SMELT WORKING GROUP

Monday, June 16, 2008

WEEKLY ADVICE TO THE SERVICE FOR DELTA SMELT

Recommendation for the week of June 16, 2008:

Maintain the 7-day average combined OMR flow more positive than -2,000 cfs unless 1) average salvage over any two consecutive days reaches or exceeds 40 delta smelt per thousand acre feet (TAF) exported (ds/TAF), 2) average salvage over a three day period reach or exceed 30 ds/TAF, or 3) the model-estimated daily OMR flow for any single day goes more negative than –2,500 cfs. If any of the above three conditions is met, then the Working Group recommends that the water export facilities immediately start operating to an OMR flow no more negative than -1,500 cfs. The Working Group would then meet to review any new data and discuss the recommendation.

Maintain the Agricultural Barriers flap gates open.

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. The three station average water temperature is about 22 degrees C on June 12 with the Rio Vista and Antioch stations being below 20 degrees C and Mossdale being just below 25 degrees C. These water temperatures mean that peak spawning has passed (field observations indicate that most spawning occurs from 12-18 degrees C). However, most spent females collected in the Spring Kodiak Survey #5 (May 5-9) and supplemental survey #15 (May 19 and 20) had a second or third stage-3 gamete development, indicating that spawning may be still occurring. Given that in-Delta temperatures are below the lethal temperature of 25 degrees C and young of the year (YOY) delta smelt are present in the system, the risk of entrainment remains a concern.

3. Recent salvage. Delta smelt salvage increased somewhat over the past week. Expanded salvage at the CVP was 24 on 6/9, 10 on 6/10, 0 on 6/11, 0 on 6/12, 20 on 6/13, 28 on 6/15 and 16 on 6/15. Expanded salvage at the SWP was 10 on 6/9, 57 on 6/10, 0 on 6/11, 42 on 6/12, 14 on 6/13, 22 on 6/15 and 26 on 6/15. The total delta smelt salvage for the past week was 269 and a total of 1689 delta smelt have been salvaged this year. Density of delta smelt caught at the SWP increased over the past two days with a density of 29.5 on 6/14 and a density of 36.7 on 6/15, which supports the Working Group's continued concern that delta smelt are present in the south and central Delta and are at risk of entrainment at the pumps.

4. Spawning condition of salvaged adult delta smelt. Adult delta smelt are no longer being taken in salvage. 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. A delta smelt sampled at the fish salvage facilities between March 23 and March 27, 2008, was a spent male.

5. Adult distribution from Fish Surveys. Survey 5 of the SKT (5/5 – 5/9) caught delta smelt in the Sacramento Deep water ship channel (station 719), Cache Slough (station 716), and in Sacramento River by Sherman Island (station 706). A total of 16 adult delta smelt were caught in the SKT survey 5, with 9 caught at Station 719, in the Sacramento ship channel. Of the 14 females collected, 8 were spent and 6 were premature (stage 3) gonad development. However, of the 8 spent females, several were developing a second or third clutch of eggs. The two males collected were stage-3 and stage-4 (i.e. pre-spawn).

Supplemental SKT Survey #15 (May 19 and 20) collected 4 adult delta smelt in the Sacramento Deep water ship channel (station 719). All four were females, of which two were characterized as spent and two were characterized as pre-spawn (stage 3). However, both spent females were developing new oocytes and the gonad were characterized as stage-3, pre-spawning. Taken together, this suggests that spawning may have continued for a few more weeks since the last SKT survey. The total number of delta smelt caught in the SKT is a low number as compared with past years, which concerns the Working Group.

6. Larval distribution from 20 mm Survey (20mm). The sixth 20-mm survey was conducted from May 27 through May 30. Thirty-two stations were sampled. Delta smelt young of the year were present at Franks Tract and Old River stations (901, 902) and in San Joaquin River stations (804, 809, 812, 815) as well as Sacramento River and in one Cache Slough station. Sample densities at 800 and 900 stations varied from 3.58 to 11.88 delta smelt per 10,000 cubic meter water trawled. For comparison, density by Cache Slough (station 716) was 10.32 delta smelt per 10,000 cubic meter of water sampled.

The seventh 20-mm survey was started on June 9 and ended on June 13. Forty-six stations were sampled. At least one tow has been processed from 26 stations. Delta smelt young of the year have so far been found in tows from Sacramento Deep Water Ship Channel, by Cache Slough, in lower Sacramento River, at the confluence, in lower San Joaquin River, and from Frank Tracts and Old River stations. A total of 84 delta smelt have been found in tows from 9 of the stations processed so far. Of these, 59 delta smelt were collected from the first tow at station 704 in the lower Sacramento River.

Summer Townet (STN) Survey

The first STN survey was completed on June 9. Delta smelt were collected at six stations. A single delta smelt was collected at station 809; all others were captured either in the lower Sacramento River or at the confluence; Suisun Bay and Montezuma Slough sample data are being checked and will be posted later this week. The second survey was started today and results are not yet available.

The catches in the two surveys show that delta smelt continue to be located within the zone of influence of the pumping facilities and could become entrained. DFG staff has posted the 20-mm and STN survey results on the Web (http://www.delta.dfg.ca.gov/).

7. Agricultural Barriers. Under Judge Wanger's Order, the flap gates on the agricultural barriers are allowed to be closed after the VAMP period ends. The Working Group is concerned that the closure of the flap gates will negatively impact OMR flow and could reduce the ability of smelt to move out of the south and central delta.

8. Particle tracking results. 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. The Working Group reviewed model results for 6 PTM runs bracketing OMR from -1500 to -4000 cfs. Results suggest 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 would result in about 12% of particles at station 902 after 31 days and about 16.5% after 38 days. Particles at stations on the Sacramento side, where most larvae were collected by the 20-mm Survey, had less than a 1% risk of entrainment after 38 days. Particle tracking results can be viewed on the Fish and Wildlife Service website (http://www.fws.gov/sacramento/) by following the link for "Service Decisions" under Delta in the Spotlight.

9. Exposure Risk. The Working Group remains concerned that with VAMP flows and export reductions ended, smelt may distributed in the central and south Delta will be relatively more vulnerable to entrainment. Currently X2 is located just west of 86 km. OMR flows were reduced to less negative than negative 1,000 cfs during last week. However, SWP is planning to increase exports today which may somewhat reduce OMR flows (i.e. more negative) and bring X2 farther east. Eastward location of X2 increases the chance that delta smelt larvae and juveniles are located in the Delta. Based upon PTM results (http://www.fws.gov/sacramento/), 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) delta smelt have been caught in the south and central Delta in recent 20 mm surveys; (2) juvenile delta smelt have been caught at the facilities and salvage appears to be increasing; (3) temperatures remain below the lethal limit for delta smelt and based on salvage and monitoring results, significant numbers of delta smelt may remain in the zone of influence of the facilities.

The Working Group recommends an OMR flow at or above -2,000 cfs on the factors above and that particle tracking seems to indicate most delta smelt in the south and central Delta would be protected by these flows. Outflow requirements and E/I ratio has been, and is expected to continue to be controlling exports and maintain releases in Sacramento River. Thus, the Working Group expects that an OMR less negative than 2,000 cfs will be maintained as CVP and SWP operates to meet Delta requirements. However, the Working Group is concerned about possible increase in salvage and change in factors that would increase movement of delta smelt into the south Delta. The Working Group therefore believes that a high salvage, measured as

density of delta smelt per thousand acre feet exported, or a short term substantial increase in OMR flows towards the pumps would indicate that an OMR flow more positive than negative 1,500 cfs would be needed to protect delta smelt. Keeping the agricultural barriers' flap gates open would be expected to help maintain higher OMR flows to protect delta smelt. Current controlling Delta water quality requirements will end on July 1 when the E/I ration changes to 65 percent.

Data Request for next week: No new PTM modeling has been requested for next week.

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

Monday, June 16, 2008

Recommendation for week of June 9:

Follow the Smelt Working Group's delta smelt recommendations to **maintain the 7-day average combined OMR flow more positive than -2000 cfs and maintain all agricultural barrier flap gates in an open position.** If age-0 longfin smelt distribution information shows an unexpectedly high number in the east or south Delta (>5 fish total spread across 3 or more locations) or salvage increases to over 40/day for either salvage facility, then the Smelt Work Group will be asked to convene.

Basis for recommendation:

Our concern level for **longfin smelt** has diminished based upon:

(1) limited numbers of age-0 longfin smelt in the central and south Delta collected by the most recent 20mm Survey and none upstream of station 804 in the San Joaquin River in the first Townet Survey;
(2) previously warm south Delta temperatures surpassing the 21.5 degrees C limit that appears to influence longfin smelt migration; and
(3) no longfin smelt at either facility in the past week and only sporadic, very low salvage of age-0 longfin smelt (< 4 to 8 per day) by either facility since May 19, 2008.

Our concern would increase if:
(1) future sampling indicated an unexpectedly high number (>5 fish total spread across 3 or more locations) of longfin smelt east or south of Jersey Point; or
(2) longfin smelt salvage increased to 20/day for either salvage facility.

The Smelt Working Group longfin smelt recommendation is based on discussion of the preceding information.

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 temperature has not been directly linked to longfin smelt distribution, but temperatures > 21.5°C seem to influence their distribution or survival; once temperatures surpass that level longfin smelt are seldom present at the location subsequently.

3. Recent salvage. Only two longfin (both on June 10) smelt were salvaged during the past two weeks, so recent pumping levels provided the desired protection.

4. Adult distribution. No longer a factor.

5. Larva and juvenile distribution. Longfin smelt was not found in any tows in the central or south Delta during the most recent 20mm Survey (Survey 7), June 9 through 13. Summer Townet captured 17 longfin smelt at station 804, and the remainder in the Sacramento River as high as station 706 or downstream. Some longfin smelt larvae/juveniles remain in the Sacramento River in the vicinity of Three Mile Slough and additional fish were caught near Antioch. Most of the longfin smelt were at or just above the confluence and might be drawn into the Delta if pumping increased suddenly to high levels (http://www.delta.dfg.ca.gov/data/20mm/CPUE_Map3.asp). Those larvae in the vicinity of Three-Mile Slough and at the San Joaquin River remain potentially vulnerable to entrainment if exports are sufficient to draw them into the south Delta. This appeared very unlikely based on previously described PTM output used for the previous recommendation (see below).

6. Particle tracking results. PTM runs based on VAMP hydrology and various post-VAMP OMR scenarios 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 or 38-day interval at the recommended negative 2000 OMR flows. This OMR recommendation continues substantial protection of longfin smelt larvae and juveniles in the western and north Delta.