

MOVEMENTS OF CULTURED WHITE SEABASS, *TRACTOSCION NOBILIS*, RELEASED THROUGHOUT THE SOUTHERN CALIFORNIA BIGHT.

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The white seabass, *Atractoscion nobilis*, is a highly prized recreational and food fish saltwater species that inhabits the west coast of the U.S. and Baja California, Mexico. A stock enhancement program began in 1983 to help restore the depressed fishery. From 1988 to 2005, researchers tagged and released more than 1.1 million hatchery-reared juvenile white seabass with a total weight exceeding 130 tonnes (Figure 1).

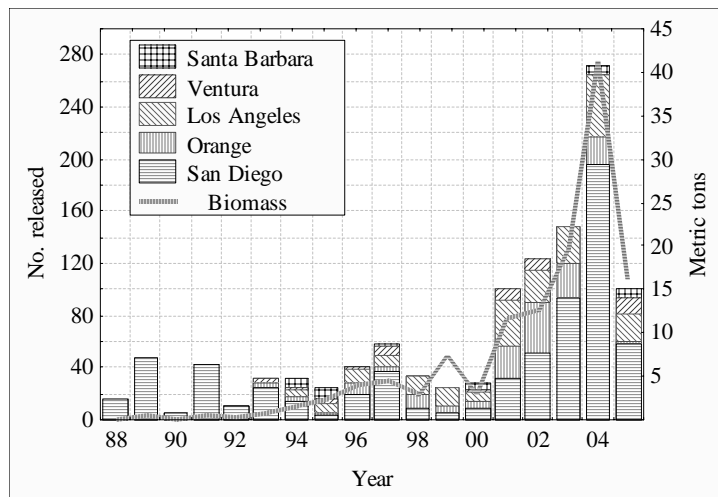


Figure 1: Number and biomass of cultured white seabass released in southern California coastal counties.

More than 1600 of these tagged white seabass have been recovered through a variety of sampling and survey methods. Time at liberty ranged from several days to 11.5 years. However most of these fish (69%) were recovered within six months in our fisheries-independent sampling program or after being entrained in coastal power generating stations (Figure 2). Distances between release and recovery sites ranged from < 1 nm to over 150 nm. Some individuals covered these greater distances in 18 months while others have been recovered near their release site three years later. Linear regression indicates that time at liberty is not a good predictor of the distance a white seabass will be recovered

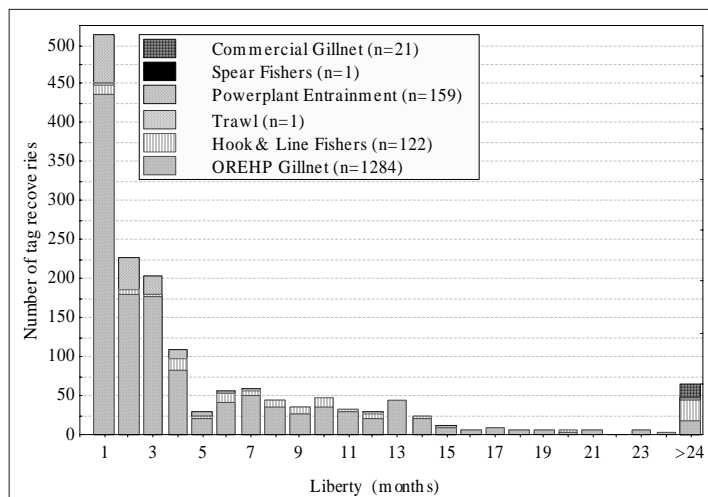


Figure 2: Time at liberty for hatchery-reared white seabass recovered through different sampling and survey methods.

from its release site as only about 37% of the observed variation can be accounted for with this analysis. Most fish were recovered fairly close to shore in water less than 30 m deep on either mainland California or at one of the offshore Channel Islands. However for fish released along the mainland to be recovered at some of these offshore islands means that they have to navigate over deep ocean basins deeper than 800 m. Dispersal appears to be fairly random with an approximately equal number of tag recoveries coming from locations north

and south of the release sites. Although white seabass caught by the artisanal fishery from the Pacific coast of southern Baja California are sampled routinely, no tagged fish have been recovered.

To increase our understanding of the short term movements patterns of white seabass, we surgically implanted acoustic pingers into the peritoneal cavity of 58 cultured white seabass (\bar{X} SL=27 cm). After surgery, fish were held for 2 to 5 weeks to assess their healing before release. Acoustically tagged cultured white seabass were released with a larger group of cultured fish into several embayments in southern California on five occasions. The fish were tracked actively from a small vessel and passively using an array of moored hydrophones. Emigration rates from embayments ranged from 37% to 57%, with most of these individuals leaving the embayment by the fifth day after release. In only one case did an individual emigrate from the embayment after the first week. Additionally, emigration from the embayments occurred only at night and on an ebbing tide, suggesting a strong innate behavior (Figure 3). For those that remained in the embayment, survival appeared to be low because we either recovered the pingers off the sea floor or we did not hear from them again.

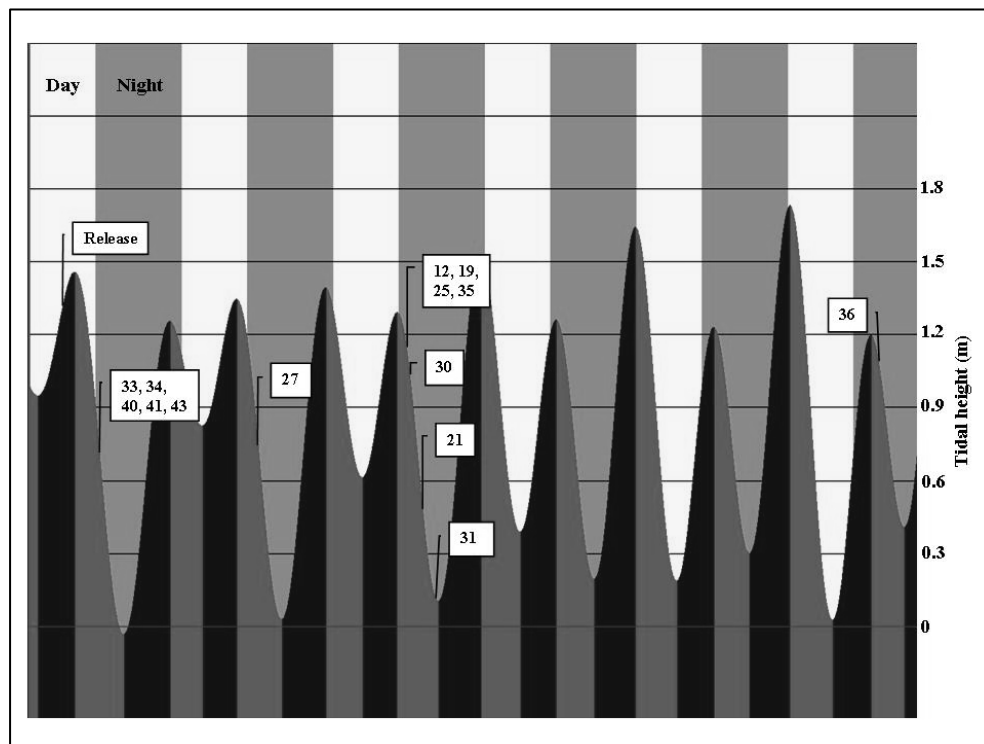


Figure 3: Diurnal and tidal cycles during which hatchery-reared white seabass with implanted acoustic pingers emigrated from a southern California embayment.

Our studies show that the movements of hatchery-reared white seabass released in southern California are quite variable and random. They typically migrate fairly quickly from the release site and disperse widely throughout their range. Because they are commonly found mixed with schools of wild fish, we suspect that their patterns of dispersal and habitat use are consistent with their wild conspecifics. Although they are found most commonly in shallow water habitats, white seabass > 20 cm SL do not prefer embayments over coastal waters.