

Brief

# Collecting data on the incidental catch of vulnerable species in Mediterranean and Black Sea fisheries

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## About the project

This brief has been produced in the scope of the MAVA Foundation-funded project “Understanding Mediterranean multi-taxa ‘bycatch’ of vulnerable species and testing mitigation – a collaborative approach”. The project aims to assess the incidental catch of vulnerable species (such as sea turtles, marine mammals, seabirds, sharks and rays) in the Mediterranean basin, raise awareness of fishers and involve them in the testing of bycatch mitigation techniques. The project is carried out by BirdLife Europe, ACCOBAMS, GFCM, SPA/RAC, IUCN-Med and MEDASSET.

# Introduction

Vulnerable species, including seabirds, sea turtles, sharks, rays, marine mammals, corals and sponges are incidentally caught in fishing operations targeting commercial species (Figure 1). Commercial fishing is one of the main causes of injury and mortality of vulnerable species, and can represent one of the most important threats to their populations. In turn, the incidental catch of vulnerable species (hereafter referred to as “bycatch”) is considered one of the main threats to the profitability and sustainability of fisheries.

The lack of data on the occurrence and level of bycatch hinders the ability to manage and apply rules on fishing vessel activities. Even where data exists, the lack of statistically robust and harmonised sampling designs limits its value and, for example, prevents comparisons between different fishing fleets and areas. Adequate monitoring programmes and frameworks that can provide sound bycatch data collection are therefore urgently required. To facilitate this, the General Fisheries Commission for the Mediterranean (GFCM) and its partners in the Mediterranean have jointly developed a framework for the collection of data on bycatch<sup>1</sup>. Although developed for use in the Mediterranean and Black Sea, the approach is applicable to fisheries outside the GFCM area of application.

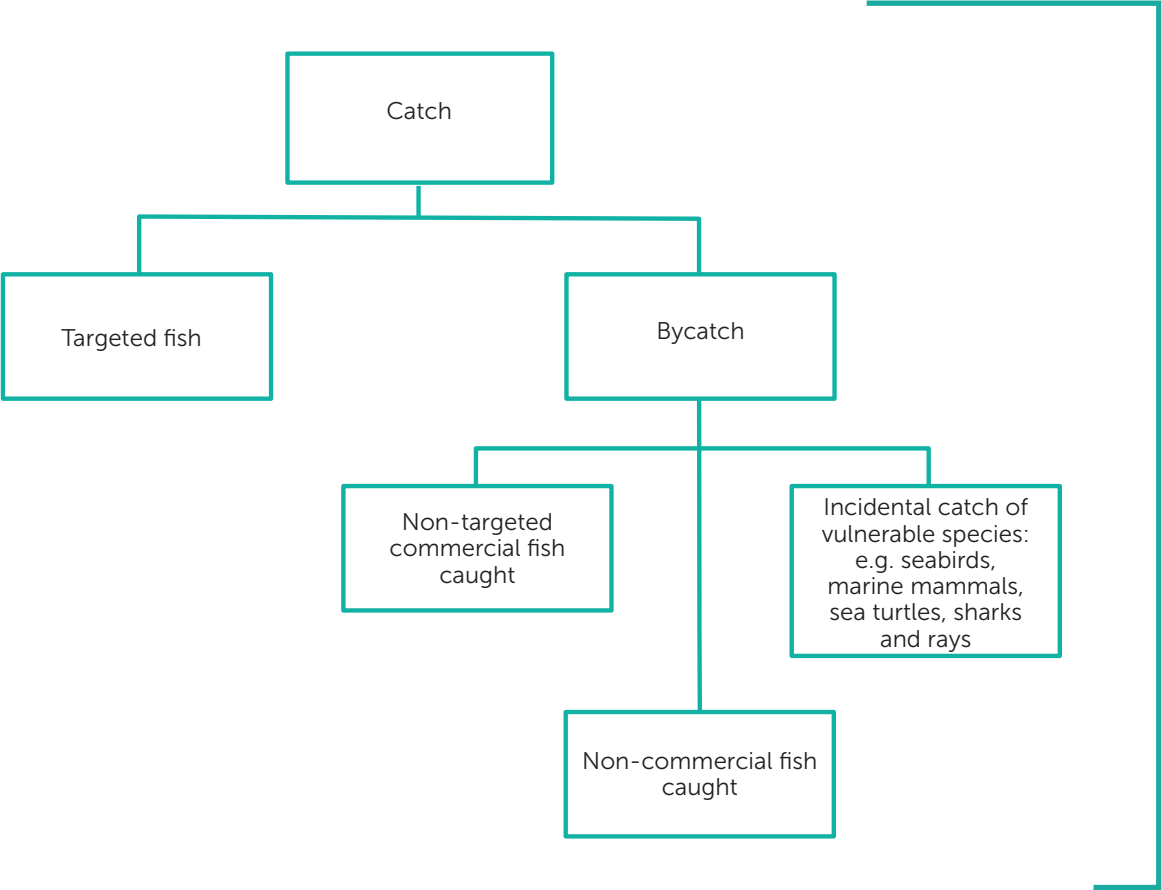


Figure 1: Example of how bycatch can occur

This standardised methodology is in line with the European Union’s requirements under the Data Collection Regulation (Regulation (EU) 2017/1004). It takes a multi-taxa approach, which optimises monitoring efforts and financial investments.

1. FAO. 2019. Monitoring the incidental catch of vulnerable species in Mediterranean and Black Sea fisheries. FAO Fisheries and Aquaculture Technical Paper No. 640. Rome, FAO. (Also available at <http://www.fao.org/3/ca4991en/ca4991en.pdf>)

## Why is a standardised data collection methodology important?

Understanding the problem of bycatch at large scales (e.g. at the sea basin level) requires that data collected through individual monitoring programmes is comparable. The use of a standardised data collection methodology provides harmonised information that can be used to understand the nature and extent of the problem (e.g. which fishing gears are most damaging for a given species, whether there are geographical or seasonal trends). This can then inform the identification and application of targeted management measures.

## How can data be collected on bycatch?

Information about bycatch can come from data obtained from commercial fisheries through a variety of approaches as well as from data that are obtained through scientific surveys and ad hoc monitoring and are independent from commercial fisheries (Table 1). Due to the complexity and difficulty of collecting data at sea, monitoring programmes can rely on several data sources to gain a more complete and robust understanding of bycatch.

| Category                 | Source of data                                     | Costs  | Inconvenience to industry | Accuracy/reliability | Data represents fishing behaviour |
|--------------------------|--|--------|---------------------------|----------------------|-----------------------------------|
| Fishery-dependent data   | On-board observers                                 | Medium | Medium                    | High                 | High                              |
|                          | Interviews with fishers                            | Low    | Medium                    | Low                  | High                              |
|                          | Logbooks from fishers                              | Low    | High                      | Low                  | High                              |
| Fishery-independent data | Data from species stranded on beaches              | Low    | None                      | Medium               | Low                               |
|                          | Surveys with research vessels or chartered vessels | High   | None                      | Medium               | Low                               |

**Table 1:** Types of methods to collect data on bycatch and their associated costs, inconvenience, reliability and representation of fisheries behaviour

The use of trained observers on-board vessels, deployed across a fishing fleet/segment in a representative manner is recognised as the most reliable way to ensure a robust estimate of the actual bycatch and potential mortality of vulnerable species caused by fishing operations. However, due to the irregularity of catches of vulnerable species, calculations based on limited observer data might lead to high biases, usually resulting in an underestimation of bycatch.

## How much monitoring is required?

To obtain reliable estimations of bycatch, it is necessary to have a robust data collection programme, with adequate coverage and reliable information. The higher the percentage of fishing trips covered by observers, the more accurate the estimates of bycatch will be. For observer programmes, this also requires higher financial investment so that more observers can be placed on fishing vessels. Sample size should be determined according to criteria such as the precision level, the confidence level, the variability within the fishing vessels targeted, and the availability of resources.

## Estimating the level of bycatch

Bycatch rate (T) is calculated by adding up the number of individuals of a given species that have been bycaught in each sampled fishing trip (N) and dividing it by the number of sampled fishing trips (D) (i.e.  $T = N/D$ ). The number of individuals bycaught (I) by that fleet can be estimated by multiplying the bycatch rate (T) by the total number of fishing trips carried out during the year by all the vessels of that fleet segment (i.e.  $I = T * F$ ).

Bycatch rates can be calculated from the data collected using the different sources that are fishery-dependent (e.g. on-board observations, interviews/questionnaires, self-sampling through logbooks). If there are differences between the bycatch rates calculated via the different methodologies, it is important to assess the reasons for these differences and decide whether, for example, there is a need to increase the number of on-board observations.

Fishery-independent data should be used as a complementary source of information in these calculations. For example, they can inform the design of an observer programme.

### Designing an observer programme: considerations and requirements

- 1) Identify the total number of fishing vessels in each country, the fishing area and the fleet segments.
- 2) If it is not possible to collect data from 100% of fishing vessels, a sub-set of vessels needs to be sampled.
- 3) There is no one-fit-all sampling strategy. Observer programmes should be designed on an annual basis. Representativeness should be ensured by adequately distributing observers over fleets, time and important areas for the fisheries (fishing areas, as well as main fishing ports).
- 4) A random sampling approach should be used to ensure that the sampled sub-set is representative of the whole vessel fleet targeted by the programme. One day should represent one "fishing trip".
- 5) Species identification guidelines should be provided to observers, interviewers and fishers participating in the data collection. Training on species identification and species' local names, safe handling/release of bycaught species, security onboard vessels, and building positive and effective relationships with fishers are also important.

This brief aims at providing policy makers and other interested parties with an overview of data collection for the monitoring of the incidental catch of vulnerable species in fisheries. It highlights and summarizes the key aspects contained in the protocol developed by the General Fisheries Commission for the Mediterranean for the data collection and monitoring of vulnerable species (i.e. sharks and rays, seabirds, sea turtles, marine mammals) in Mediterranean and Black Sea fisheries. It is based on the FAO publication *Monitoring incidental catch of vulnerable species in the Mediterranean and the Black Sea. Methodology for data collection*.

With the financial support of:



Stichting BirdLife Europe & Central Asia gratefully acknowledges financial support from the European Commission, the European Union LIFE Programme and the Mava Foundation. The content of this publication is the sole responsibility of the producers and cannot be regarded as reflecting the position of the funders mentioned above.

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