

SMELT WORKING GROUP
Monday, February 11, 2013

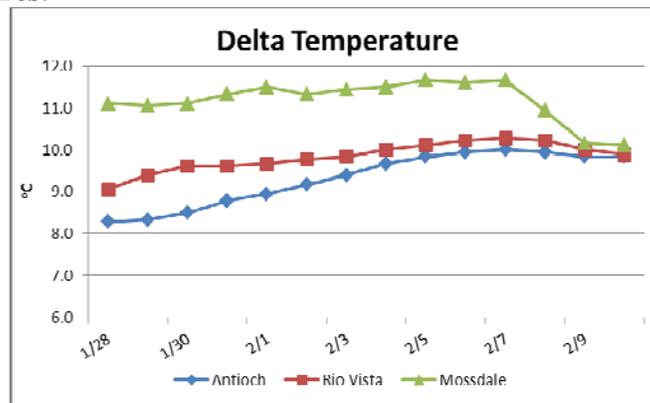
Meeting Summary:

The Working Group upheld its February 7 recommendation of -1,250 cfs as the OMR target given that the concern level has been reached. 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 agreed that less negative OMR flows reduce the risk of entrainment and thus the likelihood that the WY 2013 adult delta smelt ITL will be reached or exceeded. The Working Group will continue to monitor salvage, turbidity, and other conditions, and will reconvene Tuesday, February 19.

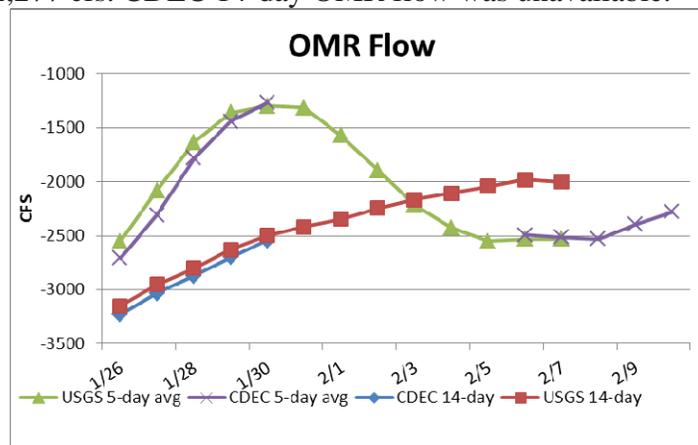
Reported Data:

1) Current environmental data:

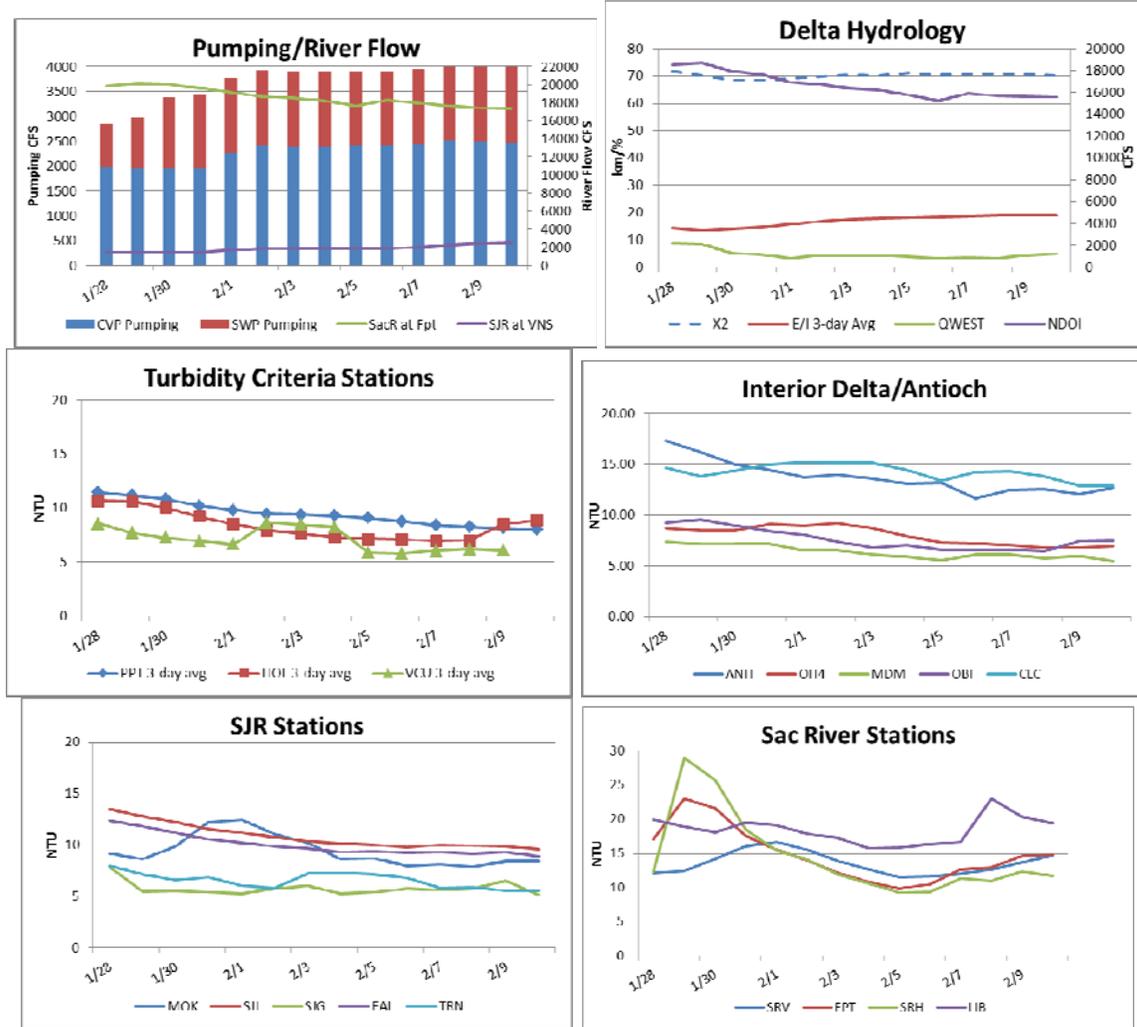
- **Water temperatures:**



- **OMR:** USGS tidally-averaged 5-day average OMR flow and 14-day average OMR flow on February 7 was -2,530 cfs and -2,000 cfs, respectively. CDEC 5-day OMR flow as of February 10 is -2,277 cfs. CDEC 14-day OMR flow was unavailable.



- **Flow:** Sacramento River flows at Freeport are approximately 17,286 cfs and San Joaquin River is 2,436 cfs. X₂ calculation from CDEC is at 70km.



Delta Fish Monitoring:

Spring Kodiak Trawl #2 was in the field last week. All 40 stations have been processed. 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 (prespaw) and 7 were stage 2. Of the 65 males collected, 4 were ripe, with the remainder prespaw. SKT #3 is the in the field the week of March 4.

Smelt Larval Survey #4 is in the field this week.

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 four 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 10, or approximately 75% 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 2,600 cfs for the week of February 11, 2013, targeting an OMR of -1,250cfs.

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).

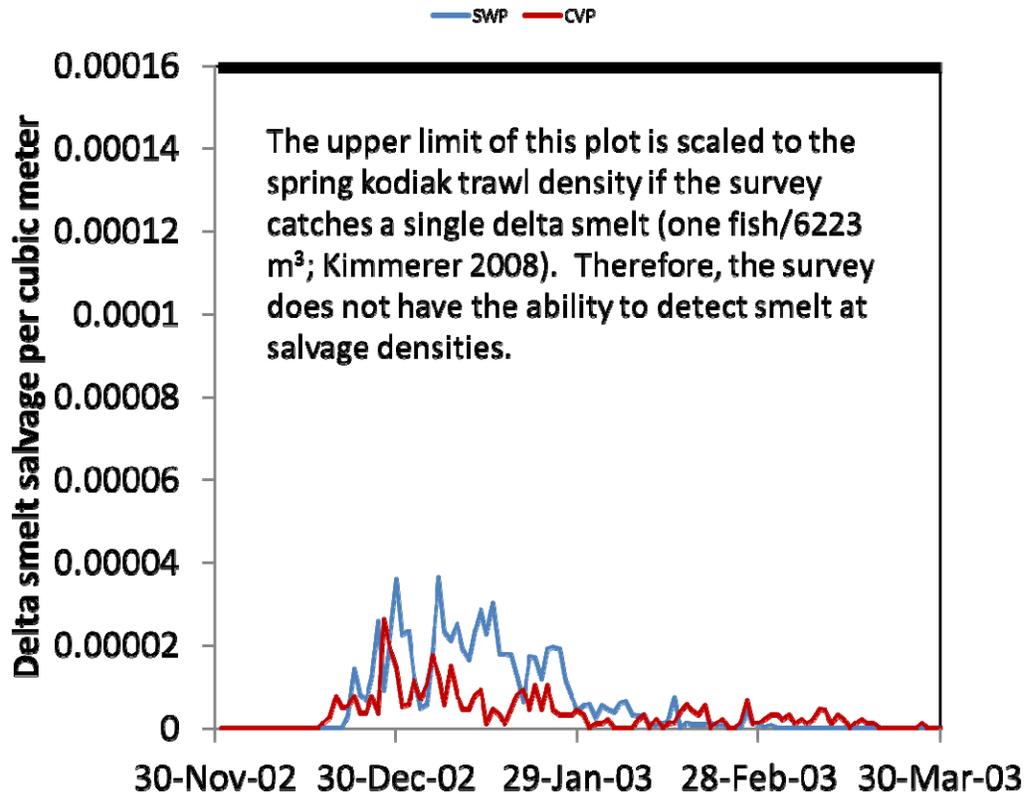
Discussion: The Working Group reviewed and discussed all relevant data from Delta monitoring, salvage, field surveys, and planned Project operations.

The Working Group discussed its recommendation from February 4 and February 7 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 recommendation was directly a result of observed salvage rates during the last few weeks and the risk of ITL exceedence by the end of February given these rates. 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 members are greatly concerned at reaching the Concern Level this early in the spawning season and that the salvage of 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. A steady rate of salvage through the end of March that would not exceed the ITL requires an average of less than 11 delta smelt per week, or 1.6 fish per day. These are much lower salvage rates than have generally been observed in recent weeks. Assuming the regular expansion factor used for estimation of salvage by the project facilities, this translates to one fish being observed in salvage counts at either facility approximately once every three days. The SWG recognized that there have been 4 consecutive days of no salvage. The SWG stated that this was not yet indicative of a reduced trend, stating that salvage data so far this WY have had several periods of consecutive days of 0-salvage. The Working Group will watch salvage closely over the next week and reevaluate salvage data during our delta smelt entrainment risk assessment on Tuesday, February 19.

Members noted the potential for additional adults from the lower San Joaquin River moving upstream into the southern Delta in the coming weeks, given that it is early in the adult entrainment period as indicated by the lack of ripe females in survey and salvage data . The Working Group acknowledged the results from the most recent SKT indicating a large proportion of the catch in the Sacramento River system. However, the Working Group concluded that adult delta smelt are in the southern Delta and vulnerable to continued entrainment, as evidenced by recent salvage, and also that salvage is expected to continue at low levels even with the less negative 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 or avoid ITL exceedence. Again, the adult salvage season typically extends into mid-March, and occasionally later.

The Working Group also considered the difference in sampling efficiency and density between the salvage facilities and the SKT, an issue raised by the DCT. The Working Group referred to the following figure during the discussion:



The above figure illustrates that as soon as the Kodiak trawl catches a single fish, it has a density much higher than even 2003 salvage densities (which were high). This indicates that the SKT has a limited ability to detect delta smelt at densities comparable to what is recorded in salvage.

The Working Group underscored the low efficiency levels and high degree of effort associated with the salvage estimation as compared to the higher efficiency level and lower degree of effort by the SKT. The salvage estimation process samples a much greater volume of water than the SKT net; therefore, comparing the two as detection methods for presence of delta smelt in the south Delta is very challenging. This is particularly the case for rare species, such as the delta smelt, because it limits the ability to deduce what non-detection in the SKT and salvage facilities mean. The Working Group can utilize the SKT to discern general distribution patterns and pulses in distribution into the central and southern Delta. However, because delta smelt population abundance is near record lows, the ability to detect those adults that are already present in the southern and central Delta is difficult. Given the relatively low level of sampling effort, the absence of catch in the south and central Delta is not meaningful evidence of species absence in the region, particularly since salvage of delta smelt is occurring.

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 general 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.

The Working Group will meet again on February 19.

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

Advice for week of February 11, 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 (-1250 cfs) will be very protective for longfin smelt.

Summary of Risk:

Risk of additional entrainment into the south Delta remains very low given the OMR advice for -1250 cfs. 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 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 4 is in the field today and tomorrow.

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 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 has fluctuated between 13,000 and 18,000 cfs. As of February 10 net Delta outflow was 15,600. X2 remained below 60 km from December 26 through January 3, but has been increasing slightly and as of February 10 was about 72. Combined State and federal exports dropped and are currently about 2,600 cfs. Qwest has been slightly positive since January 24 and as of February 10 was about +1,261 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. The 228 salvage concern level was reached February 6 and OMR scheduled for a -1250 target by February 11. These OMR levels 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

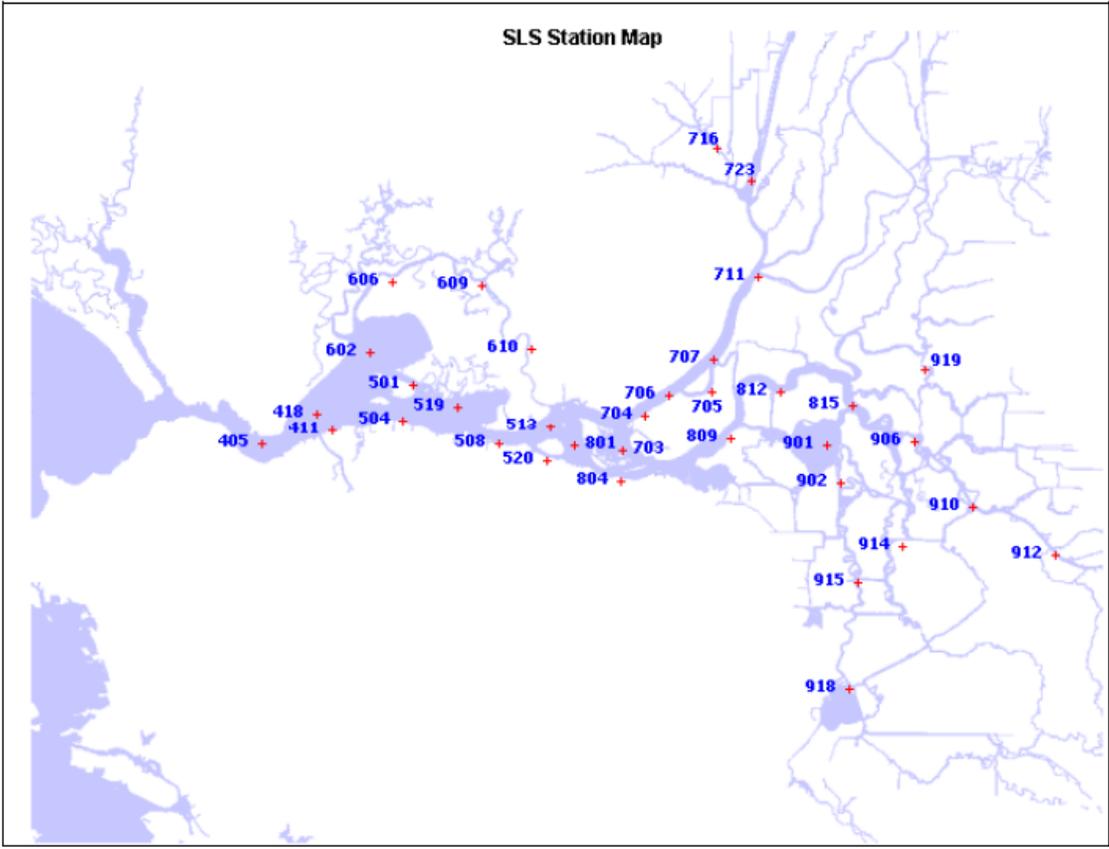


Figure 1. DFG's Smelt Larva Survey station locations.