

## Sea cucumber culture developments on the west coast of Canada

by Ian Sutherland<sup>1</sup>

The commercial sea cucumber fishery in British Columbia (B.C.) for the giant red or California sea cucumber *Parastichopus californicus* began in the early 1980s. This species is harvested along the west coast of the United States and Canada, typically for its body muscle strips and skin.

While a strong demand for the product has continued, landings from the small fishery in B.C. have decreased in recent years as a result of quotas imposed by the Canadian government to conserve stocks. In 1995, a quota of approximately 233 tonnes (split, eviscerated weight) for the B.C. coast was divided evenly to 84 licences.

As fishery catches decline for many species, people around the world are focusing on actively increasing production through aquaculture or enhancement programmes. In B.C., businesses from both the sea cucumber fishing industry and the shellfish aquaculture sector have been examining such methods for increasing sea-cucumber production. As of December 1995, three groups, each with different but complementary goals, are in the early stages of projects geared for B.C.'s sea cucumber species, conditions and regulations.

B.C.'s licenced sea cucumber fishers in the Pacific Sea Cucumber Harvesters Association joined together with Fan Seafoods Limited and Manatee Holdings Limited, two shellfish aquaculture companies with roots in the fishing industry, to look into options available for sea-cucumber aquaculture and enhancement. Beginning in early 1995, with assistance from the Partners Program of the B.C. Ministry of Agriculture, Fisheries and Food, this group collected information on activities in the field in other parts of the world, created a reference library, started a B.C. Sea Cucumber Newsletter and sent a mission to Japan to see, first hand, the impressive developments in that country.

As a result of this fishery membership and a new Individual Quota system that has given B.C. sea cucumber fishers more control of their destiny, future activities of the group will likely be primarily directed toward enhancement of the common fishery resource. The group hopes that in the near future they will be able to work together with federal and provincial government agencies to set aside selected areas where they can test and develop enhancement

techniques as well as gain the information that is necessary for proper fishery management.

It appears that worldwide, the focus of most programmes is towards the increase of sea-cucumber populations over extensive areas. This is typically done through the use of hatchery-produced seed raised to a suitable size and out-planted to open areas, where it is provided with varying levels of care and ultimately harvested.

Aquaculture operations at this time in B.C., however, normally contain cultured animals in some way in relatively restricted areas leased by aquaculturists from the provincial government. To fit more easily within the existing regulations and operations, activities by two partnerships are using the containment approach to sea-cucumber aquaculture. Both are initially using small sea cucumbers that had settled on oyster culture lines as seed to develop growout techniques. To keep costs low, most hatchery-development work has been delayed until growout methods and technology are better understood.

Sun East Enterprises Ltd, a British Columbia sea cucumber processing and marketing firm, joined Redonda Sea farms Ltd, one of B.C.'s largest shellfish aquaculture companies, in a project to look at basic questions such as whether *P. californicus* could be held, would survive and grow. The one-year study began in later 1994 and was funded jointly by these companies with assistance from the Technology Assistance Program of the Ministry of Employment and Investment.

Subtidal benthic enclosures were examined to provide a similar environment to the typical sector seafloor habitat of these sea cucumbers. Suspended containers were also tested to continue the growth of the sea cucumbers under the same conditions as those from which they were collected and to follow growout methods more typical of B.C. deepwater shellfish culture.

The sea cucumbers were not fed but subsisted and grew, presumably on the material suspended in, or settled from, the water where they were contained. Results were generally positive and have provided direction for future work and a preliminary basis for economic analysis.

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The second project using containment is just about to get under way, examining more intensive suspended culture systems as well as the results of feeding to increase growth rates and density of culture. Fan Seafoods Limited, a partner in the fisheries work above, and Gigas Growth Systems Limited, a shellfish aquaculture company focusing on intensive mechanised oyster culture operations, will be undertaking this work with assistance from the Science Council of B.C.

In British Columbia, the viability of sea-cucumber aquaculture and enhancement will depend on the ability to biologically and economically produce sea cucumbers for market and on the regulations

governing activities. Slow early growth for the species and typically low density on fishing grounds are difficulties to be overcome for economic success but increased density and good recovery in culture appear possible. In experimental work to date, however, harvestable size has not yet been reached. As well, regulations are still in the process of being defined by the B.C. Ministry of Agriculture, Fisheries and Food and the Department of Fisheries and Oceans with input from industry members.

The Beche-de-mer information bulletin has been a very useful source of information during these undertakings. The groups mentioned welcome any comments or advice from readers.

## Galapagos News

Communicated by Chantal Conand  
[Information given by J. Barry, Charles Darwin Foundation]

The situation in Galapagos was reported up to March 1995 in the *Beche-de-mer Information Bulletin* #7. During the following months, various events have taken place which show that the situation is still very tense.

- *1 September 1995*: the President of Ecuador vetoed a law of 'Special Regimen of Galapagos' which did not address the key management issues which face Galapagos. Galapagos conservation benefitted from this line.
- *3 September 1995*: Threats of violence, followed by a series of disruptive actions, began against the Charles Darwin Research Station and Galapagos National Park property and personnel. These actions have taken place in the port cities on three inhabited islands: Pto. Baquerizo Moreno (San Cristobal Island), Pto. Ayora (Santa Cruz Island), and Pto. Villamil (Isabela Island). Protesters also seized the road on Santa Cruz leading to Baltra Island, closing off the main airport for most people, completely closed the

airport in San Cristobal, and seized Park property in Pto. Villamil. On September 4, 1995, protesters descended on the Station and Park headquarters in Pto. Ayora. Station personnel were evacuated by boat, have then returned, and no one has been harmed. No property has been damaged, but mounds of rubber tires have been incinerated near Park buildings

- *January 1996*: in response to a seizure (January 12) by the Galapagos National Park of illegal sea cucumber catches, and the subsequent arrest and incarceration of 8 Ecuadorian fishermen, approximately 30 fishermen seized the local offices of the Galapagos National Park and threatened to destroy the buildings if their colleagues were not released. The fishermen held the offices for twelve hours before the seizure ended.

This seizure of Galapagos National Park property marks the second such occasion in four months, and recalls the 3 January 1995 takeover related to the same issue of illegal sea-cucumber fishing.

### Miscellaneous

Prices on the retail market in Singapore appeared to be very high in December 1995, up to S\$150/kg for first grade *Holothuria scabra* var. *versicolor* and S\$100 for *Holothuria nobilis* (teatfish) [F. Conand, personal observation].

Sea cucumbers (*Holothuria scabra*, medium grade) were found at Jakarta airport (duty-free shops) at US\$45/kg in January 1996.