

**SMELT WORKING GROUP**  
**Monday, February 9, 2015**

**Meeting Summary:**

The Working Group described the risk of entrainment under the Service-provided advice framework. 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 risk of entrainment, and
- -3500 to -5000 cfs has a medium risk of entrainment.

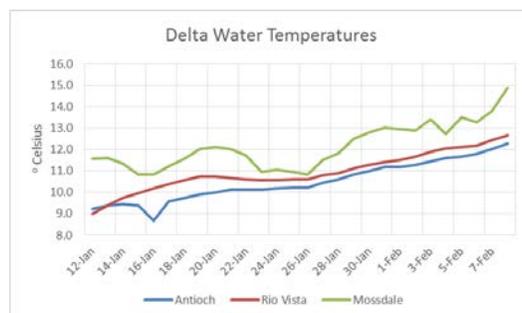
These flow ranges have the potential for a higher level of relative risk, given conditions listed in the discussion section. These relative risk levels are based upon a review of Delta Smelt relative abundance and distribution data, Delta Smelt salvage data, and Delta conditions data, including turbidity. With increased Delta water temperatures (13.3°C, 3 station average), the Working Group has begun to refer to Action 3 (protection of juvenile Delta Smelt); however, the risk values provided refer only to adult fish.

The Working Group will continue to monitor Delta Smelt survey and salvage data and Delta conditions and will meet again Tuesday, February 17, 2015 at 10 am.

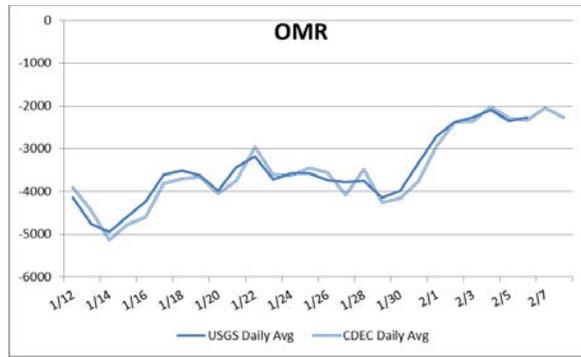
**Reported Data:**

1. **Current environmental data:**

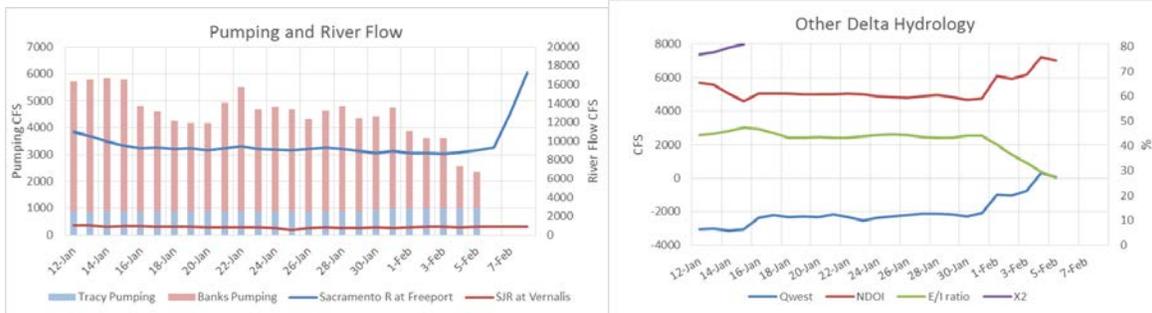
- Water Temperatures are as follows:



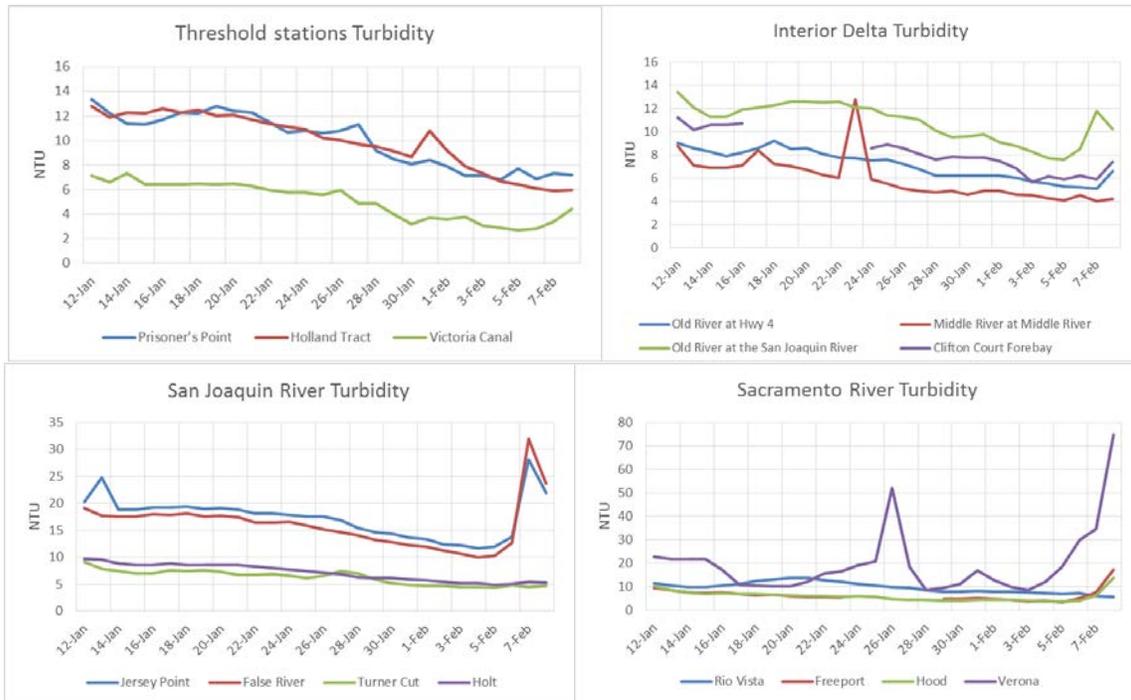
- OMR Flow: USGS tidally-averaged daily, 5-day, and 14-day average OMR flow for February 6 is -2267, -2273, and -3141 cfs, respectively. CDEC daily, 5-day average, and 14-day average OMR flow as of February 8 is -2269, -2189, and -2994 cfs, respectively.



- River Flows: Sacramento River inflow is 17,270 cfs and San Joaquin River is 924 cfs. X2 calculation from CDEC is upstream of 81 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 #3 was in the field February 2 through 4. Processing is ongoing. A total of 207 Longfin Smelt ranging in size from 5 to 10 mm were observed in samples that have been processed so far. Larvae were detected throughout the system, but the greatest densities so far are downstream of the confluence. No young-of-the-year Delta Smelt have been observed in the samples processed so far. Two adult Delta Smelt were caught at station 706 in the Lower Sac River; 66 and 68 mm in size. SLS #4 will start February 17.

Spring Kodiak Survey #2 is in the field beginning today. Preliminary results indicate 10 adult Delta Smelt were caught at station 809 (one ripe female), while none were caught at stations 812 or 815. Additional preliminary results are anticipated later this week.

The Service's Early Warning Survey has increased sampling to daily. An increase in catch at Jersey Point began on February 6. Results for the previous seven days are as follows:

2-2 (Jersey Point): 2 Delta Smelt  
2-3 (Prisoner's Point): no catch  
2-4 (Jersey Point): no catch  
2-5 (Prisoner's Point): no catch  
2-6 (Jersey Point): 14 Delta Smelt, all lanes with catch  
2-7 (Prisoner's Point): no catch  
2-8 (Jersey Point): 18 Delta Smelt, all lanes with catch

### **3. Salvage:**

No Delta Smelt salvage has occurred since January 7. The estimated cumulative seasonal total for adult Delta Smelt salvage remains at 56. No Longfin Smelt has been observed in salvage counts during WY2015. The SWP operated their fish facility with normal 30 min counts last week. The TFCF has increased their daily use of 10 min count times during the first five days then resumed 30 min counts over the weekend.

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

Combined SWP/CVP exports today are approximately 5750 cfs. Operators indicated that they are targeting an Index OMR value of -5000 cfs. The Projects have requested an OMR relaxation of the Service and NMFS. More information will be available later this week.

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

There was no official advice for the Working Group or Delta Operations for Salmonids and Sturgeon team. Turbidity modeling was circulated to the group prior to the call.

### **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 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).

RPA Component 2, Action 3: “The objective of this RPA component (which corresponds to Action 3 in Attachment B), is to improve flow conditions in the Central and South Delta so that larval and juvenile delta smelt can successfully rear in the Central Delta and move downstream when appropriate” (page 282).

“Upon completion of RPA Component 1 or when Delta water temperatures reach 12°C (based on a 3-station average of daily average water temperature at Mossdale, Antioch, and Rio Vista) or when a spent female delta smelt is detected in the trawls or at the salvage facilities, the projects shall operate to maintain OMR flows no more negative than -1,250 to -5000 cfs based on a 14-day running average with a simultaneous 5-day running average within 25 percent of the applicable 14-day OMR flow requirement. Depending on the extant conditions, the SWG shall make recommendations for the specific OMR flows within this range from the onset of implementing RPA Component 2 through its termination. The Service shall make the final determination regarding specific OMR flows. This action shall end June 30 or when the 3-day mean water temperature at Clifton Court Forebay reaches 25° C, whichever occurs earlier” (page 282).

#### Discussion:

The Working Group reviewed and discussed all relevant data from Delta monitoring, salvage, field surveys, and planned Project operations. On January 13, 2014, the Service introduced a proposed “Framework for Providing Advice to the Service” (advice framework). This proposed framework was updated based on specific SWG feedback and has been in use by SWG since January 12, 2015. Under the advice 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. Refer to the January 12, 2015 notes to view the draft advice framework.

The Service presented its updated WY2015 adult Delta Smelt ITL (196 fish) at the January 12 meeting. The January 9, 2015 reinitiation memo regarding this new limit has been posted to the Bay-Delta FWO website (<http://www.fws.gov/sfbaydelta/>).

Delta temperatures surpassed 12°C as of February 3, 2015. The Working Group is now looking to Action 3 of the Biological Opinion as well as Action 2 in framing their advice to the Service.

Turbidity has remained at lower levels in the central and southern Delta, with some increases indicated over the last day or two at Jersey Point and in the Old River corridor. These increases appear to be wind-

driven. However, higher turbidity levels are approaching the Delta from the Sacramento River side and are anticipated to reach the confluence later this week. No rain is anticipated until next weekend. Single-day catches of Delta Smelt at the Jersey Point Early Warning Survey has increased (02/06=14 Delta Smelt, 02/08 =18 Delta Smelt), over those from previous weeks. Additionally, 10 Delta Smelt were collected today (02/09) in a single Kodiak trawl in SKT 2. This indicates an apparent increase in presence at Jersey Point over previous weeks. Adult Delta Smelt from both surveys were reported to either have expressed gametes (Jersey Point 1 male, and 1 female), or be ripe (SKT 1 female).

Members indicated concern over changes in Delta conditions associated with last week's storm, and the potential changes from the anticipated storm, stating the potential to observe Delta Smelt in the trawls at Prisoner's Point, increases in turbidity in the central Delta, and possibly even some amount of salvage.

The entrainment risk advice provided below is based on current conditions. The Working Group agreed that there is potential for Delta Smelt to move when flows and turbidity associated with this weekend's storm arrive in the Delta. The level of risk the Working Group associated with each flow range is contingent upon several factors, which could change this week, thusly adjusting the relative risk for each of the flow ranges to a higher level. These factors include increases in turbidity above threshold levels in the central and southern Delta, any detection of Delta Smelt at Prisoner's Point, an increase in combined exports above that stated today, additional distribution and relative abundance results from the SKT survey this week, and any amount of salvage. The Working Group indicated their assessment of risk for this week contains a greater level of uncertainty than in previous weeks, given that we do not have the full results yet from this week's SKT survey.

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

#### Advice Framework 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.
  - Risk factors: lowest annual index on record, confirmed Delta Smelt presence in central Delta based upon Jersey Point catch data
  - Salvage: geographic influence of the pumps is reduced to southern Delta under this flow range
  - Unknowns: N/A
  - Persistence of risk: N/A
- OMR flow of -2000 to -3500 cfs: There is a low risk of entrainment under this flow range, with the potential for a medium risk of entrainment, given conditions listed below:
  - Risk factors: lowest annual index on record, confirmed Delta Smelt presence in central Delta based upon persistent Jersey Point catches from the Early Warning Survey and from the January and February SKT survey, unknown comparison of SKT results from central Delta and other areas.
  - Salvage: Observed salvage has been zero since January 8
  - Unknowns: unknown comparison of SKT results from central Delta and other areas, unknown change in turbidity for central and southern Delta for this week, potential increases in combined exports later this week.
  - Persistence of risk: level of risk for this flow range would be anticipated to remain for the week, or as long as the current hydrology and operational conditions persist, whichever is sooner. Any detection of Delta Smelt at Prisoner's Point would indicate an increase of relative risk for this flow range. Increases in turbidity for the central and

southern Delta above threshold levels would indicate an increase in relative risk for this flow range. Any detection of Delta Smelt in salvage operations at either facility would indicate an increase in relative risk for this flow range.

- OMR flow of -3500 to -5000 cfs: There is a medium risk of entrainment under this flow range, with the potential for a high risk of entrainment, given conditions listed below:
  - Risk factors: lowest annual index on record, persistent Delta Smelt presence in central Delta based upon Jersey Point catch data, unknown comparison of SKT results from central Delta and other areas.
  - Salvage: Observed salvage has been zero since January 8
  - Unknowns: unknown comparison of SKT results from central Delta and other areas, unknown change in turbidity for central and southern Delta for this week, potential increases in combined exports later this week
  - Persistence of risk: level of risk for this flow range would be anticipated to remain for the week, or as long as the current hydrology and operational conditions persist, whichever is sooner. Any detection of Delta Smelt at Prisoner's Point would indicate an increase of relative risk for this flow range. Increases in turbidity for the central and southern Delta above threshold levels would indicate an increase in relative risk for this flow range. Any detection of Delta Smelt in salvage operations at either facility would indicate an increase in relative risk for this flow range.

The Working Group will continue to monitor conditions and smelt distribution and will meet again on Tuesday, February 17, 2015.

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

### **Advice for week of February 9, 2015:**

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

Barker Slough operations advice is not warranted at this time. The Smelt Work Group did not discuss the February 1 change in water year 2015 classified to "critical"; nonetheless, few Longfin Smelt larvae were detected at criteria stations and Barker Slough exports have been well below the potential limit of 50 cfs (see Basis for advice and Discussion of Criteria for #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 February 8, 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 February sampling by Bay Study detected no Longfin Smelt in the San Joaquin River and very few in the Sacramento River ( $n= 2$ ). Kodiak Trawl sampling tends to be inefficient for Longfin Smelt, but in January the USFWS detected two adult Longfin Smelt at Jersey Point; otherwise, none have been caught at Jersey Point or Prisoner's Point. No other detections were made in the San Joaquin River or south Delta in January. In early January 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 happened. Current distribution information does not indicate advice is warranted based on this criterion.

3 & 4. The third Smelt Larva Survey (SLS) completed sampling at all stations, but sample processing remains incomplete. Sample processing is complete for the central and south Delta criteria stations, and Longfin Smelt larvae were detected at 5 of the 12 criteria stations at densities of 3 or less per tow; thus, neither criterion was met for concern. During survey 2, larvae were detected at only two stations in the central and south Delta: a single larvae at station 906 on the San Joaquin River at Medford Island and three larvae at station 809, Jersey Point (Table 1, Figure 1). In SLS 1, most larvae were distributed from the confluence downstream. Hatching for the season is only just beginning. Catches are not yet sufficient to reach concern levels based on density or distribution.

5. Based on the February 1, 2015 Bulletin 120 Water Supply Forecast the water year type changed to "Critical" in the Sacramento River. This triggers one of the criteria for consideration regarding the operations of the North Bay Aqueduct (NBA). The second is the presence of Longfin Smelt larvae in the vicinity (i.e., station 716). SLS sampling collected four larvae at station 716 and two more at 723 indicating presence but not substantial numbers. Recently, NBA has been exporting about 30 cfs as a daily average, well below the 50 cfs ceiling established for this component of the Longfin Smelt Incidental Take Permit. Based on low larval

densities and current export levels well below the potential limit of 50 cfs, no change in current operations is warranted based on this criterion.

**Current conditions:** Sacramento River flow began increasing February 7 and reached 17,800 on February 8. X2 had not dropped below 81 km by February 8. Combined State and federal exports edged up (mostly SWP) about 5,200 on February 8. Qwest has been moving positive since late January and achieved +6,000 cfs February 8. Projected OMR index will target -5,000, but this may not have a strong negative influence on Qwest for a few days.

**Summary of Risk:**

Risk of entrainment remains low in both the south Delta and Barker Slough, but this could change at any time with an influx of adult Longfin Smelt in the south Delta or with substantial hatching in either region. Risks of additional adult influx should diminish from this point forward, but larva densities could continue to increase through mid-March resulting in increased risk of entrainment to those close to export facilities.

The risk of adult entrainment increases as X2 increases. X2 remains above 81 km currently.

The limited number of Longfin Smelt larvae detected in the central and south Delta in SLSs 1 - 3, the few adults collected in the San Joaquin River or central Delta fish surveys 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 targeted at -5,000 cfs and positive Qwest (about 6,000 cfs), provide variable risk for fish that do move into or hatch into the central Delta. The overall risk of entrainment remains low, but could increase if adult fish migrate into the central or south Delta or if larvae hatch in the region. Less than half the spawning season remains and as X2 moves upstream subsequent spawners may 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 3, 2015. Sample processing is incomplete.

Year	Survey #	SLS Station	Sample Status	Species	Smelt Catch
2015	3	340	Not yet processed		
2015	3	342	Not yet processed		
2015	3	343	Not yet processed		
2015	3	344	Not yet processed		
2015	3	345	Not yet processed		
2015	3	346	Not yet processed		
2015	3	347	Not yet processed		
2015	3	348	Not yet processed		
2015	3	349	Not yet processed		
2015	3	405	Processed		No Smelt Catch
2015	3	411	Not yet processed		
2015	3	418	Not yet processed		
2015	3	501	Not yet processed		
2015	3	504	Not yet processed		
2015	3	508	Processed	Longfin Smelt	30
2015	3	513	Processed	Longfin Smelt	27
2015	3	519	Processed	Longfin Smelt	20
2015	3	520	Processed	Longfin Smelt	19
2015	3	602	Processed	Longfin Smelt	1
2015	3	606	Not yet processed		
2015	3	609	Not yet processed		
2015	3	610	Processed	Longfin Smelt	2
2015	3	703	Processed	Longfin Smelt	7
2015	3	704	Processed	Longfin Smelt	18
2015	3	705	Processed	Longfin Smelt	12
2015	3	706	Processed	Longfin Smelt	20
2015	3	707	Processed	Longfin Smelt	17
2015	3	711	Processed		No Smelt Catch
2015	3	716	Processed	Longfin Smelt	4
2015	3	723	Processed	Longfin Smelt	2
2015	3	801	Processed	Longfin Smelt	14
2015	3	804	Processed	Longfin Smelt	4
2015	3	809	Processed	Longfin Smelt	2
2015	3	812	Processed	Longfin Smelt	3
2015	3	815	Processed		No Smelt Catch
2015	3	901	Processed	Longfin Smelt	2
2015	3	902	Processed		No Smelt Catch
2015	3	906	Processed		No Smelt Catch
2015	3	910	Processed		No Smelt Catch
2015	3	912	Processed		No Smelt Catch
2015	3	914	Processed	Longfin Smelt	2
2015	3	915	Processed	Longfin Smelt	1
2015	3	918	Processed		No Smelt Catch
2015	3	919	Processed		No Smelt Catch

SWP ITP Criteria Stations

Processing is complete through 2/6/15.

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

