

Memorandum

Date: November 23, 2020

To: Gregg Erickson
Regional Manager
Bay Delta Region

From: James White
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Bay Delta Region

Subject: 2020 Fall Midwater Trawl September-October fish abundance and distribution

The Fall Midwater Trawl (FMWT) was initiated to determine the relative abundance and distribution of age-0 Striped Bass (*Morone saxatilis*) in the Estuary, but the data is used routinely for information on upper-estuary pelagic species including but not limited to Delta Smelt (*Hypomesus transpacificus*) and Longfin Smelt (*Spirinchus thaleichthys*). The FMWT samples 122 stations (see: [FMWT station map](#)) each month from September to December, and those stations range from San Pablo Bay upstream to Stockton on the San Joaquin River, to near Hood on the Sacramento River, and into Cache Slough and through the Sacramento River Deep Water Ship Channel (SRDWSC).

FMWT catch from a subset of stations (100 'index stations', which have been used since the inception of the FMWT) is used to calculate abundance indices. FMWT equipment and methods have remained consistent, which allows the comparison of abundance index trends. Monthly and annual abundance indices are calculated using catch data from index stations grouped into 14 regions. Monthly abundance indices are calculated by averaging catch per tow for index stations in each region, multiplying each regional average by its respective weighting factor (i.e., a scalar based on water volume) for each region, and summing those products for all 14 regions. The midseason abundance indices reported here are the sum of the first two (September-October) of the four planned monthly abundance indices that will comprise the annual FMWT abundance indices.

The September and October FMWT surveys were conducted Sept. 8-23 and Oct. 5-19. In 2020, 121 fish tows were conducted as well as 31 zooplankton tows each month. This includes the entirety of stations sample for the survey except non-index station 721 in Cache Slough. Extremely dense aquatic vegetation has prevented fish or zooplankton sampling at this site. Here we report catch from index and non-index stations, species distributions by region, and midseason abundance indices. A map of species distribution by station is also publicly available online: ([FMWT Species Distribution Map](#)).

Delta Smelt

No Delta Smelt were collected at index stations in September or October. The 2020 September-October index (0) is tied with 2016, 2018, and 2019 as the lowest index in FMWT history (Figure 1). No Delta Smelt were collected at non-index stations during September or October. An absence of Delta Smelt catch in the FMWT is consistent among other surveys in the estuary. The Enhanced Delta Smelt Monitoring (EDSM) survey of the U.S. Fish and Wildlife Service (USFWS) caught one Delta Smelt among 15 sampling days (between 9/1 & 9/30) comprised of 445 tows. Likewise, EDSM caught zero Delta Smelt in October over 14 days of sampling (between 10/5 & 10/30) across 568 tows (U.S. Fish and Wildlife Service 2020 Nov 17). USFWS Chipps Island Trawl survey caught zero Delta Smelt across 7 days in September (between 9/16 & 9/30) over 62 tows and none across 11 days in October (between 10/5 & 10/30) over 169 tows (U.S. Fish and Wildlife Service 2020 Nov 12).

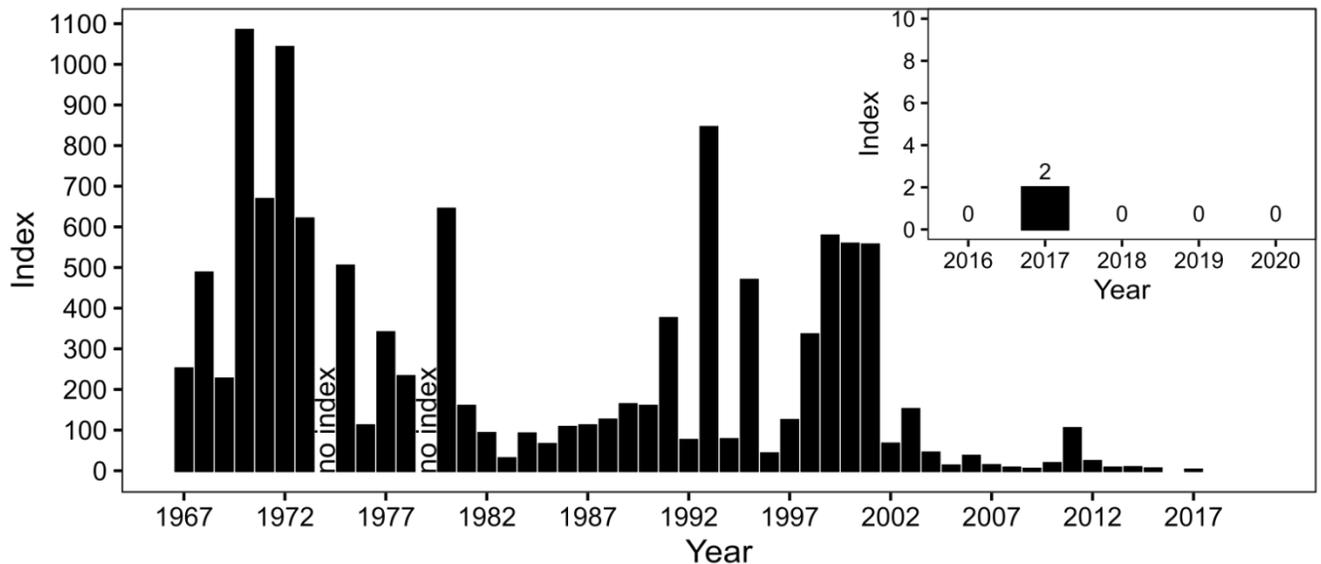


Figure 1. FMWT Delta Smelt September-October abundance indices, 1967-2020. Inset graph shows zoomed view of past five years.

Age-0 Striped Bass

Ten age-0 Striped Bass were collected at index stations in September for an index of 10 and 3 were collected in October for an index of 2. The 2020 September-October index (12) is a 90% decrease over the previous year (Figure 2). One Striped Bass was collected at non-index stations during September and one was collected in October.

In September, 8 of the Striped Bass collected at index stations were in Suisun Bay (75% of monthly index), 1 was collected in the lower Sacramento River, and 1 in the lower San Joaquin River. The single Striped Bass caught at a non-index station was from the SRDWSC.

In October, Striped Bass were only collected at index stations in Suisun Bay (n=3). One Striped Bass was caught at a non-index station in the SRDWSC.

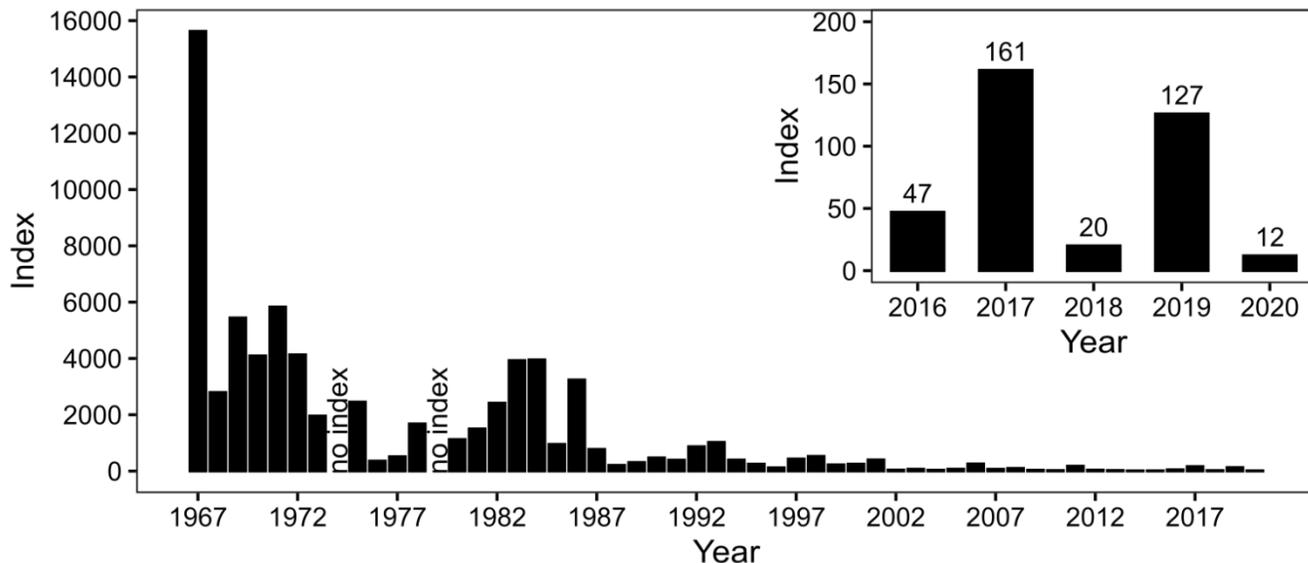


Figure 2. FMWT Age-0 Striped Bass September-October abundance indices, 1967-2020. Inset graph shows zoomed view of past five years.

Longfin Smelt

Zero Longfin Smelt were collected at index stations in September for an index of 0 and none were collected in October for an index of 0. The 2020 midseason index is zero. This is tied with 2015 as the lowest midseason index on record (Figure 3). No fish were collected at non-index stations for September or October.

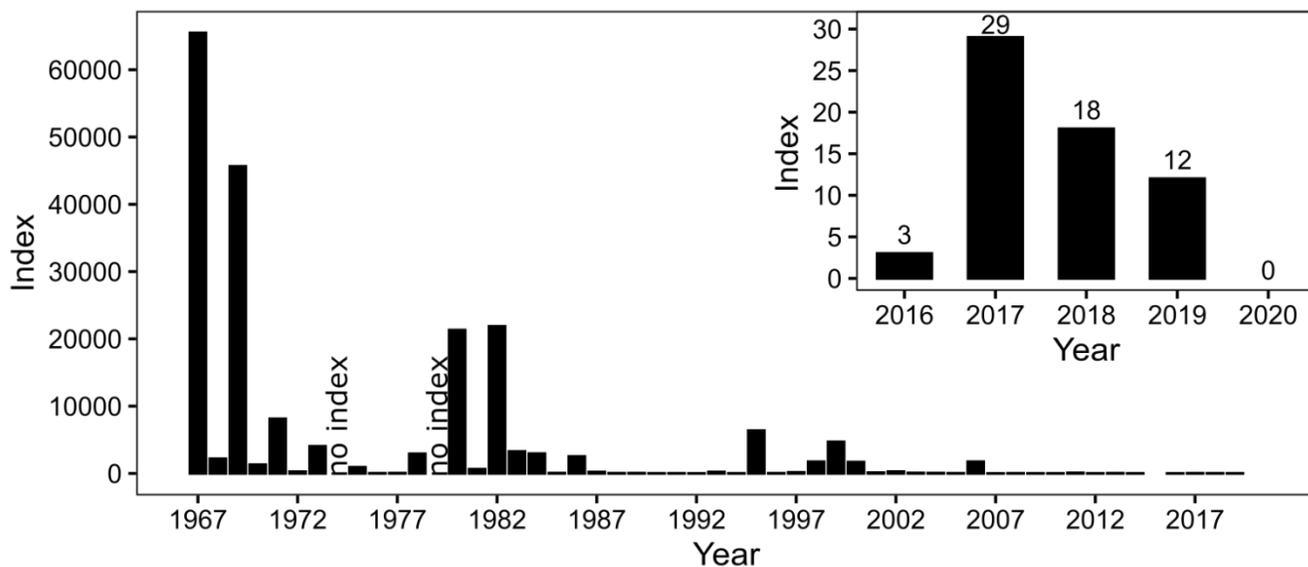


Figure 3. FMWT Longfin Smelt September-October abundance indices, 1967-2020. Inset graph shows zoomed view of past five years.

Threadfin Shad

Thirty-six Threadfin Shad were collected at index stations in September for an index of 43, and 6 were collected in October for an index of 5. The 2020 midseason index (48) is a 20% reduction from the previous year (Figure 4).

In September, Threadfin Shad were collected from index stations in the lower Sacramento River (n=33, 92% of monthly index) with the remaining fish from the lower San Joaquin River (n=3). At non-index stations, 231 fish were collected in the SRDWSC.

In October, Threadfin Shad were collected at index stations in Suisun Bay (n=5, 75% of monthly index) and the lower San Joaquin River (n=1, 25% of monthly index). Threadfin Shad collected at non-index stations were all from the SRDWSC (n=274).

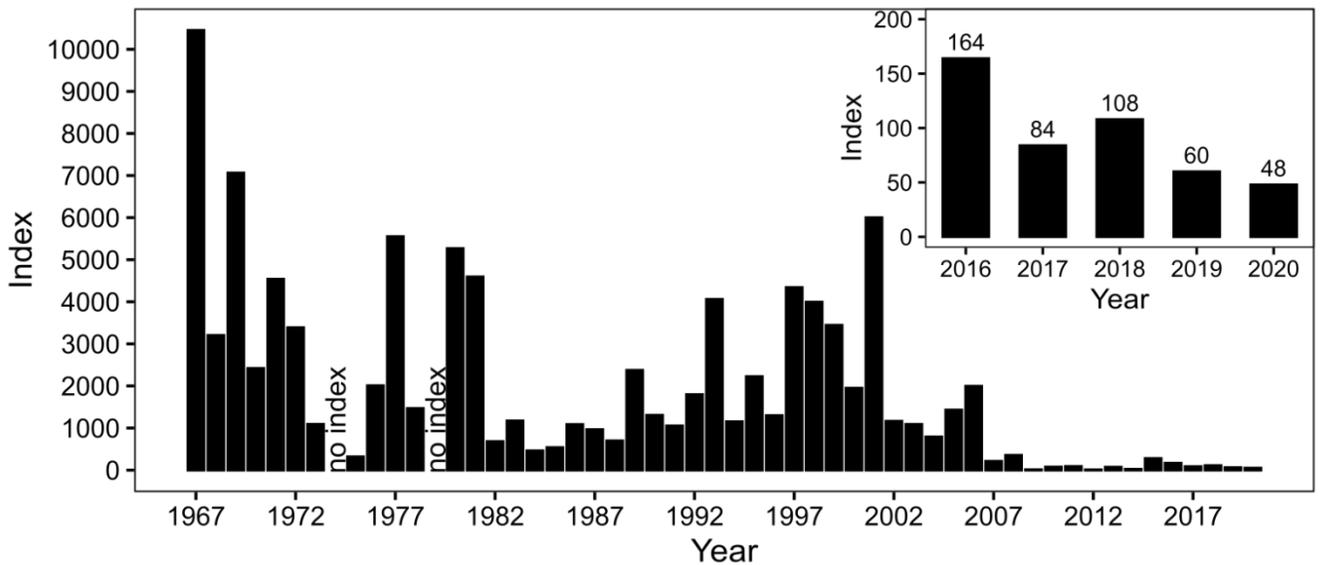


Figure 4. FMWT Threadfin Shad September-October abundance indices, 1967-2020. Inset graph shows zoomed view of past five years.

American Shad

One hundred sixtythreeAmerican Shad were collected at index stations in September for an index of 202, and 113 were collected in October for an index of 97. The 2020 midseason index (299) is a 64% decrease from the previous year (Figure 5).

In September, American Shad were collected at index stations in the lower Sacramento River (n=86, 51% of monthly index), Suisun Bay (n=62, 31% of monthly index), Carquinez Strait (n=8, 9% of monthly index), the lower San Joaquin River (n=4, 2% of monthly index), and San Pablo Bay (n=3, 7% of monthly index). Most fish caught at non-index stations were collected from the SRDWSC (n=82). However, American Shad were also collected at non-index stations in the Napa River (n=1) and the Sacramento River (n=1).

In October, American Shad were collected at index stations in Suisun Bay (n=97, 80% of monthly index), the lower Sacramento River (n=15, 19% of monthly index), and the

lower San Joaquin River (n=1, 1% of monthly index). In October, three American Shad were collected at non-index stations in the SRDWSC.

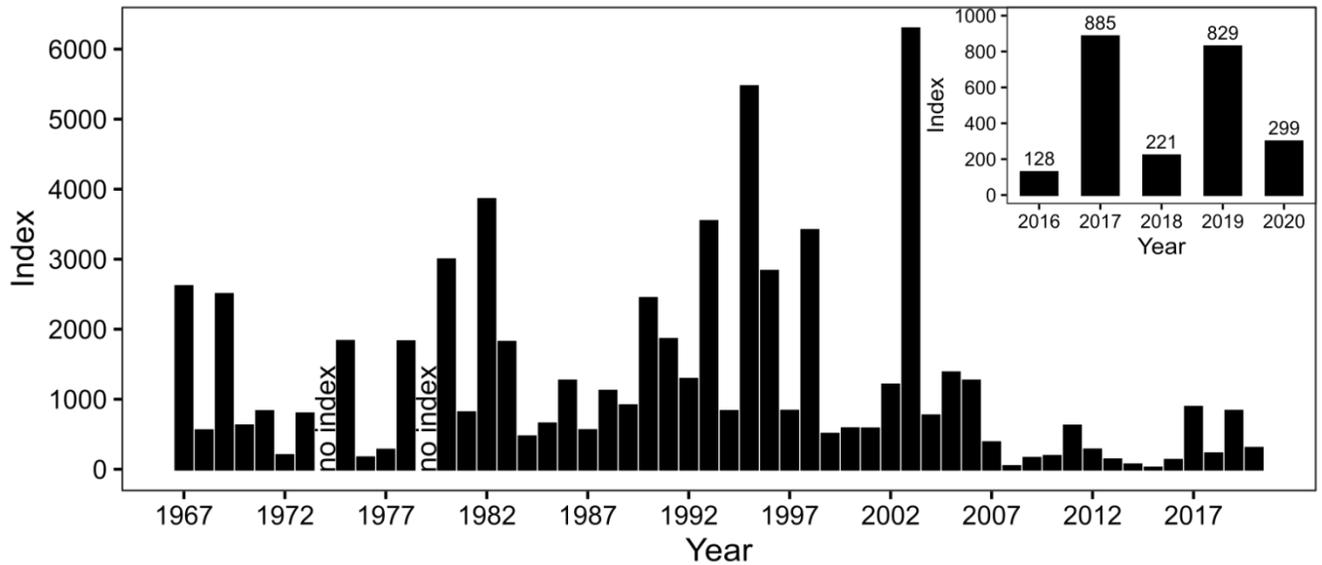


Figure 5. FMWT American Shad September-October abundance indices, 1967-2020. Inset graph shows zoomed view of past five years.

References:

U.S. Fish and Wildlife Service. 2020 Nov 12. Chipps Island trawls CHN & POD species 2012-2020. [accessed 2020 Nov 17].
https://www.fws.gov/lodi/juvenile_fish_monitoring_program/djfm/?dir=Chipps%20Island%20trawls%20CHN-POD%20species%202012-Present.

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