

Rex Sole

History of the Fishery

The rex sole (*Errex zachirus*, formerly *Glyptocephalus zachirus*) is taken commercially by bottom trawl nets from southern California to the Bering Sea at depths of 300 to 1,200 feet. Despite its wide-distribution, this species does not lend itself to a high-production targeted fishery, because it rarely aggregates in any one location at any certain time of year. It is rarely taken by sport fishermen.

The commercial fishery for rex sole in California had been steady and stable between 1970 and 1989, with most catches made incidentally to other groundfish species. Annual California landings of rex sole from 1970 to 1989 averaged 1.6 million pounds, with a range of 1.3 to 2.0 million pounds. However, during the 1990s landings declined along with landings of other groundfish. By the end of the 1990s, landings were down to approximately 630,000 pounds worth \$243,772 to fishermen. Prices have been steady at \$.35 to \$.40 per pound for the past decade. Traditionally, the majority of the landings in California have come from the Eureka-Crescent City area. Since 1985, rex sole landings from other ports as far south as Morro Bay have grown relative to landings in the Eureka-Crescent City area.

Rex sole is primarily processed for the fresh food market, where it is held in high esteem by seafood connoisseurs because of its bright, white flesh and its sweet, distinctive taste. Most rex sole are marketed in a dressed form (eviscerated with the head off), which gives processors a 35 to 45 percent yield by weight. Rex sole is generally not filleted because its thin, slight body does not allow for efficient recovery.

Status of Biological Knowledge

The rex sole belongs to the family Pleuronectidae, the right-eyed flounders. It is distinguished by a long narrow pectoral fin on the eyed side of the body, a short

compressed head, a small mouth, and a nearly straight lateral line that lacks an accessory branch.

Rex sole first appear in the trawl catch when they are about 12 inches long and 10.5 years of age. They can attain a length of 23.25 inches and an age of 24 years. Male rex sole first spawn in their second year when about five inches long. Females first spawn at age three and about eight inches. Rex sole become fully mature at age four and about nine inches in length. After 3.5 years of age, females grow somewhat faster than males; they also tend to live longer.

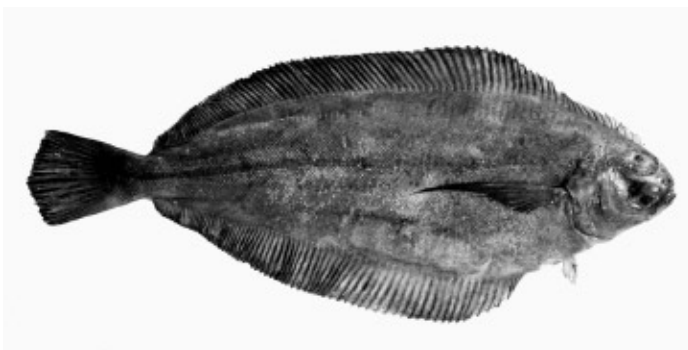
Although rex sole in spawning condition have been collected throughout the year, peak spawning activity is from February through March off San Francisco and during the summer off Eureka. Spawning rex sole are most abundant at depths of 300 to 900 feet.

The number of eggs produced by a single female rex sole increases with size. A 9.5-inch female will produce about 3,900 eggs, while a 23.25-inch female can have as many as 238,000 eggs. Rex sole eggs average about 0.10 inch in diameter, are fertilized near the sea bed, become pelagic, and probably require a few weeks to hatch.

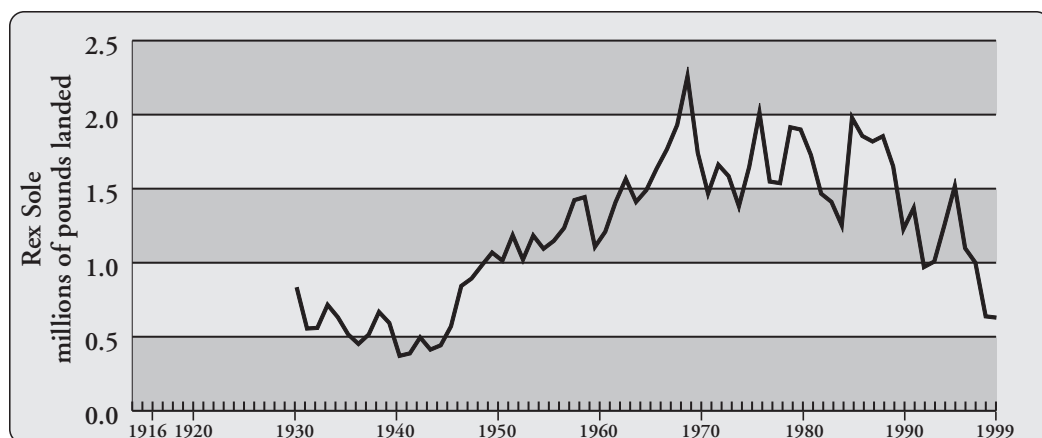
Rex sole eggs hatch to produce pelagic larvae that are about 0.25 inch in length. Larvae have been collected from nearshore to 200 miles offshore during California Cooperative Oceanic Fishery Investigations (CalCOFI) surveys and are most abundant from April to July. The larvae retain an extended pelagic existence for about a year before settling out to the bottom as two-inch-long juveniles. The long pelagic phase may make rex sole larvae more susceptible to dispersal and drift by currents, a factor that might affect survival and subsequent year-class strength. Juveniles are common on the outer edge of the continental shelf, which is possibly used as a nursery area, at depths of 490 to 660 feet.

Little is known about rex sole movements and migrations. They are found from shallow water (60 feet usually deeper than 200 feet) to depths of 2,100 feet. They show a preference for a muddy-sandy bottom but also frequent both sand and mud bottoms.

Stomach analyses show that rex sole feed primarily on amphipods and polychaetes; shrimp are also eaten. Rex sole are preyed upon by sharks, skates, rays, lingcod, and some rockfish.



Rex Sole, *Errex zachirus*
Credit: DFG



Commercial Landings 1916-1999, Rex 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.

Status of the Population

The rex sole is listed under the "other flatfish" category in the Pacific Coast groundfish plan. It is believed to be adequately protected by trawl mesh-size regulations, which result in the retention of only the larger fish. Yet, insufficient information is available to determine possible trends in stock abundance. Increased restrictions on trawling effort may be partially responsible for recent reductions in landings.

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