

Smelt Working Group
December 12, 2016

Meeting Summary

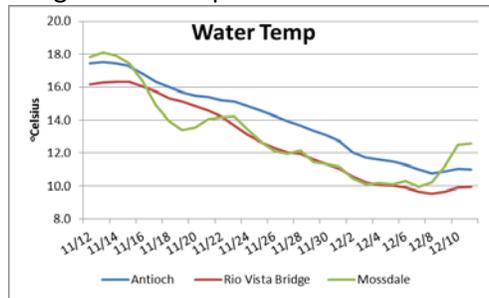
The Working Group reviewed current Delta conditions, survey data, and forecasted weather and decided to recommend OMR be set at -5,000 cfs as soon as possible to provide protection to Delta Smelt in the Sacramento River. The SWG discussed implementation of Action 1 (OMR -2,000 cfs for 2 weeks), but decided to not recommend a start to Action 1 at this time. Hydrology data will be distributed to the group daily until conditions warrant meeting to discuss the risk of entrainment, or December 19, whichever occurs sooner.

The Working Group is following guidance for entrainment protections from Action 1 (adult Delta Smelt). The Working Group will continue to monitor Delta Smelt survey and salvage data and Delta conditions, and will meet again on Monday, December 19, 2016 at 10 am, or sooner, should conditions warrant.

Reported Data

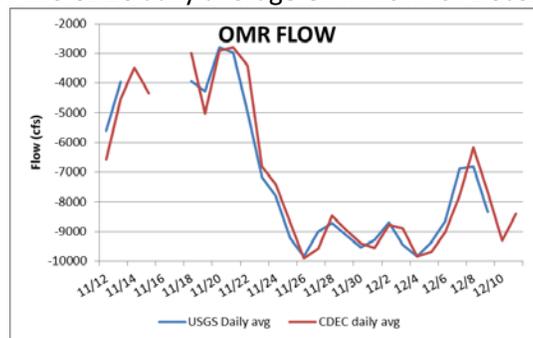
- 1. Current environmental data
 - a. Temperature

The 3-station average water temperature for December 11 was 11.2°C.



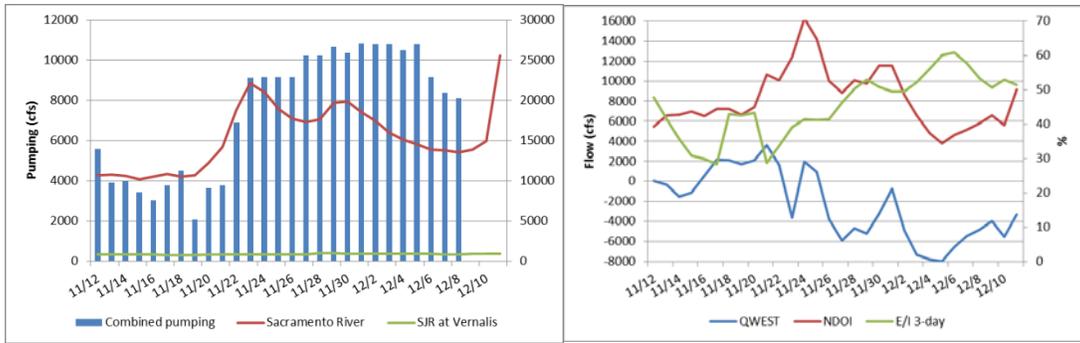
- b. OMR flow

USGS OMR average flow on December 9 was -8,330 cfs. The daily average OMR index value for December 11 was -8,000 cfs and is anticipated to increase to -10,000 cfs by December 14. The CDEC daily average OMR flow for December 11 was -8,414 cfs.

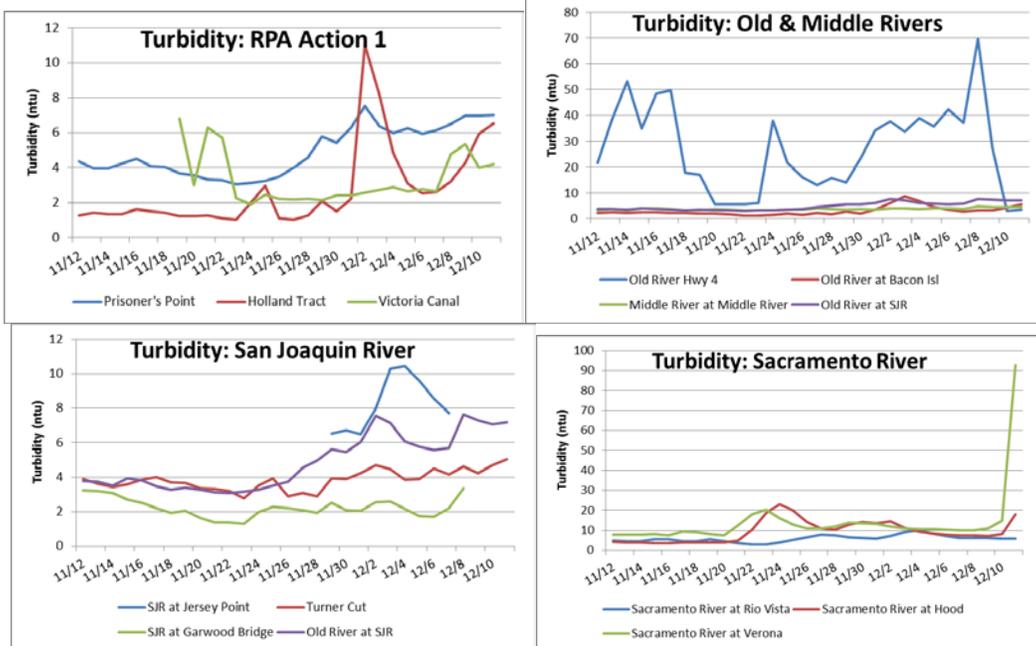


- c. River flows and pumping

Sacramento River at Freeport flow for December 11 was 25,562 cfs. San Joaquin River at Vernalis river flow for December 11 was 918 cfs. X2 is upstream of 81 km. Combined exports are 9,980 cfs today.



d. Turbidity



2. Delta fish monitoring

The FMWT is expected to complete the December survey today or tomorrow. No Delta Smelt have yet been caught at any index stations. Three Longfin Smelt were collected during the December survey: one in Suisun Bay, one in the lower Sacramento River near Three Mile Slough and one in lower Cache Slough near Elkhorn Slough. Abundance index results are anticipated later in the month or in early January 2017.

The December Spring Kodiak Trawl (SKT) was in the field last week, and is finishing the last 8 stations today. A total of 221 Delta Smelt were caught, 214 from station 706. No staging took place. The 42 confirmed Delta Smelt mortalities were collected for future study, and the other Delta Smelt were released. Two Longfin Smelt were caught in Honker Bay (81, 100 mm).

The Bay Study completed their December survey last week. Three delta smelt were caught at station 752 in the Sacramento River near Three Mile Slough.

There was no update on the start date for the Enhanced Delta Smelt Monitoring Program (EDSMP)

3. Modeling

No new PTM runs were distributed to the group this morning for discussion.

4. Salvage

No adult Delta Smelt or Longfin Smelt salvage has occurred so far this water year.

5. Expected Project Operations

Jones pumping plant is pumping 3,300 cfs today and will increase to 4,200 cfs by Wednesday. The daily average intake to Clifton Court Forebay (CCF) is 6,680 cfs today and is anticipated to remain steady. Combined pumping is 9,980 cfs today and expected to increase to 10,880 cfs by Wednesday. Operators indicated a storm was anticipated to begin moving through northern California later this week, with not only precipitation, but strong winds.

6. Delta Conditions Team

No update was given to the SWG regarding DCT.

7. Biological Opinion Background:

RPA, Action 1: Adult Migration and Entrainment

Objective: A fixed duration action to protect pre-spawning adult delta smelt from entrainment during the first flush, and to provide advantageous hydrodynamic conditions early in the migration period.

Action: Limit exports so that the average daily OMR flow is no more negative than -2,000 cfs for a total duration of 14 days, with a 5-day running average no more negative than -2,500 cfs (within 25 percent).

Timing:

Part A: December 1 to December 20 – Based upon an examination of turbidity data from Prisoner’s Point, Holland Cut, and Victoria Canal and salvage data from CVP/SWP (see below), and other parameters important to the protection of delta smelt including, but not limited to, preceding conditions of X2, FMWT, and river flows; the SWG may recommend a start date to the Service. The Service will make the final determination.

Part B: After December 20 – The action will begin if the 3 day average turbidity at Prisoner’s Point, Holland Cut, and Victoria Canal exceeds 12 NTU. However the SWG can recommend a delayed start or interruption based on other conditions such as Delta inflow that may affect vulnerability to entrainment. Part B has associated triggers involving turbidity and/or salvage.

The window for triggering Action 1 concludes when either the temperature criterion is exceeded or there is evidence of spawning. These off-ramp conditions may occur without Action 1 ever being triggered. If this is the case, Action 3 begins, unless the Service concludes on the basis of the totality of available information that Action 2 should be implemented instead.

8. Assessment of Risk Discussion

Although the December SKT detected a large number of Delta Smelt in the Sacramento River at one station, members stressed the continued extremely low abundance of Delta Smelt. The Enhanced Delta Smelt Monitoring Project (EDSMP) has not yet begun surveys, and the FMWT did not catch any Delta Smelt so far this month. Members noted our past assertions that fish

likely are present in the lower San Joaquin at Jersey Point year round, as evidenced by previous year's Early Warning Survey catches, even though many IEP surveys do not detect them during the year. Members also noted that at this time of year when fish are staging prior to spawning migration, fish would be expected to remain at or close to X2. Members suggested that the school of Delta Smelt detected at station 706 could indicate the imminent start to breeding migration, given how far upstream this station is from the X2 position.

The Working Group will be watching changes in turbidity closely at stations throughout the system, particularly during storm events such as those expected this week. The Working Group also noted that turbidity transect monitoring conducted by DWR in the South Delta during the last two years was a helpful tool that could provide valuable information again this year. Extension of highly turbid water from the San Joaquin into interior Delta channels in conjunction with indicators of Delta Smelt elevated activity or upstream movement would be considered a clear indicator of heightened risk of entrainment into the interior Delta and entrainment into the SWP and CVP intake facilities.

Although the December SKT detected a large number of Delta Smelt in the Sacramento River at one station, members stressed the continued extremely low abundance of Delta Smelt. The EDSMP has not yet begun surveys, and the FMWT did not catch any Delta Smelt so far this month. Members noted our past assertions that fish likely are present in the lower San Joaquin at Jersey Point year round, as evidenced by previous year's Early Warning Survey catches, even though many IEP surveys do not detect them during the year. Members also noted that at this time of year when fish are staging prior to spawning migration, fish would be expected to remain at or close to X2. Members suggested that the school of Delta Smelt detected at station 706 could indicate the imminent start to breeding migration, given how far upstream this station is from the X2 position.

The SWG expressed concerns regarding the current OMR flow (-8,000 cfs today, increasing to -10,000 cfs Wednesday) and the influence this level of flow is having on the Delta hydrology. Members indicated concern that at this level of OMR, the influence of the pumps can extend to the Sacramento River, especially through Three-Mile Slough.

The initial upstream movement of Delta Smelt to spawn is frequently associated with abrupt increases in freshwater inflow and turbidity during the "first flush" flows caused by winter storms. East-side streams' (Mokelumne, Consumnes, Calaveras) flows and turbidity levels have increased from the recent storm. It is unclear at this time how much influence this turbidity will have on the lower San Joaquin River. On the Sacramento River, stations further upstream have indicated higher turbidities from the weekend storms; however these increased levels have not reached the Delta yet. It is unclear to the SWG if sufficiently high turbidity will reach the lower Sacramento River to constitute a first flush event. However, with the additional storm expected later this week, there is an increased chance that a first flush event will occur. In addition, the storm later this week is anticipated to bring strong winds, which are expected to increase turbidity levels in the Old and Middle River channels independent of turbidity input from tributary streams (and possibly throughout the central and southern Delta).

Historically, members would not expect for Delta Smelt to begin spawning migration for at least a couple of weeks. However, earlier migration and subsequent salvage has happened more often in the past few years, and members suspect that migration is imminent this year.

Members suggested that early migration could become the new normal for the species. Additionally, the flows and turbidity anticipated from the east side streams likely contribute to a migration signal for the species.

Members discussed the option of recommending a start to Action 1 (-2,000 cfs OMR for 2 weeks). Although some members indicated Action 1 should begin immediately, the SWG decided to not recommend a start at this time. Members stressed the importance of keeping turbidity levels low in the lower San Joaquin River so as to avoid a continuous band of high turbidity from the Sacramento River through the southern Delta. This is expected to be challenging, given the anticipated storms later in the week.

Although members unanimously agreed that OMR needed to be no more negative than -5,000 cfs immediately, with a majority deciding not to implement Action 1 today, preferring to wait until turbidity and flow levels signaled a large first flush event. Members indicated the strong likelihood that such a flushing event could reach the Delta within the next week given the rain forecasted. Members discussed what criteria they might use to decide if Action 1 should be implemented prior to December 20. Although members did not identify specific criteria for the start of Action 1, members did identify criteria that would trigger an additional SWG meeting.

Members reviewed potential stations for monitoring this week. Most stations in the lower San Joaquin River were decided to not give sufficient warning to implement a change in operations. Members indicated that a sufficient increase in turbidity at the Sacramento River at Rio Vista (20-30 NTU) would be sufficient data to initiate an additional SWG meeting. Members decided to also monitor Prisoner's Point and other stations slightly upstream which might give an indication of how strongly the east-side streams are influencing turbidity in the lower San Joaquin River. Members decided that should Prisoner's Point turbidity reach 10 NTU, the SWG would meet again. Updated River flow and turbidity information will be distributed to the membership daily until the next meeting.

9. Review of December 2012 Conditions

Members discussed the hydrology and salvage that occurred in the first half of December 2012. Similarities were drawn between those events and what has occurred so far this December. Combined pumping through December 18 was at or greater than 10,000 cfs. The average OMR daily value during these 18 days was -8,000 cfs. Water temperatures began December at 13.4°C, and gradually decreased to 10°C during this time. Turbidity levels increased dramatically in the lower San Joaquin River during this time, and appeared to originate from the east side streams (rather than further upstream on the San Joaquin River). Turbidity began to increase at Prisoner's Point on December 6, with a corresponding increase at Jersey Point a day later. Prisoner's Point turbidity peaked at 35 NTU on December 11. Sacramento River at Hood began to increase on December 1, with Rio Vista turbidity increasing on December 2. Turbidity at Rio Vista peaked on December 6 at 130 NTU. Stations in Old River remained at turbidity less than 10 NTU until December 14, when lower San Joaquin River turbidity began to move upstream into the Old River corridor and toward the south Delta pumping stations. Turbidity generally remained greater than 10 NTU at Holland Tract until the end of January 2013. Stations further down the Old River corridor (Hwy 4) exceeded 10 NTU on December 11 and generally remained greater than 10 NTU the end of January 2013.

Salvage of Delta Smelt adults began in WY2013 on December 12 and continued for 10 straight days. Periodic salvage of adults continued that WY, with concerns that the ITL might be exceeded.

Members indicated that many of the early hydrology parameters from December 2012 appear to be repeating themselves again this December. Members indicated great concern that Delta Smelt could begin migrating upstream in the very near future, and find appropriate cues to move upstream on the San Joaquin River and into the sphere of influence of the pumps where the adults and subsequent young of the year will be at increased risk of being entrained into the Old and Middle River corridors, or even into the facilities themselves.

The Working Group will continue to monitor conditions and smelt distribution and will meet again on Monday, December 19, 2016, or sooner should conditions warrant.

WEEKLY ADVICE FOR THE DEPARTMENT OF FISH AND WILDLIFE FOR LONGFIN SMELT

Advice for week of December 12, 2016:

The Smelt Working Group advice for Longfin Smelt – operate exports to -5,000 OMR – is based on recent information and previous record low abundance.

No Barker Slough operations advice. The Smelt Work Group meeting occurred prior to concern period beginning January 15 (see #5 below).

Basis for advice:

The 2009 State Water Project 2081 for Longfin Smelt states that advice to WOMT and the DFW Director shall be based on:

1. Adult Salvage – total adult (≥ 80 mm) Longfin Smelt salvage (SWP+CVP) for December through February > 5 times the Fall Midwater Trawl Longfin Smelt annual abundance index.
2. Adult abundance, distribution or other information indicates that OMR flow advice is warranted.
3. Larva distribution in the Smelt Larva Survey or the 20mm Survey finds Longfin Smelt larvae present at 8 of 12 central and south Delta sampling stations in 1 survey (809, 812, 815, 901, 902, 906, 910, 912, 914, 915, 918, 919; see Figure 1).
4. Larva catch per tow exceeds 15 Longfin Smelt larvae or juveniles in 4 or more of the 12 survey stations listed.
5. During the period January 15 through March 31 of a dry or critically dry water year only, advice for Barker Slough pumping plant operations may be warranted if larval Longfin Smelt are detected at station 716 and other information indicates risk of entrainment.

Discussion of Criteria

1. As of December 11, 2016, no Longfin Smelt have been salvaged for the water year. There will be a Longfin Smelt adult salvage threshold for advice (see criterion in #1 above), because some Longfin Smelt were collected by the Fall Midwater Trawl Survey during the four monthly surveys; annual abundance has not yet been calculated. Advice is not warranted based on this criterion.

2. December Bay Study and Fall Midwater Trawl sampling collected no Longfin Smelt in the San Joaquin River; however, the December Fall Midwater Trawl did detect Longfin Smelt in the Sacramento River as high as station 713 (Cache Slough at Elkhorn Slough), indicating that Longfin Smelt adults are entering the Delta and are present in the Sacramento River. Presence of adult Longfin Smelt in the Sacramento River and the likelihood of increasing numbers of adults entering the Delta warrants advice, given the high export rates and strongly negative OMR.

3 & 4. The first Smelt Larva Survey (SLS) of 2015 will be conducted beginning January 5th.

5. Criteria does not begin until January 15th.

Current conditions: As of December 11th, the Sacramento River flow was 25,562 cfs and increasing; the San Joaquin was 918 cfs. X2 was close to 81. Combined State and federal exports were 9,980 cfs and planned to increase about 900 cfs on Wednesday (i.e., maximum exports). The projected OMR index projected when facilities reach maximum exports later this week is -10,000 cfs. Qwest was -3,300 and trending more positive. The runoff from the most recent storm has yet to reach the Delta.

In December, a Longfin Smelt was collected in the Sacramento River by the Fall Midwater Trawl, one each at station 706 (lower Sacramento River at Three-Mile Slough) and station 713, Cache Slough at Elkhorn Slough. These collections indicate the start of the spawning migration and that adult Longfin Smelt are moving well into the Delta. The number of adults entering the Delta is expected to increase through the month and beyond. Two additional Longfin Smelt were collected at the confluence during the December Spring Kodiak Trawl survey. This is an uncommon catch for this gear, which suggests there are a sizable number of fish present. Bay Study has not reported its catches from December downstream of the Delta and Spring Kodiak Trawl had not yet reported any results from sampling its stations in Suisun Bay.

No Longfin Smelt have been salvaged this water year.

Summary of Risk: Risk of entrainment is high for adult fish due to extremely high export rates, the start of the Longfin Smelt spawning migration and the indication that some fish are traveling well into the Delta (i.e., Cache Slough).