

Smelt Monitoring Team – Tuesday, June 8, 2021

PARTICIPANTS

- California Department of Fish and Wildlife (CDFW)
- California Department of Water Resources (DWR)
- State Water Resources Control Board (SWRCB)
- U.S. Bureau of Reclamation (USBR)
- U.S. Fish and Wildlife Service (USFWS)
- Kearns & West (KW)

ACTION ITEMS

- Jon Burau, USGS, will confirm which turbidity sensors used by the Bay Delta Live tracker are still collecting in FNU units.
- SMT to notify Dave Osti if they want to schedule any trainings on the Bay Delta Live Constituent Tracker.
- SMT members to provide feedback on the rest of the items in the post-season planning agenda outline by Friday, June 11 COB.

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 \geq 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	Not active; Not triggered

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

OMR Management Measures	Requirement	Time Frame	Trigger	Active? Triggered?
			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 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 (25° C) 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 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 (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 1 st through Feb 28 th , 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 28 th
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 st until April 1 st	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 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?
	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 30 th	Daily mean water temperature at Clifton Court Forebay is >25° C (77° F) 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 15 th through March 31 st 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 releases from Whiskeytown Dam on Clear Creek are currently 125 cfs. CVO is solidifying plans for a pulse with a peak of 600 cfs on Clear Creek and should have details confirmed in the next week. The current lower flows are anticipated to warm up the lower reaches of Clear Creek and will encourage adult spring-run Chinook salmon to move farther upstream from their current holding locations in these downstream areas in response to the short pulse flow. The volume of water used for the pulse flow is gained from the flow reductions and is considered a zero-sum change in overall release volumes.
- Releases on the Sacramento River from Keswick Dam are currently 7,100 cfs; releases could vary in the upcoming week depending on water quality conditions in the Delta.
- American River releases from Nimbus Dam were increased yesterday (June 7) to 1,500 cfs and are anticipated to range up to 2,000 cfs in coming days to support water quality needs in the Delta.
- Releases from Goodwin Dam on the Stanislaus River were increased yesterday to 1,500 cfs.
- In addition to increased releases, the projects are taking other steps to address low Delta outflow and higher salinity conditions: first, all pumping operations will be consolidated into one facility – Jones will stop pumping, and all exports will be moved to Banks. Second, the Delta Cross-channel Gates will remain closed. The Cross-channel gates were opened last weekend, from Friday, June 4 at 10am through

Monday, June 7 at 10am, to freshen water in the interior Delta. Ongoing salinity monitoring, which shows salinity mounting in multiple locations around the Delta, suggests that another opening could worsen salinity, in part because of tidal flux driven by the new moon on June 10th.

- Salinities are climbing in the Western Delta (e.g., 1.8 at Jersey Point, 2.0 at Emmaton), which is concerning given that the tide has not peaked. Operators anticipate a stronger spring tide at the end of the month, which could potentially flush out the system.
- DWR reported that Feather River releases from Oroville are currently 2,550 cfs and will continue at that level.
- Sacramento River flows at Freeport are currently 5,800 cfs; operators hope to see flows increase in coming days as the increased releases reach the Delta.
- San Joaquin River flows at Vernalis are 750 cfs and are anticipated to increase to 1,500 cfs as a result of the increased releases from Goodwin.
- Clifton Court inflows will remain at 300 cfs today (June 8) and tomorrow (June 9); once the Banks facility is taken offline, inflows at Clifton Court will increase to 550-600 cfs on June 10 and 850 cfs on June 11 to remain at that level for as long as that can be maintained.
- Delta outflows were 2,600 cfs yesterday. The projects will need to make up outflow in order to meet the current TUCP-authorized 3,000 cfs 14-day average outflow requirement. DWR and USBR are waiting to see the results of their current actions in pushing out salinity and meeting outflow before making further changes.
- QWEST was 1,500 cfs but will be shift back toward negative values this week and should fluctuate around zero.
- OMRI is -1,600 cfs but will become more positive with decreased exports and increased San Joaquin flows to -1,100 cfs later this week.
- Construction of the drought barriers has begun and should be complete by July 1st. The barriers do not change the flow in the South Delta, though they change the path the water takes to get there.

Review of Environmental Conditions and Survey Updates

CDFW shared survey updates.

- 20-mm Survey 6 (June 1st to 4th) processing is taking longer than usual. 8 of 12 criteria stations have been processed (Stations 809, 812,901, 910,912, 914, 915, and 918).
 - No Delta Smelt (DS) or Longfin Smelt (LFS) have been detected.
 - Final data from Stations 815, 902, 906, 919, and 716 (Barker Slough) is still outstanding.
- 20-mm Survey 7 will run June 14th to 17th.

USFWS reported on the EDSM Program.

- EDSM Phase 2 (20-mm) processing for the week of May 24th to 27th was not complete at last week's (June 1) SMT meeting. Processing is now complete.
 - 25 LFS (17.8-35.7 mm) were detected in Suisun Marsh strata on May 27th.
- EDSM Phase 2 (20-mm) sampled only two days last week, June 1st and 2nd, due to boat issues. They sampled two of six strata and 8 of 40 sites. All processing is complete.
 - No DS or LFS were detected.
- EDSM crews remain off the water due to boat issues. One boat may be able to return to the water to sample Thursday or Friday; the other will not be repaired until next week.
- The total number of LFS identified by EDSM Phase 2 sampling is 1,704.
- The Chipps Island Trawl caught zero DS and zero LFS in the last week.

- The Chipps Island Trawl is scheduled to sample three days this week.

CDFW provided a salvage update (June 1st to June 7th).

- No DS or LFS were salvaged at either facility.
- June 1st to June 3rd there were no exports at the SWP.
- The SWP's expanded salvage season total remains at 677 LFS.
- The CVP's expanded salvage season total remains at 188 LFS.

USBR shared water quality data (three-station average daily water temperature as of June 7th was 21.94° C; daily average turbidity at Old River at Bacon Island (OBI) was 3.01 FNU and is currently 3.3 FNU). The seven-day weather forecast for Antioch is sunny and clear with winds from the W to WSW at 9 to 20 mph and gusts up to 26 mph; the seven-day weather forecast for Stockton is sunny and clear with WNW to NW winds from 10 to 23 mph and gusts up to 30 mph. X2 is >81 km; the estimated Sacramento River X2 is 96 km; the estimated San Joaquin River X2 is 95.6. The water temperature at Clifton Court Forebay was 22.89° C (73.2° F); there have been zero days with temperatures >25° C (77° F).

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

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

- There will be a further reduction in exports.
- While there is incomplete data for 20-mm Survey 6, the data that has been processed showed zero LFS detections in the south or central Delta.
- Though there has been some cooling of water temperatures, there were six consecutive days with Clifton Court Forebay temperatures above 23° C; at temperatures that high, the probability of detecting LFS decreases. CDFW would expect salvage to be largely over for this year.

CDFW proposed retaining language from last week's ITP Risk Assessment as risk has not changed in the last week.

- SMT members agreed.

CDFW also noted that no adult LFS have been observed at Chipps Island in the last week and asked whether the ITP Risk Assessment should consider them present in the estuary.

- USFWS noted that there were two adults observed at Chipps two weeks ago.
- DWR stated that they would expect adults to be out of the system at this point, and it was surprising to detect even a limited number two weeks ago. It would be consistent with DWR's understanding to consider them out of the system (DWR defined the "system" as the Delta upstream of the confluence) at this point.
- CDFW will remove adults from the Risk Assessment and state that the SMT assumes only juveniles and larvae are still present.

CDFW also noted that no DS were detected at Station 716 in 20 mm Survey 5, so there is no advice warranted for Barker Slough operations under Condition 8.12.

USBR observed that given how close temperatures at Clifton Court came to the offramp criteria and that temperatures remain above 20 °C, it seems appropriate to amend the language in the PA Assessment to state that spawning is likely over for the season.

- CDFW agreed that is consistent with their understanding of spawning.

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 making minor changes in anticipated conditions in the Delta (including OMR Index, turbidity, X2, and QWEST values), as well as:

- Adding a statement that spawning has likely ended given that temperatures have been and remain above 20 °C, along with a citation for Damon et al. 2016 (<https://www.nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=141865>).

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 and abiotic data.

USBR reviewed the Executive Summary; no changes were made.

USFWS shared that on today's SaMT call, the team agreed that the ITP and PA have off-ramped for salmonid-related OMR criteria. Therefore, they do not expect any salmonid-related OMR actions to have relevance for the rest of the season.

No non-consensus issues were identified.

Additional Considerations/Discussion

Presentation on Bay Delta Live Salinity and Turbidity Constituent Tracker

Jon Burau, USGS, and Dave Osti, 34 North, presented the new constituent tracking tool they plan to add to the Bay Delta Live website this month. In contrast to the previous approach of measuring turbidity with boat-collected turbidity transects, which were expensive, tidally-biased, and risky, the new approach, which uses an inversion algorithm to produce EC and turbidity heat maps as a constant point in tide, is much more accurate and is updated in almost real time (i.e., every half tidal cycle). They have found the tool's estimates to track closely with observed conditions. The tool tracks turbidity across two time scales and two spatial scales, allowing users to track net movement of sediment across the Delta over time and see where it is originating from; for instance, the majority of sediment appears to originate from the Mokelumne. Over time, they hope to improve

the resolution in the tool to show how turbidity varies within channels, which will allow them to better understand the distribution of organisms within that smaller geographic space. The same approach can also be applied to a variety of water quality constituents.

Jon committed to confirming which sensors are still collecting in FNU units and clarifying with the SMT. Jon and Dave offered to set up small trainings for SMT members to learn how to use the tool. DWR observed that the hindcasting components could be useful as part of the post-season workshop.

Post-Season Meeting Planning

Prior to the meeting, KW circulated the post-season planning outline with comments from DWR, CDFW, and USBR on the items labeled weeks 1 and 2. They asked SMT members to provide feedback on the rest of the items in the outline by Friday, June 11 COB.

CDFW noted that the SMT meetings could end before the end of June if the temperature offramp criteria are met and asked whether the rest of the planning could be done via email if that occurs. KW and USBR agreed that much of the planning could be done via email but that clearly defining the goals and scope and prioritizing topics would likely need to be done together; they proposed continuing the conversation in these meetings and scheduling an additional call for that purpose if temperatures end OMR management. SMT members agreed.

USBR reported that the LTO Coordination Group will begin revising Guidance Documents in late July, so it would be useful if the SMT held their offseason meeting and provided guidance on revisions before that time.

KW shared a key question about the scope of the meetings raised by DWR in their comments on the document; they asked whether the SMT can propose changes in conflict with the current ITP or BiOp language. CDFW, USBR, DWR, and USFWS all agreed that their focus should be within the bounds of the ITP and PA language (e.g., improving SMT process, or creating products that could feed into the annual report). While the SMT could make recommendations if they see ITP or PA language that is not functioning as intended, that should not be their primary focus and would necessitate a different, director-level process to make any changes.

Agencies reported no items for elevation to WOMT.