State of California
Department of Fish and Game

M e m o r a n d u m

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To: File

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Subject: Summer Townet Delta Smelt Index 2009

Summary —- The 2009 Summer Tow Net Survey (TNS) index for delta smelt was calculated at 0.3. This value was calculated in the traditional manner without modification, but should be interpreted with the knowledge that an inappropriately-modified net was used during 1 entire sampling day and portions of 2 others spanning the end of Survey 1 and the start of Survey 2.

Background — The TNS delta smelt index is calculated by averaging indices from the first 2 surveys conducted each year (5-day surveys conducted every 2 weeks). During the 1st day of the 2nd survey in 2009, the field crew opened the townet fyke (i.e., open cone of ½-inch mesh that extends from the net mouth to within the 1/10-inch mesh codend) after observing that it was sewn shut. Based on fish length and catch data, field notes, and crew interviews, the net apparently was sewn closed late during Day 4 of Survey 1.

Rationale — The closed fyke could have reduced delta smelt catch, but we have little reason to believe that to be the case for the following 4 reasons:

(1) Of the 11 stations sampled while the fyke was closed, only 2 were within the range of delta

smelt as determined by TNS collections on other dates in 2009.

(2) No delta smelt were collected at stations sampled when the fyke was closed, even though the delta smelt length distribution during Surveys 1 and 2 indicated that about half the delta smelt present were small enough to pass through the ½-inch mesh and be retained in the codend.

(3) Although the distance traveled by the net averaged 8 m shorter when the fyke was closed (Mann-Whitney $U_{0.05,\ 140,30} = 2606$, $p = 0.039$), this represented only a 1.5% decrease in the average 559 m tow distance.

(4) The most common catch in any tow was 0.

Alternative approach — We used linear regression to estimate a traditional 2009 delta smelt index from 2 alternate delta smelt indices. The 2 alternate indices were based on historical survey data (1983-2008):

Alternate 1: Mean index from 2 surveys used for the striped bass index

Alternate 2: Mean index from July survey(s)

When the traditional index was regressed on each alternate index, both relationships were strong (Alternate 1: $r^2 = 0.700$, 24 df; Alternate 2: $r^2 = 0.699$, 24 df) and both predicted a 2009 index somewhat higher than 0.3 (Alternate 1 predicted an index of 0.36; Alternate 2 predicted an index of 0.71). Predictions from Alternate 1 closely approximated recent traditional indices, but both relationships over-predicted indices for the 2005-2008 period.