

Smelt Working Group
January 9, 2017

Meeting Summary

The Working Group reviewed current Delta conditions, survey data, and forecasted weather. Members indicated that the risk of entrainment into the facilities currently is high, and that pre-spawning adults most likely have already been entrained into the south Delta. The SWG indicated there was no OMR level prescribed in the RPA Component 1 Action 2 that would minimize entrainment into the south Delta, given the current and anticipated hydrology (including turbidity). Members indicated that hydrology that meets the temporary release from OMR prescriptions as identified in the RPA Component 1, Action 2 (page 356) are expected later this week. The SWG recommended that the Service look to the EDSM catches and salvage results this week in order to minimize take at the facilities. Should any detections occur in the “high risk, low density” zone or any salvage take place, OMR should immediately be returned to the most positive level afforded in the Biological Opinion.

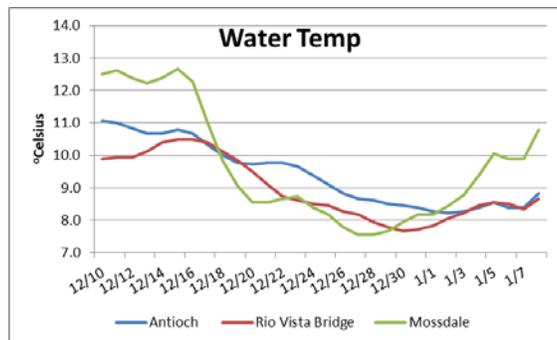
The Working Group is following guidance for entrainment protections from Action 2 (adult Delta Smelt). The Working Group will continue to monitor Delta Smelt survey and salvage data and Delta conditions, and will meet again on Tuesday, January 17, 2017 at 10 am.

Reported Data

1. Current environmental data

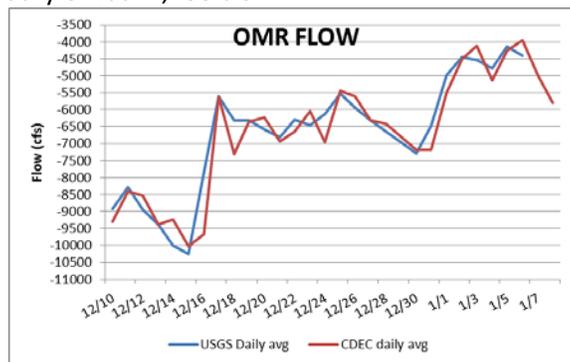
a. Temperature

Daily averages of the 3 Delta stations (Rio Vista, Antioch, and Mossdale) was 9.4°C as of January 8.



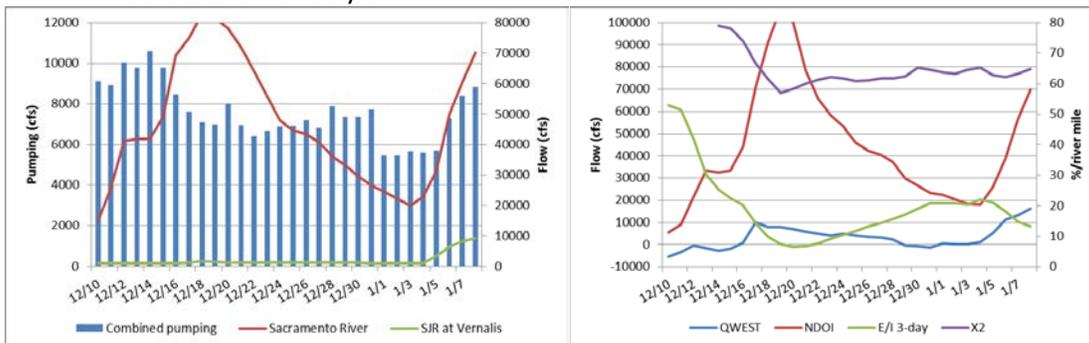
b. OMR flow

The CDEC daily average OMR flow for January 8 was -5,797 cfs. USGS daily average OMR flow for January 6 was -4,400 cfs.

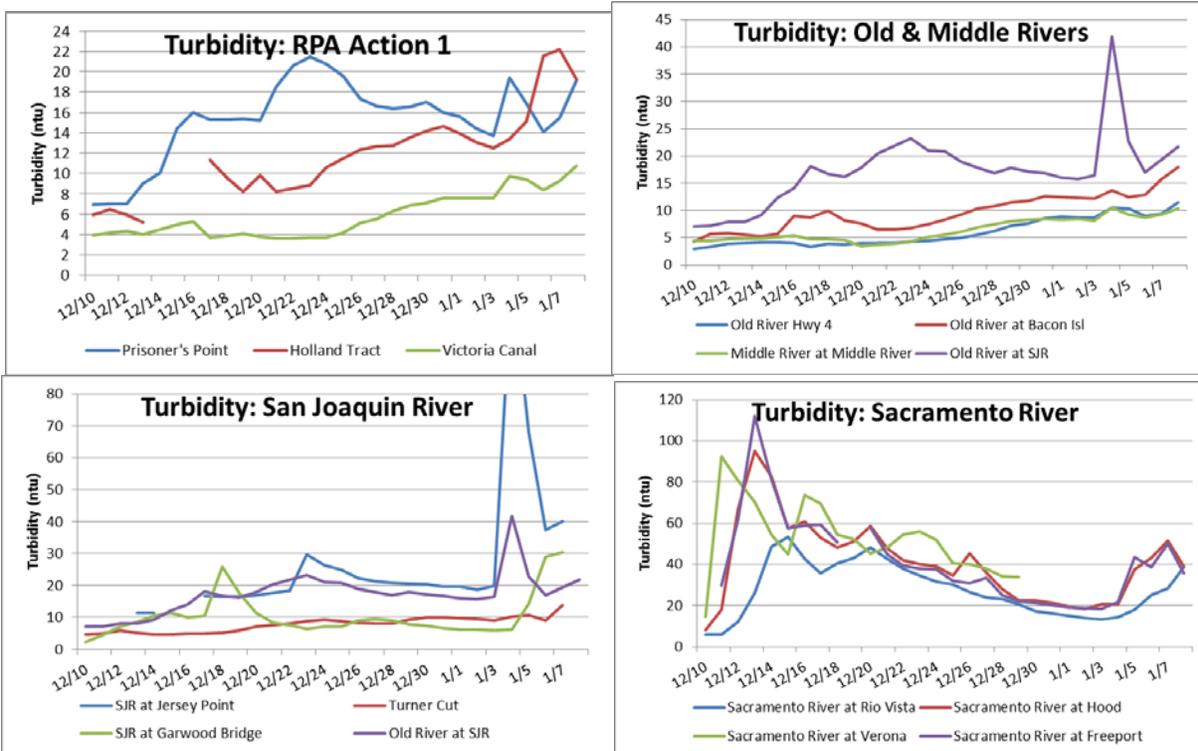


c. River flows and pumping

Sacramento River at Freeport flow for January 8 was 70,139 cfs. San Joaquin River at Vernalis river flow for January 8 was approximately 9,279 cfs. X2 was at approximately 65 km as of January 8.



d. Turbidity



2. Delta fish monitoring

The 2016 FMWT Index is 8. This is the 2nd lowest index on record. SLS #1 was in the field last week and processing is 40% complete. One adult Delta Smelt was caught at station 809 (69 mm) and one Longfin Smelt larva was caught at station 703; SKT #1 is in the field this week. One Delta Smelt adult was caught this morning at station 812 and another at station 815. Both were in prespawn condition.

EDSM 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 27 Delta Smelt were caught, 14 from the lower San Joaquin River, 5 from the Sacramento River, and 8 from Suisun Bay and Honker Bay. 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, the EDSM will survey within the low risk/high density zone as well as the high risk/low density zone.

This week's estimate indicated a large shift from last week. Last week, 471,225 fish were estimated for the low risk, high density zone, while this week the estimate is 137,327. Members also pointed out the estimate of the percentage of the population that occurs in the lower San Joaquin River had increased significantly from the previous week. Members again stressed the potential usefulness of consistently comparing catch distributions in the high and low risk zones and high and low density zones from one week to the next. Delta Smelt detected in the high risk zone, are at risk of being entrained into the South Delta, especially given the current and anticipated hydrology and turbidity conditions. These conditions during the spawning migration can lead to a greater risk of adult entrainment into the pumping facilities, and to increased larval densities in the zone of entrainment later in the year.

3. Modeling

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

4. Salvage

An estimated two Longfin Smelt were salvaged at the SWP facilities on January 6. No adult Delta Smelt salvage has occurred so far this water year.

5. Expected Project Operations

Combined pumping today is 10,000 cfs. Pumping currently is restricted by NMFS RPA Action IV.2.3 and the Service RPA Component 1, Action 2, both of which restrict OMR flows to no more negative than -5,000 cfs. Operators indicated the projected OMR Index is expected to be approximately -5,000 cfs this week.

A storm is expected to move through the area tonight through Wednesday. San Joaquin River at Vernalis is anticipated to increase to 18,000 cfs and the Sacramento River at Freeport is anticipated to reach 130,000 cfs in response to this storm.

6. Delta Conditions Team

The DCT met last Friday. Turbidity modeling results were distributed to the SWG. The DCT noted that the flow at Vernalis used for the modeling was incorrect, and results are not likely to reflect actual conditions this week. The SWG also does not indicate a need for these models as long as turbidity transects are provided.

7. DWR Turbidity Transects

Surveys were completed last week and results were distributed to the group. DWR staff indicated that the transects were done on high tide. Members advised that only one transect is needed per week during the current conditions.

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).

9. Assessment of Risk Discussion

Turbidity

Members indicated that turbidity levels throughout the central and southern Delta have increased substantially such that levels at or greater than 12 NTU are present from the export facilities through to the lower San Joaquin River. Given the anticipated storm tomorrow and Wednesday, members expect these conditions to continue until at least January 17.

Last week, members were concerned about minimizing the length of time that a turbidity bridge was in place. Given the predicted hydrology and storms, members believe that the turbidity bridge will remain in place this week no matter the OMR flow (as prescribed in RPA Component 1 Action 2). Therefore, members are concerned about minimizing the amount of salvage that is expected to occur in order to avoid exceeding the ITL for 2017. It is highly likely that Delta Smelt are present in Old River and the south Delta, and the SWG expects salvage this week. However, several members indicated their concern that salvage has become unpredictable: believing the facilities should have observed salvage prior to this week, given the suspected distribution of Delta Smelt in the south Delta and the recent turbidity bridge in the south Delta. Members are unclear on how this lack of observed salvage reflects on probability of detections this week.

Members indicated that Delta Smelt are likely to continue to move into Old River and the south Delta while turbidity conditions persist (independent of OMR flow). Members are concerned with managing the species for the remainder of the season (through Action 3 of the Biological Opinion). Members expect that once fish move into the Old River they likely will remain to be entrained into export facilities, eaten by predators or spawn there. As a result, a large proportion of the resulting larvae and juveniles would be at high risk of entrainment into the facilities. With the very low anticipated ITL for juveniles this year, the SWG would anticipate that the ITL easily could be exceeded early in the year.

Delta Smelt Detections

The EDSM continues to confirm the presence of the species in the lower San Joaquin River, especially at Twitchell Island and Prisoners Point. Fish at Prisoners Point are considered to be at greater risk of entrainment into the Old and Middle River corridors than those detected at Jersey Point or further downstream, especially when OMR is at or more negative than -5,000 cfs. This week’s results indicate a significantly larger percentage of the population may be in the

lower San Joaquin River than suggested by results from previous weeks. Members indicated that Delta Smelt likely have moved throughout Old River and into the south Delta. Members also anticipate that there are sufficient numbers of Delta Smelt already in these areas to meet or exceed the likely WY2017 adult ITL, if they are entrained in the facilities and detected in salvage.

Spawning Migration

The SWG agrees that the first flush conditions for Action 1 in the Biological Opinion likely have passed with the previous storms. However, another period of flushing conditions is occurring in the Delta with the series of storms this week. Last week, members believed it was appropriate to look to Action 1. The Service indicated in their January 6 Determination that they were looking to Action 2 of the Biological Opinion for OMR flow prescriptions. The SWG has therefore based their assessment of risk today on the guidance provided in Action 2.

Migration is anticipated to continue until spawning begins, or approximately March. Individuals are anticipated to move upstream with the turbidity field, and then to remain in position as flow and turbidity decline until they spawn. Members indicated that several periods of upstream movement would be anticipated throughout the migration period, often corresponding with elevated hydrology events.

SWG members stressed the high degree of risk that the Delta Smelt in the south and central Delta currently are under. A minority of members indicated immediate additional protections were necessary to minimize the risk of salvage. Most members could not provide adequate justification for setting a specific OMR flow for this week, due to the assumption that fish would continue to move closer to the facilities given the turbidity bridge, although some members suggest increased magnitude and duration of flood tides caused by export operations could allow similar increase in upstream fish movement. However, members are greatly concerned with the immediate potential for salvage over the next week. Members emphasized the importance of providing an immediate response to salvage or survey detections in proximity to the pumps by immediately implementing the most positive OMR indicated in the Biological Opinion. The purpose of this recommendation is to attempt to manage the take level, not to decrease entrainment into the south Delta.

Some members indicated that once the storms have passed this week, it might be appropriate to implement a more positive OMR to decrease the amount of time that the turbidity bridge remains in place.

Release from Prescriptions of Action 2

Members indicated that hydrological conditions could meet the temporary suspension of action indicated in the Biological Opinion (page 356) this week.

Advice Framework OMR Level Risk Ranking and Discussion

The above discussion points influenced and contributed to all three flow ranges described below:

OMR Flow of -1,250 to -2,000 cfs: high risk of entrainment

- Risk factors: 2nd lowest FMWT index on record, confirmed Delta Smelt presence in central Delta based upon Jersey Point, Prisoner's Point, and Twitchell Island catch data (EDSM)

- Salvage: Zero salvage this water year, geographic influence of the pumps reaches the south Delta and partly into Old River. Delta Smelt salvage is expected, given current turbidity bridge.
- Unknowns: detection probability in salvage and trawl surveys has been severely reduced, given the record low abundance
- Turbidity is elevated throughout the central and southern Delta and is expected to remain high this week.
- Persistence of risk: unlikely to change prior to January 17

OMR Flow of -2,000 to -3,500 cfs: high risk of entrainment

- Risk factors: 2nd lowest FMWT index on record, confirmed Delta Smelt presence in central Delta based upon Jersey Point, Prisoner's Point, and Twitchell Island catch data (EDSM)
- Salvage: Zero salvage this water year, geographic influence of the pumps reaches into Old River, where Delta Smelt are present. Delta Smelt salvage is expected, given current turbidity bridge.
- Unknowns: detection probability in salvage and trawl surveys has been severely reduced, given the record low abundance
- Turbidity is elevated throughout the central and southern Delta and is expected to remain high this week.
- Persistence of risk: unlikely to change prior to January 17

OMR Flow of -3,500 to -5,000 cfs: high risk of entrainment

- Risk factors: 2nd lowest FMWT index on record, confirmed Delta Smelt presence in central Delta based upon Jersey Point, Prisoner's Point, and Twitchell Island catch data (EDSM)
- Salvage: Zero salvage this water year, geographic influence of the pumps expected to reach to the lower San Joaquin River closer to -5,000 cfs OMR flow. Delta Smelt salvage is expected, given current turbidity bridge
- Unknowns: detection probability in salvage and trawl surveys has been severely reduced, given the record low abundance, no new survey data from the Sacramento River system
- Turbidity is elevated throughout the central and southern Delta and is expected to remain high this week.
- Persistence of risk: unlikely to change prior to January 9.

The Working Group will continue to monitor conditions and Delta Smelt distribution and will meet again on Tuesday, January 17, 2016.

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

Advice for week of January 9, 2017:

The Smelt Working Group has no advice for Longfin Smelt: Advice is not warranted at this time given current conditions.

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 January 8st, 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. Bay Study has not begun survey for January. Chipps Island Trawl caught 7 Longfin Smelt in late December: 3 on December 27 and 4 on December 30. This follows similar collection the previous week: on 4 on December 19 and 9 on December 21st. No additional survey data are available that would indicate the presence of adult Longfin Smelt in the San Joaquin River or south Delta. However, adult Longfin Smelt collected earlier in December by Fall Midwater Trawl and more recently by USFWS Chipps Island survey indicates that fish have entered the Delta and are present in the Sacramento River. Sacramento River flow at Rio Vista is approaching a 55,000 cfs off-ramp and San Joaquin River flow over 9,000 cfs has exceeded an off-ramp outlined in the Incidental Take Permit as of January 8. X₂ remains downstream (about 64 km). At such levels, few adults will venture into the central Delta. Qwest turned positive January 1 and reached +16,000 cfs January 8. Any larvae produced in the San Joaquin River have a low risk of entrainment into the south Delta so long as Qwest remains neutral or positive.

3&4. The first Smelt Larva Survey (SLS) of 2017 detected no Longfin Smelt larvae in the central or south Delta. Qwest has been positive since January 1 and currently exceeds 16,000 cfs. OMR is limited to -5,000 cfs based on the Delta Smelt BO. Vernalis recently exceeded 9,000 cfs and continues to increase, surpassing 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. These criteria do not begin until January 15th. Given current flow conditions, Barker Slough export restrictions will not be implemented this water year.

Current conditions: As of January 8nd, Sacramento River flow at Freeport exceeded 70,000 cfs and continues to increase; the San Joaquin at Vernalis exceeded 9,000 cfs and continues to increase. X₂ was judged to be about 64 km. Combined State and Federal operations are targeting an OMR of -5000 cfs based on the NMFS B.O.

The Smelt Larva Survey did not collect any Longfin Smelt larvae in the central or south Delta, and only one in the lower Sacramento River, based on partial sample processing; nonetheless, no larvae were detected in regions at risk of entrainment. USFWS Chipps Island survey collected 7 Longfin Smelt (85-128 mm fork length) on December 19th and 21st. Continued collection of adult Longfin Smelt indicates that the spawning migration is underway and that spawning has likely began in early December (which will result in hatching in late December or early January). The number of adults migrating to spawn is expected to increase through January and into February, but as long as X₂ remains downstream, proportionally fewer will enter the central Delta to spawn.

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) and moving X₂ downstream, a strong positive Qwest, and no detection of Longfin Smelt in the central or south Delta with the exception of one adult in salvage.