BRIEF

Collecting data on dolphin depredation

in Mediterranean and Black Sea fisheries

©GFCM/Claudia Amico

©GFCM/Claudia Amico

Human–dolphin interaction has become an issue worldwide because it can affect both the survival of wild dolphin populations and the livelihood of fishers. In the Mediterranean and the Black Sea, there are growing interactions between small-scale fisheries and dolphins (mainly common bottlenose dolphins and common dolphins) whereby dolphins are removing catches from nets (hereafter referred to as dolphin depredation) and damaging fishing gear. As well as adding to the risk of entanglement, the resulting loss of income can create conflicts between fishers and dolphins, undermining efforts to improve the conservation of marine mammals and sustainability of fisheries in the region. The lack of data on the occurrence and extent of dolphin depredation in the Mediterranean and the Black Sea hinders the ability to reduce economic losses and protect vulnerable species. Where data does exist, the lack of standardized data collection makes it difficult to compare study sites and evaluate potential ways to manage and possibly mitigate the issue. Robust and harmonized national data collection programmes, and regional and subregional monitoring, are therefore necessary.

To facilitate this, ACCOBAMS and the GFCM have developed a protocol for data collection (Carpentieri and Gonzalvo, 2022) to support harmonized surveys and allow for comparisons among fisheries across the region.

HOW CAN DATA BE COLLECTED ON DOLPHIN DEPREDATION?

Due to the complexity of the issue and challenges of collecting data at sea, monitoring programmes should obtain information using a variety of different approaches (e.g. on-board observers, questionnaires, direct interview with fishers, self-reporting, remote electronic monitoring systems, and ad hoc surveys). Generally, trained observers on board fishing vessels, when deployed across different seasons and fishing ports, is the most reliable way to collect information related to depredation events. Despite potential effects on fishery economics and issues related to the incidental capture of dolphins, there is no single system to collect depredation data on a routine basis or in an exhaustive manner. Therefore, depending on the area, fleet, and available resources, it is generally recommended to combine different data sources to obtain better coverage and more reliable results.

WHAT IS THE MINIMAL DATA COLLECTION REQUIRED?

Collecting accurate and detailed information on human–dolphin interactions is important for putting in place measures that could reduce

©GFCM/Claudia Amico

or minimize the impacts of depredation. Before starting a monitoring programme, it is essential to obtain a general overview of the investigated area to understand the existing background conditions by collecting data on the fleet, the environmental characteristics, and the presence of marine mammals.

Observers should provide good information on the peculiarities of the fleet, the fishing strategy, and the catch (e.g. landed species, discards composition, impacts on vulnerable species, species depredated) by different fishing gear. Data collection should also include all information related to the different interaction events which take into account depredation, incidental catch and the presence/absence of dolphins during monitored fishing activities.

Finally, some economic information should also be collected toward determining the real losses of dolphin interference and fishers' feelings toward this type of interaction. Estimating the economic loss caused by dolphins is no easy task. Fishers can provide a first estimation based on gear damage, reduced catch or loss of time. Where possible, trained observers can balance these estimates with further studies.

Without all these accurate information the knowledge of the impacts that depredation can have on fisheries, as well as of the impacts that fisheries can have on dolphins and on the ecosystem in general, becomes more uncertain and conservative.

ESTIMATING THE LEVELS AND IMPACTS OF DOLPHIN DEPREDATION

Once data have been collected, and to better analyse the impacts and to estimate spatial and temporal trends (if any) in the occurrence of this kind of interaction, the literature suggests estimating and applying several catch and depredation indicators. Depredation rate (DR), used to assess the rate of fish lost due to depredation, is calculated by dividing the number of fish lost or damaged (FD) by the total number of fish caught (FC) (i.e. DR = FD/FC). The number of depredation events (IR) can be estimated by dividing the number of fishing operations that experienced depredation (FOD) by the total number of fishing operations (FO) that took place (i.e. IR = FOD/FO). To estimate the damage intensity (DI) caused by these interactions, the number of fish damaged (FD) and left by dolphins can be divided by the total number of fishing operations (FO) (i.e. DI = FD/FO).

DESIGNING A ROBUST AND HARMONIZED DATA COLLECTION PROGRAMME

In an ideal data collection programme, all members of a population should be measured. But because monitoring programmes usually cannot cover 100 percent of vessels and fishing trips/fishing operations in an identified area – due, among other factors, to the multispecificity of fisheries in many Mediterranean and Black Sea countries (e.g. different types of gear, target species and fishing grounds) – it is often required to rely on a sample of information from a smaller portion of the whole population that is robust in its design and large enough to be representative. Therefore, the first essential step is to define the population to be sampled. For example, after taking into account the specificities of each area/port/country, the population of interest may comprise all the vessels using a certain gear in a fleet. This information not only determines the absolute level of sampling required to achieve a useful result, but also helps to inform the strategy for appropriate stratification of the sampling activity.

─────────

Reference:

Carpentieri, P. & Gonzalvo, J. 2022. *Dolphin depredation in Mediterranean and Black Sea fisheries – Methodology for data collection.* FAO Fisheries and Aquaculture Technical Paper No. 688. Rome, FAO. https://doi.org/10.4060/cc2943en

Strategy for data collection

1. The first step is to identify the total number of fishing vessels in each area, port or country of interest.

2. The target population should be broken down into sampling units (i.e. vessels, fishing days, fishing operation).

3. A random sampling approach should then be used to ensure that data obtained could permit an unbiased estimate and that the chosen sampled units are representative of the whole vessel fleet.

4. Monitoring programmes should be carried out throughout the year and in different areas to identify any differences between seasons and location.

5. Information obtained by on-board observers can be complemented by further interviews or questionnaires at ports. This is particularly useful when fishing fleets are mainly composed of small-scale vessels, or when the collection of the on-board sample data was obtained by the fishers themselves.

Dolphin depredation, whereby dolphins remove catches from nets and damage fishing gear, has become an issue worldwide, affecting both the survival of wild dolphin populations and fishers' livelihoods. However, the lack of data regarding the scope of these interactions in the Mediterranean and the Black Sea hinders the ability to protect both parties. As interactions between fishers and dolphins in the region become more frequent, loss of income can create conflicts, undermining efforts to improve both marine mammal conservation and fisheries sustainability in the region.

This brief summarizes the protocol developed jointly by the Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area and the General Fisheries Commission for the Mediterranean and aims at providing policy makers and other interested parties with key elements for a harmonized data collection on dolphin depredation.

With the financial support of

In collaboration with