Red Rock Shrimp

History of the Fishery

The red rock shrimp (*Lysmata californica*) fishery has been sporadic and of small magnitude since the late 1950s. It has persisted, however, due to the relatively high market value of this species for recreational fishing bait. Fishermen typically receive up to $25 a pound (about 100 shrimp per pound) when sold to retail bait stores. Bait stores will then sell the shrimp either by the dozen or the ounce at approximately twice the wholesale price. Red rock shrimp are highly regarded by anglers as the bait of choice for opaleye, black croaker, rubberlip surfperch, pile perch and other fish found along breakwaters, jetties and sea walls. In order to bring a premium price, the shrimp must be delivered to the bait stores alive. This requires special handling on the part of the fisherman as well as by the bait store. The shrimp are kept in aerated bait tanks or in floating "receivers" by the fisherman until delivery to the store. The bait stores are able to keep the shrimp alive for 24 to 48 hours by covering them with rags soaked in seawater. Dead shrimp can be salted or sugar cured but are then usually sold at a lower price. A secondary market for the shrimp is the aquarium trade. Pet and aquarium stores that sell marine fish will often buy red rock shrimp to sell to their customers. Wholesale prices may range up to ten dollars per shrimp. The shrimp must be in excellent condition, which requires special care in handling.

The red rock shrimp fishery is concentrated in shallow waters along breakwaters and sea walls where the shrimp congregate in rock crevices. This makes the fishery ideally suited to small fishing boats, usually around 20 feet long. A small boat is easier and safer to maneuver in the shallow, rocky waters. However, fisherman can only carry about 20 traps on a boat of that size. The traps are typically made of 1 1/4-inch wood lath, spaced about 1/8-inch apart. Traps measure about 18 inches on a side. A funnel-shaped opening enters the trap from the bottom. About 20 pounds of concrete, either poured or in the form of blocks, is added to each trap to keep it firmly on the rocky bottom. Fishermen have also experimented with pegboard and fiberglass frames, which add strength while weighing less than waterlogged wood. Additionally, modified metal minnow traps have also been tried but catch rates rarely equal those of the lath traps. Because the traps are set in shallow water and are often visible from shore, vandalism is a problem for the fisherman. Up to 25 percent of traps are vandalized per week of fishing.

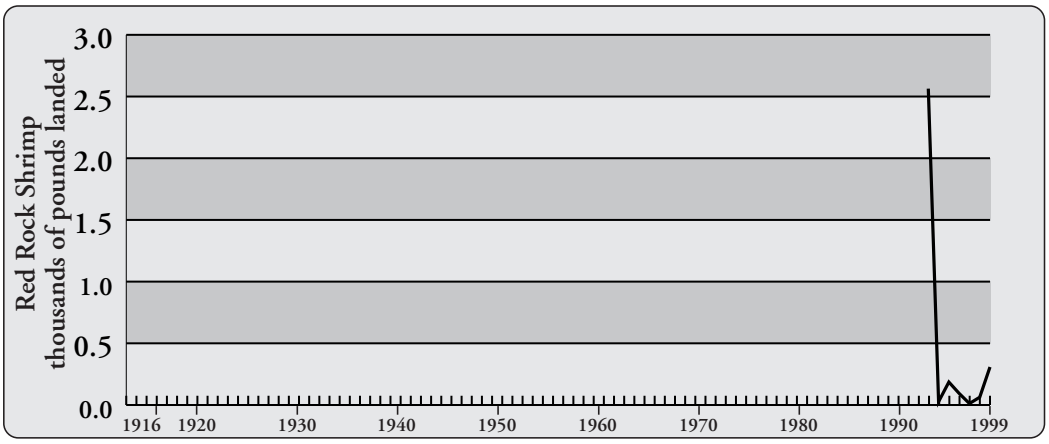
The traps are baited with whatever fish or fish trimmings may be available to the fishermen. Occasionally unbaited traps will also have good catches since shrimp will enter the traps for cover. Traps are usually left to soak for 24 to 48 hours. Catch rates average one pound per trap, but occasionally a very good catch will be four to five pounds per trap. Bycatch in the traps consists primarily of octopus, rock snails, sea cucumber, and an occasional clingfish. Purple sea urchins and Kellet's whelks are often found clinging to the underside of the traps.

The fishery is seasonal, from October to April, for several reasons, including: 1) market competition from more plentiful summertime baits, such as sand crabs; 2) higher rates of trap vandalism due to increased shoreline recreational fishing activity during summer months; 3) participation in other commercial fisheries during the summer such as barracuda, white seabass and tunas; and 4) decreased shrimp availability in traditional trapping areas beginning in the spring.

The red rock shrimp fishery is regulated by the Fish and Game Commission. Prior to 1986, a tidal invertebrate permit and a general trap permit were required. Regulations include marking traps with buoys, servicing traps once every 96 hours, and trap destruct-devices to prevent ghost fishing of lost gear. Legislation enacted in 1986 generally restricted the use of trap gear for shrimp and prawns to water 50 fathoms or greater. This included the harvest of red rock shrimp. As a result, fishermen have had to apply to the Fish and Game Commission for an experimental gear permit to harvest red rock shrimp. Under this permit, a fisherman has five years to establish a viable fishery, with annual requests for renewal. In recent years the commission has required fishermen to take onboard observers supplied by the Department of Fish and Game, report their fishing activity through submission of fishing activity logs, including any bycatch, and immediately returning all incidental species to the sea. In addition to the experimental gear permit, fishermen must also follow the general trap and tidal invertebrate regulations.

Status of Biological Knowledge

Red rock shrimp occur from Santa Barbara, California, south to Bahia Viscaino, Baja California. They are often found in low intertidal pools and crevices and extend subtidally to a depth of more than 180 feet. They tend to occur in groups of several hundred, dispersing somewhat at night but regrouping in sheltered areas during the day. It should be noted that since about 1990 a population of red rock shrimp has appeared annually in the open ocean filter housing of the Monterey Bay Aquarium (MBA). The MBA staff has conducted surveys of the local intertidal and subtidal areas, but has not discovered any other populations of red rock shrimp. The exact mechanism for this occurrence north of the normal range has not been determined but suggests that oceanographic events can significantly affect the distribution of this species.



Commercial Landings 1916-1999, Red Rock Shrimp
Data Source: DFG Catch Bulletins and commercial landing receipts. Landing data not available prior to 1993.

These shrimp grow to a length of about three inches. They are conspicuously colored with longitudinal broken stripes of red on a transparent body. Red rock shrimp may be simultaneous hermaphrodites like several other species of *Lysmata*. Captive berried females will continue to produce viable clutches following removal of the larvae. Eggs on ovigerous females are red following initial deposition on the pleopods and turn pea green just before hatching. Eggs have been noted as early as April but are more common in May, June, and July. Preliminary examination of berried females has shown that each female carries about 4,000 eggs. California's red rock shrimp is one of the larger, but less specialized, of the "cleaning" shrimp. They are often seen sharing crevices with, and cleaning, California morays. They are also known to perform cleaning activities on divers' hands when placed in their vicinity, paying particular attention to areas around fingernails or scratches on the skin.

The "cleaning" activity does not seem to be highly evolved and probably only supplements the diet. Most of the diet seems to come from scavenging scraps of decaying tissue on rocky surfaces or, when the opportunity arises, feeding on carcasses of dead fish and invertebrates.

Status of the Population

There are very few data available regarding population size and distribution of red rock shrimp. At the present time, the bait fishery for red rock shrimp appears to have little effect on the population. Diver observations suggest that they are widespread throughout southern California. Fishing effort, however, is very limited and concentrated at only a few locations such as breakwaters and sea walls. Since these shrimp are relatively short lived, there are probably large fluctuations in annual abundance.

Management Considerations

See the Management Considerations Appendix A for further information.

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