

Empty promises: The European Union is failing to protect dolphins and porpoises from fisheries by-catch

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Abstract

By-catch is the primary global conservation threat to populations of dolphins and porpoises. Despite protection for these protected species under its Habitats Directive, the European Union (EU) has failed to adequately assess and, where necessary, mitigate the by-catch of small cetaceans. Management authority is diffuse, and the EU has no over-arching, quantitative conservation objectives. To address this, we recommend that the EU adopt a comprehensive plan to conserve dolphins and porpoises in European waters. This plan should include regular formal assessments of small cetacean populations, including establishment of quantitative management objectives, generation of estimates of abundance and by-catch mortality, and agreement on biological reference points that will guide management actions to ensure that by-catch does not exceed sustainable levels.

KEYWORDS

cetaceans, conservation, EU Habitats Directive, fisheries interactions, management framework, threat

In December 2019, we attended a session on cetacean by-catch at the World Marine Mammal Conference in Barcelona. Having worked on this conservation issue in various parts of the world for more than 25 years, we were independently struck by how little progress the European Union has made in mitigating the by-catch of dolphins and porpoises. Here, we reiterate the importance of

this issue to the conservation of small cetaceans and make specific recommendations on how by-catch can be reduced to sustainable levels in Europe.

Fisheries by-catch is widely recognized as the primary conservation threat to populations of dolphins and porpoises (Read et al., 2006). The importance of this threat was identified more than



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Etymology of Ghoti

George Bernard Shaw (1856-1950), polymath, playwright, Nobel prize winner, and the most prolific letter writer in history, was an advocate of English spelling reform. He was reportedly fond of pointing out its absurdities by proving that 'fish' could be spelt 'ghoti'. That is: 'gh' as in 'rough', 'o' as in 'women' and 'ti' as in palatial.

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three decades ago, when the International Whaling Commission (IWC) convened a Workshop on By-catch in Passive Fishing Nets and Traps in 1990 (Perrin et al., 1994). Gillnets are a particular threat to many species of small cetaceans (Brownell et al., 2019), but other species are taken in large numbers by mobile fishing gear, such as pelagic trawls (Fernandez-Contreras et al., 2010).

Over the past three decades, there has been considerable progress in developing conservation strategies to mitigate the threat of by-catch to marine mammals, at least in high-income countries. These measures include: acoustic deterrent devices, also known as acoustic alarms, or pingers; time–area fisheries closures; by-catch reduction devices in trawl fisheries; and other modifications to fishing gear and practices. Such measures are now employed widely in countries such as the United States, Australia and New Zealand (Werner et al., 2006).

Monitoring programmes and by-catch mitigation strategies are mandated by national legislation in several countries. For example, the United States Marine Mammal Protection Act requires that by-catch of marine mammals is monitored by independent fisheries observers and that management actions are triggered when by-catch levels rise above population-specific biological reference points, known as Potential Biological Removals (Wade, 1998). This has, in general, been successful at reducing by-catch to sustainable levels (Geijer & Read, 2013). For example, the by-catch of harbour porpoises (*Phocoena phocoena*, Phocoenidae) in bottom-set gillnets along the US east coast was reduced from almost 3,000 in 1990 to fewer than 250 in 2016 (Hayes et al., 2019), using a combination of acoustic alarms and time–area management measures (Orphanides & Palka, 2013).

Dolphins and porpoises are included in the EU Habitats Directive (1992/43/EC), which protects them from deliberate capture or killing. Marine mammals are also included in other EU Directives, such as the Marine Strategy Framework Directive (2008/56/EC) which recommends that “the mortality rate from incidental by-catch is below levels which threaten the species, such that its *long-term* viability is ensured.” Nevertheless, by-catch of small cetaceans in European fisheries is widespread, including very large numbers of common dolphins (*Delphinus delphis*, Delphinidae) in trawl fisheries in the Bay of Biscay (e.g., Fernandez et al., 2010), and by-catches of the critically endangered population of harbour porpoises in gillnets set throughout the Baltic Sea (Dolman et al., 2016). In addition, large and likely unsustainable by-catches of harbour porpoises occur in other parts of Europe, such as the Celtic Sea and along the coast of Norway (Bjørge et al., 2013).

The response of the EU to addressing the by-catch of dolphins and porpoises has been slow and ineffective (Dolman et al., 2021). We suggest that this ineffective response results from a scattered and diffuse management responsibility for the conservation of dolphins and porpoises in Europe and from a lack of quantitative conservation objectives. The EU Habitats Directive and Common Fisheries Policy (EU1380/2013) both contain vague objectives regarding by-catch. For example, the wide-ranging Habitats Directive requires Member States to “maintain or restore....populations of wild fauna....at a *favourable* conservation status.” Within this context “*favourable*” is defined as when “the population... is maintaining itself on a *long-term* basis... the range is not reduced” and that there are “*sufficient* larger habitats to maintain its

TABLE 1 The number of gillnet vessels by vessel length class, as reported to the FAO in 2018 (Data from FAO Fisheries and Aquaculture Statistics and Information Branch)

	<12 m	12–24 m	>24 m	Total	% < 12 m
Denmark	661	31	0	692	96
France	1,852	110	17	1,979	94
Germany	1,032	11	2	1,045	99
Ireland	407	35	5	447	91
Sweden	447	9	0	456	98
UK	672	17	6	695	97
Spain	5,931	539	13	6,483	92
Portugal	4,256	230	5	4,491	95
Netherlands	106	15	0	121	88

population.” The EU Marine Strategy Framework Directive (2008/56/EC) requires Member States to conduct assessments of by-catch, but not necessarily to mitigate them. It also recommends that “the mortality rate per species from incidental by-catch is below levels which threaten the species, such that its *long-term* viability is ensured.” The Marine Strategy Framework Directive goes on to suggest that “Member States shall establish the threshold values for the mortality rate from incidental by-catch per species, through regional or sub-regional cooperation.” Again, as with the Habitats Directive, the lack of specific, quantitative objectives makes the “translation” of these Directives into national legislation extremely difficult, especially where multiple Member States are involved. Importantly, managers responsible for the conservation of marine wildlife, such as small cetaceans, typically do not have responsibility for managing fisheries and *vice-versa* (see below). Regional frameworks, such as the Agreement on the Conservation of Small Cetaceans of the Baltic, North East Atlantic, Irish and North Seas (ASCOBANS) and The Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and contiguous Atlantic area (ACCOBAMS) cover some, but not all range states, and measures adopted under these Agreements are not binding on signatory countries. Overall, there is no clear European framework to reduce the mortality of dolphins and porpoises in fisheries to sustainable levels. This limitation, and perhaps the structure of the Common Fisheries Policy itself, hampers the ability to implement effective management actions.

Even when conservation measures have been implemented in Europe, they have been largely ineffective. More than 15 years ago, EU Regulation 812/2004 laid out two approaches to address the by-catch of cetaceans in fisheries: a requirement to use acoustic deterrent devices in certain gill net fisheries, but only on vessels of 12 m in length or greater; and a requirement for independent observers to monitor by-catch in other fisheries, but only on vessels longer than 15 m (ICES, 2019). These same measures are retained in EU Regulation 1241/2019, recently reviewed by Dolman et al. (2021), which superseded Regulation 812/2004. The approaches are insufficient, however, because the vast majority (94%) of European gillnet vessels are smaller than 12 m (Table 1). Furthermore, few Member States have made these actions a management priority, and many fisheries known to take large numbers of dolphins and porpoises

remain unmonitored (Dolman et al., 2016). Nevertheless, as noted above, we know that by-catch levels are high and likely unsustainable for some species and areas (ICES, 2019). However, even in these cases, monitoring programmes are limited to large vessels only and estimates of total by-catch are negatively biased because not all fishing effort from specific fishing métiers is reported. Thus, even in those cases where we know a problem exists, the situation could be considerably worse than it currently appears (ICES, 2019).

In addition, many Member States in the EU allow recreational gillnet fishing, with the provision that catch is used only for subsistence and not sold (Pawson et al., 2008). These fisheries are generally conducted close to shore and with limitations on net lengths (e.g., 180 m in Sweden). These recreational fisheries constitute a large but unquantified amount of fishing effort and an additional source of unmonitored by-catch, particularly for harbour porpoises, which inhabit nearshore habitats.

The lack of effective conservation action by the EU is not a result of knowledge gaps on the status of cetaceans, the availability of effective mitigation strategies, or the absence of scientific advice (Berggren et al., 2002). Several international bodies, including the Scientific Committee of the IWC, ASCOBANS, and the International Council for the Exploration of the Sea (ICES) Working Group on Bycatch of Protected Species (WGBYC), regularly provide detailed scientific advice. As noted below, we already understand where management intervention is required to address this issue. Thus, we conclude that the failure to act reflects a lack of political will and action to tackle this issue.

This lack of political will is exacerbated, or perhaps given cover, by the very different management frameworks for the management of marine wildlife and commercial fisheries. *Regulations* are the most direct form of policy implementation within the EU—as soon as they are passed, they have binding legal force throughout every Member State. In contrast, *Directives* merely state a desired result and leave EU Member States to determine how to implement them. Commercial fisheries are typically managed by implementing Regulations, but management of marine wildlife relies on Directives. Implementation of Directives is complicated for cetacean populations, which often range over the jurisdictions of several Member States. This dichotomy in management approach, together with substantial mismatches in the spatial scale at which fishing effort and by-catch levels are reported (Pawson et al., 2008), has significantly limited progress in dealing with by-catch, in spite of the existence of regional agreements such as ASCOBANS and the scientific work of the ICES WGBYC.

We recommend that the EU adopt a comprehensive plan to conserve dolphins and porpoises in European waters. This plan should include quantitative conservation objectives and a framework to reduce by-catch levels when management intervention is required. Implementation of such a plan will require formal assessments of small cetacean populations, including estimates of abundance and by-catch mortality, and biological reference points used to guide management actions. Robust estimates of by-catch mortality are required for each population; this will require reliable estimates of by-catch rate and total fishing effort for each fishing métier at

appropriate spatial and temporal scales. We recommend that wherever possible, estimates of by-catch rate be generated from electronic monitoring systems which have the added benefit of providing direct measures of total effort, catch of target species and discard rates. In addition, electronic monitoring systems can be implemented on vessels for which it is difficult, or impossible, to employ human observers, due to their size, configuration or other factors.

European countries outside the EU also have a responsibility to address the by-catch of dolphins and porpoises in their Exclusive Economic Zones (EEZ). In particular, as the United Kingdom navigates its exit from the EU, it has an important responsibility to develop a national framework to address by-catch. Clearly, the United Kingdom will need to cooperate with EU member States to set conservation goals and objectives in cases where populations of small cetaceans range outside its EEZ. Other countries outside the EU, such as Norway, also share this responsibility (Bjørge et al., 2013). In the Mediterranean Sea where marine mammal and fisheries management is further complicated by geopolitical issues and multiple jurisdictions, efforts should be made to address cetacean by-catch at the population level.

The approach we are recommending is not radical. In fact, it is a straightforward fisheries and wildlife management paradigm, recognizable to any undergraduate student in applied ecology. We provide a framework for this approach in Figure 1. The first step is to establish quantitative management objectives for each population. This should be followed by the establishment of an appropriately designed (in a statistical meaningful way) monitoring programme, preferably using electronic systems that allow a more comprehensive and representative sampling of the fleet(s), to allow for accurate estimation of by-catch levels. Fortunately, most of the hard work has already been done. Range-wide estimates of abundance are available for most species of dolphins and porpoises (Hammond et al., 2013). The required technical expertise already exists in Europe, and several candidate biological reference points are available, including IWC Catch Limit Algorithms, the Potential Biological Removal model used in the United States and one developed by ASCOBANS specifically for harbour porpoise by-catch.

We highlight this issue now because political attention has been drawn to the by-catch of common dolphins in trawl fisheries in the Bay of Biscay and the by-catch of harbour porpoises in the Baltic. By-catch is also likely to be high for other populations, and in other areas of the EU, in the Mediterranean and Black Sea (Birkun et al., 2015). This requires that the EU take concrete action to address these and other by-catch issues in a systematic fashion. In the Bay of Biscay, we need quantitative estimates of the by-catch of common dolphins and an assessment of their sustainability. In the Baltic, where we already know that management action for harbour porpoise is required, Member States should replace gillnets with alternative gear types that do not pose a threat to this critically endangered population of harbour porpoises. Acoustic alarms have been considered as a mitigation measure; however, they would reduce but not eliminate by-catch for this critically endangered population, so we do not recommend their use in this instance (Dawson et al., 2013).

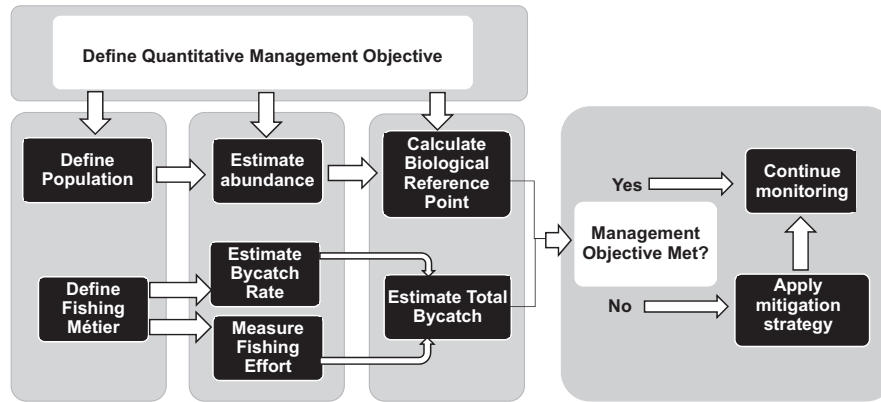


FIGURE 1 A framework to address by-catch of cetaceans in fisheries. This framework comprises a number of parallel and sequential steps aimed at aiding in the decision-making process for by-catch management. The over-arching requirement is that management sets objectives. The first parallel process involves defining the cetacean population of interest, estimating abundance and quantifying a biological reference point (safe level of mortality that ensures a viable population) and in parallel defining the fishing gear(s) operating within that area, quantifying the by-catch levels using electronic monitoring or on-board observers and extrapolating the by-catch to fleet level using fishing effort data statistics. In tandem with these two parallel activities, management objectives should be set, to enable decisions to be made. For example, if total by-catch has been estimated to exceed the calculated biological reference point, then a mitigation strategy needs to be put in place. If the by-catch is below the biological reference point, no management intervention is needed, and monitoring should continue

Since the IWC held its Workshop on By-catch in Passive Fishing Nets and Traps in 1990, we have lost one species of small cetacean, the baiji (*Lipotes vexillifer*, Lipotidae), and are about to lose a second, the vaquita (*Phocoena sinus*, Phocoenidae), to fisheries by-catch (Brownell et al., 2019). More than a dozen other populations, including the Baltic Sea harbour porpoise, are currently imperilled by this threat (Brownell et al., 2019).

Cetaceans are amongst the most iconic species of marine wildlife and are vital to the history and culture of many European maritime communities. They are also important to the European economy, generating considerable revenues from ecotourism. We are not the first to call for effective action to conserve these species by reducing their by-catch in fisheries (Dolman et al., 2016, 2021). The EU should act now before more populations and species go extinct; the time for effective action is long past.

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