

Longfin Smelt Distribution: Abundance and Evidence of Spawning in San Francisco Bay Tributaries

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Historic Surveys conducted as part of monitoring programs have shown evidence suggesting Longfin Smelt may utilize tributaries in North Bay and South Bay as spawning and larval rearing habitat predominantly during high outflow years; however, the frequency and magnitude of the contribution of tributary spawning to adult abundance and year class strength is currently unknown. In January 2015, we began sampling tributaries to the San Francisco Bay Estuary to document the distribution and relative abundance of adults, larvae, and juvenile recruits. In four tributaries, (Napa River, Sonoma Creek, Petaluma River, and Coyote Creek) adults were sampled using an otter trawl monthly, while larvae were sampled using a replica of California Department of Fish and Wildlife's Smelt Larval Survey sled. In 2016 and 2017, we included the 20-mm net in the North Bay tributaries to document juvenile distribution and abundance. Larval and juvenile Longfin Smelt were found in low densities in the North Bay tributaries in 2015 and 2016, however; no larvae or juveniles were found in South Bay tributaries. In 2017 however, with a significant increase in fresh water input, larger numbers of Longfin Smelt were found in all North Bay tributaries, San Pablo Bay, Central Bay and juveniles were also found in South Bay tributaries. Adults have been more abundant in South Bay tributaries than the North Bay suggesting this area may operate as a sink to the population in drought periods. Larval life stages were found predominantly in lower salinity habitats than juveniles and adults, and few Longfin Smelt were found in the North Bay or South Bay when water temperatures exceeded 18 °C. These data suggest Longfin Smelt spawned in North Bay tributaries during this drought period as well as during a wet year and at least some individuals are found outside of the existing monitoring range.