WHICH FISH?

EAZA

SUSTAINABLE AQUATIC RESOURCES CAMPAIGN 2020/21

Partner:

European Association for Aquatic Mammals

European Union of Aquarium Curators

WHAT IS WHICH FISH CAMPAIGN

Oceans cover approximately 70% of the surface of our planet and provide resources for millions of people. Numerous human activities such as overfishing, destructive fishing methods, marine pollution and climate change are the main threats to the oceans, as that may compromise its ability to continue providing ecosystem services and essential food resources.

Fish and invertebrates are in fact essential for human consumption and to provide income to coastal populations. There is a consensus of the need to conserve and properly manage fish stocks to avoid massive irreversible losses.
This campaign, promoted by EAZA (European Association of Zoos and Aquaria) is addressing human interference with the conservation of marine species with commercial interest, focusing on how we work in our institutions and it aims to encourage participants to change their working practices by applying the already shared vision of joining efforts to protect and manage marine biodiversity.

The campaign has three different axes:

A) Human sustainable consumption

Fishery resources should be collected and managed in a sustainable way, in order to guarantee suitable numerical levels over time, respecting the minimum catch sizes, avoiding the catch of young individuals who have not yet been able to reproduce, thus ensuring the maintenance of the species.

Overfishing leads to species impoverishment and to the gradual decrease in catches with a growing waste of energy. Compounding the situation of over-exploitation are consolidated food and cultural habits, which do not favour a diversified fishing pressure distributed over different species, focusing the pressure over a limited number of resources which, even for this reason, could become excessively exploited.
Which fish campaign promotes the sustainable sea food consumption and the dissemination of best practice.

B) Sustainable animal feed

Aside from Human fish consumption the WHICH FISH? Campaign Committee has also suggested a change of perspective versus those facilities who currently utilize fisheries resources to feed their animals, regardless of being small or large scale.

WHICH FISH? challenges the aquarium curators by stimulating a reevaluation of the choices of species, quantities and qualities of fish and invertebrates utilized for feeding their animals aiming at increasing the total number of sus-

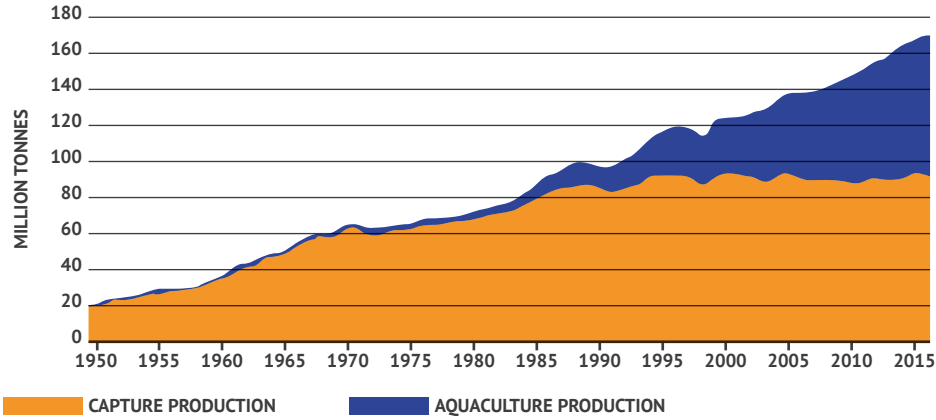
tainable marine fish and invertebrate individuals/species utilized, within the range of campaign duration and further.

C) Sustainable acquisition of aquatic species for collection plan

The third topic of the campaign is related to the necessity for zoos and aquaria to guarantee a sustainable acquisition program for fish and invertebrates displayed and maintained, by promoting implementation of sustainable collections and breeding programs.
In order to address this issue the WHICH FISH? Campaign Committee has involved EUAC (EUropean association of Aquarium Curators), which has developed the EUAC Animal Acquisition Guidelines, a very important and widely shared document that summarizes all the questions an Aquarium Curator should answer before acquiring new aquatic individuals or species for the zoological collection.
WHICH FISH? challenges the aquarium curators by stimulating a global programming of individual animal collection that aims at increasing the total number of sustainable marine fish and invertebrate individuals/species in their collection plan.

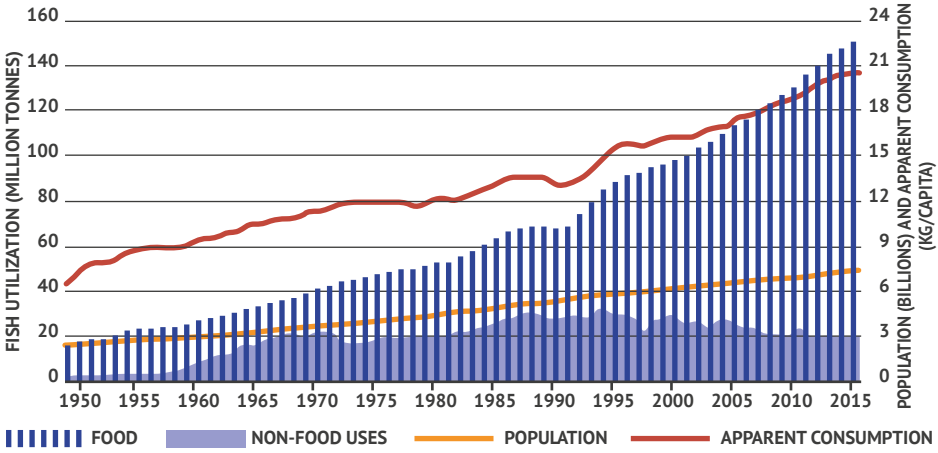
WHY A CAMPAIGN ABOUT SUSTAINABLE USE OF FISHING RESOURCES?

Global fish production peaked at about 171 million tonnes in 2016, with aquaculture representing 47 percent of the total and 53 percent, if non-food uses (including reduction to fishmeal and fish oil) are excluded. Global total capture fisheries production, as derived from the FAO capture database, was 90.9 million tonnes in 2016, a small decrease in comparison to the two previous years. World total marine catch was 81.2 million tonnes in 2015 and 79.3 million tonnes in 2016.



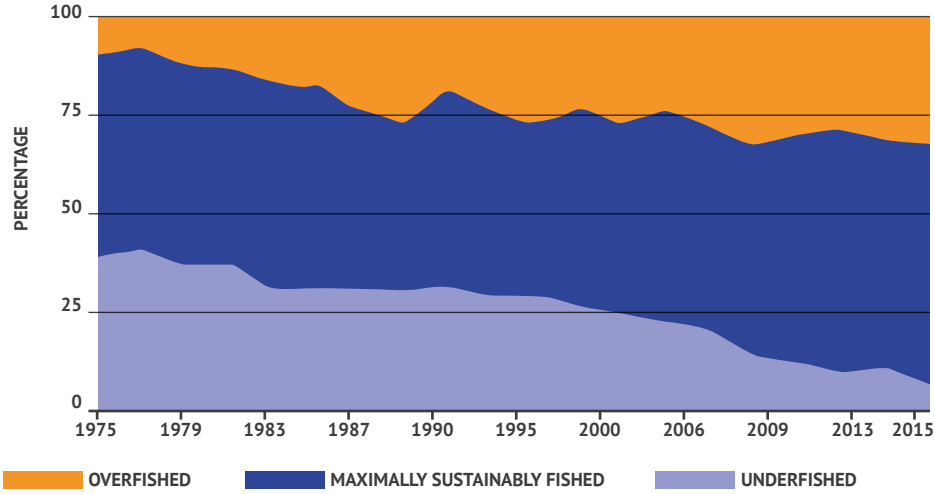
FAO. 2018.
The State of World Fisheries and Aquaculture 2018 - Meeting the sustainable development goals. Rome.

Since 1961, the average annual increase in global apparent food fish consumption (3.2 percent) has outpaced population growth (1.6 percent) and exceeded consumption of meat from all terrestrial animals, combined (2.8 percent) and individually (bovine, ovine, pig, other), except poultry (4.9 percent). In per capita terms, food fish consumption has grown from 9.0 kg in 1961 to 20.2 kg in 2015, at an average rate of about 1.5 percent per year. Preliminary estimates for 2016 and 2017 point to further growth to about 20.3 and 20.5 kg.



FAO. 2018.
The State of World Fisheries and Aquaculture 2018 - Meeting the sustainable development goals. Rome.

Based on FAO's monitoring of assessed stocks, the fraction of fish stocks that are within biologically sustainable levels has exhibited a decreasing trend, in contrast, the percentage of stocks fished at biologically unsustainable levels increased: actually 31,1% of the evaluated stocks are fished at a biologically unsustainable level, 59,9% are fully fished, only 7% are underfished.



FAO. 2018.
The State of World Fisheries and Aquaculture 2018 - Meeting the sustainable development goals. Rome.

Moreover, consolidated food consumption and cultural habits that focus attention on a limited number of resources, aggravate the situation of overfishing of some species.

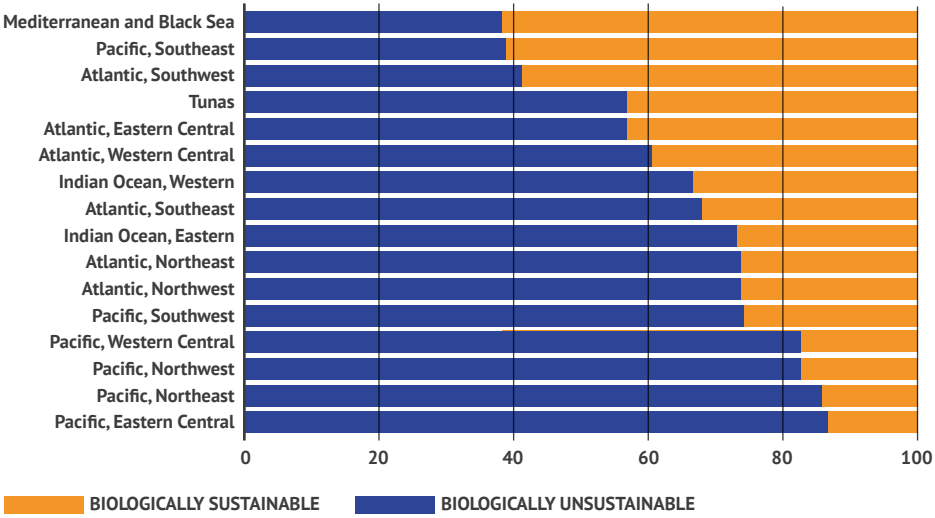
OVERFISHED
having abundance lower than the level that can produce MSY *

MAXIMALLY SUSTAINABLY FISHED
having abundance at or close to the level of MSY

UNDERFISHED
abundance above the level corresponding to MSY

**MSY: the Maximum Sustainable Yield for a given fish stock means the highest possible annual catch that can be sustained over time, by keeping the stock at the level producing maximum growth. The MSY refers to a hypothetical equilibrium state between the exploited population and the fishing activity.*

In 2015, among the 16 major statistical areas, the Mediterranean and Black Sea (Area 37) had the highest percentage (62. 2 percent) of unsustainable stocks.



FAO. 2018.
The State of World Fisheries and Aquaculture 2018 - Meeting the sustainable development goals. Rome.

A stock is a management unit of the living resources in the community or population from which catches are taken in a fishery, not necessarily linked to any biological population concept. Use of the term fish stock usually implies that the population is more or less isolated from other stocks of the same species and hence self-sustaining. This means that one species can have different stocks. A migratory species could belong to a single stock covering a very wide area, while a bottom or a demersal species could belong to a very localised stock. This is one of the reasons why it is very difficult and complex to study fish distribution and its stocks status. Therefore, caution is advised when managing fish resources.

WHAT IMPACT DOES EXCESSIVE EXPLOITATION OF A SPECIES HAVE ON THE ECOLOGICAL BALANCE?

Even if this aspect depends on the species, the biggest danger of overfishing is the disturbance of the ecological balance. This is exactly what is happening, given that the populations of many species are diminishing. Based on some estimates, in the second half of the century 90% of the oceans big predators were lost. One of the consequences is the increase of populations of other species which these predators fed on, which in turn deplete their own sources of food and are forced to find others. This provokes a chain reaction with consequences that are not predictable.

MAIN FISHING TECHNIQUES

Fishing has ancient origins and is practiced with tools that have evolved over the centuries, adapting to the characteristics of the species caught. Such tools can act on the seabed, near them or in the entire water column. Apart from fishing with the harpoon, none technique can be considered 100% selective. Therefore is necessary, as much as possible, to implement devices that allow the increase the selectivity of the fishing techniques and decrease their impact on marine life organisms and ecosystems.

PURSE SEINES

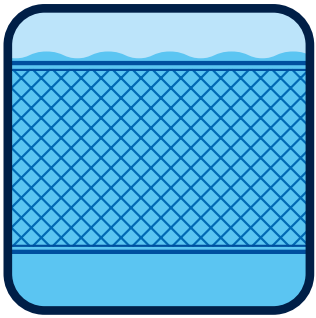
Purse seines are used in the open ocean to target dense schools of single-species pelagic (midwater) fish. A vertical net 'curtain' is used to surround the school of fish, the bottom of which is then drawn together to enclose the fish, rather like tightening the cords of a drawstring purse.

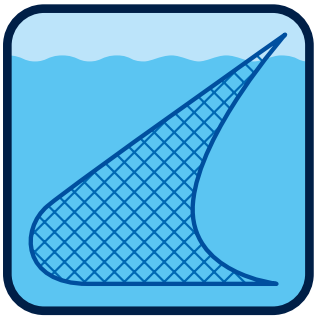
TUNA PURSE SEINE

Tuna purse seining involves surrounding tuna shoals with a net, impounding the fish by pursing the net, and drying up the catch by hauling the net so that the fish are crowded in the bunt and can then be brailed out. They nets can reach and exceed 1700 meters of length with a height of 300 metres or even more. The total weight of the armed network can arrive at 50 tons.

PURSE SEINERS FOR SMALL PELAGIC FISH

It looks like a huge rectangular net that reaches even 800 metres long and 120 metres high. This net is used for pelagic fish. During the fishing activity light sources are often used to attract the fish under the boat.





DRIFTING NETS

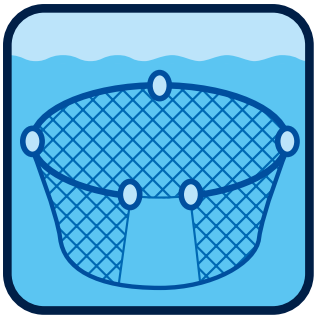
Drift netting is a fishing technique where nets hang vertically in the water column without being anchored to the bottom. The nets are kept vertical in the water by floats on the upper line (headrope) and weights on the ground-line (footrope).

BOTTOM TRAWLS

A bottom trawl is constructed like a cone-shaped net that is towed (by one or two boats) on the bottom, usually sandy or muddy. It consists of a body ending in a codend, which retains the catch. Normally the net has two lateral wings extending forward from the opening. The mouth of the trawl is assured by two dredges (rigid structures made of wood or metal), which keep it enlarged in the horizontal. The bag is the most important part of this fishing gear since it collects the fish and it is responsible for its selectivity .

SET NETS

They are anchored to the bottom.



ENCIRCLING NETS

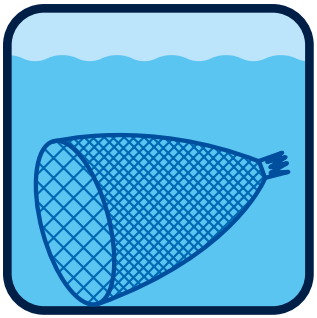
They are lowered in a circle or in a semicircle near the coast, in order to imprison the fish that is in the space delimited by the net itself. These nets are the least used, even if there are areas where they are very well known and sophisticated.

TRAMMEL NET

A trammel net consists of two/three layers of netting with a slack small mesh inner netting between two layers of large mesh netting within which fish will entangle. The mesh sizes vary according to the target species.

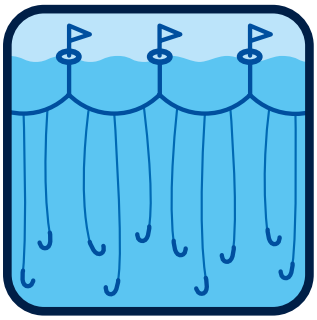
GILLNET

This fishing gear has a single piece of net. The gill net has practically a monospecific capture and one-size (depending on the mesh size). The fish is retained by its gills or the whole or part of the body being entangled, in the net webbing.



POTS

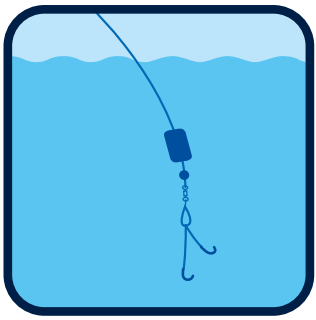
They are traps for catching fish, crustaceans and molluscs used mainly by small-scale fishing. Usually, they consist of a frame, generally in metal, surrounded by a net made with different materials (bamboo, plastic, iron, etc.). These traps have only one funnel entrance made in such a way that, once inside the animals cannot get out.



LONGLINES

A longline consists of a very long main line (usually made of thick monofilament), to which many smaller lines with baited hooks are attached. The entire longline, on board, is inside special containers. The set longlines are anchored, using weights and capture bottom animals.

The "drifting" longlines are set near the surface or even at great depths to catch large pelagic fish. The different sizes and forms of the hooks used in the longlines, together with the type of bait and setting time and direction, allow the capture of different species in a fairly selective way.

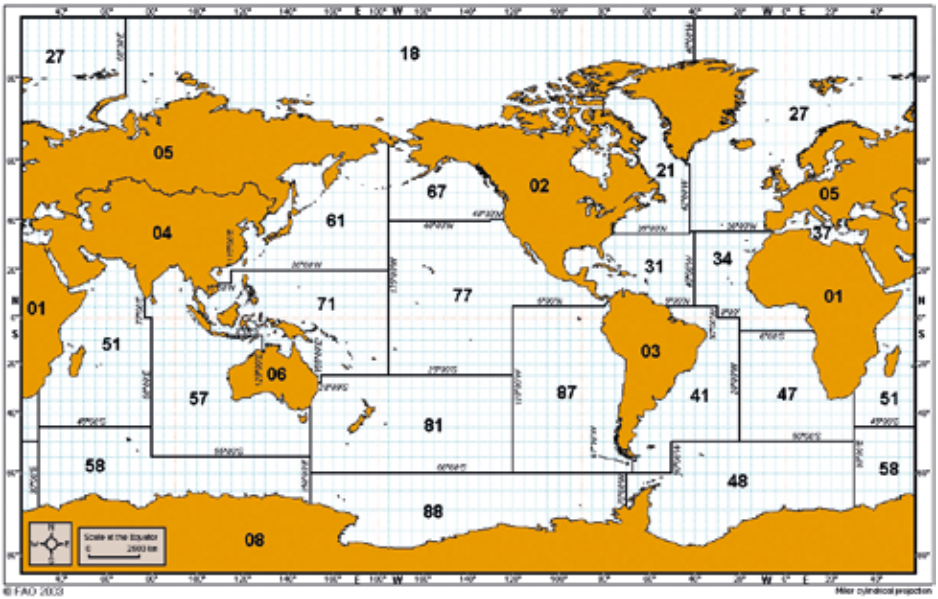


LINES

The lines are less used professionally than longlines. Unlike longlines, they are lowered and kept under continuous control by the fisherman. As soon as a fish bites, recovery begins, in a way which ensures that the fish cannot escape.

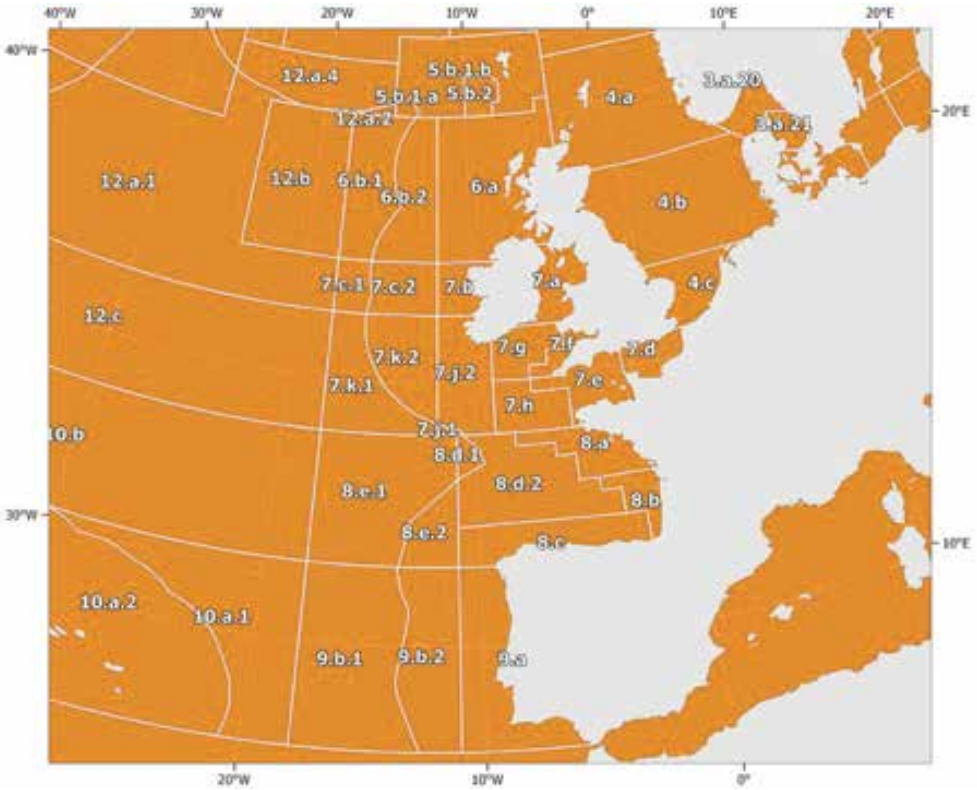
WHAT IS A FISHING AREA?

Fishing areas are sections of the sea where fishing boats use their own fishing gears. These areas have ecological conditions that foster abundance and greater density of fish species, which is the principal objective of fishermen.



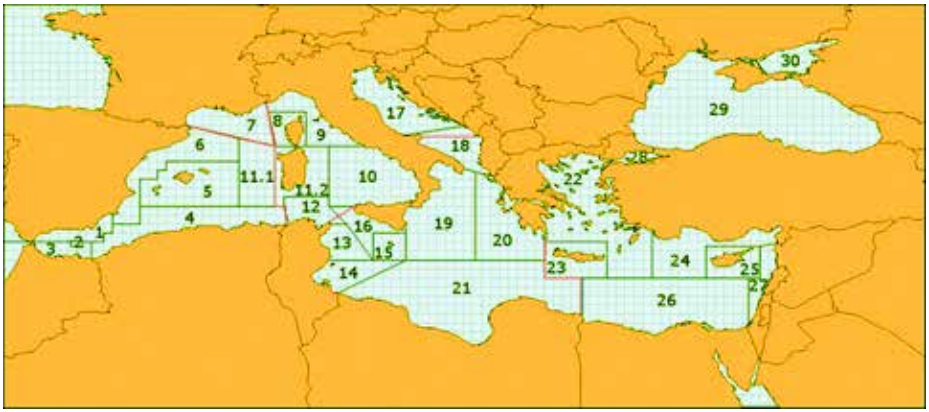
Area 18 (Arctic Sea)
Area 21 (Atlantic, Northwest)
Area 27 (Atlantic, Northeast)
Area 31 (Atlantic, Western Central)
Area 34 (Atlantic, Eastern Central)
Area 37 (Mediterranean and Black Sea)
Area 41 (Atlantic, Southwest)
Area 47 (Atlantic, Southeast)
Area 48 (Atlantic, Antarctic)
Area 51 (Indian Ocean, Western)
Area 57 (Indian Ocean, Eastern)
Area 58 (Indian Ocean, Antarctic and Southern)
Area 61 (Pacific, Northwest)
Area 67 (Pacific, Northeast)
Area 71 (Pacific, Western Central)
Area 77 (Pacific, Eastern Central)
Area 81 (Pacific, Southwest)
Area 87 (Pacific, Southeast)
Area 88 (Pacific, Antarctic)

FAO 27 SUB AREAS



- **Barents Sea** (Subarea 27.1)
- **Norwegian Sea, Spitzbergen, and Bear Island** (Subarea 27.2)
- **Skagerrak, Kattegat, Sound, Belt Sea, and Baltic Sea** (Subarea 27.3)
- **North Sea** (Subarea 27.4)
- **Iceland and Faroes Grounds** (Subarea 27.5)
- **Rockall, Northwest Coast of Scotland and North Ireland** (Subarea 27.6)
- **Irish Sea, West of Ireland, Porcupine Bank, Eastern and Western English Channel, etc** (Subarea 27.7)
- **Bay of Biscay** (Subarea 27.8)
- **Portuguese Waters** (Subarea 27.9)
- **Azores Grounds and Northeast Atlantic South** (Subarea 27.10)
- **North of Azores** (Subarea 27.12)
- **East Greenland** (Subarea 27.14)

MEDITERRANEAN GEOGRAPHICAL SUB AREAS (GSA)



GSA 1	Northern Alboran Sea
GSA 2	Alboran Island
GSA 3	Southern Alboran Sea
GSA 4	Algeria
GSA 5	Balearic Island
GSA 6	Northern Spain
GSA 7	Gulf of Lion
GSA 8	Corsica
GSA 9	Ligurian Sea and North Tyrrhenian Sea
GSA 10	Southern and Central Tyrrhenian Sea
GSA 11.1	Western Sardinia
GSA 11.2	Eastern Sardinia
GSA 12	Northern Tunisia
GSA 13	Gulf of Hammamet
GSA 14	Gulf of Gabes
GSA 15	Malta
GSA 16	Southern Sicily
GSA 17	Northern Adriatic Sea
GSA 18	Southern Adriatic Sea
GSA 19	Western Ionian Sea
GSA 20	Eastern Ionian Sea
GSA 21	Southern Ionian Sea
GSA 22	Aegean Sea
GSA 23	Crete
GSA 24	Northern Levant Sea
GSA 25	Cyprus
GSA 26	Southern Levant Sea
GSA 27	Eastern Levant Sea
GSA 28	Marmara Sea
GSA 29	Black Sea
GSA 30	Azov Sea

WHEN CAN A FISHING AREA BE CONSIDERED EXCESSIVELY EXPLOITED?

Researchers, in addition to mathematical models, use various indicators to evaluate the state of exploitation of a stock and the level of exploitation of a fishing area. For example, the average size of the species captured or the quantity of specimens (expressed in relation to a specific fishing effort). A decrease in both indicators most likely indicates a state of overfishing. Other indicators used by the researchers are fish mortality and the biomass of the reproductive stock.

HOW LONG DOES IT TAKE AN AREA TO RECOVER WHEN IT HAS BEEN SUBJECT TO EXCESSIVE FISHING?

The ability of recovery depends on factors such as the time necessary for the species to reach sexual maturity, the number of young fish that are incorporated into the exploited stock (recruitment), the surrounding environmental conditions in which the species live, or even the management measures adopted for regulating the fishing pressure (generally more fishing restrictions mean faster recovery of the resource).

WHAT CAN YOU DO

Raise awareness and knowledge in your institution.

ALL VISITORS

- Disseminate campaign information materials to the visitors (the EAZA campaign teams will provide open source information panels, which you can exhibit in your facilities, and an information leaflet).
- Organize public events such as sustainable show cooking, conferences and talks (ideas and resources will be provided).
- Introduce sustainable species in the menu of the restaurants, instead of the more exploited ones.
- Sell the gadgets of the campaign in the gift shops.

SCHOOLS/CHILDREN

- Introduce the sustainable see food topic in your outreach programmes, organize educational laboratories and dedicated events (ideas and resources will be provided).

PUBLIC RELATIONS

- SOCIAL MEDIA. Share tweets or Facebook messages with your community about the campaign. In the campaign e-newsletter there will be examples of social media messages you can use as inspiration or just copy-paste.
- PRESS. Don't forget good old classic press releases. Whenever an activity takes place, please have your communication department including the EAZA campaign.

CURATORS, BIOLOGIST OR ZOOLOGICAL MANAGERS

- Review your institutional collection plan according to guidelines provided by the campaign team, for a more sustainable supply chain.
- Review the feeding plan of the animals in order to use more sustainable species.

WHAT EVERYBODY CAN DO

(suggestions for consumers)
The stocks of some species are overfished while other species, although equally good, are less consumed.

Inform yourself and choose the species whose stocks are not overexploited.
Prefer to taste some underfished and/or unknown species.

WHICH CRITERIA DO I HAVE TO CHECK TO CHOOSE THE RIGHT WILD FISH?

FISH SIZE

A fish must reproduce at least once in life, to ensure that it can continue indefinitely and the fish population can remain productive and healthy. For this reason, some species have a minimum legal catch size defined, to guarantee that only adults who have already reproduced are fished.

Learn which species have minimum legal catch size, ask your supplier or restaurant if the seafood you buy respect this criterion and, when possible, choose larger sized specimens.

SEASON

Just like with fruit and vegetables, some fish species are not caught in some periods of the year, for different reasons:

- The seasons influence the food webs in different ways according to the area, and consequently the presence or absence of food; this affects seafood distribution throughout the year.
- Some species migrate, therefore, are not available all year round in the fishing areas.
- Some species have a variable distribution: they can be found at greater depths, offshore or near the coast, depending on the time of the year.
- To allow reproduction, in some months of the year it is forbidden to fish some species, therefore they should not be sold at the market or in restaurants.
- The quality of the meat is not always the same and is influenced by the reproduction season.

If you find seafood at the market in the "wrong" season, it means that it might come from another fishing areas. By buying seasonal fish, you will have greater chances of buying local andseasonal seafood products.

Choose to eat fish in the right season and question your supplier its origin.

DISTANCE FROM THE FISHING PLACE

A fish not caught locally, before arriving at the market, is transported for several hours. Choosing local species will ensure fresher and better fish, promote the local economy and the recovery of local traditions. You can also contribute to the reduction of carbon dioxide emissions by reducing transport distance. This information can easily be acquired by reading the tag or label which you will find next to the product displayed on the sales counter.

So, buy local fish, preferably from your geographic area.

WHICH CRITERIA DO I HAVE TO CHECK TO CHOOSE THE RIGHT FARMED FISH?

FEED

Species must be fed with a quantity of fish meal respecting an optimized species-specific feed ratio:

- Fish meal must be obtained from a sustainable source, it means that fish meal must be produced from sustainably managed stocks (in growing proportion as part of the farming practices improvement).
- Other sources of sustainable proteins such as co-products, algae, insects and flax are encouraged.

FARMING PRACTICES

Species must be farmed in optimal conditions for animal welfare and health:

- Antibiotics are used only on veterinary prescription and in compliance with European regulations.
- Species must be farmed in the respect of their natural behavioral with a species-specific density.

ENVIRONMENTAL IMPACT

Species must be farmed in optimal conditions with monitored and controlled impact on the environment:

- The dynamic balance between the production area and its environment must be maintained.
- When the production is made in an open environment, farmed species must be naturally present in the environment.
- Species must be fed with a quantity of fish meal respecting an optimized species-specific feed ration, avoiding the deposit of organic matter on the seabed.
- The level of fine particles present in the food must be less than 1%. The environment must not be affected by the presence of an aquaculture farm.
- Chemical products must be used only on veterinary prescription and in compliance with European regulations.
- Mechanical and biological cleaning of production facilities are preferred.

TRACEABILITY AND LABELLING

Retailers must supply for retail sales to the consumer all the necessary information about the product. When you buy at the fish market you need to pay particular attention to the information on the labels, both on the tags of loose fish and on pre-packaged products.

In the case of non pre-packaged products, the tag must contain the following infomation:

- Common name of the species.
- Scientific name of the species.
- Production method (fished or farmed).
- Fishing area.
  (eg. Mediterranean Sea or Black Sea and the number of the FAO GSA).
- Fishing gear.
- Defrosted: the label should indicate if the product has been defrosted.
- Country of origin of farmed fish.
- Selling price per unit of measure (Kg) referred to net weight (in the case of frozen fish, covered with glaze, the percentage of glazing is considered tare).
- Allergens (EU countries can adopt national measures about the 'means' by which this information is provided).

For more information:
https://ec.europa.eu/fisheries/sites/fisheries/files/docs/body/eu-new-fish-and-aquaculture-consumer-labels-pocket-guide_en.pdf

Always check that the sales tags have all the information required by law.

9,1 MILLIONS TONS
of unwanted bycatch are thrown out yearly

76%
of the world's fisheries are fully exploited or overfishe

If overfishing continues world food fisheries maycoll
by **2050**

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