State of California
Department of Fish and Wildlife

Memorandum

Date: February 6, 2024

To: Erin Chappell
Regional Manager
Bay Delta Region

From: Margaret Johnson
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Bay Delta Region

Subject: 2023 Summer Townet Survey Age-0 Striped Bass Abundance Index

The annual California Department of Fish and Wildlife Summer Townet Survey abundance index for age-0 Striped Bass (*Morone saxatilis*) in 2023 is 1.4. This marks an increase from the previous three years in which the indices were below 1 (Figure 1).

The Summer Townet Survey (STN) sampling period consists of six biweekly surveys, beginning in mid-June and ending in late August. During each survey, young pelagic fishes are sampled from 40 fixed stations, which consist of 31 index stations and nine supplemental non-index stations (Figure 2). These sampling stations are located in the upper San Francisco Estuary, from eastern San Pablo Bay upstream through to the Sacramento Deep Water Ship Channel (SDWSC) and to Stockton on the lower San Joaquin River. The STN age-0 Striped Bass annual index is calculated from the two survey indices bracketing the date when the Striped Bass reach or surpass a mean fork length of 38.1 mm. This year, we estimated that Striped Bass reached a mean length of 38.1 mm on August 2nd, between Surveys 4 (July 24-July 28) and 5 (August 7-11). More information on index calculation is available at the project website Summer Townet Survey.

The higher catch of age-0 Striped Bass in 2023 may be attributed to the heavy storms and resultant river runoff that occurred in the beginning of that year. Freshwater flow is associated with delayed spawning and increased abundance of young Striped Bass in the Sacramento - San Joaquin Delta (Stevens 1977, Turner & Chadwick 1972), and the total catches at index and non-index stations somewhat reflect this relationship. The highest catch of age-0 Striped Bass consistently occurred in Montezuma Slough, which showed a total catch of 671 during Survey 1. The catch in Montezuma Slough then decreased throughout the summer, as recruitment declined. The catch in Suisun Bay showed a similar pattern, beginning at 100 during Survey 1 and decreasing sharply thereafter. In midsummer, age-0 Striped Bass catches slightly increased further upstream at the confluence of the Sacramento and San Joaquin rivers, lower

Sacramento River, and the SDWSC. All subregions showed the lowest catches in Survey 6. These patterns indicate an overall decrease and slight upstream shift in age-0 Striped Bass abundance from June to August.

According to California Department of Water Resources, 2023 was a wet year which was preceded by two critical years and one dry year (see Water Year Hydrologic Classification Indices). As droughts become more frequent due to climate change (Cayan et al. 2010, Williams et al. 2020), understanding the drought resilience of native and non-native estuarine fish species will become crucial in managing their populations (Mahardja et al. 2021). The relative increase in age-0 Striped Bass abundance in 2023 demonstrates their ability to recover partially from the impacts of drought, if temporarily.

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Dr. Tim Malinich
Colin Brennan

References

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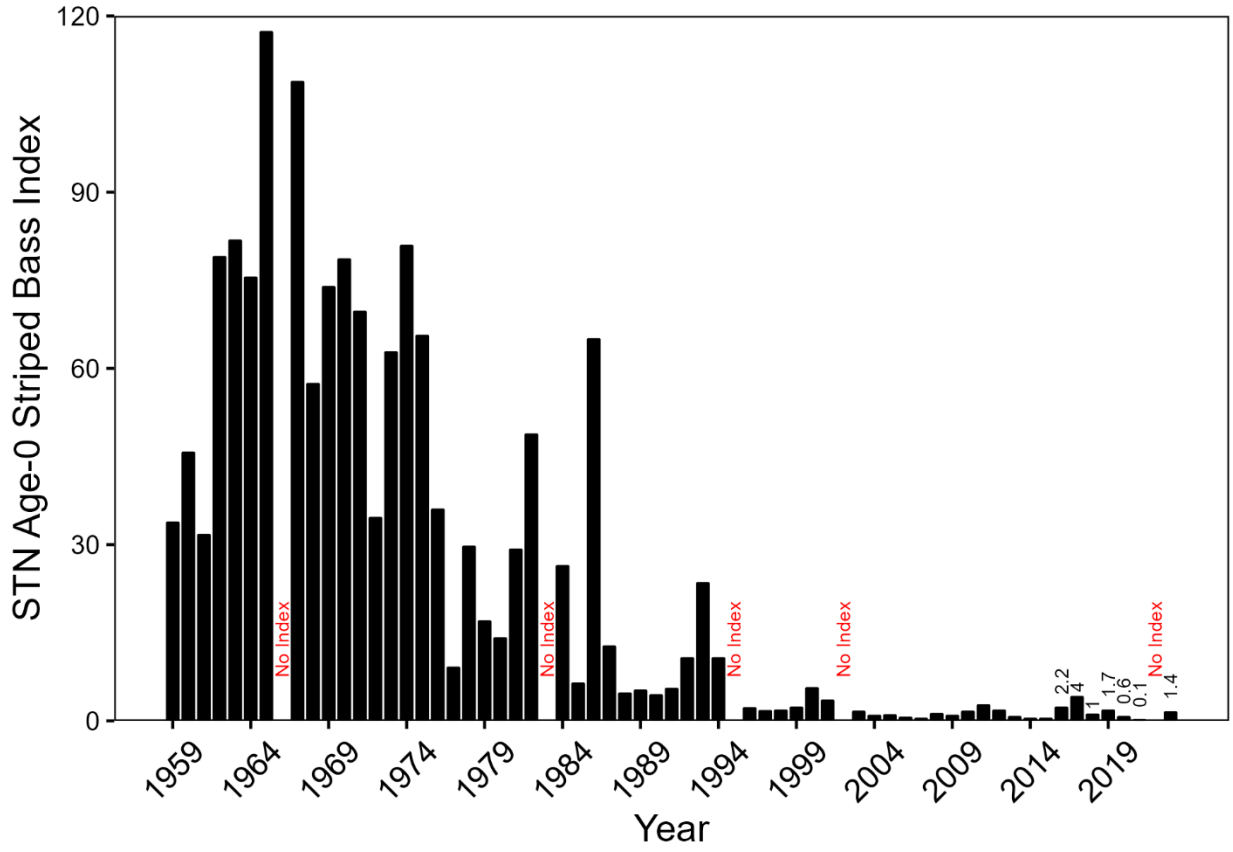

Figure 1. Summer Townet Survey age-0 Striped Bass abundance indices, 1959-2023.

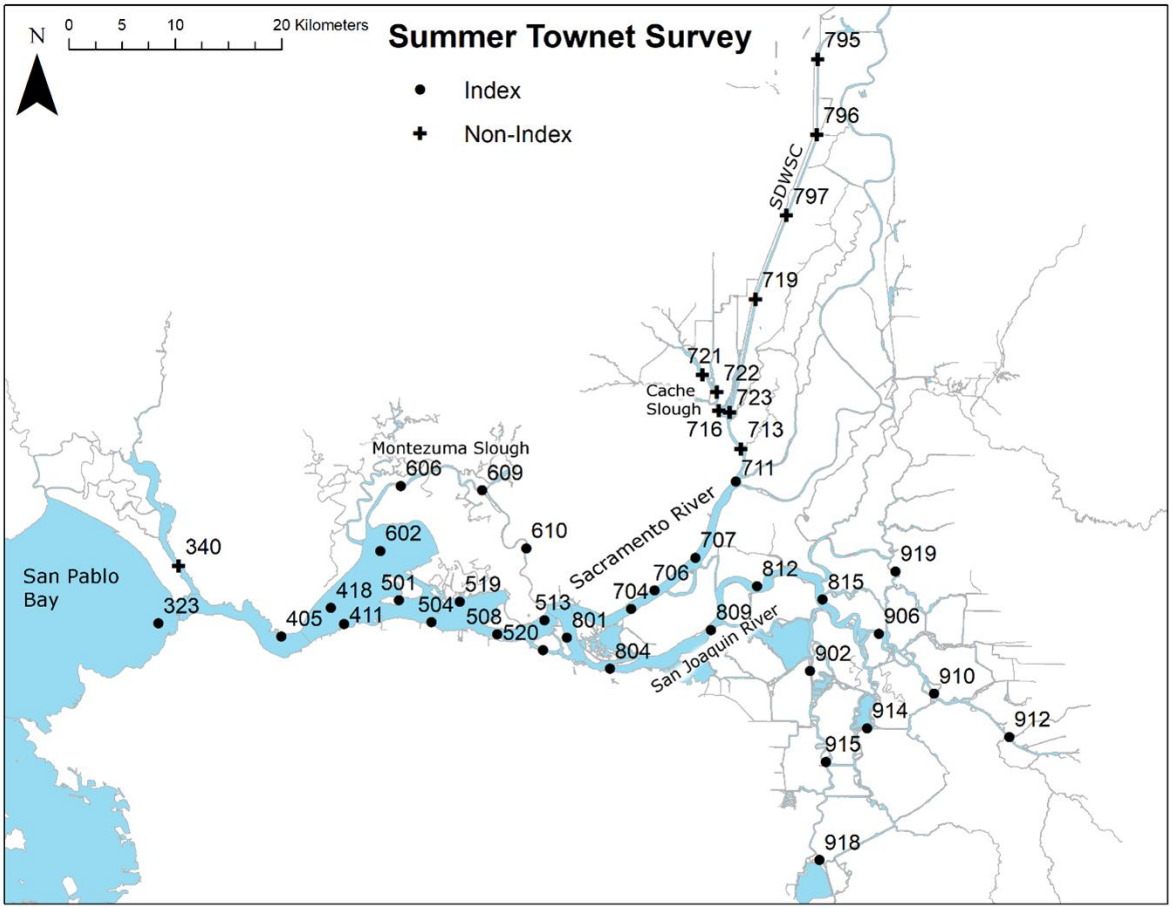

Figure 2. Map of Summer Townet Survey index stations (circles) and non-index stations (crosses) within the San Francisco Estuary. Station 722 was added in 2021 to replace the previously sampled station 721.