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CIEM Conseil International pour l'Exploration de la Mer

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Executive summary

The Working Group on Bycatch of Protected Species (WGBYC) met in Copenhagen at ICES headquarters between 4 and 7 February 2014. The meeting was chaired by Bram Couperus (Netherlands) and was attended by 13 members from ten nations. Of these, one member participated by video conferencing.

One significant aim of WGBYC continues to be the collation and review of recent annual information on the bycatch of protected species under the requirements of EC Regulation 812/2004 (Chapter 4). This is in addition to the continued coordination of bycatch monitoring and mitigation trial data (Chapter 6), and the review and dissemination of information on methodologies associated with these broad topics (Chapter 9). The European Commission has carried out two reviews of Regulation (EC) No 812/2004-COM (2009) 268 and COM (2011) 578 as required under Article 7 of Regulation 812/2004. The Commission's long-term intention is to move away from a central regulation and incorporate the main elements of Regulation (EC) 812/2004 (i.e. monitoring and mitigation) into other regulatory frameworks. This is consistent with the objective under the new CFP, of moving to regionalised decision-making, where measures are tailored to different fisheries and agreed upon at the regional level (Chapter 3).

As WGBYC continues to compile and assess data from Member State reports under Regulation 812/2004 and/or from the DCF, information available to identify fisheries with incidental catches of cetaceans and where further mitigation measures are needed is currently still limited. Furthermore, it does not necessarily allow any accurate or precise assessment of the impact of incidental catch on most cetacean populations. However, there are some data that have proven useful for a preliminary evaluation of the potential impact fisheries bycatch may be having on certain cetacean and protected fish populations (Chapter 5). In addition, changes to the design of the DCF are expected to be adopted in 2015 (Chapter 8). Changes will stipulate minimum requirements for monitoring of target and non-target species (including protected species) with greater plasticity at the regional level for tailoring monitoring to meet the needs of Member States, national and wider European obligations. The extent to which these new developments will impact future quantity and quality of data available to WGBYC for evaluating levels of bycatch for various protected species is unknown.

Following on the work developed by WKREV812 and building off of progress made during WGBYC 2013 meeting (ICES, 2013), a preliminary evaluation of estimated bycatch rates for North Sea Harbour Porpoise was conducted where expected bycatch rates were compared to four different thresholds to evaluate possible risk to this management unit (Chapter 5). Without any measure of uncertainty, preliminary results of the bycatch risk approach (BRA) show that North Sea Harbour Porpoise may be near or above sustainable removal levels. WGBYC is still awaiting guidance from the EC on setting target removal levels for protected species so impacts from fisheries interactions can be fully evaluated. WGBYC agreed to continue with the BRA focusing on how to incorporate uncertainty into the assessment where possible.

WGBYC continues to strive for annual improvements to its database developed to store data on sampling, total effort, and bycatch of protected species at various resolutions (métiers) to facilitate reporting on the effectiveness of Regulation 812/2004 and assessment of bycatch impacts (Chapter 7). Members of the ICES DataCentre attended the WGBYC 2014 meeting to discuss some issues in relation to data held by

the centre. In summary it is not currently possible for ICES to provide comprehensive fishing effort data but WGBYC agreed it would endeavour to make data requests to determine the extent of effort data available from ICES.

1 Opening of the meeting

The Working Group for Bycatch of Protected Species (WGBYC) met at ICES headquarters in Copenhagen 4–7 February 2014. Delegates were welcomed by Helle Gjeding Jørgensen. A complete list of participants is given at Annex 1. The Terms of Reference are given at Annex 2.

2 Adoption of the Agenda

The Draft Agenda was agreed and is also given at Annex 2. The Agenda follows the terms of reference. Much of the work was accomplished in small groups, with plenary sessions for discussion and agreement on major issues.

3 EU approach to bycatch management of protected species and the role of WGBYC

3.1 Background

The European Commission has carried out two reviews of Regulation (EC) No 812/2004-COM (2009) 268 and COM (2011) 578. These took place respectively after the second and fourth national reports on the implementation of the Regulation; as required under Article 7 of the Regulation. These reviews have identified deficiencies in the current regulation. However, the Commission has indicated that it sees little merit in amending Regulation (EC) 812/2004 other than to align it with the Treaty of the Functioning of the European Union (TFEU). A full review would take too long, lead undoubtedly to prolonged political discussion and possible watering down of provisions and in any case continuing to have detailed rules for managing cetacean bycatch agreed under a co-decision regulation of the Council and the European Parliament runs contrary to the objective under the new CFP, of moving to regionalised decision-making, where measures are tailored to different fisheries and agreed at regional level.

The Commission's long-term intention is to move away from a central regulation and incorporate the main elements of Regulation (EC) 812/2004 (i.e. monitoring and mitigation) into other regulatory frameworks. Once this has been achieved the Regulation could be repealed. This devolved approach will ensure that monitoring and mitigation are targeted in the areas and for the species most under threat. Improved mitigation measures could be incorporated under the new technical measures framework that will be developed as part of the reform of the CFP. This would set out the scope and management targets to be met in relation to incidental catches of cetaceans, with the possibility for Member States to develop mitigation measures for specific areas and fisheries. The monitoring requirements could be incorporated into the revised Data Collection Framework (DCF), in line with a move to a wider ecosystem approach to fisheries monitoring which would include incidental catches of non-target species such as cetaceans, seabirds and benthic organisms.

3.2 Monitoring

Over the last number of years, WGBYC has routinely assessed available data on incidental catches of cetaceans including the national reports submitted to the Commission by Member States and other supplementary information collected nationally. They have also provided advice on problematic fisheries and populations or subpopulations of cetaceans most at risk (ICES, 2010b). This analysis demonstrates observer programmes are the best source of data. However, national reports from Member States also show a reluctance to continue such programmes specifically for monitoring incidental catches because of the costs involved. Therefore, in order to continue to be able to establish which fisheries pose a threat or potential threat to cetacean populations it is important to collate existing information and identify additional/alternative sources of information to enable assessment of potential fisheries that pose an interaction threat to guide future monitoring requirements, ahead of any possible revision of the monitoring schemes. The most likely source of information, in addition to monitoring under 812/2004, is observer coverage provided under the existing DCF but whether this level of coverage will be at a sufficient resolution or in the right fisheries and areas to allow this is open to question.

3.3 Mitigation

On the acoustic deterrent devices, in 2012 the Commission tabled a proposal; COM (2012) 447 to align Regulation (EC) 812/2004 with the Treaty of the Functioning of the European Union (TFEU). This proposal has now been agreed upon by the European Parliament and the Council and will enter into legislation in mid-2014.

One of the provisions is to allow for a revision of the technical specifications and conditions of use of acoustic deterrent devices as defined in Annex II of the Regulation. This would allow adaptations to take account of technical and scientific progress since the regulation came into force but requires an analysis of the parameters contained in Annex II of the regulation to identify the changes that could be made. The report from the workshop on bycatch of cetaceans and other protected species (WKBYC; ICES2013b) did provide some advice on how these parameters might be modified.

The other relevant provision to note for this revision to Regulation 812/2004 was a commitment for the Commission by 31 December 2015, to review the effectiveness of the Regulation and, if appropriate, come forward with a new regulation for ensuring the effective protection of cetaceans. The Commission's preference is still clearly to incorporate the elements of Regulation 812/2004 into the technical measures and the DCF but this provides an additional possibility of the Commission coming forward with a new proposal replacing the current regulation in 2016.

3.4 Defining the problem

The information available to identify fisheries with incidental catches of cetaceans and for which measures are needed is currently still limited. Furthermore, it does not necessarily allow any accurate or realistic assessments of the impact of incidental catch on most cetacean populations. This means defining clear management targets for most fisheries is problematic. Other approaches, as well as the criteria used to define what constitutes an "incidental catch problem" need, therefore, to be developed. ICES is best placed to define these criteria and whether biological indicators (e.g. PBR-Potential Biological Removal) or threshold reference points could or should be used for defining a problem and setting management targets.

In 2009, ICES advised the European Commission 'that a Catch Limit Algorithm approach is the most appropriate method to set limits on the bycatch of harbour porpoises or common dolphins. In order to use this (or any other) approach, specific conservation objectives must first be specified. In both species improved information on bycatch and the biology of the species would improve the procedure.' In 2010, ICES again advised the European Commission that 'ICES advised in 2009 of the need for explicit conservation and management objectives for managing interactions between fisheries and marine mammal populations. This advice has not been acted upon. Lacking these objectives, ICES is unable to properly consider the impacts of these interactions in its management advice.'

Towards the end of 2012, the Commission requested further advice from ICES as follows:

1) Assess the extent to which current fishery monitoring schemes, including *inter alia* those conducted under the DCF and Regulation 812/2004, provide an acceptable means of assessing the nature and scale of cetaceans and other protected species bycatch. Consider alternative means and other sources of data that could be used to improve our understanding of the

conservation threat posed to cetaceans and protected species bycatch in European fisheries.

2) Advise on how Annex II of Regulation 812/2004 defining technical specifications and conditions of use Acoustic Deterrent Devices could be best revised in light of technical and scientific progress in this field.

3) Based on the methodology used and the estimates of bycatch limits (take limits) generated by region at WKREV812 and other relevant analyses, propose effective ways to define limits or threshold reference points to bycatch that could be incorporated into management targets under the reformed CFP. Limits or threshold reference points should take account of uncertainty in existing bycatch estimates, should allow current conservation goals to be met, and should enable managers to identify fisheries that require further monitoring, and those where mitigation measures are most urgently required.

ICES delivered its advice in April 2013 which can be summarized as follows:

1) Monitoring schemes. Sampling under the Data Collection Framework (DCF) can contribute to the assessment of bycatch of cetaceans and other species, but is not sufficient on its own as currently implemented by Member States. Not all fisheries are adequately covered and many issues, including design and sampling protocols would need to be modified/extended if DCF monitoring was to be the sole source of information. Monitoring under Regulation 812/2004 is much more specific for cetaceans, and has included the use of dedicated observers and remote electronic video recording. Development of remote electronic video recording seems likely to be a cost-effective way of assessing bycatch in the future.

2) Acoustic Deterrent Devices (ADDs): ICES advises that regulation should not inhibit the development of more effective devices to deter harbour porpoises and other marine mammals from fishing gear. The characteristics of existing ADDs, which can deter harbour porpoises from fishing gear, are known. These characteristics cannot though be used to define all effective devices. Further studies would be needed to define standards for harbour porpoises and for ADDs that would be effective for other marine mammal species. To allow further development of ADDs, ICES recommends that a performance standard should be set. For an ADD to become acceptable, it should have a proven ability to reduce bycatch of the relevant species in the setting of a commercial fishery.

3) Reference points. Robust methods for setting reference points for bycatch of protected species already exist. ICES recommends that a process involving both managers and scientists be established to set species and, where relevant, population-specific reference points. ICES proposes that a Bycatch Risk Approach be used to classify fisheries in terms of risk to protected species.

This work was further expanded herein under Chapter 5 demonstrating preliminary analysis of bycatch impacts on population levels.

4 ToR B National reports on cetacean bycatch under Reg. 812

4.1 Introduction

The WG was provided with Member States' annual reports to the European Commission on observations carried out under Regulation 812 in 2012. Five of the 22 EU coastal Member States are not affected by any part of Reg 812/2004 (Annex4-Table 4a; Bulgaria, Cyprus, Greece, Malta, Romania). Reports were received from 15 of the 17 Member States affected by the regulation (Annex 4-Table 4a). The report of Sweden, however, did not contain any of the required data. Finland last submitted a report in 2009 (for year 2008) and Spain in 2010 (for year 2009).

The contents of the reports have been reviewed by the following subjects: (1) implementation of the regulation, both regarding mandatory mitigation and monitoring of cetacean bycatch, (2) information of bycatch of cetaceans (records of individual bycatch events and extrapolated estimates), (3) information detailing bycatch of non-cetacean taxa and (4) other relevant issues emanating from the reports. Further information not found in the reports but provided by the participants during the meeting is also included.

Fourteen Member States which provided reports for 2012 carried out either dedicated 812/2004 cetacean bycatch monitoring or combined cetacean bycatch monitoring with their DCF discard programme. Sweden reported not having monitored any fishing effort. Monitoring efforts are detailed in Section 4.3 and Annex4-Table 4d, as well as in Annex4-Table 4f. Seventy-seven specimens of cetaceans were observed bycaught (Annex4-Table 4e). The species involved are striped dolphin (*Stenella coeruleoalba*, 1), common dolphin (*Delphinus delphis*, 30 including 13 from two events in France), bottlenose dolphin (*Tursips truncatus*, 2), Risso's dolphin (*Grampus griseus*, 1), harbour porpoise (*Phocoena phocoena*, 42), and long-finned pilot whale (*Globicephala melas*, 1). Other bycaught protected species include grey seal (*Halichoerus grypus*), harbour seal (*Phoca vitulina*), loggerhead sea turtles (*Caretta caretta*), spurdog shark (*Squalus acanthias*), bull ray (*Pteromylaeus bovinus*), tope/smooth-hound shark, porbeagle shark (*Lamna nasus*), common fresher (*Alopias vulpinus*), eagle rays *(Myliobatis aquila*), pelagic stingrays *(Pteroplatytrygon violacea*), common skate (*Dipturus batis*), twaite shad (*Alosa fallax*), Atlantic sturgeon (*Acipenser oxyrhynchus*), common guillemot (*Uria aalge*), and noble pen shell (*Pinna nobilis).* See Sections 4.4 and 7 and Annex 4-Table 4f for areas, métiers and numbers.

4.2 Implementation of Reg. 812 regarding mitigation method (Art. 2-3)

Eleven EU Member States are affected by the mitigation requirements (Annex 4-Table 4a), the implementation of these are summarized in Annex 4-Table 4b. Table 4c (Annex 4) summarizes which kind of pingers were used during 2012.

Belgium, France and the Netherlands have not implemented the use of pingers. The Swedish report mentions that fishermen operating in areas where pingers were mandatory were provided in 2007 with pingers having an expected lifetime of two years. It further stipulates than one must therefore assume that those pingers are no longer working. No information was received from Spain. Pingers are assumed to have been used in 2012 by relevant fisheries from DK, DE, IE, LV, PL and the UK. However the level of compliance, i.e. the percentage of vessels actually deploying operational pingers, is difficult to assess as the national enforcement strategy (including the frequency and coverage of the control) is not reported in Sections 3.2 of the national

reports (under Article 2.4 of 812/2004). Table 4b (Annex 4) clearly illustrates a problem in assessing the implementation of the Regulation and evaluating the overall effectiveness of the mitigation.

Germany notes that the legal framework for the detection and prosecution of infringements at sea needs further development because the relevant provision (Article 2(2)) merely requires pingers to be operational when setting the gear. There is accordingly no need to check static nets for the presence of pingers once they have been deployed, as any infringements found could not be punished.

4.3 Implementation of Reg. 812 regarding the monitoring of bycatch (Art. 4-5) as well as other monitoring, and reported cetacean bycatch rates (ToR B)

Sixteen EU Member States are affected by the monitoring requirement (Annex4-Table 4a). Meeting these requirements is achieved through a variety of observation methods in isolation or combination; using observers dedicated to reporting bycatch of protected species, adding protected species monitoring to the other activities of the DCF observers, using remote electronic monitoring (REM) and/or scientific research projects (Annex4-Table 4d).

It is worth noting that UK comments on the apparent differences between the number of bycatch events recorded depending on the type of observation scheme used. For example, during 2012 in 1064 non-dedicated sea days conducted under the English and Northern Irish discard programmes no marine mammal bycatch was recorded. By comparison, 33 marine mammals were observed bycaught in 414 dedicated sea days conducted under the protected species bycatch programme in 2012. A similar pattern was evident in the 2011 data (Northridge *et al*., 2013). These figures are likely to be influenced by the proportion of different gear types monitored and by the specific duties required of the observers in each programme. Nevertheless, the WG noted that these numbers highlight the importance of designing and optimizing monitoring programmes to serve multiple purposes.

All Member States that are affected by the Regulation, except for Sweden, carry out or attempt to carry out some form for bycatch monitoring. However, many reports do not clarify the lengths of vessels monitored or the total size of the fleet which makes an assessment of coverage within the Regulated fisheries problematic. Although monitoring is only mandatory in the Regulation for the >15 m sector, there has been some effort on <15 m vessels ('Scientific studies') by some Member States, although coverage of this large sector generally remains very low. Some countries do not consider trammelnets because this type of gear is not listed in the regulation and they focus mainly on GNS nets while others include GTR in the list of gears to be studied. Issues of financing monitoring schemes were raised by some Member States; one in particular however is achieving the highest level of coverage of towed gear of all Member States even though they have no recorded bycatch since the monitoring began. The standard unit of fishing and observer effort across all Member States is 'days at sea' with the exception of Germany where all effort is recorded in hours. 'Net metre per day' or 'net metre per immersion time' would be a more precise unit for reporting static gear effort than 'day at sea', but this information is rarely reported. The European format advised by the European commission (following advice of ICES) asks for several fields of fishing effort and one of them was named "Total soak time" defined as "net meter per hour". It must be underlined that the Bycatch Risk Approach (Section 5.1) requires a common standard unit of fishing effort. There is often

a lack of quality on detailed fishing effort for static gears because the fishing time of vessels and the fishing time of static gears are not the same.

Table 4d (Annex 4) provides the information contained in the national reports in relation to monitoring under Regulation 812/2004.

Information on cetacean bycatch events in 2012, as available in the national reports, is given in Annex 4-Table 4e. In some cases additional information not found in the reports is included for clarity. The overall monitoring effort conducted in 2012, with and without observed bycatch, and reported to the WG is described in more detail in Section 7.2.

Belgium

There was no dedicated observer programme for the monitoring of cetacean bycatch in 2012. The report was unclear as to whether such monitoring is required under Regulation 812/2004, but information received subsequently indicated that this was not the case (Annex4-Table 4a). Observations carried out under other observer programmes (e.g. DCF) did not report any cetacean bycatch. However, data from stranded harbour porpoises showed that at least 15 out of 97 analysed specimens in 2012 were bycaught. See under Section 4.6.1 for further comments.

Denmark

In 2012, the Danish gillnet fleet totalled 64 vessels in ICES Areas IIId24/ IIIc24 and 30 vessels in ICES Area IIIa/IV.

In 2012, there was no dedicated monitoring for cetacean bycatch in Danish pelagic trawls and gillnets under Reg. 812.

Other marine mammal bycatch monitoring has generally been low, except for vessels >15 m in Subarea IIIaN. On-board observations of gillnetters were carried out in Areas 27 IIIa under the DCF (45 sea days on vessel <15 m)) and IV (35 sea days, 30 days on vessel >15 m, 5 days on vessels <15 m), with no observed bycatch.

Electronic monitoring systems (REM) were installed on seven gillnet vessels in Areas 27.SD22, 27.SD23 and 27.IIIa. A total of 752 days at sea were observed (681 in vessels <15 m and 71 in vessels >15 m). Six harbour porpoise were observed bycaught in 27.SD22 (four in vessels <15 m and two in vessels >15 m) and 11 in 27.SD23 (only vessels <15 m monitored). See Annex4-Table 4e for details.

Estonia

Static gears were used on vessels up to 10 m but effort data were not reported and there was no bycatch monitoring. Interviews with fishermen suggest that no cetacean bycatch occurs in gillnets in this fleet. Under a dedicated monitoring scheme on pelagic vessels (OTM) in Area IIId and Subareas 25–32 for vessels above 16 m, 22 vessels out of 101 were monitored during 198 days at sea for a total of 2290 hours (average coverage of 15.6%) with no cetacean bycatch observed.

Finland

Finland last submitted a report in 2009 for year 2008.

France

Fisheries observations were carried out under the Obsmer monitoring programme. Dedicated monitoring was carried out for a total of 796 fishing days. The monitoring represented 199 days at sea in ICES Subarea VIII in static gears and 233 days at sea for towed gears in ICES Subareas VII and VIII and the Mediterranean Sea. In addition 268 days were observed in ICES Subareas IV and VII and 96 days for set-nets around Corsica.

A total of 26 cetaceans were observed bycaught. One of these was in the Mediterranean, with the others in ICES Divisions IVc, VIIb,e,f,h.

Germany

Levels of monitoring in regard to Regulation 812/2004 are recorded in hours rather than days at sea (as is the most common effort unit by other Member States). In Areas VI, VII and VIII, 925 hours of monitoring (18.97% of fishing effort) were carried out on >15 m pelagic trawls. There was no monitoring effort on static gear on vessels >15 m pelagic trawls. There was no monitoring effort on static gear vessels >15 m, despite 3000 hrs of fishing effort in areas covered by the Regulation. No cetacean bycatch was observed.

In the Baltic (III), 1.13% of fishing effort from >15 m pelagic trawlers was monitored (300 hours) and 0.01% of fishing effort from <15 m static netters (833 hours), with no cetacean bycatch observed. In a pilot project, bycatch of seabirds and marine mammals was monitored on three gillnet vessels through REM, no cetacean bycatch was observed.

Ireland

DCF and dedicated monitoring were conducted for 235 days out of a total of 3418 days at sea on board pelagic trawlers to meet requirements of Regulation 812/2004, including three days spent on the <15 m pelagic fleet, with no bycatch observed. No bycatch has been observed pelagic and midwater trawlers since 2006.

41 days were spent monitoring the interactions between seals and set-nets, including eight days on gillnet vessels <15 m. One bycatch event of harbour porpoise was reported.

Italy

A total of 518 days were monitored on the >15 m pelagic/midwater trawler fishery which represents 5% coverage of the fleet. The Regulation is not applicable to the monitoring of static gear in Italy and no fishing effort is provided for this fishery.

One bottlenose dolphin (*Tursiops truncatus*) was bycaught by a midwater pair trawl in GSA 17, a juvenile male (2.17 m long).

Latvia

Observations were made in pelagic trawls for small pelagic fish on nine vessels, four of which are in the >15 m category but the size of the remaining vessels was not reported. Coverage of the pelagic trawl fleet was high, with 1096 days observed by five observers which represents at least 32.9% of the >15 m pelagic fleet. A further 9.6% of the static net fleet (unknown length) was also monitored (135 days at sea).

Like in the period 2006–2011, no cetacean bycatch was observed, despite good effort coverage.

Lithuania

It is reported that space is too limited for observers on the two gillnetters (119 days at sea in total) and 16 midwater otter trawls out of 22 (722 days at sea in total). Observations can be carried out on the two 'biggest' pelagic trawl vessels. In 2012, out of 111 days at sea in total, nine days were monitored on one vessel (8.1% coverage) as part of the national fisheries monitoring scheme. No cetacean bycatch was observed.

Netherlands

Protected species monitoring is integrated with the DCF monitoring. The >15 m pelagic freezer-trawler fleet was observed with a coverage of 5.3% (30 days) in ICES Divisions VI–VIII (January–March and December) and 9.5% (93 days) for the rest of the fleet operating in all other areas. This amounts to 123 observer days coverage of the entire pelagic fleet (8.0%).

There has been little (not specified) fishing effort with static gears. Some vessels fished in IVb but have not been monitored.

Only one cetacean bycatch event of a long-finned pilot whale (*Globicephala melas*) in a midwater otter trawl was observed. The observed bycatch rate of 0.01 cetaceans per day in the pelagic trawl fishery is in line with the findings in 2006–2011 when the bycatch rate was 0.00–0.01 cetacean per day.

Poland

The Incidental Catches of Cetaceans Monitoring Programme coordinated by the Polish National Marine Fisheries Research Institute was continued. Observers monitored 70 days on pelagic trawls and 59 days on set gillnetters representing 1.1% and 2.4% observer effort, respectively. A further nine days were spent monitoring static nets on vessels with total length of 6–8 m.

No cetacean bycatch events were observed. Since 2006, no events of incidental catches of cetaceans have been reported.

Portugal

Monitoring of bycatch of cetacean species in Portuguese fisheries has been conducted under the framework of the MARPRO project and the National Biological Sampling Program (PNAB/EU-DCF). According to the national report, there are no pelagic trawlers licensed in Portugal and therefore no monitoring required.

The polyvalent fleet includes 372 vessels >12 m using gillnets/trammelnets, which were monitored for 71 days at sea (day trips) and 160 hauls (0.11% coverage trips). Three common dolphins, one harbour porpoise and one bottlenose dolphin were observed bycaught. Extrapolation to the whole fleet based on daily fishing effort is difficult, since it is a multigear fishery and the gear used is not specified in the logbooks.

Slovenia

Incidental catches of cetaceans were monitored by the Fisheries Research Institute of Slovenia during the course of its regular fisheries monitoring activities, such as the sampling of landings. Only two pelagic trawlers were required to be monitored ac-

cording to Annex III of Regulation 812/2004. These trawlers were scrapped during 2012 and prior to that, no bycatch was recorded.

Spain

The last report submitted by Spain concerned the year 2009 and indicated relatively large numbers of bycatch in some Spanish fisheries.

Sweden

No observation effort is reported.

UK

Information on protected species is collected primarily through a dedicated monitoring programme and under the DCF for the purposes of meeting the Regulation 812/2004 and the Habitats Directive. In pelagic trawling, 100 days of effort were monitored, representing 5% of total fishing effort. In static gears (GNS), 299 days were sampled; representing a coverage of 0.63%, but the report is unclear whether the observation is carried out on vessels using trammel or tanglenets. Much of this monitoring is for the Habitats Directive (maximum 135 days under Regulation 812/2004).

A total of 26 cetacean bycatch events were reported. Details and total estimates are reported in Annex4-Table 4e.

4.4 Information on the bycatch of species other than cetaceans

Information on the bycatch of species other than cetaceans was reported by several Member States in their annual reports. The species involved in 2012 were grey and harbour seals, turtles, seabirds, endangered fish species (sharks, rays, others) and bivalves (Annex4-Table 4f).

France

Two harbour seals and one grey seal were observed bycaught in trammelnets, one was released alive. Two loggerhead turtles were also reported bycaught and released alive by bottom trawls in the Mediterranean.

Germany

No report on species other than cetaceans, but the report mentions that remote electronic monitoring (REM) continued and will provide information on the fishing effort and bycatch of seabirds and other protected species. A final report was being drafted.

Italy

In Italy observers are trained to collect additional data on bycatch of other protected species under the Habitats Directive (i.e. loggerhead turtles, twaite shads and noble pen shells) and species of conservation concern (e.g. sharks and pelagic rays). Thirty-four loggerhead turtles were incidentally captured in the GFCM 17 area (with 33 incidents occurring in the northern Adriatic subarea, which should be considered the area of most concern), as well as a large number of sharks, rays, a few noble pen shells (when the net touches the seabed) and twaite shad (pers. comm. from Caterina Fortuna), all in midwater pair trawls. Annual estimates are given in Table 7 for most bycaught species.

Ireland

The study looking at the interaction between seals and Irish set-net fisheries reported the bycatch of five common guillemots, 17 common skates, one porbeagle shark, 76 spurdog shark, 40 tope/smooth hound shark, one common seal and 27 grey seals.

Poland

The Incidental Catches of Cetaceans Monitoring Programme covered also the observations of incidental catches of seabirds and endangered fish species such as twaite shad, and fish from reintroduction programmes such as Atlantic sturgeon. During the set gillnet fishing, the catches of seven birds were reported, including: six dead ones (two guillemots, one herring gull and three unidentified specimens; most likely torn apart by seagulls) and one live guillemot, which was released from the net. No protected fish species were reported bycaught.

UK

Using bycatch rates calculated from data collected annually under the bycatch programme since 2005, estimates of seal bycatch for 2012 from static net fisheries in the Irish Sea, Western English Channel and Celtic Shelf (ICES Divisions VIIaefghj) give an estimation of 492 seals, thought to be predominately grey seals (95% CI 358–700) bycaught in this area.

A complementary subproject to obtain whole bycaught specimens for detailed biological analysis ashore was also started during 2012. A number of vessels using set-nets in the Southwest UK are participating in the project. To date, five grey seals have been bycaught and delivered.

Under pinger trials, seal damage levels to the commercial fish catch is also being routinely recorded. The data collected to date do not suggest any increase in seal depredation associated with the use of DDDs on gillnets.

4.5 Further issues from the reports

4.5.1 Indicators of bycatch based on other data (strandings, interviews)

Strandings can shed light on the existence of incidental catches not captured by the monitoring in place, as appearing for 2012 from the reports from Belgium, France and Portugal.

Belgium

The report states that in 2012, strandings records were included: 97 harbour porpoises, three harbour seals and five grey seals. Investigation of the cause of death showed that 15 of the porpoise, one harbour seal and three grey seals were bycaught animals. Recreational set-net fishing is not allowed in Belgium and the report stated that it was therefore unlikely that any recreational fishery was the cause of the detected bycatch incidents.

WGBYC noted that Belgium did not have any dedicated observer programme for monitoring the bycatch of marine mammals, but was only relying on DCF monitoring alone, which did not reveal any bycatch in 2012. These strandings of bycaught animals, however, could point to an inadequacy of DCF monitoring in informing on the reliable level of marine mammal bycatch in fisheries.

France

The report indicated, without giving further explanations, strandings data collected by the National Stranding Network (RNE, Van Canneyt *et al*., 2013) indirectly pointed to a lack of monitoring on several fleet segments, including pelagic pair trawling for European sea bass in the Bay of Biscay. In the report provided by Ifremer, an analysis of bycatch over the last three years was included reporting average bycatch rates with associated CVs. A list of métiers without bycatch in the period 2010–2012 was also given.

Portugal

The marine mammal stranding network recorded 242 cetaceans, of which 34% were diagnosed bycaught. Common dolphins, harbour porpoises and bottlenose dolphins were the most frequent species and most animals showed signs of interaction with static gear; either gill or trammelnets or coastal driftnets (illegal). Two other species exhibited confirmed evidence of incidental capture, striped dolphins and minke whale (*Balaenoptera acutorostrata)*. This incidence of strandings of dolphins confirmed bycaught in static gears supports the necessity of re-enforcing the monitoring of incidental catch in static gear in order to assess the relative impact of the different gears.

4.5.2 Specific problems regarding observer coverage and representative sampling

Some specific problems related to the monitoring of incidental catches are reported under Section 4.3. One other specific problem mentioned in several reports is the number of small vessels existing in the fleet, down to 4 m in length. Getting reliable bycatch rates for this segment of the fleet is challenging both with regards to the type of monitoring which can in practice be performed, many vessels being too small to take observers, and the cost of the operation to obtain coverage levels in compliance with EU and national legislation requirements. Also these vessels, many of which only fish part-time, are not required to keep a logbook and have to record their catches only in monthly landing declarations. Effort from these vessels may not be recorded in the true population of vessels concerned with interactions with cetaceans. This challenge is particularly important for static gear fisheries in Germany (Baltic) and Portugal (polyvalent fleet).

Another problem mentioned in several reports is the fact that the choice of area and target species of a fishing vessel are often last minute decisions of the owner of the vessel and may even change during the trip itself. Therefore it is impossible to foresee or plan the exact effort in the area that has to be monitored under EC Regulation No 812/2004.

Also the refusal of some companies/vessels of taking observers on board on trips where a lot of discarding is expected, arguing for example a space problem, may lead to a bias in the observer coverage (e.g. the Netherlands).

All these problems introduce bias in the estimates of bycatch. For fishing vessels operating with nets using technological modes of observation could be better or more efficient than fisheries observers. For example, smart cameras operating on a reference or pilot study fleet could provide a more representative sample for estimating bycatch of cetaceans and birds if equipped on vessels not being sampled by traditional observers.

4.6 Recommendations from the National reports for amending the Regulation

General to most countries

EC 812/2004 is not adequate, when mitigation measures are only required for vessels larger than 12 meters. Many smaller vessels use the same type of gillnets, fish in the same areas, and have potentially the same risk of bycatching harbour porpoises than larger vessels. Thus, the future regulation should focus on type of gears, maybe areas, and not on vessel size.

Italy

Given the incidence of cetacean bycatch (bycatch events were recorded in 2008 and 2010, in the northern Adriatic Sea only) and the current level of funding, Italy recommends that, in order to achieve reliable total bycatch estimates (with CVs <30%), the monitoring be focused in the northern Adriatic only.

Latvia

Latvia suggests to reviewing the requirements of the Regulation 812/2004 and proposes the replacement of a monitoring programme on incidental catches of cetaceans with the collection of information from other available data sources in those areas where several continuous years of monitoring have not indicated any cetacean bycatch.

Poland

Poland suggests that during the subsequent years of the implementation of the Incidental Catches of Cetaceans Monitoring Programme, the observer coverage be of at least 6% (days at sea) for the Polish gillnet fleet in the Baltic Sea (in Subareas 25 and 26), and 1% for pelagic trawls.

Portugal

The main difficulties in implementing Articles 4 and 5 in the polyvalent fleet refer to logistics. Firstly, the sampling target of a predefined level of 5% of fishing effort is almost impossible to attain using observers only because of lack of funding. Another difficulty is related with the dynamic nature of the polyvalent fisheries, which makes effort planning difficult. Also the possibility of switching between gears within a day or of using several gears simultaneously prevents assessing the effort related to each gear.

Portuguese participants suggested that at least larger vessels could be required to report landing separated by métiers.

5 ToR C Impact of bycatch on population level

5.1 Bycatch risk assessment for harbour porpoise in the North Sea

Porpoise bycatch in the North Sea and adjacent waters has been monitored for over 20 years, but a comprehensive assessment of the scale of bycatch in this area has not been achieved. This is because bycatch monitoring has been carried out in specific métiers and by individual Member States over a long period of time, resulting in a series of bycatch rate estimates for specific fishery sectors which covers only the minority of all gillnet fisheries in the region. The ICES Workshop WKRev812 (ICES, 2010) suggested that to make progress in assessing porpoise or other protected species bycatch it should be possible to compile existing data on fishing effort, with whatever bycatch rate estimates are available for the general area to provide an indication of whether or not current levels of fishing effort might pose a conservation threat. This can be done in two ways. First one could compare a range of 'possible' or likely overall bycatch rates and effort data with an estimate of some conservation reference level, derived for example from the ASCOBANS 1.7% of best abundance estimate for the region. Alternatively, given a species abundance estimate and a bycatch reference limit, as well as an estimate of total fishing effort, one can ask what overall bycatch rate would be needed to exceed the bycatch reference limit and then decide whether or not this is feasible. This approach has been termed the Bycatch Risk Assessment (BRA) approach. Its main justifications can be summarized as follows:

- Existing data on observed bycatch rates can and should be used to help understand the risk that fishing poses to the conservation status of a particular species.
- We will never have perfect data to estimate bycatch levels, but we should use the large amount of data that we already have while ensuring that uncertainty is clearly stated.
- Where uncertainty in bycatch rate estimates is greatest and where the effect of that uncertainty is likely to have the greatest negative impact on conservation or economic activity, we can identify those fisheries most in need of further sampling.
- Estimates of bycatch levels (numbers per year being killed) are meaningless unless we have a reference level against which to compare them.
- Reference levels can be derived in many ways, we can use a range if necessary, but they are reflections of societal choices about conservation or welfare priorities.
- To assess the risk to a population from bycatch, all that we need is a conservation reference level or threshold, a bycatch rate or rates with a measure of uncertainty, and an estimate of total fishing effort by all vessels in the region of concern.
- Applying estimated bycatch rates to the estimate of fleet effort provides a number to compare with the reference level.
- Even where bycatch rates are very poorly known, we can use the conservation reference level and the estimate of total fishing effort to ask what bycatch rate would correspond to a bycatch that exceeds the reference level, and then ask how likely such a rate might be.

Problems with the bycatch risk assessment approach

The working group highlighted a number of reservations about the above methodology relating to the existing fishing effort data, to the bycatch reference limits and to the bycatch rate estimates. These are discussed below.

Fishing effort problems

Fishing effort data for gillnet fisheries are not available in any useful format for all the EU Member States and Norway. Data provided at the workshop are probably the most complete that are available for the North Sea, but were not available for Norway, Germany or Belgium. The most useful effort metric in this context is days at sea, but if bycatch rates for porpoises were estimated 15 years in the past, it is likely that the amount of fishing effort (net km.hours) represented by a 'day at sea' may have changed. Ideally days at sea would be available for each métier, but this has proved impossible to collate, so days at sea for each Member State are collated for all static gears making no distinction between those that are known to have high porpoise bycatch rates and those with low bycatch rates. As a result, fishing effort may be overestimated.

Reference level problems

The reference level itself

There is no universally agreed reference level. The ASCOBANS limit of 1.7% is probably the most widely cited, but other limits for porpoises in the North Sea have been derived using a variety of other methods including the PBR and CLA methods (Scheidat *et al*., 2013). The table below from Scheidat *et al*., 2013 gives some of these limits for porpoises in the North Sea based on an abundance estimate of 216 400 (cf 205 751 used in WKRev812).

ASCOBANS 1.7%	3679
Ascobans 1%	**2164**
PBR	**1246**
CLA	**840**

The underlying abundance estimate

Abundance estimates are generally derived for survey strata that are established on the basis of animal distribution and general ecological measures. These rarely coincide with the areas for which fishing effort data are available. It is therefore necessary to use density estimates by survey block to generate abundance estimates for the relevant fishery management areas. Abundance estimates are usually generated at decadal intervals, and in the intervening periods, abundance may have changed and distribution may also have shifted so that animal density may increase or decrease in areas of peak fishing, and this may be expected to influence bycatch rates.

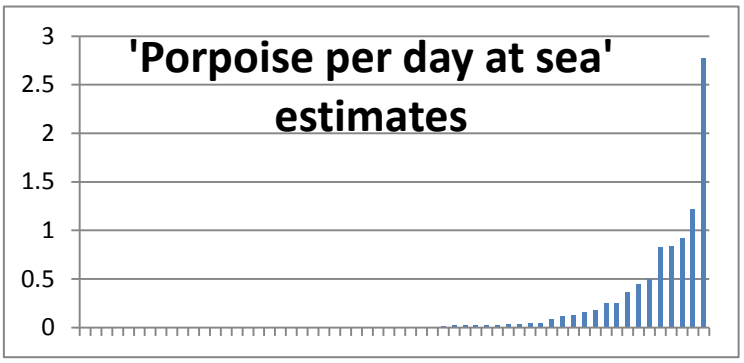
The bycatch rate estimates

Bycatch rate estimates are derived from many different research programmes which may have been established to monitor fisheries with known or suspected high rates of bycatch and may therefore be unrepresentative. Bycatch rate estimates may have

wide confidence intervals especially where limited sampling has been achieved. By-catch rates may fluctuate over time, especially as animal density shifts.

All of these concerns need to be borne in mind when trying to provide an overview of the likely scale of bycatch in a region. Nevertheless, for the reasons outlined above, collating observed bycatch rate data with fishing effort data can provide some insight into the likely scale of a problem.

Bycatch rate estimates, as animals per day at sea, where collated for 58 fishery strata in the North Sea and Danish waters (Subarea IV, and Division IIIa). These were derived from published studies and were collated by year, or years, of sampling and by fishery target species or species group to the extent that the published data allowed. Rates ranged from 0 to 2.77 animals per day at sea with an overall mean rate of 0.139 animals per day at sea. The figure below shows the distribution of these observed rates:



Total days at sea by gillnet (including drift gillnet, trammel and tanglenets) were collated where available from nations fishing in the North Sea. These were used to update the table below, originally provided in WKRev812, where available and where recent data were lacking (for Germany, Belgium and Norway) the values given in WKRev812 for 2009 were used.

Country	2009–2010		2012				
Fishing area	IV	IIIa	IV	IIIa	IIIb	IIIc	IIId
Belgium	420	0	420	0	0	0	0
Denmark	5760	5428	6704	3239	2876	6315	3651
France	2200	0	3023	0	0	0	0
Germany	1014	0	1014	0	26579		757
Netherlands	3578	0	3152	0	0	0	0
Norway	9011		9011				
Sweden	0	950	0	884			
UK	5998	0	1488				

Total effort for the North Sea and IIIa was estimated at WKRev812 as 34 400 days at sea for the most recent year at the time (mainly 2009), whereas the more recent partial data for 2012 suggest a decline in effort for the same area to around 29 000 days at sea, which would represent a 16% drop in static net fishing effort in this region over a three year period.

Further work will be needed to elaborate on the extent to which current fishing effort levels and potential overall bycatch rates might indicate a conservation issue; in the interim, each of the bycatch reference limits given below can be used to calculate the overall bycatch rate (animals per day) that would be needed for each limit to be exceeded under current levels of fishing effort:

Limit method	Bycatch limit (Porpoises per year)	Associated overall bycatch rate
1.70%	3679	0.127
1%	2164	0.075
PBR	1246	0.043
CLA	840	0.029

The overall mean bycatch rate from all observations is 0.139, which is slightly higher than the level of 0.127 porpoises per day that would result in a 1.7% take based on present levels of fishing effort. However, this overall mean is probably misleading as it is strongly influenced by sampling focused on turbot and other fisheries where bycatch rates are known to be high. Among the 58 available estimates of bycatch rate for this region (dating back to 1995), 13 (22%) exceed the 0.139 level that would indicate a total bycatch of more than 3679 animals per year. There are 15 estimates (25%) that exceed 0.075 animals per day at sea and 16 (28%) that exceed 0.043, while 21 (36%) exceed the level that would result in more than 840 animals per year.

These results suggest that current bycatch levels might exceed the conservation limits but all of the caveats listed above should be borne in mind. Further work is required to consider the available data in more detail and to explore the level of uncertainty that applies to these data. The working group agreed to pursue this approach intersessionally and to reconsider the work at the next meeting.

5.2 Protected fish species

Introduction

Under Article 12 of the EU Habitats Directive, all species in Annex IV are given strict protection from deliberate capture. Member States are required to establish a system to monitor incidental captures and to ensure that such captures do not have a significant negative impact on the species concerned. The Annex IV species of relevance to the ToR of WGBYC are *Acipenser naccarii* (Adriatic Sturgeon) and *A. sturio* (European sturgeon). Additionally, all sturgeon species other than those on Annex IV, lamprey (*Lampetra fluviatilis* and *Lethenteron zanandrai*) and shad (*Alosa* spp.) are listed in Annex V of the Directive as species whose taking in the wild and exploitation may be subject to management measures. Exploitation of these species needs to be compatible with their populations being maintained at a favourable conservation status.

Experts attending WGBYC in 2013 decided to test whether data from commercial fisheries collected under the DCF could be used to get information about the bycatch of diadromous fish species that are protected under the EU Habitats Directive (92/43/EEC). Members of WGBYC were asked to bring data from the DCF sampling scheme and, if available, other sampled fisheries to the meeting in 2014 in the following format:

- Exact locations of allis shad, twaite shad, lamprey, river lamprey and sturgeon in the DCF scheme;
- Number of sampled hauls by gear type, rectangle, year, and month ("sampled hauls" should also include those without catch);
- Number of Habitat Directive specimens of each species by gear type, rec tangle, year, and month;
- In addition members were asked to bring data on landings of Habitat Directive species by ICES rectangle, year, month, and gear.

A template format for those data was distributed to the members shortly before the meeting.

Results

Data were provided by Germany, Ireland, Italy, Sweden, The Netherlands and United Kingdom. The format of delivered data did not match the requirements of the call in all cases. Not all countries delivered the data per month or delivered the number of monitored hauls where no protected fish species were found. In all cases data were reported at least for gear type (Metiér level 4). Italy delivered the data as a sum per GFCM subdivision per year. Data from Ireland were given per rectangle, but as sum for all observed trips.

Also the range of years reported differed between countries, as shown below (Table 1:

Country	Reported years from	to
Germany	**2012**	**2012**
Ireland	**2012**	**2012**
Italy	**2006**	**2012**
Sweden	**2003**	**2012**
The Netherlands	**2008**	**2012**
United Kingdom	**1996**	**2013**

Therefore, the results presented here are preliminary and descriptive, until the data call has been followed by more countries and in the format as requested. It would also not be feasible to raise the number of observed bycatches up for a certain fleet, as raising procedures need to take into account the frequency and amount of observed bycatches, also in relation to possibly taken subsamples. For any raising calculation it also need to take into account that occurrence and observation of bycatch events is quite seldom for most of the species, so that specific statistical procedures needs to be used to avoid any errors caused by left skewed distribution of the data.

Even though, some first results can be obtained from the data, for example in which of the gears sampled in the DCF programme bycatch of protected fish species was observed. And, more generally to what extent data from the DCF programme could be useful to get better information about bycatch of these species.

Below (Table 2) reports total number of bycaught individuals of protected fish species in all observed sampled hauls in the DCF programme per species per gear type (level 4) from 1995 to 2013. Note, that not all countries reported back and those that did, not for all years (see text above). Also, sampling effort across gear types was not the same and was not reported back by all countries; in consequence, results are only comparable on a more general, descriptive level. No bycatch of sturgeons was observed during all DCF sampling analysed. Bycatch of lamprenidae was mainly observed in beam trawls, whereas the majority of bycaught shad specimens was found in both, active gears (e.g. otter and pair trawls) as well as passive gears (gillnets).

Table 2. Total number of bycaught individuals of protected fish species in all observed sampled hauls in the DCF programme per species per gear type (level 4) from 1995 to 2013. Note: not all countries reported back and those that did, not for all years. Also, sampling effort across gear types was not the same and was not reported back by all countries; in consequence, results are only comparable on a more general, descriptive level.

Gear type		Total number of specimens observed as bycatch					
Name	Code	*Lampetra fluviatilis*	*Petromyzon marinus*	*Lampraenidae spec.*	*Alosa alosa*	*Alosa fallax*	*Alosa spec.*
Dredges	DRB	0	0	0	0	0	17
Beam trawl	TBB	426	20	110	12	340	21
Bottom otter trawl	OTB	1	3	1	433	448	386
Midwater otter trawl	OTM	0	0	0	2	0	0
Otter trawl multirigg	OTT	0	0	0	2	17	0
Bottom pair trawl	PTB	0	0	0	8	30	6
Midwater pair trawl	PTM	0	0	0	0	188	111
Purse-seine	PS	0	0	0	0	0	0
Anchored seine	SDN	0	0	0	0	0	0
Fly shooting seine	SSC	0	0	0	0	0	0
Driftnet	GND	0	0	0	1	11	3
Set gillnet	GNS	0	0	0	622	77	434
Trammelnet	GTR	0	0	0	67	45	174
Pots and Traps	FPO	0	0	0	0	0	0
Set longlines	LLS	0	0	0	0	0	1

Gear type		Total number of specimens observed as bycatch					
Name	**Code**	***Lampetra fluviatilis***	***Petromyzon marinus***	***Lampraenidae spec.***	***Alosa alosa***	***Alosa fallax***	***Alosa spec.***
Hand and pole lines	**LHM**	**0**	**0**	**0**	**0**	**0**	**0**

To overcome differences in sampling and reporting levels between different years, Table 3 presents the total number of bycaught individuals in all observed sampled hauls in the DCF programme per species per gear type (level 4) for the year 2012. Note, that not all countries reported back and those that did, not for all years (see text above). Also, sampling effort across gear types was not the same and was not reported by all countries. Therefore, results are only comparable on a more general descriptive level.

Bycatch of lamprenidae was mainly observed in beam trawls, whereas the majority of bycaught shads specimens was found in both, active gears (e.g. otter and pair trawls) as well as passive gears (gillnets).

Table 3. Total number of bycaught individuals in all observed sampled hauls in the DCF programme per species per gear type (level 4) for the year 2012. Note: not all countries reported back and those that did, not for all years. Also, sampling effort across gear types was not the same and was not reported by all countries. Therefore, results are only comparable on a more general descriptive level.

Name	Code	Lampetra fluviatilis	Petromyzon marinus	Lampraenidae spec.	Alosa alosa	Alosa fallax	Alosa spec.
Dredges	DRB	0	0	0	0	0	0
Beam trawl	TBB	326	0	0	0	142	0
Bottom otter trawl	OTB	0	0	0	6	13	2
Midwater otter trawl	OTM	0	0	0	0	0	0
Midwater pair trawl	PTM	0	0	0	0	0	0
???	PTO	0	0	0	0	0	0
Driftnet	GND	0	0	0	0	2	0
Set gillnet	GNS	0	0	0	15	1	121
Trammelnet	GTR	0	0	0	2	2	1
Hand and pole lines	LHM	0	0	0	0	0	0

Comparing the results for all years and 2012 only, it can be seen that sampling effort for certain gears differs among years. For example, according to these data no catches from seiners were sampled in the DCF programme in 2012. But note that some countries reported back only sampled gear types where bycatch of protected fish species occurred.

In the Italian monitoring programme to fulfil the requirements of EU regulation 812/2004, twaite shad (*Alosa fallax*) was the only observed protected fish species bycaught in midwater pair trawl fisheries on small pelagic fish in (Table 4).

Table 4. Bycatch of Twaite Shad (*Alosa fallax*) as sum per rectangle and year, as observed in Italian fisheries during monitoring under EU regulation 812/2004 for years 2006–2012. Gear type was Midwater Pair Trawl (PTM), target species (Metiér Level 5) was Small pelagic species (anchovies=90%) for all observations.

Year	Month	rectangle	sampled hauls	*Alosa fallax* (Individuals)
2006	**1-7, 9-12**	**GSA 17**	**665**	**346**
2007	**1-7, 9-12**	**GSA 17**	**835**	**161**
2008	**1-7, 9-12**	**GSA 17**	**1660**	**350**
2009	**1-7, 9-12**	**GSA 17**	**584**	**35**
2010	**1-7, 9-12**	**GSA 17**	**1965**	**295**
2011	**1-6, 9-12**	**GSA 17**	**1691**	**250**
2012	**1-7, 9-12**	**GSA 17**	**2050**	**550**

In Ireland, the observations for protected fish species during the DCF sampling in 2012 revealed one allis shad (*Alosa alosa*) in ICES rectangle VIIfgh in February (Table 5).

Table 5. Bycatch of protected fish species per ICES rectangle as sum per trip, as observed in Irish DCF sampling in 2012. Total number of sampled hauls as well as gear type levels 4 to 6 are given.

ICES rectangle	No of sampled hauls	Gear level 4	Gear level 5	Gear level 6	*Petromyzonidae*	*Alosa alosa*	*Alosa fallax*
VIIa	**3**	**DRB**	**MOL**	**DRB_MOL_0_0**	**0**	**0**	**0**
VIIa	**6**	**DRB**	**MOL**	**DRB_MOL_0_0**	**0**	**0**	**0**
VIIa	**8**	**DRB**	**MOL**	**DRB_MOL_0_0**	**0**	**0**	**0**
VIIfgh	**5**	**DRB**	**MOL**	**DRB_MOL_0_0**	**0**	**0**	**0**
VIIbcjk	**1**	**FPO**	**CRU**	**FPO_CRU_0_0**	**0**	**0**	**0**
VIIfgh	**1**	**FPO**	**CRU**	**FPO_CRU_0_0**	**0**	**0**	**0**
VI	**10**	**FPO**	**CRU**	**FPO_CRU_0_0**	**0**	**0**	**0**
VIIa	**10**	**FPO**	**CRU**	**FPO_CRU_0_0**	**0**	**0**	**0**
VIIbcjk	**26**	**FPO**	**CRU**	**FPO_CRU_0_0**	**0**	**0**	**0**
VIIfgh	**10**	**FPO**	**CRU**	**FPO_CRU_0_0**	**0**	**0**	**0**
VI	**10**	**FPO**	**CRU**	**FPO_CRU_0_0**	**0**	**0**	**0**
VIIa	**12**	**FPO**	**MOL**	**FPO_MOL_0_0_0**	**0**	**0**	**0**
VIIfgh	**7**	**GNS**	**DEF**	**GNS_DEF_>=220_0_0**	**0**	**0**	**0**
VIIbcjk	**5**	**GNS**	**DEF**	**GNS_DEF_>=220_0_0**	**0**	**0**	**0**
VIIa	**6**	**OTB**	**CRU**	**OTB_CRU_70-99_0_0**	**0**	**0**	**0**
VIIa	**8**	**OTB**	**CRU**	**OTB_CRU_70-99_0_sep**	**0**	**0**	**0**
VIIbcjk	**8**	**OTB**	**CRU**	**OTB_CRU_70-99_0_0**	**0**	**0**	**0**
VIIfgh	**10**	**OTB**	**CRU**	**OTB_CRU_70-99_0_0**	**0**	**1**	**0**
VI	**16**	**OTB**	**DEF**	**OTB_DEF_100-119_0_0**	**0**	**0**	**0**
VIIa	**7**	**OTB**	**DEF**	**OTB_DEF_70-99_0_0**	**0**	**0**	**0**

ICES rectangle	No of sampled hauls	Gear level 4	Gear level 5	Gear level 6	*Petromyzonidae*	*Alosa alosa*	*Alosa fallax*
VIIfgh	**15**	**OTB**	**DEF**	**OTB_DEF_70-99_0_0**	**0**	**0**	**0**
VIIbcjk	**17**	**OTB**	**DEF**	**OTB_DEF_70-99_0_0**	**0**	**0**	**0**
VIIbcjk	**5**	**OTB**	**DEF**	**OTB_DEF_100-119_0_0**	**0**	**0**	**0**
VIIbcjk	**2**	**PTM**	**LPF**	**PTM_LPF_100-119_0_0**	**0**	**0**	**0**
VI	**2**	**PTM**	**SPF**	**PTM_SPF_32-69_0_0**	**0**	**0**	**0**
VIIfgh	**1**	**PTM**	**SPF**	**PTM_SPF_32-69_0_0**	**0**	**0**	**0**
VI	**2**	**PTM**	**SPF**	**PTM_SPF_32-69_0_0**	**0**	**0**	**0**
VIIbcjk	**2**	**PTM**	**SPF**	**PTM_SPF_32-69_0_0**	**0**	**0**	**0**
VIIfgh	**4**	**PTM**	**SPF**	**PTM_SPF_32-69_0_0**	**0**	**0**	**0**
VI	**4**	**PTM**	**SPF**	**PTM_SPF_32-69_0_0**	**0**	**0**	**0**
VI	**1**	**PTM**	**SPF**	**PTM_SPF_32-69_0_0**	**0**	**0**	**0**
VIIa	**4**	**PTM**	**SPF**	**PTM_SPF_32-69_0_0**	**0**	**0**	**0**
VIIa	**3**	**PTM**	**SPF**	**PTM_SPF_32-69_0_0**	**0**	**0**	**0**
VIIfgh	**3**	**PTM**	**SPF**	**PTM_SPF_32-69_0_0**	**0**	**0**	**0**
VIIfgh	**2**	**PTM**	**SPF**	**PTM_SPF_32-69_0_0**	**0**	**0**	**0**
VIIbcjk	**3**	**PTM**	**SPF**	**PTM_SPF_32-69_0_0**	**0**	**0**	**0**
VIIa	**1**	**SSC**	**DEF**	**SSC_DEF_70-99_0_0**	**0**	**0**	**0**
VIIbcjk	**2**	**SSC**	**DEF**	**SSC_DEF_70-99_0_0**	**0**	**0**	**0**
VIIfgh	**3**	**SSC**	**DEF**	**SSC_DEF_70-99_0_0**	**0**	**0**	**0**
VIIa	**2**	**TBB**	**DEF**	**TBB_DEF_70-99_0_0**	**0**	**0**	**0**
VIIfgh	**6**	**TBB**	**DEF**	**TBB_DEF_70-99_0_0**	**0**	**0**	**0**

ICES rectangle	No of sampled hauls	Gear level 4	Gear level 5	Gear level 6	*Petromyzonidae*	*Alosa alosa*	*Alosa fallax*
IV,VIId	**2**	**PTM**	**SPF**	**PTM_SPF_32-69_0_0**	**0**	**0**	**0**

Three countries (Sweden, The Netherlands, United Kingdom) reported back landings of shad (*Alosa spec*.) for some years. These results are listed in Tables 6–7.

Table 6. Landings of shad (*Alosa* spec.) in kilogramme as reported by Sweden, The Netherlands and United Kingdom per ICES subdivision and year. NA: No data available.

Year	Country	ICES subdivision	Landed weight (kg)
2009	Sweden	IIId	3
2009	The Netherlands	IVc	808
2009	United Kingdom		NA
2010	Sweden	IIId	1
2010	The Netherlands	IVb	260
2010	The Netherlands	IVc	493
2010	The Netherlands	VIId	3057
2010	United Kingdom		NA
2011	Sweden	IIId	0
2011	The Netherlands		0
2011	United Kingdom	IVb	785,8
2011	United Kingdom	IVc	125,8
2011	United Kingdom	VIIA	0,6
2011	United Kingdom	VIId	2233,2
2011	United Kingdom	VIIE	245,4
2012	Sweden	IIId	0
2012	The Netherlands		0
2012	United Kingdom	IVb	601,3
2012	United Kingdom	IVc	79,1
2012	United Kingdom	VIId	2288,9
2012	United Kingdom	VIIE	208,3

Year	Country	ICES subdivision	Landed weight (kg)
2012	**United Kingdom**	**VIIF**	**25**
2012	**United Kingdom**	**VIIG**	**72**

Table 7. Landings of shad (*Alosa spec.*) in kilogramme as reported by Sweden, The Netherlands and United Kingdom per gear (Métier level 4) and year. NA: No data available.

Country	Year	Gear	landed weight (kg)
Sweden	**2009**	**GNS**	**3**
Sweden	**2010**	**GNS**	**1**
Sweden	**2011**	**GNS**	**0**
Sweden	**2012**	**GNS**	**0**
The Netherlands	**2009**	**OTB**	**142**
The Netherlands	**2009**	**SSC**	**474**
The Netherlands	**2009**	**GNS**	**189**
The Netherlands	**2009**	**GTR**	**3**
The Netherlands	**2010**	**OTB**	**4**
The Netherlands	**2010**	**SSC**	**3677**
The Netherlands	**2010**	**GNS**	**129**
United Kingdom	**2011**	**TBB**	**84,9**
United Kingdom	**2011**	**OTB**	**798,6**
United Kingdom	**2011**	**OTT**	**20,4**
United Kingdom	**2011**	**PTB**	**234,5**
United Kingdom	**2011**	**PTM**	**0,6**
United Kingdom	**2011**	**SSC**	**1290,4**
United Kingdom	**2011**	**GND**	**610,6**
United Kingdom	**2011**	**GNS**	**231,5**
United Kingdom	**2011**	**GTR**	**105,3**
United Kingdom	**2011**	**FPO**	**1,3**

Country	Year	Gear	landed weight (kg)
United Kingdom	**2011**	**HMD**	**0,4**
United Kingdom	**2011**	**LHP**	**8**
United Kingdom	**2011**	**MISC**	**4,3**
United Kingdom	**2012**	**TBB**	**4,6**
United Kingdom	**2012**	**OTB**	**886,5**
United Kingdom	**2012**	**OTT**	**2,9**
United Kingdom	**2012**	**PTB**	**2,1**
United Kingdom	**2012**	**SSC**	**643,8**
United Kingdom	**2012**	**FPO**	**1,5**
United Kingdom	**2012**	**GND**	**560,3**
United Kingdom	**2012**	**GNS**	**1027,1**
United Kingdom	**2012**	**GTR**	**141,1**
United Kingdom	**2012**	**LHP**	**2**
United Kingdom	**2012**	**MISC**	**2,7**

6 ToR D Bycatch mitigation trials

This section describes bycatch mitigation trials conducted wholly or partly during 2012 and has mainly been produced based on information contained in the national 812/2004 reports for 2012. However, as information on mitigation trials is not a mandatory requirement of the 812 reporting format we have also included other relevant information provided directly by participants during the course of the meeting.

Information specifically relating to the mandatory use of pingers and assessment of their ongoing efficacy in relevant over 12 m fleet segments is provided under ToR B.

6.1 Pinger trials in European fisheries

Belgium: There is no mention in the report of any mitigation trials conducted during 2012.

Denmark: No field based mitigation trials were conducted during 2012. However the report states that during 2012 The Danish Technical University (DTU) analysed data from a trial which tested a potentially new pinger sound. It was thought that this sound may make harbour porpoises increase their clicks rates which in theory could lead to increased awareness of nets in the vicinity and possibly lower bycatch rates. However, the results showed that this signal is unlikely to work as no increase in click rate was observed (pers. comm. L. Kindt-Larsen). DTU Aqua also conducted a project recently to investigate if the use of pingers would cause habitat exclusion and to see if porpoises habituate to pinger use over time. Preliminary results suggest that habituation is happening to some extent, but it is not known whether the efficiency of pingers will be reduced if this trend continues (ICES, 2013).

Estonia: There is no mention in the report of any mitigation trials conducted during 2012.

France: There is no mention in the report of any mitigation trials conducted during 2012.

Germany: The report states that the Thünen Institute for Baltic Sea Fisheries (TI-OF) is involved in a project to test a new type of acoustic deterrent device - a 'porpoise alarm' (PAL) that was developed by a German company (F^3, B. Culik). The pingers that fishermen have been using are potentially controversial as they are suspected of driving porpoises away from feeding grounds. In contrast the PAL generates porpoise communication noises which in theory warn animals in the vicinity about the presence of nets, which in turn may reduce bycatch rates. In 2012 the PAL device was tested on two research trips aboard the *Clupea* fishing vessel in the Danish Straits. C. von Dorrien presented recent results from commercial testing of the PAL device carried out in 2013 during the meeting and a summary is provided under ToR F.

Greece: There is no mention in the report of any mitigation trials conducted during 2012.

Ireland: Although not conducted strictly as a mitigation trial, Dolphin Dissuasive Devices (DDDs) have been provided with operating guidelines to 12 vessels involved in the pelagic pair trawl fishery for albacore tuna as a voluntary measure. Since 2005 a total of 163 days at sea (DCF and dedicated 812/2004 monitoring) have been observed in this fishery with no records of cetacean bycatch. Despite low bycatch rates the use of DDDs will likely further reduce the probability of any bycatch occurring if fishermen feel there is an increased risk, for example if animals are present in large

numbers where the vessel is operating . However no information is currently available regarding actual levels of DDD use in the fishery. No other mitigation trials were carried out in Ireland during 2012 (pers. comm. R. Cosgrove).

Italy: The report states that in 2012 the Institute for Marine Science (ISMAR-CNR) of Ancona carried out observations (55 hauls from 28 trips) during midwater trawl fishing activity using two models of pingers (DDD 03H & Aquamark 210). Two further observations were carried out in Porto Garibaldi (2 hauls from 2 trips) using the same models. Preliminary results appear to show a strong short-term effect on bottlenose dolphin distribution around trawls equipped with pingers. Final results of the study are not available yet.

Latvia: There is no mention in the report of any mitigation trials conducted during 2012.

Lithuania: There is no mention in the report of any mitigation trials conducted during 2012.

The Netherlands: No mitigation trials were conducted in The Netherlands during 2012 (pers. comm. B. Couperous)

Poland: The report refers to the SAMBAH (Static Acoustic Monitoring of the Baltic Sea Harbour Porpoise) project (www.sambah.org), which aims to increase knowledge of the distribution of harbour porpoise within the Baltic Sea and to identify areas with higher risk of conflicts with anthropogenic activities which could form a basis for developing spatial mitigation measures. Data collection was conducted between 2011 and 2013 and data are currently being analysed, so no results are available at present. No other mitigation trials are mentioned in the report.

Portugal: The report describes voluntary trials of pingers that were conducted prior to 2012 under the framework of the SafeSea Project (EEAGrants). These trials are due to be restarted during 2014 under the MARPRO project (Life+) and will continue until 2015 at which time legislative or administrative measures will be implemented if necessary. The forthcoming trials will test pingers on trammelnets and purse-seines but will not include gillnets because bycatch rates are expected to be low and pingers are thought to affect the fishing profile of these nets. During 2012, a set of best practice operational guidelines (Manuals of Good Practices) was developed for several fisheries (Purse seining, Polyvalent, Trawling, Beach Seine and Bottom Longline) in collaboration with the industry to help vessels reduce the probability of bycatch of cetaceans and seabirds. The guidelines have now been widely distributed through Producer Organisations, Fishing Associations and directly to individual fishermen (pers. comm. A. Marçalo).

Slovenia: The report (submitted by letter) states that national Decree on protected wild animal species (Official Journal of the Republic of Slovenia No 46/2004, 109/2004, 84/2005, 115/2007, 96/2008, 36/2009 and 102/2011) provides that all cetaceans are protected wild animal species which means that it is prohibited to consciously harm, poison, kill them, take them from nature, as well as hunt, catch or disturb them. No other information relating to mitigation trials was provided.

Sweden: There is some concern regarding harbour porpoise bycatch in fisheries targeting lumpfish with large mesh (200–250 mm) gill and trammelnets in the Swedish waters of Kattegat and Öresund. The fishery is prosecuted in shallow water by small boats under 12 m (so there is no mandatory requirement under 812/2004 for these vessels to use pingers) between February and May. An initiative of the County Administrative Board of Skåne (southern Sweden) which began in 2010 involved five

fishermen voluntarily using pingers (Aquamark 100) at a maximum spacing of 450 meters while targeting lumpfish. The pingers were purchased by the County Administrative Board in cooperation with the Swedish Environmental Board. The five fishermen all operate regularly in an area that previous studies had shown relatively high densities of harbour porpoise (Börjesson and Wahlberg, 2011). The fishermen themselves suggested the lumpfish fishery as the most appropriate fishery to test pingers. Although the fishermen found using nets with pingers more time consuming than working their standard nets they concluded that it was a reasonable system if it reduces bycatch rates. The trial finished in 2011 due to a lack of commitment from the authorities. However telephone contact in 2014 suggests that the skippers have been using the pingers in the intervening period which will likely have reduced bycatch rates on those vessels. The fishermen have stated that they will continue to use pingers, despite not achieving a price premium for their product, but that they cannot be certain if the devices they have are still operational (pers. comm. S-G. Lunneryd). A presentation describing other mitigation efforts in Sweden was given by S-G Lunneryd during the meeting, a summary is provided under ToR F.

UK: The report states that pingers (model DDD-03H) have been trialled for a number of years in the UK component of the midwater pair trawl fishery for bass in the Western English Channel. All trips by one pair team (over 90% of total UK effort in the fishery) were monitored by independent observers during 2012 and the recorded cetacean bycatch was three common dolphins. Since this model of pinger has been used regularly in this fishery bycatch rates have been considerably lower than in preceding years. However, these trials have not used a controlled experimental approach with test and control tows and although bycatch rates are reduced, it is difficult at this point in time to determine the exact effect that DDDs are having because other as yet unknown or unquantified factors may also be influencing observed results. Other mitigation efforts in the UK conducted during 2012 involved field trials of the "banana" pinger using passive acoustic monitoring equipment to assess the effect on cetacean distribution and to investigate possible habituation patterns. Practical handling trials of the same device when used under commercial operating conditions were also undertaken as part of the same project (pers. comm. A. Kingston). A report is available at: http://www.cornwallwildlifetrust.org.uk

6.2 Mitigation trials in US fisheries

M. Lyssikatos (NOAA) provided reports and summary information describing recent mitigation trials aimed at reducing sturgeon and turtle bycatch. A low profile gillnet study was conducted over a four year period to assess the role of net fishing height on sturgeon bycatch rates. This trial was adapted each year to incorporate lessons learned during the previous year's experiment. The trial focused on large mesh (305 mm) gillnets used to target anglerfish. Part 1 was conducted in 2010 and evaluated the influence of the use of tie-downs on bycatch of sturgeon. Results showed a significant difference in target catches and several common dolphins were also caught in the treatment nets. No difference in sturgeon bycatch rates was observed. Part 2 was conducted in 2011 and evaluated changes in the length of tie-downs. Significant reductions were observed in sturgeon bycatch rates in treatment nets (600 mm tie-downs spaced 7.3 metres apart) when compared to control nets (1200 mm tie-downs) but overall target catch rates were lower. Part 3 was conducted in 2012 and tested another configuration with the aim of maintaining the reduced sturgeon bycatch rates whilst improving target catch rates in relation to the previous year's trial. Treatment nets had 600 mm tie-downs spaced 3.65 metres apart. Reduc-

tions in sturgeon bycatch rates were maintained and target catch rates improved. Part 4 was conducted during 2013 and involved repeating the 2012 trial configuration on different vessels and during a different season, but fewer replications were achieved. Reduced sturgeon bycatch rates were maintained but target catch rates were inconsistent between vessels. In a second mitigation trial a topless trawl (where the headline is behind the foot-line during towing) was used to assess if this design reduces bycatch of turtles in bottom-trawl fisheries whilst maintaining target catch rates. Part 1 was conducted during 2011 and compared four different headline lengths (108 ft, 133 ft, 147 ft and 160 ft) with a standard headline length of 65 feet using a twin rig set up. Turtle bycatch ratios (topless: standard) were compared for the four different headline lengths. The 160′ headline had the lowest ratio (1:25). Target finfish and horsecrab catches were similar between the control and all treatment nets. Part 2 of the study was conducted in 2012 and focused on further testing of the catchability characteristics of the 160 foot headline design, specifically in the summer flounder fishery. There were significant losses of flatfish with the 160 foot headline. For full details of both trials readers are directed to: http://www.nefsc.noaa.gov/read/protspp/PR_gear_research/

7 ToR E Development of bycatch database

7.1 Development of ICES WGBYC database

Members of WGBYC met with the ICES DataCentre in October 2013 to discuss ways of improving the manner in which bycatch data collected by the WG are compiled and ways to more easily integrate the data with other datasets held by ICES such as EC fleet effort data. A new excel template for compiling bycatch data coded with XML was subsequently developed with a view to achieving these objectives. The new template was discussed at the 2013 WGBYC meeting. It is now technically feasible for Member States to submit data individually to the ICES DataCentre. However, it was agreed that the group should continue to compile and check the data before submitting to ICES. One issue with the new template related to the new requirement to provide start and end month in two separate fields instead of season in one field: Under EC regulation 812/2004 Member States are required to provide pelagic trawl observer data for the months January to March and December (winter) and April to November (summer) and fleet and observed effort data have generally been aggregated and reported on this basis. The new format does not fit the winter period well. It was agreed, therefore, to assign the seasonal descriptors 'winter' and 'summer' to pelagic trawl data which fit the months outlined above. The descriptor 'all year' will be used for pelagic trawl data which do not fit these descriptors, for set-nets and all other fleets to satisfy legal requirements. Start and end month can still be provided where possible.

Members of the ICES DataCentre also attended the WGBYC 2014 meeting to discuss some issues in relation to data held by the centre. A question arose in relation to the completeness of fisheries data held by the centre. It was suggested that MS are likely to provide 80% of sampled data in accordance with DCF requirements based on landings, cost or total effort. This 80% requirement has implications for determining impact of bycatch of protected species, as sampled effort which detects such bycatch may not necessarily be submitted to ICES. Also, it is also unclear whether total effort data provided by MS to ICES are complete or if a proportion of total effort data is provided in relation DCF requirements. The issue of access to total fleet effort data compiled by ICES was also discussed. The current definition of requirements under the current data collection regulation is quite loose and no comprehensive policy currently exists at EC level in this regard. Meetings to progress this issue are ongoing but the resolution of data that will become available is up for discussion. In summary it is not currently possible for ICES to provide comprehensive fishing effort data. Formal requests will be required to access data that are available and it was suggested that it would be useful for WGBYC to make a data call at some point to assess the quality of the information which ICES are/will be in a position to provide.

7.2 Data compiled for 2012 in the WGBYC database

A request was issued to WG members before the meeting to provide effort and bycatch data in the new data format to facilitate input in the database. Data were received in this format from Denmark, France, Germany, Ireland, Italy, Netherlands, Portugal, Sweden and UK. Data provided by Spain were in a format which could not be used. Data were also obtained from annual reports from Estonia, Latvia, Lithuania and Poland while no observer data were available for Belgium, Greece or Slovenia. A summary of bycatch estimates provided by MS for 2012 is presented in Annex4-Table 4f. A number of bycatch events with and without pingers were observed so these

figures were combined to provide the total bycatch figure for each stratum. In addition to estimates provided by MS, extrapolated bycatch estimates were calculated by WGBYC. WGBYC bycatch extrapolations were based on number of animals divided by total observed days at sea multiplied by total effort in days at sea for a given stratum (Annex 4-Table 4f). The representativeness of these figures is unknown and likely to be quite variable among the different strata. As such these figures should be treated with caution. Extrapolated bycatch estimates were not produced for the Portuguese polyvalent fleet. Sampling focused on vessels primarily using set-nets rather than other gears in this fleet because of problems with bycatch associated with this gear type and thus extrapolations to fleet level would not be accurate.

Bycatch estimates provided by Member States for 2012 include 14 037 eagle rays *(Myliobatis aquila*), 4635 twaite shad (*Alosa fallax*), 2219 pelagic stingrays *(Pteroplatytrygon violacea*) and 748 loggerhead sea turtles (alive or dead; *Caretta caretta*) in a Mediterranean pelagic trawl fishery for anchovies, 244 common dolphins (*Delphinus delphis*) in a purse-seine fishery for small pelagic fish off Portugal, 124 common dolphins in a French midwater pair trawl fishery for demersal fish in the English Channel. Notable extrapolated bycatch estimates include 3035 harbour porpoise (*Phocoena phocoena*) in a UK gillnet fishery conducted in the English Channel. Relating to just two porpoises observed as bycatch during two days at sea in a stratum with 3035 days at sea (this amounts to 0% coverage) provides a highly inaccurate estimate of bycatch, thus demonstrating the difficulty in using unqualified extrapolated bycatch estimates. Some 483 harbour porpoise were also extrapolated from a trammelnet gillnet fishery in southern North Sea (<1% coverage), 368 grey seals (*Halichoerus grypus*) in a set-net fishery known to be a large meshed tanglenet fishery off the west coast of Ireland (6% coverage). Differences between provided and extrapolated bycatch estimates in Annex4-Table 4f can generally be explained by differences in the methods applied such as use of hauls instead of days at sea, the use of inappropriate strata or inadequate sampling. Similarity between certain records in Annex4-Table 4f can be explained by differences in métier level 6 data which are compiled by the group but not outlined in this Annex4-Table 4f. The majority of data collection programmes related to the WGBYC database has predominantly focused on cetacean bycatch in accordance with requirements under EC 812/2004. Available information on bycatch of all species of interest is presented but bycatch estimates for species other than cetaceans are generally not considered to be comprehensive. Extrapolated totals in Annex4-Table 4f are not reliable estimates of bycatch but may be used to highlight strata that require further monitoring.

8 ToR A Implementation of monitoring in the new DCF

8.1 Towards a new DCF

During the meeting the co-chair of ACOM, Eskild Kirkegaard explained the design of the new DCF:

The existing DCF will likely continue until the new DCF is adopted in 2015. Whilst the new DCF will stipulate minimum requirements for monitoring of target and non-target species (including protected species), there is greater plasticity at the regional level for tailoring monitoring to meet the needs of Member States national and wider European obligations. The way in which the DCF is financed is pivotal in this, with a move from direct to indirect financing. Member States will receive funding from the EU and the MS can determine how it is spent. The expectation is that MS will receive an increase of ~50% in funds in relation to the implementation of the new DCF. Funds must be allocated to meet the minimum requirements specified in the DCF, but the remainder can be used in relation to monitoring of bycatch in fisheries not targeted by the DCF, mitigation or pilot studies as the MS chooses.

A means of prioritizing fisheries for monitoring may be required; a risk assessment approach (e.g. Bycatch Risk Assessment; BRA) could be used to highlight those fisheries which have a greater risk of protected species bycatch. For these, there may be scope for adaptation of monitoring protocols and methods or at least DCF observers of these fisheries be made aware of the need for heightened vigilance. MS may determine individually or regionally, on a set of criteria which would guide decisions on which fisheries should be targeted for protected species bycatch monitoring. The Regional Coordination Meetings will become Regional Coordination Groups (RCG) and will coordinate DCF funded monitoring across MS.

With the move to incorporate protected species (e.g. cetaceans, seabirds and turtles) monitoring into the new DCF, there is a need to identify the data required so that the significance of protected species bycatch can be quantified and mitigated if appropriate. The requirement for data in relation to protected species bycatch is recognized primarily through Article 12 (4) of the Council Directive 92/43/EEC ("Habitats Directive") and Regulation 812/2004. More recently, Directive 2008/56/EC ("Marine Strategy Framework Directive", MSFD) requires Member States to achieve 'Good Environmental Status' (GES) by 2020. Eleven descriptors of GES are given in Annex I of MSFD; Descriptor 1 relates to the maintenance of biological diversity. When elucidating what GES means, Directive 2008/56/EC clearly states that GES is achieved when, *inter alia*, the '*human-induced decline of biodiversity is prevented*'. The biological disturbance due to '*selective extraction of species, including incidental non-target catches (e.g. by commercial and recreational fishing)*' is indicated in Annex III of MSFD as one of the 'Pressures" that needs to be evaluated.

Given that for Descriptor 3[1] the concepts of how to look at human-induced mortality are already developed, tested and agreed at the EU level (e.g. the principle of Maximum Sustainable Yield), they were embedded into the Directive. However, for De-

[1] Populations of all commercially exploited fish and shellfish are within safe biological limits, exhibiting a population age and size distribution that is indicative of a healthy stock.

scriptor 1[2] there is no clear indication of how MS should evaluate human-induced mortality, particularly incidental catches of protected species. For the northern European MS, OSPAR will coordinate the regional implementation of MSFD. The Intersessional Correspondence Group for the Coordination of Biodiversity Assessment and Monitoring (ICG-COBAM) is the main delivery group within the OSPAR framework for coordination in relation to the biodiversity aspects of the MSFD. There is strong potential to develop common bycatch targets/indicators at a regional level (OSPAR, 2012) and the majority of Contracting Parties are proposing a bycatch indicator as part of a suite to assess GES, at least for cetaceans and seals. Currently the proposed target from ICG-COBAM is that "*The annual bycatch rate of [marine mammal species] is reduced to below levels that are expected to allow conservation objectives to be met*". Proposed targets from MS are still quite generic and need further qualification before implementation is feasible. Clearly decisions are needed in regard to the target for a bycatch indicator; these include a definition of conservation objectives which is more a societal decision than a scientific one. How threshold levels should be determined is still to be decided; a move from the commonly used 1.7% of the best available abundance estimate as a threshold which if exceeded points to an unacceptable level of mortality (IWC/ASCOBANS, 2000) to a Catch Limit Algorithm-type approach has been supported (ICES Advice 2009. Report of the ICES Advisory Committee 2009. Book 1, pg. 19–21.). This is in part because 1.7% is based on a modelling exercise dedicated to harbour porpoise and it is questionable whether the figure is applicable to other cetacean species, such as common dolphin. To ascertain whether the bycatch target is being met, monitoring must enable the number of animals being bycaught in relation to the population size to be measured. Therefore, protected species bycatch monitoring must enable targets (whether regional or national) agreed for the purposes of assessing GES to be met.

The targets for proposed OSPAR indicators are to be reviewed in March 2014 by the ICES Working Group on Marine Mammal Ecology (WGMME[3]). In considering options for setting targets, the WGMME has also been requested to consider the consequences that this may have for monitoring. MSFD requires MS to implement a programme of monitoring to measure agreed indicators and that the approaches should be coordinated at regional level. If data to support measurement of bycatch against agreed targets is to be collected through the new DCF then the spatial and temporal overlap of this coverage with that of high risk fisheries needs to be assessed. This will allow MS to consider whether monitoring protected species solely through the new DCF is sufficient. It is recommended that WGMME seek input from WGBYC in regards to the limitations and challenges of data collection on bycatch which would allow an assessment at the population level, as will likely be needed as part of an assessment of GES.

[2] Biological diversity is maintained. The quality and occurrence of habitats and the distribution and abundance of species are in line with prevailing physiographic, geographic and climate conditions.

[3] It would be helpful to have an expert from the Mediterranean in attendance.

9 ToR F Develop, improve, and coordinate methods for bycatch monitoring and assessment

9.1 Development of methods for bycatch monitoring

9.1.1 Porpoise Alarm

Current state of a project to develop and test alternative pingers was presented. The pingers, called PAL (Porpoise Alarm), are based on the most recent knowledge of the behaviour of harbour porpoise regarding communication and orientation. PALs are emitting synthetic communication sounds that simulate natural porpoise communication sounds and function with source levels within natural porpoise range. Thus, potential negative effects of conventional pinger types that are currently in use, like habituation, habitat exclusion or noise pollution, should be minimized or avoided. More details about the project can be found in the 2013 report of WGBYC. During field tests carried out in 2013 a signal could be identified that increases the echolocation intensity but also increased minimum distance of harbour porpoise to the PAL.

More than 200 PAL devices were tested in practice on four commercial vessels (three from Germany, one from Denmark) at 203 days of fishing effort from August to November 2013.Vessels used gill and trammelnets, targeting cod, flatfish and hake. Results were used to improve the internal software as well as to test different mounting options of the PAL on the nets. Trials therefore need to be continued to achieve statistically sound results about the effectiveness of PAL devices.

9.1.2 The status of research on alerting pingers

The newest research project on alerting pingers is described in the section above (9.1.1). The group discussed the preliminary results and emphasized the importance of controls, it was however agreed that dummy pingers were not needed in pinger test trials, since nets with no pingers will be just as sufficient. If the final results from the PAL trial show that the PAL cannot reduce bycatch of porpoise the group raised concerns that there could be an endless search for a new 'alerting sound' in the belief that you've got the wrong one. The group therefore stressed the importance of really testing the principle "are porpoises that have higher click rates less likely to get caught than those with lower click rates". No studies have been sufficient to test what the actual affects are. In this context studies on how porpoise react acoustically around gillnets is very interesting since it is unknown if the click rate is correlated with orientation or if it actually increases or decreases.

If the PAL does reduce the bycatch rate habituation would still be a concern since this could lead to a decrease in effectiveness. However a learning process may play a role since the alerting sound could simply mean that there is something to look out for. The only way to study true bycatch habituation effects is by long-term studies of the bycatch rate.

9.1.3 Seal depredation and bycatch in set-net fisheries in Irish waters

Interactions between seals and fisheries are thought to be increasing in Irish waters. A dedicated observer programme was carried out in set-net fisheries off the west and southwest coasts of Ireland over a one year period to provide baseline information on seal bycatch and depredation. In terms of seal bycatch, grey seals (*Halichoerus grypus*) and to a lesser extent harbour seals (*Phoca vitulina*) were the predominant protected

species observed as bycatch mainly in large mesh tanglenets. Binomial and Zero inflated negative binomial models were used to investigate factors affecting seal bycatch in tanglenets. Crawfish (*Palinurus elephas*) and (*Lophius* spp.) landings, depth of gear deployment and larger mesh size were significantly positively correlated with seal bycatch. Development of mitigation measures such as improved net visibility and use of smaller mesh size has major potential to reduce seal bycatch in tanglenets.

In terms of seal depredation, proportions of fish damaged and associated economic impact of seal depredation were found to have increased substantially since the 1990s. Zero inflated negative binomial and Poisson regression models were used to assess factors affecting depredation. Factors associated with depredation included latitude, depth, timing of a haul within a trip and quantities of gear hauled. Soak time was significant in the inshore gillnet fishery for pollack species (*Pollachius sp.)* but not significant in the deeper more offshore gillnet fishery for hake (*Merluccius merluccius*). Results suggest that soak times should be kept short in shallow areas while faster hauling speeds and systems which actively deter seals from the vicinity of vessels have major potential to reduce depredation in deep-water deployments.

Points raised during a discussion of this presentation included the fact that some deep set longline fisheries have benefited from reduced depredation by cetaceans by increasing hauling speeds which may bode well for the potential application of this measure to deep set-net fisheries. A comment was made that a deep set-net fishery (~200 m deep) in the Baltic suffered depredation which was thought to occur near the seabed given that depredated fish remnants contained mud similar to the seabed habitat. This is slightly discouraging in terms of development of mitigation measures for deep set-net fisheries. However, depredation which may be occurring due to factors other than hunger such as removal of fish skin and/or viscera may still be less likely to occur at such great depths. Thus faster hauling speeds and deployment of aversive stimuli during hauling may still have some potential to mitigate depredation.

9.1.4 Seal and fishing gear development in Sweden

In the Swedish small-scale and coastal fisheries, alternative fishing gear has been, and is still being, developed. The main reason for the development is the seal inflicted damages to fishing gear and catch that threaten an economically viable gillnet fishery. Traps and pots are types of fishing gear where it is possible to protect the catch from seals.

In traps and pots, the catch can be gathered in closed departments which in turn can be designed using a solid construction and a strong material which ensures a seal-safe fishing gear. Despite several years effort there is still some work to do before there is some commercial alternative as pot or traps for many commercial fish species. However one aspect is solved, as in net and line fisheries, a pot or trap fishery could also result in a high bycatch of seals or other warm blooded animals as cetacean or birds. In order to prevent, especially bycatches of seals that are attracted to the catch inside the pot, pot entrances were equipped with seal exclusion devices (SEDs) of various sizes and shapes. A field study was conducted to investigate what effect different types of SEDs had on the bycatch of seals as well as on the pots' catchability. Results from the trials show that it is possible to decrease bycatches of seals to low levels without reducing fishing efficiency. (Königson *et al*., submitted)

9.1.5 An update on the use of remote electronic monitoring for seabird bycatch

From March 2011 until December 2012 the German Thünen-Institute of Baltic Sea Fisheries has carried out a pilot study to verify bycatch events in a gillnet fishery by Remote Electronic Monitoring (REM) in a joint project with a fisheries producer organization and an NGO. REM systems were operated on three small vessels, gillnetting for herring in spring and for cod and flatfish species during summer. The preliminary results of the project were presented at this WGBYC meeting, and more details about the project can be found in the 2013 report of WGBYC. The REM system recorded 431 trips and a total of 1460 deployments of fishing gear (1349 km of gillnets and 1211 km of longlines). In total 65 590 minutes of recovering gillnets and longlines were recorded during the two years. A total of 136 seabird bycatches and no mammal bycatch were identified by the REM system and/or fisher's protocols. In most of the trips, no bycatch of seabirds occurred. If bycatch occurred most frequently only one bird was caught. In few cases there were more than one bycaught seabird per trip, like in 2011, where at two trips in the same week, 18 and 41 seabirds respectively, were bycaught during a single trip.

The study reveals the high potential of the REM system. Few failures of the system were observed, and initial problems with the use of such systems on small vessels were solved. The data collected provides a new insight into the effort, catch composition and seabird bycatch rate in those métiers insufficiently sampled so far. It became obvious that extremely rare events like seabird or marine mammal bycatch cannot be sampled with the required precision by means of on-board observers. REM systems provide an opportunity to sample this fleet adequately and derive indicators for the Marine Strategy Framework Directive, a prerequisite to fulfil the EU-Regulations and to support policy decisions. Future work should focus on an automated evaluation of the video data, e.g. by flagging potential bycatch events, in order to reduce the cost of viewing the recorded video footage. Also, more sensors collecting depth, temperature or salinity could be connected to such an REM system and provide a more complex dataset, which could ultimately lead to a better understanding of the ecosystem processes and potential measures to mitigate unwanted bycatch of birds and mammals in fisheries.

9.2 Methods to assess pinger effectiveness

9.2.1 Estimating the effective range of the DDD pinger

Data collected between 2008 and 2011 from mitigation trials with UK based >12 metre gillnet vessels were used to estimate the effective range of the DDD static net pinger (Northridge *et al.*, 2011). Initial estimates were produced in two ways. Firstly by calculating the distance from bycatch events to pingers on the same fleet and then assessing the probability (using a bootstrap simulation $p=<0.04$) of the resulting distribution having occurred when viewed in relation to the proportion of netting within and beyond 2 km from pinger positions. Secondly we compared overall bycatch rates between pingered and unpingered fleets using a $\chi 2$ test ($p=0.001$). Both of these analytical approaches indicate that the effective range of this pinger model is approximately 2 km, if bycatch reductions rates in the region of 90% are desired. A more comprehensive analysis was subsequently conducted in 2013 using a larger dataset (from 2008 to 2013) which incorporated additional measurements by calculating distances from pingers on fleets adjacent to fleets with bycatches, and by accounting for possible issues associated with proportional soak time overlaps which can be

problematical to deal with if measurements from adjacent fleets are included in this type of analysis. Results from this more elaborate analysis were compared with results from the earlier distance based analysis and no statistically significant differences were found (ANOVA p=0.49). In light of this finding we suggest that the simpler initial approaches are an acceptable method for estimating the effective range of this device as there is no obvious loss of accuracy, estimates are considerably less time consuming to produce and any minor estimation error will likely be corrected over time as more records are included to produce subsequent estimates. Regular analyses may also reveal long-term behavioural responses such as habituation to the presence of pingers.

9.2.2 What is 'effective range' in the context of pingers

In the existing EU legislation on use of acoustic deterrents to deter small cetaceans from incidental capture in fishing gear (Council Regulation 812/2004), pingers are defined solely by their acoustic output with little attention to effectiveness in reducing bycatch. It is assumed that if pingers follow the definitions in Annex II of CR 812/2004 they will also be effective. Given the limited knowledge of how pingers work in reducing bycatch, this assumption may not necessarily hold and pingers that follow the specifications in Annex II could be very different with respect to effectiveness in reducing bycatch. It follows that comparing different pingers solely based on their acoustic output could be misleading. A better way to compare pingers would be in the form of some measure of deterring efficiency that describes directly how effective a pinger is, and one such measure could be the 'effective range' of a pinger if defined appropriately. If an effective range for pingers could be defined as e.g. pingers spaced X m apart reduce porpoise bycatch by Y% then there would be more confidence that results (reduced bycatch) would be achieved if pingers are deployed accordingly. An added benefit could be if the term 'habitat exclusion' with respect to pingers could be defined with reference to the 'effective range'.

A pragmatic definition of 'effective range' should fundamentally have the following qualities: measurable, simple and intuitive, and ideally have a simple relationship with habitat exclusion zones. There are a number of ways in which the 'effective range' of a particular pinger could be defined and quantified, based on e.g.:

1) The relationship between distance to pinger and effect on bycatch, e.g. from a number of pinger trials with the same pinger model or as described in Section 4.2.1.

2) The relationship between distance to pinger and local animal abundance, e.g. from a pinger- POD experiment[4].

3) The relationship between received sound levels and effect on bycatch, e.g. from a number of pinger trials with the same pinger model.

Defining and quantifying the 'effective range' of a particular pinger on information on the relationship between distance to the pinger and effect on bycatch has the advantages that it is simple and intuitive and it reflects animal behaviour with respect to bycatch. However, the disadvantages are that there is no simple intuitive relationship with habitat exclusion zones, that it can be very expensive to determine if based

[4] A pinger-POD experiment involves a pinger and an array of PODs set at increasing distances from the pinger; the POD recordings are used as a proxy for local animal abundance.

on a number of pinger trials with the same pinger model (although less so if based on the method described in Section 4.2.1), and that the results cannot be generalized to other pingers with different acoustic output.

Defining and quantifying the 'effective range' of a particular pinger on information on the relationship between distance to the pinger and local animal abundance is also simple and intuitive, it is relatively inexpensive to determine and there is probably a direct relationship with habitat exclusion zones. The disadvantages are that it does not necessarily reflect animal behaviour in relation to bycatch and it cannot be generalized to other pingers with different acoustic output. This definition rests on the assumption that there is a straightforward relationship between local animal abundance and animal bycatch risk, but this is not necessarily the case. When local animal abundance is represented by porpoise clicks recorded by e.g. a POD, a further assumption is introduced, i.e. that there is a straightforward relationship between local animal abundance and animal vocalization rates.

Considering the first of these two assumptions, the WG felt that the expectation was that as one increases so does the other (given a fixed amount of fishing effort). However, animal behaviour must also be considered and the relationship may not be straightforward. A Danish study has looked for a correlation between gridded porpoise bycatch risk, estimated as the product of porpoise density and fishing effort for a subset of gillnet vessels, and observed bycatch of porpoises by the same vessels and reported a strong positive correlation (Kindt-Larsen, pers.comm.). This suggests that the relationship could well be straightforward, but it needs to be independently verified, which is ongoing at the time of writing.

Considering the second of the two assumptions, the WG noted that animal vocalization rates are often used as a proxy for abundance. A decrease in the detection of e.g. porpoise clicks is often interpreted as evidence of reduced local abundance. However, a number of factors other than vocal behaviour may account for this result including changed orientation of the animal (clicks cannot be detected) and changed vocal behaviour (number of animals unchanged but clicking rate changed). This means that the relationship between vocalization rate and local abundance is not clear and warrants further study.

The WG noted that an alternative way of approaching this issue would be to quantify vocalization behaviour around nets in relation to bycatch events. The WG considered that placing click detectors on a net in a high-density area and monitoring bycatch rate could provide data on the relationship between clicks and bycatch rate. The possibility of deploying a passive 3D acoustic tracking array in future as is being developed in the UK for tidal area research was considered a particularly useful approach.

Defining and quantifying the 'effective range' of a particular pinger on information on the relationship between received sound levels and effect on bycatch, e.g. from a few pinger trials with the same pinger model, is simple and intuitive and the results can to some extent be generalized to other pingers with similar acoustic output. This seems to be the thinking behind the pinger specifications of CR 812/2004, Annex II, where pingers are expected to be effective if they comply with a few acoustic parameters. The disadvantages of this approach are that it does not necessarily reflect animal behaviour in relation to bycatch and it does not provide information relevant to assessing the extent of habitat exclusion zones.

The WG noted that the effective range of a pinger, no matter how it is defined, would vary depending on factors such as levels of ambient noise and local topography, so

some sort of standardization of these factors will be necessary in establishing the effective range of a particular pinger.

There was discussion regarding the displacement effects of pingers, how it would translate into habitat exclusion zones and what the population effects could be. In considering the significance of this effect, the ecological consequences need to be understood; i.e. whether displacement from the areas around nets leads to diminished fitness through e.g. reduced foraging success. Displacement would be perceived to have greater impact if the area from which animals are displaced is one of 'special importance'. In relation to deployment of pingers in areas of 'special importance', it is important to consider the distribution of nets (and pingers) so that the effects of pingers (area affected by noise) can be quantified. It is important to note that not all animals are excluded from the vicinity of active pingers, so we should not expect a clear-cut boundary to exist inside which all animals are excluded and outside which no animals are excluded. It seems more likely that there is a transition zone with decreasing exclusion as one moved away from the pinger. The role of 'past experience' and 'motivation' are likely key factors in determining whether animals will be excluded from the vicinity of an active pinger.

The WG encourages more research into these different aspects of pinger deployment, in particular into how deterrent efficiency varies with distance to a specific pinger, into the relationship between bycatch risk and local abundance, and into the population effects of excluding animals from the vicinity of fishing nets.

9.3 Coordination of methods for bycatch monitoring

9.3.1 Ongoing research on monitoring Portuguese fisheries interactions with protected species

An overview of work being done in Portugal regarding fisheries interactions with protected species, mainly cetaceans, for the last decades was presented. Most effort relied on results from the SafeSea-EEAGrants project (2008-2010) that was the first dedicated project in the mainland to evaluate the level of interaction of coastal Portuguese fisheries and cetaceans along the north/centre western coast. Methods of evaluation combined observation of strandings, on-board observer effort, harbour inquiries and volunteer deliveries of incidental captured animals by fishermen. Within SafeSea, the first tentative distribution and abundances evaluation were also attained, based mostly on coastal surveys (in land) and one aerial survey along the area. The first mitigation trials with Fumunda F10 and F70 pingers in several fisheries (purse-seining, beach-seine and set-nets) were performed in 2010, showing promising results with decreases of bycatch in most fisheries. Presently, this work was extended to the whole Portuguese continental coast and added to cetaceans covering also marine birds, within the framework of the running project Life+MarPro (2011–2015). Under the context of MarPro is the objective of Portugal to define protection areas and management plans for harbour porpoises, bottlenose dolphins and balearic shearwaters to fulfil Habitat and Birds Directives. The main actions of MarPro are: 1. Developing a GIS tool to accommodate and harmonize all the data; 2.Evaluate baseline estimates and distribution of target species populations through coastal, aerial and offshore boat surveys; 3. Evaluate the conflict between target species and fisheries through the same methods used during SafeSea added to the acquisition of Electronic surveillance equipment (EM) and present solutions; 4. Implement Good Practice and bycatch mitigation measures by developing manuals of good practices and test mitigation devices (pingers for cetaceans). Progress results for some of the

actions were presented and an exercise with results from EM in purse seining was shown. In order to achieve better observer effort levels Electronic Monitoring (EM) systems have been acquired and can also be used as a way to obtain better fishing effort estimates for fleets such as the polyvalent fleet which is multigear and problematic when trying to separate the fishing effort by gear type and apply the bycatch assessment approach. Other aim is also to test if EM can be used to reliably document bycatch not only of cetaceans but also of birds. The goal until the end of the project is to have EM systems on three purse-seiners, three polyvalent vessels, three bottom otter trawlers and three bottom longliners.

9.4 Improved coordination to further recording and assessment

9.4.1 Scientific basis for evaluating the use of pingers in Natura 2000 areas

WBYC engaged in a scientific discussion regarding whether pingers can or cannot be used in the Special Areas of Conservation (SACs), part of the NATURA 2000 network of protected areas SAC. The main conclusions were:

Since porpoises are both listed in Annex 2 and 4 of the HD and they need to be maintained at favourable conservation status both in and outside the SAC. Pinger regulations should therefore not be limited to SACs only.

The use of pingers in SAC needs to be considered case by case. A generalization is not possible since it depends on the size of the SAC and the level of fishing. It is possible that larger areas could encompass both porpoises and pinger fisheries since the fishery might only take place in certain parts of the area, hereby having no porpoise displacement effect beyond the SAC borders. Pinger use in small areas will have the possibility of deterring porpoises out of an area. Direct kills are however considered to be worse. Consideration should be placed on displacement; does it really affect site integrity and what are implications of moving porpoises from a site? Socio-economic factors needs to be taken into account at the management stage although not during the process of designation.

In relation to fishing effort one should keep in mind that porpoises do move over very large distances and moving effort out of an SAC could result in just as high bycatch outside the area.

9.4.2 The ASCOBANS Conservation Plan for Harbour Porpoises in the North Sea

The ASCOBANS Conservation Plan for Harbour Porpoises in the North Sea and the progress on its implementation were presented by its coordinator. The Conservation Plan, adopted in 2009 and covering ICES Areas IIIaN, IV and VIIed, aims at restoring and/or maintaining North Sea harbour porpoises at a favourable conservation status. It incorporates ASCOBANS goal of restoring and/or maintaining populations at 80% or more of their carrying capacity (ASCOBANS, 1997). The shorter term pragmatic minimum objective is to at least maintain the present situation and, if possible, improve it. The plan identifies bycatch as the main threat and is articulated around 12 specific management and/or research actions aiming at mitigating bycatch, assessing the conservation status and the risk inherent to bycatch and other anthropogenic activities, and determining maximum allowable bycatch limits. Although, there has been progress in the implementation of the plan, none of the actions are fully implemented yet. Four actions are of particular relevance to the ICES WGBYC; implementation of existing regulation on bycatch (A2), estimation of the extent of bycatch in all

fisheries (A3 and A4), and evaluation and development of mitigation methods (A5). Existing regulations under e.g. the Habitat Directive (HD) and EU Regulation 812/2004 have been poorly implemented both with regards to mitigation measures and monitoring. Mitigation measures have been taken only by some countries (SE, DK, DE, UK) and the degree of compliance and enforcement is unknown. Regarding the regular evaluation of bycatches in all fisheries, methods have been developed successfully for assessing bycatch in the less-than-15 m fleet (reference fleet and Remote Electronic Monitoring), but have been little implemented in the North Sea. Following EU regulations, monitoring has been implemented in the pelagic trawl fisheries, revealing no bycatch. Gillnet fisheries, which represent the highest risk to harbour porpoises, have had low monitoring in recent years in the North Sea except by Norway and France, as this was not mandatory under EU regulation. Limited data are available for the UK gillnet fleet since 2007. For the Danish gillnet fleet, except for very limited REM data in ICES Area IIIaN and IVb, there are no data since 2001, although it had very high bycatches in the 1980–1990s. However, the gillnet effort of UK and DK represented 17% and 32% respectively off the reported gillnet effort (measured as days at sea) in the North Sea in 2009. There has been very limited evaluation of the long-term effectiveness of the mitigation measures taken. Implementation under HD mostly focused on Natura 2000, disregarding wider measures. The conservation status of the harbour porpoise in the North Sea remains unclear, with very patchy information on bycatch rates and trends in abundance. Efforts are, however, continuing in North Sea states with assessing bycatch in the lesser fleet (<15 m), developing alternative mitigation methods, both pingers and fishing gears, looking at habituation and habitat exclusion, and developing frameworks for determining safe bycatch limits.

The question was raised as to whether/how the WGBYC and the North Sea Steering Group (NSSG), in charge of implementing the Plan, could support each other. Clearly the NSSG conclusions are very much based on the work of the WGBYC as it is composed purely of scientists. The NSSG is a mix of scientists and ministerial representatives and therefore a forum where messages can be delivered directly to managers. The ASCOBANS NSSG and Advisory Committee (AC) adopted recommendations/action points for Parties based on the conclusion and recommendation of the WGBYC, e.g. on intensifying/implementing monitoring of all gillnet fisheries (> and < to 15 m, segments with mitigation measures implemented or not). At their last meeting, they recommended Parties to deliver fishing effort and bycatch rates to EC and/or ICES in the required reporting format, in particular to facilitate the work of WGBYC.

10 Other business

10.1 New chair

The group proposed that Marjorie C. Lyssikatos should take over as chair of WGBYC in 2015.

10.2 Contact person for WGCATCH/PGCCDBS

Bram Couperus will continue as contact person for PGCCDBS in 2014, Simon Northridge explained his interest in taking over this task in 2015.

11 Specific tasks for next year's meeting

11.1 Data call bycatch fish species

A data call will be held intersessionally to collate protected fish species data from various Member States.

11.2 Fill the WGBYC database

Members agreed to enter Regulation 812 data into the WGBYC database prior to the 2015 meeting in Copenhagen.

12 References

ASCOBANS. 1997. MOP 2: UNEP/ASCOBANS Resolution 2.3 on Incidental take of Small Cetaceans. Bonn. Available at http://www.ascobans.org/en/document/indicidental-take-small-cetaceans

Börjesson D and Wahlberg. M. 2011. Inventering av tumlare (*Phocoena phocoena*) och fiskeintensiteten i Skälderviken, Skåne. (Survey of harbour porpoise (*Phocoena phocoena)* and fishery in Skälderviken, Skåne). In Swedish. 2011:8. 33pp. http://www.lansstyrelsen.se/skane/SiteCollectionDocuments/Sv/publikationer/2011/Tumlarrapport_reviderad_20110523_webbfil.pdf

European Commission. 2010. Commission Decision of 1 September 2010 on criteria and methodological standards on good environmental status of marine waters. Official Journal of the European Union 2.9.2010.

ICES. 2010. Report of the Workshop to Evaluate Aspects of EC Regulation 812/2004 (ICES WKREV812). ICES CM 2010/ACOM:66. 67pp. ICES CM 2010/ACOM:66. 67pp.

ICES. 2013. Report of the Working Group on Bycatch of Protected Species (WGBYC), 4–8 February, Copenhagen, Denmark. ICES CM 2013/ACOM:27. 73 pp.

ICES. 2013b. Report of the Workshop on Bycatch of Cetaceans and other Protected Species (WKBYC), 20–22 March, Copenhagen, Denmark, ICES CM 2013/ACOM:36. 55pp.

Konigson, S., Lovgren J., Hjelm, J., Ovegard, M., Ljunghager, F., and Lunneryd S.G. Submitted. Seal Exclusion Devices in Cod Pots Prevent Seal Bycatch and Affects Their Catchability.

M. Scheidat, R. Leaper, M. Heuvel-Greve and A. Winship. 2013. "Setting Maximum Mortality Limits for Harbour Porpoises in Dutch Waters to Achieve Conservation Objectives," Open Journal of Marine Science, Vol. 3 No. 3, 2013, pp. 133–139. doi: 10.4236/ojms.2013.33014.

Northridge, S., Kingston, A., Mackay, A., and Lonergan, M. 2011. Bycatch of Vulnerable Species: Understanding the Process and Mitigating the Impacts. Final report to Defra project MF1003. Contract (pp. 1-99). Available from http://randd.defra.gov.uk/Document.aspx?Document=MF1003-FINALRevisedAugust2011.pdf

Northridge, S., Kingston, A and Thomas, L. 2013. Annual report on the implementation of Council Regulation (EC) No 812/2004–2012. 28pp.

OSPAR. 2012. MSFD Advice Manual and Background Document on Biodiversity. A living document - Version 3.2 of 5 March 2012. Approaches to determining good environmental status, setting of environmental targets and selecting indicators for Marine Strategy Framework Directive descriptors 1, 2, 4 and 6. 140pp.

Van Canneyt O, Bouchard C., Dabin W., Demaret F., Doremus G. 2013. Les échouages de mammifères marins sur le littoral français en 2012. Rapport PELAGIS-CNRS-Université de la Rochelle pour le Ministère de l'Ecologie, du Développement Durable des Transports et du Logement, Direction de l'eau et de la biodiversité, 46p.

Annex 1: List of participants

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Annex 2: Terms of Reference for this meeting and agenda

2013/2/ACOM28 The **Working Group on Bycatch of Protected Species** (WGBYC), chaired by Bram Couperus, NL, will meet 4–7 February 2014 in ICES HQ Copenhagen, Denmark, to:

a) Work on the incorporation of monitoring requirements into the new DCF, in line with a move to a wider ecosystem approach to fisheries monitoring to include bycatch of cetaceans, seals, birds, turtles and non-target fish species. This includes collaboration with PGCCDBS, WGCATCH and Regional Coordination Meetings;

b) Review annual national reports submitted to the European Commission under Regulation 812/2004 and other published documents and collate bycatch estimates of protected species (birds, mammals, reptiles, fish);

c) Evaluate the impacts of bycatch on each relevant species and where possible at a population level, furthering the approach adopted by WKREV812 to assess likely conservation level threats;

d) Collate and review information from National 812 reports and elsewhere relating to the implementation of bycatch mitigation measures and ongoing bycatch mitigation trials, compile recent results and coordinate further work on protected species bycatch mitigation;

e) Working with the ICES Data Centre, continue to develop a database on bycatch monitoring and relevant fishing effort in European waters; review attempts made intersessionally to populate the existing database with monitoring and effort data for the relevant fleets for 2008–2010;

f) Continue to develop, improve and coordinate methods for bycatch monitoring and assessment.

WGBYC will report by 24 February 2014 for to the attention of the Advisory Committee.

Supporting Information

PRIORITY:	
Scientific justification and relation to action plan:	**a) The European Commission has decided not to amend Res. 812/2004 and to integrate monitoring of protected and endangered species into the new DCF (DCMAP). It is essential to cooperate with the scientists who design observer schemes and protocols for the monitoring of catch and discards.** **b) This is essential to use in answering part of the European Commission MoU request to "provide any new information regarding the impact of fisheries on marine mammals, seabirds..."** **c) ICES Member Countries are required to reduce levels of bycatch under several pieces of legislation; the response to this ToR will help meet that aim.** **d) An operating database will allow a more efficient response to future advice requests in this area and additional provide an audit trail for information used in the Group's reports.** **e) Working with PGCCDBS and WGCATCH will ensure more effective cross-ICES work.** **f) Bycatch monitoring and assessment is fundamental to the work of the group; any improvements in methods will help the group and other workers in this field.**
Resource requirements:	**None beyond usual Secretariat facilities.**
Participants:	**13–21 members**
Secretariat facilities:	**Secretariat support with meeting organization and final editing of report.**
Financial:	**No financial implications.**
Linkages to advisory committees:	**ACOM**
Linkages to other committees or groups:	**WGFTFB, WGMME, WGSE, WGEF, PGCCDBS, WGCATCH, SCICOM.**
Linkages to other organizations:	**NAMMCO, ASCOBANS, ACCOBAMS, GFCM, EC, IWC**

Annex 3: WGBYC draft Terms of Reference for the 2015 meeting

a) Includes collaboration with PGCCDBS, WGCATCH and Regional Coordination Meetings;

b) Assessment of monitoring and research requirements to determine levels of bycatch in the context of European legislation (e.g. MSFD)/regional convention (e.g. OSPAR) targets. Review annual national reports submitted to the European Commission under Regulation 812/2004 and other published documents and collate bycatch estimates of protected species (birds, mammals, reptiles, fish). Incorporate evaluation of historical trend from six years of MS reporting where possible. Determine efficacy of trend analysis prior to 2015 meeting;

c) Evaluate the impacts of bycatch on each relevant species and where possible at a population level, furthering the approach adopted by WKREV812 to assess likely conservation level threats. This includes cooperation with WGMME;

d) Collate and review information from National 812 reports and elsewhere relating to the implementation of bycatch mitigation measures and ongoing bycatch mitigation trials, compile recent results and coordinate further work on protected species bycatch mitigation;

e) Working with the ICES DataCentre, continue to develop a database on bycatch monitoring and relevant fishing effort in European waters;

f) Continue to develop, improve and coordinate methods for bycatch monitoring and assessment.

WGBYC will report by 27 February 2015 for to the attention of the Advisory Committee.

Supporting Information

Priority:	
Scientific justification and relation to action plan:	**a) The European Commission has decided not to amend Res. 812/2004 and to integrate monitoring of protected and endangered species into the new DCF (DCMAP). It is essential to cooperate with the scientists who design observer schemes and protocols for the monitoring of catch and discards.** **b) This is essential to use in answering part of the European Commission MoU request to "provide any new information regarding the impact of fisheries on marine mammals, seabirds..."** **c) ICES Member Countries are required to reduce levels of bycatch under several pieces of legislation; the response to this ToR will help meet that aim.** **d) An operating database will allow a more efficient response to future advice requests in this area and additional provide an audit trail for information used in the Group's reports.** **e) Working with PGCCDBS and WGCATCH will ensure more effective cross-ICES work.** **f) Bycatch monitoring and assessment is fundamental to the work of the group; any improvements in methods will help the group and other workers in this field.**
Resource requirements:	**None beyond usual Secretariat facilities.**
Participants:	**13–21 members**
Secretariat facilities:	**Secretariat support with meeting organization and final editing of report.**
Financial:	**No financial implications.**
Linkages to advisory committees:	**ACOM**
Linkages to other committees or groups:	**WGFTFB, WGMME, WGSE, WGEF, PGCCDBS, WGCATCH, SCICOM.**
Linkages to other organizations:	**NAMMCO, ASCOBANS, ACCOBAMS, GFCM, EC, IWC, OSPAR?**

Annex 4: Tables

Table 4a–e. Summary of 2012 Annual National Reports on the implementation of EU Regulation 812/2004 covering the calendar year 2012. Supplementary information brought up at the meeting has been added.

Table 4a. Overview of the national requirements under Reg. EC 812/2004, Art. 2-3 (mitigation) and Art. 4-5 (monitoring), and their implementation in 2012. Light grey=Member States not affected by any part of the Regulation: no fishing in the area concerned and/or no fishing with the gears/vessel size affected; Light green=Member States not affected by Art. 2-3 (mitigation); Light yellow=Member States not affected by Art. 4-5 (monitoring). * Two trawlers that were monitored in 2012 have since been scrapped. As a result, in 2013 there will no vessels affected by the regulation.

Coastal Member States of the EU	Delivery of 2012 Annual Reports on implementation of EC 812/2004		Reg. 812/2004, requirements and compliance						
			Mitigation (Art. 2-3)				Monitoring (Art. 4-5)		
	Delivery	Language	Fishing in *Areas* affected	Fishing with *Gears* affected	Fishing with *Vessel Size* affected (=>12 m)	Adm. implementation / Actual use	Fishing in *Areas* affected	Fishing with *Gears* affected, vessel =>15 m	Implementation
Belgium BE	Yes	Dutch	Yes	yes	yes	No	Yes	**NO**	
Bulgaria BG	**NO**		**NO**				**NO**		
Cyprus CY	**NO**		**NO**				yes	**NO**	
Denmark DK	Yes	English, append. in Danish	Yes	yes	yes	Yes / some	yes	yes	No
Estonia EE	Yes	English	Yes	**NO**			yes	yes	some
Finland FI	**MISSING**		Yes	yes	**NO**		yes	yes	**???**
France FR	Yes	French, English summary	Yes	yes	yes	No	yes	yes	some
Germany DE	Yes	English	Yes	yes	yes	Yes / some	yes	yes	some
Greece EL	Yes	English	**NO**				yes	**NO**	
Ireland IE	Yes	English	yes	yes	yes	No but ScSt / ?	yes	yes	some
Italy IT	Yes	English	**NO**				yes	yes	some
Latvia LV	Yes	English	yes	yes	yes	Yes / ?	yes	yes	some
Lithuania LT	Yes	English	**NO**				yes	yes	some
Malta MT	**NO**		**NO**				yes	**NO**	
Netherlands NL	Yes	English	yes	yes	yes	No	yes	yes	some
Poland PL	Yes	English	yes	yes	yes	Yes / some	yes	yes	some
Portugal PT	Yes	English	**NO**				yes	yes	some
Romania RO	**NO**		**NO**				**NO**		
Slovania SI	Yes - letter	English	**NO**				yes	yes*	some

Coastal Member States of the EU	Delivery of 2012 Annual Reports on implementation of EC 812/2004		Reg. 812/2004, requirements and compliance						
			Mitigation (Art. 2-3)				Monitoring (Art. 4-5)		
	Delivery	Language	Fishing in *Areas* affected	Fishing with *Gears* affected	Fishing with *Vessel Size* affected (=>12 m)	Adm. implementation / Actual use	Fishing in *Areas* affected	Fishing with *Gears* affected, vessel =>15 m	Implementation
Spain ES	**MISSING**		yes	yes	yes	**???**	yes	yes	**???**
Sweden SE	Yes	English	yes	yes	yes	**No / likely none**	yes	yes	no
United Kingdom UK	Yes	English	yes	yes	yes	Yes / some	yes	yes	some

Table 4b. Implementation of requirements under EC 812/2004, Art. 2, for the Member States affected. MS=Member States (acronyms defined in Table 4a); na=not available; Gears: GN=gillnet not specified, GNS=set gillnet, GTR= trammelnet.

MS	Area	Gear	Fleet		Implementation of the use of Pinger (Art. 2) in 2012						
			Vessel 8–12 m	Vessel >12 m	Vessels requiring pingers	Vessels using pingers	Reporting of use mandatory in Log-Book	Enforcement			Monitoring pinger effectiveness
			no.	no.	no.	no.		Tool used for monitoring the functionality of pingers	Strategy	Reported Infringement	
BE	**IVc, VIId**	**GN**	**2**	**1?**	**1?**	**0**					
DK	**IIIdc24**	**GN,GNS,GTR**	**63**	**1**	**1**	**?**	**NO**	**Hydrophones**	**Yes, not reported**	**none**	**none**
	IIIa/IV	**GN,GNS,GTR, mesh >220**	**12**	**18**	**18**	**>0**					**none**
FR	**IIIa, IV, VII**	**GNS-GTR**	**na**	**na**	**90**	**0**					
DE	**24, IIIa, IV**	**GN**	**na**	**na**	**Yes, ? no.**	**>3**	**NO**	**Pinger detectors**	**Not reported, 3 vessels checked**	**none**	**none**
IR	**IV, VII**	**GN**	**na**	**na**	**Yes, ? no.**	**?**	**NO**		**?**	**?**	**none**
LA	**27IIId**	**GNS**	**9**		**1**	**?**		**NO**	**NO**		**none**

MS	Area	Gear	Fleet		Implementation of the use of Pinger (Art. 2) in 2012						
			Vessel 8–12 m	Vessel >12 m	Vessels requiring pingers	Vessels using pingers	Reporting of use mandatory in Log-Book	Enforcement			Monitoring pinger effectiveness
			no.	no.	no.	no.		Tool used for monitoring the functionality of pingers	Strategy	Reported Infringement	
NL	Ivabc	GNS & Wreck nets	na	na	Yes, ? no.	0					
PL	27.III.d.24	GNS-demersal	?	21	21	8	?	Pinger detectors	All inspected vessels, frequency not reported	?	none (too low density)
SP	no report available										
SE	na	na	na	na	Yes, ? no.	na	no	?	Low priority in inspection plan	none	none
UK	VIIdefgh	GNS	na	22	22	>4	no, information from "scientific	Pinger detectors	NO (but from summer	?	some
	Ivabc	GNS-demersal >220	na	16	16	>0					

MS	Area	Gear	Fleet		Implementation of the use of Pinger (Art. 2) in 2012						
			Vessel 8–12 m	Vessel >12 m	Vessels requiring pingers	Vessels using pingers	Reporting of use mandatory in Log-Book	Enforcement			Monitoring pinger effectiveness
			no.	no.	no.	no.		Tool used for monitoring the functionality of pingers	Strategy	Reported Infringement	
	IV	**Wreck nets**	**na**	**≤3**	**≤3**	**?**	**studies"**		**2013)**		

Table 4c. Pingers used by the different Member States under regulation EC 812/2004 in 2012. Information on pinger experiments is reported in Section 6.1 of the report. Belgium, France and the Netherlands have not implemented pingers. There is no information available from Spain. Na=not available.

MS	Type of pinger used	Using current regulation specs?	Other mitigation being tested. See under point 6.1
DK	Aquamark 100	No - 455 m spacing under derogation	yes
DE	Conventional commercial pingers,both analogue and digital. Many Aquamark 100	Yes	No
IE	Airmar, AquaMark, Fumunda, Savewave, DDDs	No - 500 m spacing under derogation	ADDs for set-nets
LV	Na	Na	Na
PL	AquaMark	Yes	No
SE	Na	Na	No
UK	DDD-03	No - using DDDs	No

Table 4d. Summary of monitoring of static and towed gears in 2012 to meet Regulation 812/2004 as reported in National Reports. N/A=not applicable; x=unknown.

MS	Purpose	Monitoring type		Specified Monitoring targets	Area	Gear	Days at sea			Coverage (%)		
		DCF/ Dedicated	Other				Total	>15 m	<15 m	Total	>15 m	<15 m
BE	Reg 812/2004	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
DK	Reg 812/2004	DCF	REM (<15 m)	X	27.SD24-32, 27. IIIa, 27.IV	Towed	1	X	X	X	X	X
						Static (REM)	752	71	681	0.1	17.6	5.7
						Static (DCF)	80	61	19	X	X	X
EE	Reg 812/2004	Dedicated		X	IIId, 25-32	Towed	198	198	0	15.6	15.6	0.0
						Static	N/A	N/A	N/A	N/A	N/A	N/A
FR	Reg 812/2004		Fisheries monitoring	Pilot levels	VII,VIII, Med	Towed	233	X	X	X	X	X
					VIII	Static	199	X	X	X	X	X
DE	Reg 812/2004		Logbook, REM	Pilot levels	VI, VII,VIII	Towed	925 hrs	925 hrs	0	X	19.0	0.0
					VI, VII,VIII,Ixa	Static	0	0	0	0.0	0.0	0.0
					III	Static	1133 hrs	300 hrs	833 hrs		1.1	0.0
IE	Reg 812/2004	DCF		Pilot levels		Towed	227	224	3	6.5	6.4	0.1
		Dedicated				Static	41	33	8	1.5	1.2	0.3

MS	Purpose	Monitoring type		Specified Monitoring targets	Area	Gear	Days at sea			Coverage (%)		
		DCF/ Dedicated	Other				Total	>15 m	<15 m	Total	>15 m	<15 m
IT	Reg 812/2004	Dedicated		X	GSA17	Towed	518	518	0	5.0	5.0	0.0
						Static	N/A	N/A	N/A	N/A	N/A	N/A
LV	Reg 812/2004		Monitoring scheme	X	27 IIId, 26-28	Towed	1096	666	430	19.5	32.9	12.0
					27 IIId, 24-26	Static	135	X	X	9.6	X	X
LT	Reg 812/2004		Fisheries monitoring	X	27.IIId	Towed	9	X	X	8.1	X	X
NL	Reg 812/2004	DCF		Pilot levels	VI-VIII	Towed	123	30	93	8.0	5.3	9.5
						Static	0	0	0	0.0	0.0	0.0
PL	Reg 812/2004	Dedicated		X	24-29	Towed	70	70	0	1.1	X	X
						Static	59	50	9	X	2.4	X
PT	Reg 812/2004	Dedicated		X	Ixa	Static	71	71	0	0.1	X	X
SI	Reg 812/2004	X	Fisheries monitoring	X	X	Towed	X	X	X	X	X	X
SE	Reg 812/2004	None	REM	X	X	Towed	X	X	X	X	X	X
UK	Reg 812/2004 &	Dedicated		Pilot levels	IV, VII (II)	Towed pelagic	100	93	7	5.0	X	X

MS	Purpose	Monitoring type	Specified Monitoring targets	Area	Gear	Days at sea			Coverage (%)		
		DCF/ Dedicated	Other				Total	>15 m	<15 m	Total	>15 m	<15 m
	Hab Directive	**DCF**			**Static**	**299**	**66**	**234**	**0.6**	**X**	**X**

Table 4e. Collation of data on bycaught cetacean specimens and estimations of bycatch rates (if bycatch occurred) in 2012 (from the 2012 national reports; ICES, 2014). (GNS: gillnet; DEF: demersal; GTR: trammelnet; OTB: bottom otter trawl; OTM: midwater otter trawl; PTM: midwater pair trawl). * = bycatch estimates based on data from 2006 to 2012.

MS	Métier	Fishing area	Main target species	Cetacean species	Number of incidents	Number of individuals		Bycatch rates per haul		Total bycatch estimate (CV)
						With pingers	Without pingers	With pingers	Without pingers	
Baltic Sea										
DK	GNS–DEF< 15 m	27.SD22	NA	Harbour porpoise	4	4		0.020		NA
DK	GNS–DEF ≥15 m	27.SD22	NA	Harbour porpoise	2	2		0.028		NA
DK	GNS–DEF< 15 m	27.SD23	NA	Harbour porpoise	11	11		0.024		NA
Northeast Atlantic										
FR	GTR–DEF< 15 m	IVc	sole	Harbour porpoise	2	2		0.18		NA
FR	PTM–DEF	VIIe	sea bass	Common dolphin	2	5		0.11		124 (83%)
FR	PTM–DEF	VIIh	sea bass	Common dolphin	2	13		2.60		48 (49%)
FR	GNS–DEF	VIIIb	bream	Harbour porpoise	1	1		0.01		61 (100%)
FR	GNS–GTR–DEF ≥15 m	VIIe	monkfish	Harbour porpoise	1	2		0.09		NA
FR	GNS–GTR–DEF ≥15 m	VIIh	monkfish	Harbour porpoise	1	1		0.03		22 (98%)
FR	GNS–GTR–DEF< 15 m	VIIe	monkfish	Common dolphin	1	1		0.01		77 (102%)

IE	GNS	VIIb	crawfish	Harbour porpoise	1	NA	NA	NA	NA	NA
NL	OTM small pelagic fish 4–11 m	VIIj	horse mackerel	Long-finned pilot whale	1	0	1	0	0.08	9 (346%)
UK	GNS–DEF< 15 m	VIIe	Mixed demersal	Harbour porpoise	2	0	2	0	0.008	821 (14%)*
UK	GNS–DEF< 15 m	VIIf	Mixed demersal	Harbour porpoise	3	0	3	0	0.023	
UK	GNS–DEF< 15 m	VIIg	turbot	Harbour porpoise	1	0	1	0	0.013	
UK	GNS–DEF >15 m	VIIe	Mixed demersal	Harbour porpoise	3	0	3	0	0.083	
UK	GNS–DEF >15 m	VIIf	Mixed demersal	Harbour porpoise	2	0	2	0	0.095	
UK	GNS–DEF >15 m	VIIf	anglerfish	Harbour porpoise	3	0	3	0	0.333	
UK	GNS–DEF >15 m	VIIg	Mixed demersal	Harbour porpoise	2	1	1	0.040	0.166	
UK	GNS–DEF >15 m	VIIe	anglerfish	Harbour porpoise	2	2	0	0.068	0	
UK	GNS–DEF< 15 m	VIIe	mixed	Common dolphin	2	0	2	0	0.008	254 (23%)*
UK	GNS–DEF >15 m	VIIe	anglerfish	Common dolphin	2	2	0	0.068	0	
UK	GNS–DEF >15 m	VIIe	mixed	Risso's dolphin	1	0	1	0	0.027	NA

UK	**PTM–DEF >15 m**	**VIIe**	**sea bass**	**Common dolphin**	**3**	**3**	**0**	**0.043**	**0**	**NA**
PT	**GNS–GTR–DEF**	**IXa**	**Mixed demersal**	**Common dolphin**	**NA**	**0**	**3**	**0**	**0.0125**	**NA**
PT	**GNS–GTR–DEF**	**IXa**	**Mixed demersal**	**Harbour porpoise**	**NA**	**0**	**1**	**0**	**0.0063**	**NA**
PT	**GNS–GTR–DEF**	**IXa**	**Mixed demersal**	**Bottlenose dolphin**	**NA**	**0**	**1**	**0**	**0.0063**	**NA**
Mediterranean Sea										
FR	**OTM–OTB–SPF**	**GSA 07**	**anchovy**	**Striped dolphin**	**1**	**1**		**0.07**		**NA**
IT	**PTM**	**GSA 17**	**anchovy**	**Bottlenose dolphin**	**1**	**0**	**1**	**0**	**0.0006**	**31 (41%)***

Table 4f. 2012 bycatch estimates stratified by fishing area, vessel size and métier for all species (birds, cetaceans, elasmobranchs, fish, seals, turtles) reported by EU Member States under Regulation 812/2004. Information highlighted in grey is summarized in the report (Section 4.2, Section 7.2).

								Effort (Days at Sea)			Bycatch estimate	
Species	taxa	Country	Fishing Area	Vessel size (m)	Métier Level 3	Métier Level 4	Métier Level 5	Total	Observed	Number of specimens	Provided in MS reports	Extrapolated by WGBYC
Uria aalge	bird	Ireland	VIIb	<15	Nets	Set gillnet	Demersal fish	47	7	4		27
Uria aalge	bird	Ireland	VIIb	≥15	Nets	Set gillnet	Demersal fish	21	9	1		2
Delphinus delphis	cetacean	France	VIIe	<15	Nets	Trammelnet	Demersal fish	3847	46	1	77	84
Delphinus delphis	cetacean	France	VIIe	all sizes	Pelagic trawls	Midwater pair trawl	Demersal fish	713	21	5	124	170
Delphinus delphis	cetacean	France	VIIh	all sizes	Pelagic trawls	Midwater pair trawl	Demersal fish	17	5	13	48	44
Delphinus delphis	cetacean	Portugal	ICES Subarea IX	> 12 m	Polyvalent	Trammelnet	Demersal fish	63612	71	3		
Delphinus delphis	cetacean	Portugal	ICES Subarea IX	> 15 m	Seines	Purse-seine	Small pelagic fish	22952	94	1	244	244
Delphinus delphis	cetacean	UK	VIIe	<15	Nets	Set gillnet	Demersal fish	1888	58	2		65
Delphinus delphis	cetacean	UK	VIIe	>15	Nets	Set gillnet	Demersal fish	143	29	2		10
Delphinus delphis	cetacean	UK	VIIe	>15	Pelagic Trawls	Midwater pair trawl	Demersal fish	31	44	3		2
Globicephala melas	cetacean	Netherlands	VIIj		Pelagic trawls	Midwater otter trawl	Small pelagic fish	110	12	1	9	9
Grampus griseus	cetacean	UK	VIIe	>15	Nets	Set gillnet	Demersal fish	143	29	1		5

								Effort (Days at Sea)			Bycatch estimate	
Species	**taxa**	**Country**	**Fishing Area**	**Vessel size (m)**	**Métier Level 3**	**Métier Level 4**	**Métier Level 5**	**Total**	**Observed**	**Number of specimens**	**Provided in MS reports**	**Extrapolated by WGBYC**
Phocoena phocoena	cetacean	Denmark	IIIc	<15	Nets	Set gillnet	Demersal fish	3757	267	6		84
Phocoena phocoena	cetacean	Denmark	IIIb	<15	Nets	Set gillnet	Demersal fish	2657	442	11		66
Phocoena phocoena	cetacean	France	VIIIb	<15	Nets	Set gillnet	Demersal fish	4096	66	1	61	62
Phocoena phocoena	cetacean	France	VIIh	15-24	Nets	Trammelnet	Demersal fish	510	23	1	22	22
Phocoena phocoena	cetacean	France	IVc	<15	Nets	Trammelnet	Demersal fish	2659	11	2		483
Phocoena phocoena	cetacean	France	VIIe	15-24	Nets	Trammelnet	Demersal fish	876	17	2		103
Phocoena phocoena	cetacean	Portugal	ICES Subarea IX	> 12 m	Polyvalent	Trammelnet	Demersal fish	63612	71	1		
Phocoena phocoena	cetacean	UK	VIIe	<15	Nets	Set gillnet	Demersal fish	3035	2	2		3035
Phocoena phocoena	cetacean	UK	VIIf	<15	Nets	Set gillnet	Demersal fish	1461	5	3		877
Phocoena phocoena	cetacean	UK	VIIf	>15	Nets	Set gillnet	Demersal fish	117	3	3		117
Phocoena phocoena	cetacean	UK	VIIg	>15	Nets	Set gillnet	Demersal fish	393	11	2		71
Phocoena phocoena	cetacean	UK	VIIe	>15	Nets	Set gillnet	Demersal fish	143	29	3		15
Phocoena phocoena	cetacean	UK	VIIe	>15	Nets	Set gillnet	Demersal fish	143	29	2		10

								Effort (Days at Sea)			Bycatch estimate	
Species	**taxa**	**Country**	**Fishing Area**	**Vessel size (m)**	**Métier Level 3**	**Métier Level 4**	**Métier Level 5**	**Total**	**Observed**	**Number of specimens**	**Provided in MS reports**	**Extrapolated by WGBYC**
Phocoena phocoena	cetacean	UK	VIIf	>15	Nets	Set gillnet	Demersal fish	43	10	2		9
Stenella coeruleoalba	cetacean	France	GSA7	>=15	Bottom trawl	Bottom otter trawl	Small pelagic fish	887	3	1		296
Tursiops truncatus	cetacean	Italy	GSA 17 (Zone 37.2.1)	≥15	Pelagic trawls	Midwater pair trawl	Small pelagic fish	10228	518	1		20
Tursiops truncatus	cetacean	Portugal	ICES Subarea IX	> 12 m	Polyvalent	Trammelnet	Demersal fish	63612	71	1		
Alopias vulpinus	elasmobranch	Italy	GSA 17 (Zone 37.2.1)	≥15	Pelagic trawls	Midwater pair trawl	Small pelagic fish	10228	518	4		79
Dipturus batis	elasmobranch	Ireland	VIIb	≥15	Nets	Set gillnet	Demersal fish	140	8	14		245
Dipturus batis	elasmobranch	Ireland	VIIb	<15	Nets	Set gillnet	Demersal fish	47	7	2		13
Dipturus batis	elasmobranch	Ireland	VIIb	≥15	Nets	Set gillnet	Demersal fish	21	9	1		2
Galeorhinus galeus/ Mustelus spp.	elasmobranch	Ireland	VIIb	<15	Nets	Set gillnet	Demersal fish	47	7	40		269
Lamna nasus	elasmobranch	Ireland	VIIb	<15	Nets	Set gillnet	Demersal fish	47	7	1		7
Myliobatis aquila	elasmobranch	Italy	GSA 17 (Zone 37.2.1)	≥15	Pelagic trawls	Midwater pair trawl	Small pelagic fish	10228	518	639	14037	12617

								Effort (Days at Sea)			Bycatch estimate	
Species	**taxa**	**Country**	**Fishing Area**	**Vessel size (m)**	**Métier Level 3**	**Métier Level 4**	**Métier Level 5**	**Total**	**Observed**	**Number of specimens**	**Provided in MS reports**	**Extrapolated by WGBYC**
Pteromylaeus bovinus	elasmobranch	Italy	GSA 17 (Zone 37.2.1)	≥15	Pelagic trawls	Midwater pair trawl	Small pelagic fish	10228	518	13	286	257
Pteroplatytrygon violacea	elasmobranch	Italy	GSA 17 (Zone 37.2.1)	≥15	Pelagic trawls	Midwater pair trawl	Small pelagic fish	10228	518	101	2219	1994
Squalus acanthias	elasmobranch	Ireland	VIIb	<15	Nets	Set gillnet	Demersal fish	47	7	76		510
Alosa fallax	fish	Denmark	IIIa	<15	Nets	Set gillnet	Demersal fish	1822	50	1		36
Alosa fallax	fish	Italy	GSA 17 (Zone 37.2.1)	≥15	Pelagic trawls	Midwater pair trawl	Small pelagic fish	10228	518	211	4635	4166
Halichoerus grypus	seal	France	VIIe	<15	Nets	Trammelnet	Demersal fish	3847	46	1	77	84
Halichoerus grypus	seal	Ireland	VIIb	≥15	Nets	Set gillnet	Demersal fish	140	8	19		333
Halichoerus grypus	seal	Ireland	VIIb	≥15	Nets	Set gillnet	Demersal fish	140	8	2		35
Halichoerus grypus	seal	Ireland	VIIb	≥15	Nets	Set gillnet	Demersal fish	21	9	6		14
Phoca vitulina	seal	France	VIIh	<15	Nets	Trammelnet	Demersal fish	673	13	1	22	52
Phoca vitulina	seal	France	VIId	<15	Nets	Trammelnet	Demersal fish	11925	81	1		147
Phoca vitulina	seal	Ireland	VIIb	≥15	Nets	Set gillnet	Demersal fish	21	9	1		2

								Effort (Days at Sea)		Bycatch estimate		
Species	**taxa**	**Country**	**Fishing Area**	**Vessel size (m)**	**Métier Level 3**	**Métier Level 4**	**Métier Level 5**	**Total**	**Observed**	**Number of specimens**	**Provided in MS reports**	**Extrapolated by WGBYC**
Phocena phocoena	seal	Ireland	VIIb	≥15	Nets	Set gillnet	Demersal fish	140	8	1		18
Caretta caretta	turtle	Italy	GSA 17 (Zone 37.2.1)	≥15	Pelagic trawls	Midwater pair trawl	Small pelagic fish	10228	518	34	747	671
Caretta caretta	turtle	France	GSA7	>=15	Bottom trawl	Bottom otter trawl	Demersal fish	3602	70	2		103
		Denmark	IV	>=15	Bottom trawl	Beam trawl	Crustaceans	3733	14	0		0
		Denmark	IV	>=15	Bottom trawl	Bottom otter trawl	Crustaceans	447	4	0		0
		Denmark	IIIa	>=15	Bottom trawl	Bottom otter trawl	Crustaceans	2116	6	0		0
		Denmark	IIIc	<15	Bottom trawl	Bottom otter trawl	Demersal fish	2012	7	0		0
		Denmark	IIIc	>=15	Bottom trawl	Bottom otter trawl	Demersal fish	841	12	0		0
		Denmark	IIId	>=15	Bottom trawl	Bottom otter trawl	Demersal fish	3395	15	0		0
		Denmark	IIId	<15	Bottom trawl	Bottom otter trawl	Demersal fish	2974	21	0		0
		Denmark	IV	<15	Bottom trawl	Bottom otter trawl	Mixed demersal and crustaceans	590	1	0		0
		Denmark	IIIa	<15	Bottom trawl	Bottom otter trawl	Mixed demersal and crustaceans	186	2	0		0
		Denmark	IIIa	<15	Bottom trawl	Bottom otter trawl	Mixed demersal and crustaceans	575	2	0		0

Species	taxa	Country	Fishing Area	Vessel size (m)	Métier Level 3	Métier Level 4	Métier Level 5	Effort (Days at Sea)		Bycatch estimate		
								Total	Observed	Number of specimens	Provided in MS reports	Extrapolated by WGBYC
		Denmark	IIIa	>=15	Bottom trawl	Bottom otter trawl	Mixed demersal and crustaceans	506	3	0		0
		Denmark	IIIa	<15	Bottom trawl	Bottom otter trawl	Mixed demersal and crustaceans	4155	6	0		0
		Denmark	IIIa	<15	Bottom trawl	Bottom otter trawl	Mixed demersal and crustaceans	2648	6	0		0
		Denmark	IV	>=15	Bottom trawl	Bottom otter trawl	Mixed demersal and crustaceans	793	7	0		0
		Denmark	IIIa	>=15	Bottom trawl	Bottom otter trawl	Mixed demersal and crustaceans	4486	36	0		0
		Denmark	IIIa	>=15	Bottom trawl	Bottom otter trawl	Mixed demersal and crustaceans	6758	39	0		0
		Denmark	IV	>=15	Bottom trawl	Bottom otter trawl	Mixed demersal and crustaceans	5196	58	0		0
		Denmark	IIId	<15	Bottom trawl	Bottom pair trawl	Demersal fish	20	1	0		0
		Denmark	IIId	<15	Longlines	Drifting longlines	Anadromous species	340	6	0		0
		Denmark	IV	<15	Nets	Set gillnet	Demersal fish	327	1	0		0
		Denmark	IIIa	<15	Nets	Set gillnet	Demersal fish	271	3	0		0
		Denmark	IV	<15	Nets	Set gillnet	Demersal fish	2094	4	0		0
		Denmark	IIIa	<15	Nets	Set gillnet	Demersal fish	150	5	0		0

Species	taxa	Country	Fishing Area	Vessel size (m)	Métier Level 3	Métier Level 4	Métier Level 5	Effort (Days at Sea)		Bycatch estimate		
								Total	Observed	Number of specimens	Provided in MS reports	Extrapolated by WGBYC
		Denmark	IV	>=15	Nets	Set gillnet	Demersal fish	564	5	0		0
		Denmark	IIIc	<15	Nets	Set gillnet	Demersal fish	2167	7	0		0
		Denmark	IV	>=15	Nets	Set gillnet	Demersal fish	2174	19	0		0
		Denmark	IIIb	<15	Nets	Set gillnet	Demersal fish	68	23	0		0
		Denmark	IIIc	>=15	Nets	Set gillnet	Demersal fish	201	71	0		0
		Denmark	IIId	>=15	Pelagic trawls	Midwater otter trawl	Demersal fish	10	1	0		0
		Denmark	IIIa	<15	Seines	Anchored seine	Demersal fish	546	2	0		0
		Denmark	IIId	>=15	Seines	Anchored seine	Demersal fish	275	3	0		0
		Denmark	IIIa	>=15	Seines	Anchored seine	Demersal fish	644	8	0		0
		Denmark	IV	>=15	Seines	Anchored seine	Demersal fish	1079	18	0		0
		Estonia	III.d		Pelagic trawls	Midwater otter trawl	Demersal fish	107	26	0		0
		Estonia	III.d		Pelagic trawls	Midwater otter trawl	Small pelagic fish	1061	73	0		0
		France	GSA7	>=15	Bottom trawl	Bottom otter trawl	Crustaceans	104	2	0		0

Species	taxa	Country	Fishing Area	Vessel size (m)	Métier Level 3	Métier Level 4	Métier Level 5	Effort (Days at Sea) Total	Observed	Bycatch estimate Number of specimens	Provided in MS reports	Extrapolated by WGBYC
		France	VIIIa	<15	Nets	Set gillnet	Crustaceans	721	1	0		0
		France	GSA8	<15	Nets	Set gillnet	Crustaceans		1	0		0
		France	VIIe	<15	Nets	Set gillnet	Crustaceans	1645	2	0		0
		France	VIIIb	15-24	Nets	Set gillnet	Demersal fish	340	1	0		0
		France	VIIIc	15-24	Nets	Set gillnet	Demersal fish	42	2	0		0
		France	VIIe	15-24	Nets	Set gillnet	Demersal fish	138	4	0		0
		France	VIId	<15	Nets	Set gillnet	Demersal fish	1350	4	0		0
		France	VIIh	15-24	Nets	Set gillnet	Demersal fish	148	6	0		0
		France	VIIIa	>=24	Nets	Set gillnet	Demersal fish	1123	10	0		0
		France	VIIk	>=24	Nets	Set gillnet	Demersal fish	644	13	0		0
		France	VIIIa	<15	Nets	Set gillnet	Demersal fish	10029	14	0		0
		France	GSA8	<15	Nets	Set gillnet	Demersal fish		16	0		0
		France	VIIe	<15	Nets	Set gillnet	Demersal fish	4550	28	0		0

Species	taxa	Country	Fishing Area	Vessel size (m)	Métier Level 3	Métier Level 4	Métier Level 5	Effort (Days at Sea)		Bycatch estimate		
								Total	Observed	Number of specimens	Provided in MS reports	Extrapolated by WGBYC
		France	VIIIb	<15	Nets	Set gillnet	Large pelagic fish	335	3	0		0
		France	VIIe	<15	Nets	Set gillnet	Small pelagic fish	76	1	0		0
		France	VIIIa	<15	Nets	Trammelnet	Crustaceans	671	2	0		0
		France	VIIe	<15	Nets	Trammelnet	Crustaceans	386	4	0		0
		France	GSA8	<15	Nets	Trammelnet	Crustaceans		40	0		0
		France	IVc	15-24	Nets	Trammelnet	Demersal fish	323	1	0		0
		France	VIIIc	15-24	Nets	Trammelnet	Demersal fish	1	1	0		0
		France	VIId	15-24	Nets	Trammelnet	Demersal fish	460	11	0		0
		France	VIIIa	<15	Nets	Trammelnet	Demersal fish	8479	22	0		0
		France	VIIIb	15-24	Nets	Trammelnet	Demersal fish	4592	38	0		0
		France	GSA8	<15	Nets	Trammelnet	Demersal fish		39	0		0
		France	VIIIb	<15	Nets	Trammelnet	Demersal fish	6250	41	0		0
		France	IVb	>=15	Pelagic trawls	Midwater Otter trawl	Demersal fish	10	1	0		0

Species	taxa	Country	Fishing Area	Vessel size (m)	Métier Level 3	Métier Level 4	Métier Level 5	Effort (Days at Sea)		Bycatch estimate		
								Total	Observed	Number of specimens	Provided in MS reports	Extrapolated by WGBYC
		France	VIId	>=15	Pelagic trawls	Midwater Otter trawl	Demersal fish	148	2	0		0
		France	IVb	>=15	Pelagic trawls	Midwater Otter trawl	Small pelagic fish	13	2	0		0
		France	VIId	<15	Pelagic trawls	Midwater Otter trawl	Small pelagic fish	791	3	0		0
		France	VIIb	>= 50	Pelagic trawls	Midwater Otter trawl	Small pelagic fish	12	6	0		0
		France	VIIIa	>=15	Pelagic trawls	Midwater Otter trawl	Small pelagic fish	265	6	0		0
		France	VIIj	>= 50	Pelagic trawls	Midwater Otter trawl	Small pelagic fish	117	7	0		0
		France	IVa	>= 50	Pelagic trawls	Midwater Otter trawl	Small pelagic fish	170	9	0		0
		France	VIId	>=15	Pelagic trawls	Midwater Otter trawl	Small pelagic fish	571	16	0		0
		France	VIIIa	all sizes	Pelagic trawls	Midwater pair trawl	Demersal fish	497	5	0		0
		France	VIId	all sizes	Pelagic trawls	Midwater pair trawl	Demersal fish	189	10	0		0
		France	VIIIb	all sizes	Pelagic trawls	Midwater pair trawl	Large pelagic fish	35	2	0		0
		France	VIIIc	all sizes	Pelagic trawls	Midwater pair trawl	Large pelagic fish	68	2	0		0
		France	VIIk	all sizes	Pelagic trawls	Midwater pair trawl	Large pelagic fish	179	5	0		0

Species	taxa	Country	Fishing Area	Vessel size (m)	Métier Level 3	Métier Level 4	Métier Level 5	Effort (Days at Sea) Total	Observed	Bycatch estimate Number of specimens	Provided in MS reports	Extrapolated by WGBYC
		France	VIIIa	all sizes	Pelagic trawls	Midwater pair trawl	Large pelagic fish	107	8	0		0
		France	VIIj	all sizes	Pelagic trawls	Midwater pair trawl	Large pelagic fish	200	12	0		0
		France	VIIId	all sizes	Pelagic trawls	Midwater pair trawl	Large pelagic fish	274	21	0		0
		France	VIIIa	all sizes	Pelagic trawls	Midwater pair trawl	Small pelagic fish	857	10	0		0
		France	VIIIb	all sizes	Pelagic trawls	Midwater pair trawl	Small pelagic fish	215	19	0		0
		Germany	27.III.d.24	VL12-<18	Nets	Set gillnet	Demersal fish	323	1	0		0
		Germany	27.III.d.24	VL<10	Nets	Set gillnet	Demersal fish	400	3	0		0
		Germany	27.III.22	VL<10	Nets	Set gillnet	Demersal fish	15931	4	0		0
		Germany	27.III.22	VL10-<12	Nets	Set gillnet	Demersal fish	2226	11	0		0
		Germany	27.III.d.24	VL10-<12	Nets	Trammelnet	Demersal fish	34	1	0		0
		Germany	27.III.22	VL<10	Nets	Trammelnet	Demersal fish	8214	2	0		0
		Germany	27.III.22	VL10-<12	Nets	Trammelnet	Demersal fish	208	2	0		0
		Ireland	VIIj	<15	Nets	Set gillnet	Demersal fish	100	1	0		0

Species	taxa	Country	Fishing Area	Vessel size (m)	Métier Level 3	Métier Level 4	Métier Level 5	Effort (Days at Sea)		Bycatch estimate		
								Total	Observed	Number of specimens	Provided in MS reports	Extrapolated by WGBYC
		Ireland	VIIj	≥15	Nets	Set gillnet	Demersal fish	69	2	0		0
		Ireland	VIIb	≥15	Nets	Set gillnet	Demersal fish	75	3	0		0
		Ireland	VIIg	≥15	Nets	Set gillnet	Demersal fish	170	5	0		0
		Ireland	VIIj	≥15	Nets	Set gillnet	Demersal fish	179	6	0		0
		Ireland	VIIh	≥15	Pelagic trawls	Midwater otter trawl	small pelagic fish	42	1	0		0
		Ireland	VIb	≥15	Pelagic trawls	Midwater otter trawl	small pelagic fish	7	2	0		0
		Ireland	VIIj	≥15	Pelagic trawls	Midwater otter trawl	small pelagic fish	59	2	0		0
		Ireland	VIIa	<15	Pelagic trawls	Midwater otter trawl	small pelagic fish	130	3	0		0
		Ireland	VIIb	≥15	Pelagic trawls	Midwater otter trawl	small pelagic fish	103	3	0		0
		Ireland	VIIc	≥15	Pelagic trawls	Midwater otter trawl	small pelagic fish	4	4	0		0
		Ireland	VIa	≥15	Pelagic trawls	Midwater otter trawl	small pelagic fish	263	5	0		0
		Ireland	VIa	≥15	Pelagic trawls	Midwater otter trawl	small pelagic fish	0	5	0		0
		Ireland	VIIb	≥15	Pelagic trawls	Midwater otter trawl	small pelagic fish	5	5	0		0

Species	taxa	Country	Fishing Area	Vessel size (m)	Métier Level 3	Métier Level 4	Métier Level 5	Effort (Days at Sea)		Bycatch estimate		
								Total	Observed	Number of specimens	Provided in MS reports	Extrapolated by WGBYC
		Ireland	VIIg	≥15	Pelagic trawls	Midwater otter trawl	small pelagic fish	35	8	0		0
		Ireland	VIIj	≥15	Pelagic trawls	Midwater otter trawl	small pelagic fish	0	9	0		0
		Ireland	VIa	≥15	Pelagic trawls	Midwater otter trawl	small pelagic fish	36	12	0		0
		Ireland	VIa	≥15	Pelagic trawls	Midwater otter trawl	small pelagic fish	146	14	0		0
		Ireland	VIIk	≥15	Pelagic trawls	Midwater pair trawl	Large pelagic fish	262	8	0		0
		Ireland	VIIb	≥15	Pelagic trawls	Midwater pair trawl	Small pelagic fish	52	2	0		0
		Ireland	VIIg	≥15	Pelagic trawls	Midwater pair trawl	Small pelagic fish	35	2	0		0
		Ireland	VIb	≥15	Pelagic trawls	Midwater pair trawl	Small pelagic fish	2	3	0		0
		Ireland	VIIg	≥15	Pelagic trawls	Midwater pair trawl	Small pelagic fish	250	4	0		0
		Ireland	VIIj	≥15	Pelagic trawls	Midwater pair trawl	Small pelagic fish	65	7	0		0
		Ireland	VIIb	≥15	Pelagic trawls	Midwater pair trawl	Small pelagic fish	223	8	0		0
		Ireland	VIIh	≥15	Pelagic trawls	Midwater pair trawl	Small pelagic fish	28	8	0		0
		Ireland	VIIa	≥15	Pelagic trawls	Midwater pair trawl	Small pelagic fish	28	10	0		0

Species	taxa	Country	Fishing Area	Vessel size (m)	Métier Level 3	Métier Level 4	Métier Level 5	Effort (Days at Sea)		Bycatch estimate		
								Total	Observed	Number of specimens	Provided in MS reports	Extrapolated by WGBYC
		Ireland	VIa	≥15	Pelagic trawls	Midwater pair trawl	Small pelagic fish	258	13	0		0
		Ireland	VIa	≥15	Pelagic trawls	Midwater pair trawl	Small pelagic fish	192	17	0		0
		Ireland	IVa	≥15	Pelagic trawls	Midwater pair trawl	Small pelagic fish	114	20	0		0
		Ireland	VIIj	≥15	Pelagic trawls	Midwater pair trawl	Small pelagic fish	268	26	0		0
		Latvia	27.III.d		Nets	Set gillnet	Demersal fish	1407	135	0		0
		Latvia	27.III.d		Pelagic trawls	Midwater otter trawl	Small pelagic fish	5611	1096	0		0
		Lithuania	27.III.d		Pelagic trawls	Midwater pair trawl	Small pelagic fish	111	9	0		0
		Netherlands	VIIb		Pelagic trawls	Midwater otter trawl	Small pelagic fish	22	1	0		0
		Netherlands	VIa		Pelagic trawls	Midwater otter trawl	Small pelagic fish	103	1	0		0
		Netherlands	VIIk		Pelagic trawls	Midwater otter trawl	Small pelagic fish	0	1	0		0
		Netherlands	IIa		Pelagic trawls	Midwater otter trawl	Small pelagic fish	3	2	0		0
		Netherlands	VIIe		Pelagic trawls	Midwater otter trawl	Small pelagic fish	62	2	0		0
		Netherlands	VIIh		Pelagic trawls	Midwater otter trawl	Small pelagic fish	19	3	0		0

Species	taxa	Country	Fishing Area	Vessel size (m)	Métier Level 3	Métier Level 4	Métier Level 5	Effort (Days at Sea)		Bycatch estimate		
								Total	Observed	Number of specimens	Provided in MS reports	Extrapolated by WGBYC
		Netherlands	IVc		Pelagic trawls	Midwater otter trawl	Small pelagic fish	19	4	0		0
		Netherlands	VIIb		Pelagic trawls	Midwater otter trawl	Small pelagic fish	124	4	0		0
		Netherlands	VIIc		Pelagic trawls	Midwater otter trawl	Small pelagic fish	48	5	0		0
		Netherlands	VIIc		Pelagic trawls	Midwater otter trawl	Small pelagic fish	50	7	0		0
		Netherlands	VIa		Pelagic trawls	Midwater otter trawl	Small pelagic fish	187	11	0		0
		Netherlands	VIId		Pelagic trawls	Midwater otter trawl	Small pelagic fish	45	11	0		0
		Netherlands	IVb		Pelagic trawls	Midwater otter trawl	Small pelagic fish	72	15	0		0
		Netherlands	IIb		Pelagic trawls	Midwater otter trawl	Small pelagic fish	24	16	0		0
		Netherlands	IVa		Pelagic trawls	Midwater otter trawl	Small pelagic fish	161	22	0		0
		Netherlands	VIId		Pelagic trawls	Midwater pair trawl	Small pelagic fish	6	1	0		0
		Netherlands	VIIh		Pelagic trawls	Midwater pair trawl	Small pelagic fish	19	2	0		0
		Netherlands	VIIj		Pelagic trawls	Midwater pair trawl	Small pelagic fish	32	3	0		0
		Poland	IIId 26	≥15	Nets	Set gillnet	Demersal fish	61	10	0		0

Species	taxa	Country	Fishing Area	Vessel size (m)	Métier Level 3	Métier Level 4	Métier Level 5	Effort (Days at Sea)		Bycatch estimate		
								Total	Observed	Number of specimens	Provided in MS reports	Extrapolated by WGBYC
		Poland	IIId 24	≥15	Nets	Set gillnet	Demersal fish	290	19	0		0
		Poland	IIId 25	≥15	Nets	Set gillnet	Demersal fish	1737	21	0		0
		Poland	IIId 24		Pelagic trawls	Midwater otter trawl	Small pelagic fish	627	9	0		0
		Poland	IIId 26		Pelagic trawls	Midwater otter trawl	Small pelagic fish	2800	23	0		0
		Poland	IIId 25		Pelagic trawls	Midwater otter trawl	Small pelagic fish	2693	38	0		0
		Portugal	ICES Subarea IX	> 15 m	Bottom trawl	Bottom otter trawl	Demersal fish	12616	144	0		0
		UK	IVc	<15	Nets	Driftnet	Demersal fish	703	2	0		0
		UK	VIIa	<15	Nets	Driftnet	Demersal fish	7	4	0		0
		UK	IVb	<15	Nets	Driftnet	Small pelagic fish	60	1	0		0
		UK	VIId	<15	Nets	Driftnet	Small pelagic fish	199	5	0		0
		UK	VIIf	<15	Nets	Set gillnet	Crustaceans	939	3	0		0
		UK	VIIf	>15	Nets	Set gillnet	Demersal fish	180	1	0		0
		UK	VIIe	>15	Nets	Set gillnet	Demersal fish	101	1	0		0

Species	taxa	Country	Fishing Area	Vessel size (m)	Métier Level 3	Métier Level 4	Métier Level 5	Effort (Days at Sea)		Bycatch estimate		
								Total	Observed	Number of specimens	Provided in MS reports	Extrapolated by WGBYC
		UK	VIIh	>15	Nets	Set gillnet	Demersal fish	180	1	0		0
		UK	VIId	<15	Nets	Set gillnet	Demersal fish	9835	1	0		0
		UK	IVc	<15	Nets	Set gillnet	Demersal fish	985	1	0		0
		UK	VIIe	<15	Nets	Set gillnet	Demersal fish	2361	1	0		0
		UK	VIIa	<15	Nets	Set gillnet	Demersal fish	276	2	0		0
		UK	VIId	<15	Nets	Set gillnet	Demersal fish	1098	2	0		0
		UK	VIId	<15	Nets	Set gillnet	Demersal fish	687	2	0		0
		UK	VIIg	>15	Nets	Set gillnet	Demersal fish	158	3	0		0
		UK	IVb	<15	Nets	Set gillnet	Demersal fish	57	3	0		0
		UK	IVc	<15	Nets	Set gillnet	Demersal fish	359	3	0		0
		UK	IVc	<15	Nets	Set gillnet	Demersal fish	1378	4	0		0
		UK	VIIf	<15	Nets	Set gillnet	Demersal fish	275	4	0		0
		UK	IVb	<15	Nets	Set gillnet	Demersal fish	23	4	0		0

Species	taxa	Country	Fishing Area	Vessel size (m)	Métier Level 3	Métier Level 4	Métier Level 5	Effort (Days at Sea) Total	Observed	Bycatch estimate Number of specimens	Provided in MS reports	Extrapolated by WGBYC
		UK	IVb	<15	Nets	Set gillnet	Demersal fish	483	5	0		0
		UK	VIIg	>15	Nets	Set gillnet	Demersal fish	289	6	0		0
		UK	VIIf	<15	Nets	Set gillnet	Demersal fish	934	7	0		0
		UK	VIIa	<15	Nets	Set gillnet	Demersal fish	43	7	0		0
		UK	VIIa	<15	Nets	Set gillnet	Demersal fish	75	8	0		0
		UK	VIIg	<15	Nets	Set gillnet	Demersal fish	69	10	0		0
		UK	IVb	<15	Nets	Set gillnet	Demersal fish	52	14	0		0
		UK	VIIe	<15	Nets	Set gillnet	Demersal fish	1392	17	0		0
		UK	VIIf	<15	Nets	Set gillnet	Demersal fish	1063	25	0		0
		UK	VIIg	<15	Nets	Set gillnet	Demersal fish	182	34	0		0
		UK	VIId	>15	Pelagic Trawls	Midwater otter trawl	Small pelagic fish	0	1	0		0
		UK	VIIa	>15	Pelagic Trawls	Midwater otter trawl	Small pelagic fish	3	2	0		0
		UK	IIa	>15	Pelagic Trawls	Midwater otter trawl	Small pelagic fish	18	4	0		0

Species	taxa	Country	Fishing Area	Vessel size (m)	Métier Level 3	Métier Level 4	Métier Level 5	Effort (Days at Sea) Total	Observed	Bycatch estimate Number of specimens	Provided in MS reports	Extrapolated by WGBYC
		UK	IVa	>15	Pelagic Trawls	Midwater otter trawl	Small pelagic fish	15	5	0		0
		UK	VIa	>15	Pelagic Trawls	Midwater otter trawl	Small pelagic fish	276	5	0		0
		UK	VIIe	<15	Pelagic Trawls	Midwater otter trawl	Small pelagic fish	139	7	0		0
		UK	VIIe	>15	Pelagic Trawls	Midwater otter trawl	Small pelagic fish	11	8	0		0
		UK	VIa	>15	Pelagic Trawls	Midwater otter trawl	Small pelagic fish	37	10	0		0
		UK	VIIa	>15	Pelagic Trawls	Midwater pair trawl	Small pelagic fish	34	14	0		0

Annex 5: Technical Minutes from the Bycatch Review Group

- RGBYC
- By correspondence for 11 March 2014
- Reviewers: Sara Königson, Sweden; Marije Siemensma, Netherlands; Daniel Oesterwind, Germany
- Working Group: Working Group on Bycatch of Protected Species (WGBYC)

The Working Group's report concerns review of annual national reports submitted to the European Commission under Regulation 812/2004 and other published documents to collate bycatch estimates of protected species (birds, mammals, reptiles, fish).

General comments

Reports submitted from MS include data reported from DCF discard programs, dedicated monitoring programmes and sometimes information from strandings. Information on effort in different métiers and for different vessels is not always collected the same way by Member States. This makes reviewing the reports a hard task. However reviewers asked for a more summarizing review of the reports for example comparing the reports to former year's reports. Has observed effort increased over the years or is there any other changes observed such as better data quality?

Regarding the extrapolation of estimated bycatch, information of how the group came up with the numbers both in the table and in the introduction is needed. Estimations of bycatch in different fisheries have been estimated for many Member States. However are these numbers reliable with regards to the data quality and the effort coverage? In what way can we use these numbers and reports? It could also be valuable to summarize the gaps that have been identified such as data on total effort for different fisheries which are often missing.

In addition the Review Group provided a range of comments and suggestions directly into the report and tables annex.