monitoring Team – Tuesday, May 18, 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

ACTION ITEMS

- Kearns & West to add a standing item to the Additional Considerations section of the SMT agenda to discuss post-season workshop topics (time permitting).

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 future entrainment or a spent Delta Smelt (DS) has been collected in monitoring surveys.	Not active; Not triggered

[1] The current instrumentation measures turbidity in Formazin Nephelometric Units (FNUs).

OMR Management Measures	Requirement	Time Frame	Trigger	Active? Triggered?
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 Enhanced Delta Smelt Monitoring (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
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 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 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 (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.	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 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.	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 1st through Feb 28th, exceeds most recent Fall Midwater Trawl (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 28th
8.4.2[2] (Larval and Juvenile	If triggered, it will restrict south Delta exports for seven consecutive	January 1st through June	(1) LFS larvae or juveniles are found in four or more of	Triggered on 1/26,

[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?
Longfin Smelt Entrainment Protection)	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.	30th or until the temperature offramp occurs	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, 901, 902, 906, 910, 912, 914, 915, 918 and 919	2/2, 2/23, 3/9, 3/16, 3/30
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	Nov 1st through June 30th 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?
	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.			
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.	No
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 15th through March 31st in dry and critical water years for LFS, and from March 1st through June 30th 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 forecasted conditions continue to be dry through this week, though there is some weather system instability and a slight potential for precipitation in the Northern Sierras at higher elevations towards the end of the week. Conditions will be cooler over the next seven days.
- Releases from Whiskeytown Dam on Clear Creek are currently 200 cfs; the scheduled spring pulse flow is complete.
- Releases on the Sacramento River from Keswick Dam are currently at 8,800 cfs; releases may vary by up to 2,000 cfs in either direction in the coming week.
- American River releases from Nimbus Dam are currently at 900 cfs and will increase to 1,000 cfs tomorrow (May 19th) to support D-1641 water quality requirements in the Delta.
- Releases from Goodwin Dam on the Stanislaus River are currently 900 cfs and are being stepped down from higher flows due to last week's emergency action for water quality concerns. Flows will decrease to 700 cfs tomorrow (May 19th).
- Jones Pumping Plant exports will remain at 800 cfs.
- The Delta Cross-channel Gates are currently closed. CVO reported that USBR plans to keep the gates closed until further notice to support water quality at Emmaton.

- DWR reported that Feather River releases from Oroville were increased from 2,300 cfs to 2,500 cfs yesterday (May 17th).
- Sacramento River flows at Freeport are currently 7,400 cfs and are anticipated to increase slightly in the coming days. San Joaquin River flows at Vernalis are 1,140 cfs and are anticipated to decrease slightly in the coming days.
- Clifton Court inflows were 0 cfs over the weekend in preparation for dam safety inspections; yesterday, forebay inflows returned to 300 cfs and will remain at this level for the rest of the week. The Banks Pumping Plant went offline for maintenance on May 16th and will be back online late in the day on May 21st. No salvage of fish will occur at the Skinner facilities during this period as there is no flow through them due to the lack of export pumping.
- Delta outflows are 5,700 cfs today and will remain near this level throughout the upcoming week.
- The OMRI is -1,000 cfs today and is anticipated to be between -1,400 or -1,300 cfs and -1,000 cfs over the next seven days. When the Grantline and Old River at Tracy agricultural barriers close later this month, the OMRI will become more negative.
- QWEST was ~600 cfs yesterday and may decrease slightly in the coming days, depending on San Joaquin River inflows to the Delta.

Review of Environmental Conditions and Survey Updates

USFWS reported that the San Joaquin Beach Seines will be off the water for the next two weeks due to boat issues.

CDFW shared survey updates.

- 20-mm Survey 5 began yesterday. One station (Station 902) has been processed so far; no DS or LFS were detected.
- CDFW was successfully able to access and sample Station 918 yesterday.
- CDFW shared an update on 20-mm Survey 4 catch data with SMT members via email yesterday. Processing is 78% complete. 1,671 LFS and 1 DS have been detected so far.

USFWS reported on the EDSM Program.

- Two life stage-specific abundance estimates for DS were generated for the May 3rd to 7th sampling period:
    - For age zero fish in the Lower Sacramento the estimate was 9,143 DS.
    - For age zero fish in the Sacramento Deep Water Ship Channel the estimate was 5,299 DS.
- EDSM Phase 2 (20-mm) sampled last week Monday through Thursday (May 10th to 13th); all samples are processed. Only 34 of 40 sites were sampled due to boat issues and a crew emergency.
    - No DS were detected.
    - 14 LFS were detected last week, bringing the total number of LFS identified by EDSM Phase 2 sampling to 1,676.
        - 12 LFS (16.2 to 23.5 mm) on May 10th in the Lower Sacramento strata.
        - One LFS (26.5 mm) on May 11th in the Suisun Bay strata.
        - One LFS (19.9 mm) on May 12th in the Suisun Marsh strata.
- EDSM crews will sample Monday through Friday this week (May 17th to 21st), though sampling will be reduced to due boat issues.
- The Chipps Island Trawl caught zero DS and one LFS in the last week. The LFS was caught on May 13th (80 mm, no expression).

- The Chipps Island Trawl is scheduled to sample five days this week and three days per week starting next week.

CDFW provided a salvage update (May 11th to May 17th).

- No adult or larval DS were salvaged at either facility.
- 4 LFS (26 mm) were salvaged at the CVP, bringing the expanded salvage season total to 188 LFS.
- 74 LFS (21 to 48 mm) were salvaged at the SWP, bringing the expanded salvage season total to 605 LFS.
- There was a high-salvage event at the SWP on May 15th at 7:00 a.m. As a result, the 9:00 a.m. and 11:00 a.m. sampling windows were reduced.
- There will be no salvage at the SWP this week, as export operations were halted for Banks Pumping Plant maintenance starting on May 16th.
    - The secondary channel was sampled on May 17th; no DS or LFS were retrieved.
- No larval (under 20 mm) LFS were detected at either project.

DWR asked when the last larval LFS was detected by qualitative larval sampling. CDFW confirmed that the last time a larval LFS was salvaged was on March 17th.

- *Post meeting correction: The last time a larval LFS was detected at the SWP was April 30th and May 2nd at the CVP.*

USBR shared water quality data (three-station average daily water temperature as of May 17th was 19.62° C; daily average turbidity at Old River at Bacon Island (OBI) was 2.42 FNU and is currently 4.20 FNU). The seven-day weather forecast for Antioch is sunny and clear with W to WSW and WNW winds from 9 to 18 mph and gusts up to 26 mph; the seven-day weather forecast for Stockton is sunny and clear with W to WSW and NW winds from 8 to 23 mph and gusts up to 30 mph. The estimated Sacramento River X2 is 94.2 km; the estimated San Joaquin River X2 is 93.70 km. The water temperature at Clifton Court Forebay on May 17th was 20.08° C (68.14° F); there have been zero days with temperatures >77° F.

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

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

- 20-mm survey 4 catch data indicate most LFS are still concentrated in the lower Sacramento River and confluence and thus the center of distribution has not yet shifted farther downstream.
    - This is relatively late in the season for the downstream shift to occur.
    - Several of the tows in the lower Sacramento River had reduced tow times or reduced number of tows due to filamentous algae, yet still detected large numbers of LFS.
- Exports are currently low (1,100 cfs combined) and salvage is tapering off for the season.
- Water temperatures are cooling down with the recent cooler weather.

CDFW proposed retaining language from last week's ITP Risk Assessment as risk has not changed in the last week. The risk to fish outside the OMR corridor is low; risk within the OMR corridor is moderate. Recommendations from the SMT would not change the salvage trajectory of fish currently in the south Delta.

- SMT members agreed.

DWR suggested that the SMT consider ending qualitative larval sampling for the year soon. No DS have been detected in the OMR corridor and there have been no indications that LFS are still spawning. The value of retaining this data stream for real time operations is decreasing.

- CDFW generally agreed while also noting that a DS was salvaged last spring even though DS had not been detected elsewhere in the corridor; thus, salvage of DS is still possible this year.
- USFWS acknowledged that as in the case of field surveys, continuing qualitative larval sampling requires additional effort but noted that based on their sampling scale, fish are more likely to be detected at the facilities than in field surveys.
- CDFW pointed out that all DS detected recently have been >20 mm.
- SMT members agreed to discuss when to stop qualitative larval sampling for the season during future SMT meetings.
- USFWS suggested incorporating eDNA into the suite of tools available to the SMT to help supplement existing surveys.

USFWS asked what would happen if OMR management was off-ramped due to reaching the temperature trigger prior to June 30th.

- DWR confirmed that once OMR management is off-ramped, the SMT is no longer able to make recommendations.
- DWR also noted that the OMRI is unlikely to control operations through June.

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 included:

- Minor changes in anticipated conditions in the Delta (including OMR Index, turbidity, X2, and QWEST values);
- The total abundance estimate for age zero fish for May 3rd to 7th (14,442 DS);
- The most recent DS detections: one on May 6th (25 mm) in the Sacramento Deep Water Ship Channel and one (24.8 mm) on May 6th in the Lower Sacramento;
- The total number of DS detections since April (nine DS);
- Addition of a table tracking the total number of DS observed since the onset of OMR management this water year (14 DS);
- Replacing references to temperatures being conducive to spawning and with language noting temperatures are rising and spawning is anticipated to decrease.

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 nine 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 removed language referencing historical Spring Kodiak Trawl (SKT) data analysis (consistent with removing references to the SKT from the rest of the assessment last week).
- The SMT clarified that recent DS detections were in the Lower Sacramento and Deep Water Ship Channel.
- The SMT clarified language noting that the potential for entrainment of DS into the south Delta is reduced due to less negative OMRI values.

No non-consensus issues were identified.

Additional Considerations/Discussion

SMT members discussed holding a post-season workshop to discuss lessons learned and recommend additional tools or analyses that might support the SMT going forward.

- USBR suggested the SMT discuss potential workshop topics at the end of future SMT meetings and develop a proposal to share with the LTO group. USBR recommended coordinating with the LTO group as an SMT workshop could lead to suggested updates to the OMR guidance document.
- CDFW agreed that a post-season workshop would be valuable and noted that two workshops might be needed – one to discuss lessons learned and one to discuss potential updates to the guidance document.
- USFWS also agreed, suggesting the workshop could be an opportunity to submit recommendations for additional monitoring that would enhance the available data used by the SMT to inform decision-making.
- The SMT agreed to add a standing item to the Additional Considerations section of the agenda to discuss workshop topics and develop a plan to share with the LTO group (time permitting).

The group also noted that, in addition to DWR's ITP reporting requirements, USBR develops two reports: an annual report and a seasonal report. A draft of the OMR seasonal report was recently circulated by USBR to the LTO group. USFWS noted that there is interest in exploring how to better integrate the regulatory requirements of the ITP and the PA.

Agencies reported no items for elevation to WOMT.