

State of California  
Department of Fish and Wildlife  
**Memorandum**

Date: 08/02/2023

To: Erin Chappell  
Regional Manager  
Bay Delta Region

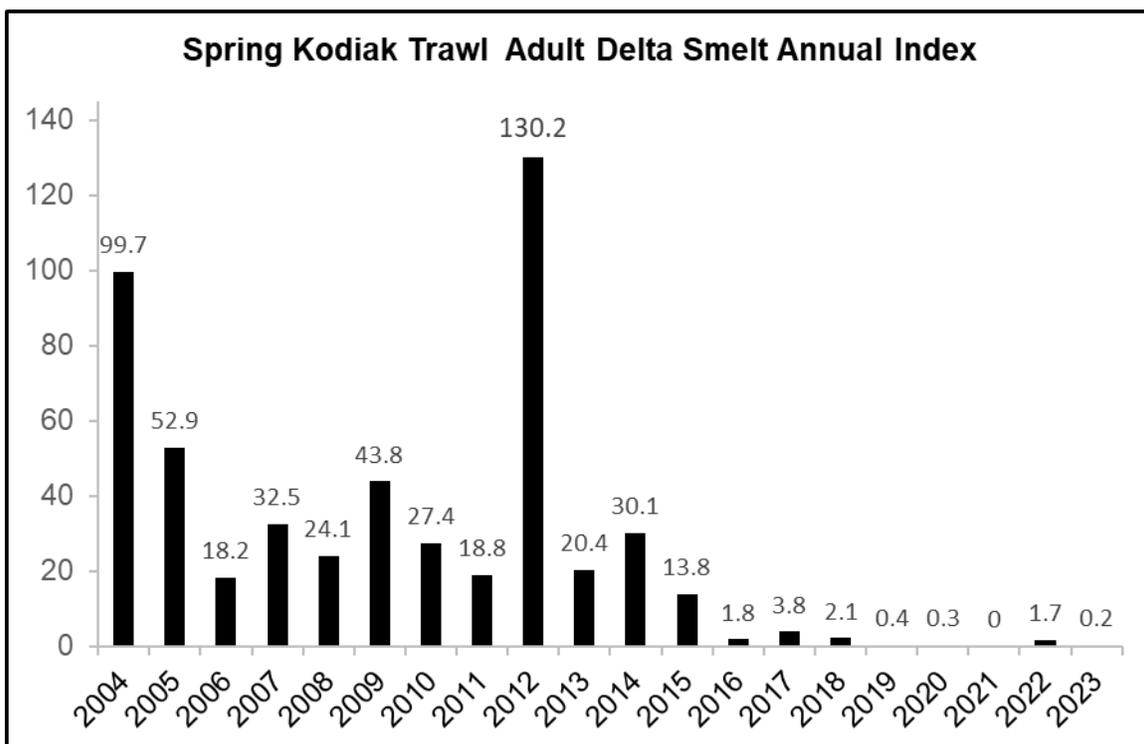
From: Jennifer C. Oceguera Zavala  
Environmental Scientist  
Bay Delta Region

Subject: 2023 Spring Kodiak Trawl Delta Smelt Index

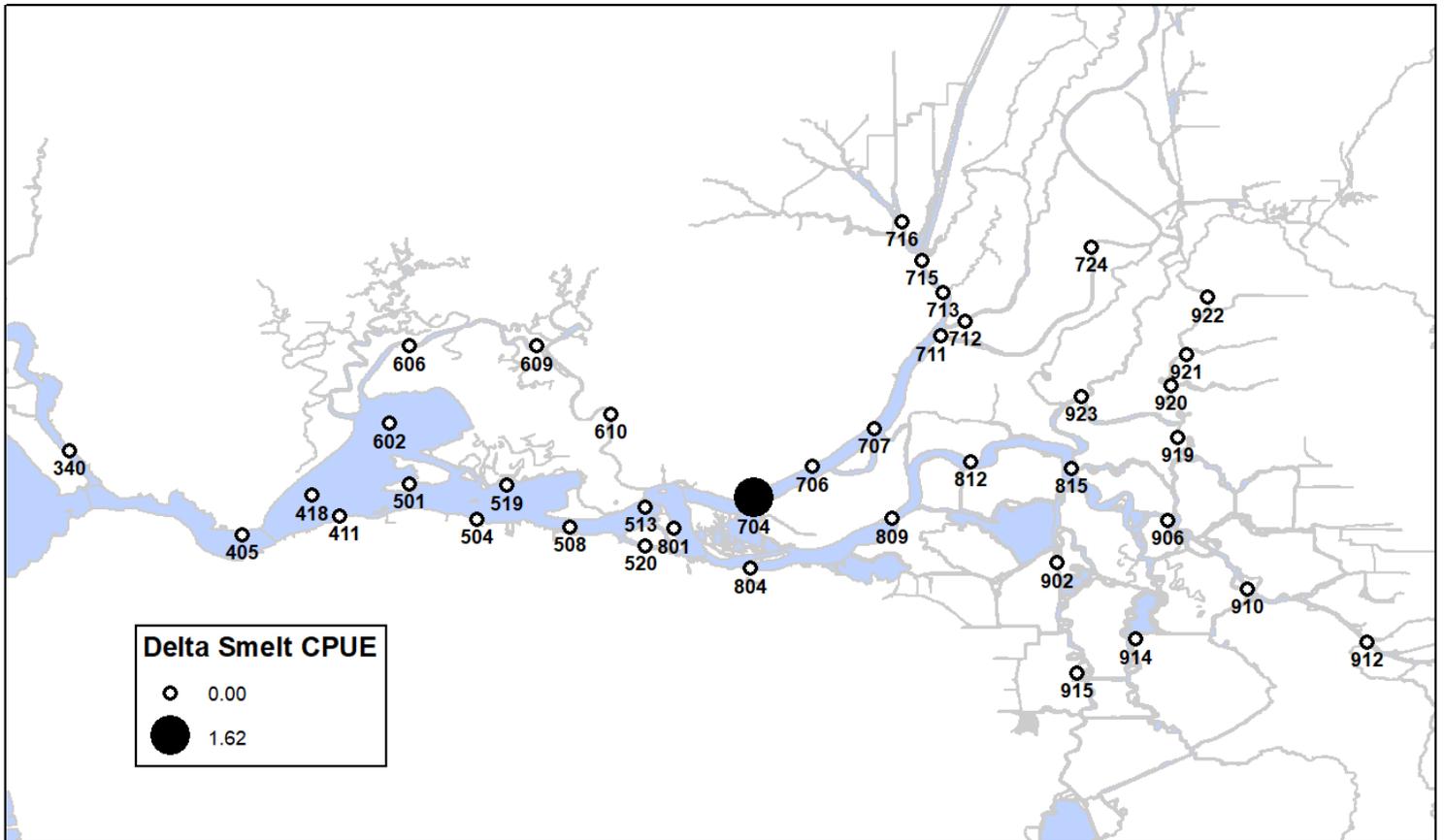
*2023 Survey Results*

The 2023 Spring Kodiak Trawl (SKT) Delta Smelt index of relative abundance was 0.2 (Figure 1). This is a decrease from the 2022 SKT index (1.7) and the second lowest number since the project's inception in 2002. All Delta Smelt caught by SKT this season were hatchery reared fish from the 2022-2023 Experimental Release efforts.

SKT samples 40 stations (39 index stations) delta-wide monthly from January to May each year to track the distribution, abundance, maturation, and migration timing of adult Delta Smelt. All index stations were sampled in all the index surveys for the 2023 SKT season resulting in 156 tows. The 2023 index represents one individual caught at station 704 on February 8, 2023 (Figure 2). The fish was VIE tagged and attributed to the Rio Vista hard release event of January 23, 2023. Three additional tagged individuals were caught at the Sacramento Deep Water Ship Channel non-index station (719). All three individuals originated from the soft and hard release events on January 9, 2023 at the Sacramento DWSC. As a non-index station, these fish are not included in the SKT index calculation (see 'Index Methods' section below).



**Figure 1. The CDFW's Spring Kodiak Trawl Delta Smelt index, 2004-2023.**



**Figure 2. Map of the upper San Francisco Estuary showing the CDFW Spring Kodiak Trawl index stations and associated adult Delta Smelt catch per unit effort (10,000 m<sup>3</sup>) for all index surveys.**

*Index Methods*

SKT operates annually to track the distribution, relative abundance, and spawning condition of adult Delta Smelt throughout its historic range in the upper San Francisco Estuary. The SKT is conducted monthly from January to May and was initiated in 2002. The methods were standardized in 2004 and a Delta Smelt index was first developed in 2012.

The SKT Delta Smelt index is calculated using only index surveys (surveys 1- 4) and the 39 index stations (Figure 2). Station 719 (Sacramento Deep Water Channel) was added in 2005 to increase Delta Smelt coverage and is excluded as an index station because it has not been routinely sampled since the survey's inception. Logistical issues sometimes prevent stations from being sampled (Table 1). To calculate the index, stations are grouped into three spatial regions and a mean catch per 10,000 cubic meters of water (i.e., CPUE) is calculated. The regional means are then summed to create an index for each survey, and survey indices are summed to calculate the SKT index. The SKT index allows for comparison across years to reflect trends in the population, but it is not an abundance estimate of the overall population.

**Table 1. Index stations not sampled during CDFW's Spring Kodiak Trawl.**

Survey	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
1	724	724				922				724		711 724		724 922 923			501	340	610 609 606 602	
2	724 919 920 921 922 923			340	340							923	724			724			920 921 922 923	
3	724								724 610 609 606 602 519 504 501 418 411 405 340		724			724				704 920 921 922 923		
4	724	724															All Stations			