

Other Flatfishes

History of The Fishery

Several flatfish species are taken incidentally in commercial groundfish fisheries. These include the rock sole (*Pleuronectes bilineatus*), butter sole (*Pleuronectes isolepis*), fantail sole (*Xystreurys liolepis*), sand sole (*Psetichthys melanostictus*), slender sole (*Eopsetta exilis*), bigmouth sole (*Hippoglossina stomata*), California tonguefish (*Symphurus atricauda*), curlfin turbot (*Pleuronichthys decurrens*), hornyhead turbot (*Pleuronichthys verticalis*), spotted turbot (*Pleuronichthys ritteri*), C-O turbot (*Pleuronichthys coenosus*), diamond turbot (*Hypsopsetta guttulata*), arrowtooth flounder (*Atheresthes stomias*), and Pacific halibut (*Hippoglossus stenolepis*). Some of these, notably the Pacific halibut, diamond turbot, and rock sole, are taken by recreational anglers as well, but most are caught primarily by commercial boats. Arrowtooth flounder and Pacific halibut are considered as minor flatfishes in California flatfish fisheries because they are landed in relatively small quantities. However, both species are major components in the flatfish fisheries in northern waters from Oregon to Alaska.

Landings of most of these flatfishes are difficult to extract from landings data for the early years (beginning in 1916), because many were combined with other categories of flatfish. For example, prior to 1931 turbot was included with soles. Also, some species such as Pacific halibut are included in California landings, even though most were landed elsewhere and shipped to California ports. Starting in the early 1950s, some of these flatfish landings, primarily arrowtooth flounder (1950) and soles (1953), were listed separately in the catch data.

Generally, incidental flatfish catches have contributed only a small amount to the annual statewide commercial landings. From 1953 to 1999, these annual flatfish landings averaged about 0.1 percent of the total statewide landings. During this period, flounders (mostly arrowtooth flounder) comprised 49.2 percent of incidental flatfish landings, soles 41.2 percent, turbot 8.0 percent, and Pacific halibut 1.6 percent. Starting in the 1960s, commercial landings of minor flatfish, as a group, have declined, although not all species showed this trend.

Since 1950, arrowtooth flounder landings averaged 278,300 pounds per year with peak years occurring in 1956 (1,070,700 pounds), 1960 (1,007,700 pounds), and 1961 (1,100,900 pounds). These high landings were due, in part, to the less desirable fishes, such as arrowtooth flounder, finding a market with the animal food industry, primarily as mink food. Arrowtooth flounder no longer is used for mink food, but is processed for human consumption. Incidental sole landings since 1953 averaged about 244,000 pounds per year, with a peak in 1979 when 839,000 pounds were landed. After 1979, there was a general decline

in the annual landings of sole. Turbot landings averaged about 47,000 pounds per year from 1953 to 1999, with a peak of 176,000 pounds in 1954, and another good year occurring in 1959 (129,000 pounds). Since 1964 there has been an overall general decline in commercial turbot landings. Landings in 1999 were approximately 8,000 pounds, the lowest since 1953. Pacific halibut contributed heavily to the minor flatfish fishery prior to the mid-1950s. The last good year for Pacific halibut landings was 1952, when 242,600 pounds were landed. Landings then began a rapid downward trend. From 1969 to 1988, no landings were recorded, except for three years: 1971, 1972, and 1986 (25, 235, and 34,500 pounds, respectively). From 1989 to 1999, landings did increase somewhat, averaging approximately 4,600 pounds per year.

Most of the incidental flatfish are taken by otter trawls. The exception is Pacific halibut, where set longline is the dominant gear used. Trammel nets are used to catch some flatfish in central and southern California waters, and many small-boat commercial fishermen use hook-and-line. Recreational anglers occasionally catch soles or turbot while fishing for sanddabs, starry flounder, or California halibut. Diamond turbot are sought by recreational anglers in quiet coastal waters, bays, and sloughs.

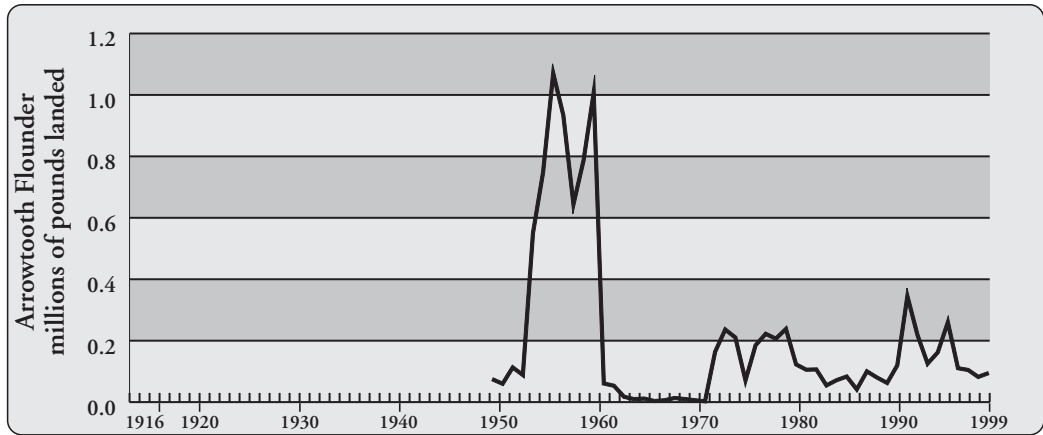
Status of Biological Knowledge

In general, flatfish spawn during late winter and early spring. Arrowtooth flounder, however, spawn as late as August in the southeast Bering Sea and Gulf of Alaska, where the greatest concentrations of this species are found. The larvae are pelagic and undergo metamorphosis to the adult form. After flatfish settle on the bottom, they eat small crustaceans, polychaetes, and mollusks. As they grow, they eat larger food forms of the same groups. Some, such as sand sole, arrowtooth flounder, and Pacific halibut, include fish in their diet.

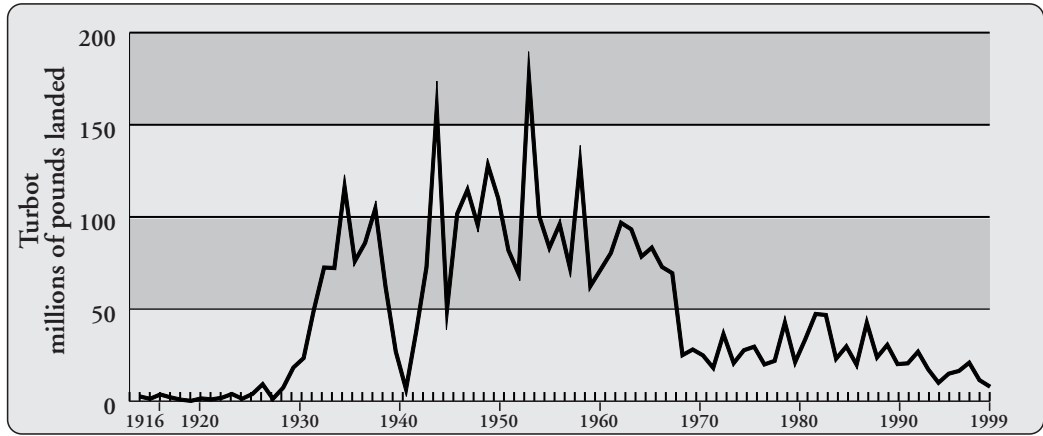


Diamond Turbot, *Hypsopsetta guttulata*
Credit: DFG

Commercial Landings 1916-1999, Arrowtooth Flounder
Arrowhead flounder were aggregated under the landing classification "unclassified sole" prior to 1950. Data Source: DFG Catch Bulletins and commercial landing receipts.



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



As a group, minor flatfish species range from the Gulf of California/Baja California to the Bering and Chukchi Seas off Alaska. Within this overall range some species are quite restricted while others are found throughout most of this range. They occur from shallow water to depths in excess of 3,000 feet (Pacific halibut).

Status of the Populations

Major fluctuations of commercial landings of flounder, soles, and turbot have occurred since 1950. Despite these fluctuations and declining commercial landings that started in the 1960s, market sampling and commercial landing records indicate that these populations remain in good condition and currently are not being over-harvested. Arrowtooth flounder stock assessment work conducted in 1993 by the Washington Department of Fisheries indicated that the status of the population, at that time, was in good condition because there was no decline in fishery catch-per-unit-effort (CPUE) between 1987 and 1992 and no trend in triennial bottom trawl survey CPUE from 1977 to 1992. Current catch levels remain well below the level of acceptable biological catch (ABC) established

by the Pacific Fishery Management Council (PFMC). The densities of arrowtooth flounder are low south of Cape Blanco, Oregon. Pacific halibut landings in California have declined since the peak years during the 1930s; however, the species is considered uncommon in California waters. Pacific halibut are monitored extensively by the International Pacific Halibut Commission (IPHC) and recent stock assessment analysis indicates that while abundance in numbers is still quite high relative to the levels of 1975 or 1980, the prospect for a decline in the biomass in waters north of California is a possibility.

Management Considerations

See the Management Considerations Appendix A for further information.

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References

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