## Fall Midwater Trawl Survey Results

*Lee Miller*

The 1997 fall midwater trawl abundance index for young striped bass is 565. The abundance index is the sum of monthly indices for September-December. The 1997 index is higher than indices from the last two years, but is the fifth lowest of record. The December index is 64, the second lowest of record. Young striped bass were found mainly in the lower San Joaquin and Sacramento Rivers in September, with distribution expanding into Suisun Bay in October and into San Pablo Bay by December.

The 1997 fall midwater trawl abundance index for American shad is 2,302. The 1997 index is almost half the 1996 index and almost one-third of the record high index of 6,859 recorded in 1995.

The fall index for longfin smelt is 689, about half of last years index of 1388 and more than an order of magnitude lower than the 1995 index of 8,633.

More information about fall midwater trawl results can be viewed on the Internet. The URL is www.Delta.dfg.ca.gov/data/mwt97/.

## Bay Fish and Shrimp Monitoring

*Kathy Hieb*

The San Francisco Bay Study fisheries monitoring survey collected 3 "new" species in November 1997. One species is a recently introduced goby from Asia (*Tridentiger barbatus*) and its introduction is discussed by Kevin Fleming in the next article in this newsletter. We also collected a blue crab (*Callinectes sapidus*) in Carquinez Strait and a juvenile white seabass (*Cynoscion nobilis*) in South Bay. Although several blue crabs have been collected by bay shrimp trawlers in recent years, we do not know if a reproducing population is established in the estuary. These collections may have been recaptures from one or several deliberate introductions. The white seabass collection was not unexpected, as the white seabass population has increased north of Point Conception during the present El Niño event.

Pacific sardine catches increased to record numbers in the estuary in late 1997. In November and December 1997, Pacific sardines were more common than northern anchovy, which is a first for the survey. Not only have Pacific sardine numbers increased, but northern anchovy numbers have decreased along the

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## Exotic Goby Takes Up Residence in Estuary

*Kevin Fleming, DFG*

One more exotic species of goby appears to have taken up residence in the estuary. Four sh^kihaze gobies, *Tridentiger barbatus* (Gunther), have been collected in otter trawls during routine sampling of the estuary by the San Francisco Bay/Delta Outflow Study. The first, a 32mm TL juvenile, was collected on November 3, 1997, in the San Joaquin River near West Island at a depth of 12.9 meters. The bottom temperature was 17.6°C and the bottom salinity was 1.8. The next three were collected on December 3, 1997, in a single tow in San Pablo Bay near Point San Pedro at a depth of 6 meters. The bottom temperature was 13.9°C and the bottom salinity was 12.8.

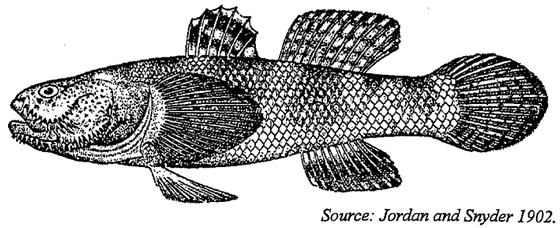
Our information on the sh^kihaze goby is limited to descriptions of morphology and range; a literature review is underway. The sh^kihaze goby can be distinguished from other gobies by the presence of barbels on the edges of the suborbital and lower jaw. No other goby in the estuary exhibits this characteristic. The sh^kihaze is native to Asian marine and brackish waters, from China to Japan and Korea (Jordan and Synder 1902, Masuda *et al* 1984, Tomiyama 1936).

### Reference


Jordan D.S., J.O. Synder. 1902. A Review of the Gobioid Fishes of Japan, with Descriptions of Twenty-One New Species. Proceedings of the United States National Museum 24(1244):33-132.

Masuda H., K. Amaoka, C. Araga, T. Uyeno, T. Yoshino, editors. 1984. The Fishes of the Japanese Archipelago. 2 ed. Tokyo: Tokai University Press. 437 p.

Tomiyama I. 1936. Gobiidae of Japan. Japanese Journal of Zoology 7(1):37-112.

*Source: Jordan and Snyder 1902.*

Figure 1
The sh^kihaze goby has recently been found in the estuary.



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central California coast during the present El Niño.

Preliminary 1997 abundance indices for selected estuarine species, including the shrimp *Crangon franciscorum*, Dungeness crab, longfin smelt, and starry flounder indices have been calculated and will be reported in the next issue of the IEP Newsletter.

## Phytoplankton Biomass and Community Composition

A gradual decrease in chlorophyll a concentration characterized stations in the upper estuary between October and December. The highest chlorophyll a concentrations occurred in October in the southern Delta (stations P8 and C10), where concentrations were 6-22 ug/l due to an increase in diatoms and greens; *Skeletonema potamos* was the most abundant diatom. At the rest of the stations, chlorophyll a concentrations were 3 ug/l or less. By November, chlorophyll a concentrations decreased by a factor of two in the southern Delta (3-12 ug/l) with the decline of *Skeletonema potamos*. A small increase in chlorophyll a concentrations to 5 ug/l in the lower Sacramento River at Point Sacramento (D4) was associated with the flagellate, *Cryptomonas ovata*, but concentrations at the rest of the stations remained at <2 ug/l. Chlorophyll a concentrations continued to decrease and the maximum concentration in December was only 5 ug/l at Vernalis (C10).

## Indirect Measurement of Delta Outflow Using Ultrasonic Velocity Meters and Comparison with Mass-Balance Calculated Outflow

*Richard N. Oltmann, USGS*

A measurement of the quantity of water flowing from the Sacramento-San Joaquin Delta into Suisun Bay (Delta outflow) has been desired by those studying and managing the San Francisco Bay/Delta estuary since the 1920s. Historically, Delta outflow has been estimated using a mass-balance calculation that uses measured Delta inflows and exports, and imprecise estimates of consumptive use for the approximately 2,000 small agricultural diversions within the Delta. The DWR has estimated Delta outflow for 1929 to present using the computer program DAYFLOW. The USBR also estimates Delta outflow using the mass-balance method; their estimates are in close agreement with the DWR estimates. Although the mass-balance method has worked reasonably well over the years, it has several shortcomings. The method does not account for the filling and draining of the Delta during the spring-neap tidal cycle, and neglects any effects from variations in atmospheric pressure and wind (wind effects will not be discussed in this article). Also, any error in the estimation of Delta consumptive use is passed directly to the estimate of Delta outflow.

As part of the IEP, the USGS can now provide indirect measurements of Delta outflow by combining flow measurements from 4 of the 10 continuous flow monitoring stations currently operated by the USGS in the Delta. Ultrasonic velocity meters (UVM) are being used to provide 15-minute interval time-series of tidal flow data at the ten flow monitoring stations.

For an explanation of the operation of a UVM, please refer to the autumn 1995 Newsletter article "Continuous Flow Measurements Using Ultrasonic Velocity Meters: An Update". Indirect measurements of Delta outflow are obtained by combining the measured flow data from the UVM stations for the San Joaquin River at Jersey Point, Sacramento River at Rio Vista, Threemile Slough, and Dutch Slough at Jersey Island (Figure 1).

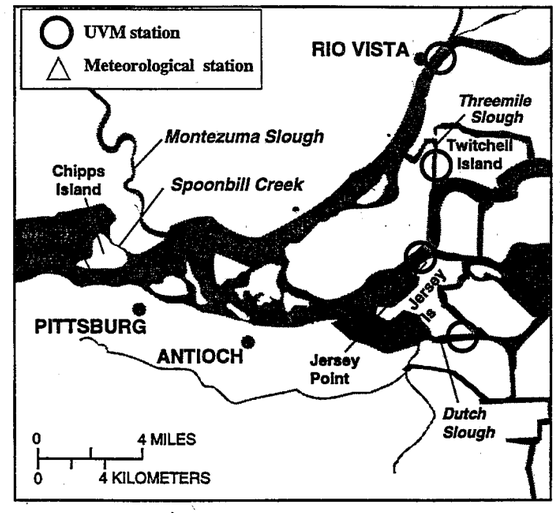


Figure 1
Continuous flow monitoring UVM stations used to provide indirect measurement of delta outfiflow.

The first attempt by the USGS to