

Smelt Working Group
January 25, 2016

Meeting Summary

The Working Group reviewed current Delta Smelt distribution, salvage data, and Delta conditions. 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 delta smelt for each of the flow ranges is characterized as follows:

- -1250 to -2000 cfs has a medium risk of entrainment,
- -2000 to -3500 cfs has a high risk of entrainment,
- -3500 to -5000 cfs has a high risk of entrainment.

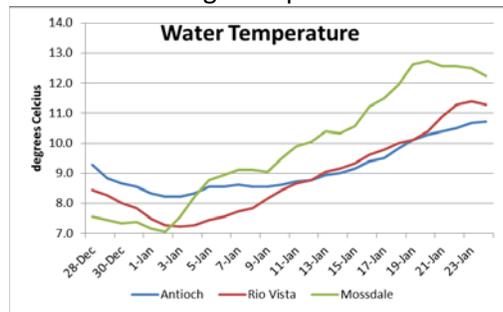
The Working Group will continue to monitor Delta Smelt survey and salvage data and Delta conditions, and will meet again on Monday, February 1, 2016 at 10 am.

Reported Data

1. Current environmental data

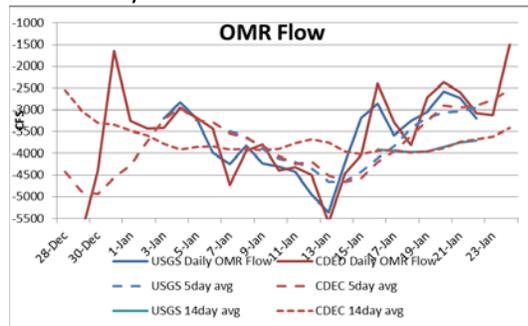
a. Temperature

Combined average temperature for January 24 is 11.4°C



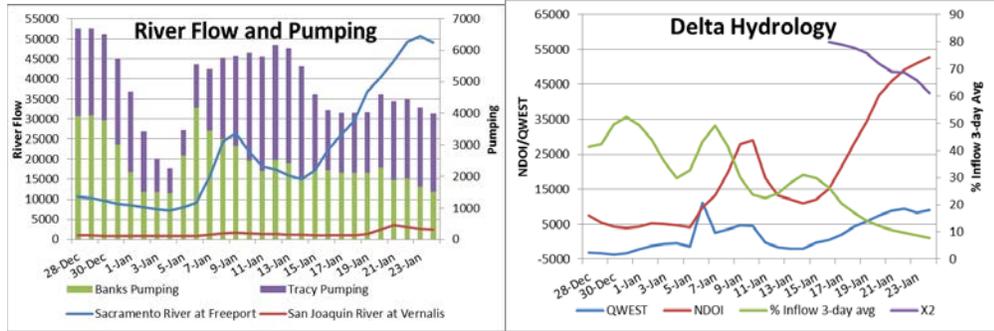
b. OMR flow

USGS OMR daily average flow on January 22 is -3193 cfs. CDEC OMR daily average flow for January 24 is -1494 cfs.

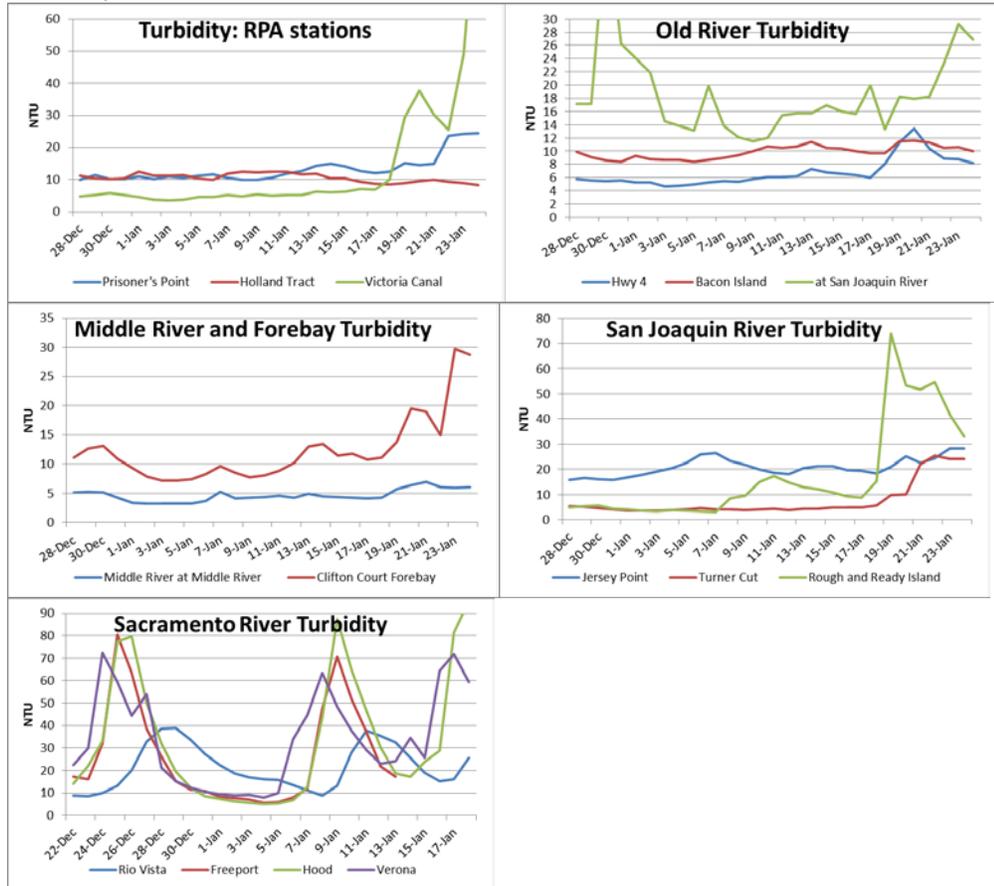


c. River Flows and pumping

Sacramento River at Freeport flow for January 24 was 49,151 cfs. San Joaquin River at Vernalis river flow for January 24 was 2416 cfs. Combined exports are 3800 cfs today; combined exports tomorrow (January 26th) are expected to be 3900cfs.



d. Turbidity



2. Delta fish monitoring

CDFW has released the 2015 FMWT indices:
 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).

SKT #2 is in the field February 8.

Smelt Larva Survey #2 was in the field the week of January 19. Sample processing is 50% complete. No Delta Smelt have been detected as yet. So far, 32 Longfin Smelt have been identified, ranging in length from 5-8mm. SLS #3 is in the field next week (week of February 3).

Spring Kodiak Trawl #2 will be in the field the week of February 8.

The Early Warning Survey began November 30.

Early Warning Survey Results, January 20 through 24

Date	Location	Delta Smelt Catch
1/20	Prisoner's Point	1
1/21	Prisoner's Point	1
1/22	Prisoner's Point	1
1/23	Prisoner's Point	1
1/24	Prisoner's Point	4

3. Modeling

No Particle Tracking modeling runs were requested or reviewed.

DWR turbidity modeling was provided by the DCT; however, given the low model accuracy discussed in previous weeks' notes they are not being relied upon for turbidity forecasting.

4. Salvage

Four Delta Smelt were salvaged on January 21 at the CVP fish salvage facility; this is the first Delta Smelt salvage of the year. A salvage of 4 Delta Smelt represents 10% of the concern level of the WY 2016 adult Delta Smelt incidental take. No Longfin Smelt have been observed in salvage sampling at either the federal or state Delta pumping facilities during the current water year (see attachment).

Adult Delta Smelt				
Date	CVP	SWP	Total	Cumulative
01/18	0	0	0	0
01/19	0	0	0	0
01/20	0	0	0	0
01/21	4	0	4	4
01/22	0	0	0	4
01/23	0	0	0	4
01/24	0	0	0	4

5. Expected Project Operations

Jones pumping plant is pumping 2500 cfs today and dropping to 2000 cfs tomorrow. The daily average intake to Clifton Court (CC) is 1900 cfs. Combined pumping is 3900 cfs. Pumping is targeting an OMR indexed flow of no more negative than -2500 cfs for today. Operators indicated that exports are expected to remain at this level (under the January 21 Service Determination) until there is a subsequent Service Determination.

6. Delta Conditions Team

DCT met on 01/22; the January 21 DWT turbidity transect data and a DCT summary (including turbidity forecasting) were provided (see attached)

7. Assessment of Risk:

BiOp Background

RPA Component 1, Action 2 states, "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 specific OMR flows within this range are recommended by the Working Group from the onset of Action 2 through its termination..."

The Service stated in its January 14, 2016 Determination that "...we have moved into Action 2 of Component 1 of the 2008 Biological Opinion..." According to the Biological Opinion, "Action 2 reflects the period when OMR prescriptions for pre-spawning adult delta smelt are still required to protect parental stock" once "the main pulse of fish migration has occurred and adults are holding more tightly to their selected spawning areas" (p 355).

The WY 2016 adult Delta Smelt incidental take (IT) is 56, as is 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.

Discussion:

The Working Group concluded that risk of entrainment into the south Delta would remain high at current levels (OMR flows of -2500 or more negative) because recent catches at Prisoner's Point indicate fish continue to move (and have moved) into areas where they will (or already have) become vulnerable to entrainment, and elevated turbidity levels from the mouth of Old River to the export facilities further encourage fish to move into the sphere of influence of the pumps. Recent Early Warning Survey (EWS) catches at Prisoner's Point after the peak catch of six on January 16 have consistently been one fish, with an elevated catch of four on January 24.

Presently, Old River turbidity appears to be at approximately 9-10 NTU (CDEC station data) from Holland Tract to Bacon Island, with much higher turbidities at the mouth of Old River at the San Joaquin River, and along other south Delta corridors (particularly in front of the export facilities). The Working Group noted that the Old River corridor is subject to fluxes of increased turbidity at high and low tide: at low tide, higher turbidity would be pulled toward the north into Old River from the south Delta, while at high tide, higher turbidity would be pulled toward the south. The Working Group also noted a disparity between the CDEC stations and boat transect turbidity. Members recognize the possibility that both data sets are accurate, such that the CDEC station data indicates turbidity levels closer to the side of the channel, while boat data reflects turbidity in the main channel. The DWR boat transect is in the field today and data is expected later in the week.

The Working Group noted that Delta Smelt are in the south Delta, as evidenced by the salvage event at the CVP Fish Facility on January 21. The Working Group expects that further salvage likely will occur this week; especially should pumping be increased, although Delta Smelt may not be detected in salvage sampling due to record low abundance and detection ability (a concern raised by the Working Group throughout the year).

The Working Group also discussed the possibility that Delta Smelt will remain in the south Delta and in the Old River corridor through spawning. This would create a prolonged increased risk of entrainment for the species as the season progresses into the juvenile protection period. It is unclear at this time if this scenario can be avoided.

More precipitation is expected late in the week and through next weekend. However, dry weather is expected for the next few days at least. Members stressed the importance of using the current break in the weather to allow the higher turbidity in the south Delta to settle out of the water column and to keep higher turbidity from entering Old River at the San Joaquin River. Members hope this will encourage additional fish to remain in the lower San Joaquin River, rather than moving into Old River.

2015 Delta Smelt abundance indices

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

Early Warning Survey as an indicator of upstream movements and entrainment risk

Previously, members of the Working Group stated that elevated catch in the Jersey Point south lane trawl or at Prisoners Point would indicate increased Delta Smelt movement and increased risk of entrainment into interior Delta channels. The Working Group particularly is concerned about these locations since the south lane at Jersey Point is more hydrodynamically linked to tidal flow into these interior Delta channels, and presence of fish at Prisoners Point reinforces the evidence that Delta smelt are moving upriver. Fish in these areas are considered at greater risk of entrainment into Old River than fish distributed downstream or along the Sacramento River. Delta Smelt have been consistently collected at Prisoner's Point in the past week with four individuals collected on January 24. Given that the combined station catch of Delta Smelt was only two in the December SKT, and only seven in the January SKT, a catch of four fish at Prisoner's Point on January 24 in the Early Warning Survey suggests a substantial portion of the Delta Smelt population may be in the San Joaquin River in WY 2016.

Conditions conducive to a spawning movement have begun. Therefore, it is essential that protective actions continue to be implemented this week to minimize Delta Smelt distribution into the Old River and Middle River prior to spawning. With the detection of a female expressing eggs in the Early Warning Survey last weekend, the start of spawning season could happen at any time, although spawning season rarely begins prior to February, and SKT 1 did not detect any evidence of imminent spawning.

Salvage

The Working Group concluded that any salvage observed at either facility will be of high concern because Delta Smelt abundance is at a historic low, contributing to low detection probability of Delta Smelt in salvage under RPA compliant operations (BiOp page 338). One fish was detected in salvage sampling on January 21, counting as four salvaged Delta Smelt due to an expansion factor of four. The Working Group expects that additional Delta Smelt will be entrained into the facilities this week, but may not be observed in salvage sampling due to lower detection probability than previous years due to record low Delta Smelt density.

Turbidity and Delta Smelt Distribution

The four primary Delta Smelt abundance indices, as well as catches from the December 2015 and January 2016 SKT all indicate that abundance has been at a record low all last year and remains so. As a result, the Working Group expects that salvage and single tow trawl surveys are increasingly unreliable indicators of Delta Smelt distribution. As members of the Working Group have stressed in previous meetings, sporadic, low catch in surveys from record low abundance makes using those survey results for assessing the species' distribution and risk of entrainment very challenging. The Working Group has used turbidity as a proxy for location of Delta Smelt, based on well documented associations of the fish with turbid water, its migration response to turbidity (BiOp pages 146 and 347 and EWS results) and more than two decades of salvage events which have occurred in association with the dispersal of turbidity from the San Joaquin River into the South Delta to the export facilities.

Given the elevated Old River turbidity levels mentioned previously, members indicated the importance of achieving less turbid conditions as quickly as possible to reduce the risk that additional Delta Smelt will move from the lower San Joaquin River into Old River and closer to the pumping facilities. Members again stressed the importance of minimizing the movement of adult Delta Smelt into Old River, which potentially reduces the risk of entrainment for both adults in active pre-spawn movement, and later of hatching larvae and juveniles in the coming weeks/months. Members indicated that management of OMR flow to prevent entrainment of young of year fish hatched in the Old River corridor would be exceptionally challenging.

Given these considerations, the Working Group would like to minimize the length of time that elevated turbidities occur in the Old River corridor. Members indicated that turbidities can drop faster in Old River south of Bacon Island than in the central Delta, so taking immediate action during the break in weather can assist in minimizing elevated turbidities within the influence of the pumps. Members stressed the importance of achieving turbidity levels in Old River and the south Delta of 8 NTU or less as soon as possible. The group discussed other specific turbidity levels, and decided that 8 NTU or less would be necessary to ensure conditions that do not encourage the species to move closer to the pumps. There is not clear evidence that 8 NTU will be low enough to discourage actively moving Delta Smelt. However, published research (Grimaldo) and unpublished data from Early Warning Sampling suggest fish begin moving into higher velocity areas of the water column around 10 NTU, suggesting Delta Smelt would not cease such movement until turbidity dropped to at least 8 NTU. However, much lower turbidity would provide greater assurance of reduced Delta Smelt vulnerability to advection toward the pumps.

Comparison to last winter

The first salvage of Delta Smelt last season occurred on January 2, after a period of OMR flows that ranged from around -6000 to -4000 (see SWG notes, 01/05/2015). The start of the salvage season began one to two weeks after increased inflow and turbidity were observed in the Delta. Although some hydrological conditions are presently different from this time last season, higher flows, elevated turbidity, and presence of Delta Smelt at Prisoner's Point suggest the migration "season" has started. Especially given the exceedingly low abundance and sporadic catch in surveys, the Working Group indicated the increased catch at Prisoner's Point over the weekend clearly indicates that fish currently are (and have been) moving upstream into the south Delta.

OMR Flow

Scheduled OMR flow for today (-2500 cfs) is anticipated to represent a higher risk of entrainment to fish than the same OMR flow last week (due to the widespread increases in turbidity levels). The Working Group suspects that more fish may have been entrained than were detected in January 21 salvage— either because they are too diluted to have much likelihood of being detected in the salvage counts.

The Working Group will be considering the following suite of conditions criteria this week to gauge the potential for diminished entrainment risk:

- Consecutive days of zero salvage
- Consecutive days of favorable turbidity, indicating a "break" in a turbidity bridge, or dispersion of turbidity into an area within the entrainment zone. This would include gauge readings of 8 NTU or less through the Old River corridor (from CDEC stations HOL to VCU). This value is based upon the observation that Delta Smelt salvage can occur at turbidities in the Old River of approximately 10 NTU, and also the observation that values from the fixed sensors have been consistently lower than those observed in the turbidity transect survey. The Service should look to both the CDEC gauge data and the DWR turbidity transect data to monitor turbidity levels as the boat transects usually return higher turbidity levels than the gauges. The Working Group cautions that the boat transects are not completed at consistent points of tide levels. The Working Group would like to see turbidities at or less than 8 NTU at all points of the tidal cycle.
- Consecutive days of ≤ 1 Delta Smelt catch at Prisoner's Point in the early warning survey.

The above discussion points influenced and contributed 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 medium risk of entrainment under this flow range. This is the most protective range for Delta Smelt.
 - Risk factors: lowest annual indices on record, confirmed Delta Smelt presence in central Delta based upon Prisoner's Point catch and observed salvage data.
 - Salvage: Four salvaged during the previous week, geographic influence of the pumps does not extend to central Delta under this flow range
 - Unknowns: detection ability in salvage and trawl surveys has been severely reduced, given the record low abundance indexes; low Sacramento River catch densities (unable to assess percentage of population in the lower San Joaquin River). A lower risk of entrainment for this flow range could occur should Old River corridor and south Delta turbidity decrease to 8 NTU or less (CDEC station and DWR boat transect).
 - Persistence of risk: unlikely to change until turbidity levels in Old River and the south Delta decrease to 8 NTU or less

- OMR flow of -2000 to -3500 cfs: There is a high risk of entrainment under this flow range, given conditions listed below:
 - Risk factors: lowest annual index on record, confirmed Delta Smelt presence in central Delta based upon Prisoner's Point catch and observed salvage data, elevated turbidity throughout Old River and the south Delta.
 - Salvage: Four salvaged during the previous week, influence of pump not likely to extend to the lower San Joaquin River under this OMR flow range.
 - Unknowns: detection ability in salvage and trawl surveys has been severely reduced, given the record low abundance indexes, low Sacramento River catch densities (unable to assess percentage of population in the lower San Joaquin River), turbidity trend is expected to decrease in the Old River corridor this week. A lower risk of entrainment for this flow range could occur should Old River corridor and south Delta turbidity decrease to 8 NTU or less (CDEC station and DWR boat transect).
 - Persistence of risk: unlikely to change until turbidity levels in Old River and the south Delta decrease to 8 NTU or less.
- OMR flow of -3500 to -5000 cfs: There is a high risk of entrainment under this flow range.
 - Risk factors: lowest annual index on record, confirmed Delta Smelt presence in Prisoner's Point catch data and observed salvage data, elevated turbidity throughout Old River and the south Delta.
 - Risk factors: lowest annual index on record, confirmed Delta Smelt presence in central Delta based upon Prisoner's Point catch and observed salvage data.
 - Salvage: Four salvaged during the previous week, geographic influence of the pumps could extend to the lower San Joaquin River at the more negative end of this flow range, especially affecting the southern bank near Jersey Point.
 - Unknowns: detection ability in salvage and trawl surveys has been severely reduced, given the record low abundance indexes, low Sacramento River catch densities (unable to assess percentage of population in the lower San Joaquin River), turbidity trend is expected to decrease in the Old River corridor this week. It is unclear if a lower risk of entrainment for this flow range could occur should Old River corridor and south Delta turbidity decrease to 8 NTU or less (CDEC station and DWR boat transect), due to the possibility that particles can be pulled from the lower San Joaquin River at the higher end of this flow range.
 - Persistence of risk: unlikely to change until turbidity levels in Old River decrease to 8 NTU, and possibly not until turbidity levels in the lower San Joaquin River decrease to a similar level.

The risk factors considered most pertinent to the above assessment of risk were extremely low population abundance (detailed above), confirmed Delta Smelt presence in the San Joaquin River based upon salvage, and the distribution of turbidity greater than 12 NTU into the south Delta.

The Working Group will continue to monitor conditions and smelt distribution and will meet again on Monday, February 1, 2016.

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

Advice for week of January 25, 2016:

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

No Barker Slough operations advice is warranted at this time (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. As of January 24, 2016, no Longfin Smelt has been salvaged for the water year. 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. January Bay Study sampling detected no Longfin Smelt in the lower San Joaquin or Sacramento rivers. December Bay Study sampling collected no Longfin Smelt in the San Joaquin River. The December Fall Midwater Trawl sampled the region and did not detect Longfin Smelt in the San Joaquin River or the south Delta. Distribution information does not indicate advice is warranted based on this criterion.
- 3 & 4. The second Smelt Larva Survey (SLS) of 2016 was completed during the week of January 19th and sample processing is incomplete. Longfin Smelt larvae were detected in low numbers at 4 of 12 criteria stations (Table 1, Figure 1). Neither the distribution (Basis for advice #3) nor the catch density (Basis for advice #4) criterion was achieved.
5. The January 1 water supply index forecast at 90 percent exceedance remains within the “critical” range of water year types, and triggers review of larva distribution and Barker Slough operations. No larvae were detected at station 716. A single larva was caught at 723 in the

vicinity (Table 1, Figure 1). Barker Slough exports remained below 30 cfs since January 1. These results were not sufficient to warrant advice for Barker Slough operations.

Current conditions: The Sacramento River flow peaked at 50,850 cfs on January 23 and dropped slightly to 49,268 on the 24th. The San Joaquin at Vernalis peaked at 3,627 cfs on January 21st and declined slowly to 2,421 cfs January 24th. X2 reached about 61 on January 24th. Qwest turned positive on January 16 and became increasingly positive to 8,970 cfs on January 24th. On January 24, combined State and federal exports reached about 4,000 cfs targeting an OMR of -3,500 cfs. Barker Slough exports have been ≤ 20 cfs for the past two weeks and < 30 cfs since January 1, 2016; these export levels do not pose much risk of entrainment.

Bay Study detected no Longfin Smelt within the Delta and Suisun Bay during January sampling. For the week of January 10 through January 16, eight additional Longfin Smelt were collected by the Chipps Island Trawl (January 13th), the first catches since December 23rd. Only three Longfin Smelt have been previously reported by Chipps Island Trawl sampling: two adults on December 18 and the third adult on December 23. In December, a few Longfin Smelt were collected by the Fall Midwater Trawl, one each in Carquinez Strait, Grizzly Bay and just upstream of Chipps Island. These were the first and only collections of Longfin Smelt by the Fall Midwater Trawl this year. Also in December, a single Longfin Smelt was collected by the Bay Study in Carquinez Strait. No Longfin Smelt was collected in the San Joaquin River or south Delta by either survey in December.

The Smelt Larva Survey (SLS) #2 caught 1 or 2 larvae at four criteria stations in the central and south Delta (Table 1), but did not achieve either trigger criterion (Criteria 3 & 4 above). No larvae were detected at station 716, the criterion station for potential advice on Barker Slough operations during dry and critical water-year types.

No Longfin Smelt has been observed in salvage sampling this water year.

Summary of Risk: Risk of entrainment is very low due to a substantially positive Qwest and the few larvae detected in the lower San Joaquin River and south Delta by the Smelt Larva Survey (Table 1). Increased hatching is expected in upcoming weeks, but we currently have no information indicating much or any spawning in the central or south Delta.

Current Qwest flows are positive and very favorable for downstream transport away from the export pumps. Exports will target -2,500 cfs OMR in the absence of a more protective action by the USFWS to protect Delta Smelt.

The Barker Slough distribution trigger, that is larvae present at Smelt Larva Survey station 716, was not achieved, though larvae were detected in the vicinity at station 723 (see Table 1, Figure 1). Nonetheless, Barker Slough exports have been low (< 30 cfs) throughout the month of January, so risk of entrainment remains very low.

Table 1. Longfin Smelt catch by station in the Smelt Larva Survey 2. Sample processing is incomplete.

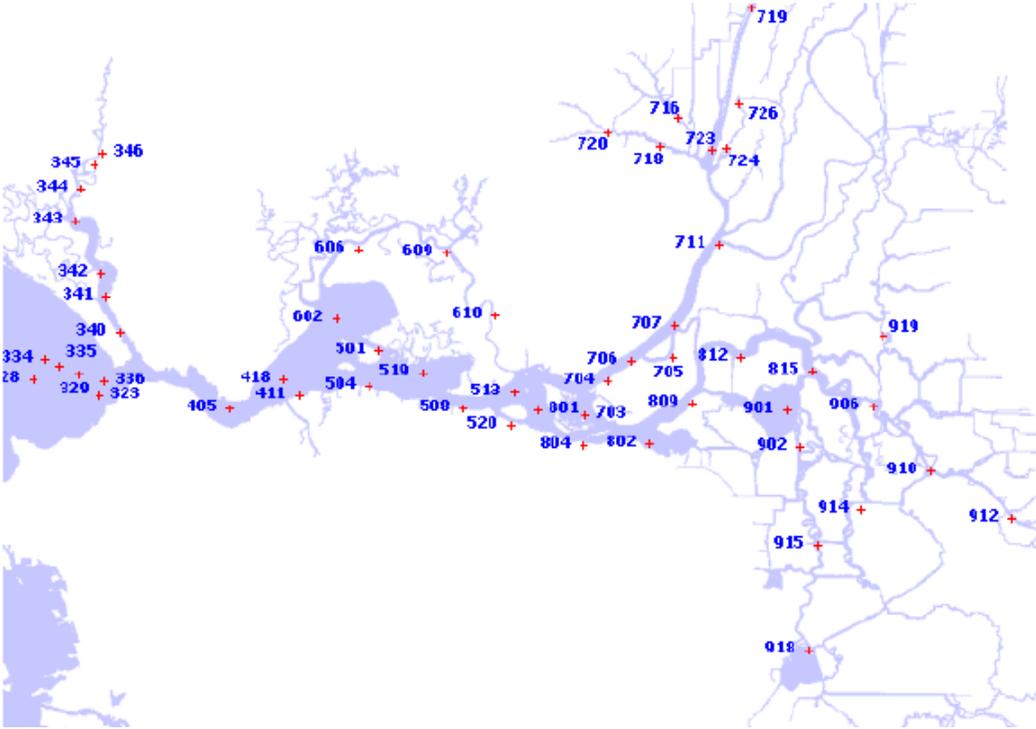
Table 1. Smelt catch per station from 2016 Smelt Larva Survey, Survey 2.

Year	Survey #	SLS Station	Sample Status	Species	Smelt Catch
2016	2	340	Not yet processed		
2016	2	342	Not yet processed		
2016	2	343	Not yet processed		
2016	2	344	Not yet processed		
2016	2	345	Not yet processed		
2016	2	346	Not yet processed		
2016	2	347	Not yet processed		
2016	2	348	Not yet processed		
2016	2	349	Not yet processed		
2016	2	405	Not yet processed		
2016	2	411	Not yet processed		
2016	2	418	Not yet processed		
2016	2	501	Not yet processed		
2016	2	504	Not yet processed		
2016	2	508	Not yet processed		
2016	2	513	Not yet processed		
2016	2	519	Not yet processed		
2016	2	520	Processed	Longfin Smelt	10
2016	2	602	Processed	Longfin Smelt	2
2016	2	606	Not yet processed		
2016	2	609	Not yet processed		
2016	2	610	Not yet processed		
2016	2	703	Processed		No Smelt Catch
2016	2	704	Not yet processed		
2016	2	705	Processed	Longfin Smelt	1
2016	2	706	Not yet processed		
2016	2	707	Processed	Longfin Smelt	1
2016	2	711	Processed		No Smelt Catch
2016	2	716	Processed		No Smelt Catch
2016	2	723	Processed	Longfin Smelt	1
2016	2	801	Processed	Longfin Smelt	6
2016	2	804	Processed	Longfin Smelt	4
2016	2	809	Processed		No Smelt Catch
2016	2	812	Processed	Longfin Smelt	2
2016	2	815	Processed	Longfin Smelt	2
2016	2	901	Processed		No Smelt Catch
2016	2	902	Processed		No Smelt Catch
2016	2	906	Processed	Longfin Smelt	1
2016	2	910	Processed		No Smelt Catch
2016	2	912	Processed		No Smelt Catch
2016	2	914	Processed		No Smelt Catch
2016	2	915	Processed	Longfin Smelt	2
2016	2	918	Processed		No Smelt Catch
2016	2	919	Processed		No Smelt Catch

SWP ITP Criteria Stations

Processing is complete through 1/21/16.

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



SWG Weekly Salvage Update
Reporting Period: January 18-24
Prepared by Bob Fujimura on January 24, 2016 8:12:00
Preliminary Results - Subject to Revision

Species/Life Stage	Daily Salvage						Trend
	18-Jan	19-Jan	20-Jan	21-Jan	22-Jan	23-Jan	
Adult Delta Smelt							
SWP	0	0	0	0	0	0	0
CVP	0	0	0	4	0	0	1
TOTAL	0	0	0	4	0	0	0.7 ↗
CUM TAKE	0	0	0	4	4	4	
% of 2016 CL	0%	0%	0%	10%	10%	10%	
Adult Longfin Smelt							
SWP	0	0	0	0	0	0	0
CVP	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0 →
SWP daily export	4,196	4,208	4,530	3,738	3,837	3,313	3,970 ↘
CVP daily export	3,787	3,793	4,837	4,975	4,993	4,999	4,531 ↘
SWP reduced counts	0%	11%	0%	0%	0%	0%	2% ↘
CVP reduced counts	0%	0%	0%	0%	0%	0%	0% ↘

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

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

Generated by Bob Fujimura on January 24, 2016

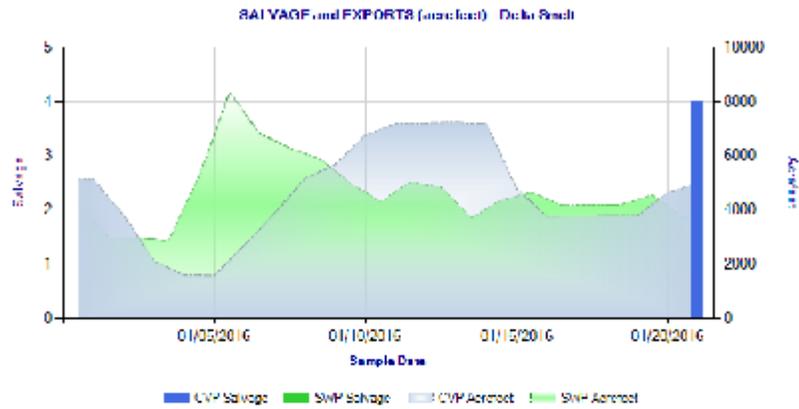


Figure 1. Daily salvage of Delta Smelt and water exports from the state and federal fish salvage facilities during January 1-21, 2016. Graph obtained from the DFG salvage monitoring web-page:

<http://www.dfg.ca.gov/delta/apps/salvage/SalvageExportCalendar.aspx>

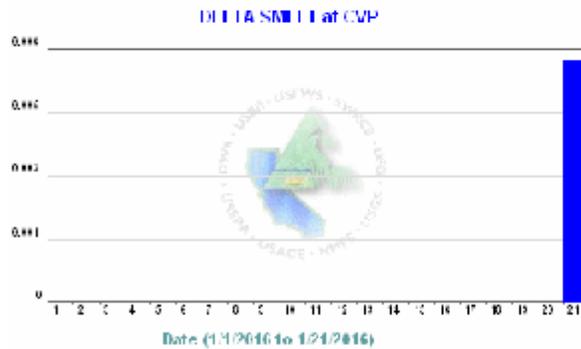


Figure 2. Daily salvage densities (fish per 10,000 m3) Delta Smelt from the federal fish salvage facilities during January 1-21, 2016. Graph obtained from the DFG salvage monitoring web-page:

<http://www.dfg.ca.gov/delta/apps/salvage/SalvageExportCalendar.aspx>