

Smelt Working Group  
December 27, 2016

**Meeting Summary**

The Working Group reviewed current Delta conditions, survey data, and forecasted weather. The Working Group described the risk of entrainment under the Service-provided advice framework. Under this framework the relative risk of entrainment for OMR flow ranges is discussed and assessed. For the current week, the risk of entrainment for each of the flow ranges is characterized as follows.

- -1,250 to -2,000 cfs has a low risk of entrainment,
- -2,000 to -3,500 cfs has a low to moderate risk of entrainment,
- -3,500 to -5,000 cfs has a moderate to high risk of entrainment, and
- OMR flows more negative than -5,000 cfs present a level of risk to the species that the members find unacceptable.

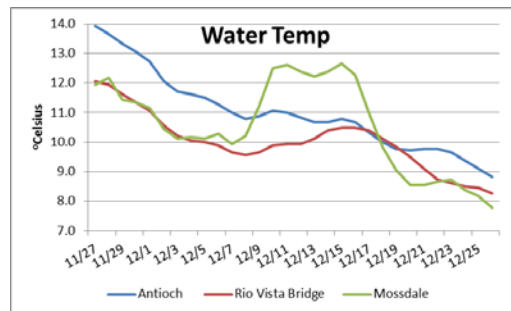
The Working Group is following guidance for entrainment protections from Action 2 (adult Delta Smelt). The Working Group will continue to monitor Delta Smelt survey and salvage data and Delta conditions, and will meet again on Tuesday, January 3, 2016 at 10 am.

**Reported Data**

**1. Current environmental data**

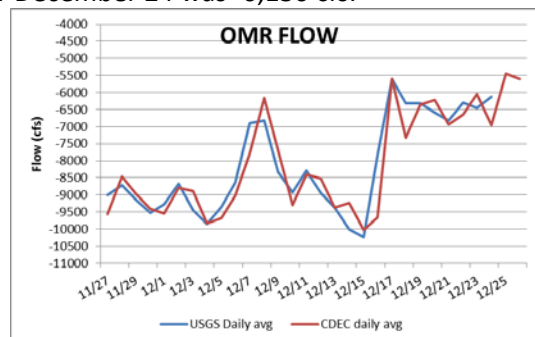
a. Temperature

Daily averages of the 3 Delta stations (Rio Vista, Antioch, and Mossdale) was 8.3°C as of December 26.



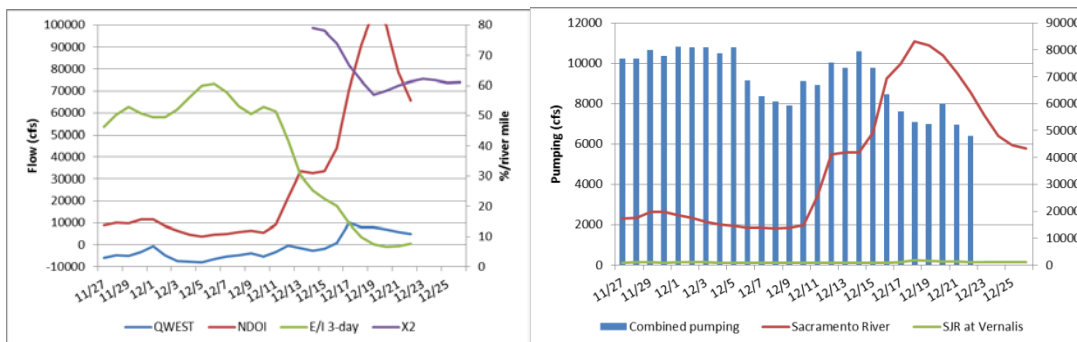
b. OMR flow

The CDEC daily average OMR flow for December 26 was -5,608 cfs. USGS daily average OMR flow for December 24 was -6,130 cfs.

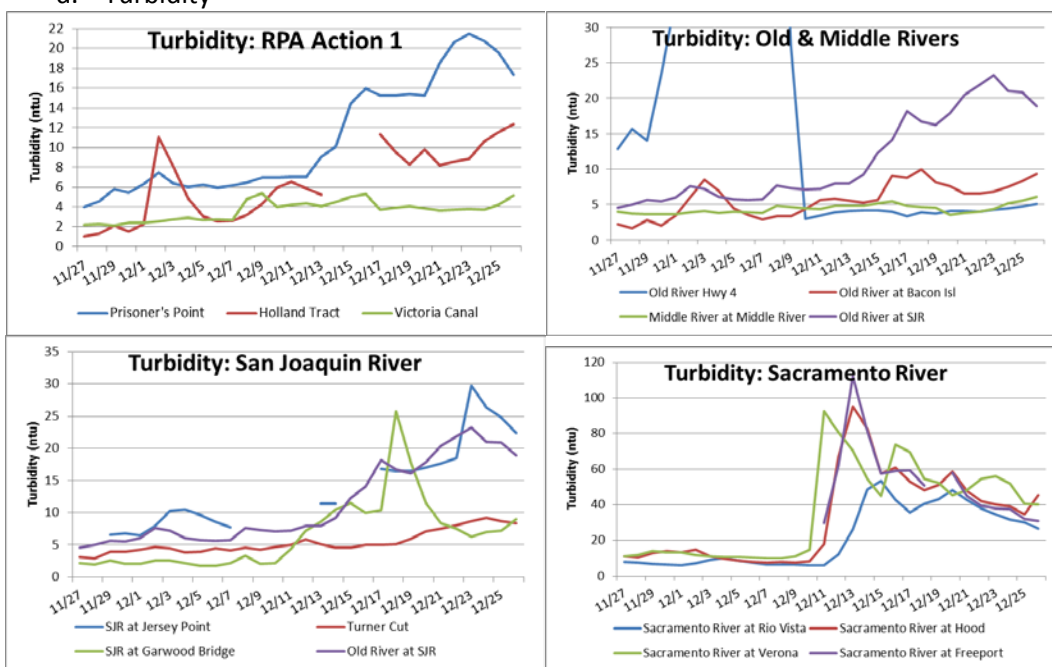


c. River flows and pumping

Sacramento River at Freeport flow for December 26 was 43,281 cfs. San Joaquin River at Vernalis river flow for December 26 was 1,141 cfs. X2 was at 61.1 km as of December 26.



d. Turbidity



2. Delta fish monitoring

The 2016 FMWT Index is 8. This is the 2<sup>nd</sup> lowest index on record. No new survey data information. No additional fish surveys until January 3, 2017.

EDSM was in the water last week. Survey locations were in the lower San Joaquin River, confluence, and downstream of the confluence. A total of 19 Delta Smelt were caught, several from the lower San Joaquin River. The EDSM was not able to conduct the full survey, so abundance estimates generated based on last week's catch may not accurately reflect the entire population. One Delta Smelt had been caught so far this morning, at a high risk, high density site (San Joaquin River at Twitchell Island).

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**

Combined pumping today is 7,000 cfs and possibly increasing, due to results from a Director's call this morning. The Director's decided OMR should be targeted at -7,000 cfs from now until January 1.

#### **6. Delta Conditions Team**

The DCT met last Friday. No update for the SWG.

#### **7. DWR Turbidity Transects**

Surveys were completed last week on Monday and Thursday in the Old River corridor and data was distributed to the SWG.

#### **8. 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.

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).

## **9. Assessment of Risk Discussion**

The Service requested that the SWG provide guidance on the risk of entrainment using the OMR flow categories from the last couple of years. The Service also requested that the SWG provide a threshold for OMR flows. As the Service did not indicate what part of the Biological Opinion to look to for guidance, members decided to look to Action 2 for discussion today, based on recent hydrology. However, members also requested that the Service clarify what section of the Biological Opinion the SWG should refer to for guidance for the January 3 meeting. Members discussed the Service's request for a threshold level for OMR. Members expressed some confusion regarding what was meant by threshold, indicating that the SWG assessment of risk works on a gradient, rather than precise values. Some members are concerned that the Delta Smelt population can no longer sustain any level of "harvest" or "bycatch."

Members discussed entrainment risk and clarified that the SWG will continue to base their assessment of risk of entrainment into the south Delta, rather than into the facilities.

### *Turbidity*

Members indicated that First Flush conditions are receding in both the Sacramento River system and the San Joaquin River system. Although turbidity appears to be decreasing in the lower San Joaquin River, current turbidity remains high (~18 NTU at Prisoners Point and 23 NTU at Jersey Point).

Turbidity has increased in the northern end of Old River, as far south as Bacon Island. Under current and anticipated conditions, higher turbidity is anticipated to encroach further south in Old River, decreasing the distance between suitable turbidity for migrating Delta Smelt and the facilities. Members stressed the primary importance of maintaining lower turbidity in the Old River corridor at this time.

### *Delta Smelt Detections*

Members stressed that the EDSM has confirmed 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. Some members indicated there could be sufficient numbers of Delta Smelt in the lower San Joaquin River to meet or exceed the likely WY2017 ITL, should conditions encourage them to move into the south Delta.

### *Spawning Migration*

The SWG agrees that the conditions for Action 1 in the Biological Opinion likely have passed with the previous storms. The SWG believes it is appropriate to look to Action 2 now, in order to control how far south high turbidity encroaches into the Old River corridor, and to encourage Delta Smelt to remain in the lower San Joaquin River or move into the Sacramento River. The group emphasized that the migration period is the most effective time to manage OMR levels and achieve desired results that can positively affect the distribution of the species for the remainder of the season (and the subsequent risk of entrainment).

Members expect that Delta Smelt have begun their migration to spawning habitat. 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 with the receding tide.

SWG members stressed the importance of providing immediate additional protections beyond those currently in place. Members emphasize that anticipated OMR levels (approximately -7,000 cfs) put too large a percentage of the population at increased risk of entrainment. The SWG emphasized that the species has decreased in abundance to such an extent that it can no longer sustain entrainment losses as in previous years. Some members indicated allowing any percentage of the population to be removed by entrainment can no longer be justified. Some members were concerned that any entrainment losses below or above salvage detection levels could jeopardize the existence of the species. The SWG is concerned with any proportion of the population in high risk of entrainment areas.

#### 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: Low 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 does not extend to the central Delta under this flow range
- Unknowns: detection ability in salvage and trawl surveys has been severely reduced, given the record low abundance
- Turbidity of 10 NTU is not anticipated to move upstream past Bacon Island. Would expect clearer conditions by Jan 1 in the Old River corridor.
- Persistence of risk: unlikely to change prior to January 2

#### **OMR Flow of -2,000 to -3,500 cfs: Low to moderate risk of entrainment (-2,000 cfs has a low risk, -3,500 cfs has a moderate risk)**

- 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 does not extend to the San Joaquin River under this flow range
- Unknowns: detection ability in salvage and trawl surveys has been severely reduced, given the record low abundance
- Turbidity of 10 NTU is not anticipated to move upstream past Bacon Island. Would expect clearer conditions by Jan 1 in the Old River corridor.
- Persistence of risk: unlikely to change prior to January 2

#### **OMR Flow of -3,500 to -5,000 cfs: moderate to high risk of entrainment (-3,500 cfs has a moderate risk, -5,000 cfs has a high risk)**

- 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,
- Unknowns: detection ability in salvage and trawl surveys has been severely reduced, given the record low abundance, no new survey data from the Sacramento River system
- Turbidity of 10 NTU is anticipated to move southward past Bacon Island, especially as flows approach -5,000 cfs.
- Persistence of risk: unlikely to change prior to January 2

OMR Flows more negative than -5,000 cfs have an even higher risk of entrainment. Members are greatly concerned that the anticipated exports up until January 1 and the resulting -7,000 cfs OMR will encourage fish that currently are in a low risk zone to move into a higher risk zone, and potentially resulting in an unsustainable risk of entrainment for the population.

The Working Group will continue to monitor conditions and smelt distribution and will meet again on Tuesday, January 3, 2016.

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

### **Advice for week of December 26, 2016:**

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 ( $\geq 80$ 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 26<sup>th</sup>, no Longfin Smelt have been salvaged during the current water year. The 2016 Fall Midwater Trawl annual abundance index for Longfin Smelt is 7 and will be used to set the salvage threshold for advice described above in the first criterion. Advice is not warranted based on this criterion.

2. No new survey data is 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 no longer above the 55,000 cfs off-ramp outlined in the Incidental Take Permit, but X<sub>2</sub> remains downstream and Qwest is still moderately positive. Any larvae produced in the San Joaquin River have a low risk of entrainment into the south Delta so long as Qwest remains moderately positive.

3&4. The first Smelt Larva Survey (SLS) of 2017 will be conducted beginning January 3rd.

5. Criteria does not begin until January 15<sup>th</sup>, and given flow conditions, is unlikely to be implemented this water year.

**Current conditions:** As of December 26<sup>th</sup>, Sacramento River flow at Rio Vista had decreased to 38,500 cfs; the San Joaquin was at 1100 cfs. X<sub>2</sub> remains downstream at 61 km. Combined State and Federal operations are targeting an OMR of -7000 cfs for the remainder of the calendar year.

USFWS Chipps Island survey collected 13 Longfin Smelt (85-128 mm fork length) on December 19<sup>th</sup> and 21<sup>st</sup>. No CDFW surveys have been conducted since the last Smelt Working Group meeting. Continued collection of adult Longfin Smelt indicates that the spawning migration is underway and that spawning has likely begun. The number of adults entering the Delta is expected to increase as the spawning migration continues.

**Summary of Risk:** Risk of entrainment is low due to high outflow moving X<sub>2</sub> downstream and a positive Qwest.