

**SMELT WORKING GROUP**  
**Monday, January 12, 2015**

**Meeting Summary:**

The Working Group described the risk of entrainment under a new Framework for Providing Advice to the Service. Under this framework the relative risk of entrainment for each of the three flow ranges is ranked and discussed:

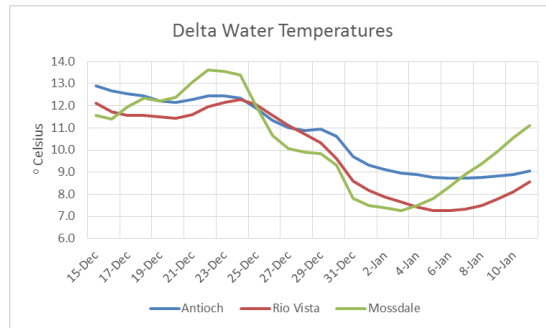
-1250 to -2000 cfs has a low risk of entrainment, -2000 to -3500 cfs has a low to medium risk of entrainment, and -3500 to -5000 cfs has a high risk of entrainment. These relative risk levels are based on a variety of conditions, including but not limited to, lowest annual index on record, turbidity in south Delta slightly above threshold levels for smelt movement, confirmed Delta Smelt presence in central and southern Delta, and sporadic reduction in salvage efficiency due to debris loads.

The Working Group will continue to monitor Delta Smelt survey and salvage data and Delta conditions and will meet again Tuesday, January 20, 2015 at 10am.

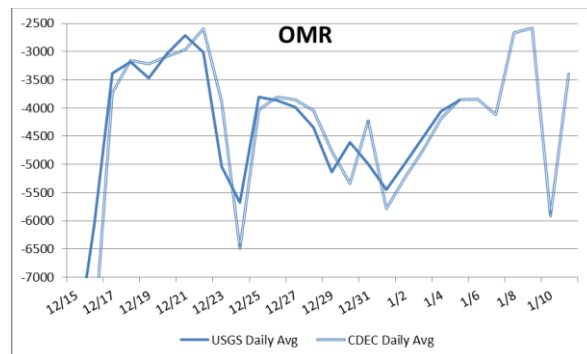
**Reported Data:**

**1. Current environmental data:**

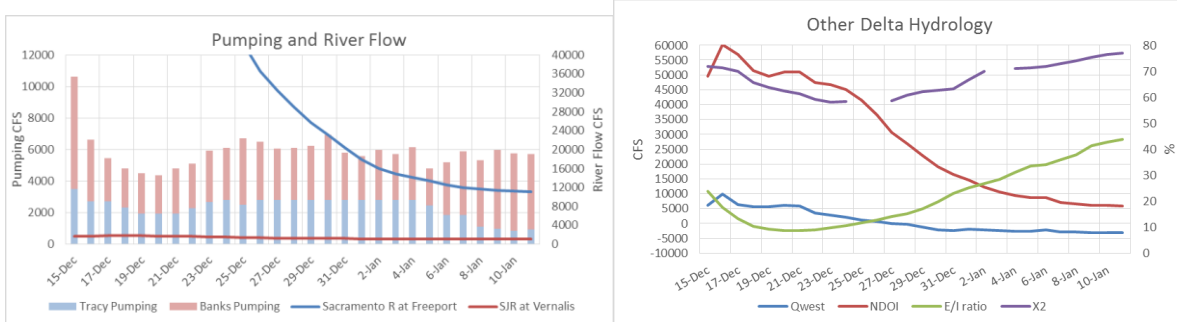
- Water Temperatures are as follows:



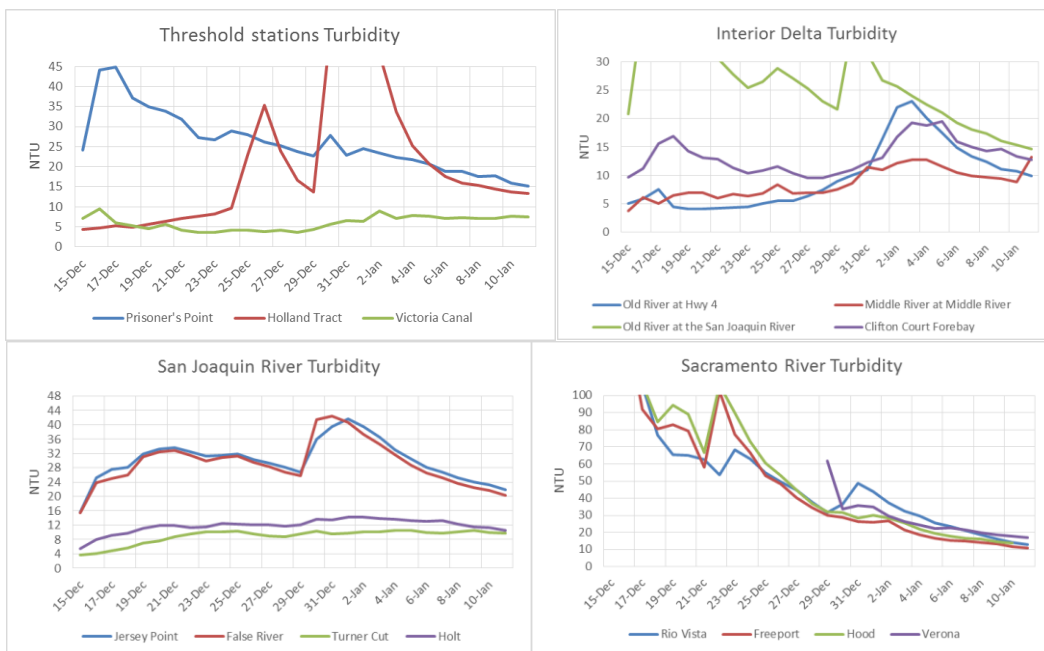
- OMR Flow: USGS tidally-averaged OMR flow has been unavailable since January 6. CDEC daily, 5 day average, and 14 day average OMR flow as of January 11 is -3398, -3735, and -4333 cfs



- River Flows: Sacramento River inflow is 11,109 cfs and San Joaquin River is 1057 cfs. X2 calculation from CDEC is 76.9 km. The graphs below show the most recent trends in Delta hydrology and water quality that were evaluated by the Working Group



- Turbidity:



## 2. Delta Fish Monitoring:

The 2014 Fall Midwater Trawl Annual Index for Delta Smelt 2014 is 9. This is the lowest fall index, and approximately one half of the previous lowest indices of 17 (2009) and 18 (2013).

Smelt Larva Survey was in the field last week. Processing is ongoing. 32 out of 44 stations were sampled. No Delta Smelt have been observed in the processed samples, but none were expected this early in the year. A total of 3 Longfin Smelt were observed in samples collected from stations 723 and 809.

Spring Kodiak Trawl #1 is in the field this week. Preliminary results indicate that this morning four Delta Smelt were caught at station 809, while none were caught at station 812.

The Service's Early Warning Study reported Delta Smelt catches at Jersey Point and Prisoner's Point. The Service has reduced sampling to one day per week at each location. Delta Smelt catch data from last week's Early Warning Study is as follows (tows were 15 for both days):

1/5/2015 Prisoner's Point=1 Delta Smelt

1/6 Jersey Point=5 Delta Smelt

### **3. Salvage:**

Delta Smelt were salvaged on January 2, 4, 6, and 7 with daily expanded totals of 12, 24, 4 and 16 fish, respectively. The estimated cumulative seasonal total for adult Delta Smelt salvage is now 56. No Longfin Smelt have been observed in salvage counts during WY2015. Salvage counts have returned to 30 minutes per 2 hours, although high debris loads coming into both fish facilities sporadically are causing some of the fish counts to be reduced.

### **4. Expected Project Operations:**

Combined SWP/CVP exports today are 5800 cfs. Operators indicated that the Index OMR value was anticipated to be -5000 cfs in compliance with NMFS RPA Action IV.2.3.

### **5. Delta Conditions Team:**

There was no update on the DCT.

### **6. Assessment of Risk:**

Background:

RPA Component 1: "Beginning in December of each year, the Service shall review data on flow, turbidity, salvage, and other parameters that have historically predicted the timing of Delta Smelt migration into the Delta. On an ongoing basis, and consistent with the parameters outlined... [in the BO]...the SWG shall recommend to the Service OMR flows that are expected to minimize entrainment of adult Delta Smelt" (page 280).

RPA Component 1, Action 1, Part B: "High-entrainment risk period: Delta Smelt have historically been entrained when first flush conditions occur in late December. In order to prevent or minimize such entrainment, Action 1 shall be initiated on or after December 20 if the 3 day average turbidity at Prisoner's Point, Holland Cut, and Victoria Canal exceeds 12 NTU, or if there are three days of Delta Smelt salvage at either facility or if the cumulative daily salvage count is above the risk threshold based upon the 'daily salvage index' approach described in Attachment B. Action 1 shall require the Projects to maintain OMR flows no more negative than -2,000 cfs (14-day running average) with a simultaneous 5-day running average flow no more negative than -2,500 cfs to protect adult Delta Smelt for 14 days. However, the SWG can recommend a delayed start or interruption based on other conditions such as delta inflow that may affect vulnerability to entrainment." (page 281).

RPA Component 1, Action 2: "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...” (page 352).

#### Discussion:

The Working Group reviewed and discussed all relevant data from Delta monitoring, salvage, field surveys, and planned Project operations. The Service indicated this will be the first meeting where the Working Group utilizes the **Framework for Providing Advice to the Service**. Under this Framework, the Working Group is to evaluate the risk of entrainment relative to three ranges of OMR flow (-1250 to -2000 cfs, -2000 to -3500 cfs, and -3500 to -5000 cfs). Specific guidelines were provided to the Working Group in how to discuss the risk of entrainment under each flow range.

The Service presented its updated WY2015 adult Delta Smelt ITL (196 fish). Justification for the new limit will be provided at a later date.

Turbidity remains above 10 NTU throughout much of the central and southern Delta, although levels appear to be decreasing. Members are concerned about these above-threshold levels for smelt movement, as Delta Smelt may still try to occupy southern Delta channels. Members noted that some Delta Smelt likely remain distributed throughout much of the south Delta and these fish continue to face a high risk of entrainment under current operations. The Working Group agreed that as long as south Delta turbidity remains at or above 10NTU, it is reasonable to expect some continued movement of Delta Smelt into the south Delta and as a result, additional salvage.

High debris loads have negatively impacted fish salvage efficiency. Although fish counts have mostly returned to the full 30 minutes per two hours, debris continues to sporadically reduce the already low probability of detecting Delta Smelt in salvage operations. The CVP facility has reduced its pumping to 900 cfs, and the SWP facility has increased to 4900 cfs.

Fish surveys continue to detect Delta Smelt in the lower San Joaquin River (DFW collected four delta smelt at Jersey Point this morning). The Working Group assumes there are Delta Smelt distributed throughout the central and southern Delta, based on survey results and salvage through last week. Some members expressed surprise that after the increase of pumping at the SWP, salvage at the SWP has occurred on only one day so far. The Working Group expects more fish to be seen in salvage operations in the near future. Elsewhere in the Delta, Delta Smelt have been strongly surface oriented, so it is possible that fish will be more readily detected once debris loads decrease at the facilities and water hyacinth that had been clogging the SWP intake channel finishes clearing out, and the fish have a clear path to the salvage facilities.

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

#### **Framework for Advice OMR Level Risk Ranking and Discussion**

- OMR flow of -1250 to -2000 cfs: There is a low risk of entrainment under this flow range. This is the most protective range for Delta Smelt this week.
  - Risk factors: lowest annual index on record, turbidity levels at threshold levels for fish movement in south Delta, confirmed Delta Smelt presence in central and southern Delta, sporadic reduction in salvage efficiency due to debris loads

- Salvage: geographic influence of the pumps is reduced to southern Delta under this flow range
- Unknowns: future occurrence of high winds increasing turbidity levels could result in an increased risk of entrainment under this flow range. Would expect Qwest to become more positive under this flow scenario.
- Persistence of risk: N/A
- OMR flow of -2000 to -3500 cfs: There is a low to medium risk of entrainment under this flow range.
  - Risk factors: lowest annual index on record, turbidity levels at threshold levels in south Delta, confirmed Delta Smelt presence in central and southern Delta, sporadic reduction in salvage efficiency due to debris loads
  - Salvage: Salvage would be anticipated to decrease for this flow range relative to the 20 fish salvaged over the past week.
  - Unknowns: future occurrence of high winds increasing turbidity levels could result in an increased risk of entrainment under this flow range. Increased pumping at the SWP facility could increase the risk of entrainment for this flow range.
  - Persistence of risk: level of risk for this flow range would be anticipated to remain for the week, or until south Delta turbidity declines below 10 NTUs.
- OMR flow of -3500 to -5000 cfs: There is a high risk of entrainment under this flow range.
  - Risk factors: lowest annual index on record, turbidity levels at threshold levels in south Delta, confirmed Delta Smelt presence in central and southern Delta, sporadic reduction in salvage efficiency due to debris loads
  - Salvage: Salvage would be anticipated to remain at the level seen over the previous week for this flow range (20 fish salvaged over the past week).
  - Unknowns: future occurrence of high winds increasing turbidity levels could result in an increased risk of entrainment under this flow range. Increased pumping at the SWP facility could increase the risk of entrainment for this flow range.
  - Persistence of risk: level of risk for this flow range would be anticipated to remain for the week, or until south Delta turbidity declines below 10 NTUs. Should salvage drop to zero for this week, the risk of entrainment under this flow range could drop as early as next week.

The Working Group will continue to monitor conditions and smelt distribution and will meet again on Tuesday, January 20, 2015.

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

### **Advice for week of January 12, 2015:**

The Smelt Working Group does not have any Longfin Smelt-related advice based on recent information.

Barker Slough operations advice was not provided by the Smelt Work Group, because the meeting occurred prior to the concern period, which begins 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 January 11, 2015, no Longfin Smelt have been salvaged for the water year. The interim Longfin Smelt adult salvage threshold for advice is  $> 80$  (see criterion in #1 above), which is based on a combined September through December Fall Midwater Trawl Longfin Smelt index of 16. No advice is warranted based on this criterion.

2. Early January sampling by Bay Study detected Longfin Smelt adults in the Sacramento River at Rio Vista (station 761), a juvenile and adult in the Sacramento River at Sherman Lake (station 736), none in the San Joaquin River, and juveniles ( $< 80$  mm) and adults throughout Suisun Bay December. Previously, Fall Midwater Trawl sampled the Bay-Delta region during the first half of the month and the supplemental Spring Kodiak Trawl survey during last week, and neither detected any Longfin Smelt in the central or south Delta. Late December catches by the Chipps Island trawl suggested that spawning movement into the western Delta is currently ongoing. Mention was made during the call that “Early Warning Sampling” at Prisoner’s Point caught 2 ripe Longfin Smelt adults this past week. Distribution information does not indicate advice is warranted based on this criterion.

3 & 4. The first Smelt Larva Survey (SLS) of 2015 began January 5<sup>th</sup> and sampled all stations except for those in Napa River (Table 1, Figure 1). Only a single Longfin Smelt larva was detected from among the 12 central and south Delta criteria stations. Hatching for the season is only just beginning. Catches are not yet sufficient to reach concern levels based on density or distribution.

5. The criterion does not take effect until January 15, and the water year classification as of January 1 2015 will be a determining factor.

Current conditions: Sacramento River flow decreased to 11,311 cfs at Freeport on January 11. X2 increased to about 77 km after a low of 61 km on December 28. Combined State and federal exports have been about 5,800 cfs. Qwest has been slightly more negative than -3,000 cfs and will likely remain stable as river flows decline and tides swing to neap.

Summary of Risk:

Risk of entrainment is very low, but this could change at any time with an influx of adult Longfin Smelt into the central and south Delta or with substantial hatching in the region. The risk of entrainment is low when X2 remains low (<70 km), which has been the case until early January.

The limited number of Longfin Smelt larvae detected in the central and south Delta in SLS 1, the few adults in the San Joaquin River or central Delta fish surveys (FMWT sampling; SKT trawls) and the absence of adult Longfin Smelt in salvage samples to date suggests few fish have moved into the central or south Delta for spawning. Current conditions, particularly OMR of about -3,500 cfs and a modestly negative Qwest, don't add much risk for fish that do move into the central Delta. Recent exports have been sufficient to draw turbidity >10 NTU into the south Delta and connect with the export facilities, but this condition is diminishing. It is not clear whether this south Delta turbidity will correspond with some Longfin Smelt salvage. The overall risk of entrainment remains low, but could increase as X2 moves upstream of 77 km. At least half the spawning season remains and as X2 moves upstream subsequent spawners will move upstream as well, potentially placing them and their progeny closer to the export facilities.

Table 1. Longfin Smelt catches by station in Smelt Larva Survey 1, 2015. Sample processing is incomplete.

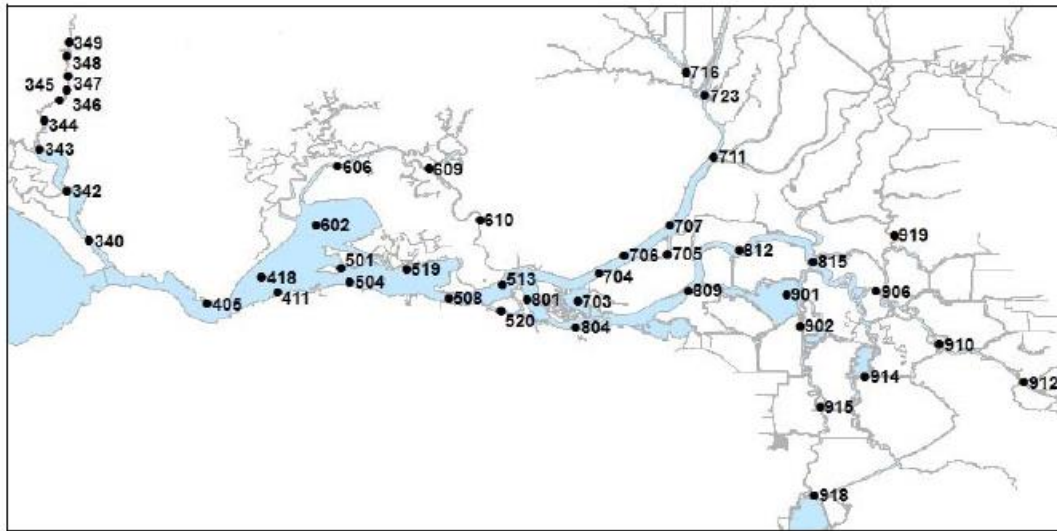
Year	Survey #	SLS Station	Sample Status	Species	Smelt Catch
2015	1	340	Not Sampled		
2015	1	342	Not Sampled		
2015	1	343	Not Sampled		
2015	1	344	Not Sampled		
2015	1	345	Not Sampled		
2015	1	346	Not Sampled		
2015	1	347	Not Sampled		
2015	1	348	Not Sampled		
2015	1	349	Not Sampled		
2015	1	405	Not Sampled		
2015	1	411	Not Sampled		
2015	1	418	Not Sampled		
2015	1	501	Not yet processed		
2015	1	504	Not yet processed		
2015	1	508	Not yet processed		
2015	1	513	Not yet processed		
2015	1	519	Not yet processed		
2015	1	520	Not yet processed		
2015	1	602	Not yet processed		
2015	1	606	Not yet processed		
2015	1	609	Not yet processed		
2015	1	610	Not yet processed		
2015	1	703	Processed		No Smelt Catch
2015	1	704	Processed		No Smelt Catch
2015	1	705	Processed		No Smelt Catch
2015	1	706	Not yet processed		
2015	1	707	Not yet processed		
2015	1	711	Processed		No Smelt Catch
2015	1	716	Processed		No Smelt Catch
2015	1	723	Processed	Longfin Smelt	2
2015	1	801	Not yet processed		
2015	1	804	Not yet processed		
2015	1	809	Processed	Longfin Smelt	1
2015	1	812	Processed		No Smelt Catch
2015	1	815	Processed		No Smelt Catch
2015	1	901	Processed		No Smelt Catch
2015	1	902	Processed		No Smelt Catch
2015	1	906	Processed		No Smelt Catch
2015	1	910	Processed		No Smelt Catch
2015	1	912	Processed		No Smelt Catch
2015	1	914	Processed		No Smelt Catch
2015	1	915	Processed		No Smelt Catch
2015	1	918	Processed		No Smelt Catch
2015	1	919	Processed		No Smelt Catch

SWP ITP Criteria Stations

Processing is complete through 1/09/15.



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



### **Smelt Working Group Framework for providing advice to the Service**

The U.S. Fish and Wildlife Service (Service) is requesting that the Smelt Working Group (SWG) provide delta smelt entrainment protection advice in a new format, and has supplied a framework for how to provide the additional information. In summary, the Service's new SWG advice framework provides structure for describing salvage trend, given current conditions. The Service will incorporate the SWG's advice in determinations with regard to any implementation of the biological opinion (BiOp) with regard to the Incidental Take Limit.

As it has in the past, the SWG will continue to compile and interpret real-time information regarding delta and longfin smelt. The SWG will submit its advice in writing to the Service and California Department of Fish and Wildlife if they agree that a protective OMR flow is warranted to reduce smelt entrainment under RPA Components 1 and 2.

#### **PROCESS**

- The SWG will, as before, review real-time biological data as they pertain to delta smelt entrainment risk as defined in RPA 1 and 2, including population status, relative abundance and distribution, sexual maturation, Delta conditions, cumulative salvage, and current operations.
- The SWG provides delta smelt entrainment risk advice to the Service, as described below:
- Individual risk narratives for the following flow ranges:
  - -1250 to -2000 cfs
  - -2000 to -3500 cfs
  - -3500 to -5000 cfs
- For each OMR range:
  - What effect would operations in that flow range have on the risk factors that are currently important? Examples of the currently important risk factors are Delta conditions, population status, relative abundance and distribution, sexual maturation, and season (ie. life history stage)
  - What effect would operations in that range have on salvage, relative to recent salvage?
  - What "unknowns" (e.g. weather) might affect risk for operations in this range?
  - If operations in that range would result in increased risk of salvage, how long would that risk persist if average OMR remained within the range?