

# Memorandum

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Subject: 2013 Index of Delta Smelt Relative Abundance from the 20-mm Survey

The 2013 20-mm delta smelt index is 7.8 (Figure 1). The index is calculated each year once the accuracy of the data has been verified. It is calculated by summing the geometric means of delta smelt catches over a specific period of time for each year. This year's index was from Surveys 3 through 6, which occurred from April through May.

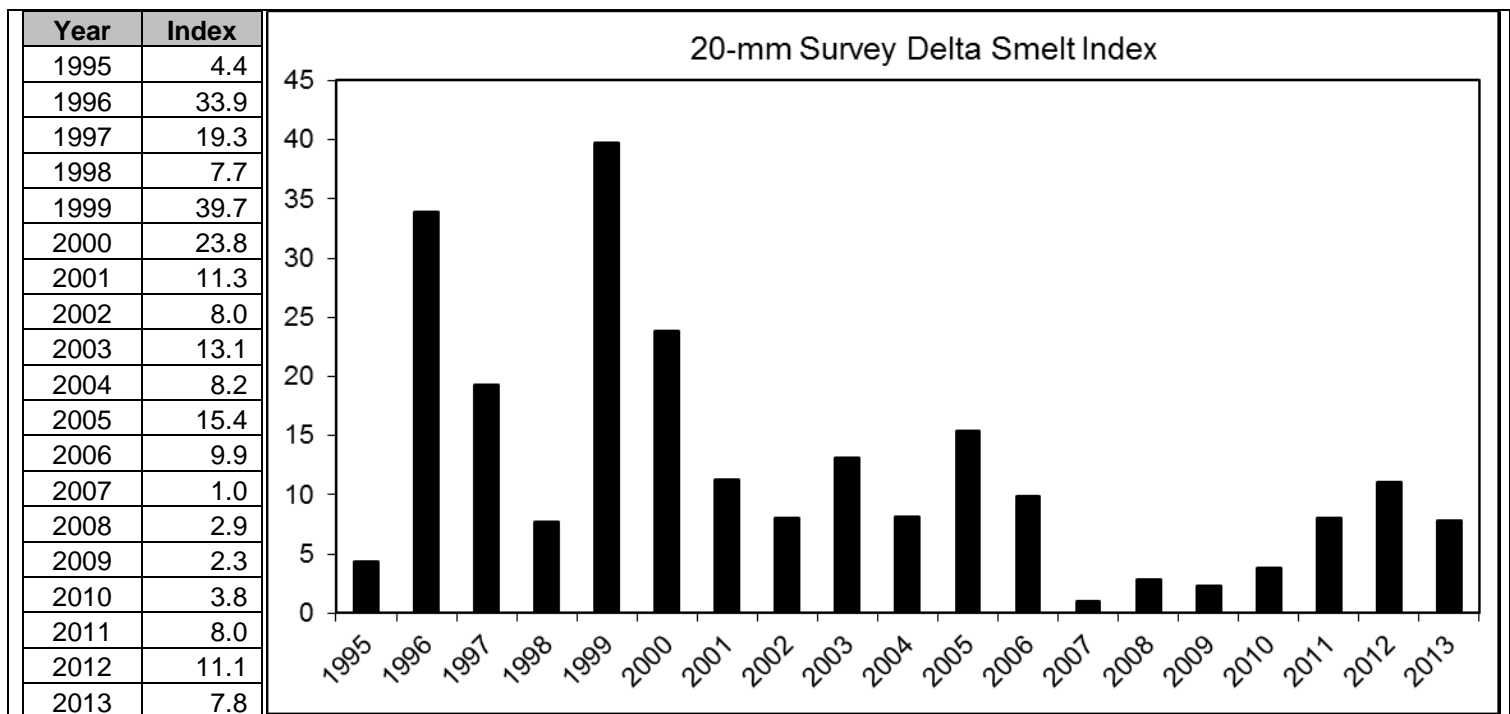


Figure 1. The 20-mm survey delta smelt index over the period of record, 1995-2013.

The following is a summary of the methods used to calculate the index.

The index is calculated using the data from only 4 out of the 9 surveys conducted: the 2 surveys before and the 2 after the point where the average length of delta smelt (less than 60 mm in length) equals 20

mm. From this subset of surveys, the delta smelt catch-per-unit-effort (CPUE) is calculated for each of the 41 “core” stations. One (1) is added to each CPUE value and then a log10 transformation is performed. For example:

CPUE	3.45
CPUE+1	4.45
Log10Trans = $\log(4.45)/(\log 10)$	0.65

These calculations are made for each station within a given survey. The average is taken of all the resulting “Log10Trans” values within a survey in order to obtain one value. The geometric mean is calculated on this average value, like so:

$$10^{(\text{Avg}([\text{Log10 Trans}]))-1}$$

The 20-mm delta smelt index is the summation of the 4 geometric means.

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