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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 <sup>1</sup>

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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ducting the fish census at the same time. Sincere appreciation is extended to both Robert H. Richmond and Barry D. Smith of the University of Guam Marine Laboratory for their tutelage to R.T. Tsuda on sea cucumber identification and ecology prior to the October 1996 survey.

The 1996 sea cucumber survey (Figure 1) was conducted in waters ranging from 0.3 to 7 metres deep (MLLW) at 20 of the 22 habitats within the Saipan Lagoon described and quantified by Steven S. Amesbury, Dennis R. Lassuy, Robert F. Myers and Vaughan Tyndzik in *A survey of the fish resources of Saipan Lagoon* (University of Guam Marine Laboratory, Technical Report No. 52, March 1979). The habitats included sea-grass and macroalgal beds and patches, sandy areas, patch reefs, fringing reefs, barrier reefs and shallow harbor areas within the 30.7 km<sup>2</sup> Saipan Lagoon. The 1996 survey included similar habitats to six of the seven stations sampled by R. Chandran in 1988.

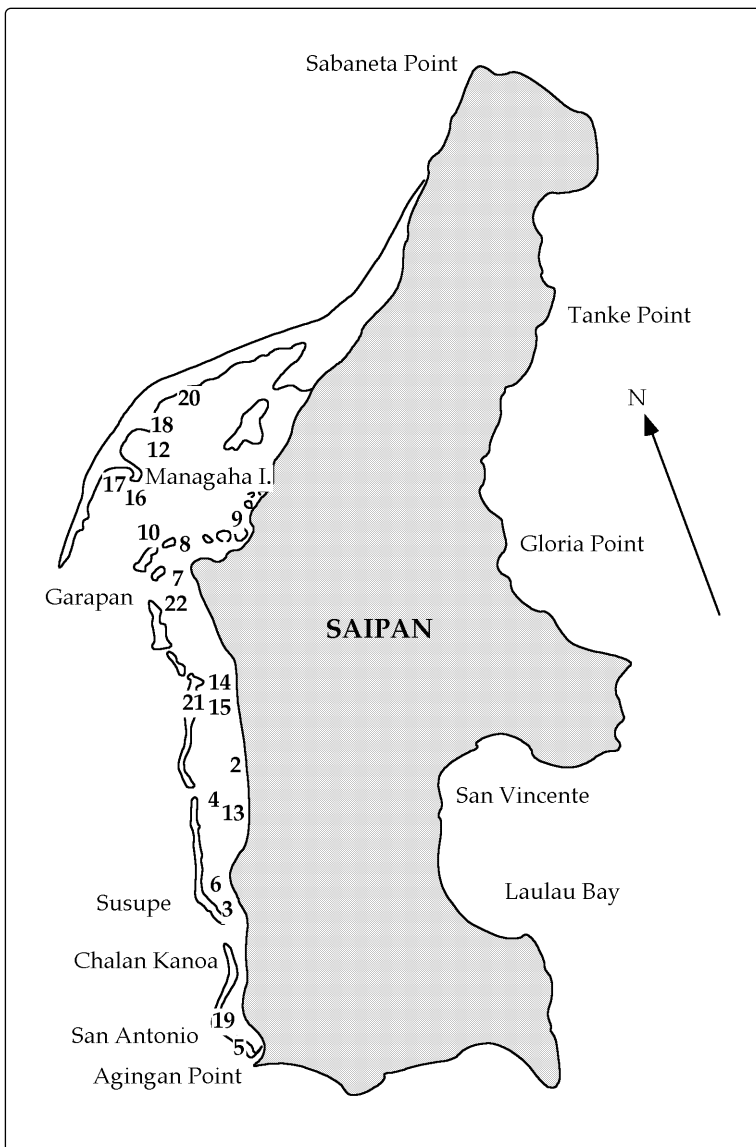


Figure 1: Map of Saipan showing the 20 stations used for the survey

R. Chandran based his 1988 counts on one set of four 10-metre long by 1-metre wide transects (i.e., area of 40 m<sup>2</sup>) in five sites and two sets of transects (i.e., area of 80 m<sup>2</sup>) in two sites. In 1996, the species composition and density were obtained from four 100 m<sup>2</sup> circles, i.e., rotating a 5.64-metre long polypropylene rope around the weighted end, per habitat, as described by Steven S. Amesbury and Alexander M. Kerr in a workshop paper 'Data collection methods for beche-de-mer resource management in Micronesia' included in the *Results of the Workshop, A Regional Management Plan for a Sustainable Sea Cucumber Fishery for Micronesia*, 3-5 March 1993, edited by R.H. Richmond.

R. Chandran quantified only four edible sea cucumbers, i.e., *Holothuria (Halodeima) atra*, *Stichopus chloronotus*, *Bohadschia marmorata* and *Actinopyga echinites*. The 1996 survey quantified these four species, plus four additional species, i.e., *Actinopyga mauritiana*, *Actinopyga miliaris*, *Bohadschia argus* and *Holothuria (Halodeima) edulis*. Two *Holothuria (Microthele) axiologa* were found in waters 4 to 7 m deep in the harbor and around a patch reef outside of the 100 m<sup>2</sup> circles. The estimated population size of each species of commercially-valued sea cucumber was derived by multiplying the mean density per square metre in each habitat by the square metre area of the applicable habitat and totaling the products of each applicable habitat. R. Chandran's density data were, likewise, used in the same manner, i.e., total number of each sea cucumber species divided by total area quantified at seven sites (360 m<sup>2</sup>) within the Saipan Lagoon, i.e., 30.7 km<sup>2</sup> instead of 51.8 km<sup>2</sup>, so that the estimated sea cucumber populations for 1988 and 1996 could be compared.

Whereas R. Chandran's 1988 revised estimated sea cucumber populations appear high, the recent October 1996 estimates may be underestimations of the number of sea cucumber species within the Saipan Lagoon. The 1996 population estimates of *Actinopyga echinites* at 29,238 vs. Chandran's 583,244, *Holothuria atra* at 8,186,527 vs. Chandran's 154,160,000 and *Stichopus chloronotus* at 146,575 vs. Chandran's 2,455,766 were approximately 17 to 20 times less than that estimated for the same species in 1988. In the case of *Bohadschia marmorata*, the 1996 population estimate of 30,671 was nearly 100 times less than Chandran's 1988 estimate of 3,020,225 for Saipan Lagoon. The 1996 survey recorded only 6 individuals of *Bohadschia marmorata* during the entire

survey period. Chandran's 1988 revised estimated populations of 3.0 million and 0.6 million, respectively, were based on 46 *B. marmorata* in one of seven sites and 7 *A. echinites* in two of seven sites.

The most abundant commercially-valued sea cucumber in the Saipan Lagoon, i.e., excluding *Holothuria atra*, is *Stichopus chloronotus* with a 1996 estimated population of 146,600, with the majority of the individuals present on the lagoon slope of the barrier reef flat and on the barrier reef. One 100 m<sup>2</sup> circle consisted of 14 small individuals, with a mean length of 11 cm, or an estimated population of 384,000 individuals within the 2.74 km<sup>2</sup> of one of the barrier reef habitats. Chandran's 1988 revised estimates of 2.4 million (i.e., 0.080 per 1 m<sup>2</sup>) seems high, since he only observed 29 individuals in his seven sites; the 1996 survey documented 42 individuals in 8 of the 20 habitats.

The 1996 population estimate of approximately 20,000 *Actinopyga mauritiana* (surf redfish) in the Saipan Lagoon seems plausible, since this species is mainly found on the seaward reef margin and slope in the surf zone. A total of 15 *A. mauritiana* was

counted in one of the 20 habitats, i.e., the edge of the leeward fringing reef off Managaha Island. Only one specimen each of *Holothuna axiologa* and *Holothuria edulis* was found in the lagoon.

The one specimen of *H. edulis* allowed a projection of approximately 900 individuals inhabiting the lagoon; R. Chandran never encountered this species in the Saipan Lagoon during his extended studies.

Since the specimen of *H. axiologa* was found outside of the sampling circle, a population estimate was not prepared. The low estimate of 5,317 *Actinopyga miliaris* encountered in the Saipan Lagoon may be attributed to mistaken identification while counting *Holothuria atra*. The population estimate for *Bohadschia argus* at approximately 6,000 also seems low.

Future surveys should target four species within the Saipan Lagoon, i.e., *Stichopus chloronotus*, *Actinopyga echinites*, *Bohadschia marmorata* and *Bohadschia argus*. Population counts of *Actinopyga mauritiana* can be obtained from the commercial harvesters when they initiate harvesting within the confines of the lagoon.

## Distribution and abundance of beche-de-mer on Torres Strait reefs

by Brian Long & Timothy Skewes<sup>1</sup>

### Introduction

Beche-de-mer is once again an important fishery in Torres Strait after a 50-year lull. Historically it has been a very valuable fishery with annual catches earlier this century sometimes greater than 500 t, and continued to be a prominent fishery up until the Second World War (Shelley, 1985). Torres Strait, a shallow stretch of treacherous reef-studded water situated between Australia and Papua New Guinea, was a wild frontier for pearl and beche-de-mer fishing entrepreneurs at the turn of the last century. This spirit is still evident in the recent gold rush for beche-de-mer in Torres Strait which started on the reefs on the Papua New Guinea side of the border in the early 1990s and has since spread to the reefs on the Australian side (Queensland Fisheries Management Authority (QFMA), personal communication).

One consequence of the enthusiastic fishing has been the recent closure of the beche-de-mer fisheries on both sides of the border because of concerns of over-

fishing (Lokani et al., 1996; QFMA, pers. comm.). Currently, beche-de-mer is a very important fishery on the PNG side of Torres Strait with catches reaching 192 t dry weight (approximately 3,000 t wet-weight) in 1991 (Lokani, 1996). With the renewed interest on the Australian side between 1,200 to 1,400 t wet-weight of beche-de-mer were collected in 1995 (QFMA, pers. comm.). The fishery at the turn of the last century was based on black and white teatfish (*Holothuria nobilis* and *H. fuscogilva*) whereas the fishery now is mainly sandfish, *H. scabra*. Over the last couple of years there has been, however, an increasing number of lower valued species such as *Actinopyga* spp. reported in the catch.

Although research on the PNG side of Torres Strait has shed some light on the stock in PNG waters (Lokani et al., 1996), very little is known about the distribution and abundance of beche-de-mer in Australian waters of Torres Strait. The CSIRO Division of Fisheries recently conducted a survey of the marine resources of Torres Strait reefs on behalf of

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