

Sanddabs

History of the Fishery

Although not as important to California fisheries as other flatfishes, sanddabs are nevertheless highly prized by the commercial industry and recreational anglers for their excellent edibility. Four species of sanddabs are found in California waters - Pacific sanddab (*Citharichthys sordidus*), longfin sanddab (*Citharichthys xanthostigma*), speckled sanddab (*Citharichthys stigmæus*), and gulf sanddab (*Citharichthys fragilis*). Commercial sanddab landings and recreational catches consist predominantly of the two largest species, Pacific sanddab and longfin sanddab. Pacific sanddab is the most abundant and makes up the bulk of the landings in central and northern California waters, whereas Pacific sanddab and longfin sanddab are caught in southern California. Because of their smaller size, speckled and gulf sanddabs are not important to the fisheries.

Recorded sanddab landings were highest (2.6 million pounds) in 1917. In 1918, landings decreased to 1.8 million pounds, and from 1919 to 1921 they remained less than 0.8 million pounds. In 1922, annual landings increased, reaching approximately two million pounds in 1925. From 1930 to 1974, annual landings were below a million pounds. Since 1975, landings have fluctuated between 1.4 million pounds and 0.6 million pounds annually. During the last decade, landings have been above the historical annual average, except for 1983 and 1984, the period of a strong El Niño event. Landings rebounded in 1985 and have increased since then. Approximately 1.44 million pounds were landed in 1990, but landings crashed in 1992 (also an El Niño year) to 0.6 million pounds, and then rebounded to more than 2.0 million pounds in 1997 and 1999. In the 1990s, ex-vessel value ranged from \$0.46 to \$0.80 per pound (1990 and 1999, respectively). Value increased from \$0.46 to \$0.70 per pound from 1990 to 1993, dropped to \$0.51 per pound in 1995 and 1996, and then increase to a high of \$0.80 per pound in 1999.

Since 1970, most of the commercial sanddab landings have been in northern and central California, with the largest landings at Eureka and San Francisco Bay and less at Monterey Bay. The commercial catch of sanddabs is mainly by otter trawls and some by hook-and-line, especially in the Monterey Bay area.

Many recreational anglers target them, mostly from small boats and commercial passenger fishing vessels (CPFVs). Sanddabs are one of a few fish groups for which there is no catch limit. Sanddab catches from CPFVs were small during the 1990s, with reported catches reaching 2,200 fish in 1990 and dropping to about 100 fish in 1998 (a strong El Niño year). About 70 percent of these were taken in southern California between Long Beach and Newport Beach. Sanddabs comprise an unknown, but probably large

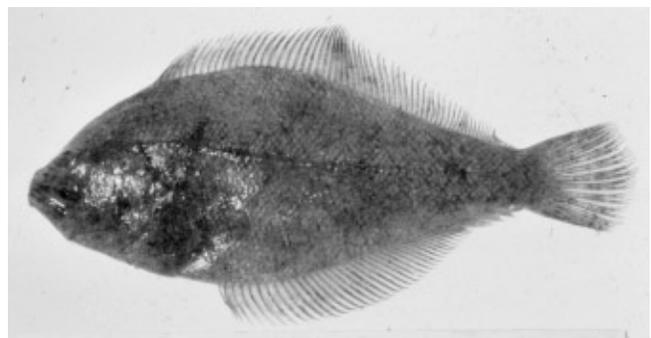
part of the unspecified flatfish catch, which has decreased from about 14,000 fish in 1990 to 4,000 fish in 1998.

As an El Niño event is more likely to have an immediate affect on the abundance of sanddab larvae than on harvestable adults, the immediate drop in sanddab catches during some El Niño years may be due in part to a shift in fishing effort to more desirable species.

Status of Biological Knowledge

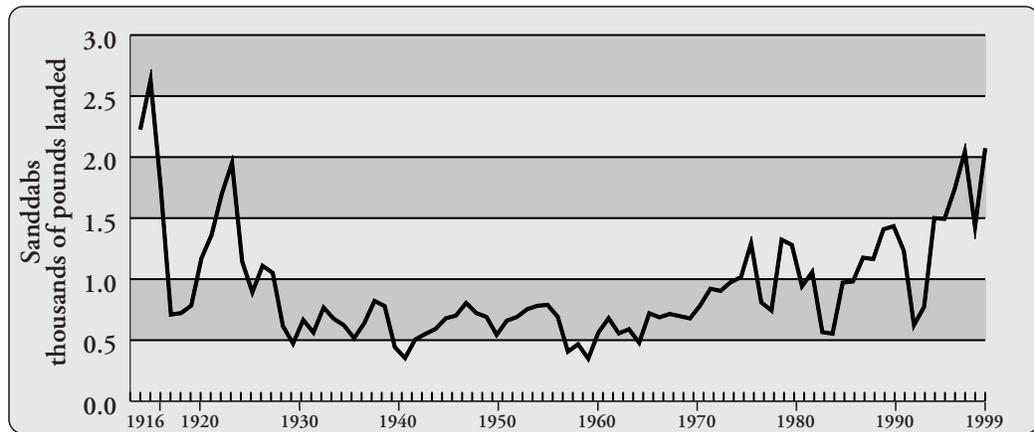
Sanddabs belong to the family Paralichthyidae (sometimes included as part of Bothidae - left-eye flounders). Biogeographically, Pacific sanddab and speckled sanddab are temperate species whereas longfin sanddab and gulf sanddab are warm-temperate to tropical species. Pacific sanddab ranges from the Bering Sea to Cape San Lucas, Baja California Sur, Mexico; speckled sanddab from Point Montague Island, Alaska to Magdalena Bay, Baja California Sur, Mexico; longfin sanddab from Monterey Bay to Costa Rica; and gulf sanddab from off Ventura, California to Cape San Lucas, Baja California Sur, and the Gulf of California. Speckled sanddab and Pacific sanddab occur throughout the state, with speckled sanddab occurring from the surface to a depth of 1,200 feet, and Pacific sanddab at 30 to 1,800 feet. Maximum depths of both species are suspect as the speckled sanddab seldom occurs deeper than 300 feet and Pacific sanddab seldom deeper than 600 feet. Longfin sanddab occurs at depths from seven to 660 feet, but usually less than 450 feet, and gulf sanddab from 59 to 1,140 feet. Most species are found on muddy to sandy mud bottoms but speckled sanddab occurs commonly on sandy bottoms.

Pacific sanddab is the largest species, reaching 16 inches, and up to two pounds. Most, however, are smaller than 10 inches and weigh, at most, 0.5 pound. The next largest species is longfin sanddab at 10 inches, followed by gulf sanddab at nine inches, and speckled sanddab at seven inches. Pacific sanddab live to a maximum of 10 years whereas speckled sanddab live to about 3.5 years. Pacific sanddabs mature at about three years, whereas the speck-



Pacific Sanddab, *Citharichthys sordidus*
Credit: DFG

**Commercial Landings
1916-1999, Sanddabs**
Data Source: DFG Catch
Bulletins and commercial
landing receipts.



led sanddab matures at one year. Spawning begins in July, peaks in August, and ends sometime in September for Pacific sanddab and extends from spring to fall for speckled sanddab. Females may spawn twice during a season. In contrast, most northern flatfish species spawn during late winter to early spring.

Sanddab larvae are pelagic and may be found near the surface and out to many miles offshore. Sanddab larvae transform and settle to the bottom at lengths of 0.6 to 1.6 inches. Juveniles and adults feed near or on the bottom on a variety of nektonic and benthic prey, including shrimp, crabs, marine worms, squid, octopus, eggs, and small fishes. Speckled sanddab feed largely on mysids and amphipods, but small Pacific sanddabs feed on copepods and polychaetes. Adults feed more on euphausiids and squid. Sanddabs, in turn, are preyed upon by larger fishes, diving birds, and marine mammals.

Status of the Population

Commercial landings indicate that sanddab populations are in good condition and currently are not being overharvested. The Pacific Fishery Management Council has not recommended a change in the minimal acceptable biological catch of incidentally caught "Other Flatfish" (which includes sanddabs) during the past decade, indicating a stable and likely reasonably utilized resource.

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References

- Allen, M. J. 1976. Addition of *Citharichthys fragilis* Gilbert to the California fauna. Calif. Fish Game 62(4):299-303.
- Allen, M. J. 1982. Functional structure of soft-bottom fish communities of the southern California shelf. Ph.D. dissertation. Univ. Calif., San Diego, La Jolla, CA. 577 p.
- Arora, H.L. 1951. An investigation of the California sand dab, *Citharichthys sordidus* (Girard). Calif. Fish and Game. 37:3-42.
- Ford, R.F. 1965. Distribution, population dynamics, and behavior of a bothid flatfish, *Citharichthys stigmaeus*. Ph.D. dissertation. University of California, San Diego. La Jolla, CA.
- Hensley, D. A. 1995. Paralichthyidae: Lenguados. Pages 1349-1380 In: W. Fischer, F. Krupp, W. Schneider, C. Sommer, K. E. Carpenter, and V. H. Niem (eds.), Guia FAO para la identificacion de especies para los fines de la pesca Pacifico Centro-oriental, Vol. III, Vertebrados Parte 2. United Nations, Food and Agriculture Organization, Rome, It.
- Kramer, D. E., W. H. Barss, B. C. Paust, and B. E. Brachen. 1995. Guide to Northeast Pacific flatfishes: families Bothidae, Cynoglossidae, and Pleuronectidae. Alaska Sea Grant College Program, Marine Advisory Bull. No. 47. 104 p.
- Moser, H. G., and B. Y. Sumida. 1996. Paralichthyidae: lefteye flounders and sanddabs. Pages 1325-1355 In: H. G. Moser (ed.), The early stages of fishes in the California Current Region. Calif. Coop. Oceanic Fish. Invest. Atlas No. 33.