

Smelt Monitoring Team – Tuesday, June 1, 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

- SMT members to email CDFW with any suggestions for language in the ITP Risk Assessment that should be discussed with the group at a future meeting.
- SMT members to share suggested topics for a post-season meeting via email.
- USBR and DWR to notify the facilities that qualitative larval sampling will be off-ramped for this season.

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	Not active; Not triggered

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

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 28 th	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 weather conditions will have above average air temperatures for the first few days of the week before cooling slightly going into the weekend and early next week.
- Releases from Whiskeytown Dam on Clear Creek are currently 125 cfs; CVO is planning to reduce in-stream flows to support a near-future short term pulse flow of approximately 600 cfs, but the timing of this decrease/ pulse flow is not yet confirmed. The lower flows are anticipated to warm up the lower reaches of Clear Creek and 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 are currently at 1,000 cfs; flows are anticipated to increase to 1,250 cfs on Thursday (June 3rd) to support water quality needs in the Delta.
- Releases from Goodwin Dam on the Stanislaus River are 600 cfs and are anticipated to increase to 750 cfs tomorrow (June 2nd) to meet Vernalis flow requirements.

- Jones Pumping Plant exports will remain at 800 cfs.
- The Delta Cross-channel Gates are currently closed and are anticipated to remain closed for the foreseeable future to support water quality at Emmaton [Three Mile Slough once the Temporary Urgency Change Petition (TUCP) is granted].
- DWR reported that Feather River releases from Oroville are currently 1,850 cfs; no immediate changes are anticipated but operators will continue to assess needs as outflow and water quality conditions in the Delta evolve.
- Sacramento River flows at Freeport are currently just below 6,000 cfs and will decrease slightly in the coming days before increasing again after the Nimbus Dam release.
- San Joaquin River flows at Vernalis were 650 cfs as of yesterday (May 31st).
- Clifton Court inflows are 300 cfs; the Banks Plant is offline for maintenance through June 4th.
- Delta outflows were 3,700 cfs yesterday and will be slightly lower over the next couple of days before stabilizing around 3,000 cfs once the Nimbus Dam release flows reach the Delta and the requested TUCP Net Delta outflows (3,000 cfs) go into effect starting June 1st.
- The OMRI was -1,600 cfs yesterday. The Grant Line barrier was fully closed on May 27th, which changed the OMRI equation and shifted the OMRI to slightly more negative values.
- QWEST is currently around -400 cfs and will vary by a couple hundred cfs over the next seven days.

USFWS asked about the status of the other agricultural barriers. DWR confirmed that the Middle River and Old River at Tracy barriers are also closed.

NMFS asked when the last remaining culvert would go tidal. DWR confirmed that they submitted the order and are awaiting confirmation from their field division.

USFWS asked if Delta operations are currently being controlled by Vernalis flow objectives. DWR explained that they are awaiting approval of a TUCP request; assuming the TUCP goes forward, Delta outflows will remain near 3,000 cfs and operators will be monitoring water quality at Jersey Point and Three Mile Slough. The response to the TUCP is anticipated later today (June 1st).

Review of Environmental Conditions and Survey Updates

CDFW shared survey updates.

- 20-mm Survey 6 started today (June 1st) and will sample through Friday (June 4th).
- Processing of 20-mm Survey 5 (May 17th and 20th) is 75% complete. CDFW circulated catch data to SMT members via email earlier today.
 - No Delta Smelt (DS) were detected so far.
 - 138 Longfin Smelt (LFS) were detected, primarily in the lower Sacramento River (16 to 38 mm).
 - The distribution of LFS is similar to 20-mm Surveys 3 and 4, but the density is lower.
- 20-mm Surveys 3 and 4 are still being processed. When there is a backlog, CDFW staff prioritize the newest survey data in the queue (most recently, Survey 5) and then work their way backwards.
- Summer Towntnet Survey 1 will start on June 7th.

USFWS reported on the EDSM Program.

- EDSM Phase 2 (20-mm) sampled last week Monday through Friday (May 24th to 28th); they sampled in all six strata but because of boat issues were only able to sample 39 of 40 sites. Processing is 90% complete.
 - No DS were detected so far, so no abundance estimate was generated.

- Eight LFS were tentatively identified from Suisun Marsh (23 to 35 mm). USFWS will provide updates on the confirmed detections at next week's SMT meeting.
- The total number of LFS identified by EDSM Phase 2 sampling is 1,678.
- EDSM crews will sample today through Friday this week (June 1st to 4th). Only one crew is scheduled to sample due to continuing boat issues. USFWS will prioritize sites if needed.
- The Chipps Island Trawl caught zero DS and two LFS (one, 31 mm, on May 26th; one, 93 mm, on May 28th) in the last week.
 - The Chipps Island Trawl is scheduled to sample three days this week.

CDFW provided a salvage update (May 25th to May 31st).

- No adult or larval DS were salvaged at either facility.
- In the last week, the SWP salvaged 62 LFS (33 to 53 mm), bringing the expanded salvage season total to 677 LFS. No smelt larvae were detected on May 25th or 26th. Still waiting for the results from larval samples taken after May 26th. The Banks Pumping Plant will be shut down for maintenance this week (5/31/21 through 6/4/21).
- No smelt were salvaged at the CVP in the last week. The expanded salvage season total for the CVP is 188 LFS. No smelt were detected in qualitative larval sampling.

USBR shared water quality data (three-station average daily water temperature as of May 31st was 21.9° C; daily average turbidity at Old River at Bacon Island (OBI) was 4.48 FNU and is currently 5.60 FNU). The seven-day weather forecast for Antioch is sunny and clear with winds from the W to N at 7 to 17 mph and gusts up to 24 mph; the seven-day weather forecast for Stockton is sunny and clear with WNW to NNW winds from 5 to 11 mph and gusts up to 18 mph. X2 is >81 km; the estimated Sacramento River X2 is 89.30 km; the estimated San Joaquin River X2 for today was not available. The water temperature at Clifton Court Forebay was 21.97° C (71.55° F); there have been zero days with temperatures >25° C (77° F).

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

DWR suggested reviewing the Risk Assessment language to ensure any references to seasonal timing are still relevant, particularly as temperatures are increasing.

CDFW reviewed key sections of the ITP Risk Assessment.

- CDFW noted that all three life stages are still present:
 - A 93-mm (i.e., adult) LFS was detected by the most recent Chipps Island Trawl.
 - The size ranges reports in the most recent 20-mm and EDSM surveys are consistent with larval and juvenile LFS.
 - DWR agreed.
- DWR asked what the fork length cutoffs are for DS life stages.
 - CDFW confirmed that juveniles are considered to be between 20 mm and 58 mm.
- In Section 1-A (Sacramento River and confluence), SMT members agreed to add a bullet to the exposure risk subsection noting that while young of year LFS are present in the Sacramento River, they are at low risk of entrainment into the central Delta.
- SMT members agreed that the language in Section 1-B (Central Delta) still reflects current conditions, though CDFW will update OMRI values to the current projections.
- DWR suggested noting the increase in LFS salvage last week in the discussion of Condition of Approval 8.4.2.
 - CDFW agreed, and recommended removing language stating salvage appears to be decreasing.

- DWR also suggested noting that the SMT expects LFS salvage to end soon due to increasing water temperatures, and that young of year LFS may be moving to seek cooler water.
- USFWS agreed with the recommendation to mention the three-day increase in salvage last week and suggested noting that high temperatures may be responsible for fish moving towards the facilities. USFWS also proposed pointing out that tidally filtered OMR values became more negative around the same time.

USBR asked SMT members if the likelihood of entrainment for larval DS is still increasing due to seasonal timing, or if risk is now declining at this point in the season.

- DWR responded that the risk of entrainment for larval DS should be decreasing giving the seasonal timing and increasing water temperatures.
- USFWS noted that Figure 5 in [Grimaldo et al. 2009](#) indicates that DS salvage peaks in May with the second highest peak in June. Salvage in both months is notably higher than the rest of the year.

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

- Adding a citation for Grimaldo et al. 2009 to the historical trends section.
- Removing language referencing increased turbidity due to high winds.

NMFS noted that turbidity at Old River at Highway 4 was >12 NTU over the Memorial Day weekend, but acknowledged that this is not a key location and the spike may be due to high boat traffic originating from Discovery Bay. USBR recommended not pointing out this spike in the assessment, as it was an isolated incident and the turbidity report will be appended to the document.

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.

- The language in question five referencing high turbidity in Clifton Court Forebay last week was removed.

USBR reviewed the Executive Summary.

- Language describing the likelihood of larval entrainment was updated per the discussion in Part 2.
- DWR suggested updated the language describing the risk of adult DS entrainment to be low (rather than lower) due to seasonal timing.

No non-consensus issues were identified.

Additional Considerations/Discussion

Off-ramping Larval Sampling at the Facilities

SMT members discussed whether qualitative larval sampling at the state and federal facilities should be off-ramped for the season.

- USBR pointed out that the PA assessment executive summary notes that the risk of entrainment for larval DS is declining. This could indicate that temperatures and seasonal timing would now justify off-ramping larval sampling.
- USFWS recommended reconsidering the current approach to qualitative larval sampling given the lower number of detections. They encouraged using larval sampling over the entire season to complement field surveys and help compensate for the low efficiency of detecting fish <30 mm. USFWS acknowledged that there would be logistical and budgetary considerations related to expanding larval sampling, but emphasized that the additional effort would likely be worthwhile.
 - USBR and DWR agreed to include this suggestion in the list of potential topics for the post-season meeting.
- DWR acknowledged there is a larger conversation to have around larval sampling in the long-term, but proposed off-ramping larval sampling for the current season. The last larval detection was about one month ago and water temperatures and distribution data indicate the likelihood of larval detections at the facilities is decreasing. DWR also noted that they consider larval sampling to be a real-time management tool rather than a monitoring program.
- USBR agreed with DWR's proposal to off-ramp, noting that they did not anticipate any significant changes in the next week.
- USFWS reiterated their support for retaining larval sampling until June 30, given that DS salvage has historically happened year-round. USFWS also noted that incorporating eDNA sampling would be highly valuable as a way to generate time series data and validate relationships.
- DWR suggested that CDFW and DWR could share an update on their plans for piloting larval entrainment monitoring, including nets and an eDNA component, as part of Condition of Approval 7.6.2 during the post-season meeting.
- USFWS shared a document with historical data, including the last larval detections. During previous drought years (2014 and 2015), the last dates of larval detection were in late April and early May. The last juvenile salvage dates in 2014 and 2015 were also in late April and early May. Based on this, the lack of evidence for DS in the south Delta this year, the dry conditions, and warm temperatures, USFWS did not think larval sampling efforts were likely to detect any additional DS this year.
- USFWS reiterated that historically, June was the second highest month for DS salvage. They also noted that the SMT focuses on entrainment risk, thus having additional data on entrainment seems more

informative than field surveys. USFWS noted that while there may be diminishing returns in continuing larval sampling this season, in future (especially wetter) years, this data may be valuable.

- USFWS pointed out that additional data this year is unlikely to change the salvage trajectory and continuing larval sampling is unlikely to have a measurable impact on the species given current operations.
- USFWS acknowledged that there are many constraints this year.
- CDFW agreed that additional larval sampling data would not help with decision making for DS or LFS. LFS densities are shifting outside of the central Delta and the size of LFS are increasing. A DS detection is unlikely, and even if a DS was detected, it would not inform decision-making. CDFW agreed with the recommendation to off-ramp larval sampling for the season.
- NMFS and the State Board indicated they were also comfortable with off-ramping larval sampling for the remainder of this season.

DWR and USBR will update the state and federal facilities that qualitative larval sampling should be off-ramped for the season.

Post-Season Meeting Planning

USBR reviewed a document outlining potential topics, organized chronologically, that the SMT might want to discuss during a post-season meeting. The document is intended to help SMT members identify potential meetings topics, clarify the potential outcomes of discussing those topics, and develop a proposal to bring to the Long Term Operations (LTO) group. The LTO group is interested in understanding the value of a post-season SMT meeting. USBR acknowledged that the SMT will likely generate more potential areas for discussion than can be covered in a single meeting, but hopes this process will help track ideas for future conversations.

SMT members agreed to share ideas related to the first five topics via email:

- Onset of OMR Management/Integrated Early Winter Pulse Protection (ITP 8.3 & 8.3.1)
- Onset of OMR Management/Adult Longfin Smelt Entrainment Protection (ITP 8.3 & 8.3.1)
- OMR Management for Adult Longfin Smelt (ITP 8.4.1)
- Turbidity Bridge Avoidance (ITP 8.5.1)
- Larval and Juvenile Longfin Smelt Entrainment Protection (ITP 8.4.2)

SMT members will discuss these suggestions at next week's meeting.

Agencies reported no items for elevation to WOMT.