

Smelt Working Group
January 30, 2017

Meeting Summary

The Working Group reviewed current Delta conditions, survey data, and forecasted weather. Hydrology that meets the temporary release from OMR prescriptions as identified in the RPA Component 1, Action 2 (page 356) has been in effect since January 13. Flows on the Sacramento River at Rio Vista and on the San Joaquin River at Vernalis have both been in exceedance of 90,000 cfs and 10,000 cfs, respectively. Rio Vista flows are expected to drop below 90,000 cfs early this week, however, with the anticipated storms later this week, flows are expected to again rise above 90,000 cfs by the weekend. During the short time that Rio Vista flows will be less than 90,000 cfs on the three-day average, the SWG indicated that the anticipated OMR flows (Index -1,800 cfs today and anticipated to remain steady this week) are sufficiently protective of Delta Smelt.

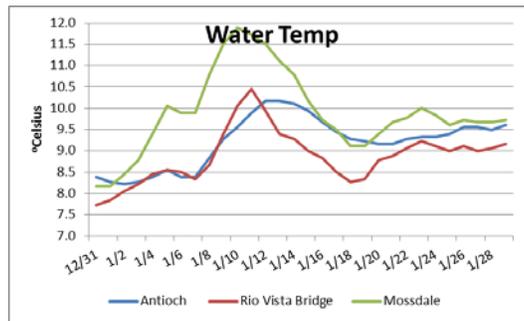
The Working Group is following guidance for entrainment protections from Action 2 (adult Delta Smelt). The Working Group will continue to monitor Delta Smelt survey and salvage data and Delta conditions, and will meet again on Monday, February 6, 2017 at 10 am.

Reported Data

1. **Current environmental data**

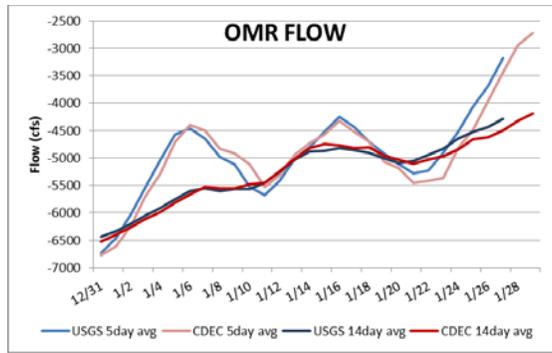
a. Temperature

Daily average of the three Delta stations (Rio Vista, Antioch, Mossdale) was 9.5°C on January 29.



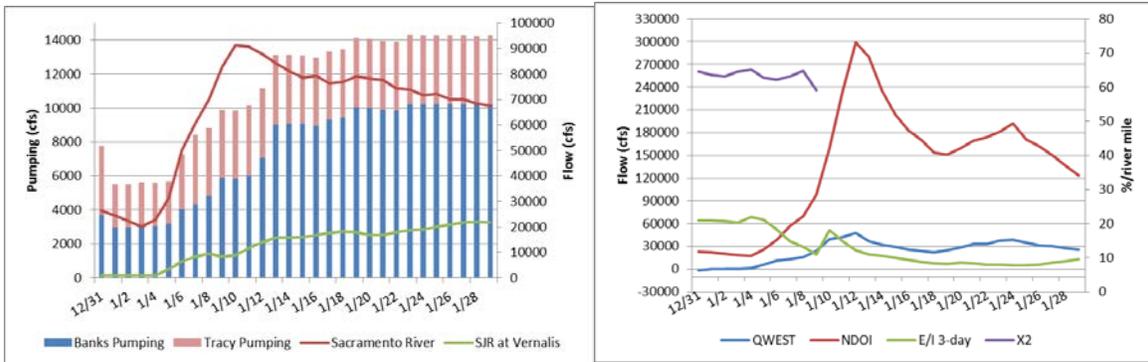
b. OMR flow

The CDEC daily average OMR flow for January 29 was -2,520 cfs. USGS daily average OMR flow for January 27 was -2,128 cfs.

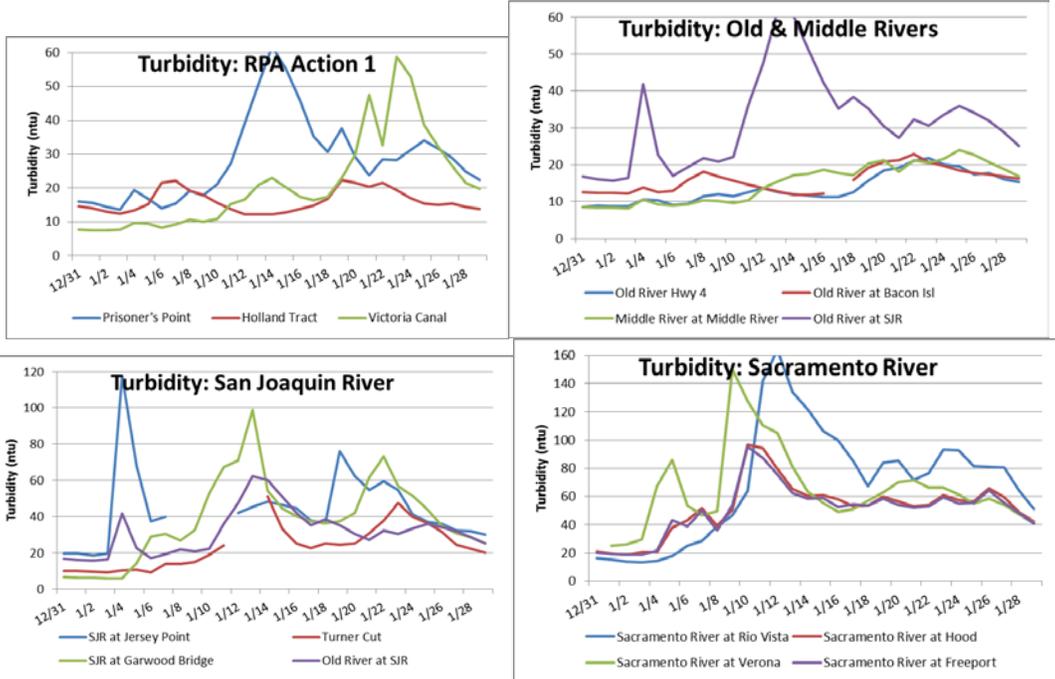


c. River flows and pumping

Sacramento River at Freeport flow for January 29 was 67,446 cfs. San Joaquin River at Vernalis river flow for January 29 was approximately 21,754 cfs. X2 was downstream of 59 km as of January 29.



d. Turbidity



2. Delta fish monitoring

The 2016 FMWT Index is 8. This is the 2nd lowest index on record.

SLS #2 was in the field January 16 through 19. No Delta Smelt were caught. Five larval Longfin Smelt were caught: one in the lower San Joaquin River, two in Suisun Bay, and two in the Napa River

SLS #3 is in the field this week, running January 30th through February 2nd.

SKT #2 is in the field next week, running February 6th through February 9th.

Enhanced Delta Smelt Monitoring was in the water last week. Survey locations were in the lower San Joaquin River, Sacramento River, confluence, and downstream of the confluence. A total of 15 Delta Smelt were caught, 3 in Suisun Bay/Marsh, 8 in Honker Bay, 3 in the lower San Joaquin River, and 1 in the Cache Slough/Liberty Island area. Four Delta Smelt were caught in the wings of the nets and were not included in the abundance analysis because they cannot be assigned to a specific tow event with high certainty. The EDSM was not able to conduct the full survey, so abundance estimates generated based on last week's catch may not represent the entire population. This week's EDSM sampling effort will be the firsttime when the full sampling protocol is in the field.

3. Modeling

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

4. Salvage

No Longfin Smelt or Delta Smelt have been salvaged since January 10th. The seasonal total of Delta Smelt salvage so far is 4 fish.

Operations at the Skinner Fish Facility indicated that during predator flushes and debris removal, salvage operations were not taking place and that any listed fish seen at these times were not being recorded.

5. Expected Project Operations

Combined pumping today is 14,500 cfs. Pumping is currently unrestrained by OMR levels.

Operators indicated that the OMR Index for today is approximately -1,800 cfs, and expected to remain stable this week.

A storm is expected to move through the area Wednesday through Friday. San Joaquin River at Vernalis is anticipated to remain at or above 20,000 cfs and the Sacramento River at Freeport is anticipated to drop below 90,000 cfs before increasing again in response to the storm.

6. Delta Conditions Team

No DCT update was given.

7. DWR Turbidity Transects

Surveys were suspended earlier in January due to safety concerns. SWG also suggested that while turbidity remains high throughout the system, the transects do not provide sufficiently helpful information for the group at this time considering the high turbidities throughout the system. Transects are not anticipated to continue until at least next week.

8. Biological Opinion Background:

RPA Component 1, Action 2 states, “An action implemented using an adaptive process to tailor protection to changing environmental conditions after Action 1. As in Action 1, the intent is to protect pre-spawning adults from entrainment and, to the extent possible, from adverse hydrodynamic conditions.” “The range of net daily OMR flows will be no more negative than -1,250 to -5,000 cfs. Depending on extant conditions (and the general guidelines below) specific OMR flows within this range are recommended by the Working Group from the onset of Action 2 through its termination...”

The timing of Action 2 is immediately after Action 1. Before this date (in time for operators to implement the flow requirement) the SWG will recommend specific requirement OMR flows based on salvage and on physical and biological data on an ongoing basis. If Action 1 is not implemented, the SWG may recommend a start date for the implementation of Action 2 to protect adult Delta Smelt. (BiOp page 352).

Justification for Release from Prescriptions of Action 2

The “...offramp for prescriptions in Actions 1 and 2 should be Sacramento River flows at Rio Vista exceeding a three-day average of 90,000 cfs and San Joaquin River flows at Vernalis exceeding 10,000 cfs. Based on historic observations, it is predicted that salvage under these flow conditions will be minimal” (page 356).

Based on guidance from the USFWS, the Rio Vista flow value will be tracked by DWR according to a calculation based on an equation used for the DAYFLOW program. Any Rio Vista trigger or offramp terms relating to the suspension of Action 2 will use the 3-day average of this calculation.

9. Assessment of Risk Discussion

Turbidity

Members indicated that turbidity levels for the past few weeks have been elevated throughout the central and southern Delta, effectively forming a turbidity bridge from the confluence and the lower San Joaquin River to the export facilities. Although turbidity levels are presently decreasing, members expect the anticipated rain storm late Wednesday through Friday will maintain wide-spread elevated turbidity until at least February 7.

During the last SWG meeting (January 9), members expressed concern regarding the elevated risk of salvage while a turbidity bridge was in place. Members recommended operations be managed to minimize the duration of a turbidity bridge in order to reduce the risk of exceeding the annual ITL, which is the second lowest on record. Given that only four Delta Smelt were indicated in salvage since January 9, concern has lessened, and members agree the risk of salvage exceeding the ITL under current hydrological and turbidity conditions is low. Members are uncertain why a only single and limited salvage event occurred, given the documented presence of Delta Smelt in the Old River corridor at the time the turbidity bridge formed, conditions which in prior years proceeded larger salvage events. Members emphasized their

past concerns that salvage has become unpredictable and challenging to apply to the group's assessment of the risk of entrainment.

Although expected levels of salvage did not occur, members maintain the assertion from January 9 that Delta Smelt are more likely to continue to move into Old River and the south Delta while turbidity conditions persist (independent of OMR flow).

Delta Smelt Detections

The EDSM continues to confirm the presence of Delta Smelt in the lower San Joaquin River. Results from last week's survey effort suggest that a smaller proportion of the population is present in the lower San Joaquin than in previous weeks. Results also indicate that a larger percentage of fish have moved well downstream of the confluence than in previous weeks. However, members again stressed that it is too early to draw firm conclusions from the new survey.

Members believe that Delta Smelt are present in the South Delta. It is unclear what their distribution is, but presence has been confirmed both through salvage and by EDSM trawls in the South Delta two weeks ago. The mechanisms for the low salvage despite high exports and high turbidity are poorly understood at this point, and these relationships may deviate from our conceptual models during such high flows. Some members suggested that perhaps fish are not moving into the south Delta as we had expected. Some members suggested that at the next SWG meeting, the group go over our assumptions of how Delta Smelt adults move during the migration season.

Spawning Migration

Spawning movements may continue until spawning begins. Initially, individuals move upstream in strong association with the field of elevated turbidity, and then are believed to remain upstream as flow and turbidity decline until they spawn. Members indicated that several periods of strong upstream movement may occur, with subsequent smaller movements throughout the migration period as occurs with other smelt species, often in correspondence with elevated hydrology and turbidity events [Sommer, T., F. H. Mejia, M. L. Nobriga, F. Feyrer, and L. Grimaldo. 2011. The spawning migration of Delta Smelt in the upper San Francisco Estuary. *San Francisco Estuary and Watershed Science* 9(2)].

Release from Prescriptions of Action 2

Hydrologic conditions that meet the temporary suspension of action indicated in the Biological Opinion (page 356) are in place, although they are anticipated to reduce below the prescribed conditions today, followed by an increase again over the weekend.

General discussion

Members pointed out that OMR flows are significantly more positive relative to the last SWG meeting, and that flows at Vernalis are greater than 20,000 cfs with both parameters expected to remain steady this week. Some members pointed out that with the unreliability of salvage and the current inability to draw significant conclusions from the EDSM, the group doesn't have

sufficient information to draw conclusions about what percentage of the population might be currently in, or at risk of entering, the central and southern Delta. However, the group agreed that given the anticipated OMR flows and Vernalis flows, and considering that no salvage has occurred in response to similar conditions over the past several weeks, expected conditions may be sufficient to prevent large numbers of Delta Smelt from moving into the Old and Middle River, and expectations of a salvage event occurring are low.

The Working Group will continue to monitor conditions and Delta Smelt distribution and will meet again on Monday, February 6, 2017.

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

Advice for week of January 30, 2017:

The Smelt Working Group has no advice for Longfin Smelt: Advice is not warranted at this time given current flow conditions above the off-ramp thresholds at Rio Vista and Vernalis.

No Barker Slough operations advice. Water year runoff is listed to be above normal, eliminating the need for Barker Slough restrictions this water year.

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 January 22nd, only one Longfin Smelt has been salvaged during the current water year. The 2016 Fall Midwater Trawl annual abundance index for Longfin Smelt is 7, so the incidental take limit for adult Longfin Smelt is 35. Given the current water conditions, it is unlikely that many more adults will be salvaged. Advice is not warranted based on this criterion.

2. In January ,Bay Study Survey collected four Longfin Smelt; one was collected in the San Joaquin River just upstream of the Antioch Bridge; all others were caught farther downstream. Chipps Island Trawl continues to collect low numbers of Longfin Smelt weekly. Enhanced Delta Smelt Monitoring collected a single Longfin Smelt near Twitchell Island on January 24. No additional survey data are available that would indicate the presence of adult Longfin Smelt in the San Joaquin River or south Delta. Sacramento River flow at Rio Vista appears about 97,000 cfs and declining, but well above 55,000 cfs off-ramp; San Joaquin River flow above 21,000 cfs; both continue to exceeded flow off-ramp outlined in the Incidental Take Permit. X_2 remains downstream (about 64 km).

3&4. The second Smelt Larva Survey (SLS) of 2017 detected a single Longfin Smelt larvae in the central or south Delta, and all additional larvae were collected downstream based on complete processing (Table 1). Qwest has been positive since January 1, reaching about 64,000 cfs on January 13th, and as of January 29th was over 26,000 cfs and decreasing. OMR is limited to -5,000 cfs based on the Delta Smelt BO. Vernalis flows exceeded 21,000 on January 29, and remain above the 8,000 cfs off-ramp for the Incidental Take Permit; thus, no need for OMR restrictions for protecting larvae. Any larvae recently hatched in the San Joaquin River have a low risk of entrainment into the south Delta in the near future so long as Vernalis flows remain above 5,000 cfs and Qwest remains positive.

5. Current measurements place the water year as above normal, thus, Barker Slough export restrictions will not be implemented this water year.

Current conditions: As of January 29th, Sacramento River flow at Rio Vista was reported at 97,736 cfs and the San Joaquin at Vernalis at 21,729 cfs. Both remain well above the off-ramp thresholds for the Longfin Smelt Incidental Take Limit. Although flows are declining, storms expected at the end of the week will substantially increase river flows.

Summary of Risk: Risk of entrainment is very low due to high outflow surpassing off-ramp triggers (i.e., no OMR restrictions based on Longfin Smelt ITP).

Table 1. Longfin Smelt catch by station in the 20-mm Survey, #2. Sample processing is complete..

Year	Survey #	SLS Station	Turbidity	Sample Status	Species	Smelt Catch	Min Length	Max Length	Mean Length	
2017	2	340	132	Processed		No Smelt Catch				
2017	2	342	110	Processed	Longfin Smelt	2	5	6	5.5	
2017	2	343	178	Processed		No Smelt Catch				
2017	2	344	182	Processed		No Smelt Catch				
2017	2	345	231	Processed		No Smelt Catch				
2017	2	346	316	Processed		No Smelt Catch				
2017	2	347	376	Processed		No Smelt Catch				
2017	2	348	399	Processed		No Smelt Catch				
2017	2	349	382	Processed		No Smelt Catch				
2017	2	405	101	Processed		No Smelt Catch				
2017	2	411	119	Processed	Longfin Smelt	2	6	6	6	
2017	2	418	149	Processed		No Smelt Catch				
2017	2	501	125	Processed		No Smelt Catch				
2017	2	504	101	Processed		No Smelt Catch				
2017	2	508	114	Processed		No Smelt Catch				
2017	2	513	123	Processed		No Smelt Catch				
2017	2	519	124	Processed		No Smelt Catch				
2017	2	520	83.6	Processed		No Smelt Catch				
2017	2	602	136	Processed		No Smelt Catch				
2017	2	606	208	Processed		No Smelt Catch				
2017	2	609	151	Processed		No Smelt Catch				
2017	2	610	144	Processed		No Smelt Catch				
2017	2	703	103	Processed		No Smelt Catch				
2017	2	704*	122	Processed		No Smelt Catch				
2017	2	705	93.3	Processed		No Smelt Catch				
2017	2	706	109	Processed		No Smelt Catch				
2017	2	707	108	Processed		No Smelt Catch				
2017	2	711	81.9	Processed		No Smelt Catch				
2017	2	716	127	Processed		No Smelt Catch				Barker ITP
2017	2	723	103	Processed		No Smelt Catch				
2017	2	801	81.3	Processed		No Smelt Catch				
2017	2	804	61.7	Processed		No Smelt Catch				
2017	2	809	70.7	Processed		No Smelt Catch				
2017	2	812	62.8	Processed	Longfin Smelt	1	6	6	6	
2017	2	815	57.1	Processed		No Smelt Catch				
2017	2	901	59.7	Processed		No Smelt Catch				
2017	2	902	27.6	Processed		No Smelt Catch				
2017	2	906	32.0	Processed		No Smelt Catch				
2017	2	910	31.8	Processed		No Smelt Catch				
2017	2	912	30.5	Processed		No Smelt Catch				
2017	2	914	23.7	Processed		No Smelt Catch				
2017	2	915	20.2	Processed		No Smelt Catch				
2017	2	918	15.2	Processed		No Smelt Catch				
2017	2	919	27.6	Processed		No Smelt Catch				

Processing is complete through 01/27/2017

* Five minute tow

SWP ITP Criteria Stations

Figure 1. CDFW's 2017 Smelt Larva Survey station locations.

