



Glossary

Although many of the terms used in the texts for *ICES-FishMap* are widely used in biological and fishery related fields of research and thus do not need further explanation, a number of expressions require a more specific definition to preclude misunderstanding. Some of the definitions below were directly taken from the *Encyclopedia of marine sciences* or from *Key to the fishes of northern Europe* [2].

1. Baretta-Bekker, J.G., Duursma, E.K., and Kuipers, B.R. (eds). 1992. *Encyclopedia of marine sciences*. Springer-Verlag, Berlin. 311 pp.
2. Wheeler, A. 1978. *Key to the fishes of northern Europe*. Frederick Warne, London. 380 pp.

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Adult (mature) fish: fish that have reached sexual maturity.

Age group: a group of fish of the same age. By convention, fish are called 0-group in their year of birth, 1-group in their second year of life, and so on. See also **year class**.

Anadromous: migrating from saline waters to spawn in fresh water, as opposed to **catadromous**. The Atlantic salmon is a classic example.

Anguilliform: with an eel-like shape. The scientific name for eel is *Anguilla anguilla*.

Bathypelagic: living pelagically over great depths.

Beam trawl: a type of bottom trawl, mainly used for flatfish and shrimps. The horizontal opening of the net is provided by a beam, which may be 12 m long or more. Fish on the bottom are disturbed by 'tickler chains' fixed in front of the groundrope and then enter the net.

Benthic: bottom-living. Typical benthic organisms are sea urchins and sea stars. Although it is possible that some fish species may be truly benthic, it is usual to describe fish which spend most of their time on or close to the seabed as **demersal**. By contrast, **pelagic** species spend most of their time somewhere in the water column off the bottom.

Benthopelagic: living on the bottom and up to 200 to 300 m above the bottom in deep water.

B_{lim}: limit biomass (see **Precautionary Approach**).

B_{pa}: precautionary biomass (see **Precautionary Approach**).

BTS: Beam Trawl Survey.

By-catch: species in the catch that are not the main target of the fishery. Often the by-catch species are non-commercial and are rejected as **discards**. However, valuable species such as halibut and anglerfish are usually taken also as a by-catch and landed.



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Catadromous: migrating from fresh water to spawn in the sea, as opposed to **anadromous**. The eel is a good example.

Catch: strictly speaking, this term refers to the total quantity of fish taken by the fishery. However, in most cases a proportion of the catch is rejected at sea (**discards**). The fish which are brought ashore constitute the **landings**, which are sometimes described as **nominal catches**.

Catchability: the degree to which fish are vulnerable to the fishing gear. The catchability of a species, or of different size classes of the same species, may vary enormously depending on which gear is used. Thus, pelagic species such as mackerel have a low catchability in bottom trawls and flatfishes have a low catchability in trawls fished in mid-water. It is clear, therefore, that although the *Atlas* surveys were undertaken with a more or less standard fishing gear, catch rates of the various species do not reflect absolute differences in abundance.

CEFAS: the Centre for Environment, Fisheries and Aquaculture Science in Lowestoft (United Kingdom).

Cohort: see **year class**.

Demersal: living on or close to the seabed. See also **benthic**.

Discards: organisms that are returned to the sea after capture. As a consequence of heavy gear, long tows and large pressure differences between bottom and the surface, individuals of most species are either dead or have no chance to survive. Fish may be discarded for several reasons; they may be of non-marketable species, they may be below the minimum legal landing size, current prices may be considered too low, or the quota for a particular species may have been exceeded. Discarding may take place on a very large scale, particularly when an abundant **year class** starts to enter the exploitable part of the stock.

Elasmobranchs: fish with cartilaginous skeletons, such as sharks and rays. Fish with bony skeletons are called **teleosts**.

Euryhaline: capable of living in waters of widely ranging salinity.

Fecundity: the total number of eggs spawned by a female during a single spawning season. The eggs may be laid singly or in masses and released all at once (**synchronous spawning**) or in several batches (**serial spawning**). In [ICES-FishMap](#), frequent reference is made to the number of eggs produced per gram female body weight. This parameter, which facilitates comparison within and between species, is the **relative fecundity**.

Fertilization: in fishes, fertilization is usually external, the eggs and sperm (milt) being shed into the water. In some groups, however, fertilization is internal. Male sharks and rays, for example, have specialized copulatory organs (claspers) to facilitate the introduction of sperm.

Fishing mortality: deaths caused by fishing.



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F_{lim}: limit fishing mortality rate (see **Precautionary Approach**).

F_{pa}: precautionary fishing mortality rate (see **Precautionary Approach**)

Growth: unlike mammals, fish continue to grow throughout their lives. In temperate regions such as the North Sea, growth is most rapid during the warmer months of the year and slows down or stops during the winter.

IBTS: International Bottom Trawl Survey.

ICES: International Council for the Exploration of the Sea.

Industrial fishery: a fishery that catches fish in bulk for reduction to fish meal and fish oil. The industrial fishery is usually targeted at small, short-lived species such as sandeels and Norway pout, which are considered unsuitable for human consumption. However, large quantities of herring may be taken by an industrial fishery.

Isobath: a line on a chart connecting points of equal water depth.

Juvenile (immature) fish: fish that have not reached sexual maturity.

Landings: fish that are brought ashore. See **catch**.

Larva: stage of life between hatching from the egg and metamorphosis.

L₅₀: length at which 50% of the individuals sampled in that length class are sexually maturing/mature. The onset of maturity will occur over a range of sizes for any species.

Maerl: Maerl is a collective term for several species of calcified red seaweed. It grows as unattached nodules on the seabed, and can form extensive beds in favourable conditions. Maerl is slow-growing, but over long periods its dead calcareous skeleton can accumulate into deep deposits (an important habitat in its own right), overlain by a thin layer of pink, living maerl.

Metamorphosis: process during which the larva acquires characteristics such as scales, and adult body proportions.

Mortality rate: a measure of the rates at which fish in a given stock die during a given time period. Fisheries biologists usually make a distinction between **natural mortality rate (M)** and **fishing mortality rate (F)**.

Natural mortality: deaths due to natural causes, such as disease and predation.

Nektonic: moving independently of the current. See **planktonic**.

Nominal catches: see **catch**.



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Nursery (nursery area): an area providing a favourable environment (food, shelter) for young fish.

Oviparous: egg-laying.

Ovoviviparous: form of reproduction whereby the eggs develop and hatch within the mother's oviduct, following internal fertilization, and are expelled as larvae.

Pelagic: living mostly off the bottom. See **benthic**.

Planktonic: floating in the water column. The movements of planktonic organisms are almost entirely dictated by the prevailing currents. By contrast, **nektonic** organisms can move independently of the current

Precautionary approach: implemented in the ICES advice on fisheries management in 1998, consisting of a framework of biological reference points, related to upper exploitation boundaries. Management decisions for sustainable fisheries should restrict the risk that the spawning biomass falls below a minimum limit, or that the fishing mortality rate becomes too high. A minimum level of spawning stock biomass, or limit biomass (B_{lim}), is defined. Below B_{lim} there is a higher risk that the stock reaches a level where it suffers from severely reduced productivity. In a similar way a limit fishing mortality has been defined (F_{lim}). Management should prevent the spawning stock to decrease below B_{lim} , and avoid a fishing mortality above F_{lim} .

To avoid the risk of the spawning stock to decrease to or below B_{lim} because of uncertainties in the assessment, a higher stock biomass has also been defined, the precautionary biomass (B_{pa}). Similarly, to avoid the fishing mortality to become as high as F_{lim} , a lower level of fishing mortality has been defined, the precautionary fishing mortality (F_{pa}). In general, management advice is aimed at avoiding the risk that the spawning stock falls below B_{pa} , and that fishing mortality rate increases above F_{pa} .

For a more detailed explanation of the precautionary approach, see the latest report of the ICES Advisory Committee for Fisheries Management (ACFM).

Purse seine: a fishing method whereby entire shoals of fish (usually pelagic species) are encircled by a sheet of netting, the bottom of which is then drawn together to form a bag or 'purse'.

Recruitment: 1) the number of young produced by a given stock each year, or 2) the numbers of new fish which are added to the exploitable portion of the stock resulting from growth or migration of smaller fish.

Relative fecundity: see **fecundity**.

RIVO: Netherlands Institute for Fisheries Research in IJmuiden (the Netherlands).

Serial spawning: release of eggs in several batches. See **fecundity**.

Spawning stock biomass: see **stock**.

SSB: Spawning Stock Biomass. See **stock**.



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Stock: a part of a fish population, usually with a particular migratory pattern, specific spawning grounds, and subject to a distinct fishery. **Total stock** refers to both juveniles and adults, either in numbers or by weight, while **spawning stock (biomass)** refers to the numbers (weights) of individuals which are old enough to reproduce.

Synchronous spawning: release of eggs at one time. See **fecundity**.

Teleosts: fish with bony skeletons. See **elasmobranchs**.

Viviparous: form of reproduction whereby the young develop within the mother and are nourished by her via a placenta.

Von Bertalanffy growth parameters: the growth curve can be described by the Von Bertalanffy growth equation. The equation gives the length (L) of a fish at time t.

$$L_t = L_{\infty} (1 - e^{-K(t-t_0)})$$

Three parameters are needed to describe growth: L_{∞} , K and t_0 .

Year class (cohort): a group of fish born in the same year. Thus 1-group fish sampled in 2003, 2-group fish sampled in 2004, and 3-group fish sampled in 2005 are all members of the 2002 year class. See also **age group**.