

Management options of the commercial dive fisheries for sea cucumbers in Baja California, Mexico

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Isostichopus fuscus and *Parastichopus parvimensis* have been commercially fished in Baja California (BC) for ten and six years respectively. Processors sell these whole, gutted and dried, boiled, semifrozen and as raw fresh muscle. These products are all exported to the United States and later re-exported to Asia. For both coasts, landings averaged 1000 t from 1988 to 1994 (fresh total weight); the highest catch, in 1991, was almost 2000 t.

Until now, sea cucumber fishing has been virtually unrestricted; divers could take animals 365 days a year from any area as long as they held a permit.

In 1992 and 1993 there was a noted drop in diver's catch per unit of effort (CPUE) and total catch, related to the 'explosion' of fishing effort (more permits and bigger fleet size). In the light of decreasing catches and CPUE and increasing harvest depths, it appeared that the resource had been overfished and this has prompted intensive management. Closed season, size limits, underwater population surveys and catch monitoring all play a role in maintaining the resource.

In February 1994, regulations were adopted to restrict the harvest season to the period from 1 October to 30 April. This seasonal closure for five months was designed to permit reproduction. Different size limits were proposed for each species. They consisted of length limits (26 – 23 cm and 24 – 21 cm) and weight limits (550 – 400 g and 350 – 200g) for whole and gutted-and-drained sea cucumbers respectively.

Recommendations for catch and CPUE levels are : total catch under 1000 t per year (harvest season) with a fleet size of 50 boats and 14 permits.

These regulations have still not been enforced, but in May 1994 the National Institute of Ecology declared *I. fuscus* to have the status 'in danger of extinction' along the Mexican Pacific coast, which means a ban on the fishing of this species in the entire area.

Future changes will be made to the regulations in the light of additional information from our studies.

Developments in California sea cucumber landings

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Kristine Barsky and Dave Ono from Associate Marine Biologists (74763.1265@compuserve.com, California Dept. of Fish and Game, 530 East Montecito Street, Room 104, Santa Barbara, California 93103) write about the situation of the sea cucumber fishery in California.

The sea cucumber fishery began in California near Los Angeles around 1978. The catch is composed of the warty sea cucumber (*Parastichopus parvimensis*) and the California or giant red sea cucumber (*P. californicus*).

Warty sea cucumbers inhabit the ocean bottom from the intertidal zone out to 27 m, and range from Monterey Bay to Baja California. This species is uncommon north of Point Conception.

Giant red sea cucumbers inhabit the subtidal zone out to 90 m, and range from the eastern Gulf of Alaska to Baja California.

Warty sea cucumbers migrate annually between their shallow- and deep-water depth limits.

Fishermen claim that giant red sea cucumbers make similar large-scale movements over varying depth ranges, but this has not been verified by research.

The warty cucumber is harvested by hand by commercial divers, primarily in southern California (south of Point Conception). The California sea cucumber is taken primarily with trawl net gear, also in southern California.

The catch averaged under 45 t annually until 1982, when a trawl fishery developed near Santa Barbara. During the next 10 years, annual landings increased gradually. In 1991, an influx of trawlers, predominantly out of the port of Los Angeles, greatly expanded the fishery.