

# SMELT WORKING GROUP

## Monday, April 9, 2012

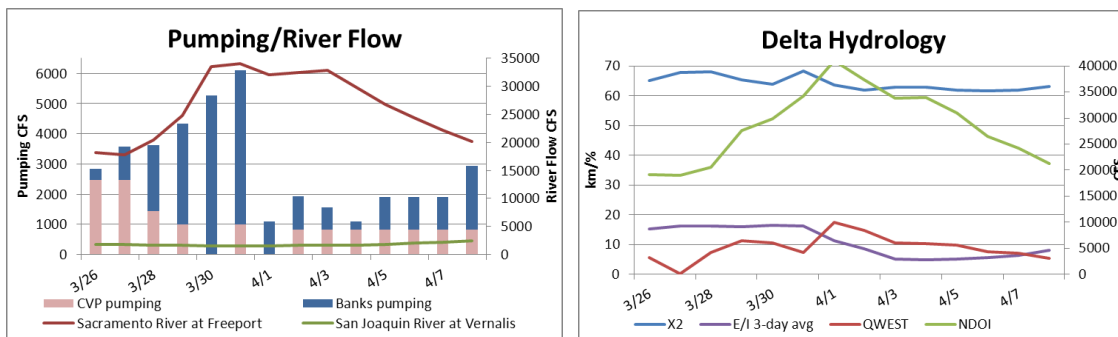
### Meeting Summary:

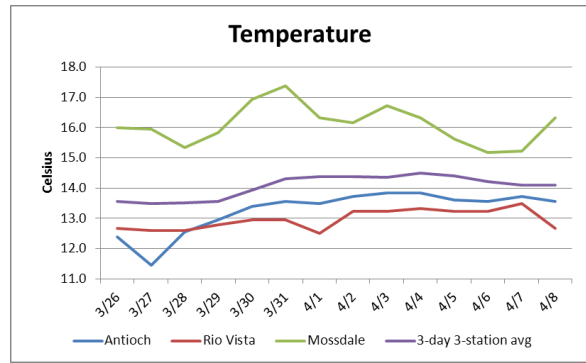
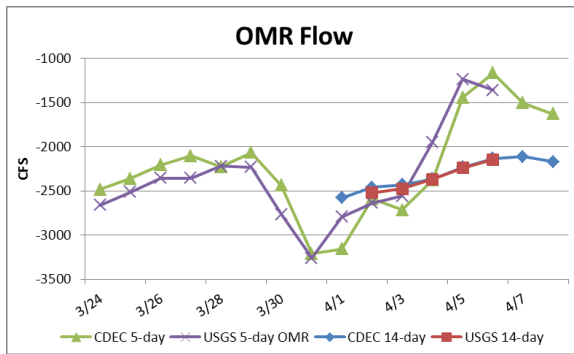
The Working Group agreed that given their present distribution, current salvage, and Delta conditions, risk of entrainment of delta smelt remains low and therefore, the Working Group recommends that no change in operations is necessary to adequately protect delta smelt from entrainment. The Working Group also agreed that given their present distribution, existing constraining conditions was sufficient to protect longfin smelt. The Working Group will continue to monitor smelt salvage, adult and larval smelt survey data, and delta hydrological conditions and will reconvene April 16, 2012, at 10 am.

### Reported Data:

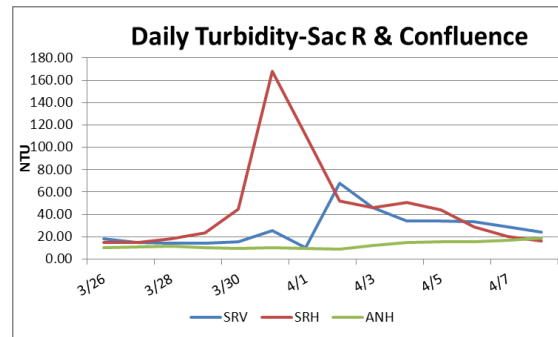
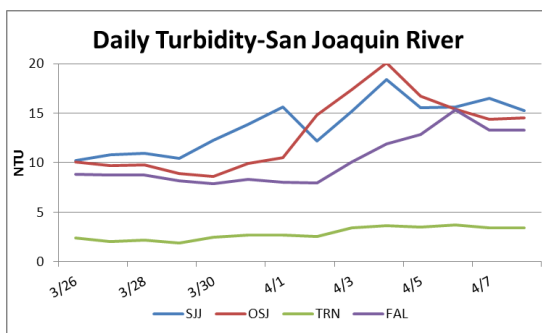
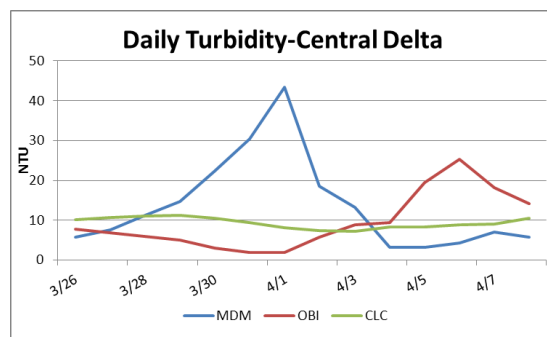
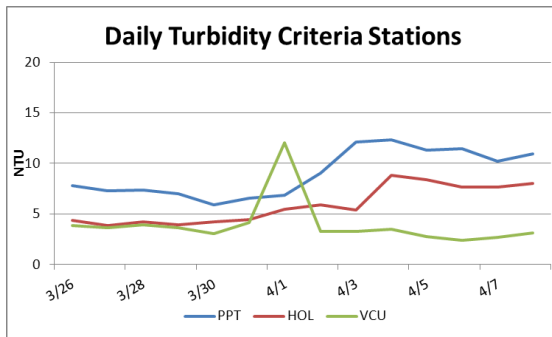
#### 1) Current environmental data:

- **Water temperature** for the 3 station average is 14.1°C.
- **OMR:** USGS tidally-averaged OMR 5-day and 14-day averages as of April 6 are -1,363 cfs and -2,145 cfs, respectively. CDEC 5-day average and 14-day averages as of April 8 are -1,628 cfs and -2,171 cfs, respectively.
- **Flow:** Sacramento River inflow is 20,114 cfs and San Joaquin River is 2,449 cfs.  $X_2$  calculation from CDEC is 63.24 km. The graphs below show the most recent trends in Delta hydrology and water quality that were evaluated by the Working Group.





● **Turbidity:**



**2) Delta Fish Monitoring:**

Spring Kodiak Trawl # 4 was in the field last week. A total of 181 adult delta smelt were collected. Most of the delta smelt adults were in prespawn condition, however some showed evidence of a previous spawn. Detections were widespread, with the majority around the confluence and Montezuma Slough areas. 20-mm Survey #2 was in the field the week of March 26. All tows have been processed. 24 larval delta smelt have been collected (5-14 mm). Seven adults were also collected. 20-mm Survey #3 is in the field this week. Smelt Larval Survey #6 was in the field March 19 and 20. A total of 239 larval delta smelt were collected. A total of 1,162 longfin smelt were collected. See “WEEKLY ADVICE FOR THE DEPARTMENT OF FISH AND GAME FOR LONGFIN SMELT” for additional details. The annual FMWT Delta Smelt Index for 2011 is 343 (sum of all four months). The 2011 Delta Smelt Recovery Index (based on September and October) is 55. More information on the Recovery Index can be found on the Bay-Delta Office’s web site at <http://www.fws.gov/sfbaydelta/> under “hot topics.” Results from CDFG surveys are available online at: <http://www.dfg.ca.gov/delta/>.

### 3) Salvage:

The cumulative total for adult delta smelt for WY 2012 is 199. The table below details daily estimated adult delta smelt and juvenile longfin smelt salvage for the season:

Table 1: Estimated daily adult delta smelt and juvenile longfin smelt salvage ( $\geq 20$  mm) for WY2012

| <b>Delta Smelt (adults)</b> |            |            |              | <b>Longfin Smelt (YOY<math>\geq 20</math> mm)</b> |            |            |              |
|-----------------------------|------------|------------|--------------|---|------------|------------|--------------|
| <b>Date</b>                 | <b>CVP</b> | <b>SWP</b> | <b>Total</b> | <b>Date</b>                                       | <b>CVP</b> | <b>SWP</b> | <b>Total</b> |
| <b>1/18</b>                 | 4          | 0          | 4            | <b>2/29</b>                                       | 8          | 0          | 8            |
| <b>1/24</b>                 | 4          | 0          | 4            | <b>3/3</b>  | 4          | 0          | 4            |
| <b>1/25</b>                 | 4          | 0          | 4            | <b>3/5</b>  | 4          | 4          | 8            |
| <b>1/26</b>                 | 5          | 0          | 5            | <b>3/6</b>  | 32         | 0          | 32           |
| <b>1/27</b>                 | 2          | 0          | 2            | <b>3/7</b>  | 0          | 8          | 8            |
| <b>1/28</b>                 | 4          | 0          | 4            | <b>3/9</b>  | 8          | 0          | 8            |
| <b>1/30</b>                 | 12         | 0          | 12           | <b>3/11</b>                                       | 0          | 48         | 48           |
| <b>1/31</b>                 | 1          | 0          | 1            | <b>3/12</b>                                       | 0          | 8          | 8            |
| <b>2/1</b>                  | 3          | 0          | 3            | <b>3/13</b>                                       | 8          | 16         | 24           |
| <b>2/3</b>                  | 4          | 0          | 4            | <b>3/14</b>                                       | 4          | 8          | 12           |
| <b>2/10</b>                 | 4          | 0          | 4            | <b>3/15</b>                                       | 0          | 28         | 28           |
| <b>2/13</b>                 | 4          | 0          | 4            | <b>3/16</b>                                       | 4          | 24         | 28           |
| <b>2/14</b>                 | 4          | 0          | 4            | <b>3/17</b>                                       | 0          | 34         | 34           |
| <b>2/15</b>                 | 1          | 0          | 1            | <b>3/18</b>                                       | 4          | 16         | 20           |
| <b>2/17</b>                 | 2          | 0          | 2            | <b>3/19</b>                                       | 0          | 14         | 14           |
| <b>2/18</b>                 | 4          | 0          | 4            | <b>3/20</b>                                       | 4          | 22         | 26           |
| <b>2/20</b>                 | 4          | 0          | 4            | <b>3/21</b>                                       | 4          | 172        | 176          |
| <b>2/21</b>                 | 4          | 0          | 4            | <b>3/22</b>                                       | 42         | 152        | 194          |
| <b>2/22</b>                 | 8          | 0          | 8            | <b>3/23</b>                                       | 3          | 126        | 130          |
| <b>2/23</b>                 | 0          | 4          | 4            | <b>3/24</b>                                       | 16         | 144        | 156          |
| <b>2/24</b>                 | 0          | 12         | 12           | <b>3/25</b>                                       | 4          | 82         | 86           |
| <b>2/25</b>                 | 0          | 4          | 4            | <b>3/26</b>                                       | 6          | 72         | 76           |
| <b>2/27</b>                 | 4          | 18         | 22           | <b>3/27</b>                                       | 21         | 62         | 88           |
| <b>2/28</b>                 | 4          | 4          | 8            | <b>3/28</b>                                       | 8          | 222        | 230          |
| <b>2/29</b>                 | 0          | 10         | 10           | <b>3/29</b>                                       | 28         | 130        | 158          |
| <b>3/1</b>                  | 0          | 2          | 2            | <b>3/30</b>                                       | 8          | 88         | 96           |
| <b>3/2</b>                  | 0          | 6          | 6            | <b>3/31</b>                                       | 8          | 88         | 96           |
| <b>3/5</b>                  | 0          | 4          | 4            | <b>4/1</b>  | 36         | 62         | 98           |
| <b>3/6</b>                  | 4          | 20         | 24           | <b>4/2</b>  | 25         | 40         | 65           |
| <b>3/9</b>                  | 4          | 0          | 4            | <b>4/3</b>  | 36         | 28         | 64           |
| <b>3/11</b>                 | 4          | 4          | 8            | <b>4/4</b>  | 25         | 8          | 33           |
| <b>3/13</b>                 | 0          | 4          | 4            | <b>4/5</b>  | 12         | 66         | 78           |
| <b>3/17</b>                 | 4          | 0          | 4            | <b>4/6</b>  | 16         | 88         | 104          |
| <b>3/24</b>                 | 4          | 0          | 4            | <b>4/7</b>  | 52         | 28         | 80           |
| <b>3/27</b>                 | 1          | 0          | 1            | <b>4/8</b>  | 28         | 8          | 36           |

Larval or prejuvenile (< 20 mm) longfin smelt were observed in daily larval fish samples twice at the SWP.

Current delta and longfin 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>

#### 4) Expected Project Operations:

Combined CVP/SWP exports are approximately 2,900 cfs as of April 8. Combined exports are presently curtailed to comply with the NMFS stipulation agreement OMR restriction of -2,500 cfs from April 8-14 (OMR restriction after April 14 will be -3,500 cfs).

#### 5) Particle Tracking Modeling:

The Working Group did not request PTM runs for this week.

#### 6) Assessment of Risk:

##### Background:

The collection of a spent female in the SKT Survey #2 on February 15 indicates that delta smelt spawning has begun. The Working Group discussed the risk of entrainment for larval delta smelt and any discussion of a recommendation was intended to protect larval delta smelt (B.O., p 282). The Working Group will follow the guidance for Action 3 of the B.O. (pp. 357-368).

Combined incidental take levels for State and federal fish facilities are based on the most recent FMWT abundance index. The 2011 FMWT index for delta smelt is 343. This means that the authorized incidental take of adults is 2,487 (estimated) and the concern level is 1,862 (estimated), cumulative for the December through March period.

Table 2: Incidental Take Levels for the larval/juvenile life stage (cumulative)

|              | <b>Concern Level</b> | <b>Take Limit</b> |
|--------------|----------------------|-------------------|
| <b>April</b> | 101                  | 151               |
| <b>May</b>   | 4,471                | 6,705             |
| <b>June</b>  | 11,327               | 16,991            |
| <b>July</b>  | 12,851               | 19,276            |

**Discussion:** The Working Group reviewed and discussed all relevant data from fish surveys, Delta monitoring, salvage, and planned Project operations. No delta smelt has been salvaged at either facility since March 27. The overall Delta conditions, absence of salvage and survey data indicates a low risk of entrainment. The Working Group noted that present restrictions on operations by NMFS should adequately protect emerging larvae in the lower San Joaquin River through April 14. The Working Group noted that given the size of the delta smelt larvae in SLS

#6 and the expected growth rates, these larvae would be expected to be reaching the smallest size detectable by the equipment for 20-mm Survey. The Working Group expects with the extended spawning season, larvae reaching detectable sizes will continue through the next few weeks, and subsequent SLS detections will increase. CDFG is hoping to have data for the central and southern Delta stations from 20-mm Survey #3 out by this Friday. The Working Group noted concern that should detections from the 20-mm Survey show elevated numbers for the central and southern Delta stations, the group would need to meet again prior to the April 16 meeting.

## **7) Longfin Smelt:**

Longfin smelt larval distribution (Smelt Larva Survey 1, January 9-10) exceeded the criteria for advice from the SWG under the SWP's 2081 permit; CDFG therefore requested that the Working Group discuss entrainment risk for longfin smelt. The 2081 identifies OMR flow between -1,250 and -5,000 cfs as the range to select from in determining a level adequately protective of longfin larvae. Because few larvae were collected in the central and south Delta for 20-mm Survey #2 (9 total) the risk is currently low. Qwest remains positive and Delta outflow generally has been greater than 20,000 cfs since March 17, which should assist the remaining larvae in moving downstream and out of the central Delta.

See "WEEKLY ADVICE FOR THE DEPARTMENT OF FISH AND GAME FOR LONGFIN SMELT" for additional details regarding this discussion.

The Working Group will hold the next call on April 16 at 10 am.

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

### **Advice for week of April 9, 2012:**

The Smelt Working Group believes that OMR no more negative than -5000 cfs is protective of longfin smelt at this time. The current OMR target of -2500 will be substantially more protective and beneficial to larvae and juveniles remaining in the lower San Joaquin River.

**Summary of risk:** Risk of entrainment into the south Delta is currently low. Larva densities decreased substantially in the central and south Delta in Smelt Larva Survey (SLS) 5 and remained at similar low levels in SLS 6 and 20mm Survey #2. Recent runoff has maintained Qwest in the 3,100 cfs range, likely transporting larvae in the central Delta westward. Currently, NMFS restrictions constrain OMR to remain no more negative than -2500 cfs through 14 April. Larvae continue to be salvaged periodically and small juveniles in modest numbers. The period of potential Barker Slough export restrictions concluded for the year on 31 March.

### **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 ( $\geq 80$  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).
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: After January 15 through March 31 of critically dry or dry water years (Sacramento River), based on abundance and distribution and detection at Station 716.

### **Discussion of Criteria and Conditions**

Review of past information: Longfin smelt larvae were collected in the Smelt Larva Survey #1 (January 9-10, 2012), so adult salvage and distribution are now informational and can be viewed as suggestive possible future larvae distribution. As of 5 March 2012, no  $\geq 80$  mm longfin smelt have been salvaged for the water year, but larva sampling began at both facilities 16 February, and longfin smelt larvae were detected by the State on 19 February and at both facilities 20 February. The Fall Midwater Trawl longfin smelt annual abundance index for 2011 is 477. The total adult salvage level threshold for advice is 2385 (see criterion in #1).

December Fall Midwater Trawl and Bay Study surveys collected adult longfin smelt in the San Joaquin River just downstream and just upstream of the Antioch Bridge. In early January, Bay Study collected adult longfin smelt as far upstream as San Andreas Shoals on the San Joaquin River. The first Smelt Larva Survey of 2012 caught longfin smelt larvae at 9 of 12 criteria stations in the central and south Delta (criterion #3, Figure 1) triggering the need for advice. Larva catches (densities) were very low during survey 1 and hydraulic conditions at the time posed little risk to longfin smelt larvae. Larvae numbers increased in Smelt Larva Survey 2, and then declined slightly in survey 3 and again in survey 4 followed by a substantial drop in survey 5.

Review of new and current information: Smelt Larva Survey 6 (19-20 March 2012) detected low numbers of longfin smelt larvae in the central and south Delta criteria stations (criterion #3 and Figure 1 below), similar to those from survey 5. The second 20mm Survey (26-29 March) also detected low numbers of longfin smelt larvae in the central and south Delta (Figure 1). These observations indicate continued low risk of entrainment into the south Delta. Qwest was positive throughout March including high levels 18 and 19 March (over 10,000 cfs positive) and a steep increase at the end of the month to 9,972 on 1 April, likely leading to the lower longfin smelt numbers in the central Delta. Qwest declined through early April to 3100 on 8 April, remaining positive. Longfin smelt larvae or small juveniles continue to be detected at the SWP, but

numbers have dropped (salvage ranges up to high 10s) and CVP (salvage ranges up to low 10s). The recently salvaged large larvae (15-19 mm) and small juveniles (20-30mm) collected at the fish facilities were either spawned in or drawn into the south Delta months prior to detection at the facilities (otolith growth data indicates 80+ days to reach 20 mm; no evidence that longfin smelt spawn upstream of the facilities in the San Joaquin River). Thus, current longfin smelt salvage likely reflects larva distributions, hydrology and OMR advice from late January and early February when they were entrained into the south Delta, and subsequent south Delta hydrodynamics that allowed them to grow for months prior to salvage. Current conditions are very favorable for larvae in the central Delta, but will likely only delay salvage of larvae and juveniles remaining in the south Delta.

Combined State and federal exports were recently coordinated to achieve no more negative than -2500 cfs OMR for the period 8-14 April to protect winter-run Chinook salmon and steelhead. OMR was estimated at -1628 cfs (CDEC 5-day) and -2171 (CDEC 14-day). Such OMR flows along with positive Qwest should not draw many additional longfin smelt larvae or juveniles into the south Delta.

The longfin smelt incidental take permit restrictions for Barker Slough exports concluded for 2012 on 31 March. Although longfin smelt larvae remain in the vicinity, exports remain sporadic and low, and should not entrain larvae.

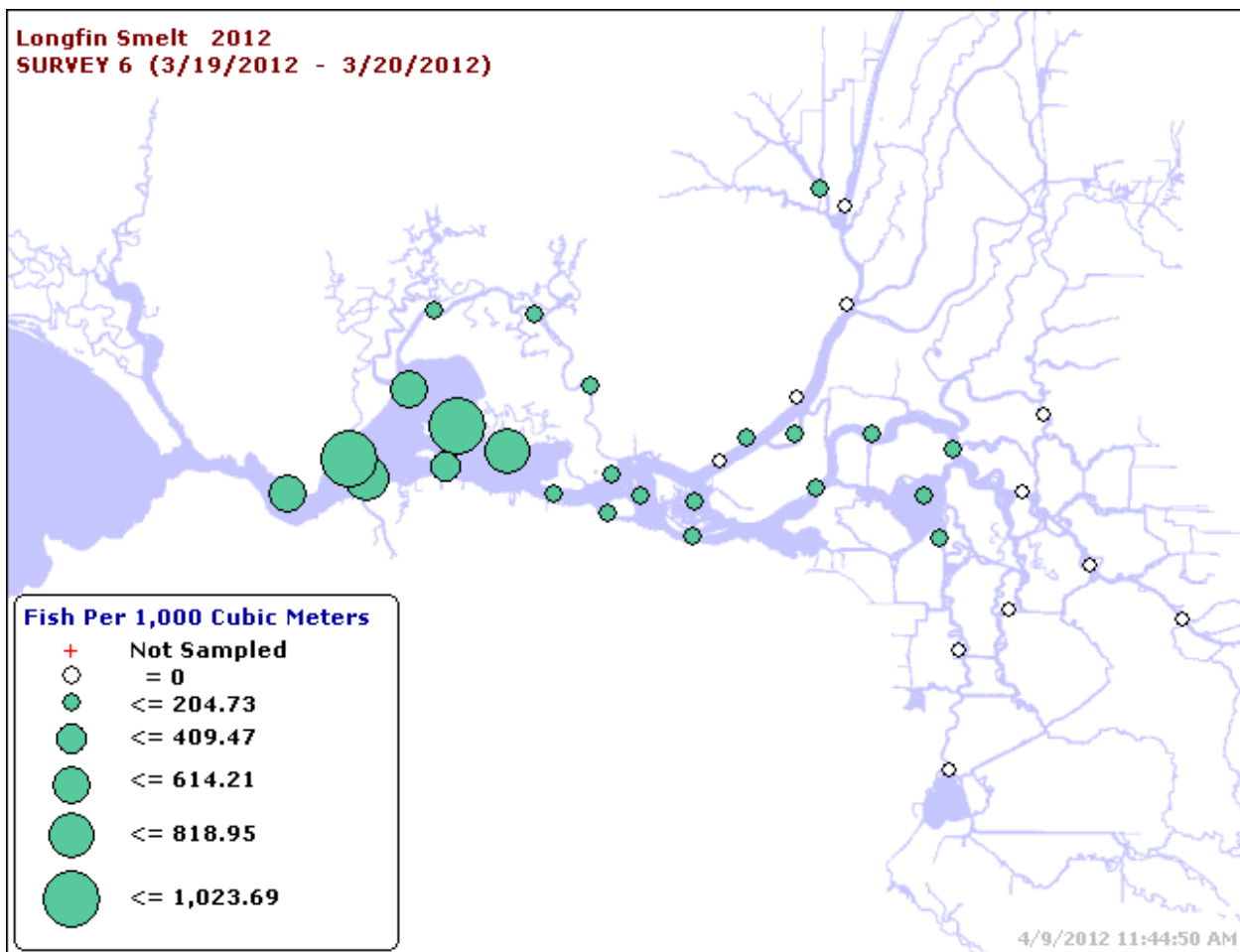


Figure 1. Longfin smelt catch per 1000 cubic meters filtered by station during Smelt Larva Survey, survey 6 2012.



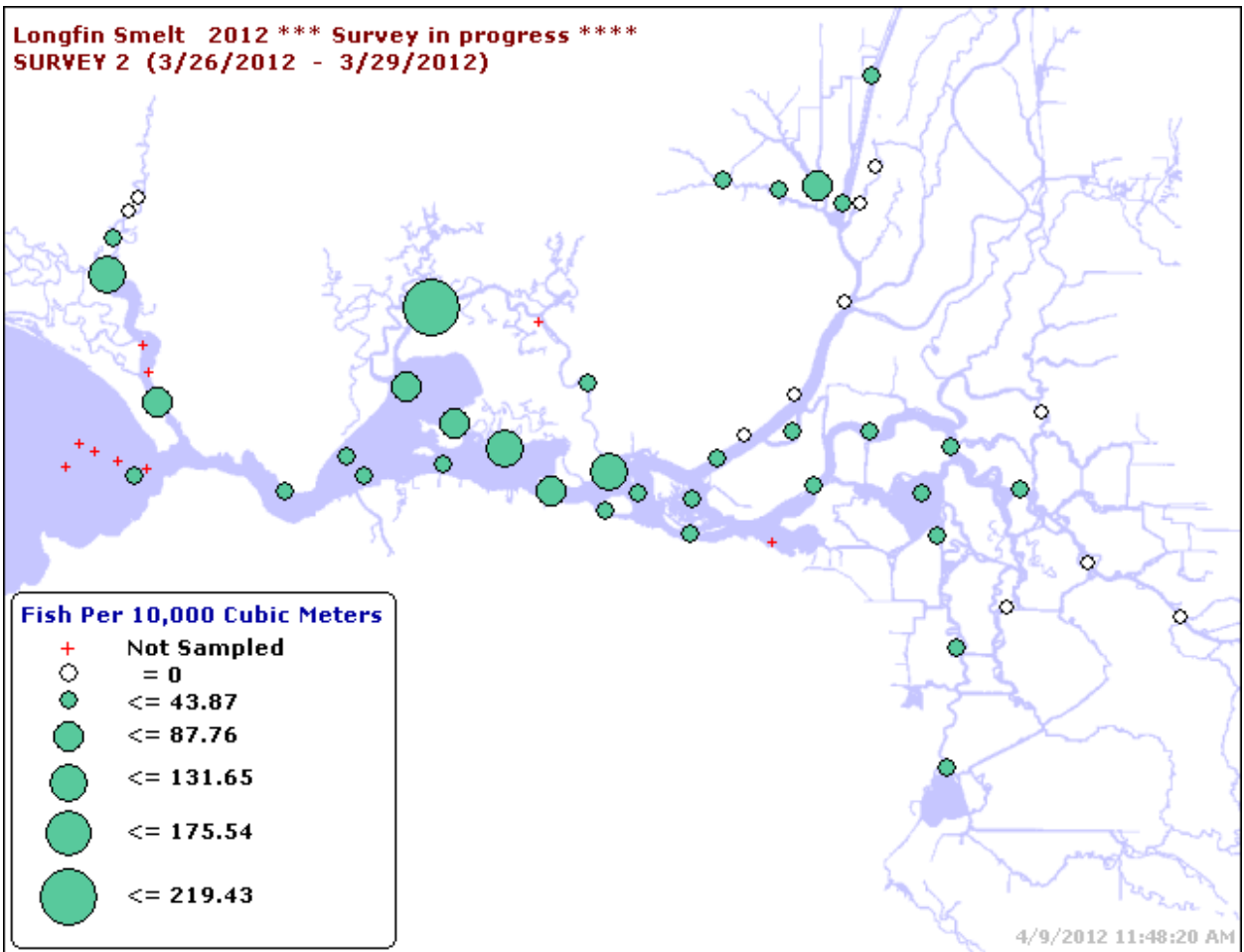


Figure 2. Longfin smelt catch per 10,000 cubic meters filtered by station during 20mm Survey, survey 2 2012.