

Smelt Working Group
May 31, 2016

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 OMR flow ranges is discussed and assessed. For the current week, the risk of entrainment of larval and juvenile Delta Smelt for each of the flow ranges is characterized as follows:

- -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.

Should salvage occur prior to June 6 or if field surveys detect Delta Smelt in the central Delta, the Working Group will need to reconvene to reassess the risk of entrainment.

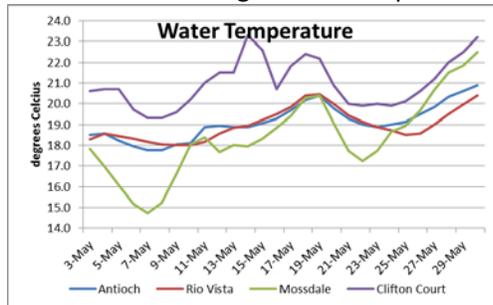
The Working Group is following guidance for entrainment protections from Action 3 (juvenile Delta Smelt). The Working Group will continue to monitor Delta Smelt survey and salvage data and Delta conditions, and will meet again on Monday, June 6, 2016 at 10 am.

Reported Data

1. Current environmental data

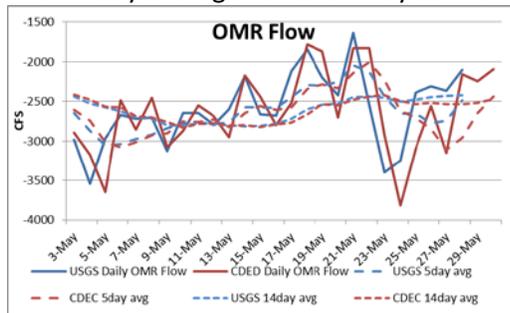
a. Temperature

The 3-station average water temperature for May 30 was 21.3°C.



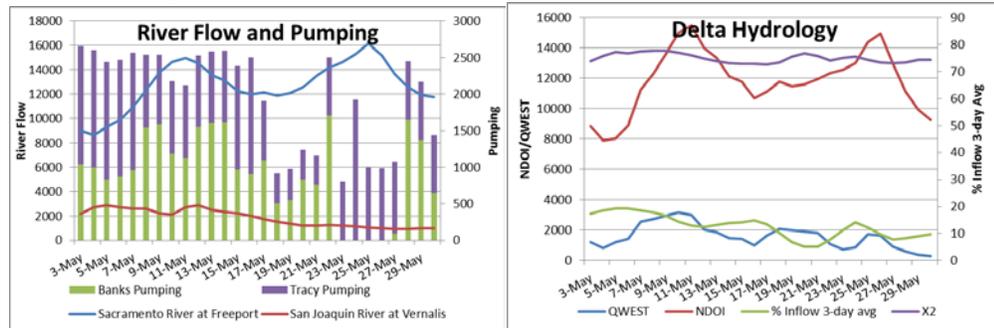
b. OMR flow

USGS OMR 5-day, and 14-day average flows on May 28 were -2483 and -2423 cfs, respectively. The corresponding 5-day and 14-day OMR index values were -2290 and -2140 cfs. The daily OMR index value for May 30 was -2120 cfs. The CDEC OMR 5-day and 14-day average flows for May 30 were -2442 and -2471 cfs, respectively.



c. River flows and pumping

Sacramento River at Freeport flow for May 30 was 11,773 cfs. San Joaquin River at Vernalis river flow for May 30 was 1019 cfs. X2 is at 74.31km. Combined exports are 1500 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 #6 was in the field last week. Sample processing is 23% complete. So far, no Delta Smelt were collected. 20-mm Survey #7 is in the field next week.

Last 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 at the SWP, delaying sample processing.

5. Expected Project Operations

Jones pumping plant is pumping 800 cfs today. The daily average intake to Clifton Court (CC) is 700 cfs today and is anticipated to increase to 1800 cfs by Wednesday. Combined pumping is 1500 cfs today and expected to increase to 2600 cfs by Wednesday. Pumping is constrained to comply with the Service’s May 23 Determination, which stated that OMR flow could be no more negative than -3000 cfs.

Operators stated that if the -3000 cfs OMR limit were not in place, the SWRCB’s Habitat Protection Outflow standard for June of X2 west of Collinsville or NDOI of greater than 7100 cfs for 30 days likely would be constraining exports.

6. Delta Conditions Team

There was no DCT team meeting on May 28.

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. Although the Working Group has had continuing concerns regarding larvae in the Old River corridor as well as the lower San Joaquin River (due to the decline of catch in surveys this year) most members indicated their assessment of entrainment

risk has declined to some extent. Delta Smelt catch data from the most recent field surveys (20-mm Survey #6, week of May 23) do not show a strong presence of Delta Smelt in the ~~central and~~ south Delta. The last salvage event was on April 28. Although no strong presence has been detected in at least 4 weeks in the south or central 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. A minority indicated the assessment of entrainment risk should be higher than was determined for this week.

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: none since 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 through the remainder of the season.
- OMR flow of -2000 to -3500 cfs: There is a low risk of entrainment under this flow range.
 - Risk Factors: lowest annual indices on record, low likelihood of detection
 - Salvage: none since 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 June 6.
- OMR flow of -3500 to -5000 cfs. There is a *medium* risk of entrainment under this flow range.
 - Risk Factors: lowest annual indices on record, low likelihood of detection
 - Salvage: none since 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 June 6, but could be increased if salvage occurs or if detection from central Delta field surveys occurs.

The Working Group will continue to monitor conditions and smelt distribution and will meet again on Monday, June 6, 2016.

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

Advice for week of May 30, 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 (≥ 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 adult Longfin Smelt were salvaged during the week of May 23-29. 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 (≥ 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 sixth 20-mm Survey of 2016 was conducted the week of May 23 and no Longfin Smelt larvae were detected at the south Delta stations processed as of May 27th (Table 1); however, a few tow durations ($n=3$) were shortened to 2.5 min (25% of normal tow times) at two south Delta stations to deal with submerged macrophyte debris at one station and for logistical reasons at the second station. Decreased tow durations may reduce the probability of detection, however, no Longfin Smelt are expected to remain in the south Delta due to rising water temperatures. 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 was 11,773 cfs on May 30 and the San Joaquin River at Vernalis was 1,019 cfs. Also on May 30, Qwest was + 303 cfs. On May 30, combined State and federal exports were about 1,500 cfs, although on June 1 combined export are expected to increase to a level between 2,500 and 3,000 cfs 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 and at the south Delta fish salvage facilities. 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.

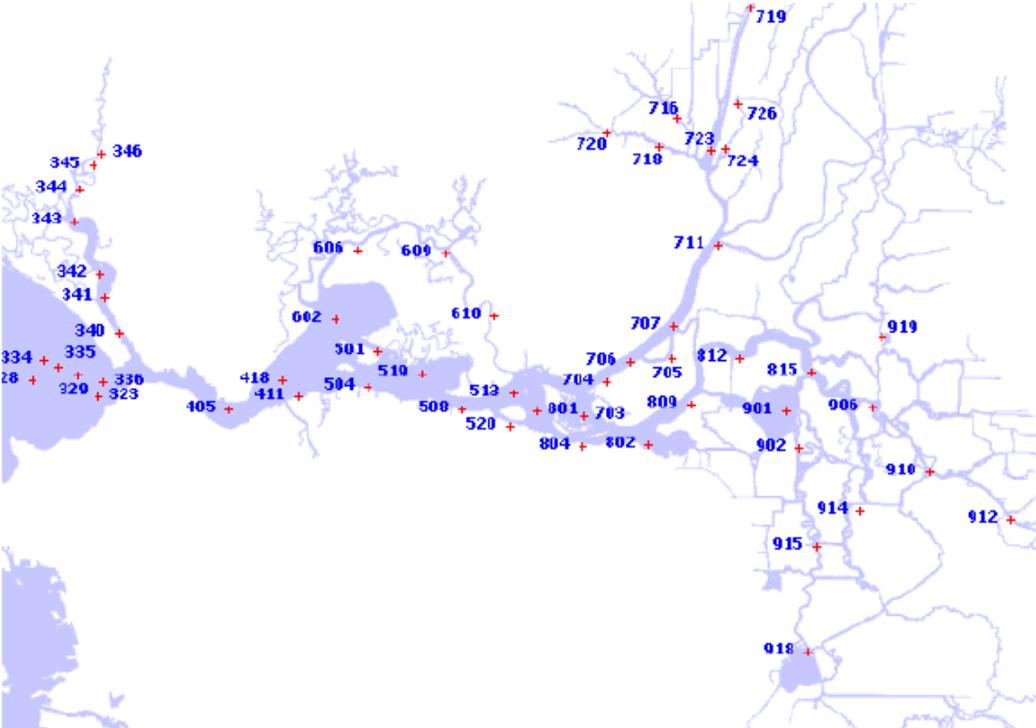
Table 1. Longfin Smelt catch by station in the 20-mm Survey, #6. Sample processing is incomplete.

Table 2. Longfin smelt catch per station from 2016 20-mm Survey, Survey 6. (These data are preliminary and subject to change)

Year	Survey	Station	Date	# Tows Processed	Species	Total Catch	Min Length	Max Length	Avg Length	
2016	6	323		0	Not Yet Processed	0				Subsum Bay & West
2016	6	340		0	Not Yet Processed	0				
2016	6	342		0	Not Yet Processed	0				
2016	6	343		0	Not Yet Processed	0				
2016	6	344		0	Not Yet Processed	0				
2016	6	345		0	Not Yet Processed	0				
2016	6	346		0	Not Yet Processed	0				
2016	6	405		0	Not Yet Processed	0				
2016	6	411		0	Not Yet Processed	0				
2016	6	418		0	Not Yet Processed	0				
2016	6	501		0	Not Yet Processed	0				
2016	6	504		0	Not Yet Processed	0				
2016	6	519		0	Not Yet Processed	0				
2016	6	602		0	Not Yet Processed	0				
2016	6	606		0	Not Yet Processed	0				
2016	6	609		0	Not Yet Processed	0				
2016	6	610		0	Not Yet Processed	0				
2016	6	508		0	Not Yet Processed	0				
2016	6	513		0	Not Yet Processed	0				
2016	6	520		0	Not Yet Processed	0				
2016	6	801		0	Not Yet Processed	0				
2016	6	804		0	Not Yet Processed	0				
2016	6	703		0	Not Yet Processed	0				
2016	6	704		0	Not Yet Processed	0				
2016	6	705	23-May-16	2	No Longfin Catch	0				
2016	6	706		0	Not Yet Processed	0				
2016	6	707		0	Not Yet Processed	0				
2016	6	711		0	Not Yet Processed	0				
2016	6	716		0	Not Yet Processed	0				
2016	6	718		0	Not Yet Processed	0				
2016	6	719		0	Not Yet Processed	0				
2016	6	720		0	Not Yet Processed	0				
2016	6	723		0	Not Yet Processed	0				
2016	6	724		0	Not Yet Processed	0				
2016	6	726		0	Not Yet Processed	0				
2016	6	809		0	Not Yet Processed	0				
2016	6	812		0	Not Yet Processed	0				
2016	6	815	24-May-16	3	No Longfin Catch	0				
2016	6	901*	23-May-16	3	No Longfin Catch	0				
2016	6	902	23-May-16	3	No Longfin Catch	0				
2016	6	906	24-May-16	3	No Longfin Catch	0				
2016	6	910*	23-May-16	3	No Longfin Catch	0				
2016	6	912	23-May-16	3	No Longfin Catch	0				
2016	6	914	23-May-16	3	No Longfin Catch	0				
2016	6	915	23-May-16	3	No Longfin Catch	0				
2016	6	918	23-May-16	3	No Longfin Catch	0				
2016	6	919	24-May-16	3	No Longfin Catch	0				

*Reduced tow time
Processing is complete through 5/27/2016

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



SWG Weekly Salvage Update

Reporting Period: May 23-29, 2016

Prepared by Bob Fujimura on May 30, 2016: 10:00

Preliminary Results -Subject to Revision

Species/Life Stage	Daily Salvage							Trend	
	23-May	24-May	25-May	26-May	27-May	28-May	29-May		
Juvenile Delta Smelt									
SWP	0	0	NS	NS	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%		
Juvenile Longfin Smelt									
SWP	0	0	NS	NS	0	0	0		0
CVP	0	0	0	0	0	0	0		0
TOTAL	0	0	0	0	0	0	0	→	0
SWP daily export	0	0	0	0	173	3,267	2,711	↘	879
CVP daily export	1,593	3,822	1,977	1,956	1,954	1,591	1,586	↘	2,068
SWP reduced counts	NR	NR	NR	NR	0%	47%	12%	↗	20%
CVP reduced counts	17%	0%	0%	0%	0%	0%	0%	→	2%
SWP larval samples	NS	NS	NS	NS	100%	NA	NA	→	100%
CVP larval samples	100%	100%	100%	NA	NA	NA	NA	→	100%
DS larvae present - SWP	NS	NS	NS	NS	NA	NA	NA	→	
DS larvae present - CVP	N	N	N	NA	NA	NA	NA	→	
LFS larvae present - SWP	NS	NS	NS	NS	NA	NA	NA	→	
LFS larvae present - CVP	N	N	N	NA	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; NR = not relevant

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

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