

Memorandum

Date: 08/06/2021

To: Stacy Sherman
Regional Manager
Bay Delta Region

From: Adam Chorzyczewski
Environmental Scientist
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Subject: The 2021 20-mm Survey Delta Smelt Index

The 2021 20-mm Survey Delta Smelt index of relative abundance was 0.0 (Figure 1). Only one Delta Smelt was caught during the 2021 season: a 25 mm juvenile in the Sacramento Deep Water Shipping Channel (SDWSC) on May 6th. To remain consistent over time, the annual index value is calculated using a subset of “index stations” that have been sampled since the inception of the survey; however, additional “non-index stations” have been routinely sampled in the north Delta since 2008. The one Delta Smelt was collected at a non-index station, so the detection did not contribute to the index calculation.

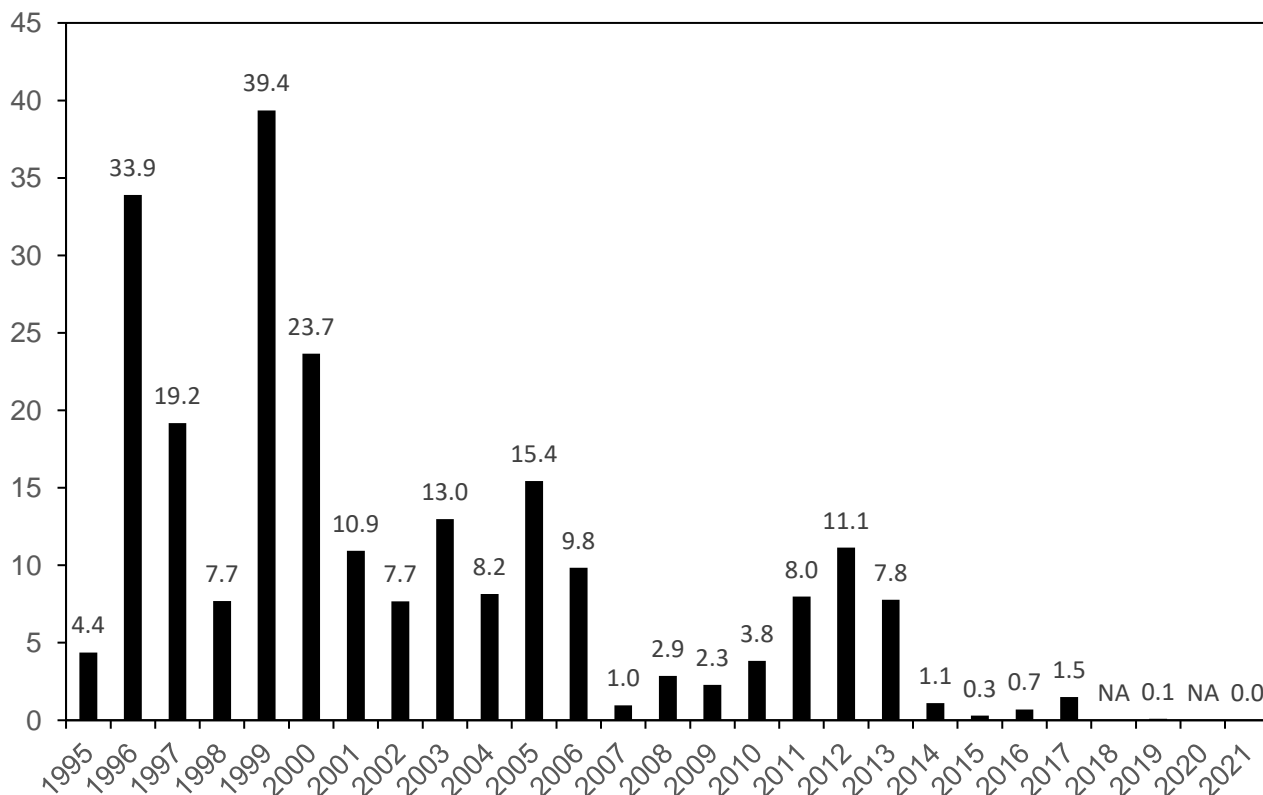


Figure 1. Delta Smelt index of abundance from CDFW's 20-mm Survey, 1995-2021. Delta Smelt catch in 2018 and 2020 were insufficient to produce an index value.

The 20-mm Delta Smelt index is considered not calculable (NA) when it is not possible to determine when mean Delta Smelt fork length reached 20-mm. In 2018 this was due to low and inconsistent Delta Smelt catch and in 2020 disruptions in sampling due to the COVID 19 pandemic. The 2021 index of 0.0 reflects 0 Delta Smelt caught at index stations during a

complete sampling season. This year, Delta Smelt observations have been rare for all monitoring programs in the San Francisco Estuary. From late March through June, the USFWS Enhanced Delta Smelt Monitoring (EDSM) program used gear similar to the 20-mm Survey and collected seven juvenile Delta Smelt (FL = 12.7 – 25.7 mm), six from the SDWSC and one from the lower portion of the Sacramento River (Figure 2), and one adult Delta Smelt (FL=56 mm) in the SDWSC. For the first time in its 20-year history, the CDFW Spring Kodiak Trawl (SKT), which monitors the spawning stock of adult Delta Smelt, did not catch any Delta Smelt. Likewise, EDSM conducted 1,182 sampling events using similar gear as SKT and detected two adult Delta Smelt, both in the SDWSC. These catch results highlight the low spawning stock and low juvenile recruitment in 2021.

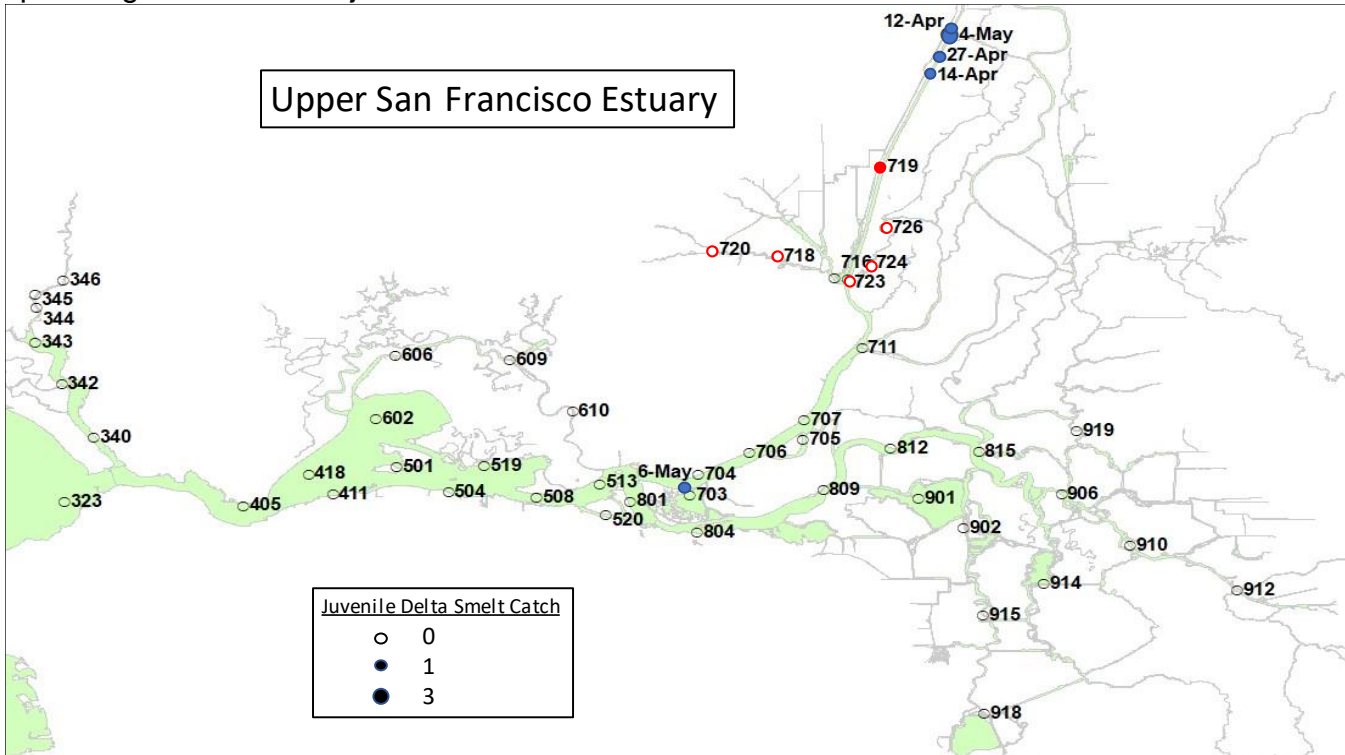


Figure 2. Map of the upper San Francisco Estuary showing the 2021 CDFW 20-mm Survey stations and associated juvenile Delta Smelt catch. Stations in black are index stations, stations in red are non-index stations. EDSM detections are shown in blue.

Index Calculation

The annual 20-mm Survey monitors the distribution and relative abundance of post-larval and juvenile Delta Smelt throughout their historical range. Nine week-long surveys are conducted every other week from mid-March through early July. Each survey samples a total of 47 stations: 41 “index stations” which have been sampled since the inception of the survey and 6 “non-index stations” in the North Delta which were added to the sampling regime in 2008. When water flows are high an additional 5 non-index stations are sampled in San Pablo Bay.

To calculate the index, Delta Smelt catch at each station is standardized to a volume of 10,000 cubic meters (i.e., CPUE). The mean station CPUE is used to calculate the geometric mean of the four index surveys, which are summed to produce the annual index. The index surveys are comprised of the two surveys directly before and the two surveys directly after Delta Smelt mean fork length reaches 20 mm¹. Since the index is calculated using a geometric mean, both abundance and distribution can affect the magnitude.

Additional information on prior year indices, methods, and 20-mm Survey data can be found on

our webpage: <https://www.wildlife.ca.gov/Conservation/Delta/20mm-Survey>.

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