

Memorandum

Date: September 28, 2021

To: Stephanie Fong
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From: Dr. Timothy D. Malinich
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Subject: 2021 Summer Townet Survey Age-0 Striped Bass Abundance Index

The 2021 Summer Townet Survey (STN) age-0 Striped Bass abundance index was 0.1 and set on July 5th, 2021 (Figure 1). This is the lowest index recorded in the history of the Summer Townet Striped Bass index.

STN annually conducts six Delta-wide surveys on alternating weeks beginning in June and running through August. Each survey samples 31 stations that contribute to the index, as well as nine supplemental stations in the Napa River, Sacramento Deep Water Ship Channel (SDWSC) and Cache Slough (Figure 2). The annual abundance index is calculated using catch data from the two surveys bracketing the date when the mean fork length of age-0 Striped Bass (*Morone saxatilis*) reach or surpass 38.1 mm. The abundance of age-0 Striped Bass beyond this size has been found to be an indicator of survivorship to mid-summer (Stevens 1977).

The mean 38.1 mm fork length in 2021 was exceeded on July 5th, between survey 2 (June 21-June 23) and survey 3 (July 6-8). In 2021 STN caught only 14 age-0 Striped Bass (mean fork length 34.3 mm, measured from 13 fish) at index stations during survey 2. Two weeks later only 3 individuals (mean fork length 39.3 mm) were captured during survey 3. Striped Bass from both surveys 2 and 3 were observed in Suisun Bay, the confluence of the San Joaquin and Sacramento rivers, the Lower Sacramento River and the south Delta (Table 1).

In 2021 Striped Bass were largely observed in the non-index stations located within the north Delta, upstream of the Townet Index stations. In survey 2, 37 Striped Bass were caught in Cache Slough and the SDWSC. In survey 3 this number decreased to 11, but again fish were located in the SDWSC and Cache Slough stations. While the timing of the Striped Bass Townet index in 2021 was similar to 2020 (also set on July 5th and bracketed by Survey 2 and 3), the distribution of age-0 Striped Bass was strikingly different. In contrast to 2021, non-index stations from 2020 in both surveys 2 and 3, had a total age-0 Striped Bass catch of 12 and only within the SDWSC.

Low catches by STN are supported also by CDFW's 20-mm survey, conducted between March and July of 2021. The 20-mm survey first observed larval Striped Bass in late April and these

were consistently caught in the North Delta, Lower Sacramento River, and the East Delta/San Joaquin River region. Larval Striped Bass catch peaked during Survey 5 (May 17- May 20th, n=653, index and non-index stations) before falling off in the first week of June (survey 6, between June 1- June 7, n=292). Following this survey week, the first Summer Townet survey of 2021 caught a total of 159 Striped Bass from index and non-index stations (Figure 3). No Striped Bass were caught in July by 20-mm. The Striped Bass catch from 20-mm can be accessed here: [20-mm EDI](#), or viewed here: [CDFW 20-mm Survey](#).

The STN age-0 Striped Bass index can help identify changing trends in the bass population but is not a direct predictor of the Striped Bass population. For instance, it is possible that age-0 Striped Bass were not present within the geographic sampling range of the Summer Townet Survey, and changes in flows and the position of X2 are known to impact the STN indices (Stevens 1979; Kimmerer et al. 2001). Other potential impacts to the San Francisco Estuary Striped Bass population, and therefore the STN index, have been explored such as Striped Bass movements into shallower shoal habitats rather than open water habitats (Sommer et al. 2011).

References

- Kimmerer WJ, Cowan JH, Miller LW, Rose KA. 2001. Analysis of an estuarine striped bass population: Effects of environmental conditions during early life. *Estuaries*. 24(4):557–575. doi:10.2307/1353257.
- Interagency Ecological Program (IEP), L. Damon, and A. Chorazyczewski. 2021. Interagency Ecological Program San Francisco Estuary 20mm Survey 1995 - 2021 ver 3. Environmental Data Initiative. <https://doi.org/10.6073/pasta/292cd283cb636b8adae9bb97761ba5d3> (Accessed 2021-09-17).
- Sommer T, Mejia F, Hieb K, Baxter R, Loboschefskey E, Loge F. 2011. Long-term shifts in the lateral distribution of age-0 striped bass in the San Francisco estuary. *Trans Am Fish Soc.* 140(6):1451–1459. doi:10.1080/00028487.2011.630280.
- Stevens DE. 1979. Environmental factors affecting striped bass (*Morone saxatilis*) in the Sacramento-San Joaquin estuary. *San Fr Bay Urban Estuary*. 1970:469–478.

Attachments: (Figures 1-3, Table 1)

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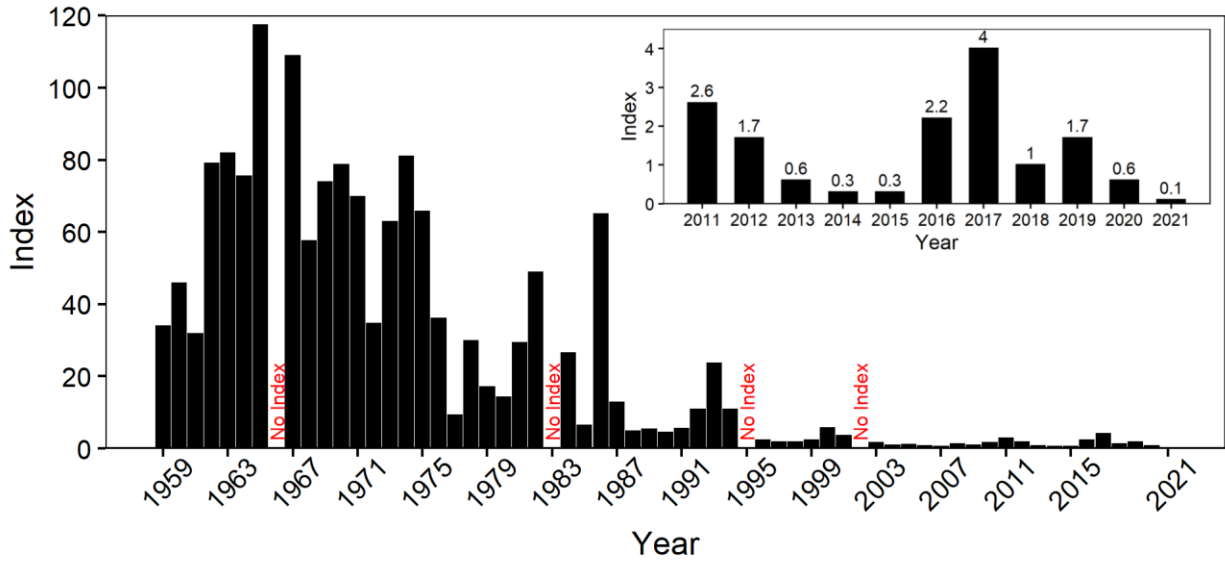


Figure 1. Summer Townet Survey age-0 Striped Bass abundance indices, 1959-2021, with inset displaying 2011-2021.

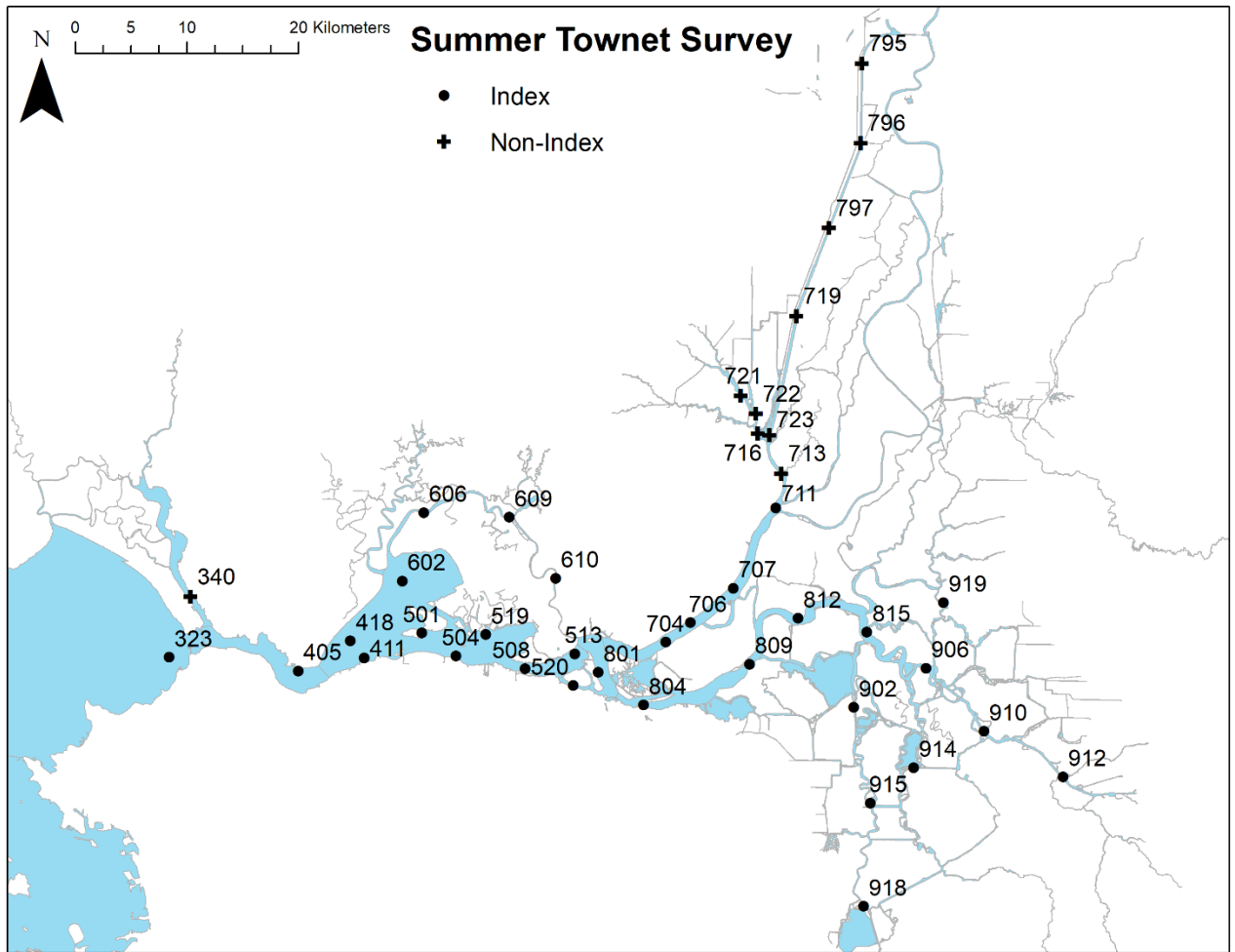


Figure 2. Map of Summer Townet Survey index stations (circles) and non-index stations (crosses) within the San Francisco Delta Estuary. Note that the non-index station 722 was

added in 2021 to replace the previously sampled non-index station 721. Station 721 could not be sampled this year due to excessive aquatic vegetation.

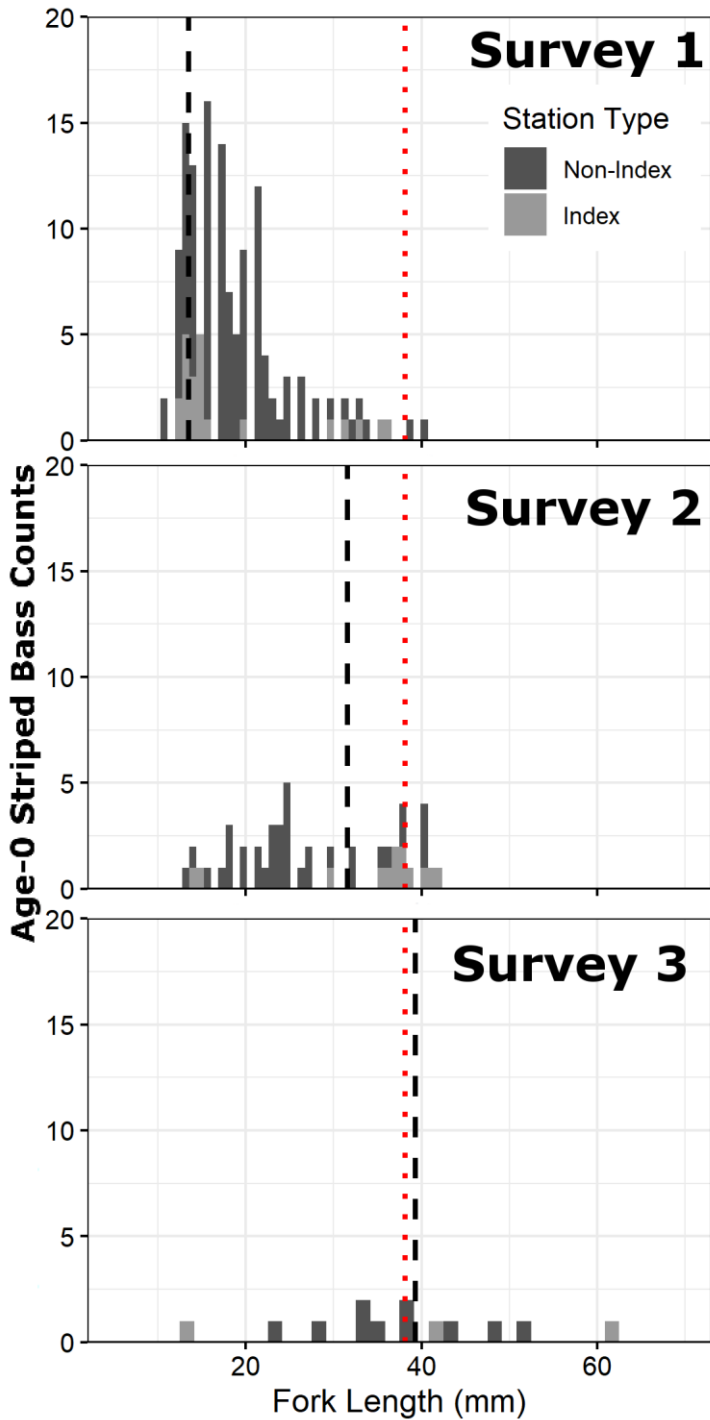


Figure 3. Length frequency histograms for age-0 Striped Bass caught in index (light grey) and non-index stations (dark grey) in surveys 1-3. The red dotted line indicates the target 38.1 mm mean fork length used to calculate the age-0 Striped Bass index and the black dashed line indicates the mean fork length for age-0 Striped Bass within a single survey at index stations (Survey 1=18.5 mm, Survey 2=34.3 mm, and Survey 3=39.3 mm).

Table 1. Age-0 Striped Bass catch in index stations in 2021, by region for surveys 2 and 3 as well as the stations contributing to catch within each region.

Survey	Region	Catch	Stations
2	Suisun Bay	4	504, 602
2	Sacramento River	4	704, 706
2	Lower San Joaquin	5	801, 804
2	South Delta	1	910
3	Sacramento River	1	706
3	Confluence	2	801