

## GLOSSARY

**Abyssal floor/plains:** Pertaining to the great depths of the ocean; deep bottom area or portion of submerged earthform between the depths of 4,000 - 7,000 m.

**Age at first maturity:** Mean or median age at first maturity, i.e., age at which 50% of a cohort spawn for the first time ( $T_m$ ).

**Asymptotic length:** A parameter of the von Bertalanffy Growth Function (VBGF), expressing the mean length the fish of a given stock would reach if they were to grow for an infinitely long period ( $L_\infty$ )

**Bathymersal:** Living and feeding on the bottom below 200 m.

**Bathypelagic:** Region of the oceanic zone between 1,000 m to 4,000 m, i.e., between the mesopelagic layer (above) and the abyssopelagic layer (below). Also refers to animals living or feeding in open waters at depths between 1,000 and 4,000 m.

**Benthic:** Dwelling on, or relative to, the bottom of a body of water; living on the bottom of the ocean and feeding on organisms thereon.

**Benthopelagic:** Living and feeding near the bottom, as well as in midwater or near the surface. Feeding on both benthic and free-swimming organisms.

**Bioluminescence:** The light produced by organisms, such as lanternfish (Fam. Myctophidae).

**Biomass:** The combined weight, at or during a certain time, of all the members of a given population or stock.

**By-catch:** Non-targeted organisms taken incidentally in a fishery; by-catch species are often of lesser value than the target species, and thus often discarded. Some by-catch species are of commercial value and are retained for landing and sale. By-catch often consists of the juveniles of commercial species, and their loss has a deleterious impact on the overall yield obtained from a certain area.

**Carnivores:** Feeding on animal tissues, in contrast to herbivores, which feeding on plants. Most exploited fish are second- or higher-order carnivores, i.e., they feed on other carnivorous animals.

**Catch:** The number (or weight) of all fish killed by fishing operations, whether the fish are landed or not.

**Commercially important fishes:** species taken in and landed by capture fisheries, or farmed by the aquaculture industry of a country.

**Continental shelf:** The sea bottom from the shore out to a depth of 200 m; a zone adjacent to a continent or around an island, and extending from the low-water line to the depth at which there is usually a marked increase of slope to greater depth; the edge of the continent that is submerged in relatively shallow ocean water.

**Continental slope:** Region of the outer edge of a continent between the generally shallow continental shelf and the deep ocean floor, from 200 to 2,000 m; often steep.

**Critically endangered:** As defined by IUCN, a taxon is 'critically endangered' when it is facing an extremely high risk of extinction in the wild in the immediate future

**Deep-sea fishes:** Species living below 1000 m; some authors extend this to include species occurring between 500 and 1000 m.

**Demersal:** Referring to species living on or near the bottom and feeding on benthic organisms, e.g., the flatfishes.

**Deposit-feeders:** Species that feed on particles in the sediments. Because deep sea areas are far below the zone where light reaches and plants can grow, deposit-feeders are particularly abundant in the deeper waters, where they feed on 'marine snow', falling from surface layers, or drifting down from shallower waters, and consisting mainly of the remain of planktonic algae.

**Ecosystem-based (fisheries) management:** A concept whose definition is still evolving, but which moves away from an earlier emphasis on a few species of commercial interest, toward an explicit consideration of the food webs within which these species are embedded, and the habitats they require for the different phases of their life cycles.

**Endangered:** As defined by (IUCN, a taxon is 'endangered' when it is not 'critically endangered', but is facing a very high risk of extinction in the wild in the near future.

**Endemism:** Native and restricted to a particular area, e.g., a river basin, an island or seamount, a country or a continent.

**Epifauna:** The animals living on the surface of the bottom of a water body.

**Epipelagic-** The uppermost (normally lighted) layer of the ocean, between the ocean surface and the thermocline, usually between depths of 0-200 m; living or feeding on surface waters or at midwater to depths of 200 m.

**Expert systems:** A computer software/database, mimicking some features of the expertise held by professionals, and which can assist them in the exercise of their profession.

**Extinction:** Disappearance of a taxonomic group (species, genus or higher) of organisms from existence in all regions. Extinction occurs one population at a time, and a species is extinct when its last population is gone. The same applies to genera with reference to their component species, etc.

**Fecundity:** Number of propagules (eggs, larvae or pups in fishes) an animal produces during each reproductive cycle; the potential reproductive capacity of an organism or population. Usually increases with age and size.

**Filter-feeders:** Species that capture particles swept past them by water currents. Many filter-feeders take bushy shapes, which make them very vulnerable to mechanical damage.

**Fitness:** Contribution of an individual to the next generation, relative to the contribution of other individuals. The number of offspring an organism manages to produce, and which manage to grow and reproduce. Organisms use different strategies to realize their fitness, which may be 'called fitness strategies'.

**Fuzzy logic:** A type of logic that can recognize both true and false simultaneously, along with the degrees of belief associated with these propositions.

**Gas glands:** see Swim bladder.

**Genetic diversity:** The variety of genes within a particular species, variety, or breed; the sum of information embedded in the genes of an individual organism, community or ecosystem.

**Herbivore:** Feeding on plants, also plant eating, phytophagous (*see also* Carnivore).

**Hills:** Here: underwater mountains of heights below 1000 m; could also be referred as 'seamounts'.

**Hyperstability:** In fishery science terms, hyperstability refers to a phenomenon in which an observed index of stock abundance (e.g. catch per unit of effort or CPUE) remains stable although the abundance of the stock in question is actually declining.

**Intrinsic rate of population increase:** the maximum (potential) rate of growth of a population (resulting from the growth of individuals, and the entry of new individuals in the populations. Usually approached when a population are small relative to the resources available to it ( $r_{max}$ ).

IUCN: International Union for the Conservation of Nature.

Life span: *See* Longevity.

Longevity: oldest fish ever recorded for a species or stock; also the age in an unexploited stock at which only 1% of a cohort has survived ( $T_{max}$ ).

$L_{max}$ : *see* Maximum length.

$L_{\infty}$ : Asymptotic length (*see also* von Bertalanffy growth function).

$M$ : *see* Natural mortality.

Maturity: The stage of the life cycle of an organism at which it is able (during the reproductive season, if any) to develop ripe gonads and to participate in spawning (*See also* Age at first maturity).

Maximum length: Size of longest individual recorded from a stock ( $L_{max}$ ).

Natural mortality: That component of total mortality not caused by fishing, but by natural causes such as predation, diseases, senility, etc. ( $M$ ).

Omnivore: Pertain to animals feeding on both plant and animal tissue.

Overexploitation: *See* Overfishing.

Overfishing: Catching more fish than the maximum catch that a population can sustain, thus inducing a decline in its abundance, which then leads to declining catches.

Pelagic: Living and feeding in the open sea; associated with the surface or middle depths of a body of water; free swimming in the seas, oceans or open waters; not in association with the bottom. Many pelagic fish feed on plankton. In FishBase, 'pelagic' refers to fishes of to surface or mid water from 0 to 200 m depth (*see* Epipelagic).

Perciforms: A group of advanced fishes possessing hard spines in their fins, and including the perches, snappers, mackerels, tuna, etc. supporting large fisheries.

Phylogenetic: Based upon natural evolutionary relationships; pertaining to the evolutionary history of a particular group of organisms.

Rate of population increase: in a balanced or equilibrium fishery, the increment due to the rate of population increase replaces what is removed by fishing, and the rate of 'surplus production' (i.e., catch) is numerically equal to the rate of fishing. The maximum rate of increase of a population is determined by its intrinsic rate of increase ( $r_{max}$ ) (*see* Intrinsic rate of increase).

Reef-associated: Living and feeding on or near coral reefs.

Resilience: The capacity of a system to tolerate impacts without irreversible change in its outputs or structure. In species or populations, this is often understood as the capacity to withstand exploitation.

SCUBA: Self-contained underwater breathing apparatus; aqualung equipment enabling diving by providing air (or other gaseous mixtures) without the need of an air tube to the surface.

Seamounts: undersea mountains (usually of volcanic origin) rising from the seafloor and peaking below sea level. By general consensus states, seamounts should be steep-sided and rise 1,000 m or more from the sea floor. Most are circular or elliptical although very elongated seamounts do occur.

Seamount-associated: Refers to species that aggregate in association with seamounts and similar oceanic features.

**Stock-recruitment models:** Mathematical, often dome-shaped, functions used in fisheries science to express the relationships between parental stock size (ordinate axis) and the subsequent 'recruitment' of juveniles (abscissa).

**Sustainable exploitation:** The use of components of biological diversity in a way and at a rate that does not lead to the long-term decline of biological diversity and stock biomass, thereby maintaining its potential to meet the needs and aspirations of present and future generations.

**Swim bladder:** A tough-walled gas-filled sac located just beneath the vertebral column of many bony fishes; its principal function is to offset the weight of heavier tissue such as bone. In some fishes also used for sound production or respiration. Often lacking in bottom fishes. Sometimes called air bladder, a less appropriate term.

**Thermocline-** The distinct interface between surface waters and cooler, deeper waters; region between the warm upper layer and the lower cold layer of the sea, where temperature declines abruptly (1C° or more per meter) with increasing depth.

$T_{max}$ : See Longevity.

**Trawl:** A fishing net that is dragged behind a boat (rarely two). A wide range of demersal (bottom) or pelagic (mid-water) species of fish are taken by this fishing method, which usually has devastating impact on epibenthic organisms, notably on the filter-feeders of seamounts.

**Trophic level:** A number, usually ranging from 1 to 5, expressing the position of organisms within food webs, with plants having a definitional trophic level of 1, herbivores 2, first-order carnivores 3, etc. Note that due to their mixed diet, fish can intermediate trophic levels, e.g. 3.6 or 4.1. Most fishes caught by fisheries range from 2.2. to 4.2, with a mean about 3.5. The mean trophic level of marine fisheries is declining over time, a process now known as 'fishing down marine food webs'.

**von Bertalanffy growth function (VBGF):** Mathematical model commonly used to describe the growth of fish and other aquatic organism as a function of their age. The VBGF parameters are: asymptotic length ( $L_{\infty}$ ), and the curvature parameter  $K$  (of dimension 1/time), which determines how fast  $L_{\infty}$  is approached. Low values of  $K$ , usually associated with high values of  $L_{\infty}$  and low natural mortality ( $M$ ), are generally associated with high vulnerabilities to the effect of fishing.

**Vulnerable:** As defined by IUCN, a taxon is 'vulnerable' when it is not critically endangered or endangered but is facing a high risk of extinction in the wild in the medium-term future.

**Zooplankton:** Small animals which drift freely in the water column; most are herbivores.