

# Rock Crabs

## History of the Fishery

Rock crabs are fished along the entire California coast. The catch is made up of three species — the yellow rock crab (*Cancer anthonyi*), the brown rock crab (*C. antennarius*), and the red rock crab (*C. productus*). The commercial fishery is most active in southern California (from Morro Bay south), where 85 to 90 percent of the landings occur, and of lesser importance in northern areas (Monterey, Halfmoon Bay, and Eureka yield 10-15 percent), where a fishery for the more desirable Dungeness crab takes place. A major recreational fishery has not developed, but recreational crabbing is popular in many areas and is often conducted in conjunction with other fishing activities.

In 1950, a separate reporting category for commercial rock crab landings was established. Since then, landings have risen from 20,000 pounds to over two million pounds in 1986. Landings increased by 10 percent per year from 1957 to 1971, jumped nearly 50 percent in 1972, and continued a steady increase to two million pounds in 1986. Prior to 1987, a portion of the landings calculated whole-crab weights based on landings of claws only. Since then, whole crabs and claws have been reported separately, and whole crab landings have showed a commensurate decline. Rock crab landings for 1999 were 790,000 pounds and have averaged 1.2 million pounds per year since 1991, including the landings of claws converted to whole weight.

Commercial crabbing has expanded from nearshore areas around major ports such as San Diego, San Pedro, Santa Barbara, and Morro Bay to more distant mainland areas and the Channel Islands. Most rock crabs are landed alive for retail sale by fresh fish markets. Often the crabs are cooked and eaten on site and, depending on the tastes of the consumer, muscle tissue, as well as other organs (ovaries in particular) are consumed. Rock crab meat has

not been successfully marketed frozen or canned. During 1999, ex-vessel prices for whole rock crabs and crab claws averaged about \$1.25 per pound

Several trap designs and materials are used in the rock crab fishery. The most popular are single chamber, rectangular traps of two by four-inch or two by two-inch welded wire mesh. Several types of molded plastic traps are used by some fishermen because the traps are collapsible or nest together on a boat deck. Traps are set and buoyed singly or, perhaps, in pairs if loss to vessel traffic is a concern. Most trapping occurs in depths of 90 to 240 feet on open sandy bottom or near rocky reef-type substrate. Two hundred or more traps may be fished by one boat, with a portion pulled up and emptied each day. Traps are usually "soaked" for 48 to 96 hours prior to pulling. Commercial crab boats are usually small, ranging from skiffs to vessels of 40 feet or more.

Recreational gear ranges from a diver's or shore picker's hand to baited hoop nets, collapsible star traps, or traditional traps (north of Point Arguello) fished from piers, jetties, and boats. Most of this effort takes place along the shallow, nearshore open coast and in bays. Some increased recreational take has occurred in central and northern California in recent years as combination fishing and crab trips aboard commercial passenger fishing vessels have developed. Traps, primarily targeting Dungeness crabs, are set and pulled during these trips. However, depending on location and season, rock crabs (brown and red) are often taken as well.

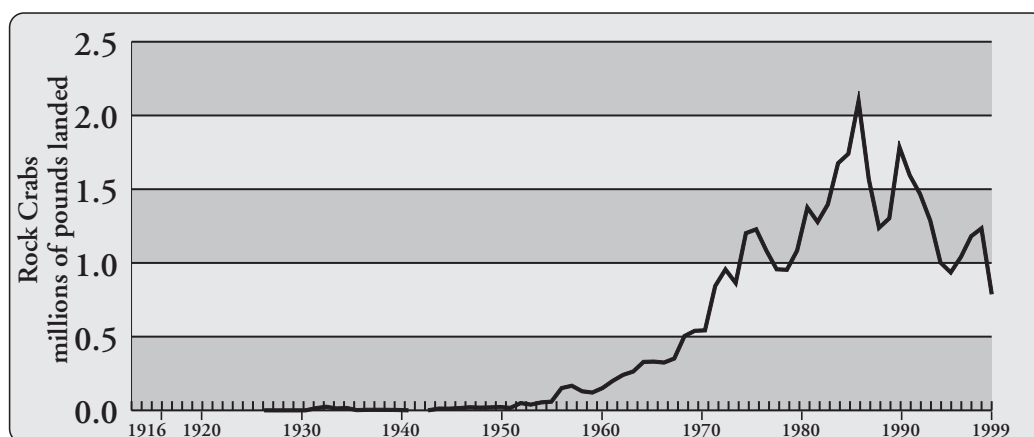
Commercial regulations have been enacted to protect crabs below reproductive size. Present regulations require a minimum harvest size of 4.25-inch carapace width and escape rings measuring 3.5 inches in diameter in each trap. Due to the multi-species nature of the fishery, the minimum size was chosen to accommodate the different characteristics of the three rock crab species. The recreational take is controlled by a four-inch minimum carapace width and a personal bag limit of 35 crabs per day.

## Status of Biological Knowledge

Yellow rock crabs range from Humboldt Bay into southern Baja California, brown rock crabs from northern Washington to central Baja California, and red rock crabs from Kodiak Island to Central Baja California. All three species inhabit waters from the low intertidal zone down to depths of 300 feet or more. Although these species may occur together throughout much of their range, yellow rock crabs are most abundant in southern California, brown rock crabs in central California and red rock crabs in northern California. Yellow rock crabs prefer open sand



Yellow Rock Crab, *Cancer anthonyi*  
Credit: DFG



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

or soft bottom habitat, while brown and red rock crabs prefer rocky or reef-type substrate.

Rock crabs, like other crustaceans, grow in a step-wise fashion with each molt of the external shell. Yellow and brown rock crabs molt 10 to 12 times before reaching sexual maturity at about three inches carapace width. Crabs of this size may molt twice a year, while crabs as large as six inches carapace width or more may molt once a year or less. Growth-per-molt, as a percentage of size, decreases as the crab increases in size and age. Males of all three species attain sizes 10 to 15 percent larger than females. Yellow rock crabs grow to exceed seven inches in carapace width, brown rock crabs 6.5 inches, and red rock crabs eight inches. While the longevity of rock crabs is not well known, many crabs may reach five or six years of age.

Mating takes place after the females molt and are still in the soft-shell condition. In southern California, mating is most common in the spring, but occurs throughout the year. About three months after mating, the eggs are laid, then fertilized from a sperm packet left by the male during mating. The developing eggs are carried in a mass under the abdomen of the female. Depending on size and species, nearly four million eggs may be carried by a female rock crab. After six to eight weeks, the eggs hatch into planktonic larvae, which undergo seven developmental molts before settling to the bottom as juveniles.

Rock crabs are both predators and scavengers, feeding on a variety of other invertebrates. Strong crushing claws allow them to prey on heavy-shelled animals such as snails, clams, abalone, barnacles, and oysters. The olfactory sense of crabs is well developed and allows them to detect and locate food at a distance.

Rock crabs, especially juveniles, are preyed upon by a variety of other marine organisms. Fishes such as cabezon, barred sand bass and several species of rockfish are known

to feed on rock crabs. Important invertebrate predators include the octopus and certain sea stars. As rock crabs grow larger, they become less susceptible to predators except during the soft-shell post-molt period; however, the sea otter is one animal that is an effective predator on large rock crabs.

Rock crabs do not appear to migrate or to undertake large-scale movements. Tagged adults have moved several miles, but no pattern was apparent. Some local movements also may occur in relation to mating or molting. Egg-bearing yellow rock crabs are known to congregate in rock-sand interface habitats.

## Status of the Populations

Information is not available on stock sizes, recruitment and mortality rates, the effects of different oceanographic regimes, or potential yield of rock crab populations. The commercial fishery, however, has had a localized effect on crab abundance and size. Fishing areas intensively exploited over an extended period show a lower catch-per-trap and a reduced size-frequency distribution compared to lightly exploited areas. In Santa Monica Bay, an area closed to commercial crab fishing for decades, experimental catch rates were higher, crab sizes larger and size-frequencies broader than in adjacent areas open to commercial trapping. Future research should be aimed at a better understanding of fishery-related rock crab population parameters.

## Management Considerations

See the Management Considerations Appendix A for further information.

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## References

Carroll, J.S. 1982. Seasonal abundance, size composition, and growth of rock crab, *Cancer antennarius* Stimpson, off central California. J. Crust. Biol. 2:529-561.

Carroll, J.C. and R.N. Winn. 1989. Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (Pacific Southwest) -- brown rock crab, red rock crab, and yellow crab. U.S. Fish Wild. Serv. Biol. Rep 82 (11.117). U.S. Army Corps of Engineers, TR EL-82-4. 16 p.

Reilly, P.N. 1987. Population studies of rock crab, *Cancer antennarius*, yellow crab *Cancer anthonyi*, and Kellet's whelk, *Kelletia kelletii*, in the vicinity of Little Cojo Bay, Santa Barbara County, California. Calif. Fish and Game. 73:88-98.

Winn, R.N. 1985. Comparative ecology of three cancrinid crab species (*Cancer anthonyi*, *C. antennarius* and *C. productus*) in marine subtidal habitats in southern California. Ph.D. dissertation. University of southern California, Los Angeles. 235 p.