

## SMELT WORKING GROUP Monday, April 15, 2013

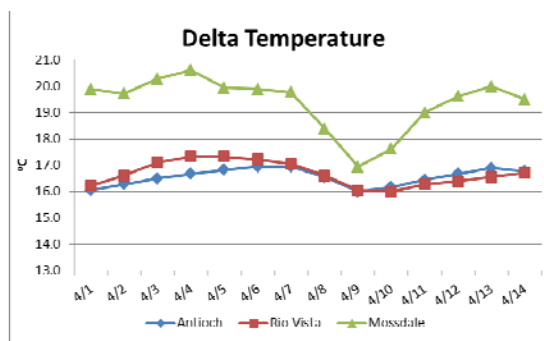
### Meeting Summary:

The Working Group agreed that given their present distribution, current salvage, and Delta conditions, risk of entrainment of delta smelt remains low and therefore, the Working Group recommends that no change in operations is necessary to adequately protect delta smelt from entrainment. The Working Group also agreed that given their present distribution, existing constraining conditions were sufficient to protect longfin smelt. The Working Group will continue to monitor smelt salvage, adult and larval smelt survey data, and Delta hydrological conditions and will reconvene April 22, 2012, at 10 am.

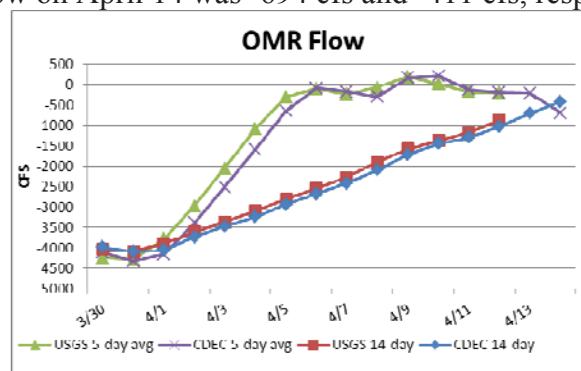
### Reported Data:

#### 1) Current environmental data:

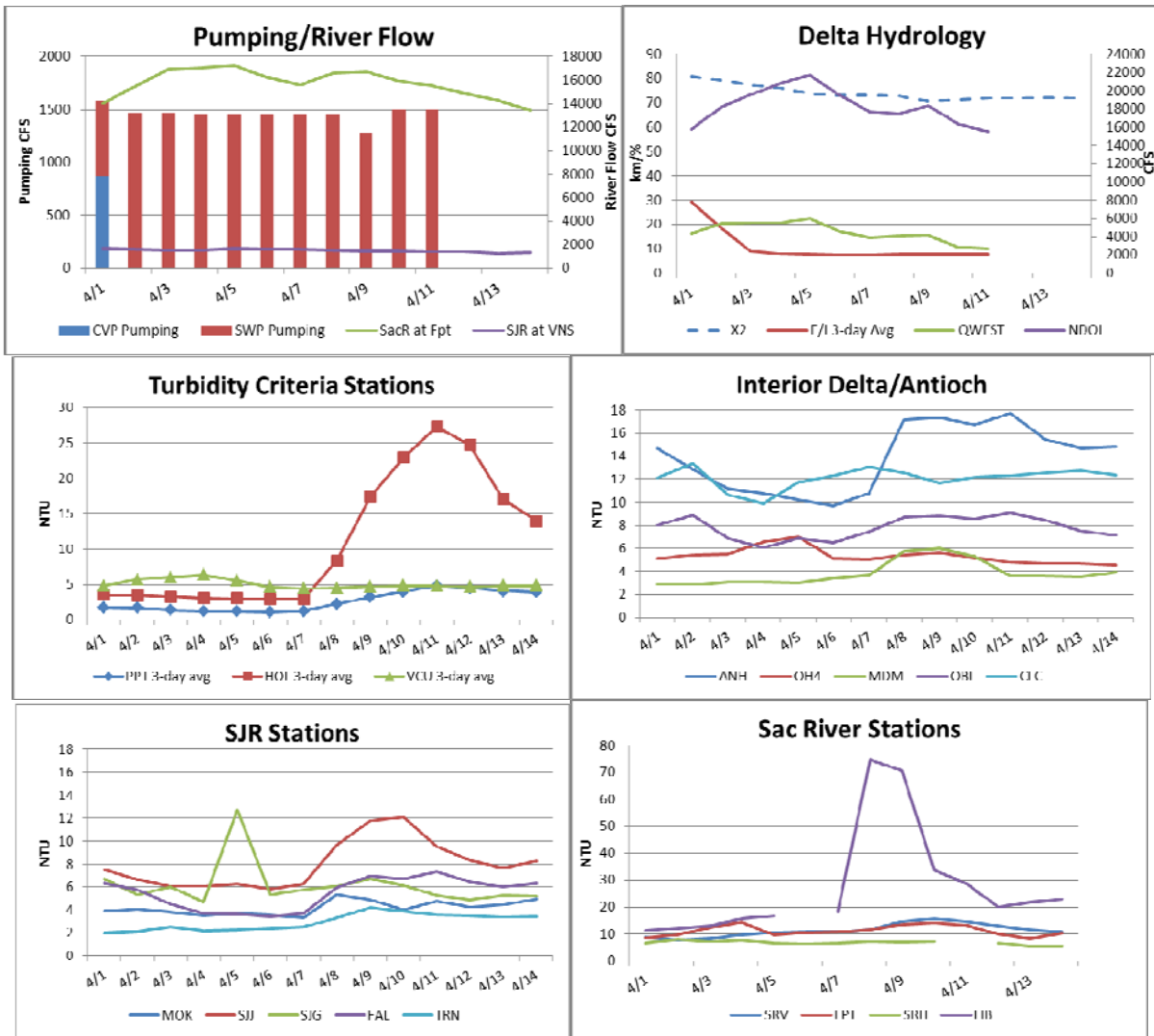
- **Water temperatures:**



- **OMR:** USGS tidally-averaged 5-day average OMR flow and 14-day average OMR flow on April 12 was -195 cfs and -867 cfs, respectively. CDEC 5-day average OMR flow and 14-day average OMR flow on April 14 was -694 cfs and -411 cfs, respectively.



- **Flow:** Sacramento River flows at Freeport are approximately 13,452 cfs and San Joaquin River at Vernalis is approximately 1,296 cfs, while X<sub>2</sub> was at 71.98km.



**Delta Fish Monitoring:**

Current data for the Smelt Larval Survey (including distribution maps) have been uploaded to the SLS webpage (<http://www.dfg.ca.gov/delta/projects.asp?ProjectID=SLS>). This survey has completed for the 2013 season.

20-mm Survey #3 was in the field last week. Current data for Survey #2 has been uploaded to the 20-mm Survey webpage (<http://www.dfg.ca.gov/delta/projects.asp?ProjectID=20mm>).

Processing of samples from Survey #3 is on-going (at least one tow has been processed for all south and central Delta stations, and most Sacramento River system stations; none of the confluence or Suisun Bay samples have been processed). A total of 35 delta smelt have been observed ranging in length from 7-16mm (one adult, 74mm, was collected in the Sacramento River at station 718). Nineteen delta smelt were collected at 7 south and central Delta stations; 16 delta smelt were collected at 5 Sacramento River system stations.

20-mm Survey #4 begins next Monday (April 22) and Spring Kodiak Trawl #5 will start on April 29.

CDFW Stockton office is in the process of moving locations, so lab processing for survey samples will be delayed for up to two weeks, starting Thursday, April 11.

The 2012 annual Fall Midwater Trawl Index (September through December) is 42. The combined SWP and CVP total allowable take for adult delta smelt for the WY 2013 as calculated from the FMWT Index using the formula prescribed in the BO is 362 (revised). The combined SWP and CVP total allowable take for larval-juvenile delta smelt for the WY 2013 following the formula in Table C-4 of the BO is 2350 (revised).

The 2012 Delta Smelt Recovery Index (based on September and October) is 13. 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 CDFW surveys are available online at: <http://www.dfg.ca.gov/delta/>.

### **1) Salvage:**

#### Delta Smelt:

No adult delta smelt (DS) have been salvaged since March 25 and represent 20 Larval delta smelt (<20mm) were observed during larval fish sampling at the SWP on April 5 (2 individuals: 12.2mm, 13.9mm); and April 8 (2 individuals: 12.9mm, 16.7mm) No young of the year delta smelt of salvageable size have been observed at the fish facilities this season.

#### Longfin Smelt:

No young of the year ( $\geq 20$  mm FL) longfin smelt (LFS) was salvaged at the SWP last week. Larval delta smelt (<20mm) were observed daily during larval fish sampling at the SWP between April 5 and April 9. No adult LFS was salvaged last week.

#### Salvage Operations

The CVP was not pumping last week, but has resumed pumping this morning at 800 cfs. SWP is pumping at 900 cfs today and will reduce to 700 cfs tomorrow. One of the two CVP salvaged fish release sites will be out of commission starting on May 1 for repairs.

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>

### **2) Expected Project Operations:**

Combined CVP/SWP exports are approximately 1,700 cfs as of today. CVP pumping operations began again today at 800 cfs after being shut down for two weeks for mechanical replacements.

Projected operations are expected to target a combined 1,500 cfs through at least April 19, and potentially to April 22, in support of the NMFS RPA requirement of 1:1 pumping with the flow at the San Joaquin River at Vernalis. This RPA requirement continues from April 1 through May 31.

### **3) Particle Tracking Modeling:**

DWR provided PTM runs for three scenarios: -5,000 cfs, -3,500 cfs, and -1,250 cfs OMR flow. Stations 815, 901, and 906 were included. Flux locations (of particles) were Jersey Point, Holland Tract, and Old River near Frank's Tract. For OMR flow of -5,000 cfs, station 815 experiences 30% of particles entrained further into the south Delta, while 15% of particles flow downstream of Jersey Point (leave the central Delta). After 30 days most of the particles inserted remain in the central and south Delta.

### **4) Turbidity Modeling:**

No turbidity modeling was discussed today.

### **5) 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 Working Group from the onset of Action 2 through its termination..." (page 35).

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 -5,000 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.

The Working Group continues to assess the risk of entrainment to adults and is following the guidance provided in Action 3 of the RPA for assessing the risk of entrainment to juveniles. The Working Group discussed its April 8 recommendation, the Service’s March 12 determination of -5,000 cfs OMR flow target, the WY 2013 adult and juvenile delta smelt Incidental Take Limit, the recent delta smelt distribution data from field surveys, and the very low level of salvage of adult delta smelt for the previous month.

The Projects have not salvaged adult delta smelt since March 25, 2013. In past years, adult salvage significantly tapers off by the end of March and early April. Although a few adult smelt may be expected in salvage between now and June, the Working Group believes it would be highly unlikely if the cumulative seasonal total of adult delta smelt salvage approached or exceeded the Incidental Take limit at this point in time (for WY 2013, [revised] 362 adult delta smelt). The Working Group expects that this year’s adult delta smelt salvage season has come to a close and does not anticipate making further recommendations for that life stage in subsequent weeks. The Working Group’s current recommendation is considered protective for larval and post-larval delta smelt.

Daily OMR flows since April 8 have ranged between approximately -1,500 and +1,700 cfs, and adult delta smelt salvage numbers have remained at zero since March 25. Similar OMR flows are expected to continue through May 31, which is the end of the NMFS BO’s San Joaquin River flow RPA requiring a 1:1 ratio of exports to flows at Vernalis in critically dry water year types. The daily OMR flows have been mostly more protective than the range of 14-day average OMR target flows required in the Service’s BO RPA Action 3 for larval and juvenile delta smelt (-1,250 to -5,000 cfs).

Based on the samples that have been processed so far from 20-mm Surveys #2 and 3, it appears that larval hatching in the central and south Delta may be occurring in the same (or slightly lower) proportion as in the north Delta. The Working Group will continue to monitor this pattern of fish distribution, and review additional 20-mm survey #3 data as it becomes available. Based on the preliminary results from 20-mm Surveys #2 and 3, some members cautioned that an OMR flow of -5,000 cfs may not be adequately protective of larval delta smelt.

Members were concerned regarding the limited distributional information from 20-mm Surveys #2 and 3. According to the PTM runs (-5,000 and -3,500 cfs scenarios) particles at Frank’s Tract and in the Old River corridor were very likely to be entrained. With a nearly equal proportion of larvae in the central and southern Delta as in the north Delta, the Working Group was concerned with what could potentially occur with salvage later in the year. However, the Working Group agreed that data were insufficient to be able to predict the extent of salvage and its impact on the population. Members agreed that there was sufficient evidence to suggest that OMRs approaching -5,000 cfs would not be protective of delta smelt juveniles, given survey data and PTM runs.

Members indicated that at the present sizes being captured in larval fish sampling at the fish facilities and field surveys, delta smelt are more likely to behave as particles now than at any other time this year (<20mm in size), stating that the PTM results may provide a very reasonable depiction of delta smelt behavior at this stage. . Given the current size and growth rate of young delta smelt, and the apparent distribution of larval delta smelt just along the edge of the zone of influence, the Working Group would like to see QWEST continue to remain positive until individuals achieve the  $\geq 20$  mm size, when they are better able to adjust their position in the water column and behave less like particles. The Working Group expects to begin seeing individuals  $\geq 20$  mm in size within two to three weeks. Given that the present distribution is almost equal in the central and southern Delta as in the north Delta, a positive QWEST should assist this apparently large percentage of the population's larval delta smelt in moving downstream, out of the influence of the pumps.

Since April 1, due to the complete outage at CVP, there have been no fish salvage operations at the Tracy Fish Collecting Facility. Since that time, the only salvage data available to review have been those collected at the SWP, which could reduce the sensitivity to detecting salvaged fish. With the CVP beginning pumping operations again this morning, the Working Group will have salvage data from both facilities to review and use in the delta smelt entrainment risk assessment in subsequent weeks. Members acknowledged that at the present low pumping rates at both facilities, salvage operations are not optimal, and detection rates are anticipated to be lower than at higher pumping rates.

The Working Group expects to see low levels of larval and juvenile delta smelt salvage between now and May 31. Residence time in the Delta is anticipated to increase with the current OMR flow levels, giving larvae more opportunity to grow and therefore, more likely to be detected as larger individuals by the salvage operations. The Working Group suspects these larvae were likely hatched in the southern Delta.

Based on the review of current delta smelt distribution and salvage data, current Delta conditions and projected operations, the Working Group agrees that projected operations are sufficiently protective of delta smelt. As projected operations are anticipated to change in the next two to three weeks, the Working Group will be monitoring conditions and surveys with vigilance. Should OMR flow become increasingly negative, the Working Group will meet to discuss a potential recommendation to change OMR flow.

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

##### **Advice for week of April 15, 2013:**

The Smelt Working Group believes that an OMR of -5,000 cfs is protective of longfin smelt at this time. No advice for Barker Slough operations is necessary at this time.

##### **Summary of Risk:**

Risk of additional entrainment into the south Delta is very low. Few longfin smelt larvae remain in the central Delta, and current hydrologic conditions are very favorable. As of April 1, combined exports dropped to 1,500 cfs and remained at this level through April 15. Qwest turned

positive at about 4,000 cfs soon after April 1 and was 1,871 cfs on April 14. Qwest will likely remain at about that level while total exports match San Joaquin River inflow at about 1,500 cfs. Thus there's little risk of additional larva entrainment into the south Delta even though some longfin smelt larvae remain in the San Joaquin River and Franks Tract. Within the south Delta, OMR is close to zero, slightly negative. The longfin smelt ITP concern period for Barker Slough ended March 31. Barker exports have been < 35 cfs since March 1 and mostly zero between March 18 and April 3 indicating little risk of entrainment even though longfin smelt densities were relatively high based on 20-mm Survey #2 results for Station 718 and 720.

### **Summary of Advice:**

Previously, SLS Survey #3 distribution numbers triggered Longfin Smelt Incidental Take Permit advice from the SWG on February 4 to limit OMR flows to -5,000 cfs (see criterion 3 below). On February 19, to limit south Delta entrainment of larvae from Station 809 and other San Joaquin River stations, an OMR of no more negative than -4,000 cfs was advised. On February 25 and 26, SLS Survey #5 central and south Delta catches from declined rather than increased, so as of March 4 an OMR of -5,000 was once again deemed protective. Since then central and south Delta larva numbers have remained low. As of April 8 and similar to March and early April reviews, OMR of -5,000 was deemed protective.

On March 31, the ITP advice period for Barker Slough ended. Even though longfin smelt larvae remain in the vicinity, Barker Slough exports have remained very low since March 1 (< 30 cfs) and posed very little risk for longfin smelt larvae.

### **Basis for advice:**

The 2009 State Water Project 2081 for longfin smelt states that advice to the DFG Director shall be based on the following criteria:

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 20-mm Survey finds longfin smelt larvae present at 8 of 12 central and south Delta sampling stations in 1 survey (Stations 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. For Barker Slough Exports only: between January 15 and March 31 of Critically Dry or Dry water years only (Sacramento River), based on abundance and distribution and detection of longfin smelt larvae at Station 716.

### **Discussion of Criteria**

1. No juvenile or adult longfin smelt were salvaged during the period of April 1-14. Due to warming water temperatures, it is unlikely that any more adult longfin smelt will be salvaged this

year. More juvenile longfin smelt can be expected in salvage, but no ITP criterion exists for juvenile longfin smelt.

On January 20 and 21, 2013, adult longfin smelt salvage occurred at the SWP for a total salvage of 4. This was the first and only instance of adult longfin smelt salvage this water year. The Fall Midwater Trawl longfin smelt annual abundance index has completed and is 61. The total salvage level threshold for advice is  $> 305$  (see criterion in #1). No advice is warranted based on this criterion.

2. Longfin smelt spawning is likely over for 2013. In early March Bay Study collected 3 longfin smelt adults just upstream from the Antioch Bridge, suggesting that some additional spawning took place in the lower San Joaquin River. No other longfin smelt adults were detected in the central or south Delta since then.

January Bay Study sampling collected a single longfin smelt in the San Joaquin River at their Station 863 (Santa Clara Shoals, between Twitchell and Bradford Islands). In February, no longfin smelt were collected at central Delta sampling stations. On March 4, 3 longfin smelt were collected by Bay Study just upstream of the Antioch Bridge, suggesting spawning is not over in the San Joaquin River, but not suggesting any substantial additional risk. SLS #6 starting March 18 should detect any larvae hatching from spawning about March 4. Distribution information does not indicate advice is warranted based on this criterion.

3 & 4. The third 20mm Survey took place April 8-11 and longfin smelt larvae were detected in low numbers in and near Franks Tract (Table 1). With the exception of Station 809, few larvae remain in the region. The last Smelt Larva Survey of the year (Survey #6) took place March 18-19. Central and south Delta larva catches (densities) declined in Survey #6 compared to Survey #5, indicated that hatching is waning for the year. The first 20-mm Survey took place March 11-14 and collected only 12 larval longfin smelt in the central and south Delta. Thus, there is no evidence of additional risk of entrainment into the south Delta and an OMR of -5,000 remains protective at this time.

The third SLS survey of 2013 was conducted January 28 and 29. During Survey #3, longfin smelt larvae were collected at 9 of 12 central or south Delta stations, so the **distribution criterion was met**. During the 4<sup>th</sup> SLS survey the distribution criterion was again achieved, but the density criterion of  $\geq 4$  stations with  $> 15$  larvae each was not. Typically, this second criterion would be necessary to warrant additional protections beyond -5,000 cfs OMR. However, the high catch at Station 809 (and moderate catch at Station 901) poses some additional risk for entrainment into the south Delta. Given these data and the likelihood that we're seeing the peak hatching, an OMR of no more negative than -4,000 cfs was deemed warranted on February 18. Catches from SLS Survey #5 showed declines in the south Delta and the lower San Joaquin River (809), with some increases at Stations 812 and 815. The first 20-mm Survey indicated that only 12 larvae were collected in the central and south Delta. The last SLS Survey #6 occurred March 18 & 19, and provided results similar to the 20-mm Survey #1. These results indicate that fewer larvae are in and near the central Delta, and that an OMR of -5,000 is protective.



5. Barker Slough Exports: The ITP period of concern ended March 31. Even though numerous longfin smelt larvae are present at Station 716 and at 718 and 720 in Lindsay Slough, mostly zero recent export levels pose little risk.

(<http://www.water.ca.gov/swp/operationscontrol/docs/delta/DeltaHydrology.pdf>).

**Current conditions:** Net Delta outflow was approaching 12,300 cfs on April 14. X2 remained about 72 km. Combined State and federal exports are currently at 1,500 cfs to match Vernalis flows for salmonids, but this will increase during the upcoming week along with Vernalis flow. Vernalis flows are about 1,300 cfs, but are scheduled to increase with increased releases on the Stanislaus River. After running modestly negative, Qwest was +3,946 on April 7 and declined slowly to +1,871 on April 14.

Table 1. Longfin and delta smelt catch per station from 20mm Survey, survey 3, 2013. Processing is partial and data are preliminary and subject to change.

Year	Survey	Station	Date	# Tows Processed	Species	Total Catch	Min Length	Max Length	Avg Length	
2013	3	323		0	Not Yet Processed	0				Suisun Bay & West
2013	3	340		0	Not Yet Processed	0				
2013	3	342		0	Not Yet Processed	0				
2013	3	343		0	Not Yet Processed	0				
2013	3	344		0	Not Yet Processed	0				
2013	3	345		0	Not Yet Processed	0				
2013	3	346		0	Not Yet Processed	0				
2013	3	405		0	Not Yet Processed	0				
2013	3	411		0	Not Yet Processed	0				
2013	3	418		0	Not Yet Processed	0				
2013	3	501		0	Not Yet Processed	0				
2013	3	504		0	Not Yet Processed	0				
2013	3	519		0	Not Yet Processed	0				
2013	3	602		0	Not Yet Processed	0				
2013	3	606		0	Not Yet Processed	0				
2013	3	609		0	Not Yet Processed	0				
2013	3	610		0	Not Yet Processed	0				
2013	3	508		0	Not Yet Processed	0				Confluence
2013	3	513		0	Not Yet Processed	0				
2013	3	520		0	Not Yet Processed	0				
2013	3	801		0	Not Yet Processed	0				
2013	3	804		0	Not Yet Processed	0				
2013	3	703		0	Not Yet Processed	0				Sac. River System
2013	3	704		0	Not Yet Processed	0				
2013	3	705	09-Apr-13	1	No Longfin Catch	0				
2013	3	706	09-Apr-13	1	Longfin Smelt	2	19	21	20.00	
2013	3	707	09-Apr-13	1	No Longfin Catch	0				
2013	3	711	08-Apr-13	1	No Longfin Catch	0				
2013	3	716	08-Apr-13	1	Longfin Smelt	42	12	29	20.26	
2013	3	718	08-Apr-13	1	Longfin Smelt	96	13	27	20.26	
2013	3	719	08-Apr-13	1	Longfin Smelt	6	13	19	16.33	
		720		0	Not Sampled	0				
2013	3	723	08-Apr-13	1	Longfin Smelt	2	21	26	23.50	
2013	3	724	08-Apr-13	1	Longfin Smelt	1	16	16	16.00	
2013	3	726	08-Apr-13	1	No Longfin Catch	0				
2013	3	809	08-Apr-13	1	Longfin Smelt	28	11	18	14.21	
2013	3	812	09-Apr-13	1	Longfin Smelt	5	11	17	13.80	
2013	3	815	09-Apr-13	1	No Longfin Catch	0				
2013	3	901	08-Apr-13	1	Longfin Smelt	15	10	18	13.73	
2013	3	902	08-Apr-13	1	Longfin Smelt	2	9	12	10.50	
2013	3	906	09-Apr-13	1	No Longfin Catch	0				
2013	3	910	08-Apr-13	1	No Longfin Catch	0				
2013	3	912	08-Apr-13	1	No Longfin Catch	0				
2013	3	914	08-Apr-13	2	No Longfin Catch	0				
2013	3	915	08-Apr-13	3	No Longfin Catch	0				
2013	3	918	08-Apr-13	1	No Longfin Catch	0				
2013	3	919	09-Apr-13	1	No Longfin Catch	0				

Processing complete through 4/10/2013