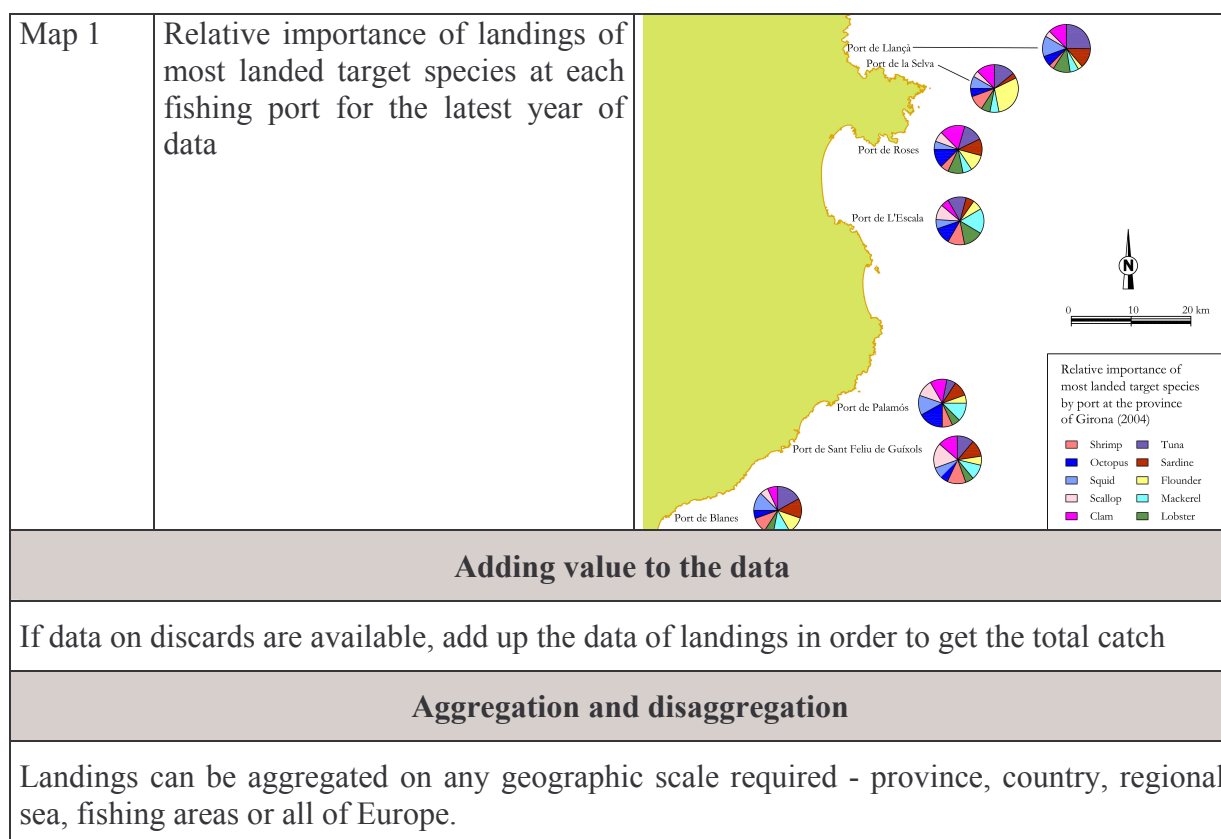


Indicator	
23	Fish stocks and fish landings
Measurement	
23.2	Landings by species
What should the measurement tell us?	
<p>The most obvious impact that fishing has on the ecosystem is the removal of organisms from the environment – the catch. Ideally a fishing impact indicator would include all catches that are landed (landings) plus catches that are returned (discards). However, most of statistics do not take into account those organisms that are caught but not landed – discards. These may be commercially valuable target species that are discarded for regulatory or marketing reasons, or non-target species. Most discarded species, especially fish and marine mammals, do not survive. Landings statistics, therefore, underestimate the total catch of fishing vessels and, thus, the impact on the environment.</p> <p>Increases or decreases in landings do not signal a healthy or unhealthy fishing industry or environment, as increases in fish landings may be driven by either increasing amounts of available fish or increasing fishing effort. Similarly, decreasing landings may be the result of a lack of available fish or a change in management measures or fishing patterns.</p> <p>However, most European fish catches are regulated by Total Allowable Catches (TACs). These are management mechanisms that aim to regulate fishing mortality by restricting the amount of fish that can be removed each year. The TACs are then divided among the countries that fish those stocks to give each country a “quota” of fish that it is allowed to catch. The individual country then divides its quota among the various sectors of its fishing fleet. Policies increasingly aim to balance the amount of fish removed against the stocks’ ability to cope with the effect of artificially removing a proportion of the population. This involves regulating the amount of fish that can be removed.</p> <p>Therefore, in order to set TACs and ensure compliance, it is necessary to monitor the landings of fishing vessels as well as catches, i.e. taking into account the discards. Vessels and countries that do not adhere to their agreed quota may suffer sanctions e.g. reduced quota the following year, confiscation of over-quota catch or, in the case of countries’ non-compliance with international agreements, economic sanctions. This latter action is a recent development by some international fisheries organisations, especially in relation to high-value stocks at risk, such as tuna.</p>	
Parameters	
(i)	Annual landings by major groups of species expressed in metric tones per year
(ii)	Annual landings of most landed species expressed in metric tones per year

Coverage	
Spatial	Temporal
All fishing ports in the reference region. At any geographic scale required	Annually since at least 1995 but earlier if possible ⁽¹⁾
Data sources	
<p>Data on landings by species in each reference region can be obtained from the competent national or regional authorities and administrations responsible for the fisheries. This data can also be obtained by contacting fishermen's guilds and ports individually. Therefore, although the quality of the data varies from country to country and hence restrictions may exist in comparability between countries datasets (being in many cases a function of the general characteristics of the national fishing industry), there should be a high degree of consistency in time series within a country or region.</p> <p>In addition to the national/regional data sources, at European level, each country reports monthly data on the quantities (tones) of fishery products landed in its ports. These data are available at EUROSTAT database, at national level only (not disaggregated by port or region). The EU-15 and EU-25 totals include data for those countries for the period prior to their accession to the EU. The methodologies vary from country to country depending on the nature of their fishing industries. Basic documentation used in collecting the data from EU fisheries includes fishing log-books, landings declarations and sales notes used in the management of catch quota and market management systems within the Common Fisheries Policy. The methodologies used by EEA member countries have been described in the Eurostat publication "Fisheries: The collection and compilation of fish catch and landing statistics in member countries of the European Economic Area" (1998). The methodologies used by the ten (1998) Candidate Countries have been described in a working document. More information can be requested via e-mail to: Estat-fisheries@cec.eu.int.</p> <p>FAO/FIDI also makes the global annual catch statistics per country available to the public in a compiled annual yearbook in both hard copy and digital format (either on CD-ROM or downloadable from the FAO Fishery Department web site in the section Statistics). All countries reporting to international organisations are included in the FAO data-base. Certain aggregates (e.g. world totals, and totals for the EU and fishing areas) are developed within the data-base. The catches are expressed in the live weight equivalent of the landings or in other word -: nominal catch ⁽²⁾. As such, they exclude all quantities caught but not landed (discarded fish, fish consumed on board). The unit used is generally the metric ton. For certain high-value products (e.g. corals, sponges and pearls) the data are expressed in kg. Data for marine mammals (e.g. whales) and certain other animals are expressed in the number of specimens caught. The data are for the calendar year and are generally from 1950 onwards although the level of detail by species and fishing area is more restricted for the earlier years. Although FAO data bases provide valuable information to estimate this measurement, there are some considerations when measuring landings by major groups of species that should be taken into account ⁽³⁾.</p>	

Methodology		
	Steps	Products
1	Obtain the annual series of landings (tonnes) by port and species in all ports of the reference region ^(2,3)	Annual landings by port and species in the reference region
2	Add up the annual landings by species from all ports in the reference region	Total annual landings by species in the reference region
3	Aggregate data obtained in step 2 into major groups of species ⁽⁴⁾	<u>Annual landings by major groups of species in the reference region</u> (Graph 1)
4	Represent the annual landings of the ten most landed species (those for which the highest total landing during the period considered is obtained) in your reference region	<u>Annual landings of the ten most landed species in the reference region</u> (Graph 2)
5	For the latest year, calculate and map the relative importance of the most landed species (those selected in step 4) at each port in the reference region by sector charts	Relative importance of the most landed species at each port in the reference region for the latest year of data (Map 1)
Presentation of the data		
Graph 1		
Graph 2	Bar chart showing annual landings by major group of species for the period under study in the ports of the reference region, expressed in metric tonnes per year	<p style="text-align: center;">Annual landings by major group of species in the province of Girona</p>
Graph 3	Linear chart showing annual landings of the most landed species in the period under study in the ports of the reference region, expressed in metric tonnes per year	<p style="text-align: center;">Landings of most landed target species in the province of Girona</p>



Notes

⁽¹⁾ Data from the pre-1995 period will help identify long term trends on overall landings as well as the relative importance of individual ports.

⁽²⁾ The *nominal catch* data are normally derived from the landed quantities of the fishery products, the landed weight being converted to the live weight equivalent (nominal catch) by the application of factors. Similarly, *landed weights* for products resulting from primary processing at sea (gutting etc.) can be converted to *live weight equivalent (nominal catch)* once a reliable relationship is established (from the [Co-ordinating Working Party on Fishery Statistics](#) (CWP) of the Food and Agriculture Organisation (FAO)).

⁽³⁾ Ideally, this indicator should include all by-catch (including discards), transshipping and recreational fishing statistics but for many countries this data would be almost impossible to acquire. If there is no possible way to obtain this data it must be assumed that the measurement will underestimate the total catch and hence the impact of fisheries on the environment. Such limitations should be reported. Some of the limitations already mentioned are:

- Trans-shipping at sea - although mainly occurring in international waters, it must not be neglected in monitoring catches, otherwise a considerable proportion of the overall catch may be unaccounted for. Every effort should be made to identify where trans-shipping is taking place
- Recreational fishing - in view of its importance regarding some stocks for certain countries and the difficulty of distinguishing between recreational and subsistence fishing, the data should include the catches from recreational fisheries. However it is recognised that certain countries are unable to supply the data for recreational fisheries.

⁽⁴⁾ Aggregating data into major groups will help with the development, representation and understanding of this measurement. All species for which catches are reported to international organisations are included in the Eurostat database. They are identified in the database by the internationally assigned three letter identifier (eg COD = Atlantic cod, PLE = European plaice). Aggregates of species groups have been developed within the mentioned database using the International Standard Statistical Classification of Aquatic Animals and Plants

(ISSCAAP): <ftp://ftp.fao.org/FI/DOCUMENT/cwp/handbook/annex/AnnexS2listISSCAAP2000.pdf>. When aggregating species data you can use both the standard taxonomic classification or the ISSCAAP, which classifies all aquatic species into 50 classes, and these in turn are regrouped into the 9 ISSCAAP divisions (or Major groups) of the FAO.

However, we suggest further classification into the following major groups:

- ✓ cartilaginous fishes
- ✓ demersal fishes
- ✓ pelagic fishes (other than thunnids)
- ✓ thunnids
- ✓ diadromous fishes
- ✓ cephalopods
- ✓ other molluscs
- ✓ crustaceans
- ✓ aquatic plants
- ✓ miscellaneous