European Commission

Marine & freshwater finfish aquaculture in the EU

What is finfish aquaculture?

Finfish aquaculture is the farming of **freshwater** and **marine** fish species in controlled aquatic enclosures such as ponds, lakes, reservoirs, or net pens in the sea. These can be completely closed systems such as recirculating aquaculture systems (RAS), semi-closed systems such as flow-through/raceway systems and artificial ponds, open systems such as submerged nets/cages and extensive farming in natural ponds or wetlands.

Though some farms may breed their own stock, others rely on the supply of juveniles from aquaculture hatcheries and nurseries or capture-based operations.

Benefits of finfish aquaculture

Some forms of finfish aquaculture offer specific advantages:

- When managed sustainably, pond aquaculture can help to **preserve and restore ecosystems and biodiversity**. In turn, these ecosystems provide protection against climate change impacts such as rising sea levels and flooding.

- Through restocking initiatives, finfish farming plays a role in **restoring vulnerable wild populations** in Europe (e.g. sturgeons, European eel).

Challenges for finfish farmers

Finfish farming encounters the following specific challenges:

Marine finfish farms

- Escapees from nets damaged by storms or predators
- Predators such as seabirds, marine mammals (dolphins, seals), sharks and other large predatory fish (halibut, bluefish)
- Red tide – harmful blooms of microscopic algae
- Changes in water temperature and other physical factors (salinity, waves, winds, currents, sea level, water turbidity)
- Water quality (pollution, excess nutrients, effluents, eutrophication)

Freshwater farms

- Droughts
- Changes in temperature
- Predators protected under conservation laws such as cormorants, herons and European otters

Access to affordable and sustainable feed

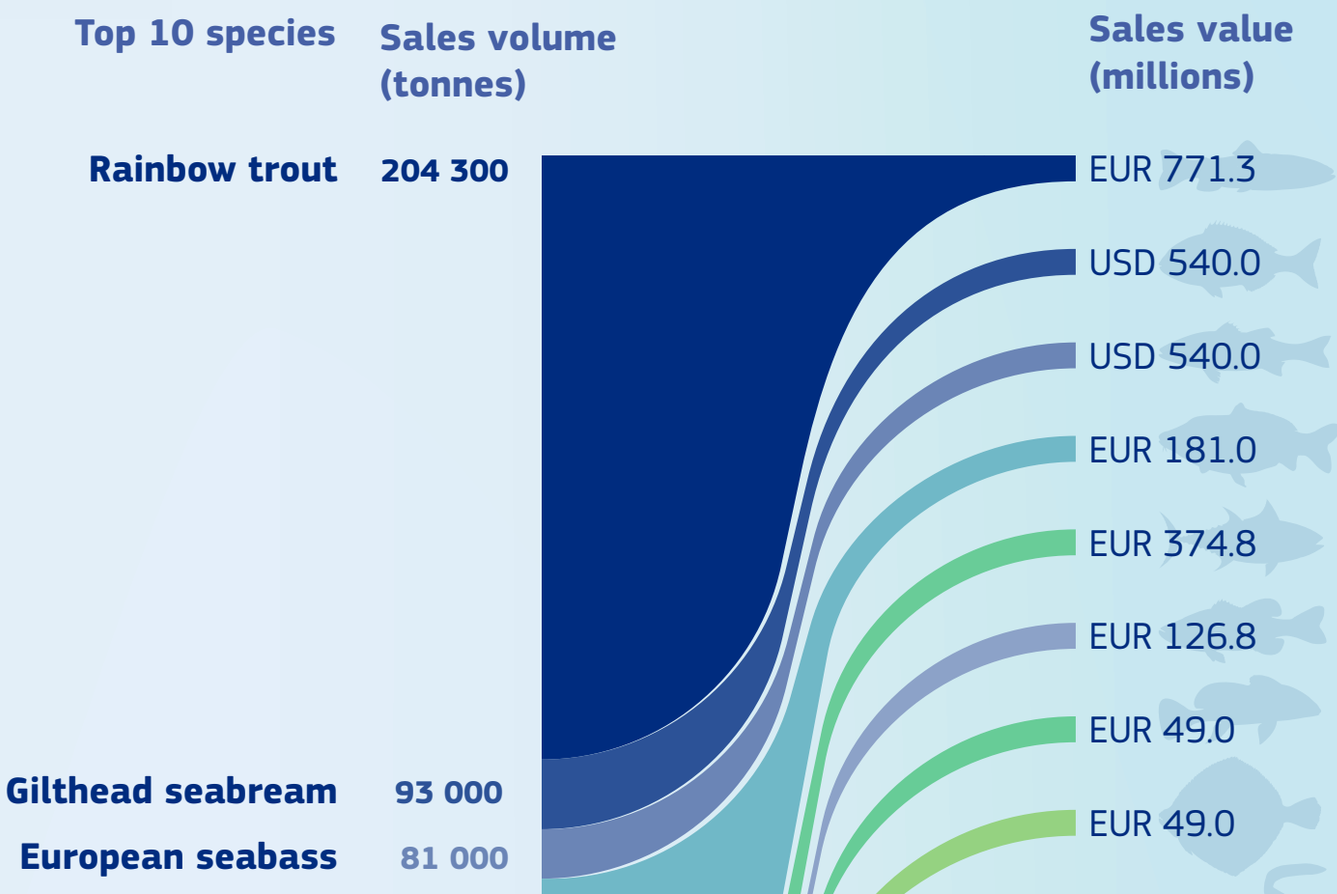
- Feed ingredients should be sourced in a way that is most respectful for ecosystems and biodiversity and should ensure good fish health and welfare.

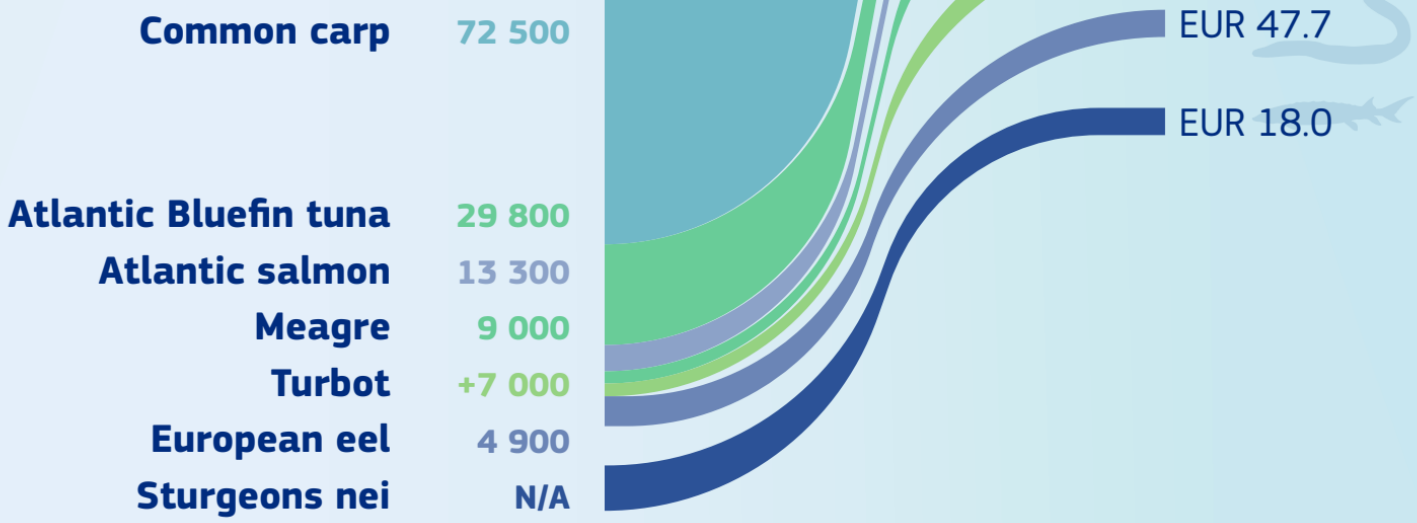
Dependency on supply of seed or juveniles

- Some species such as tuna and eel require the capture of wild stocks.

The European Commission's 'Strategic guidelines for a more sustainable and competitive EU aquaculture for the period 2021-2030' address these challenges to promote the sustainable growth of finfish aquaculture in line with the aims of the European Green Deal.

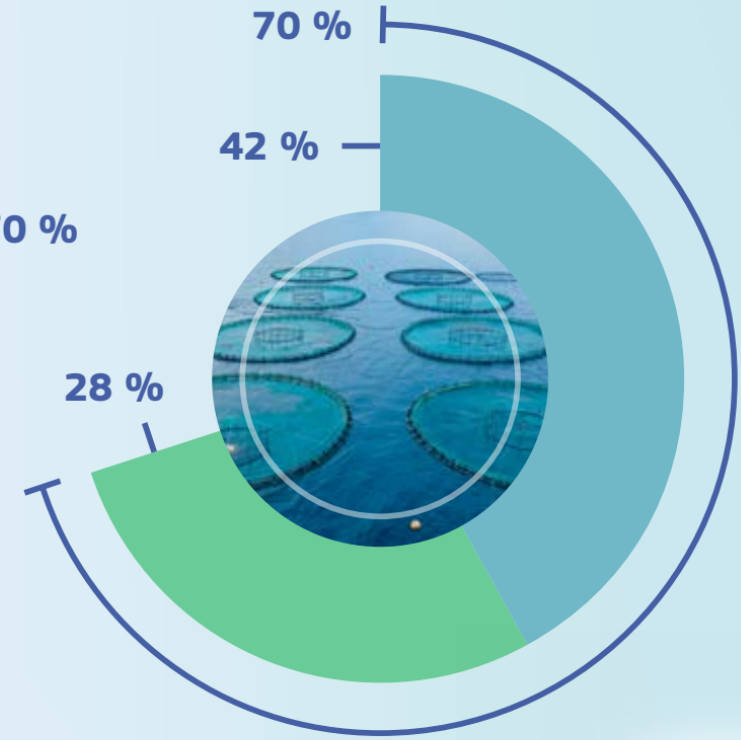
Finfish aquaculture production in the EU (2020)





Economic performance in 2020

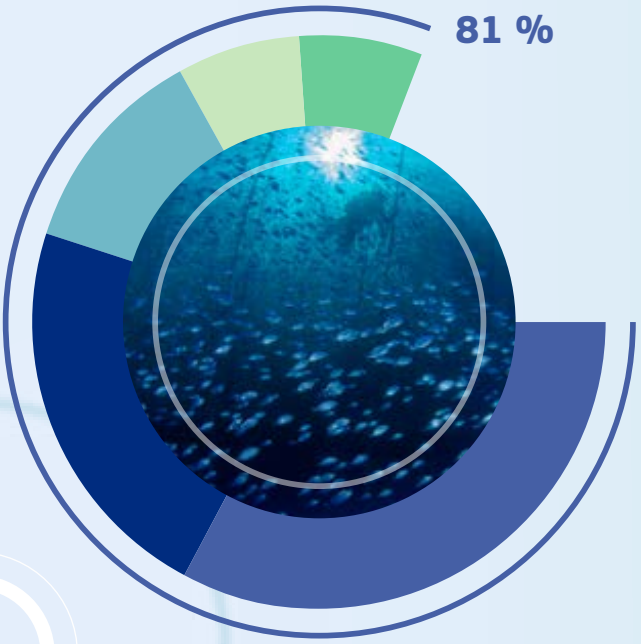
Marine finfish (42 %) and freshwater finfish (28 %) production accounted for 70 % of the total aquaculture turnover in Europe.



Marine finfish

€1.76 billion in turnover

↑ 3 %



from 2019

Greece (33 %), Spain (22 %), Malta (12 %), Ireland (7 %) and Croatia (7 %) accounted for 81 % of the EU marine aquaculture turnover.

Greece – No 1 turnover

€582.7 million sales value

Freshwater finfish

€1.01 billion in turnover

France, Poland, Denmark, Italy and Germany accounted for most of the EU freshwater aquaculture turnover.

↓ 4.4 % from 2019

France – No 1 turnover

€160.7 million sales value

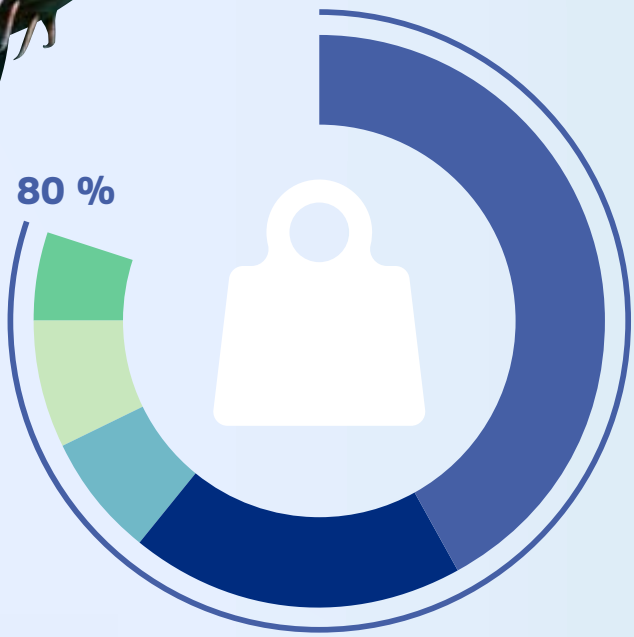
Production in 2020

Marine finfish (21 %) and freshwater finfish (28 %) production accounted for 49 % of the total aquaculture sales volume in Europe.

Marine finfish

267 700 tonnes in sales volume

↓ 1 % from 2019



80 % of EU marine aquaculture production was concentrated in Greece (42 %), Spain (19 %), Malta (7 %), Croatia (7 %) and Ireland (5 %).

Freshwater finfish

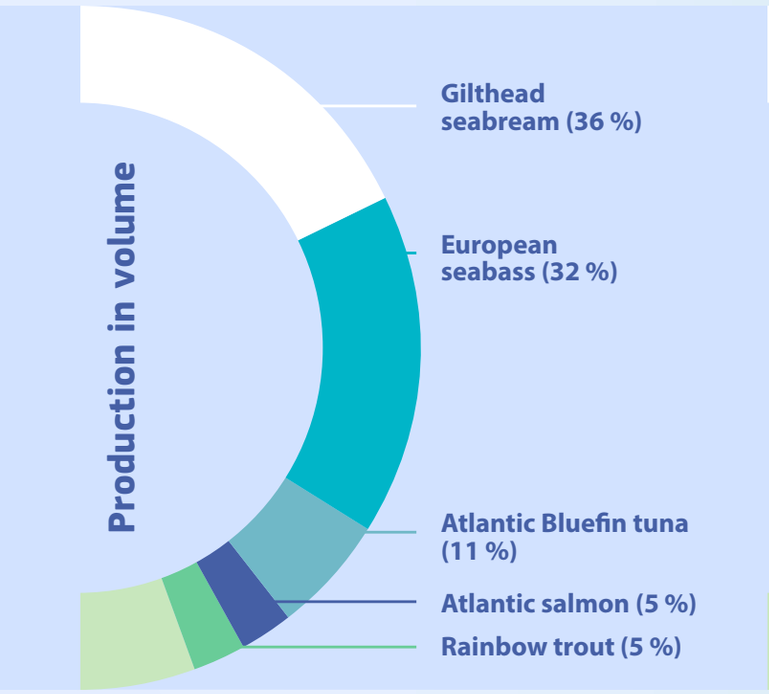
306 700 tonnes in sales volume

EU freshwater aquaculture production was mainly concentrated in France, Poland, Italy, Denmark and Romania.

↑ 1.4 % from 2019

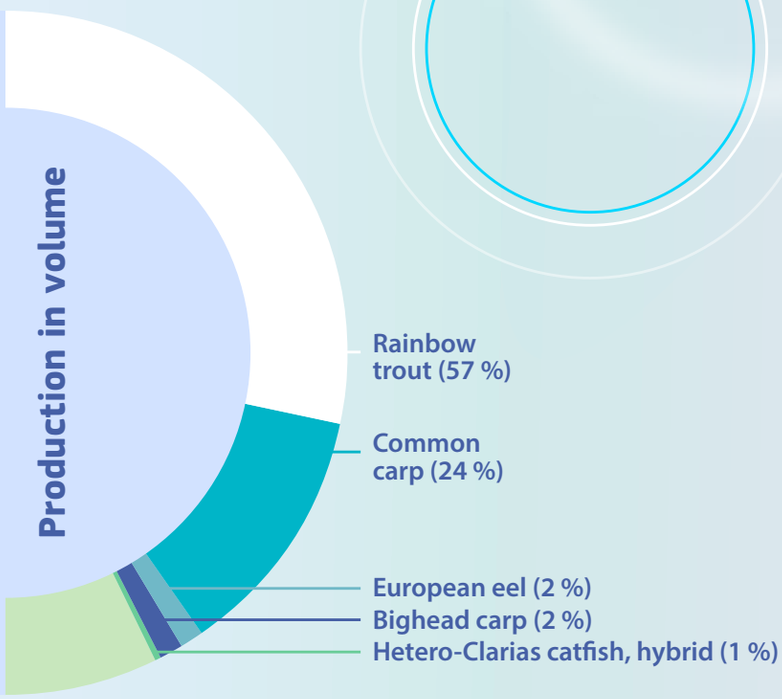
Top 5 species in 2020

Marine finfish



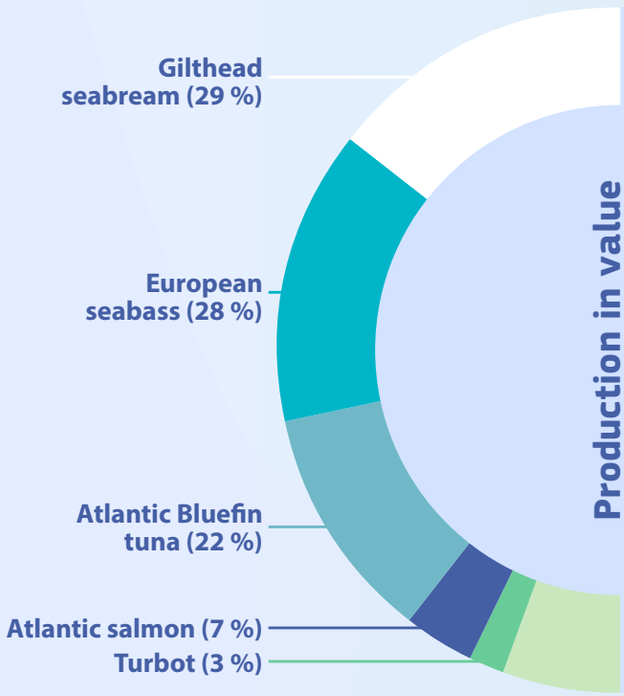
Others (11 %)

Freshwater finfish



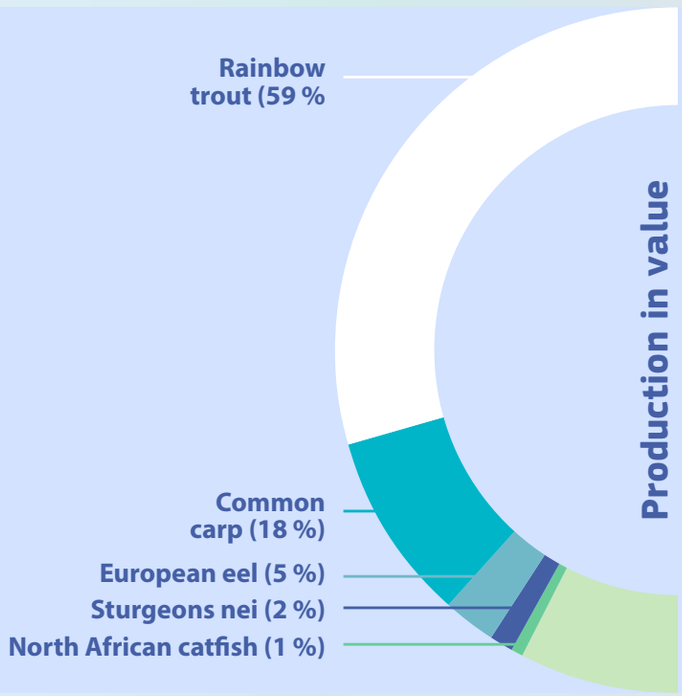
Others (14 %)

Marine finfish



Others (11 %)

Freshwater finfish



Others (15 %)

Greece – No 1 producer of seabream and seabass

103 000 tonnes sales volume

Denmark, France and Italy accounted for

60 % of rainbow trout production

Malta – No 1 producer of Atlantic Bluefin tuna

17 100 tonnes sales volume

Poland and Czechia accounted for over

50 % of common carp production

Organic finfish production in 2020*

	t	Share of total production for species (2020)	Main EU producers
Salmon	12 870	74 %	Ireland
Trout	4 590	2 %	France, Spain, Denmark
Carp	3 562	4 %	Hungary, Romania, Lithuania
Seabream/ Seabass	2 750	1.5 %	Greece

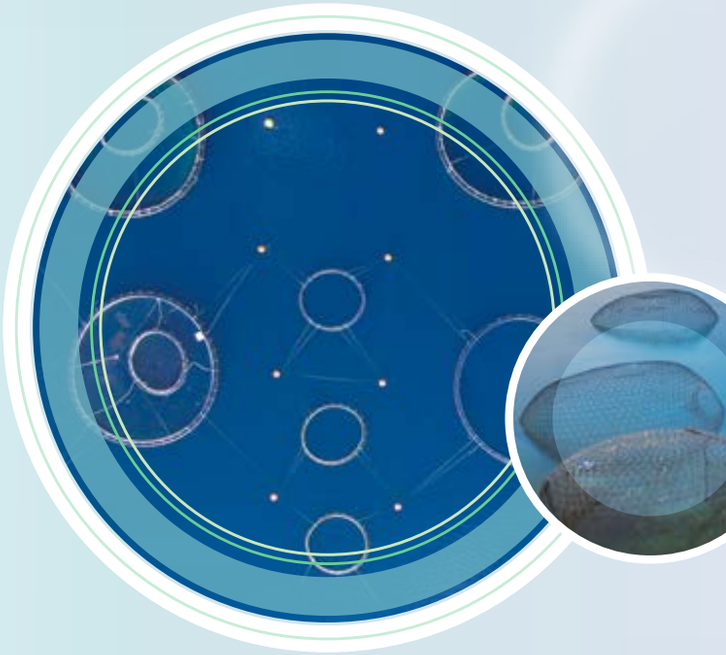
Ireland – 100 % of Atlantic salmon production was organically certified in 2020.

*Source: EUMOFA Organic Aquaculture in the EU – Final report 2022

Finfish aquaculture techniques

Pond culture is the earliest form of breeding and rearing fish in natural or artificial basins. Ponds range in size and shape and support farming a variety of species in diverse aquatic environments. Ponds can range from standing pools to more intensive systems that use running waters to renew oxygen levels and flush away waste.

Open net pens or **cages** involve rearing fish in floating or submerged enclosures in open water bodies such as coastal waters, protected bays, lakes, rivers and reservoirs. Since the farms are exposed to the surrounding waters and climatic conditions, risks of pollution, disease, eutrophication, predator attack and escapees must be mitigated. Parameters such as excess nutrients and effluents, as well as changes in water temperature and chemistry, also need regular monitoring.



Raceways or **flow-through systems** are inland facilities that usually consist of concrete basins or canals, equipped with a controlled inlet and outlet system. Water from natural streams or wells creates a continuous inflow that provides the necessary water

quality for culturing fish. Outflowing water must be treated before it is returned to the environment to have the same quality as the receiving water to avoid deterioration.

Recirculating aquaculture systems (RAS) are land-based facilities that minimise water consumption by filtering, adjusting and reusing the water. This recirculation process within a closed system makes it possible to control conditions and treat waste. At the same time, it prevents escapees and limits the spread of disease.

Marine species

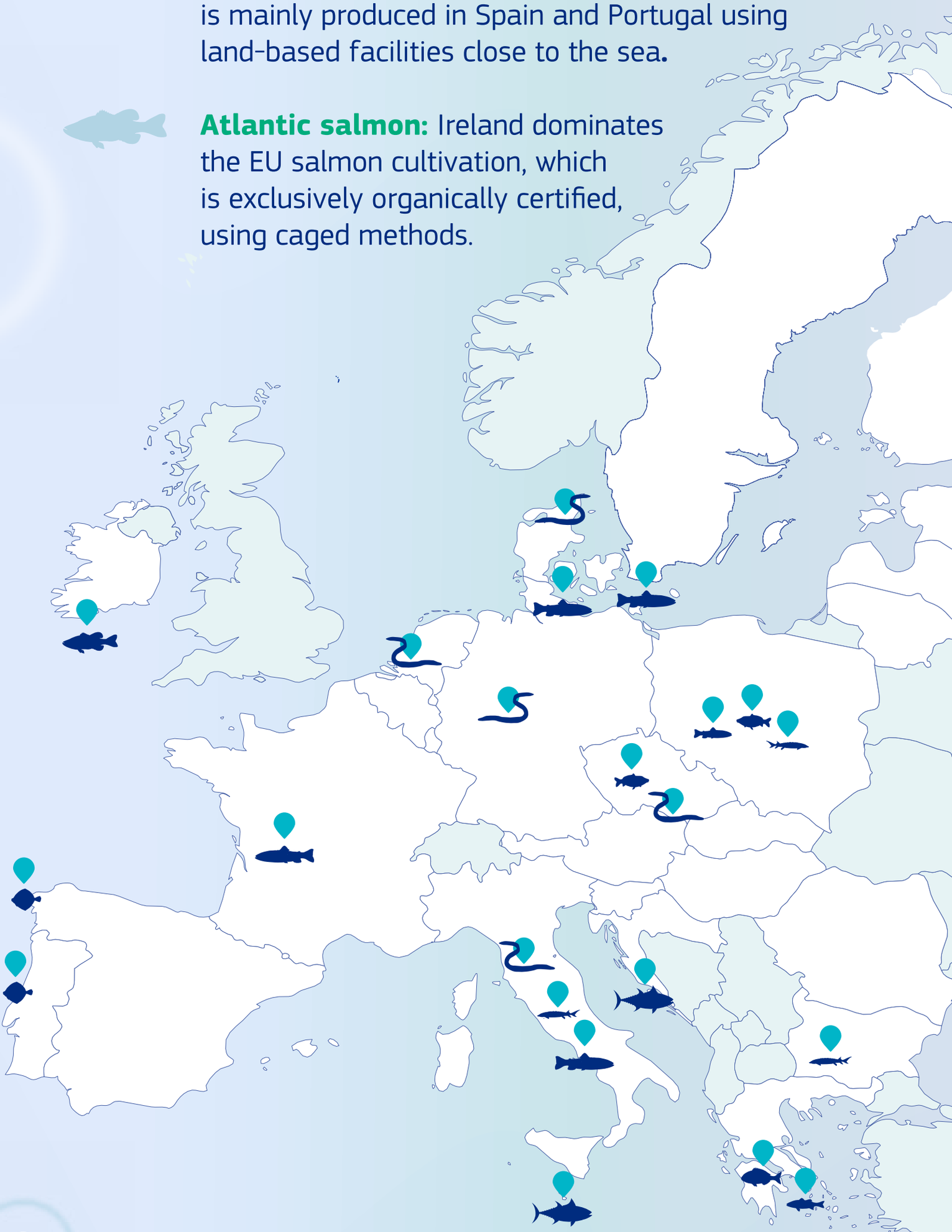
Seabream and seabass: The second largest worldwide producer of seabass and seabream is Greece, where cage farming near sheltered coastlines is the dominant technique.

Atlantic Bluefin tuna: Malta and Croatia lead in the EU farming of Atlantic Bluefin tuna using the method of trapping, on-growing and enhancing in sea cages.

Turbot: Due to favourable biophysical conditions

regarding temperature and water salinity, turbot is mainly produced in Spain and Portugal using land-based facilities close to the sea.

Atlantic salmon: Ireland dominates the EU salmon cultivation, which is exclusively organically certified, using caged methods.



Freshwater species

Rainbow trout: Most Rainbow trout is

produced in freshwater, but Denmark and Finland produce small volumes in marine water cages in the Baltic Sea. The leading EU producers are France, Denmark, Italy and Poland. Denmark produces trout in cages, ponds and RAS systems. Poland is increasingly using RAS technologies, while France mainly uses raceways.

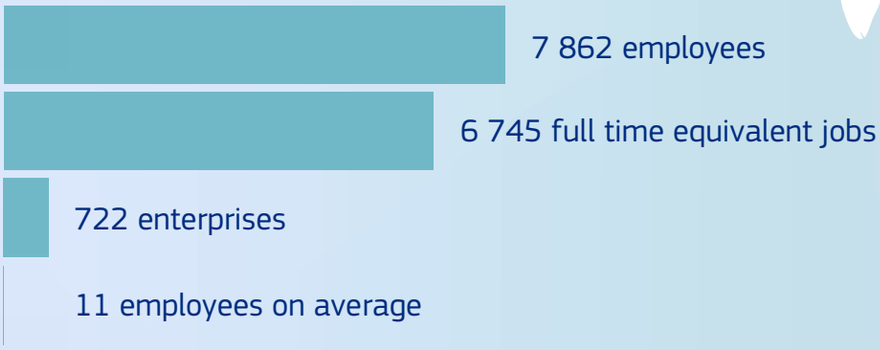
Common carp: European cultivation of carp dates back to mediaeval times. Over half of the total EU production occurs in Poland and Czechia, where traditional earth pond methods are common.

European eel: The main producers of European eel are the Netherlands, Italy, Germany and Denmark, where intensive RAS technologies are most prevalent, but some farms also use flow-through systems and ponds.

Sturgeon: Italy, Poland and Bulgaria are the top EU producers of sturgeon, primarily reared for caviar. Farming techniques range from raceways to RAS, open net pens, and to a lesser extent ponds.

Employment in 2020

Marine finfish Employees



Freshwater finfish Employees

Marine finfish – Top 5 employers in 2020

Country	Enterprises	Employees	Full time equivalent
Greece	358	3 322	3 196
Spain	110**	N/A	N/A
Croatia	29	854	746
Portugal	46	501	490
Malta	9	410	300

Freshwater finfish – Top 5 employers in 2020

Country	Enterprises	Employees	Full time equivalent
Poland	1 242	6 131	3 678

Germany	2 394	4 413	2 808
Romania	470	2 055	2 055
France	313	1 446	1 102
Bulgaria	731	1 216	974

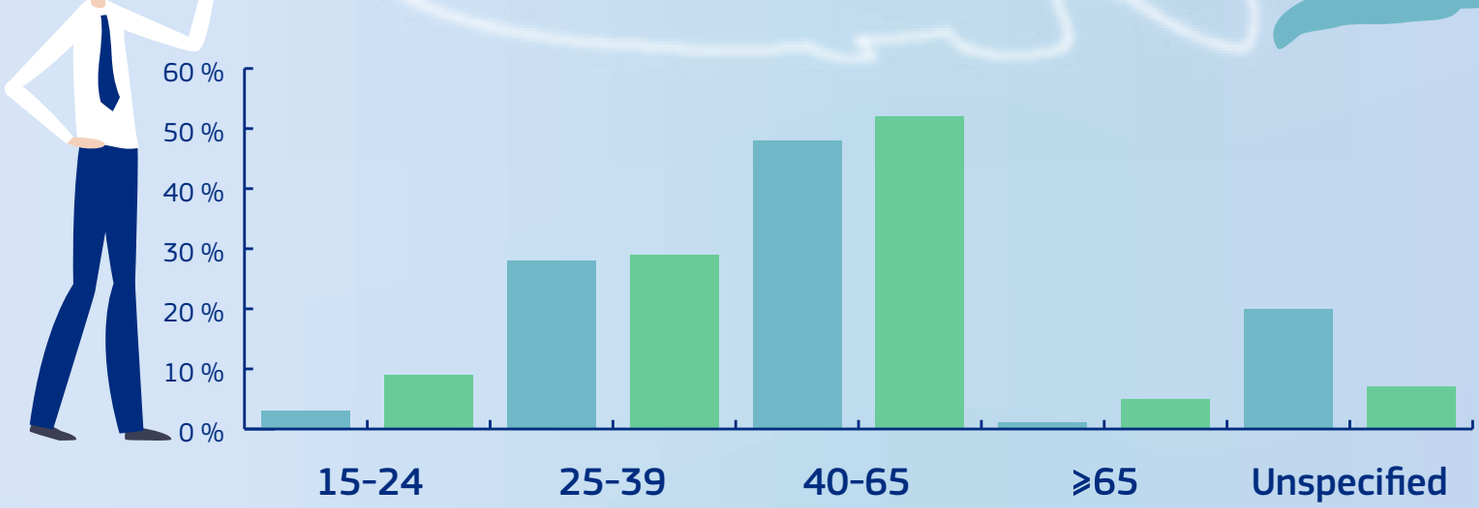
**Source: Aquaculture_in_Spain_2023_APROMAR

Socio-demographics in 2020

Gender

Marine finfish		Freshwater finfish
77 %		82 %
23 %		18 %

Age



Marine finfish

Freshwater finfish

Education level

Marine finfish		Freshwater finfish
51 %	Low	26 %
37 %	Medium	55 %
7 %	High	13 %
5 %	Unspecified	6 %

low = primary and lower secondary school
medium = upper secondary school, post-secondary non-tertiary education
high = tertiary education, Bachelor's, Master's, Doctoral (or equivalents)

Nationality

82 % **Nationals of their own country**

18 % mainly other EU Member States

Nationals of their own country **89 %**

11 % mainly other EU Member States

Main data source: Scientific, Technical and Economic Committee for Fisheries

(STECF) The EU Aquaculture Sector - Economic Report 2022

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