

Roadmap for ICES bycatch advice on protected, endangered, and threatened species



ICES

International Council for
the Exploration of the Sea

CIEM

Conseil International pour
l'Exploration de la Mer



This roadmap describes the legislative background, the science needs, and a path for ICES to strengthen its advice on incidental bycatch.

Introduction to legislative background

There are several legislative instruments in ICES Member Countries, Regional Fisheries Management Organisations (RFMOs) and the European Union concerning bycatch of protected, endangered, and threatened species (PETS). These include, amongst others:

Canada

The Canadian [Policy on Managing Bycatch](#) has two specific objectives: 1. to ensure that Canadian fisheries are managed in a manner that supports the sustainable harvesting of aquatic species and that minimizes the risk of fisheries causing serious or irreversible harm to bycatch species; and 2. to account for total catch, including retained and non-retained bycatch, with six specific goals as outlined in the [Implementation of the Policy on Managing Bycatch](#). Canada has also implemented a [North Atlantic right whale \(*Eubalaena glacialis*\) action plan](#) with a management objective to reduce mortality and injury as a result of fishing gear interactions. [The National Plan of Action for Reducing the Incidental Catch of Seabirds in Longline Fisheries](#) (2007) provides, amongst others, an assessment of bycatch levels of seabirds within Canada's longline fisheries, and presents a series of actions to better identify bycatch levels and further enhance efforts that reduce the incidental capture of seabirds.

European Union

One of the objectives of the [EU Common Fisheries Policy \(EU1380/2013\)](#) is to ensure that negative impacts of fishing activities on the marine ecosystem are minimized. This includes, amongst others, avoiding and reducing unwanted catches of commercial and protected species. The obligation to monitor and to collect data lies with the EU Member States, who should cooperate with each other and with the Commission to coordinate data collection activities within the same region (in regional Member State groups, i.e. through Regional Coordination Groups on data collection that identify and prioritize the fishery/species combinations to be sampled for incidental bycatch under the revised EU Data Collection Framework).

Further, [EU Regulation 2019/1241 on the conservation of fisheries resources and the protection of marine ecosystems through technical measures](#) as its objective to 'ensure that incidental catches of sensitive marine species, including those listed under Directives 1992/43/EC and 2009/47/EC that are a result of fishing, are minimised and where possible eliminated so that they do not represent a threat to the conservation status of these species'. Annex XIII of this Regulation is dedicated to monitoring measures and reduction of incidental catches of sensitive species.

An assessment of the levels of mortality due to incidental bycatch (all catches of species not targeted in fisheries operations (=incidentally/accidentally caught), including those not taken on board, regardless of later treatment) is also required to fulfil the objectives of the [EU Marine Strategy Framework Directive \(2008/56/EC\)](#) (MSFD). Specifically, Criterion 1 (Mortality rate from bycatch) of Descriptor 1 (Biological diversity is maintained) should include species (birds, mammals, reptiles, and non-commercially exploited species of fish and cephalopods) that are regionally at risk from incidental bycatch. Underlying data by fleet segments are needed to enable the identification of those métiers contributing most to incidental bycatches of each of the species considered. Assessing D1C1 for a species will involve aggregating bycatch estimates from different métiers to give a total bycatch mortality level per species or population.

Effective preventive measures to avoid and monitor bycatch are also required by the [EU Habitats Directive \(1992/43/EC\)](#) and the [EU Birds Directive \(2009/47/EC\)](#) as part of the measures taken under the system of protection which EU Member States need to establish for species listed in Annex IV of the Habitats Directive and for all wild birds. Deliberate capture and killing of these species is forbidden. Furthermore, bycatch should be monitored and additional conservation measures taken if needed to ensure there is no significant negative impact on the species concerned. In addition, the objective of the [EU Action Plan for reducing incidental catches of seabirds in fishing gears \(COM\(2012\) 665 final\)](#) is 'to minimise and, where possible, eliminate the incidental catches of seabirds'.

Iceland

Incidental bycatch of marine mammals and seabirds must be recorded in fisheries logbooks according to [Regulation on Catch Books 746/2016](#).

Norway

A [Marine Resources Act](#) which entered into force in 2009, integrates conservation and sustainable use as basic principles for management of Norwegian fisheries. The Act applies to all wild living marine resources, and amongst others, requires incorporation of new scientific knowledge on the bycatch of fish, seabirds, and marine mammals.

United States

The [Marine Mammal Protection Act](#), enacted in 1972, establishes a national policy to prevent marine mammal stocks from declining beyond the point where they cease to be a significant element in the ecosystem in which they



The overarching goal of the roadmap for ICES bycatch advice on PETS: To assess the risk of, and the impact of fleet activity on incidental bycatch, and to include these in ICES Fisheries Overviews by 2022.

are a part. Bycatch is also addressed in the [Endangered Species Act](#) and the U.S. primary federal fisheries regulation, [Magnuson-Stevens Fishery Conservation and Management Act](#). The Magnuson-Stevens Act requires that conservation and management measures shall, to the extent practicable, minimize bycatch, and to the extent bycatch cannot be avoided, minimize the mortality of such bycatch. In 2016 [The National Bycatch Reduction Strategy](#) was developed to guide and coordinate national efforts to reduce bycatch and bycatch mortality in support of sustainably managing fisheries and recovering and conserving protected species.

RFMOs

Some RFMOs may have binding regulations on bycatch and bycatch reporting.

To address the requirements of the legislative instruments mentioned above in relation to incidental bycatch of PETS, this document aims to start actions to facilitate more efficient consolidation of data and knowledge, and planning future steps in ICES. In addition to the above, the aim is also linked to the Article 18(1) of

[EU Regulation 2017/1004](#) that states ‘... Member States, the Commission, scientific advisory bodies and any relevant end-users of scientific data shall cooperate to develop compatible data storage and exchange systems... Those systems shall also facilitate dissemination of information to other interested parties. Such systems may take the form of regional databases’. The objective is to further improve and operationalize the required data flows to ensure that ICES special and recurring advice, as well as the input to fisheries overviews, meet the highest quality as required under the [ICES Advisory Plan](#) and by the users of ICES advice. This should hopefully assist not only managers, but also a variety of other stakeholders (incl. environmental NGOs) in implementation of the relevant legislative instruments.

The basis for the current ICES annual advice on “Bycatch of cetaceans and other marine animals” is available online: [http://ices.dk/sites/pub/Publication%20Reports/Guidelines%20and%20Policies/16.3.3.2 Basis for the advice on Bycatch of small cetaceans and other marine animals.pdf](http://ices.dk/sites/pub/Publication%20Reports/Guidelines%20and%20Policies/16.3.3.2%20Basis%20for%20the%20advice%20on%20Bycatch%20of%20small%20cetaceans%20and%20other%20marine%20animals.pdf)

1. Networks

1.1 ICES expert groups involved in bycatch work

The main expert groups working on bycatch issues are: Working Group on Bycatch of Protected Species (WGBYC), Working Group on Marine Mammal Ecology (WGMME), ICES/NAFO Working Group on Harp and Hooded Seals (WGHARP), and Joint OSPAR/HELCOM/ICES Working Group on Marine Birds (JWGBIRD), and ICES/FAO Working Group of Fishing Technology and Fish Behaviour (WGFTFB), which is dealing with interactions of protected species in capture fisheries. In addition, Working Group on Spatial Fisheries Data (WGSFD) collates and analyses spatial fisheries data in order to evaluate fishing effort, intensity, and frequency, all of which are essential to estimate bycatch risk, and Working Group on Commercial Catches (WGCATCH) documents national fishery sampling schemes and establishes best practice and guidelines on sampling and estimation procedures.

1.2 Data

Most of the background information assimilated by WGBYC for ICES annual bycatch advice has since 2007 been derived from EU Member State reports, as required under [Council Regulation \(EC\) No. 812/2004](#) (repealed and replaced by EU Regulation 2019/1241). ICES has issued official [data calls](#) since 2018 to improve consistency in the reporting of incidental bycatch data at a regional scale through the EU Data Collection Framework. The data calls are periodically reviewed and adapted according to the advisory needs related to the requirements of different legislative instruments. In the future, it is expected that data will be provided through the ICES Regional Database and Estimation System (RDBES).

1.3 International cooperation

In addition to fishermen's organizations, involvement of regional managers as well as conservation-oriented end users is important, not only to improve data collection, knowledge/information sharing, joint methodology, and indicator development, but also for efficient use of human and financial resources. Therefore, effective cooperation with the following conservation and regional seamangement organisations should be secured: ACCOBAMS, ASCOBANS, GFCM, HELCOM, NAMMCO, NEAFC, OSPAR, RCGs, and other RFMOs and RSCs.

In addition to the Habitats and the Birds directives, MSFD is one of the key drivers for assessment of incidental bycatch in EU waters. There are several ways in which ICES could assist EU Member States to deliver assessments of bycatch for MSFD Article 8 reporting in 2024. These might include, amongst others, developing sampling protocols and common formats for data reporting/storing, and methodologies for indicator assessment and threshold setting. Advisory opportunities and needs in relation to the implementation of the Habitats and the Birds directives will also be investigated.

ICES ensures cooperation for data/information sharing, bycatch assessments, and risk evaluations with the following organizations:

- Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and contiguous Atlantic area (ACCOBAMS)
- Agreement on the Conservation of Small Cetaceans of the Baltic, North East Atlantic, Irish and North Seas (ASCOBANS)
- General Fisheries Commission for the Mediterranean (GFCM)
- Baltic Marine Environment Protection Commission (HELCOM)
- North Atlantic Marine Mammal Commission (NAMMCO)
- North-East Atlantic Fisheries Commission (NEAFC)
- OSPAR Commission
- Regional Fisheries Management Organizations (RFMOs)

1. Objective: Ensure cooperation with ACCOBAMS, ASCOBANS, GFCM, HELCOM, NAMMCO, NEAFC, OSPAR, RCGs, and other RFMOs and RSCs for data/information sharing, bycatch assessments, and risk evaluations

2. The proposed operational scheme / workflow

1. WGBYC will handle all data gathered through ICES data calls relative to the monitoring and estimation of PETS bycatch, and assemble and synthesize any data and information that is brought to the attention of WGBYC by other groups.
2. WGMME, WGHARP, and JWGBIRD will assemble data and qualitative information available from other sources not fully covered by WGBYC (incl. strandings, entanglement, interviews, research projects, national/local monitoring) on marine mammals (WGMME), harp and hooded seals (WGHARP), and birds (JWGBIRD). This information shall be reported to WGBYC preferably by the WGBYC data call deadline.

3. WGFTFB will work on interaction of protected species in capture fisheries, such as modifications in fishing gear and/or operational methods to minimize impacts, and also on mitigation of bycatch impacts. The outputs of WGBYC in terms of high-risk métiers for certain species could inform priorities for WGFTFB.

4. WGCATCH will continue developing sampling protocols, and WGSFD will perform quality check of the fishing effort data and continue developing methods to estimate gear-specific fishing effort. The feedback from WGBYC and needs of legislative instruments (e.g. in the EU the DCF, MSFD, and the Habitats and the Birds directives could inform priorities for WGCATCH.

2. Approach: A one single expert group in ICES (WGBYC) will evaluate all bycatch data/information from multiple sources and determine the primary sources (i.e. highest quality; best available science) to be utilized for advisory purposes

3. Bycatch advice

In general, advice is needed to improve monitoring of bycatch, to improve assessments of impacts of bycatch, and to improve preventive measures.

The ADGBYC 2019 proposed that from 2020 onwards, separate advice sheets should be presented for 1) mammals/birds/turtles and 2) protected fish species, including elasmobranchs. The outputs from WGBYC would support both advisory processes.

The scale and volume of the data on fish species received from 2018 onwards (i.e. the year when the first official data call was launched) are much greater than for mammals, birds, or turtles. This is partly because the data are derived from dedicated at-sea sampling programmes for fish (from on-board catch sampling programmes conducted by EU Member States), and because the data are raised (extrapolated) using standard procedures for fish sampling.

There is a need to agree on a list of fish species of relevance for ICES bycatch advice. The aim is to establish an “ICES bycatch fish species list” by 2021, which will be periodically re-evaluated and updated.

Also, there is a need to revisit/establish the relevant assessment units for PETS, bearing in mind the regional approach for ecosystem/fisheries assessments/advice – ICES [ecoregions](#), but also considering the scales of assessment in legislation, such as the MSFD ([Commission Decision \(EU\) 2017/848](#)).

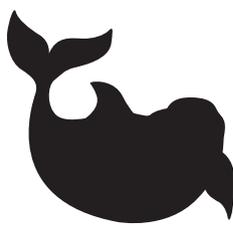
ICES is requested to provide bycatch advice according to the Administrative Agreement between the EU and ICES (recurrent advice). Special requests are likely to come from the Directorate General for Maritime Affairs and Fisheries (DG MARE), Directorate General for Environment (DG ENV), and also from OSPAR.

Examples of marine taxa affected by, and the main fishing gears responsible for bycatch



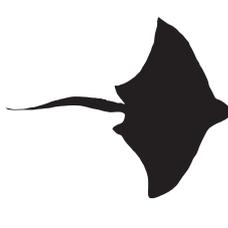
Dolphins - common dolphin (*Delphinus delphis*)

Bycaught in: pelagic trawls, bottom trawls, gillnet, trammelnet



Porpoises - Harbour porpoise (*Phocoena phocoena*)

Bycaught in: gillnet, trammelnet, beach seines



Elasmobranchs - the common skate (*Dipturus batis*)

Bycaught in: bottom trawls, gillnet, trammelnet



Birds - Balearic shearwater (*Puffinus mauretanicus*)

Bycaught in: gillnet, trammelnet, longlines



Turtles - loggerhead turtle (*Caretta caretta*)

Bycaught in: longline, pelagic trawls, gillnet

[Fisheries Overviews](#) summarize fishing activities in ICES ecoregions, including which countries are catching what species, the various fishing methods being used, and how fisheries are managed. Fisheries overviews are ICES advice products and are as such approved by ICES Advisory Committee (ACOM).

3. Objective: Operationalize, via fisheries overviews, bycatch advice for both (1) special requests and (2) recurrent advice

4. Data needs and availability, and database issues

4.1 Data and method requirements

To assess the conservation threat posed by fishery bycatch to a particular protected species the following three types of information are required: (i) the susceptibility of that population to bycatch in particular fisheries (based on observer effort data and number of bycatch incidents recorded by fishing gear, but also using other sources such as strandings or fisher logbooks); (ii) the scale of the fisheries concerned (based on total fishing effort by fishing gear for all relevant fleet segments, incl. recreational fisheries, with effort given in meaningful metrics, e.g. km*soak time for gillnets, area swept for trawls, or number of hooks for longlines); (iii) the resilience of the population to bycatch.

The WGBYC data call gathers information to estimate i) and ii). The work of other expert groups, such as WGCATCH and WGSFD, is also very relevant to ii). Currently, the most pressing data gap is for small vessels (< 12m in size) that are not covered by either VMS or AIS. The WGBYC data call does not provide data to estimate iii), since resilience depends on the population abundance and its ability to grow and recover. Data to assess iii) would be required from national and international scientific surveys to estimate population distribution, structure, and abundances, together with life history and demographic parameters. In addition, cooperation should be sought with the fishing sector to encourage bycatch reporting.

4.1. Objective: Collect information and determine methods to assess the resilience of protected species to bycatch (WGMME, WGHARP, JWGBIRD, WGEF)

4.2 Improving data

Key issues when considering bycatch are the different ways in which effort is reported by countries, the paucity of data from some fleet métiers, and the populations of PETS. Data limitations are an important factor affecting the quality of advice; the limitations need to be highlighted and data sources improved. Within the EU, availability and improvement of the quality of effort data should be discussed by the RCGs to resolve these issues as a priority.

4.2. Objective: Identify and describe potential new data sources (WGMME, WGHARP, JWGBIRD), and propose options for improving the data availability and quality (e.g. through monitoring; WGBYC, WGCATCH, WGSFD, WGEF)

4.3 Database

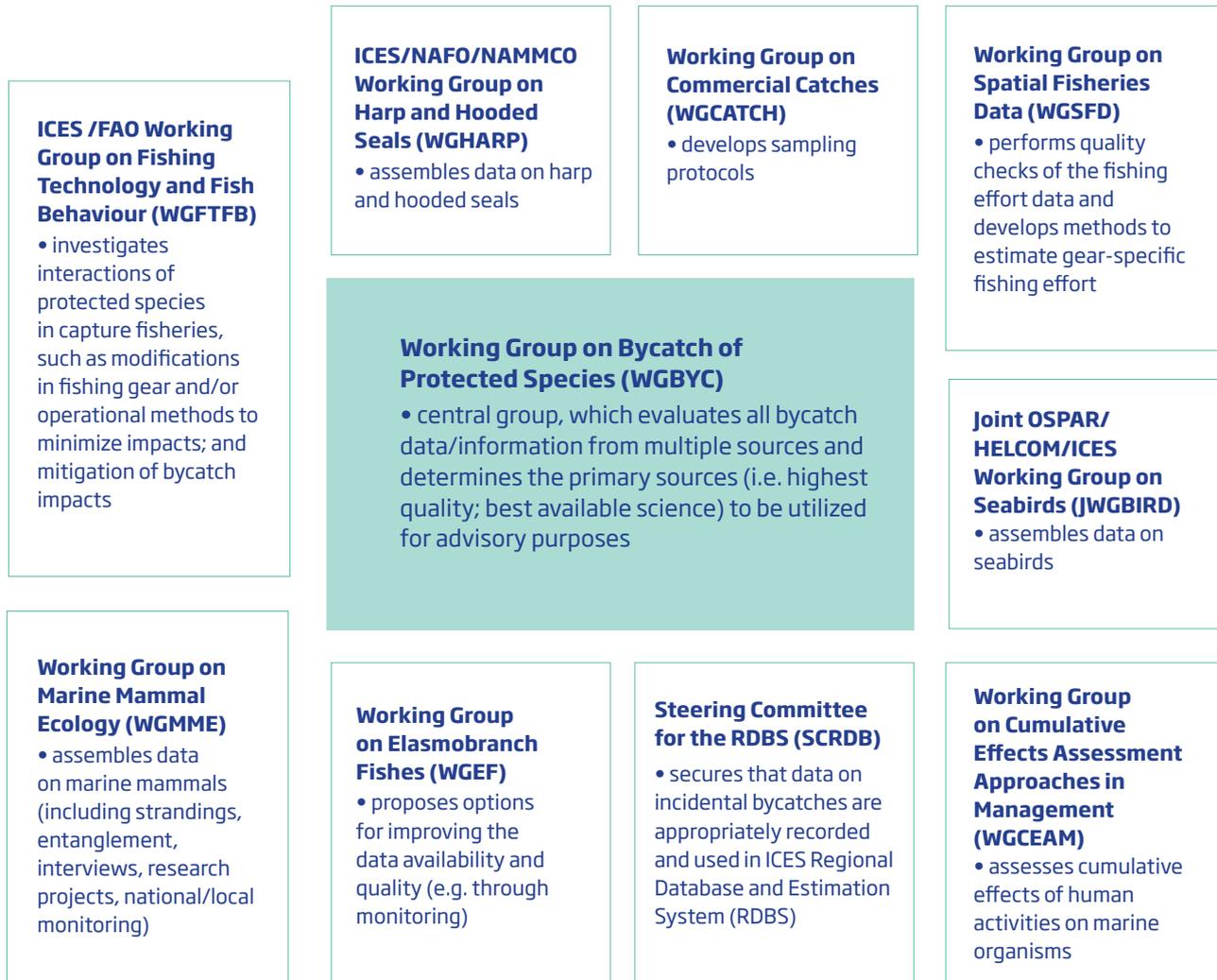
The RDBES is being “tailored” to accommodate bycatch incidents of protected species from 2020 onwards. Ongoing work by WGBYC, WGCATCH, and SCRDB (Steering Committee for the RDBES) ensures appropriate recording and use of data on incidental bycatches. For example the list of species within RDBES has been adapted to allow the recording of incidental bycatch of rare species. Following recommendations from WGBYC, fishing effort (i.e. days-at-sea) has been made a mandatory field within the RDBES exchange format. In addition, it will be possible to identify which part of the fishing operation was sampled (e.g. pre-sorting, sorting; for additional details see [WGCATCH 2018](#)).

5. Strategic developments

While improving data availability and quality should be considered as the primary objective (as it affects the quality of advice), several other parallel activities need to be prioritized as well, with the timeline of actions to be coordinated with relevant Expert Groups. The following topics should be considered:

- i) development of new (bycatch) indicators and estimation methods, which could include investigations and operationalization of alternative / supplementary sources of evidence-based data on bycatch (including involvement of WGECO),
- ii) methodological work towards setting threshold values for incidental bycatch, derived based on the conservation/management objectives (when available), and testing to ascertain their ecological relevance,
- iii) development of new metrics to measure fishing effort for different fisheries (e.g. set nets and longlines)

Internal workflow and system for creating the evidence base for the bycatch advice



for improving the quality of assessments (including involvement of WGSFD),

iv) start assessing cumulative effects of human activities on marine organisms and performing bycatch risk assessments, including also spatiotemporal considerations, which requires advanced understanding of the spatial and seasonal distribution patterns of the different fleets and populations of PETS (including with involvement of WGCEAM),

v) investigate whether improved resolution (finer-scale temporal and spatial) bycatches and fisheries data would improve advice to management (including involvement of WGSFD),

vi) investigate interactions of PETS in capture fisheries, including the advancement of knowledge in gear modifications and/or operational methods to prevent/ minimize and mitigate bycatch impacts, and inform preventative or mitigation measures,

vii) investigate operational trade-offs when reconciling objectives in legislation on bycatch of PETS,

viii) address specific scientific issues, such as a) obtaining and analysing detailed information on the circumstances surrounding each bycatch incident by using underwater cameras and acoustic monitoring, or b) improving monitoring at a wider scale by applying sensors on nets and installation of Remote Electronic Monitoring (REM).