

Fishery in California in 1995

by Kristine Barsky

In 1995, 590,000 lbs of California (*Parastichopus californicus*) and warty (*P. parvimensis*) sea cucumber worth US\$ 463,290 were landed in the state of California. This was 9 per cent less than the 646,000 lbs landed in 1994. Eighty per cent of the sea cucumbers were taken by trawl, and the remaining 20 per cent were harvested by divers. Almost all of the landings were made in southern California (south of Pt. Conception).

Only 78 of the 116 fishermen possessing sea cucumber permits made landings in 1995. The average ex-vessel price for both sea cucumber species, regardless of the

way it was harvested, was US\$ 0.70/lb. The price ranged between US\$ 0.20 and US\$ 1.00/lb.

Landings for the first half of 1996 totaled 368,000 lbs, greater than the 3-year average of 213,000 lbs for the same period. Since summer and fall are normally the time of peak trawl activity, landings this year will probably exceed last year's.

Legislation is pending that will affect the way in which the sea cucumber fishery will be regulated in the next fishing season.

A brief survey of the commercial sea cucumber *Isostichopus fuscus* (Ludwig, 1875) of the Galapagos Islands, Ecuador

by J. Sonnenholzner¹

Introduction

The sea cucumber fishery was originally located along the continental Ecuadorian coast in 1988. Four years later this fishery was centered mainly on the western side of the Galapagos archipelago (Aguilar et al., 1993). Traditional fishing in the Galapagos Islands is relatively undeveloped and there has never been any traditional fishing of sea cucumbers (Conand, 1995). Giant sea cucumbers *Isostichopus fuscus* are caught by artisanal fishermen, and this fishery has developed without any control around the Galapagos Islands during the last eight years (De Paco et al., 1993). Ecuador's General Fisheries Direction has reported that ten companies are exporting dried sea cucumbers and the data shows that sea cucumber fishery was less than 0.04 t (fresh total weight) from 1983 to 1988 and 50.3 t from 1989 to 1995.

The highest catch (30 t) was reported in 1995. These products are all exported, 66.7 per cent to the U.S. and 33.3 per cent to Taiwan. The maximum value paid per kg/net in Ecuador is US\$ 30.00. The aim of this paper is to contribute briefly with biological and ecological information on the giant commercial sea cucumber *I. fuscus* in the western side of the archipelago area where they were intensively fished.

Location and distribution

The Galapagos Islands are volcanic islands located 570 miles (960 km) off the continental Ecuadorian coast and are composed of thirteen large islands, six small islands and forty-two islets (Anon, 1992). Fernandina and Isabela islands are characterised by vertical drop-offs that fall dramatically and have mixed bottoms of rocks and sand with dispersed coral communities. The eastern side of the Fernandina Island has semi-exposed and protected areas (Wellington, 1975).

Isostichopus fuscus is limited to the west American coasts (Deichmann, 1958) and it is distributed in the western zone of the Galapagos Islands. It is the most commonly found sea cucumber species in shallow waters (<20 m) (Wellington, 1975).

Field procedures

In April 1993, individuals (n = 200) from rocky reefs, boulders and broken coral rubble from depths of 0 to 24 m on the eastern side of the Fernandina Island were collected in five stations covering a sampling zone, 17.30 km along the Bolivar Channel from Punta Mangle (0°25' S, 91°23' W) to Punta Espinoza

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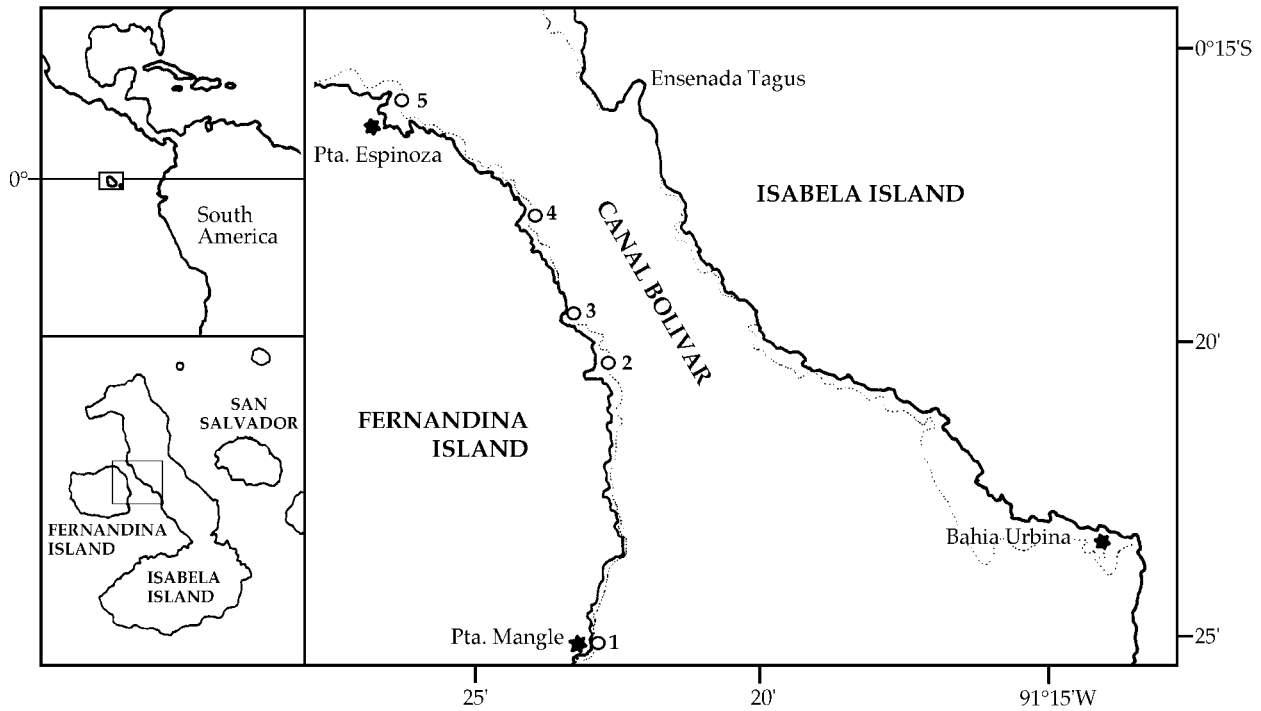


Figure 1: Study area, east coast of the Fernandina Island (Narborough), covering a sampling zone of five stations from Punta Mangle (0°25'S, 91°23'W) to Punta Espinoza (0°15'S, 91°26'W), in the Bolivar Channel

Table 1: Sampling of *Isostichopus fuscus* on the 5 stations along the eastern coast of Fernandina Island

Sampling site	Location	Station no.	No. of ind.	Depth	Size (cm)	Mean size (cm)	Wet weight (g)	Mean wet weight (g)
Pta. Mangle	0°25'S 91°23'W	1	20	5-12	10-30	25	110-295	205
Pto. Galvez	0°20'S 91°23'W	2	75	1-15	7-32	20	100-410	350
		3	15	10-24	15-25	17	190-300	270
Diag. Tagus Cove	0°17'S 91°24'W	4	55	3-18	8-30	20	210-290	290
Pta. Espinoza	0°15'S 91°26'W	5	35	5-19	10-21	20	160-295	270

(0°15' S, 91°26' W) (Figure 1). Samples were put in plastic trays with sea water and the allometric parameters were measured.

Parameters of *I. fuscus*

Table 1 shows five sites, number of samples, size and wet weight intervals and averages sampled, respectively. The average size of the individuals was 20 cm and the interval of the wet weight was 100-410 g, with an average of 271 g. 37.5 per cent of the individuals collected were found in the Stations 2 and 4; these two

stations had the greatest size and wet weight intervals of all the stations sampled along the Bolivar Channel. The specimens are cylindrical, tough and flexible with thick flanks, flat underside and convex upper side. The smooth skin is covered on the top and sides with numerous warts (see Figure 2a on next page). There are numerous large tube feet in three rows on the underside. The mouth is directed downwards (Figure 2b). The buccal tentacles are shaped like shields. The body surface is brownish, with the warts darker. The colour may change to dark brown depending on the colour of the substrate.

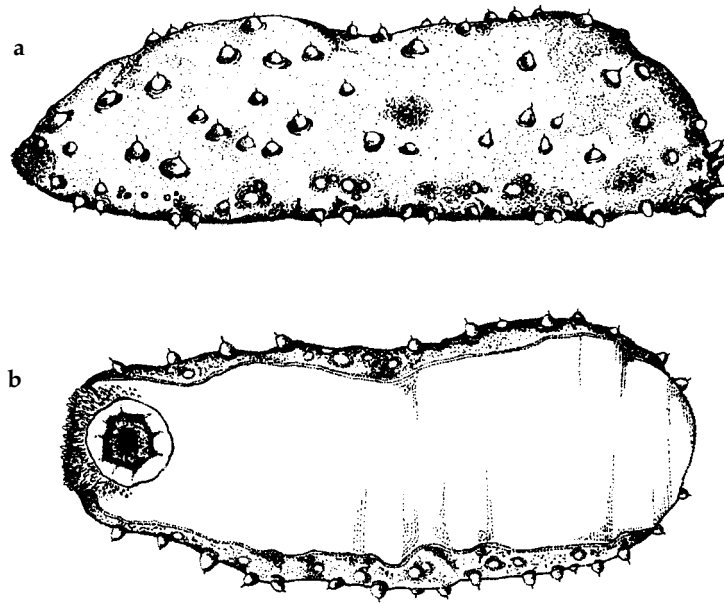


Figure 2: *Isostichopus fuscus*
(a) lateral view; (b) ventral view

Discussion and conclusion

Isostichopus fuscus was found most abundantly between 5 and 18 m on the non-exposed coasts on the eastern side of Fernandina Island as in Stations 2 and 4 (see Table 1), which are characterised by an abundant presence of boulders and broken coral rubble on the bottom. Several individuals were found on sand at the base of the large boulders at the edge of reef flat.

The lack of biological and ecological information on the sea cucumbers of the Galapagos Islands has limited comprehension of the real situation of the stocks of this fragile marine invertebrate.

The consequences of overfishing have been reported in the Solomon Islands, Cook and Fiji Islands (Richmond & Martinez, 1993), Baja California, Mexico (Castro, 1995) and Costa Rica (Anon, 1994).

The Ecuadorian government still does not have any legislation to restrict the exploitation of this marine resource. Sitwell (1993) mentioned that the enormous increase in catch rates of sea cucumbers in Galapagos could lead to a collapse of the fishery in the whole archipelago in a period of three or four years (Stone, 1995; Langreth, 1995; Gibbs, 1995).

Acknowledgments

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News from Ecuador

Fishers demanding the release of eight fishers, gaoled for illegally collecting sea cucumbers, took over Galápagos National Park offices on the islands of Isabela in January 1996; this is the second revolt relating to the issue of sea cucumber fishing in four months, and one-year on from a similar invasion in January 1995 (*TRAFFIC Bulletin* 15(2):58).

In this latest incident, Galápagos Congressman Eduardo Veliz reportedly was responsible for rallying the support of fishers who, armed with machetes, threatened to destroy the building unless their gaoled colleagues were released; when they learned that the majority of their colleagues had escaped, the siege was brought to an end after 12 hours. National Parks staff were not harmed. The incident was sparked by the seizure and subsequent incineration of 80,000 sea

cucumbers by officials. Eight of a group of some 30 fishermen were arrested; the rest fled.

On June 1996, over 30 000 sea cucumbers and 32 shark fins were seized in various islands of the archipelago during an operation jointly undertaken by the navy and the Galápagos National Parks Service; six people were detained and four boats and diving equipment seized. The sea cucumbers were incinerated.

Galápagos National Parks Press Release, February 1996; Charles Darwin Foundation, Inc., in litt., 7 February 1996; *El Universo* (Ecuador), 22 June 1996; *Hoy* (Ecuador), 20 June 1996.

Source: *TRAFFIC Bulletin* vol.16 no.2 (1996)

Survey of commercially-valued sea cucumbers in the Saipan Lagoon, CNMI

by Roy T. Tsuda ¹

In 1985, Dueñas & Swavelly, Inc. in association with Pacific Basin Environmental Consultants, Inc. prepared a Saipan Lagoon Use Management Plan for the Coastal Resources Management Office (CRMO) of the Commonwealth of the Northern Mariana Islands. In its 1996 update of this plan, one of the tasks assigned to Dueñas & Associates, Inc. (formerly Dueñas & Swavelly, Inc.) by the CNMI CRMO was to conduct a resurvey of the sea cucumber resources and to document any changes in population as compared with Ravi Chandran's 1988 Master of Science Thesis in Biology from the University of Guam entitled *The dis-*

tribution and abundance of holothurians in Saipan Lagoon, Mariana Islands.

The sea cucumber survey was conducted from 21 to 25 October 1996 by Roy T. Tsuda of Dueñas & Associates, Inc. (also Professor Emeritus of Marine Biology, University of Guam Marine Laboratory) and Michael S. Trianni of the CNMI Division of Fish and Wildlife, with the assistance of Steven S. Amesbury (Professor of Marine Biology) of the University of Guam Marine Laboratory and Patrick G. Bryan of the CNMI Division of Fish and Wildlife, who were con-

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