

Purple Sea Urchin

History of the Fishery

Purple sea urchins (*Strongylocentrotus purpuratus*) have been used by humans in California for thousands of years as shown by remains in middens left by American Indians along the coast. Prior to the early 1970s, few people harvested purple sea urchins and, along with red sea urchins (*Strongylocentrotus franciscanus*), they were considered to be pests because they grazed kelp.

The purple sea urchin has fishery potential, its roe being reported to be very similar in quality to some of the highly desirable domestic Japanese species as well as being a desirable product in Mediterranean countries. However, it has been harvested only on a limited and experimental basis in California as an adjunct to the much larger and more lucrative red sea urchin fishery. All the requirements of the restricted access commercial sea urchin permit fishery apply to harvest of purple sea urchins except there are no minimum sizes or closed periods. A minor recreational fishery for purple urchins also takes place in southern California with a daily bag limit of 35.

Since 1990, annual purple sea urchin landings have ranged from 14,000 to 388,000 pounds, averaging 139,000. Landings were less than 50,000 pounds in five of those years, with the highest landings of 388,000 and 316,000 pounds in 1991 and 1992 when several attempts were made to develop a viable fishery for this species for the Japanese market. In recent years, purple sea urchins have also been exported to markets in the Mediterranean region. Harvesting has occurred in both southern and northern California with approximately 60 percent of the landings coming from northern areas since 1990. Unfavorable harvesting and processing economics and limited availability of harvestable quality purple sea urchins for the Japanese market have been the main impediments to growth of this fishery.

Status of Biological Knowledge

General biology of the purple sea urchin is very similar to the closely related red sea urchin and will not be repeated in detail here. In addition to external color differences, maximum size is much smaller for purple sea urchins and only rarely do they attain a test diameter over four inches. Purple sea urchins live primarily in shallow water and are the only abundant sea urchin in intertidal areas along the California coast. The maximum reported depth is 500 feet. The published range is from Cedros Island, Baja California, to Alaska.

Feeding habits and reproduction are quite similar to the red sea urchin. Age of first reproduction probably is one or two years. Larvae spend an uncertain length of time in the plankton, and it is probably at least six to eight weeks

before metamorphosis takes place and juveniles are ready to settle to the bottom. Peak settlement periods tend to be in spring and early summer and there is substantial year-to-year variation both in timing and intensity. Settlement tends to be less variable south of Point Conception and is depressed during El Niño events. El Niño events appear to favor settlement in northern California, however. Energetic movements of water to the offshore in northern California have been associated with reduced recruitment.

Growth is highly variable and strongly linked with food availability. At one year of age, purple sea urchins can be between about 0.4 and 1.2 inches. After five years, size can range from 1.25 to 2.0 inches. Growth rates of very small individuals up to an age of one year are not well known.

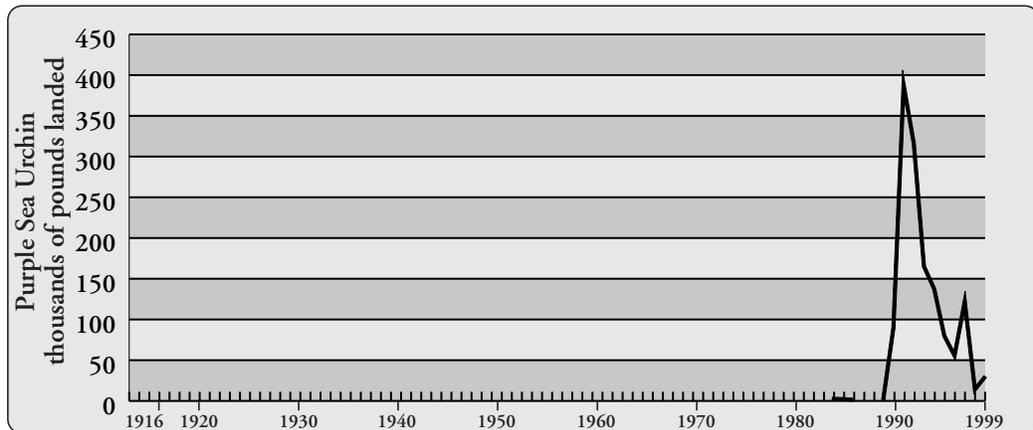
Predators of purple sea urchins include those for red sea urchins but, because purple sea urchins are common in the intertidal zone, predators also include sea gulls, oyster catchers, and raccoons. Sea otters are able to reduce sea urchin populations to levels unsuitable for commercial or recreational fishing, but apparently not to levels that would threaten the species' continued existence.

Purple sea urchins show increased mortality above 73° F, which appears in part to be physiological stress, but elevated temperatures also promote development of one or more pathogens that can cause mass mortalities. Mass mortalities have been observed more frequently in southern than in northern California especially in association with elevated water temperatures during El Niño events.

Status of the Population

Larval settlement rates monitored at a number of locations in southern and northern California over the past 10 years do not indicate a change in larval production and recruitment patterns, which indicates that the status of this species appears to be stable.

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



Management Considerations

See the Management Considerations Appendix A for further information.

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