Sea cucumber conservation and management

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Sea cucumbers (Echinodermata: Holothuroidea) have been widely exploited for traditional food and medicinal purposes all over the world, which has led into a rapid decline of their natural populations. Traditional fishing grounds (i.e. Indo-Pacific) were heavily exploited and new fishing areas have been found in distant and remote areas (e.g. the Galapagos Islands, Ecuador). Their conservation and management are of paramount importance as they fulfill an important role in marine ecosystems and are a significant source of income to coastal communities. These fisheries currently involve almost 50 species, some of which remain under taxonomic uncertainties and with serious gaps in scientific knowledge such as reproductive biology, ecology, habitat distribution, larval ecology, amongst others.

The current population status of sea cucumbers worldwide to satisfy the *beche-de-mer* market has fueled debates, e.g. the FAO technical workshop "Advances in sea cucumber aquaculture and management – ASCAM" and the CITES technical workshop "Conservation of sea cucumbers in the families Holothuridae and Stichopodidae", both were aimed at providing the scientific tools to help in their conservation and sustainable management and exploitation.

With this in mind, FAO developed a project aimed at collating and disseminating information on the global status of commercially exploited sea cucumber stocks and to improve the capacity among all exploiting nations in the conservation and sustainable use of sea cucumbers. This project has three sub-components that include:

- review and analysis of the available information on the global status of commercially-exploited sea cucumber stocks and identification of 'hot spots' to develop and implement appropriate management approaches;
- preparation of an identification guide for commercial sea cucumbers, including the development of genetic markers and a
- technical workshop to draft the guidelines for their conservation and management.

Regional review and hotspot analysis

To fully understand the current status of sea cucumber populations worldwide, the project will be undertaken focussing on five regions, namely: 1) Asia, 2) Australia and Pacific Island Nations (PINs), 3) North America (excluding Mexico), 4) Mexico, Central and South America and 5) Africa and Indian Ocean. In each region, the following 'hotspots' had been identified, namely Philippines, Papua New Guinea, the *Cucumaria frondosa* fishery in Newfoundland, Canada, Galápagos Islands and Seychelles, respectively. These regional reviews (RR) and hotspot (HTP) analyses are currently under preparation by well-known and respected sea cucumber scientists and will be the basis for discussion during the planned technical workshop that will take place in the Galapagos from 19 to 23 November 2007.

The main objective of the RR and HTP analyses is to review published and unpublished literature regarding the population status, fishing statistics, landing figures of commercially important sea cucumber species within all countries of each region and the designated hotspot. These documents will take into consideration, as far as possible, all relevant published (e.g. books, journal articles and widely disseminated reports) and grey literature (e.g. in-country reports) on sea cucumbers and incorporate, wherever possible, the activities undertaken by FAO and CITES on sea cucumbers.

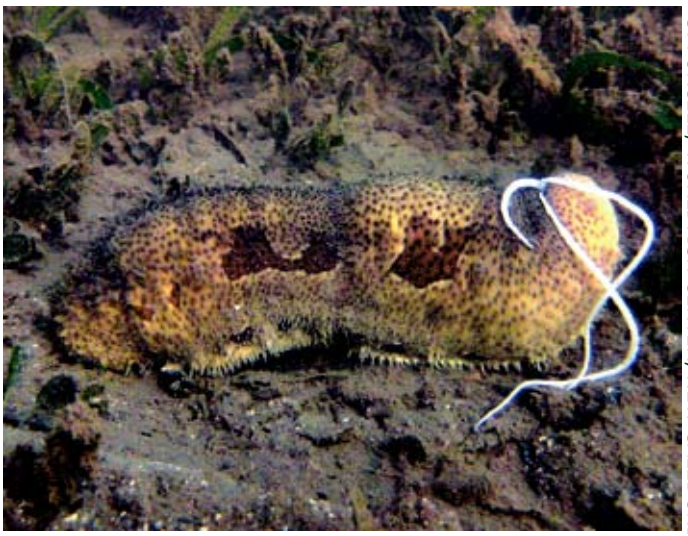
Identification guide for commercial sea cucumbers including genetic markers

One of the major issues in the conservation of sea cucumbers is the proper taxonomic identification of the species entering the international market, especially after they have been processed. The lack of adequate tools to help enforcement officials and researchers has been one of the crucial points in any implementation of management actions on sea cucumber species.

The need for this tool, led to the development of a comprehensive guide which will include

photos of live and processed specimens and a photo of the calcareous spicules from the dorsal body wall, as a taxonomic character. Although the original idea for this FAO publication was a simple identification guide for major commercial sea cucumber species, further analysis concluded that it should include available scientific information on the biology, ecology, marketing and processing activities, as well as photos and descriptions of commercial species at different processing levels[1].

Currently this project has gathered information on 39 species, with information spanning over 20 countries, on management practices, scientific information available, main market, population status, type of fishery and main use.


S. PURCELL, WORLDFISH CENTER, NEW CALEDONIA

Live specimen of Bohadschia similis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Live specimen of Bohadschia argus

As stated before, taxonomic uncertainties remain a key point in the conservation of holothurians, representing one of the greatest needs of those species of commercial interest. This project also includes the genetic bar-coding of commercial species aiming to provide yet another tool for the correct identification of sea cucumbers in the international market, as well as helping to understand the connectivity among holothurian populations, rendering information on how stocks should be managed to benefit sustainability of sea cucumber populations worldwide. This study is using the mitochondrial CO1 gene, which has been helpful in clearly distinguishing all holothurian species thus far investigated.

Technical workshop in the Galapagos Islands

This technical workshop intends to gather between 15 and 20 sea cucumber experts from all over the world, with the final goal of developing a set of guidelines for the conservation and management of sea cucumber populations. The workshop will have socio-economists, policy makers, managers and biologists who will discuss the conservation and management of sea cucumber populations worldwide. Their work will be based on the RR and HTP documents which will help identify problems and pinpoint management guidelines common to the different regions and those that need to be dealt with.

Upon completion of this project, there will be practical tools that will help managers, decision makers, politicians and biologists to take informed and appropriate decisions on the management of holothurian populations worldwide, hence helping to attain their conservation and supporting their sustainable exploitation.

[1]For more information, please refer to the following publication: Toral-Granda M.V. 2006. Fact sheets and identification guide for commercial sea cucumber species. *SPC Beche-de-Mer 24: 49-52.*

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