

# Petrale Sole

## History of the Fishery

The California fishery for petrale sole (*Eopsetta jordani*) began in the San Francisco Bay area during the late 1880s. Petrale were then, as they are now, a highly desirable flatfish. Most are filleted for the fresh market, with the remainder being cleaned and smoked or dried. The majority of the petrale sole landed are taken commercially with bottom trawls, along with various other flatfishes and rockfishes, although some are caught by long-line or entangling nets. The sport fishery is negligible, with only a few thousand pounds being landed annually. The principal sport catch is made by partyboats fishing for bottomfish species such as rockfishes.

In 1924, there were 66,000 pounds of petrale sole landed. From 1924 through 1933, annual landings averaged about 250,000 pounds, with over 1.4 million pounds landed in 1931. The trawler fleet increased greatly in size and efficiency following World War II. New gear technology allowed trawling on new grounds at greater depths, resulting in larger landings. Also contributing to increased production was the discovery of winter spawning grounds at depths of 900 to 1,200 feet. Concentrations here were very dense and catches increased accordingly. Over five million pounds were landed in 1948. Between 1982 and 1991, landings averaged 1.7 million pounds. From 1992 to 1999 landings averaged 1.3 million pounds.

## Status of Biological Knowledge

Petrale sole are found from the Bering Sea to northern Baja California on sandy bottoms at depths ranging from 60 to 1,500 feet. These fish have been known to move great distances; tagged fish released off Eureka, California have been recovered in British Columbia. Nevertheless, most tagged petrale sole are recovered within short distances of the release point.



Petrale Sole, *Eopsetta jordani*  
Credit: DFG

Tagging studies in Washington, Oregon, and California indicate that petrale sole concentrate for spawning in deep water during winter and, shortly after spawning, disperse inshore and northward through the spring and summer months. During fall and winter, they show an offshore and southerly movement again concentrating on local deep water spawning grounds. Seasonal landing distributions show the same pattern. During winter, a targeted fishery occurs in deep water and large catches and landings of petrale are made, while during summer, they are caught in association with many other groundfish and individual petrale landings are relatively small. Within California, four spawning populations of petrale sole have been delineated by tagging experiments and by locating spawning fish. These are in the Cape Mendocino, Point Delgado, Point Montara, and Point Sal areas.

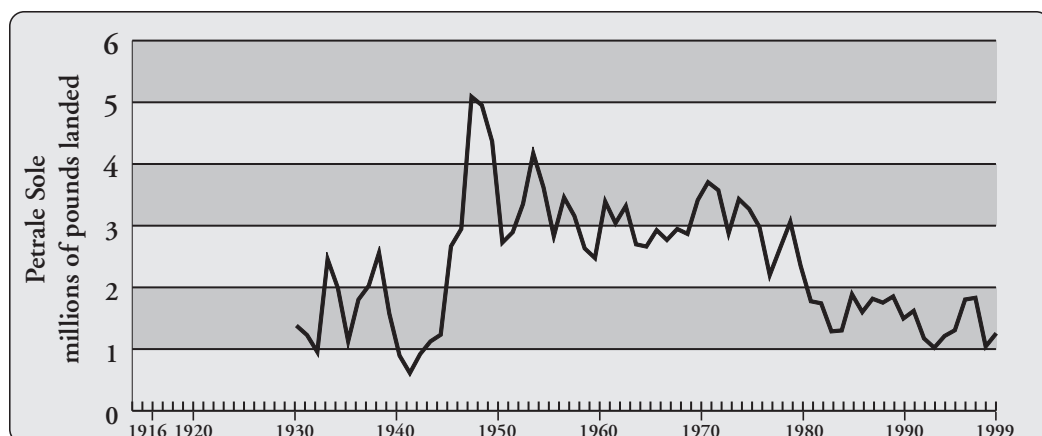
Age and growth studies on petrale sole in California have been very limited. However, growth appears to be rapid during the first few years for both male and female fish, after which the growth rate becomes disproportionate, with females growing more rapidly than males. The maximum recorded sizes and ages of California petrale sole are 19.5 inches and 21 years for males and 25.2 inches and 25 years for females. Petrale sole enter the fishery at about three years of age, but most of the petrale catch consists of females between five and seven years old and about 14 to 17 inches long.

Petrale sole reproduce in water between 900 and 1,200 feet deep from November through March, with peak spawning during January and February. Males reach first maturity at three years of age and 11.7 inches long, and females at four years and 12.5 inches. About 50 percent of the males are mature at seven years and 16 inches. The largest immature male recorded was 15.2 inches and eight years; the largest immature female, about 18.5 inches and nine years. Eggs are pelagic and hatch in about 8.5 days at 44.6 F.

Petrale sole are among the largest California flatfish. They feed on euphausiids, shrimp, anchovies, herring, juvenile hake, small rockfish, and other flatfish.

## Status of Population

A 1999 stock assessment, which focused on petrale stocks off Oregon and Washington did not estimate absolute biomass or offer a harvest projection for California. However, the authors did examine some limited data from California including a set of shelf survey indices of biomass and noted that this index has been steadily



**Commercial Landings  
1916-1999, Petrale Sole**  
Prior to 1931, all soles were combined as one group; individual species were tabulated separately when they became sufficiently important. Data Source: DFG Catch Bulletins and commercial landing receipts.

increasing since 1980. This assessment suggests recent California catches are sustainable, prompting the PFMC to retain a statewide acceptable biological catch of 3.3 million pounds.

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