

## SMELT WORKING GROUP

Monday, March 17, 2008

### WEEKLY ADVICE TO THE SERVICE FOR DELTA SMELT

Recommendation:

**Maintain the 7-day average combined OMR flow more positive than -2,000 cfs.**

Basis for recommendation:

The recommendation is based on a review of active risk factors.

1. Size of spawning population. The 2007 Fall Midwater Trawl (FMWT) index of 28 (the second lowest on record) continued a record of declining abundance indices that started in about 2000, with two of the last three years setting new record lows. The persistence of such extremely low FMWT indices remains a very high degree of concern for the work group.
2. Water temperatures. Water temperatures at all three stations of record have exceeded 12°C for nearly three weeks. Based upon temperatures and the presence of spent fish, the Working Group expects that peak spawning has started in the southern and central Delta and is underway in the north Delta, and that larval fish are either already at risk of entrainment or may become vulnerable this week.
3. Recent salvage. The Working Group finds that adult delta smelt salvage has been higher than we had expected this year, given the low FMWT index. The adult concern level (formerly known as “yellow light”), was reached on February 22<sup>nd</sup>. Further, 56 adult delta smelt were collected at the fish salvage facilities at SWP and CVP between March 3 and 9 despite the decrease in exports to meet a 7-day average OMR flow of negative 3,000 cfs. Recent entrainment and salvage of adult smelt has lowered over the past week (20 delta smelt salvaged between March 10 and 16) as the OMR target flows was reduced. This may indicate that the lower daily negative OMR values seen since about 3/13 have reduced the transport of delta smelt in the central and south delta to the export facilities. The Working Group remains concerned that a number of delta smelt spawners may remain in the south and central Delta areas and may be vulnerable to entrainment (see Exposure Risk discussion below).
4. Spawning condition of salvaged adult delta smelt. The presence of a spent male delta smelt at the CVP/SWP salvage facilities on February 15, 2008, and a spent female on 2/17/08 indicates that at least some spawning started no later than mid-February. The delta smelt sampled at the fish salvage facilities between March 04 and March 9, 2008, included both spent (stage VI) and mature fish with highly developed eggs (Female Stage IV and Male Stage V) further indicating that spawning has started in earnest.
5. Adult distribution from Fish Surveys. The Chipps Island Trawl sampled 1 adult delta smelt on March 10 and 1 adult smelt on March 12. The third Spring Kodiak Trawl (SKT) survey (3/10/08

to 3/14/08) caught delta smelt in the Cache Slough and Sacramento Deep water ship channel as well as in Suisun Bay and the central Delta (Bay Study caught one in the central Delta in early March). A total of 64 adult delta smelt were caught in the SKT survey 3, with 50 caught at one site (Station 719, in the Sacramento ship channel). The total number of delta smelt caught in the SKT is a low number as compared with past years, which concerns the Working Group. Also, the continuing catch of adult delta smelt in the central delta indicates that larval delta smelt may be recruited within the influence of the export facilities.

6. Larval distribution from 20 mm Survey (20mm). Results of 20 mm Special Survey #11 (sampling conducted Mar 3 to Mar 7, 2008) revealed substantial numbers of longfin larvae in the lower Sacramento River and downstream, but no delta smelt larvae were captured at any station. In the supplemental survey conducted March 3 to March 7, sampling effort at each station was one-third (1 tow instead of 3) of what it is in normal surveys. A full 20 mm survey is underway this week.

7. Exposure Risk. As indicated above under #3, the SWG thinks it is possible that a significant fraction of this year's smelt population may be distributed in the central Delta where they are relatively more vulnerable to entrainment. Based upon PTM results, it is possible that substantially negative OMR flows over only a few days will result in high entrainment for delta smelt present in the San Joaquin River and other central Delta channels. Therefore the Working Group remains concerned that entrainment of larval and juvenile delta smelt spawned in the central Delta may represent a loss of a substantial percentage of this year's delta smelt production. The reasons for our concern are (1) the SKT is a poor tool for detecting very sparsely distributed fish, making inference about overall distribution risky; (2) nevertheless the SKT has detected at least one adult smelt in each of two central/eastern Delta locations; and (3) cumulative and continued adult salvage despite reduced exports indicates that a substantial number of delta smelt have entered the south and central Delta to spawn, increasing the risk of larval and juvenile entrainment. The -2,000 cfs OMR value was chosen because the results since about 3/13 seem to show that last week's decision by the Service to target -2,000 cfs is working by reducing salvage at the CVP/SWP facilities and by not drawing more delta smelt into the central Delta, as indicated by the most recent SKT. The Working Group noted that the recent daily values of OMR have been less negative than -2000 cfs, so it is possible the beneficial effects being attributed to a -2000 OMR limitation are slightly optimistic.

8. Particle tracking results (Attachment 1). The Working Group believes the most efficient protective measure at this time is to prevent or minimize as far as possible entrainment of fish into the Old River and Middle River. Particle tracking modeling suggests that at negative 1,500 cfs OMR flows, the 30-day entrainment risk would be essentially 0% for smelt larvae occurring at stations 809, 812 and 815, as well as locations in the Sacramento River. A -2,000 cfs OMR appears to protect larval delta smelt since the past week's survey results and salvage numbers indicate that southward transport of larval and adult delta smelt is minimized under the conditions seen since about 3/13.

Data Request for next week: No new PTM modeling required for next week since conditions in the delta are not likely to change significantly.

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

### **Recommendation:**

Follow the Smelt Working Group's delta smelt recommendation to maintain the 7-day average combined OMR flow more positive than -2,000 cfs.

### **Basis for recommendation:**

Our concern level for **longfin smelt** remains high based upon:

- (1) a record low 2007 longfin smelt Fall Midwater Trawl (FMWT) index (13) and a "low given the outflow conditions" FMWT index in 2006; and
- (2) probable February spawning in or near the south Delta based on the presence of a spent adult female in salvage (February 14, 2008, CVP) and subsequently by capture of a longfin smelt larvae (February 24, 2008, SWP); and combined longfin smelt salvage of 56 fish from 23 January through 2 March

Our concern is tempered by (1) limited longfin smelt salvage for both facilities in March (1 larva and 2 juveniles  $\geq 20$ mm TL); (2) distribution information from early-March 20mm Survey, wherein all larval longfin smelt larvae were collected in the Sacramento River or Suisun Bay; and (3) by recent adult distribution information from Spring Kodiak Trawl and Bay Study suggesting much of the current longfin smelt spawning might be taking place in the Sacramento River.

The Smelt Working Group longfin smelt recommendation is based on discussion of the preceding information and recent results of particle tracking modeling, which suggested that at negative -2,000 cfs OMR the 30-day entrainment risk would be essentially  $\leq 2\%$  for smelt larvae occurring at stations 809, 812 and 815, as well as locations in the Sacramento River.

### Discussion:

1. Size of spawning population. The 2007 FMWT longfin smelt index of 13 was the lowest on record and except for an increase in 2006 continues a record of very low abundance indices that started in 2001. The persistence of such extremely low FMWT indices creates a very high degree of concern for the SWG.

2. Water temperatures. Water temperatures have been suitable for longfin smelt spawning since late November 2007 and larvae are present in the water column. Temperature has not been linked to the termination of longfin smelt spawning, but small larvae collected by larvae surveys drop sharply in April based on historical sampling. This suggests that spawning typically declines in March when water temperatures surpass 15°C.

3. Recent salvage. Sporadic salvage of larval and juvenile longfin smelt in March indicates that recent (post-3/13) pumping levels provided desired protection. Modest to substantial adult longfin smelt salvage was expected this year given the low Delta outflow. At present, no level of concern based upon the relationship of historic adult salvage to the subsequent FMWT index has been defined for longfin smelt. Nonetheless, the SWG is concerned that the current salvage level (72 adults total for the winter) portends potential south Delta spawning and the subsequent salvage of larvae and juveniles. Juvenile salvage is typically low in March and doesn't peak until April or May.

4. Adult distribution. Recent adult distribution information from Spring Kodiak Trawl, Bay Study and UFWS trawling suggests that most longfin smelt were in the Sacramento River portion of the system: Spring Kodiak collected one adult in the low Sacramento River another in Grizzly Bay and a juvenile near Chipps Island; Bay Study collected longfin from the Sacramento River (n=7) or Suisun/San Pablo bays (n=4); the USFWS caught 16 longfin smelt at Chipps Island. Previously reported USFWS longfin smelt catches in their Sacramento and Mossdale Trawls (7 March) were in error. Assuming these catches inform us of spawning regions, then most recent spawning has taken place outside the south Delta.

5. Larva and juvenile distribution. No new information after early-March 20mm Survey, except salvage and a single Spring Kodiak Trawl catch reported above. Based on complete reporting from the early-March 20mm survey, longfin smelt were primarily downstream of the Delta in Suisun Bay, and that those remaining within the Delta were in the Sacramento River channel or Cache Slough. Those larvae upstream of Three-Mile Slough remain potentially vulnerable to entrainment if exports are high enough to draw them into the central and south Delta. This appeared very unlikely based on PTM data for current conditions (see below).

6. Particle tracking results. PTM runs based on current hydrology indicated that particles in San Joaquin River stations 809, 812, and 815 were very unlikely to be entrained by south Delta pumping (i.e.,  $\leq 2$  percent entrained) during a 31-day time-step at the recommended negative 2,000 OMR flows. This OMR recommendation provides substantial protection of longfin smelt larvae and juveniles in the central and north Delta.