SMELT WORKING GROUP
Tuesday, February 19, 2013

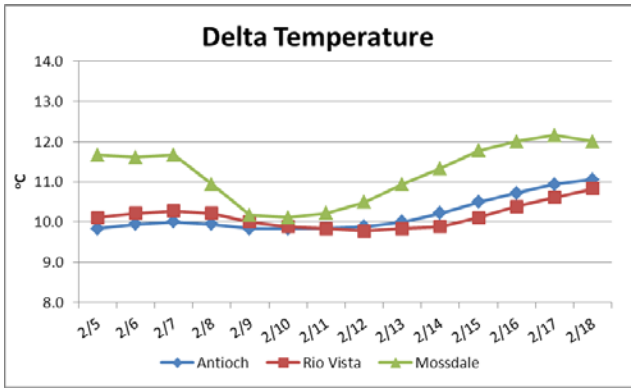
Meeting Summary:

The Working Group recommended that its February 15 recommendation of -2,500 cfs as the OMR target be maintained for today and tomorrow. Should salvage of adult delta smelt not exceed a total of four fish during this period, the OMR flow rate can be increased to -3,500 cfs. The water projects concern level of salvage (228 adult delta smelt or 75% of the total Incidental Take Limit [ITL]) was reached on February 6, 2013. The Working Group will continue to monitor salvage, turbidity, and other conditions, and will reconvene Monday, February 25.

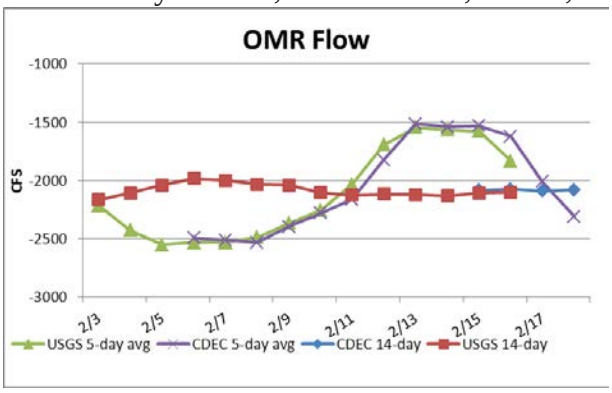
Reported Data:

1) Current environmental data:

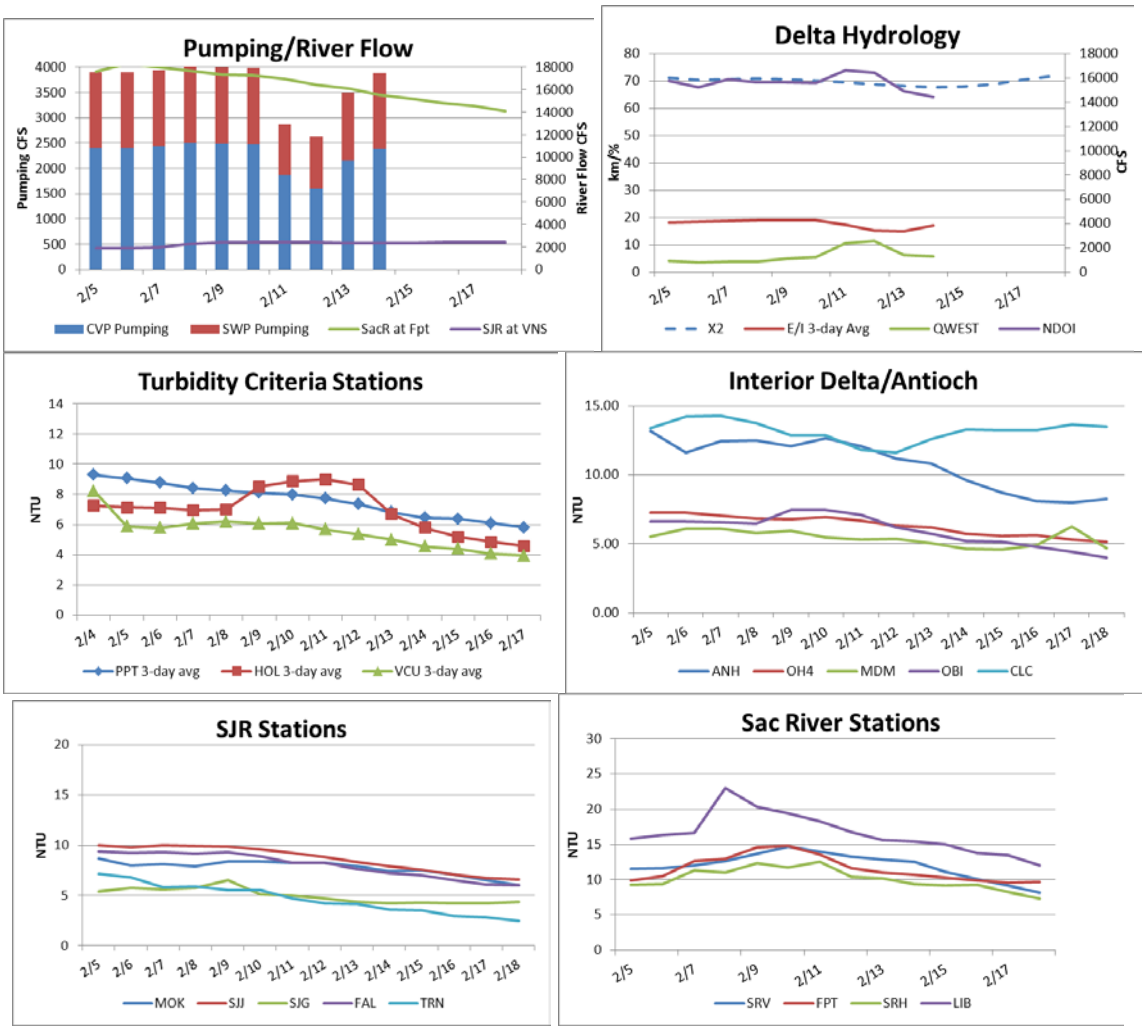
- **Water temperatures**:



- **OMR:** USGS tidally-averaged 5-day average OMR flow and 14-day average OMR flow on February 16 was -1,829 cfs and -2,100 cfs, respectively. CDEC 5-day OMR flow 14-day average OMR flow as of February 18 is -2,309 cfs and -2,081 cfs, respectively.



- **Flow:** Sacramento River flows at Freeport are approximately 14,099 cfs and San Joaquin River is 2,410 cfs. X_2 calculation from CDEC is at 71.8km.



Delta Fish Monitoring:

Spring Kodiak Trawl #2 was in the field the week of February 4. A total of 126 delta smelt (most stage 3) were detected, a majority from station 719 in the Sacramento DWSC. Delta smelt were also detected at station 815, Chipps Island, and Montezuma Slough. Of the 58 females collected, 51 were stage 3 (prespawn) and 7 were stage 2. Of the 65 males collected, 4 were ripe, with the remainder prespawn. SKT #3 is the in the field the week of March 4. SKT #3 is in the field the week of March 4

Smelt Larval Survey #4 was in the field last week. A total of 4,674 larval longfin smelt have been counted thus far, ranging in size from 5 to 11mm. No delta smelt larvae or adults have yet been detected. The survey did result in surpassing a distributional criterion for the State Water Project's longfin smelt ITP. Four hundred sixty-seven longfin smelt larvae were collected at criteria stations in the central and southern Delta. SLS #5 is in the field the week of February 25.

The first 20mm survey of WY 2013 will commence March 11th.

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 CDFW surveys are available online at: http://www.dfg.ca.gov/delta/.

2) Salvage:

For the last twelve days, no salvage has occurred at either Delta facility. The total combined delta smelt salvage for the season is now 228 (100 at the SWP and 128 at the CVP) as of February 18, or approximately 75% of the total allowable take of 305. No longfin smelt have been salvaged since January 21st. The total combined longfin smelt salvage for the season is 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 19, 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 reviewed and discussed all relevant data from Delta monitoring, salvage, field surveys, and planned Project operations.

The Working Group discussed its recommendation from February 15 and found that the justification to go to a more negative OMR flow in the range provide for in the Biological Opinion should the Projects salvage no more than four fish at either facility today and tomorrow (a total of four fish for this 48 hour period) was an appropriate protective measure. The Working Group agreed that this recommendation was directly a result of zero observed salvage for the previous twelve days.

The Working Group members remain concerned that the Concern Level was reached on February 6th, early in the adult season, and that the salvage of only 77 additional adult delta smelt will cause the ITL to be reached. Based on a review of historic salvage data, the Working Group expects adult salvage to continue through March. With approximately 40 days remaining until the end of the adult salvage season, members estimate the Projects could salvage 14 adult delta smelt each week and not exceed the limit. Although this is a low salvage rate, it is a higher rate than has been observed in the previous twelve days. The SWG stated these twelve days is indicative of a reduced trend in salvage, however, OMR flow rates have varied within this period. OMR flows have approached or surpassed the Service's Determination level since February 16, and were previously more positive. Based partly on Ken Newman's analysis presented at the February 15 SWG meeting (see attachment to 2-15-2013 notes), members noted that at least four or five days of monitored salvage after a change in OMR flow rate is necessary to increase confidence in the trend of salvage. Therefore, the Working Group recommends that salvage and OMR flow rate be closely monitored today and tomorrow, which would provide a total of five days with OMR flow adequately close to -2,500 cfs. Should no more than four adult delta smelt be salvaged over this period of 48 hours, the OMR flow rate can be increased to -3,500 cfs.

Members cautioned that a conservative approach was necessary in allowing OMR flows to become more negative. Should an increasing trend in salvage appear, the Working Group will reassess the risk of entrainment and determine an appropriately protective OMR flow rate. Members indicated an increased trend would be three consecutive days of salvage or more than 14 fish salvaged in any given period of seven consecutive days. 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, et al 2011)*.

The Working Group will meet again on February 25.

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

Advice for week of February 19, 2013:
The Smelt Working Group believes that an OMR of -4,000 is protective of longfin smelt at this time. The recent and near-term OMR advice for delta smelt of -2,500 cfs and near future advice of -3,500 cfs will be protective for longfin smelt**.**

Summary of Risk:
Risk of additional entrainment into the south Delta is low given the OMR advice for -2,500 cfs and SLS #4 results showed some double digit catches in the central Delta and a triple digit catch at 809. SLS #3 distribution numbers surpassed the distribution criterion threshold and in SLS #4, 4 stations had double digit catches (or more) approaching the density criterion (i.e., catches > 15 at 4 or more stations). To limit south Delta entrainment of larvae from 809 and other San Joaquin River stations, OMR of no more negative than -4,000 cfs is advised. Qwest conditions since survey 4 have been positive and OMR only weakly negative (generally less negative than the target -2,500), leading to little likelihood of 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 Below Normal for the Sacramento River. Smelt Larva Survey 5 is in the field next week.

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 (>=80mm) 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. 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). In February, no longfin smelt were collected at central Delta sampling stations. 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). During the 4th SLS survey the distribution criterion was again achieved, but the density criterion, 10 or more larvae were detected at 4 locations, but the density criterion of ≥ 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 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 was deemed warranted at this time. .

5. Barker Slough Exports: current water type for the Sacramento River is Below Normal (http://cdec.water.ca.gov/cgi-progs/reports/EXECSUM), 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 mid-January, then fluctuated between 13,000 and 18,000 cfs through February 11, before dropping more recently to 12,800 as of February 18. X2 has been in the vicinity of 72 since early February and remained at 72 as of February 19. Combined State and federal exports are currently about 3,900 cfs. Qwest has been slightly positive since January 24 and as of February 18 was about +1,000.

Current OMR advice for delta smelt: On February 19, after 3 days of targeting -2,500 and no delta smelt salvage, the SWG determined that if not more than a single additional delta smelt was detected in salvage (i.e., salvage of about 4) in the next 2 days (i.e., ending Wednesday mid-night), then OMR can target -3,500 cfs. Once implemented, the -3,500 cfs OMR will be maintained. The SWG determined that a daily salvage of 12 or 3 consecutive days of salvage would necessitate a working group meeting, if such occurred outside of the weekly Monday AM meeting schedule. This target OMR was deemed protective of longfin smelt larvae at this time.

Table 1. Longfin smelt catch per station from 2013 Smelt Larva Survey, Survey 4.

Study Year	Survey #	SLS Station	Sample Status	Species	Smelt Catch	
2013		405	Not yet processed			
2013		411	Not yet processed			
2013		418	Not yet processed			
2013		501	Not yet processed			
2013		504	Not yet processed			
2013		508	Not yet processed			
2013		513	Not yet processed			
2013		519	Not yet processed			
2013		520	Not yet processed			
2013	4	602	Processed	Longfin Smelt	286	
2013	4	606	Processed	Longfin Smelt	152	
2013	4	609	Processed	Longfin Smelt	28	
2013	4	610	Processed	Longfin Smelt	81	
2013	4	703	Processed	Longfin Smelt	46	
2013	4	704	Processed	Longfin Smelt	1678	
2013	4	705	Processed	Longfin Smelt	122	
2013	4	706	Processed	Longfin Smelt	490	
2013	4	707	Processed	Longfin Smelt	483	
2013	4	711	Processed	Longfin Smelt	38	
2013	4	716	Processed	Longfin Smelt	428	
2013	4	723	Processed	Longfin Smelt	105	
2013	4	801	Processed	Longfin Smelt	226	
2013	4	804	Processed	Longfin Smelt	44	
2013	4	809	Processed	Longfin Smelt	368	SWP ITP Criteria Stations
2013	4	812	Processed	Longfin Smelt	3	
2013	4	815	Processed	Longfin Smelt	8	
2013	4	901	Processed	Longfin Smelt	40	
2013	4	902	Processed	Longfin Smelt	13	
2013	4	906	Processed	Longfin Smelt	11	
2013	4	910	Processed	Longfin Smelt	1	
2013	4	912	Processed		No Smelt Catch	
2013	4	914	Processed	Longfin Smelt	2	
2013	4	915	Processed	Longfin Smelt	9	
2013	4	918	Processed	Longfin Smelt	7	
2013	4	919	Processed	Longfin Smelt	5	

Processing is complete through 2/19/13.

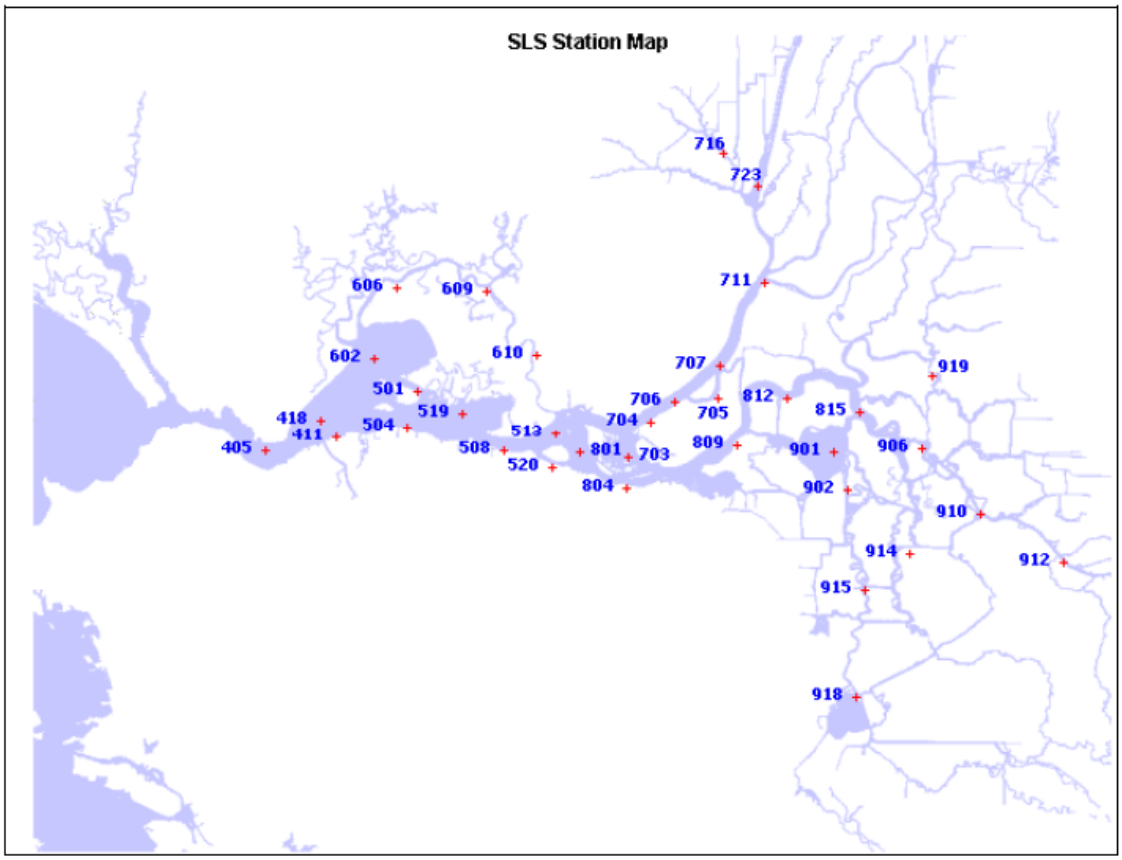


Figure 1. DFG's Smelt Larva Survey station locations.

*Kathleen M. Fisch, Jordana M. Henderson, Ronald S. Burton, Bernie May. 2011. Population genetics and conservation implications for the endangered delta smelt in the San Francisco Bay-Delta. Conservation Genetics 12:1421–1434