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# Glossary

<i>Beche-de-mer</i>	meaning “spade of the sea”, this term refers to dried sea cucumbers after gutting and boiling and in some cases after salting and smoking.
<i>Capacity (capacity in management institution)</i>	the level of competence, skills and resources to develop, implement and monitor the management plan.
<i>Decision control rules</i>	rules agreed at the onset of developing a management plan about what management actions will be taken in light of the level of performance relative to reference limits.
<i>Depleted stock</i>	populations of sea cucumbers within a fishery that have declined to levels whereby the rate of natural reproduction and population replenishment is poor, or unable to keep pace with mortality losses, due to low densities of breeding adults.
<i>Ecosystem</i>	an organizational unit consisting of an aggregation of plants, animals (including humans) and micro-organisms, along with the non-living components of the environment.
<i>Effort</i>	the total amount of fishing activity over a period of time.
<i>Exploitation</i>	use of the resource for personal gain, whether for subsistence or commercial purposes.
<i>Fishery</i>	the sum of all fishing activities on a given resource (e.g. a sea cucumber fishery), or the activities of a certain style of fishing on a particular resource (e.g. a dive fishery).
<i>Fishing</i>	this term is used interchangeably with “collecting” and “harvesting” to describe the act of removing sea cucumbers from the wild for commercial or subsistence purposes.

<i>Hookah</i>	equipment to allow divers to breath underwater using hoses delivering compressed air from compressors onboard a boat above them.
<i>Incentive</i>	a management measure intended to motivate or encourage stakeholders to conduct their activities in a responsible way that contributes towards achieving the goals and objectives. Incentive measures can include, for example, implementation of suitable systems of access rights, taxes and subsidies and market incentives such as ecolabelling and tradable access or property rights.
<i>Indicator</i>	<p>a variable that can give a measure of the state of the system at any one time, instead of measuring a response directly. For example, declining exports is an indicator that stocks have decreased, even though the stock itself is not measured.</p> <p>in the context of reviewing the effectiveness of a management strategy, an indicator is a variable that shows the present state of a component of the fishery, for example, abundance of valuable sea cucumbers in fishing grounds.</p>
<i>Life-history traits</i>	biological or ecological characteristics of particular species relating to different developmental stages or reproduction.
<i>Longevity</i>	the life span of an animal.
<i>Management measure</i>	specific control or action applied to the fishery towards the objectives, including technical measures, input controls, output controls and user rights.
<i>Management plan</i>	a formal or informal arrangement between a fisheries management authority and interested parties or stakeholders that identifies the partners in the fishery and their respective roles, details the agreed objectives for the fishery and specifies the management rules and regulations that apply to it and provides other details about the fishery that are relevant to the task of the management authority.

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<i>Management tool</i>	another term for <i>management measure</i> , because these are “instruments” used by managers to achieve the fishery objectives.
<i>Manager</i>	here, refers to the person charged with, or responsible for, the stewardship of the fishery, including the formation of management regulations, monitoring and enforcement. The manager would generally be the leader of the <i>managing institution</i> .
<i>Managing institution</i>	the group of people in charge of developing management plans for the fishery and responsible for monitoring, and adapting to, changes in the status of resources. It could be the fishery service of the country or province, in the case of centralized management, or a group of community leaders in the case of community-based management.
<i>Marine protected area</i>	a portion of the marine benthos and water, with its associated biota, reserved to protect part or all of the designated environment. The protection may allow for regulated levels of extraction (fishing) of plants and animals.
<i>Maximum sustainable yield</i>	the highest theoretical limit at which sea cucumbers can be harvested without significantly affecting the reproductive process or the natural replenishment of the population.
<i>Mortality</i>	death of sea cucumbers in the population due to fishing or natural events.
<i>No-take zone</i>	used in the same sense as “marine reserve” to mean a marine area, and its occupants, fully protected by law from the removal or harm of animals, plants and habitat.
<i>Objective</i>	a statement that defines and quantifies the fishery management goals and defines what the management strategy is trying to achieve.
<i>Oocytes</i>	female sexual cells or unfertilized eggs released from females.

<i>Overfishing</i>	a state where fished populations are not able to easily recover to the pre-harvest number of animals or to levels where the populations can increase in numbers, i.e. a state of negative per-capita population growth.
<i>Precautionary approach</i>	involves the application of prudent foresight when action needs to be taken with incomplete knowledge. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.
<i>Recruitment</i>	the addition of young sea cucumbers to the population, here considered as the addition of juveniles to a population after post-settlement mortality.
<i>Reference point</i>	a benchmark against which to assess the performance of management in achieving the objectives. A <i>limit reference point</i> is a level of a certain parameter to avoid going beyond.
<i>Sedentary</i>	slow moving and staying in the same vicinity for long periods.
<i>Spatial</i>	referring to things, or processes, in geographic space.
<i>Sperm</i>	male sexual cells.
<i>Stakeholder</i>	any person or group with a legitimate interest in the use and future of the resource. It includes but is not limited to fishers, processors, buyers, resource stewards, conservationists and conservation agencies, tourism agents, scientists and resource managers.

- Status of stocks/  
resource* the abundance and sizes of individual sea cucumbers in wild populations within the fishery relative to healthy levels at which the animals would be breeding successfully and at which populations could withstand some losses from fishing without undermining population recovery. Stock status can be defined relative to fishing impacts, i.e. underexploited, fully exploited or depleted.
- Stock* a group of individual sea cucumbers occupying a well-defined spatial range independent of other populations of the same species. A stock would normally be regarded as an entity for management or assessment purposes – thus, populations in different areas (e.g. individual reefs) that are normally connected through dispersal would be considered a single stock.
- Temperate* pertaining to regions with cold climates, away from the tropics.
- Trepang* a term used in Indian Ocean countries for dried sea cucumbers; a synonym of *beche-de-mer*.
- UVC* underwater visual census. This survey method involves divers recording the number and sizes of sea cucumbers along belt transects of the sea floor.

## Further reading

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Fisheries & Management	Biology	Ecology	Species identification	Survey methods
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Fisheries & Management	Biology	Ecology	Species identification	Survey methods
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**Pandemic overfishing to critical levels currently threatens the persistence of sea cucumber fisheries and the important role they play in the livelihoods of coastal fishers. Resource managers must embrace an ecosystem approach to fisheries, in which biodiversity conservation, ecosystem services and the concerns of stakeholders are taken into account together with the economic gains from fishing.**

**This document is an abridged version of FAO Fisheries and Aquaculture Technical Paper No. 520 *Managing Sea Cucumber Fisheries With An Ecosystem Approach*. This document provides a “road map” for developing and implementing better management of sea cucumber fisheries. Also summarized here are the merits and limitations of potential management regulations and actions by the resource manager, and steps required for their implementation.**

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