

Smelt Working Group  
May 23, 2016

**Meeting Summary**

The Working Group agreed that given present distribution, current salvage, and Delta conditions, there was no indication that the projected combined exports of approximately 2600cfs for today, dropping to 1500cfs by Wednesday, May 25 (potentially resulting in daily average OMR flows of approximately -2000 cfs) need to be modified for the protection of Delta Smelt adults and larvae. Should the projected combined exports increase from 1500cfs prior to May 31; the Working Group may need to reassess the risk of entrainment.

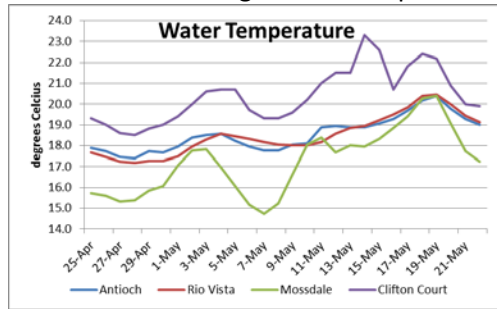
The Working Group is following guidance for entrainment protections from Action 3 (juvenile Delta Smelt). The Working Group will continue to monitor Delta Smelt survey and salvage data and Delta conditions, and will meet again on Tuesday, May 31, 2016 at 10 am.

**Reported Data**

1. Current environmental data

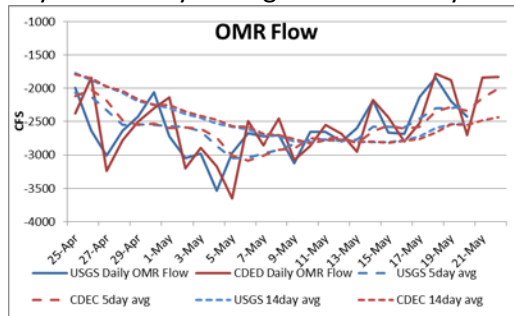
a. Temperature

The 3-station average water temperature for May 22 was 18.4°C.



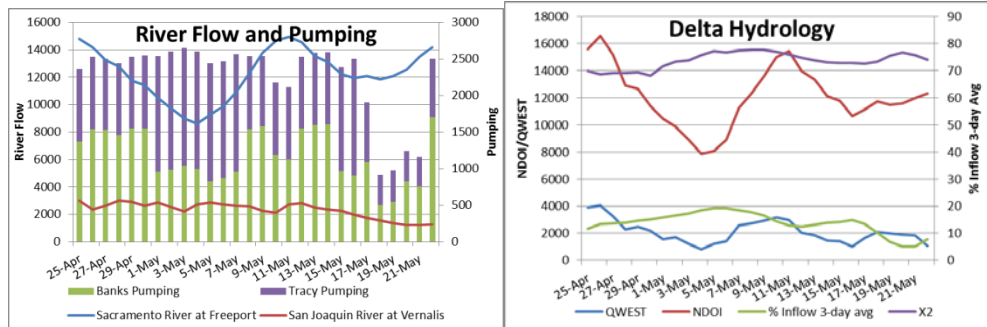
b. OMR flow

USGS OMR 5-day, and 14-day average flows on May 20 were -2250 and -2530 cfs, respectively. The corresponding 5-day and 14-day OMR index values were -1780 and -2440 cfs. The daily OMR index value for May 22 was -2560 cfs. The CDEC OMR 5-day and 14-day average flows for May 22 were -2004 and -2434 cfs, respectively.



c. River flows and pumping

Sacramento River at Freeport flow for May 22 was 14,185 cfs. San Joaquin River at Vernalis river flow for May 22 was 1255 cfs. X2 is at 74.1km. Combined exports are 2600 cfs today.



**2. Delta fish monitoring**

The CDFW 2015 FMWT indices are:

The 2015 Delta Smelt annual FMWT index is 7.

The 2015 Longfin Smelt annual FMWT index is 4.

Both indices are the lowest on record (i.e. since 1967).

20-mm Survey #5 was in the field last week. Sample processing is 50% complete. Samples taken from the south and central Delta, and some stations on the Sacramento River system, were shortened to 2 ½ minutes (normal survey 10 minutes) due to clogging of the nets by algae. So far, a total of 25 juvenile Delta Smelt were collected, 21 from the Sacramento Deepwater Shipping channel, although one fish was from Jersey Point. 20-mm Survey #6 is in the field this week.

CDFW indicated that the Kodiak Index for 2016 is expected to be released on June 3.

The Early Warning Survey began November 30 and ended on March 30.

**3. Modeling**

No new PTM runs were distributed to the group this morning for discussion.

**4. Salvage**

No adult Delta Smelt salvage has occurred since February 22. The cumulative season total of salvaged adult Delta Smelt is 12, which represents 29% of the concern level of the WY 2016 adult Delta Smelt incidental take. Four juvenile Delta Smelt were salvaged on April 28, combined with the previous salvage, represents 3% of the concern level of the WY 2016 juvenile Delta Smelt incidental take.

No adult Longfin Smelt have been observed in salvage sampling at either the federal or state Delta facilities during the current water year. Two juvenile Longfin Smelt were salvaged on March 9 at the SWP; eight juvenile Longfin Smelt were salvaged on March 11 at the CVP. Combined salvage of >20 mm Longfin Smelt is ten for the season.

Larval sampling has been conducted since March 1st at both the SWP and CVP. No larval Delta Smelt has been detected in the samples processed so far this season. Larval Longfin Smelt were detected at the SWP on March 16. Current larval sample processing time has increased substantially; a single sample from last week took approximately 5 hours to process. Members indicated the knowledge expected to be gained from conducting larval sampling at the fish

facilities has decreased given the very low sampling efficiency and low population size, reducing the need for larval sampling as the season progresses. Members agreed that most Delta Smelt likely are of salvageable size. Because current larval Delta Smelt monitoring has not produced useful data, most members agreed that continued sampling is no longer required this season. Some members indicated a lingering need for this information, and that the facilities could reduce their sampling effort to decrease the staff time required to sort the batches.

A power outage occurred at the CVP’s Tracy Fish Collection Facility on May 18 lasting 2 hours, to repair the traveling screens. One 30 minute fish count was missed. A 15 minute power outage at the SWP Fish Facility occurred on May 22 to conduct a predator removal.

**5. Expected Project Operations**

Jones pumping plant is pumping 800 cfs today and may increase to 1000 cfs by Wednesday. The daily average intake to Clifton Court (CC) is 1800 cfs today and is anticipated to reduce to 500 cfs by Wednesday. Combined pumping is 2600 cfs today and expected to decrease to 1500 cfs by Wednesday. Pumping is constrained to comply with the NMFS RPA IV.2.1.

**6. Delta Conditions Team**

The DCT team met on Friday, May 20. A brief update of the discussion was provided to the Working Group by FWS.

**7. Assessment of Risk:**

BiOp Background

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).

The WY 2016 adult Delta Smelt incidental take (IT) is 56, as stated in the Service’s December 23, 2015 memo to the Bureau of Reclamation. The concern level is 42. The method to calculate the adult IT is described on p 386 of the 2008 BiOp, with the corrections described in both the February 22, 2013, and December 23, 2015 memos. The alternative approach that the Service presented to the 2015 independent review panel at the Long-term Operation Biological Opinions annual science review will be piloted this year.

The WY 2016 larval/juvenile Delta Smelt incidental take is 392, and the concern level is 261. The method to calculate the larval/juvenile IT is described on p 389, with revision provided in the February 22, 2013 Service memo to the Bureau of Reclamation.

2015 Delta Smelt abundance

The four primary 2015 annual abundance indices for all Delta Smelt life stages are the lowest on record.

	2014	2015
SKT	30.1	13.8
20-mm	1.1	0.3
TNS	0.5	0.0
FMWT	9	7

## Discussion

Entrainment risk of adult Delta Smelt is considered to be low, and was not evaluated.

The Working Group assumes spawning occurred in the lower San Joaquin River, as well as potentially in the Old River corridor. The Working Group has continuing concerns regarding larvae in the Old River corridor as well as the lower San Joaquin River, given the decline of catch in surveys this year. Delta Smelt catch data from the most recent field surveys (20-mm Survey #5 [week of May 9], and SKT #5 [week of May 2]) do not show a strong presence of Delta Smelt in the central and south Delta. However, four juvenile Delta Smelt were salvaged on April 15 as well as on April 28, indicating a presence of juvenile Delta Smelt in the south Delta. Members stressed the concern with very low abundance and associated challenges in survey detection, and that zero detection at a station does not indicate Delta Smelt are not present.

The SWG has stressed since early in the season that Delta Smelt have been present not only in the lower San Joaquin, but also at times, in the south Delta. The confirmation of juvenile salvage on April 15 and April 28 is evidence of this. Members assume there are some number of fish in the south and central Delta. Even with detections in the 20-mm Survey #5 showing only one detection in the central Delta and none in the south Delta (although algae fowling of gear reduced count times to  $\frac{1}{4}$ ), members stressed their concern that the very low population abundance (as evidenced by SKT 5 having zero detections of adults) affects probability of detection, and, therefore, distribution cannot be determined with accuracy. Members indicated that a larger percentage of fish may be in the south and central Delta than would be assumed from field survey catch data.

The SWG briefly discussed the continued need for larval fish sampling at the fish salvage facilities given the substantial increase in sample processing time (see Salvage section). While some members expressed that there may be ways to modify the larval sampling such that the processing effort could be alleviated without losing this method as a way to confirm Delta Smelt presence, others mentioned that Delta Smelt have not been observed in the larval fish samples to date and are now partially retained by salvage operations, reducing the benefit of continuing the sampling over the cost of processing.

The earlier life stages of Delta Smelt are at greater risk for entrainment, given that they behave more like a particle than older life stages. Older life stages have greater ability to control their position in the water column.

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

### Advice Framework OMR Level Risk Ranking and Discussion—**Young of Year Delta Smelt**

- 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 larval Delta Smelt.
  - Risk factors: lowest annual indices on record, low likelihood of detection.
  - Salvage: four salvaged April 28, geographic influence of the pumps does not extend to central Delta under this OMR flow range
  - Unknowns: detection ability in salvage and trawl surveys has been severely reduced, given the record low abundance indexes.
  - Persistence of risk: expected to continue until May 31.

- OMR flow of -2000 to -3500 cfs: There is a *medium* risk of entrainment under this flow range.
  - Risk Factors: lowest annual indices on record, low likelihood of detection
  - Salvage: four salvaged April 28, geographic influence of the pumps extends to the Old River corridor
  - Unknowns: detection ability in salvage and trawl surveys has been severely reduced, given the record low abundance indexes.
  - Persistence of Risk: expected to continue until May 31.
- OMR flow of -3500 to -5000 cfs. There is a *high* risk of entrainment under this flow range.
  - Risk Factors: lowest annual indices on record, low likelihood of detection
  - Salvage: four salvaged April 28, geographic influence of the pumps extends to the lower San Joaquin River.
  - Unknowns: detection ability in salvage and trawl surveys has been severely reduced, given the record low abundance indexes.
  - Persistence of Risk: expected to continue until at least May 31

The Working Group will continue to monitor conditions and smelt distribution and will meet again on Tuesday, May 31, 2016.

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

### **Advice for week of May 23, 2016:**

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

The period of potential Barker Slough operations restriction is over for 2016 (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 20-mm 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. No Longfin Smelt were salvaged during the week of May 16-May 22. No Longfin Smelt have been salvaged since mid-March. On March 9, 2016, the first Longfin Smelt was salvaged for the water year, a young-of-the-year ( $\geq 20$  mm); additional young-of-the-year were salvaged on March 11 for a total salvage of 10. Salvage of young-of-the-year does not count toward the adult salvage limit for advice. The **Longfin Smelt adult salvage threshold for advice is 20** based on a Fall Midwater Trawl abundance index of 4 for 2015 (see criterion in #1 above). No advice is warranted based on this criterion.

2. No adult Longfin Smelt were collected by the Bay Study during May in the Delta, Suisun or San Pablo bays. Distribution information does not indicate advice is warranted based on this criterion.

3 & 4. The fifth 20-mm Survey was conducted the week of May 9 and no Longfin Smelt larvae were detected at the few south Delta stations processed (Table 1); however, numerous tow durations were shortened to 2.5 min (25% of normal tow times) to allow effective sampling during a filamentous algae bloom. This tow duration reduction would tend to reduce detection of smelts, but no Longfin Smelt were expected to remain in the south Delta. Neither the distribution (Basis for advice #3) nor the catch density (Basis for advice #4) criterion was achieved. The Bay Study collected 14 young of the year Longfin Smelt in the first half of their May survey: 1 at station 429 (Suisun Bay), 5 in at station 427 (Carquinez Strait) and 7 in San Pablo Bay, and 13 in central San Francisco Bay (n=27 total for May).

5. The Barker Slough criterion terminated for the water year on March 31.

**Current conditions:** The Sacramento River flow were 14,185 cfs on May 22 and the San Joaquin River at Vernalis was 1,255 cfs. Also on May 22, Qwest was +1,067 cfs. On May 23, combined State and federal exports are at about 2,600 cfs, but will drop to between 1500 and 2000 on May 25 and remain at that level through the week.

There is no new adult distribution information.

**Summary of Risk:** Risk of entrainment in the south Delta is very low due to consistent lack of detection in the central and south Delta criteria stations. Qwest remains slightly positive. There is very little likelihood of additional Longfin Smelt larvae hatching in the lower San Joaquin River, and larva numbers are likely to remain at zero (Table 1). April usually marks the end of the hatching season.

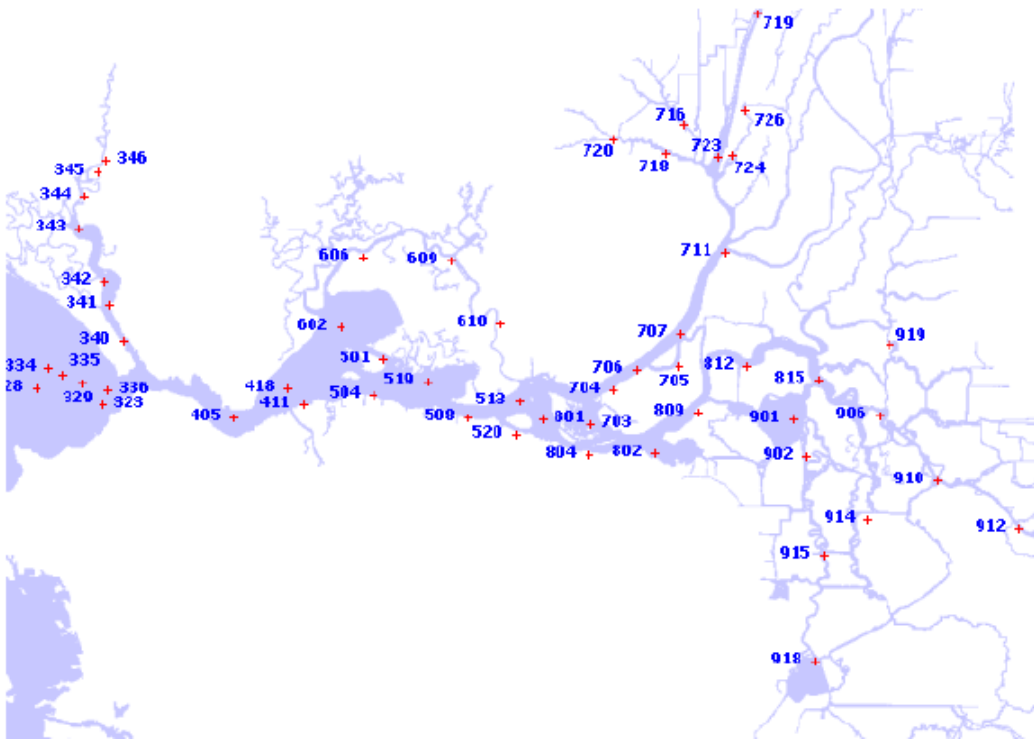
The Barker Slough concern period ended March 31.

Table 1. Longfin Smelt catch by station in the 20-mm Survey, #5. Sample processing is incomplete.

Year	Survey	Station	Date	# Tows Processed	Species	Total Catch	Min Length	Max Length	Avg Length
2016	5	323		0	Not Yet Processed	0			
2016	5	340		0	Not Yet Processed	0			
2016	5	342		0	Not Yet Processed	0			
2016	5	343		0	Not Yet Processed	0			
2016	5	344		0	Not Yet Processed	0			
2016	5	345		0	Not Yet Processed	0			
2016	5	346		0	Not Yet Processed	0			
2016	5	405		0	Not Yet Processed	0			
2016	5	411		0	Not Yet Processed	0			
2016	5	418		0	Not Yet Processed	0			
2016	5	501		0	Not Yet Processed	0			
2016	5	504		0	Not Yet Processed	0			
2016	5	519		0	Not Yet Processed	0			
2016	5	602		0	Not Yet Processed	0			
2016	5	608		0	Not Yet Processed	0			
2016	5	609		0	Not Yet Processed	0			
2016	5	610		0	Not Yet Processed	0			
2016	5	508		0	Not Yet Processed	0			
2016	5	513		0	Not Yet Processed	0			
2016	5	520		0	Not Yet Processed	0			
2016	5	801	10-May-16	3	Longfin Smelt	2	24	28	26
2016	5	804	11-May-16	3	Longfin Smelt	1	18	18	18
2016	5	703		0	Not Yet Processed	0			
2016	5	704	10-May-16	3	Longfin Smelt	1	28	28	28
2016	5	705*	10-May-16	3	No Longfin Catch	0			
2016	5	706		0	Not Yet Processed	0			
2016	5	707*	10-May-16	2	No Longfin Catch	0			
2016	5	711	10-May-16	1	No Longfin Catch	0			
2016	5	716	12-May-16	3	No Longfin Catch	0			
2016	5	718	12-May-16	3	No Longfin Catch	0			
2016	5	719	12-May-16	3	No Longfin Catch	0			
2016	5	720	12-May-16	1	No Longfin Catch	0			
2016	5	723	12-May-16	3	No Longfin Catch	0			
2016	5	724	12-May-16	3	No Longfin Catch	0			
2016	5	726	12-May-16	3	No Longfin Catch	0			
2016	5	809	11-May-16	3	No Longfin Catch	0			
2016	5	812*	11-May-16	3	No Longfin Catch	0			
2016	5	815*	11-May-16	3	No Longfin Catch	0			
2016	5	901*	10-May-16	3	No Longfin Catch	0			
2016	5	902*	10-May-16	3	No Longfin Catch	0			
2016	5	906*	11-May-16	3	No Longfin Catch	0			
2016	5	910	10-May-16	3	No Longfin Catch	0			
2016	5	912	10-May-16	3	No Longfin Catch	0			
2016	5	914	10-May-16	3	No Longfin Catch	0			
2016	5	915*	10-May-16	3	No Longfin Catch	0			
2016	5	918*	10-May-16	3	No Longfin Catch	0			
2016	5	919*	11-May-16	3	No Longfin Catch	0			

\*Reduced tow time  
Processing is complete through 5/20/2016

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





**SWG Weekly Salvage Update**  
**Reporting Period: May 16-22, 2016**  
 Prepared by Jerry Morinaka on May 23, 2016: 9:00  
 Preliminary Results -Subject to Revision

Species/Life Stage	Daily Salvage							Trend	
	16-May	17-May	18-May	19-May	20-May	21-May	22-May		
<b>Juvenile Delta Smelt</b>									
SWP	0	0	0	0	0	0	0		0
CVP	0	0	0	0	0	0	0		0
TOTAL	0	0	0	0	0	0	0	→	0.0
CUM TAKE	8	8	8	8	8	8	8		
% of 2016 CL	3%	3%	3%	3%	3%	3%	3%		
<b>Juvenile Longfin Smelt</b>									
SWP	0	0	0	0	0	0	0		0
CVP	0	0	0	0	0	0	0		0
TOTAL	0	0	0	0	0	0	0	→	0
<b>SWP daily export</b>	1,802	2,132	1,001	1,082	1,640	1,493	3,386	↘	1,791
<b>CVP daily export</b>	3,169	1,620	810	844	819	812	1,576	↘	1,379
<b>SWP reduced counts</b>	0%	0%	0%	0%	40%	60%	7%	↘	15%
<b>CVP reduced counts</b>	0%	0%	17%	0%	0%	0%	0%	→	2%
<b>SWP larval samples</b>	100%	100%	100%	100%	100%	100%	100%	→	100%
<b>CVP larval samples</b>	100%	100%	100%	100%	NA	NA	NA	→	100%
<b>DS larvae present - SWP</b>	N	N	NA	NA	NA	NA	NA	→	
<b>DS larvae present - CVP</b>	N	N	N	N	NA	NA	NA	→	
<b>LFS larvae present - SWP</b>	N	N	NA	NA	NA	NA	NA	→	
<b>LFS larvae present - CVP</b>	N	N	N	N	NA	NA	NA	→	

= missed count collection  
 = fish salvage facility outage occurred

TOTAL = combine daily salvages for CVP+SWP; daily water export = AF; Trend = compared to previous week

NA = not available at the time of this report; NS = not sampled

Reduced counts = percentage of time that routine salvage sample time were less than 30 min per 2 hours of salvage and export operations

Larval samples = percentage of daily scheduled samples taken during periods of water export

Yellow highlighted dates indicate fish salvage facility outage occurred.

Larvae present = whether Delta Smelt (DS) or Longfin Smelt < 20 mm was observed from daily fish larva collections at the SWP or CVP fish facilities