

SMELT WORKING GROUP
Thursday, February 7, 2013

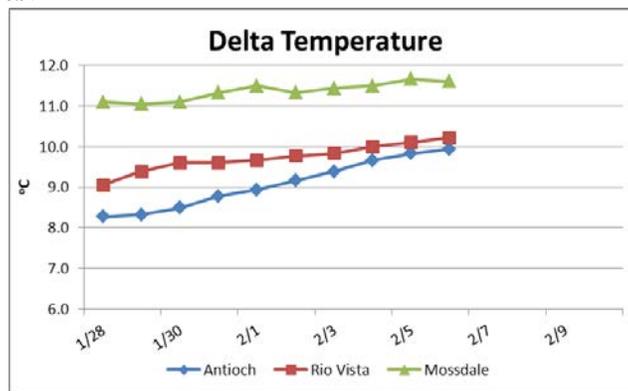
Meeting Summary:

The water projects concern level of salvage (228 adult delta smelt or 75% of the total Incidental Take Limit [ITL]) was reached on February 5, 2013, therefore, the Working Group was requested by the Service to hold an impromptu meeting. The Working Group upheld its February 4 recommendation of -1,250 cfs as the OMR target should the concern level be reached. The Working Group agreed that less negative OMR flows have a higher probability of reducing the risk of entrainment and thus delaying the occurrence or potential exceedence of the WY 2013 adult delta smelt ITL. The Working Group will continue to monitor salvage, turbidity, and other conditions, and will reconvene Monday, February 11.

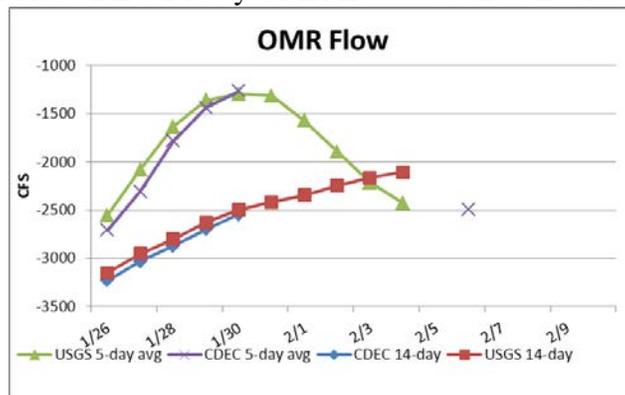
Reported Data:

1) Current environmental data:

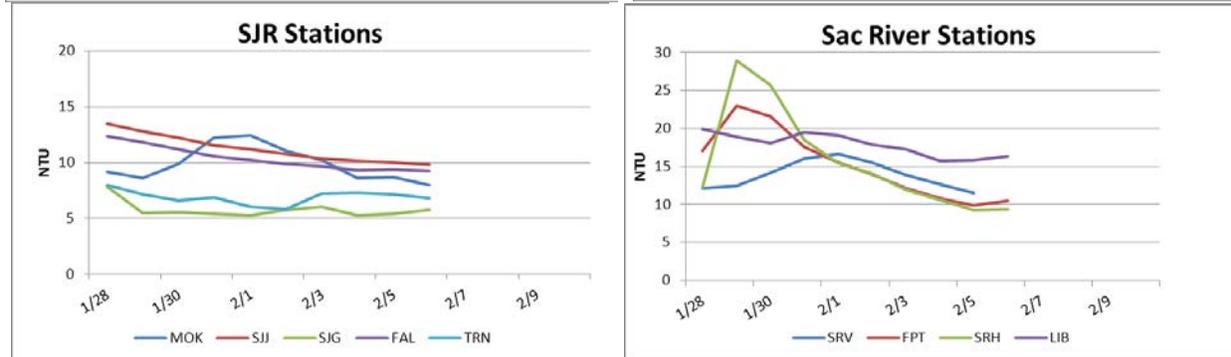
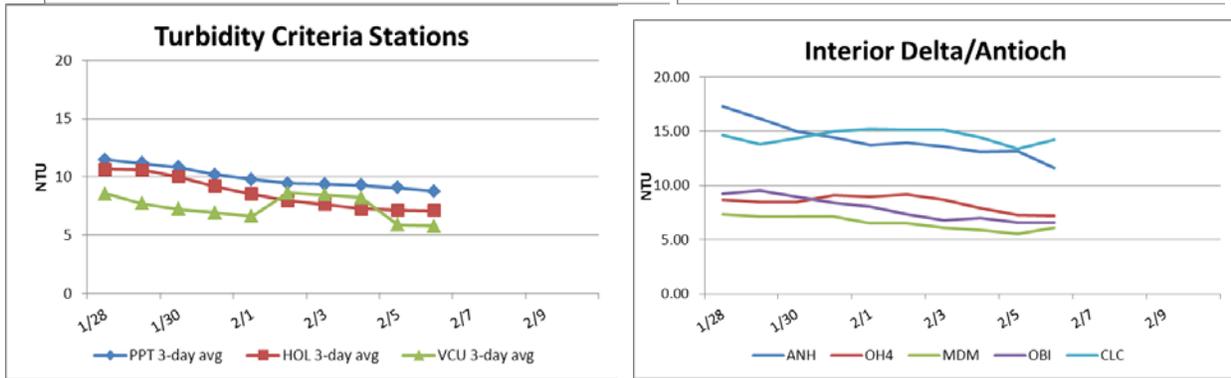
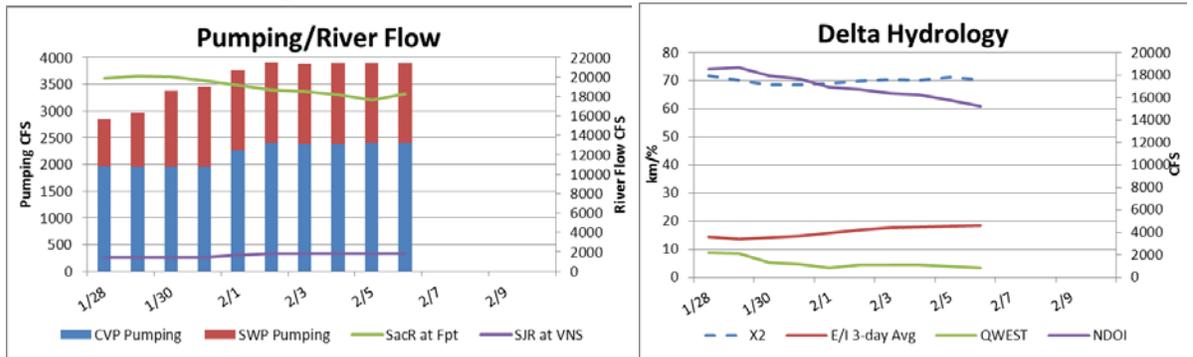
- **Water temperatures:**



- **OMR:** USGS tidally-averaged 5-day average OMR flow and 14-day average OMR flow on February 4 was -2,426 cfs and -2,106 cfs, respectively. CDEC 5-day OMR flow as of February 6 is -2,492 cfs. CDEC 14-day OMR flow was unavailable.



- Flow:** Sacramento River flows at Freeport are approximately 18,289 cfs and San Joaquin River is 1,871 cfs. X_2 calculation from CDEC is at 70.4km.



Delta Fish Monitoring:

Spring Kodiak Trawl #2 is in the field this week. All southern and central Delta stations have been processed, in addition to most other areas. 77 delta smelt (most stage 3) were detected at station 719 in the Sacramento DWSC, one at station 815, one at Chipps Island and 46 total from 3 stations in Montezuma Slough.

Smelt Larval Survey #3 completed a full survey (35 stations) on January 29, 2013 and all samples have been processed (see longfin smelt advice at the end of these notes). No delta smelt larvae or adults were detected. The survey did result in surpassing a distributional criterion for the State Water Project's longfin smelt ITP. A total of 2248 longfin smelt larvae were collected, 151 of which were collected at stations in the central and southern Delta. Smelt Larval Survey #4 is in the field next week, February 11-12.

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 305.

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. Results from CDFG surveys are available online at: <http://www.dfg.ca.gov/delta/>.

2) Salvage:

For the last three days, daily low levels of salvage occurred at the CVP facility. The total combined delta smelt salvage for the season is now 232 (100 at the SWP and 132 at the CVP) as of February 6, or approximately 76% of the total allowable take of 305. No longfin smelt were salvaged over this reporting period. The total combined longfin smelt salvage for the season is now 4.

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>

3) Expected Project Operations:

Combined CVP/SWP exports are expected to be approximately 3,900 cfs for the week of February 3, 2013, targeting an OMR of -2,500cfs.

4) Particle Tracking Modeling:

No PTM runs were requested for this week.

5) Turbidity Modeling:

No turbidity modeling was discussed today.

6) 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).

Discussion: The Working Group was given a list of discussion points by the Service for this impromptu meeting:

- Recommendation for immediate operations and justification
- Review of hydrodynamic and turbidity risk conditions for the remainder of the season
- Discussion of delta smelt distribution and importance of Spring Kodiak Trawl results
- Discussion of likely salvage trajectory under plausible distribution scenarios

The Working Group was further tasked with the goal of providing a recommendation to the Service which would provide appropriate protection for delta smelt within the limits of the Biological Opinion, including the ITL of 305 fish. The Working Group reviewed and discussed all relevant data from Delta monitoring, salvage, field surveys, and planned Project operations.

The Working Group discussed its recommendation from February 4 and found that the justification to go to the least negative OMR flow in the range provide for in the Biological Opinion once the concern level was reached was still an appropriate protective measure. The Working Group agreed that this measure was directly a result of the current trend in salvage and the likelihood of ITL exceedence by the end of February given the current salvage rate. An independent justification for this precautionary measure is the significant decline in effective population size of delta smelt observed between sampling years in the mid 2000's (Fisch and others 2011).

The Working Group acknowledged the decreasing trend in turbidity in the central and southern Delta, with the exception of the Forebay. Members were divided as to the possibility of additional adults from the lower San Joaquin River moving upstream into the southern Delta in the coming weeks. The Working Group also acknowledged the results from the most recent SKT indicating a large proportion of the catch in the Sacramento River system. However, the Working Group indicated that adult delta smelt are in the southern Delta, as evidenced by recent salvage, and salvage is expected to continue at low levels even with the more positive OMR target. The Working Group's recommendation for targeting less negative flows is made with the understanding that the magnitude of possible salvage reduction is uncertain, but that less negative flows are likely to reduce the daily salvage rate and thereby delay ITL exceedence. The adult salvage season typically extends into mid-March, occasionally later.

The group discussed the implications of reduced SWP exports (currently 1,500 cfs) on the salvage detection of delta smelt entrained into Clifton Court Forebay (CCF). An inverse relation has been reported between pre-screen loss and exports at the SWP in previous experiments for delta smelt (Castillo and others 2012) and Chinook salmon (Gingras 1997). Based on these studies, operational criteria to reduce residence time in CCF would result in increased salvage detection of entrained delta smelt.

In reviewing the additional Service-requested questions, the SWG provided the following guidance:

The SWG recommends that the full suite of available data be reviewed when assessing potential entrainment risk for the remainder of the adult entrainment period (i.e., through at least mid-March), including delta smelt distribution and salvage data, flows, turbidity, water temperature, and projected operations. A review of data from WY 2013 thus far has demonstrated that assessing entrainment risk using only delta smelt distribution data, or only Delta turbidity data, for example, could have resulted in an assessment of low risk for delta smelt entrainment. However, the adult delta smelt salvage data, which are the ultimate indicator of entrainment of fish into the south Delta, have illustrated that delta smelt are present in the south Delta, and are vulnerable to entrainment, despite what may have been considered otherwise favorable conditions.

Some members of the SWG provided a summary review of historic salvage and distribution data, which indicated that delta smelt movement into the Delta is associated both with turbidity early in the season (for example, during the first flush), and also apparently irrespective of turbidity when spawning conditions are suitable (for example, temperature) in late February or March. The interior-Delta spawning movement of these pre-spawn delta smelt puts the fish in the central and south Delta, potentially proximal to the pumps, resulting in an increased probability of entrainment, regardless of pumping rate. Some participants countered that delta smelt may not move into areas that are not turbid during an interior-Delta spawning movement.

The Working Group will meet again on February 11.

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

Advice for week of February 4, 2013:

The Smelt Working Group believes that an OMR of -5000 is protective of longfin smelt at this time. The current OMR advice for delta smelt (-2500 cfs, dropping to -1250) will be very protective for longfin smelt.

Summary of Risk:

Risk of additional entrainment into the south Delta remains very low. Salvage and survey data for adult longfin smelt suggests limited spawning in the central and south Delta. SLS #3 distribution numbers surpassed the criterion 3 threshold, yet densities were low at all but 2 criteria stations and current densities do not by themselves warrant protections beyond -5000 OMR. Qwest conditions since survey 3 have been positive and OMR only weakly negative (generally less negative than the target -2500), leading to little south Delta entrainment. Currently X2 is located at about Chipps Island, which suggests that a few adult longfin smelt will move into the central and south Delta to spawn. Barker Slough criteria are only in effect during “Dry” and “Critical” water years; this year is currently forecast as Wet for the Sacramento River.

Basis for advice:

The 2009 State Water Project 2081 for longfin smelt states that advice to the DFG 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 20mm Survey finds longfin smelt larvae present at 8 of 12 central and south Delta sampling stations in 1 survey (809, 812, 815, 901, 902, 906, 910, 912, 914, 915, 918, 919; see Figure 1).
4. Larva catch per tow exceeds 15 longfin smelt larvae or juveniles in 4 or more of the 12 survey stations listed.
5. For Barker Slough Exports only: Between January 15 and March 15 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. On January 20 and 21, 2013, longfin smelt salvage occurred at the SWP for a total salvage of 4. These are the first and only instances 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. 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). Distribution information does not indicate advice is warranted based on this criterion.

3 & 4. The third Smelt Larva Survey (SLS) 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** (cf., Table 1 and Basis for Advice #s 3 & 4 above). Given the potential to entrain some larvae from Franks Tract into the south Delta and the likelihood of peak hatching occurring in early February, an OMR less negative than -5000 would be more protective, but a more positive OMR is not yet warranted based on current central and south Delta longfin smelt larval densities.

5. Barker Slough Exports: current water type for the Sacramento River is Wet (<http://www.water.ca.gov/swp/operationscontrol/docs/delta/DeltaWQ.pdf>), therefore even though longfin smelt larvae are present at station 716, no advice is provided. Current exports are low (14-20 cfs) and don't pose a risk to larvae in Barker Slough (<http://www.water.ca.gov/swp/operationscontrol/docs/delta/DeltaHydrology.pdf>).

Current conditions: Net Delta outflow declined steadily through January. As of January 31 net Delta outflow was 17,690. X2 remained below 60 km from December 26 through January 3, but has been increasing slightly and as of February 3 was about 71. Combined State and federal exports are currently about 3900 cfs. Qwest has been slightly positive since January 24 and as of January 31 was about +1170 and declining.

To delay or reduce the likelihood of exceeding the delta smelt adult salvage limit, the Smelt Working Group today recommended maintaining the OMR target at -2500 until the total delta smelt salvage reached 75% of the annual limit, or 228 out of 305, at which time the OMR target is recommended to become -1250. These targets should provide substantial additional protection for longfin smelt larvae.

Table 1. Longfin smelt catch per station from 2013 Smelt Larva Survey, Survey 3.

Study Year	Survey #	SLS Station	Sample Status	Species	Smelt Catch
2013	3	405	Processed	Longfin Smelt	114
2013	3	411	Processed	Longfin Smelt	180
2013	3	418	Processed	Longfin Smelt	92
2013	3	501	Processed	Longfin Smelt	270
2013	3	504	Processed	Longfin Smelt	335
2013	3	508	Processed	Longfin Smelt	174
2013	3	513	Processed	Longfin Smelt	67
2013	3	519	Processed	Longfin Smelt	86
2013	3	520	Processed	Longfin Smelt	62
2013	3	602	Processed	Longfin Smelt	56
2013	3	606	Processed	Longfin Smelt	21
2013	3	609	Processed	Longfin Smelt	4
2013	3	610	Processed	Longfin Smelt	4
2013	3	703	Processed	Longfin Smelt	76
2013	3	704	Processed	Longfin Smelt	109
2013	3	705	Processed	Longfin Smelt	25
2013	3	706	Processed	Longfin Smelt	33
2013	3	707	Processed	Longfin Smelt	170
2013	3	711	Processed	Longfin Smelt	22
2013	3	716	Processed	Longfin Smelt	38
2013	3	723	Processed	Longfin Smelt	98
2013	3	801	Processed	Longfin Smelt	34
2013	3	804	Processed	Longfin Smelt	27
2013	3	809	Processed	Longfin Smelt	69
2013	3	812	Processed	Longfin Smelt	9
2013	3	815	Processed	Longfin Smelt	7
2013	3	901	Processed	Longfin Smelt	51
2013	3	902	Processed	Longfin Smelt	1
2013	3	906	Processed	Longfin Smelt	2
2013	3	910	Processed		No Smelt Catch
2013	3	912	Processed		No Smelt Catch
2013	3	914	Processed	Longfin Smelt	1
2013	3	915	Processed	Longfin Smelt	2
2013	3	918	Processed		No Smelt Catch
2013	3	919	Processed	Longfin Smelt	9

SWP ITP Criteria Stations

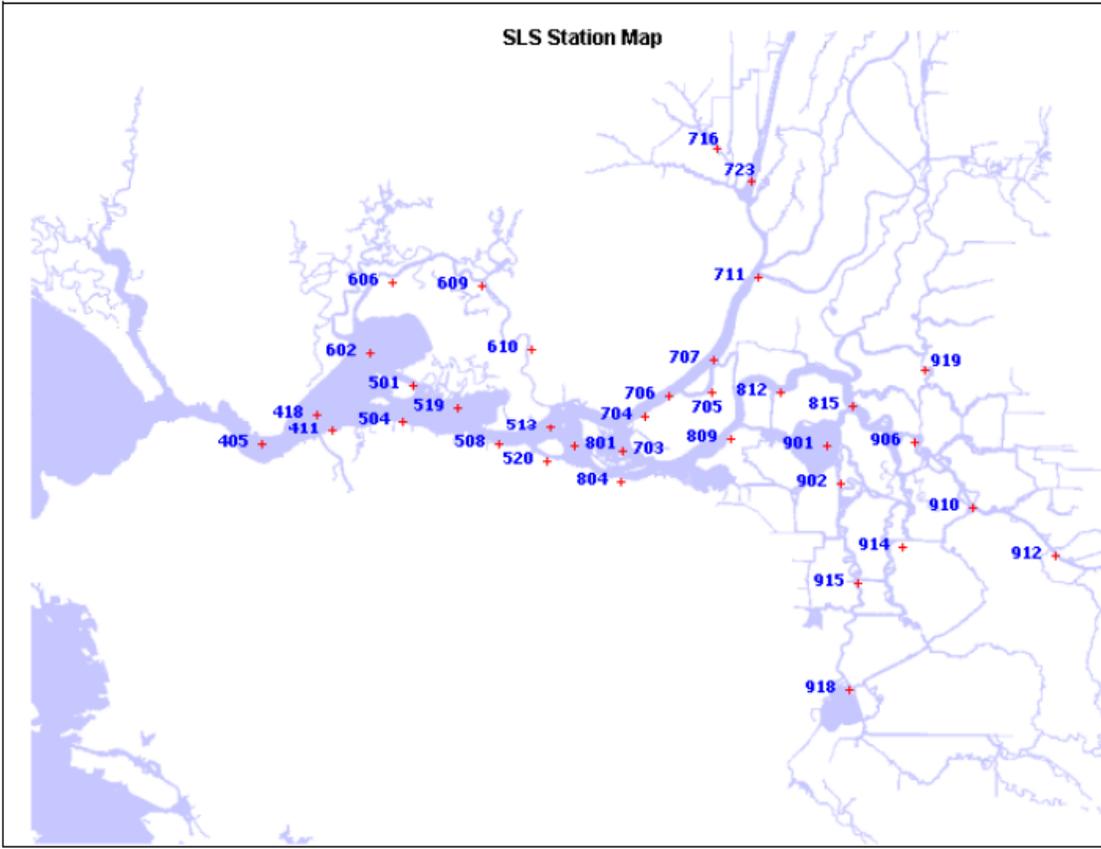


Figure 1. DFG's Smelt Larva Survey station locations.