

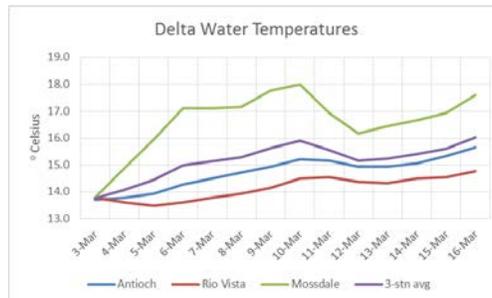
**Smelt Working Group  
Monday, March 17, 2014**

**Meeting Summary:**

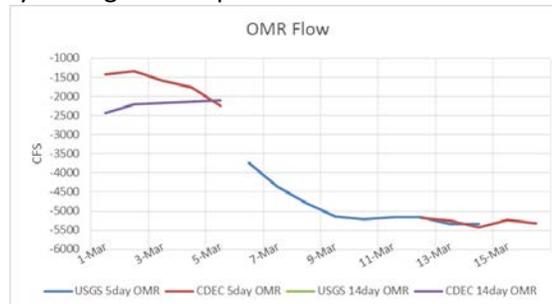
The Working Group agreed given their present distribution, current salvage, and Delta conditions, there was no indication that projected exports (potentially resulting in OMR flows no more negative than -6000 cfs on a 14-day average) need to be more restrictive for the protection of delta smelt adults and larvae. The SWG discussed that delta smelt larvae are expected to be hatching in greater numbers in the Delta during a time of increasingly negative QWEST values, and increased project exports resulting in OMRs no more negative than -6000 cfs. This combination of factors results in a level of concern that will cause the SWG to continue to monitor delta smelt survey and salvage data, Delta conditions, and project operations and reconvene a meeting to discuss any changes in delta smelt entrainment risk, if necessary. The Working Group also agreed that given their present distribution, existing constraining conditions were sufficient to protect longfin smelt from entrainment in the southern Delta. Barker Slough operations are to target 50 cfs exports, as the longfin smelt larva density at Station 716 exceeded the ITP criteria. The next scheduled SWG meeting will be Monday, March 24.

**Reported Data:**

1. **Current environmental data:**
  - **Water temperatures:**



- **OMR flow:** USGS tidally averaged OMR flow 14-day average is unavailable, but the 5-day average for March 14 is listed as -5340 cfs. CDEC 14-day OMR flow is unavailable, but the 5-day average for March 16 is listed as -5321 cfs. OMR Index Method 14-day average was reported as -5445 cfs and the 5-day average was reported as -5780 cfs.



- **Flow:** Sacramento River average daily flow for March 16 was 12,895 cfs and San Joaquin River average daily flow was 960 cfs. X2 calculation from CDEC was 73.54km. The graphs below show the most recent trends in Delta hydrology and water quality that were evaluated by the Working Group.



## 2. Delta Fish Monitoring:

Smelt Larval Survey #5 was in the field the week of March 3. Processing is ongoing. Delta smelt larvae were reported from this survey last week (8 fish). No additional delta smelt have been counted since last week. A total of 357 longfin smelt larvae have been counted thus far from catch. Sizes ranged from 5-18 mm. SLS #6 is in the field this week. Preliminary results for the south and central Delta stations are expected prior to the end of this week.

Spring Kodiak Trawl #3 was in the field last week. The highest densities reported are from the Sacramento Deepwater Shipping Channel. Other locations with detections are the lower San Joaquin River, Suisun Bay, Sacramento River, and confluence. A total of 88 delta smelt were collected: 30 spent females, 9 spent males, 1 ripe female, 7 ripe males, 40 prespawm males and females, and 1 undetermined sex.

20-mm Survey #1 and SLS #6 (the last SLS of the season) are in the field this week. The Working Group requested that results from SLS #6 (south, central, and northern Delta specifically) be processed prior to catch from 20-mm Survey #1.

Jersey Point sampling is continuing for the Service's Early Warning Study. Catch ranged from zero to seven delta smelt per day from March 10 through 16. The study is expected to run

through April 15. Trawls are expected to be performed once per week unless hydrology changes significantly. Should hydrology change (river flow increase), trawls will be increased to daily for 14 consecutive days and then decrease to once per week until the next change in hydrology.

The 2013 Annual FMWT surveys have concluded. The Annual FMWT Index (based on all four months) for delta smelt is 18, the second lowest on record, and statistically indistinguishable from the lowest, 17, from 2009.

The 2013 Delta Smelt Recovery Index (based on September and October) is 4. More information on the Recovery Index can be found on the Bay-Delta Office's web site at [http://www.fws.gov/sfbaydelta/species/delta\\_smelt.cfm](http://www.fws.gov/sfbaydelta/species/delta_smelt.cfm). Results from CDFG surveys are available online at: <http://www.dfg.ca.gov/delta/>.

### **3. Salvage:**

No adult delta smelt or longfin smelt have been observed in salvage in WY2014 thus far. Young of the year longfin smelt ( $\geq 20$  mm) were observed in salvage for one out of the last seven days. Longfin smelt  $< 20$  mm were observed in salvage on March 13 at the SWP. Larval fish samples from this past weekend are being processed or waiting identification verification.

Tracy Fish Collection Facility is undergoing 2 hour shutdowns daily for work related to the replacement screens. Debris load was not discussed.

Larval sampling at the SWP fish salvage facility continues. Larval sampling at the CVP salvage facility has begun on March 13, but is occurring only during daytime hours from Monday through Friday. It was reported that Reclamation staff are awaiting the repair of a fume hood prior to the start of full larval sampling, which is necessary to process the preserved larval samples.

Current longfin smelt and delta smelt salvage information can be downloaded from DFG's salvage FTP site at <ftp://ftp.dfg.ca.gov/salvage/Daily%20Smelt%20Summary/> or queried from DFG's salvage web page at <http://www.dfg.ca.gov/delta/apps/salvage/SalvageExportCalendar.aspx>

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

Combined SWP/CVP exports are at 5400 cfs as of today. Operators indicated they currently are constrained by the Export/Inflow 3-day ratio, which, as of yesterday, was 35%. DWR indicated they are in the process of requesting a return to the original standard, which indicates a 14-day averaging period. If this switch is approved, operators estimate E/I will no longer constrain the export pumps.

Reclamation submitted a request to the SWRCB last Friday to be allowed to adjust implementation of RPA Action 3 to allow for up to 7 days of OMR indexed flow more negative than -5000cfs on a 14-day average. The Service, NMFS, and CDFW all submitted letters agreeing to the proposal, some with restrictions. Under this condition, the operators are expecting OMR flows to be in the range of -5000 cfs to -6000 cfs this week.

No precipitation is indicated this week. The DCC gate is closed.

Flow to the Stanislaus River from Goodwin is at 550 cfs in order to meet the electrical conductivity standard at the San Joaquin River at Vernalis. No estimation at this time on when the flows might change.

The board's order from January 31, 2014 states that project operations must maintain a monthly net Delta outflow of no less than 3000 cfs and must not pump more than combined 1500 cfs. An addendum was submitted to the Board on February 7. This addendum allows the operators to revert to compliance with the monthly Outflow standard, and increase pumping above the 1500 cfs included in the TUC petition. A request to extend the board's January 31, 2014 order was approved through the end of March. An additional addendum was approved to modify the number of days required to meet an X2 at Chipps Island (11,400 cfs on a 3-day running average) for the remainder of March. The projects will continue to meet X2 at Collinsville (7,100 cfs on a 3-day running average) prescribed in the Board's Plan.

**5. Particle Tracking Modeling:**

No PTM runs were requested for this week.

The Working Group requested modeling runs be generated for the Working Group call on Monday, March 24. The Service will draft the modeling request and submit it to the members prior to submitting it to DWR. Runs are expected by Friday, March 21.

**6. Turbidity Modeling:**

No modeling runs were discussed this week.

**7. Assessment of Risk:**

**Background:**

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 SWG 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. Adult take limit is 155 with a concern level of 116 fish. Juvenile take limit is 1007 with a concern level of 671 fish. These numbers reflect the revised take estimate produced last February.

Members are concerned about several factors: second-lowest delta smelt FMWT Index year on record, occurrences of reduced efficiency of salvage operations, recent change in Qwest to be negative (potentially resulting in larvae being drawn into the southern Delta), expecting an increase in hatching of delta smelt in the next couple of weeks, and potential future rapid changes to operations as has occurred already this year due to ongoing drought negotiations. Members also noted that survey results from SLS continue to indicate the majority of delta smelt are outside the central and southern Delta, lack of salvage for delta smelt so far this year, and the decreasing catch from the Service’s Jersey Point sampling.

Members indicated there was not sufficient evidence to recommend a more positive OMR than is currently planned by operators. The Working Group expressed concern that survey results this week and salvage will need to be carefully monitored, as well as other hydrology data.

**8. Framework for providing advice to the Service:**

No update was provided.

The SWG will have the next meeting on March 24.

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

**Advice for week of March 17, 2014:**

The Smelt Working Group believes that current and planned export rates are protective of Longfin Smelt at this time.

Barker Slough operations advice is provided by the Smelt Work Group to target 50 cfs exports, because Longfin Smelt larva remain present at station 716.

**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 March 16, 2014, no age-1 or adult Longfin Smelt have been salvaged for the water year. The Fall Midwater Trawl Longfin Smelt annual abundance index was 164. The total salvage level threshold for advice is >820 (see criterion in #1). No advice is warranted based on this criterion.

On February 24, the first Longfin Smelt larva was detected at the SWP and larvae were detected almost daily for about a week before declining (CVP started sampling for larvae as of March 13 on a day-time work-week schedule). On February 28, the first juvenile (age-0) Longfin Smelt was detected at the SWP; age-0 fish have been detected roughly every other day since. After March 10 and through March 16, only a single juvenile Longfin Smelt was collected for a salvage of 4. This information is not related to a criterion and does not have a direct effect on advice.

2. December Fall Midwater Trawl and Bay Study sampling in December through March collected no Longfin Smelt in the central or south Delta, suggesting limited or no recent proximity to the export pumps. Distribution information does not indicate advice is warranted based on this criterion.

3 & 4. The fifth Smelt Larva Survey (SLS) of 2014 was conducted March 3-5; SLS 6 started today, March 17. The larva distribution criterion (#3 above) was met during survey 3, but distribution diminished by survey 4 and again during survey 5 (cf., Table 1 and Basis for Advice #s 3 & 4 above). Except for 1 station in the lower San Joaquin River channel, central and south Delta larva densities remained very low during survey 5. Longfin Smelt larvae were detected at only 4 central and south Delta stations in survey 5, indicating low risk of entrainment.

5. The fifth SLS detected a single Longfin Smelt larvae at station 716 (and 2 at 723); the export restriction advice continues while larvae are present (Table 1). Water year 2014 has been classified as critically dry. During Smelt Larval Survey #2, 62 Longfin Smelt larva were collected at 716 and a similar number at 723. The export target if larval smelt are present at station 716 is an export pumping limit of 50 cfs as a 7-day mean. The SWG provides advice because larval density exceed the criterion. Since early February Barker Slough exports have remained below 40 cfs.

**Current conditions:** Outflow declined after March 9 from over 20,000 cfs to about 12,000 to 14,000 cfs in March 12-16. Combined State and federal export reached 6,800 cfs on March 9 and remained at that level for a few days prior to increasing to about 7,000 cfs on March 13; exports are currently about 5,400 cfs combined. Qwest started strongly positive in early March at > 6,000 cfs and then dropping and becoming increasingly negative beginning March 9, and has been more negative than -2,800 since March 13. The OMR index has been more negative than -5,000 cfs in both 5-day (-5,780 cfs) and 14-day (-5,405 cfs) periods.

**Summary of Risk:** Modestly negative Qwest and strongly negative OMR flows could put central and south Delta larvae at substantial risk; however, few larvae have been detected in the region (Table 1), so the overall risk is low.

Only one larvae was detected at station 716 near Barker Slough, so risk of entrainment is low; nonetheless, advice is to continue export restrictions.

No adult Longfin Smelt have been detected to date in the central or south Delta by fish surveys or by salvage, and collections at Chipps Island dropped very low after early February with only a few collected in late February and early March. This suggests limited additional spawning in the central or south Delta. The small to modest numbers of larvae at only a few locations sampled in the central and south Delta support this conclusion. Even though the current and predicted exports will result in an OMR targeting -5,000 to -6,000 cfs, few Longfin Smelt larvae remain vulnerable to entrainment in the south Delta. These circumstances all support the conclusion of low risk of entrainment.

Table 1. Longfin Smelt catch per station from 2014 Smelt Larva Survey, Survey 5.

Study Year	Suney #	SLS Station	Sample Status	Species	Smelt Catch	MinOfLength	MaxOfLength	AvgOfLength
2014	5	340	Not yet processed					
2014	5	342	Not yet processed					
2014	5	343	Not yet processed					
2014	5	344	Not yet processed					
2014	5	345	Not yet processed					
2014	5	346	Not yet processed					
2014	5	347	Not yet processed					
2014	5	348	Not yet processed					
2014	5	349	Not yet processed					
2014	5	405	Not yet processed					
2014	5	411	Not yet processed					
2014	5	418	Processed	Longfin Smelt	14	6	10	7.6
2014	5	501	Processed	Longfin Smelt	31	7	12	8.9
2014	5	504	Not yet processed					
2014	5	508	Processed	Longfin Smelt	129	6	18	8.9
2014	5	513	Processed	Longfin Smelt	11	6	12	8.7
2014	5	519	Processed	Longfin Smelt	23	6	10	7.8
2014	5	520	Processed	Longfin Smelt	26	6	12	8.4
2014	5	520	Processed	Delta Smelt	1	5	5	5.0
2014	5	602	Processed	Longfin Smelt	9	7	10	8.8
2014	5	606	Processed	Longfin Smelt	5	7	11	9.0
2014	5	609	Processed	Longfin Smelt	5	7	15	9.8
2014	5	610	Processed	Longfin Smelt	4	5	9	6.5
2014	5	703	Processed	Longfin Smelt	5	7	10	8.8
2014	5	704	Processed	Longfin Smelt	3	8	12	10.0
2014	5	705	Processed	Longfin Smelt	6	7	11	9.0
2014	5	706	Processed	Longfin Smelt	2	6	8	7.0
2014	5	707	Processed		No Smelt Catch			
2014	5	711	Processed	Delta Smelt	2	6	6	6.0
2014	5	716	Processed	Delta Smelt	1	5	5	5.0
2014	5	716	Processed	Longfin Smelt	1	10	10	10.0
2014	5	723	Processed	Longfin Smelt	2	8	14	11.0
2014	5	723	Processed	Delta Smelt	4	5	6	5.5
2014	5	801	Processed	Longfin Smelt	21	5	12	8.5
2014	5	804	Processed	Longfin Smelt	4	6	6	6.0
2014	5	809	Processed	Longfin Smelt	28	6	17	10.5
2014	5	812	Processed	Longfin Smelt	8	6	16	9.8
2014	5	815	Processed	Longfin Smelt	2	10	11	10.5
2014	5	901	Processed	Longfin Smelt	10	6	14	9.2
2014	5	902	Processed		No Smelt Catch			
2014	5	906	Processed		No Smelt Catch			
2014	5	910	Processed		No Smelt Catch			
2014	5	912	Processed		No Smelt Catch			
2014	5	914	Processed		No Smelt Catch			
2014	5	915	Processed		No Smelt Catch			
2014	5	918	Processed		No Smelt Catch			
2014	5	919	Processed		No Smelt Catch			

SWP ITP Criteria Stations

Processing is complete through 3/7/14.

Figure 1. DFW's Smelt Larva Survey/20-mm Survey station locations.

