

Agenda Item 3.1

Follow-up form AC24 on Threats to Small
Cetaceans

Bycatch

Information Document 3.1a

**Report from the ACCOBAMS-
ASCOBANS Joint Bycatch Working
Group**

Action Requested

Take note
Provide feedback

Submitted by

Co-chairs of the Joint Bycatch Working Group



Note:

Delegates are kindly reminded to bring their own document copies to the meeting, if needed.

Report from the ACCOBAMS-ASCOBANS Joint Bycatch Working Group

The Joint Bycatch Working Group (JBWG) was established in January 2019. Dr. Ayaka Amaha Oztürk (Turkish Marine Research Foundation, Turkey) and Dr. Peter Evans (Sea Watch Foundation, UK) agreed to act as Co-chairs. No objections or new nominations were received, and the chairing roles were confirmed in February 2019.

The two Co-chairs have kept in regular e-mail contact since February and have also held a Telecom session involving the ASCOBANS and ACCOBAMS Secretariats, in order to plan for future meetings and the development of two consultancies.

In April 2019, Peter Evans attended the ICES WGBYC meeting in Faro, Portugal, on behalf of ASCOBANS. At the meeting, he gave a presentation on the bycatch risk mapping project which he has been leading as part of the UK NERC-Defra funded Marine Ecosystems Research Programme. The Terms of Reference for the ICES WGBYC meeting are reproduced in Annex 1, and the final report is tabled amongst the ASCOBANS AC25 documents (AC25/Inf.3.1c).

In May 2019, the IWC held a two-day workshop in Kenya on challenges and strategies for tackling bycatch in small scale fisheries with an evaluation of usefulness of existing data. The focus was upon mitigation of bycatch in gillnets in the Western Indian Ocean and Arabian Sea. Neither of the Co-chairs attended, but a report is available amongst the ASCOBANS AC25 documents (AC25/Inf.7.1a).

Over the last few years, through the ASCOBANS Secretariat, the Bycatch Working Group has made representations to the European Commission concerning proposals for a New Technical Measures Regulation. This Regulation was adopted in July 2019 and repealed the Regulation 812/2004, coming into effect on 24 August.

Article 3 of the Technical Measures included the following of relevance:

- *ensure that incidental catches of sensitive marine species, including those listed under Directives 92/43/EEC and 2009/147/EC [...] that result from fishing are minimised and where possible eliminated such that they do not represent a threat to the conservation status of these species;*
- *ensure, including by using appropriate incentives, that the negative environmental impacts of fishing on marine habitats are minimised [...];*
- *have in place fisheries management measures for the purposes of complying with the obligations under Directives 92/43/EEC, 2009/147/EC, 2008/56/EC in particular with a view to achieving good environmental status in line with Article 9(1) of that Directive, and 2000/60/EC.*

Under Article 4, one of the targets was that Technical Measures shall aim to ensure... *that bycatches of marine mammals, marine reptiles, seabirds and other non-commercially exploited species do not exceed levels provided for in Union legislation and international agreements that are binding on the Union.*

In this context, Annex XIII laid out measures applicable to cetaceans, seabirds and turtles;

- *Member States shall take the necessary steps to collect scientific data on incidental catches of sensitive species;*

- *As a result of scientific evidence, validated by ICES, STECF, or in the framework of GFCM, of negative impacts of fishing gears on sensitive species, Member States shall submit joint recommendations for additional mitigation measures for the reduction of incidental catches of the concerned species or in a concerned area on the basis of Article 18 of this Regulation;*
- *Member States shall monitor and assess the effectiveness of the mitigation measures established under this Annex.*

Concerns remained that measures for the monitoring & mitigation of bycatch of protected species such as cetaceans were inadequate, and these were expressed in various fora, including the meeting of the ASCOBANS Jastarnia Group in Turku, Finland in March 2019.

In June 2019, the EU Scientific, Technical and Economic Committee for Fisheries (STECF) organized an Expert Working Group meeting at JRC in Ispra, Italy. Ayaka A. Oztürk attended the meeting in person, whilst Peter Evans contributed remotely. Several members of the Joint Bycatch Working Group also participated either in person or remotely. The purpose of the workshop was to review the implementation of Regulation 812/2004 in the context of the New Technical Measures Regulation as they related to cetaceans, and to help refine the implementing acts to be adopted. Background to the meeting and the terms of reference are detailed in Annex 2. A report of the meeting is now available and is tabled amongst the ASCOBANS AC25 documents (AC25/Inf.6a).

In September 2019, OSPAR and HELCOM organized a workshop “to examine possibilities for developing indicators for incidental bycatch of birds and marine mammals”. The objectives and terms of reference for this meeting are detailed in Annex 3. Ayaka A. Oztürk attended the meeting as an ACCOBAMS observer and presented its conservation objectives, assessment needs and existing assessment processes, including the recent development of multi-taxa bycatch projects in the Mediterranean Sea. Peter Evans did the same for ASCOBANS whilst also co-chairing the workshop with Kate Kaminska. Several members of the Joint Bycatch Working Group attended the workshop which had a total attendance of fifty persons (representatives of Parties to OSPAR, HELCOM, and other international bodies, marine mammal and bird experts, NGOs and fisheries specialists). A conservation objective was put forward, and proposals were made for setting quantitative thresholds for cetacean bycatch taking account of uncertainty resulting from inadequate data. A report will be presented to both OSPAR and HELCOM Parties in October. A Chair’s summary is provided in Annex 4.

Recognizing the need for new reviews of the cost effectiveness of different monitoring methods as well as of approaches to mitigating bycatch from specific gears, ASCOBANS advertised two consultancies¹ in May (following review by the Working Group). In response to applications received for both, contracts were signed in August.

The first consultancy awarded to Grant Course was to conduct a cost-benefit analysis of available and potential monitoring tools aboard fishing vessels (e.g. mobile REM vs. marine mammal observers) that will investigate options for more robust and cost-effective monitoring of small cetacean bycatch in the ASCOBANS region (as agreed at ASCOBANS AC24). The terms of reference are described in Annex 5.

¹ <https://careers.un.org/lbw/jobdetail.aspx?id=116844&Lang=en-US> and <https://careers.un.org/lbw/jobdetail.aspx?id=116842&Lang=en-US>.

The second consultancy awarded to Dr Fiona Read was to conduct a cost analysis for mitigation measures in fisheries with high bycatch levels in the ASCOBANS region (as also agreed at ASCOBANS AC24). The terms of reference are described in Annex 6.

WWF is also contemplating a review of REM to monitor cetacean bycatch (through a consultancy), and so we shall ensure the efforts are complementary and do not overlap. Earlier in the year, WWF advertised another consultancy to develop guidelines for the safe handling and release of small cetaceans from fishing gear. In July, the ASCOBANS Secretariat circulated the WWF draft document to members of the Joint Bycatch Working Group, requesting feedback by 4 August. The advanced draft is available amongst the ASCOBANS AC25 documents (AC25/Inf.3.1b).

In December of this year, the European Cetacean Society (ECS), jointly with the Society for Marine Mammalogy (SMM), is organizing the second World Marine Mammal Conference (WMMC), in Barcelona, Spain. A poster abstract entitled 'Intergovernmental framework for tackling cetacean bycatch', led by the ASCOBANS Secretariat, was submitted with ACCOBAMS and CMS. This has been accepted and will be presented at WMMC. Input from the Joint Bycatch Working Group is invited.

The Marine Stewardship Council will be organizing a workshop at WMMC, entitled "Incentivising consistent data collection and transparent reporting of marine mammal bycatch in fisheries". It will be held in Barcelona on 8 December, prior to the WMMC.

Discussions have taken place between the Co-chairs and the ASCOBANS and ACCOBAMS Secretariats concerning the subject matter and timing for a first meeting/workshop of the Joint Bycatch Working Group. The idea to hold a meeting in conjunction with the WMMC in December was abandoned because this would be too early and there were high fees (conference + workshop) associated which would limit attendance. France has expressed interest in hosting such a meeting, possibly in Brest, and it is suggested that this might be held in the spring of 2020 on the subject of the two consultancies since they will have reported by then.

ANNEX 1: Terms of Reference of ICES WGBYC Meeting, Faro, Portugal, 5-8 Mar 2019**Terms of Reference**

- a) Review and summarize annual national reports submitted to the European Commission under Regulation 812/2004 and other published documents to collate bycatch rates and estimates in EU waters and wider North Atlantic;
- b) Collate and review information from national Regulation 812/2004 reports and elsewhere in the North Atlantic relating to the implementation of bycatch mitigation measures and ongoing bycatch mitigation trials and compile recent results on protected species bycatch mitigation;
- c) Evaluate the range of (minimum/maximum) impacts of bycatch on protected species populations where possible, furthering the bycatch risk approach to assess likely conservation level threats and prioritize areas where additional monitoring is needed;
- d) Continue to develop, improve and coordinate with other ICES WGs on methods for bycatch monitoring, research and assessment within the context of European legislation (e.g. MSFD) and regional conventions (e.g. OSPAR) (intersessional);
- e) Continue to coordinate and support among WGBYC members research proposals/projects and funding opportunities in support of researching protected species bycatch mitigation;
- f) Continue, in cooperation with the ICES Data Centre, to develop, improve, populate through formal Data Call, and maintain the database on bycatch monitoring and relevant fishing effort in European waters. (Intersessional).

ANNEX 2: Terms of Reference of STECF Expert Working Group Meeting on Review the implementation of the EU regulation on the incidental catches of cetaceans (EWG 19-07), Ispra, Italy, 17-21 June 2019

Background

Regulation (EU) 812/2004 of the European Parliament and of the Council lays down measures for the reporting of incidental catches of cetaceans in few defined fisheries and one single measure to mitigate against such catches. The Regulation identifies fisheries where the use of acoustic deterrent devices (ADDs or “pingers”) is mandatory, the technical specifications and conditions of use of these devices, and fisheries where observer schemes to obtain representative data in order to assess the extent of bycatch of cetaceans. Member States are also responsible for enforcing the use of ADDs and monitoring their efficacy over time, as well as implementing monitoring schemes according to the guidelines under this Regulation.

In 2011, the European Commission carried out two separate reviews of the Regulation (EU) 812/2004 (COM (2009) 368; COM (2011) 578) as required under Article 7 of the Regulation. In 2012, ICES WGBYC (Working Group on Bycatch of Protected Species) gives a summary of the conclusions. In an attempt to address the shortcomings in the monitoring part of the Regulation, the main conclusion of these reviews led to the Commissions’ decision to implement monitoring of incidental bycatch of sensitive species into the Data Collection Framework (DCF), which began in January 2017. The report of this meeting builds on the remaining shortcomings, which refer mainly to the technical part of the Regulation. For the monitoring part, it re-addresses the shortcomings that were already recognised by previous reviews and reflects on the current effectiveness of incidental bycatch monitoring under the new DCF.

An STECF Expert Working Group (EWG-19-07) met from 17 to 21 June 2019 in Ispra (Italy) to review the implementation of the Regulation (EU) No 812/2004. Under Article 6 of the Regulation, Member States are obliged to provide an annual report on the implementation of the Regulation to the Commission. Under Article 8 of the regulation, the Commission is also required to undertake an assessment of the effectiveness of the regulation and where appropriate submit an overarching proposal for ensuring the effective protection of cetaceans. ICES, through the Working Group on Bycatch of Protected Species (WGBYC) provides a review of the Member State data reports on an annual basis; however, it is necessary to undertake a more in-depth and holistic analysis of the overall efficacy of this Regulation.

The Council has signed off the new Technical² Measures Regulation that carries over many of the technical provisions laid out in Regulation (EU) No 812/2004 and makes provisions for updating the technical specifications of acoustic deterrent devices and the possible introduction of other mitigation measures. The proposal also foresees the setting of maximum bycatch limits for marine mammals. EWG 19-07 was asked to provide an overview on where such maximum thresholds have been developed and applied.

EWG 19-07, also provided a broader overview of the whole problem of cetacean bycatch in the many areas covered by Regulation (EU) 812/2004. Various aspects related to population

² <https://www.consilium.europa.eu/en/press/press-releases/2019/06/13/final-greenlight-on-new-technical-and-conservation-measures-in-fisheries/>

status, bycatch rates, fishery effort and observation effort have different levels of scientific knowledge. These aspects affect a better or a worse understanding of the whole problem, likely biasing the conceptual framework of the Regulation itself.

Terms of Reference

The EWG 19-07 was requested to address the following Terms of Reference:

Tor 1. To provide a holistic review of the effectiveness of the current regulation based on ICES advice and other sources of information in terms of mitigating bycatches of cetaceans.

Tor 2. To provide observations on potential shortcomings of the regulation and where appropriate, indicate possible revisions to the technical specifications laid out in the Regulation.

Tor 3. To provide a summary of candidate maximum bycatch thresholds for the species most typically caught as bycatch.

ANNEX 3: Joint OSPAR-HELCOM Workshop to examine possibilities for developing indicators for incidental by-catch of birds and marine mammals, Copenhagen, Denmark, 3-5 September 2019**Objectives**

The objective of the workshop is to develop methods to assess, for conservation purposes, the pressure of incidental by-catch of birds and marine mammals. The focus is on the identification of cost-effective assessment- and data collection approaches. Conservation objectives based on already existing agreements will frame and form the basis for exploring the sustainable level of incidental by-catch pressure but are not intended to be the focus of the workshop.

The following aims will guide the work towards the objective;

Data needs for carrying out assessments should be identified and compared to current data availability. Where monitoring programmes are currently not generating suitable data, the workshop should investigate barriers to monitoring data becoming available and develop proposals for improved monitoring approaches and data collection in order to move towards operational assessments.

Approaches to identify areas of increased and decreased risk of incidental by-catch (i.e. high risk/low risk areas) should be explored. Different methods may be considered for birds and marine mammals as relevant. This information may contribute to proposals on improved monitoring approaches.

Regionally harmonised indicators are strived for, and therefore consideration should be given to proposals for approaches to setting thresholds as part of the proposal indicator assessment method.

To achieve the workshop objective, work should focus on practical aspects and develop proposals on which assessment method to use with different levels of data availability. Model-based assessments should be included in the considerations, in particular to explore possibilities to define and assess thresholds without high quality by catch and/or abundance data (e.g. aiming to take high inter-annual variability into consideration). The workshop should also consider how to calculate numbers for total by-catch from existing monitoring data and levels of rigour in the data required to inform on management action.

Birds and marine mammals were selected to be the focus for the workshop, as most comprehensive information is believed to exist for these ecosystem elements. OSPAR and HELCOM also recognize the importance of by-catch of turtles and non-commercial fish as significant pressures on these ecosystem elements, however these species groups will not be directly addressed during the workshop.

Terms of Reference

To achieve the workshop objective of developing methods for assessing incidental by-catch of birds and marine mammals, the following tasks are to be carried out during the workshop;

a. Data requirements, sources and monitoring:

Compare the data needs to current data availability, and as relevant identify possible additional data sources;

Identify barriers to preventing appropriate monitoring data becoming available;

Develop practical proposals on how to address data gaps, taking into consideration and approximating the associated costs, with an aim to enable assessments both in the short- and long-term.

b. Identifying areas of increased risk/low risk of incidental by-catch:

explore methodologies for identifying incidental by-catch high risk (and if possible also low risk) areas based on the collated background information;

consider spatial and temporal aspects of identifying areas of high risk/low risk (e.g. due to changes in spatiotemporal distribution of fisheries and the species at risk of incidental by-catch) and how to incorporate this information when defining high risk/low risk areas.

c. Methodologies for indicator assessment, including threshold setting:

explore alternative metrics/parameters, and model-based approaches for regional indicator based assessment;

explore the relevant resolution of data for assessments, taking into consideration spatial-, temporal and taxonomic resolution;

consider if different methods need to be proposed for data rich and data poor species;

compare available methods for threshold setting, such as Catch Limit Algorithm, and propose the most suitable methods to be used.

d. Identify next steps for developing monitoring and assessment of bycatch by OSPAR and HELCOM

The workshop should look for synergies between species groups and, where possible, identify methodologies (or elements of methodologies) that can be relevant across species groups.

The workshop should also make use of existing assessment processes (e.g. ICES, ASCOBANS) or obligations (e.g. DCMAP) to avoid duplicating effort and to potentially use them to help implement its proposals.

ANNEX 4: Chair's Wrap-up summary of Joint OSPAR-HELCOM Workshop to examine possibilities for developing indicators for incidental by-catch of birds and marine mammals, Copenhagen, Denmark, 3-5 September 2019

The workshop addressed the marine bird and marine mammal faunas of the combined OSPAR and HELCOM regions. These comprise c. 70 species of birds, 40 species of cetaceans and 8 pinniped species. There is much variation in population distributions and sizes, demographic trends, and life history parameters as well as information available, so there is a need to consider species or species groups regionally. For seals and a small number of better known cetaceans, this can be at the scale of the management or assessment unit, whereas for most other cetaceans and birds it will be more appropriate to do so by OSPAR region (Arctic Waters, Greater North Sea, Celtic Seas, Bay of Biscay & Iberian Coast, and Wider Atlantic) or in the case of birds in the Baltic, in three regions – Kattegat to Bornholm basin, Baltic Proper, and Bothnian Bay.

In order to assess the impact of bycatch, where possible one should delineate by species population, then obtain information on its abundance, trends, some key life history parameters (e.g. annual adult mortality, generation length), and bycatch rates. This requires decisions on which metrics to use, and these can vary within and between major taxa (e.g. abundance estimates may be numbers of birds at breeding sites, seal numbers at moulting haul-outs or pup production, or at-sea abundance).

The most challenging parameter to measure is usually bycatch rate and this is consistently under-recorded because of sampling difficulties. There are methods available, such as remote electronic monitoring (REM) for finer scale analyses, to improve our estimates and better understand the factors affecting bycatch rates, and there are ways being developed to reduce deployment costs so that REM can be moved between vessels for better statistical sampling. Risk mapping (including overlays of species density distributions and fishing effort operating particular gears so that different types can be distinguished) can help in this respect to focus resources for better monitoring, whilst information from other sources, such as strandings, can supplement at-sea reporting/recording.

Good information on fishing effort is crucial for robust estimates of bycatch rates. Although inadequate in many ways, 'Days at Sea' (DaS) from VMS remains the long-standing method to measure fishing effort. However, more refined metrics such as net length (e.g. for static gillnets) or other net dimensions (e.g. for trawls), and soak time would be better to apply in the future, whilst VMS can be supplemented by AIS and logbook information. A major sampling issue is the scarcity of monitoring for small vessels. Bycatch events are, by their very nature, difficult to predict, and this represents a major challenge in attempting to extrapolate from low sampling to the entire fishing fleet.

In developing a bycatch indicator and thresholds to alert one to unsustainable levels of bycatch, it is necessary to first have a clear conservation objective. The workshop proposed the following: "Minimise and where possible eliminate incidental catches of all marine mammal and bird species such that they do not represent a threat to the conservation status of these species." Although one customarily sets an accompanying directly measurable management objective, it was decided not to do so at this stage as that may depend upon the species group or taxon and our level of knowledge.

A number of options were proposed for setting thresholds, designed to take account of uncertainty which can be very great particularly for the data poor species/species groups. For birds, emphasis was placed on using a single measure: 1% of natural annual adult mortality,

but in some cases, it should be possible to be informed by Population Viability Analysis (PVA) or to directly apply a Removals Limit Algorithm (RLA); both approaches will need further testing. For mammals, an RLA approach may be possible for those data rich species, whereas for others, a PBR (Potential Biological Removals) or Rule of Thumb approach drawn from the results of RLA testing on species of comparable life history features (generation length) may be appropriate. Where such models are used, it is important to consider how one addresses terms such as “carrying capacity”, to consider other anthropogenic removals, and above all, to be precautionary in the face of often great uncertainty.

Finally, one must not lose sight of the overriding conservation objective to minimise bycatch and drive it towards zero, so thresholds should not be taken as a substitute for taking mitigation action.

ANNEX 5: Consultancy to conduct a cost-benefit analysis of different monitoring methods aboard fisheries with regards to cetacean bycatch

The overall objective of this consultancy is to conduct a cost-benefit analysis of available and potential monitoring tools aboard fishing vessels that will investigate options for more robust and cost-effective monitoring of small cetacean bycatch in the ASCOBANS region. The tools and methods compared in the analysis need to specifically include those available for vessels of less than 15 metres length (including those less than 10 metres length).

The ASCOBANS North Sea Group, as well as the ICES Working Group on Bycatch of protected Species (WGBYC), have both highlighted gaps in knowledge regarding bycatch estimates for small cetaceans in European waters. Reliable bycatch estimates are needed to determine current bycatch levels of small cetaceans in fisheries conducted in the ASCOBANS area, as well as to assist in prioritised and appropriate mitigation measures. Dedicated observer schemes are used in some countries to monitor cetacean bycatch and when properly designed they have frequently been considered the 'best' monitoring approach (albeit they can be expensive).

Members of the ASCOBANS North Sea Steering Group suggested that Remote Electronic Monitoring (REM) could be used to complement dedicated schemes or be an alternative to such; it may be that they provide a cost-efficient and reliable way to monitor cetacean bycatch on fishing vessels, in particular where there are practical limitations to using dedicated at-sea observers on board (Kindt-Larsen et al., 2012; Bjørge et al., 2013; Scheidat et al., 2018). If they are shown to be reliable and cost-efficient, this could help address monitoring gaps and reduce uncertainty in bycatch estimates. The present cost-benefit analysis must also consider other options besides REM where it is considered not feasible to have observers or any particular reason.

To assist in the cost-benefit analysis and the REM topic in particular, attention is drawn to the Workshop on Remote Electronic Monitoring (REM) held in October 2015 in The Hague, The Netherlands (ASCOBANS, 2015). Its aim was to discuss the current status, potential shortcomings, and new developments in REM techniques that could be used to help improve cetacean bycatch monitoring. One of the main conclusions of the workshop was that from a technical perspective, REM could be used successfully to monitor small cetacean bycatch, but decisions whether REM was the best and most cost-effective option would depend on the specific situation. This is influenced by the type of monitoring being conducted, the fishing fleet targeted, as well as personnel and technical costs and these can vary greatly between countries. If a large proportion of the effort in a certain fleet was to be monitored, new solutions might have to be found with regards to lowering the costs for the REM systems and developing a more flexible system that, for example, could readily be moved around from boat to boat thus sampling a larger proportion of the fleet. In some cases, it might be useful to apply different methods simultaneously, such as observers and REM systems, as the data collected could be of complementary value. It was clear that in some cases for very small vessels (without a wheelhouse or a hard structure for mounting), the current REM systems were not suitable right away, and the boats would need modification to adjust for cameras on board, or alternative REM systems might need to be developed, such as solar powered systems as used on some artisanal vessels.

Any cost-benefit analysis of a new REM (or indeed any) data collection/mitigation approach must consider a number of key issues including:

- a) whether a technique is adequate to answer the bycatch questions being asked and if it is deemed so, under what circumstances/situations is it the most appropriate;

- b) levels of stakeholder involvement required and potential for achieving this;
- c) practical aspects of use including installation requirements, security, privacy and health & safety;
- d) sampling design/effort;
- e) data to be collected (and the reliability of those data) and the analysis costs of obtaining the required data from the raw data (e.g. reviewing digital footage);
- f) analytical techniques and dealing with uncertainty.

Many of these were discussed in the workshop report.

The consultancy must address at least the following questions, taking into account the above issues:

1. What are the currently available REM systems that could be deployed in the ASCOBANS region? What are the costs per vessel of each of these systems, as well as their advantages and disadvantages (including by vessel type and size)? How do those costs vary between ASCOBANS Range States?
2. What are the costs per vessel of alternative monitoring methods such as dedicated Marine Mammal Observers, for particular Range States where levels of small cetacean bycatch may be a concern (selection to be made in consultation with ASCOBANS)? Consider at the same time the various practical aspects (health & safety, privacy, ease of deployment on various types and sizes of vessel).
3. What are the estimated costs of various alternatives based upon sampling of 5% and 10% of a nation's fleet, for specific gear types (selected in consultation with ASCOBANS).
4. Compare strengths and weaknesses of the different monitoring options with one another, in terms of likely costs, practicalities of implementation, and likelihood of achieving adequate monitoring of bycatch.

The study will need to take into account the prospects of stakeholder engagement, sampling design, costs of training both in data collection & analysis, logistical issues (particularly aboard small vessels), and analytical costs (including reviewing digital footage).

ANNEX 6: Consultancy to conduct a cost analysis for mitigation methods in fisheries with high bycatch

The overall objective of this consultancy is to estimate the costs of applying specific mitigation measures in a number of fisheries known to have high bycatch levels in the ASCOBANS region.

Following on from a document presented at CMS COP12 on “Review of Methods used to reduce Risk of Cetacean Bycatch and Entanglements” (UNEP/CMS/COP12/Inf.15), a study is needed to estimate the costs of applying specific mitigation measures in fisheries known to have high bycatch levels (notably static gillnets and a variety of trawling activities) in the ASCOBANS region. Such a study would significantly advance policy discussions by providing estimated costs for reducing bycatch in individual fisheries. Pilot projects could evolve from the information provided by this consultancy, with an immediate impact on bycatch levels within those fisheries.

Specific ASCOBANS mandates to which this consultancy will contribute are:

1. North Sea Plan/Jastarnia Plan/WBBK Plan
2. ASCOBANS Resolution 8.5 on bycatch
3. Work Plan 2017-2020: Make recommendations to Parties and other relevant authorities on bycatch mitigation measures for further action for the end of this triennium and the following triennium.

The study should provide answers to the following questions:

- 1.(a). What are the gear modifications (including 'pingers'), that have been already documented to reduce the risk of cetacean bycatch that should be considered appropriate for the fisheries and cetacean species in the ASCOBANS Agreement Area.
- 1.(b). What would be the estimated cost of the implementation of the identified beneficial gear modifications by species and fishery type? In providing this estimation, the consultant should specify:
 - (i) the current estimated cost of the modification;
 - (ii) where can it be obtained (i.e. is it available within the country or does it need to be imported); and
 - (iii) apart from cost, what are the potential strengths or barriers for its use, including amount of change from current fishing practices, level of bycatch reduction expected, potential positive or negative implications in terms of levels of target catch, gear damage and processing time etc.
- 2.(a). Are there alternative gears to the gear modifications identified under 1 that could be used for the same target species in the ASCOBANS Agreement Area?
- 2.(b). If so, identify the strengths and weaknesses of those including consideration of:
 - (i) the potential level of bycatch benefits per fishery and species;
 - (ii) the costs associated to changing gear and changing fishing practices;
 - (iii) the potential changes in catch rate and/or potential secondary catch; and
 - (iv) any other potential barriers or incentives associated with changing fishing gear.