

Memorandum

Date: October 31, 2019

To: Stacy Sherman
Acting Regional Manager
Bay Delta Region

From: James White
Environmental Scientist
Bay Delta Region

Subject: 2019 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, almost to 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 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. 3-16 and Sept. 30-Oct. 11. 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 2019 September-October index (0) is tied with 2016 and 2018 as the lowest index in FMWT history (Figure 1). No Delta Smelt were collected at non-index stations during September or October.

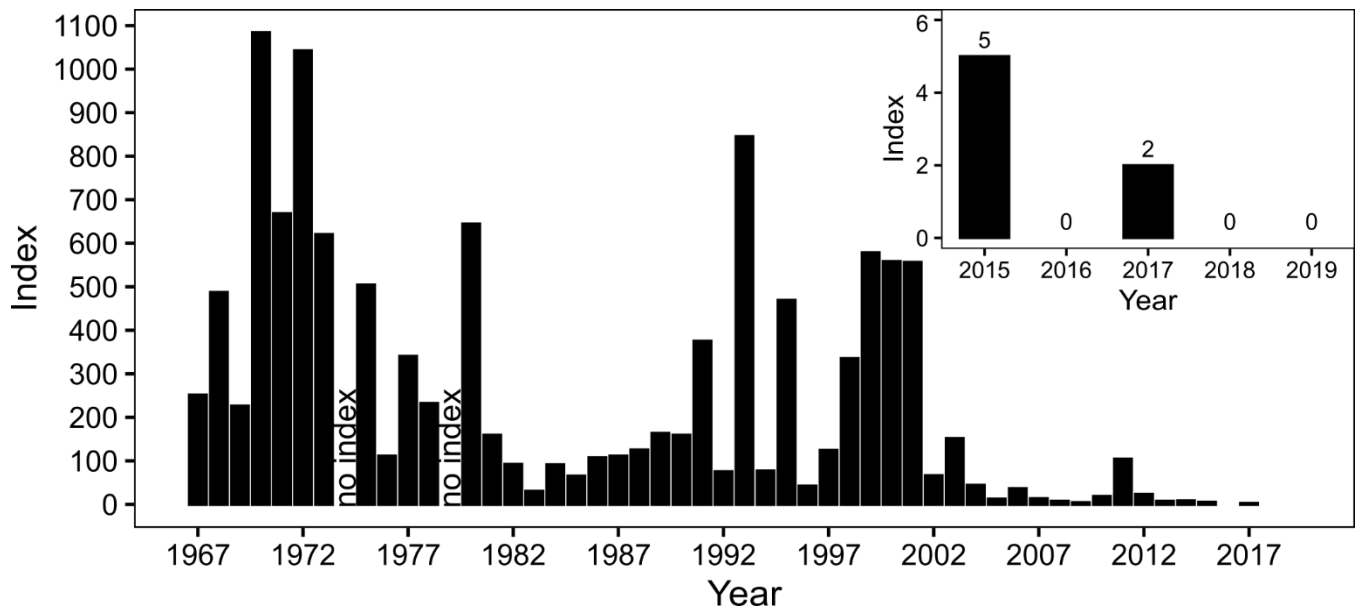


Figure 1. FMWT Delta Smelt September-October abundance indices, 1967-2019.

Age-0 Striped Bass

79 age-0 Striped Bass were collected at index stations in September for an index of 84 and 35 were collected in October for an index of 43. The 2019 September-October index (127) is a 6.35 fold increase over the previous year (Figure 2). 11 Striped Bass were collected at non-index stations during September and one was collected in October.

In September, 74 of the Striped Bass collected at index stations were in Suisun Bay (85% of monthly index), 2 were collected in San Pablo Bay, and once each in the lower Sacramento River, lower San Joaquin River, and eastern Delta. All 11 Striped Bass caught at non-index stations were from the SRDWSC.

In October, most Striped Bass were collected at index stations in Suisun Bay (n=26, 68% of monthly index). The remaining fish were collected from San Pablo Bay (n=2), Carquinez Strait (n=4), the lower Sacramento River (n=1), and the lower San Joaquin River (n=2). One Striped Bass was caught at a non-index station in the SRDWSC.

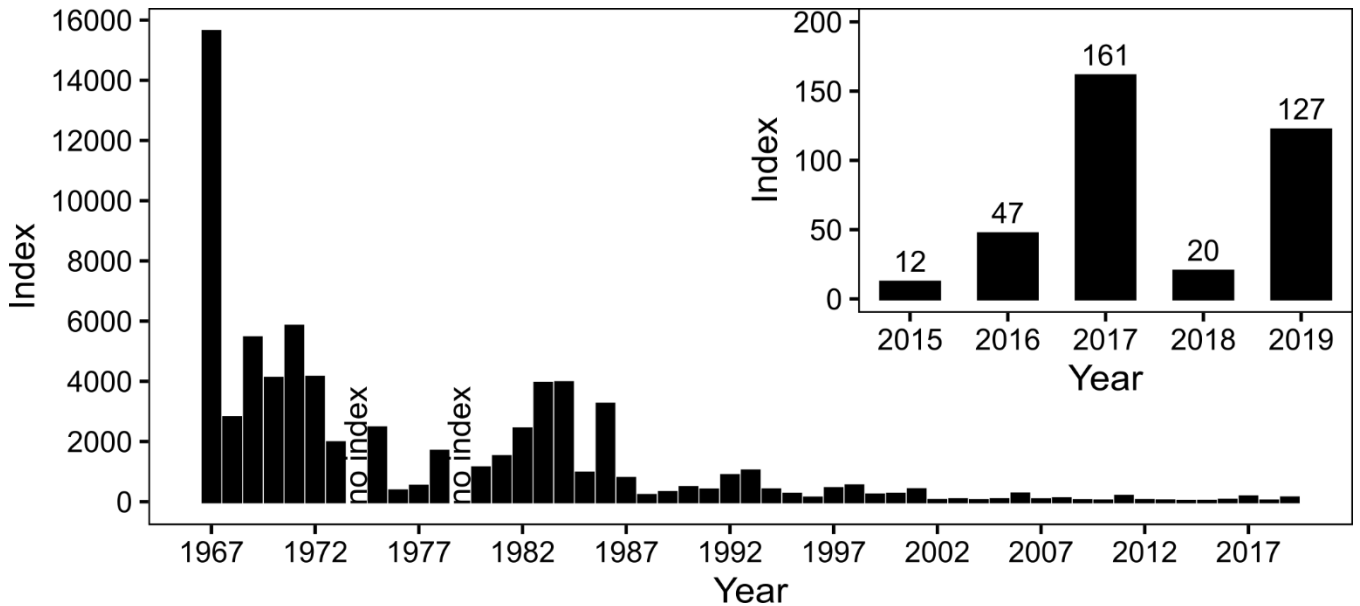


Figure 2. FMWT Age-0 Striped Bass September-October abundance indices, 1967-2019.

Longfin Smelt

Seven Longfin Smelt were collected at index stations in September for an index of 11 and 2 were collected in October for an index of 2. The 2019 midseason index is 12 (not 13 due to rounding). This is a 33% reduction compared to the previous midseason index (Figure 3). No fish were collected at non-index stations for September or October.

In September, Longfin Smelt were collected in Suisun Bay (n=5, 57% of monthly index) and Carquinez Strait (n=2, 43% of monthly index).

In October, the two Longfin Smelt were both collected in Suisun Bay.

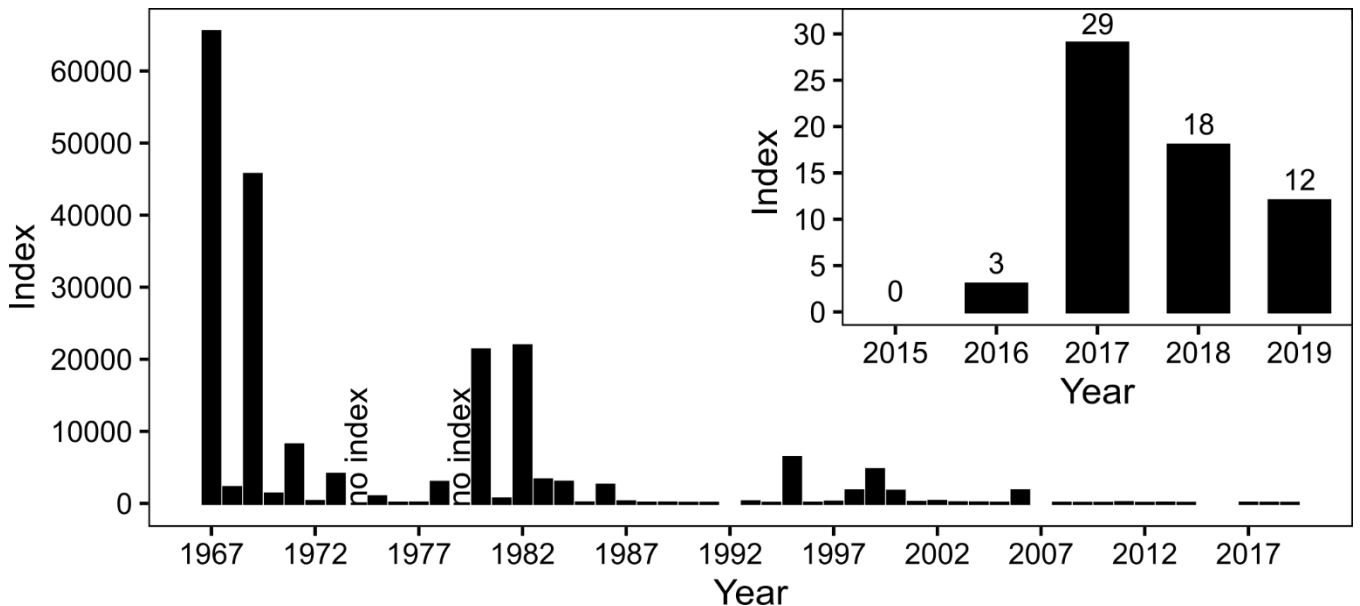


Figure 3. FMWT Longfin Smelt September-October abundance indices, 1967-2019.

Threadfin Shad

22 Threadfin Shad were collected at index stations in September for an index of 43, and 16 were collected in October for an index of 17. The 2019 midseason index (60) is the 5th lowest in survey history (Figure 4).

In September, Threadfin Shad were collected from index stations in San Pablo Bay (n=4), Suisun Bay (n=12, 23% of monthly index), the lower Sacramento River (n=2), and the eastern Delta (n=4). At non-index stations, 95 fish were collected in the SRDWSC.

In October, Threadfin Shad were collected at index stations in Suisun Bay (n=10, 59% of monthly index) and the lower San Joaquin River (n=6, 41% of monthly index). Threadfin Shad collected at non-index stations were mostly from the SRDWSC (n=1046), but two were collected from Steamboat Slough.

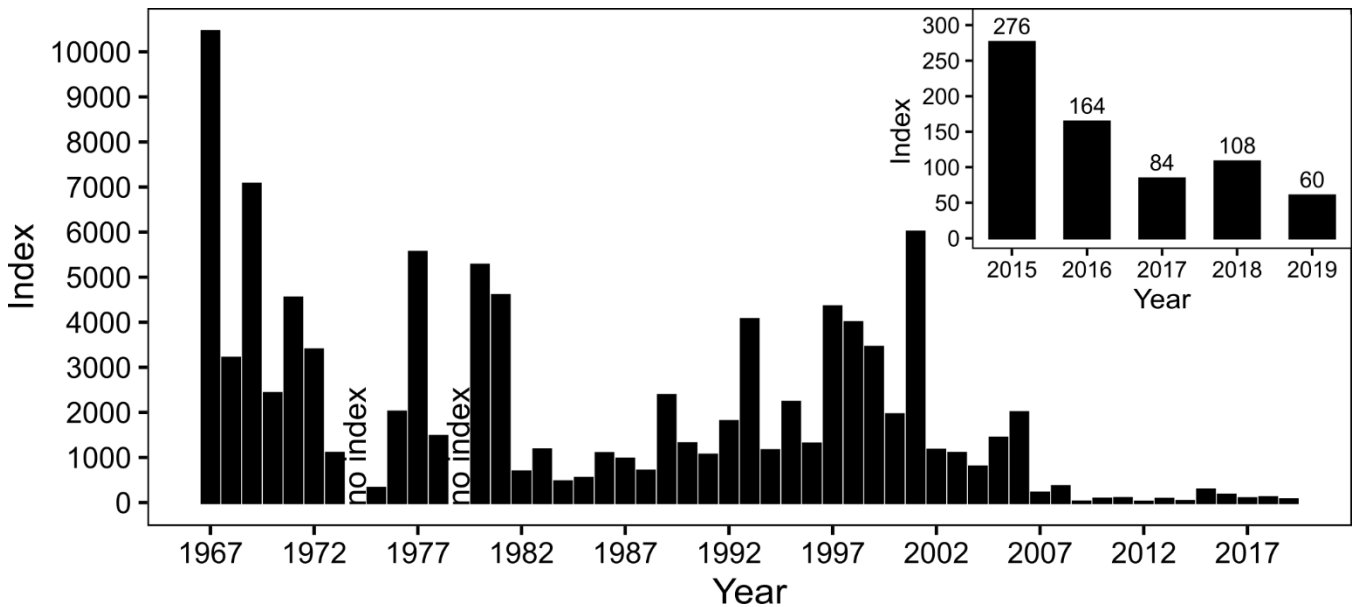


Figure 4. FMWT Threadfin Shad September-October abundance indices, 1967-2019.

American Shad

438 American Shad were collected at index stations in September for an index of 568, and 217 were collected in October for an index of 261. The 2019 midseason index (829) is a 375% increase from the previous year (Figure 5).

In September, American Shad were collected at index stations in Suisun Bay (n=252, 39% of monthly index), San Pablo Bay (n=33, 21% of monthly index), Carquinez Strait (n=15, 11% of monthly index), the lower Sacramento River (n=60, 13% of monthly index), and the lower San Joaquin River (n=78, 16% of monthly index). Most fish caught at non-index stations were collected from the SRDWSC (n=10). However, American Shad were also collected at non-index stations in the Napa River (n=3),

Cache Slough (n=1), Little Potato Slough off the San Joaquin River (n=1), and the Mokelumne River (n=3).

In October, American Shad were collected at index stations in Suisun Bay (n=188, 76% of monthly index), the lower Sacramento River (n=16, 7% of monthly index), the lower San Joaquin River (n=4, 2% of monthly index), San Pablo Bay (n=6, 13% of monthly index), and Carquinez Strait (n=3, 3% of monthly index). In October, the majority of fish were collected at non-index stations throughout the SRDWSC (n=31) and 8 fish were collected from Steamboat Slough off the Sacramento River.

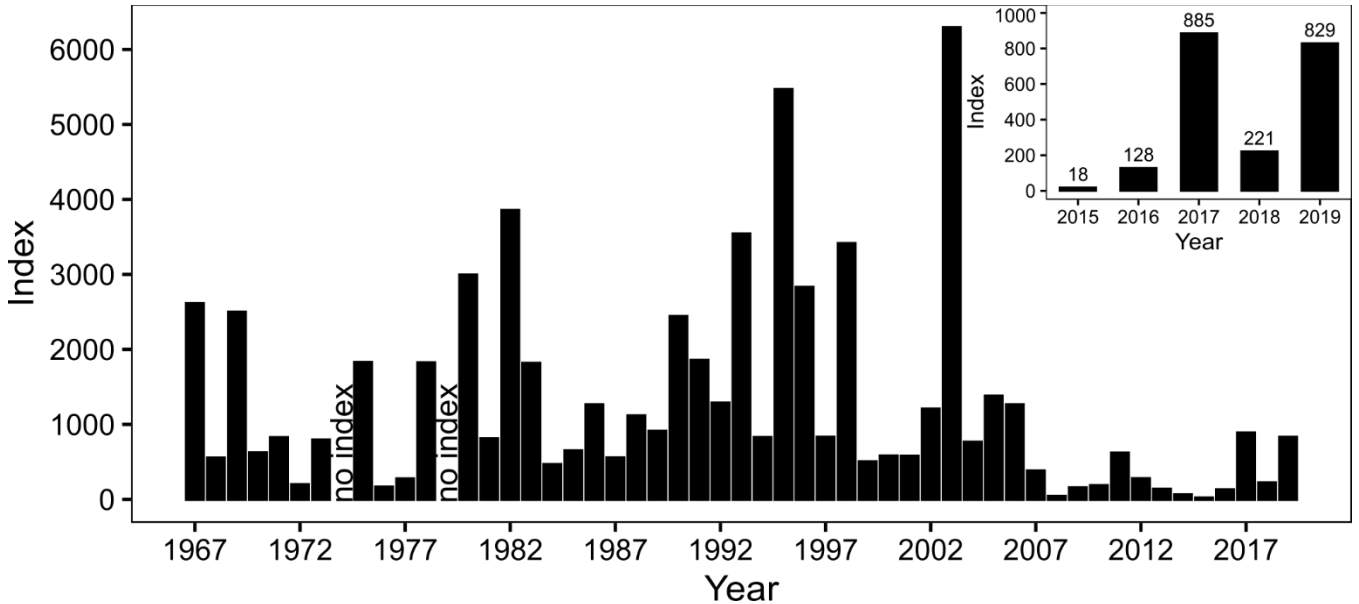


Figure 5. FMWT American Shad September-October abundance indices, 1967-2019.