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Executive summary

The Working Group on Bycatch of Protected Species met in Copenhagen at ICES headquarters between 7st and 10 February 2012. The meeting was chaired by Bram Couperus (Netherlands) and was attended by eleven members from ten nations.

The broad aim of the meeting is to collate and review recent information on the bycatch of protected species, especially under the requirements of EC Regulation 812/2004, to coordinate bycatch monitoring and bycatch mitigation trials and to disseminate and review information on methodologies associated with these topics.

The Working Group reviewed and commented on EU Member States' reports under council regulation 812/2004, in order to review the status of information on recent bycatch estimates and to assess the extent of the implementation of bycatch mitigation measures the reports were reviewed.

The group discussed the implications of two reviews of Regulation 812/2004 by the EC and took note of the fact that the Regulation will not be amended. In this light the group supported the conclusions to implement bycatch monitoring schemes in future in the DCF by close cooperation with ICES expert groups like SGPIDS.

Reports from 17 member states indicated extrapolated minimum estimates of bycatch for 2010 of about 870 specimens. The species involved are striped dolphin, common dolphin, bottlenose dolphin and habour porpoise.

However, estimates are still very patchy, and several EU member states have not fulfilled their monitoring obligations. Bycatch monitoring was judged to be less than optimally directed in many cases. The observer effort may not be representative of the fleet effort and any extrapolated numbers derived solely in this report should therefore be treated with care.

The WG reviewed recent bycatch mitigation trials, including trials of gillnet modifications and experiments that attempt to quantify the effect of pingers on porpoise displacement.

Implementation of bycatch mitigation measures was also found to be patchy, with few EU member states able to provide unequivocal confirmation that the obligations under Regulation 812/2004 for pinger deployment are being met.

The WG continued to develop a streamlined and effective database for the collation, storage and analysis of European bycatch monitoring and fishing effort data for those fishing sectors where bycatch monitoring is mandated under Regulations 812/2004.

WGBYC reviewed five marine fish species that are listed in at least one of the Annexes of the Habitats Directive. Despite the limited analysis the group was able to carry out, it was concluded that national DCF sampling; and landings data contain valuable data about the bycatch of at least shads.

1 Opening of the meeting

The Working Group forBycatch of Protected Species (WGBYC) met at ICES headquarters in Copenhagen 7–10 February 2012. 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 cetacean bycatch management and the role of WGBYC

The European Commission has carried out two separate reviews of Regulation (EC) 812/2004 (COM(2009) 368; COM(2011) 578) as required under Article 7 of the Regulation. In the latest review the Commission reached the following conclusions:

There has been insufficient sampling in the right fisheries or areas to enabling sound management decisions to be made with respect to cetacean bycatch.

Information on cetacean populations is fragmented and population status remains unclear so the actual impact of fishing on populations is poorly understood.

Article 2 (Acoustic Deterrent Devices) of the Regulation has been ineffective. There is still a general reluctance by fishermen to use the devices currently available due to practical and economic reasons.

Many Member States have made a considerable effort to meet the reporting requirements of the Regulation. However, the quality and content of the reports from some Member States submitted remains inconsistent, making analysis difficult.

Monitoring targets specified in the Regulation appear over ambitious and these targets could be rethought. A more general approach whereby Member States would be required to demonstrate their fisheries were not exceeding some agreed level of cetacean bycatch would be more appropriate.

Greater flexibility and co-ordination is required in allocating monitoring effort.

Data collection under the Habitats Directive and also the linkage with the Regulation needs to be clarified so the utility of the data collected is maximised and duplication is eliminated.

For fishing activities and for other areas outside the scope of the Regulation where incidental catches are problematic, Member States have the responsibility under the Habitats Directive to take appropriate measures to safeguard cetacean populations.

The Regulation has been in place for six years, and despite notable improvements with regard to reporting and observer coverage it is still not fully meeting its objective of preventing the accidental capture of cetaceans in fishing gears. Recognising this in the most recent communication the Commission outlined their approach in the future to managing incidental catches of cetaceans.

There is no intention to amend Regulation (EC) 812/2004. According to the Commission this would take a considerable amount of time (~two years minimum) as it would have to be agreed under co-decision of the European Parliament and Council. Tabling this amendment would also most probably result in a protracted political debate on the Regulation which could result in a dilution of any measures agreed.

On this basis and in line with the objectives of the reform of the Common Fisheries Policy (CFP) to move to ecosystem management, it is the Commission's intention to incorporate improved mitigation measures for protected species into the technical measures regulations and monitoring under the DCF. Once this is achieved, Regulation (EC) 812/2004 could be repealed.

The Commission recognises that while this is the most rational approach it does raise a number of questions that need to be addressed. Following informal discussions

held at the 2012 WGBYC meeting it is apparent that this Working Group are well placed to address some of these issues. Specifically the following were highlighted:

a) Given there will be a transitional period to allow for the development of a new management framework for cetaceans it is important that the current measures under Regulation (EC) 812/2004 are still implemented and a level of monitoring is maintained in the relevant fisheries. However, it is clear that many Member States are struggling to maintain dedicated cetacean monitoring programmes and therefore the Commission would like to request WGBYC look at the fisheries/métiers being monitored under the current DCF and establish how this overlaps with fisheries where there is a known bycatch problem and/or are included under Regulation (EC) 812/2004. This will provide a clearer picture of bycatch monitoring that could be achieved under the DCF and also highlight areas where specific monitoring for cetacean bycatch is required. As a corollary to this WGBYC should also continue to consider other sources of bycatch data that maybe relevant, including data from fisheries outside the scope of the Regulation.

b) One of the criticisms of Regulation (EC) 812/2004 is that it does not contain clear management objectives. To assist the Commission in defining these objectives for future management measures and building on the work carried out by WKREV812 (ICES. 2010), WGBYC are requested to review the methodology used and the estimates of bycatch limits (take limits) generated by region at WKREV812. This analysis should determine whether the approach taken is reasonable and provides a sufficient basis to be used as a methodology to set sustainable take limits on a regional basis going forward.

c) It is the Commission's intention over-time to incorporate mitigation measures for protected species into a new technical measures framework as described in Article 14 of the draft CFP Basic Regulation (COM(2011) 425). This framework would contain the scope, objectives, targets and permanent measures to be met with specific mitigation measures for specific area and fisheries developed under Multiannual Plans (MAPs) as described in Articles 10 and 11 of the draft Basic Regulation. However, the Commission needs advice on the objectives (as discussed in (b) above) and appropriate measures that would apply on a permanent basis and included in the framework regulation and how best to incorporate regionally specific measures under MAPs and at what level of detail.

d) The Commission intends to incorporate monitoring requirements into the new DCF, in line with a move to a wider ecosystem approach to fisheries monitoring which would include bycatch of non-target species such as marine mammals, turtles and seabirds. However, it is important to assess how best to incorporate this into the new DCF in terms of species and fisheries to be covered, sampling protocols, information to be collected and levels of coverage required. WGBYC should continue to discuss this with PGCCDBS/SGPIDS and also through the Regional Co-ordination Meetings (RCMs).

4 ToR A: National reports on cetacean bycatch under Reg.812

4.1 Introduction

The WG had been provided with member states' reports to the European Commission on observations carried out under Regulation 812. Reports were received from 19 member states. The contents of the reports have been reviewed by three subjects: (1) monitoring of cetaceans, (2) pingers and mitigation and (3) information of bycatch on other taxa than cetaceans. Table 1(a–c) briefly summarizes the contents of the national reports with emphasis on whether or not other taxa were included in the monitoring scheme in 1c, if applied observer effort is being combined with the DCF sampling schemes, and on pinger usage (1b).The 17 countries who provided a report, carried out 2989 observer days during which 28 specimens of cetaceans were recorded as bycatch. This results in a total minimum estimated bycatch of 871 specimens (Table 1c). The species involved are striped dolphin, common dolphin, bottlenose dolphin and harbour porpoise.

4.2 Reported cetacean bycatch rates and extrapolated bycatch totals

In the following section information on cetacean bycatch has been summarised from the national reports. In some cases additional information not found in the reports is included for clarity:

Lithuania. A variety of factors (e.g. financial, limited space on small vessels) has meant that an observer scheme has not been put in place on the Lithuanian fleet. The report indicates that three gillnetters and 16 OTM trawlers are not suitable to take an observer on board due to lack of space on the vessel and for safety reasons. Deploying observers is also dependent on the cooperation of a single fisheries company with two pelagic pair trawl; this has proven difficult. In an attempt to assess bycatches, 270 interviews with fishermen were conducted in 2010 and no bycatch events of cetaceans were reported.

Latvia. Monitoring of cetacean bycatch was carried out alongside the DCP monitoring scheme. In total 299 days at seaon pelagic trawl and 160 days at sea on static gillnetters were monitored covering 14 vessels of the fleet in 2010 which meets the obligations under Regulation 812/2004. No bycatch was reported, further supporting findings in 2006–2009. Latvia questioned the value of continuing such monitoring and made a request to the commission that the cetacean bycatch observer programme should cease, stating that cetacean observations could be incorporated in other existing national fisheries programmes.

Italy. Under Regulation 812/2004, Italy operates a dedicated observer scheme to record bycatch of multiple species (protected species and those of conservation concern). However, Italy has not met the target level of monitoring (to achieve a bycatch estimate with a 30% CV) as this would be prohibitively expensive. Limited funding, limited observers and an overly bureaucratic process were noted as concerns in the development of a fully adequate observer scheme. Two bottlenose dolphins were recorded as bycatch in a single haul of a pelagic pair trawl for anchovy in 2010. Since In 2008, when bycatch has been recorded, it has been restricted to the Northern Adriatic. Italy would like to restrict monitoring efforts to this area.

Greece: there is no legal requirement to monitor Greek fishing vessels as vessels flying the Greek flag do not operate within the area provisions of Article 4 or 5 of the Regulation.

Germany: Germany carried out some monitoring on pelagic trawlers in ICES Subareas VI, VII and VIII and some sampling of the set gillnet fishery in the Baltic. No cetacean bycatches were observed. A bycatch incident on a trawler which was sampled coincidentally by both a German and a Dutch observer did not show up in the German report.

France: there is an ongoing observer monitoring programme on both over 15 m and under 15 m vessels. Among those fisheries defined in Annex 3 of the Regulation that are applicable to the French fleet, 705 days at sea were observed: 279 on pelagic trawls and 426 for setnets. Pilot schemes were implemented for under 15 m pelagic trawlers in Areas VII and VIII and on netters in the Bay of Biscay (VIII). Reported bycaught species of cetacean were harbour porpoise, common and striped dolphin.

Monitoring out with the Regulation has occurred in conjunction with the DCF programme.

Ireland: Dedicated monitoring in response to Regulation 812/2004 was initiated in 2010. Four fleets were identified as requiring monitoring and three of these (OTM small pelagic, PTM small and large pelagic) were monitored in 2010; set gillnets were not covered. A total of 151 monitoring days at sea were carried out both as part of the dedicated independent observer programme and DCF on pelagic trawlers, with no cetacean bycatch observed. Apart from 4 common dolphins observed as bycatch by an OTM vessel targeting small pelagic fish in 2006, no other cetacean bycatch incidents have occurred in 432 days of observations onboard Irish pelagic trawlers since 2005. Decreasing levels of cetacean bycatch in the Irish albacore tuna fishery have been verified through a total of 100 observer days carried out in this fishery since 2005 with not one cetacean bycatch incident observed. Following initial problems with cetacean bycatch in this fishery when the pair pelagic fishing method was first introduced in 1998, this major reduction is thought to be due to increased levels of experience and the use of powerful sonar which obviates the need to deploy fishing gear until tuna are clearly detected.

Cyprus: Fishing vessels are not involved in any fishing activities in the areas indicated in Annexes I and III of the Regulation.

Belgium: there is a legal requirement for fishers to take observers onboard. There is no dedicated marine mammal observer scheme; however, observations have been made during discard sampling, biological monitoring, etc. No bycatch was recorded in 2010.

Estonia: monitoring of cetacean bycatch takes place as part of biological sampling programmes of cod, herring and sprat. Observers apparently spent a total of 122 days at sea on mid-water otter trawlers over 16 m in length (sic). No cetacean bycatch was documented. Static gears are used on boats up to 10 m, but there was no bycatch monitoring in these vessels although interviews with fishermen suggest no bycatch. Estonia would like the Regulation as it applies to Estonia to be amended so as to apply only to fishing vessels which are engaged in fishing below latitude 56°30'.

UK: The United Kingdom report included bycatch estimates for 2010 from monitoring programmes under EU regulation 812 of 338 harbour porpoises and 86 common dolphins based on the fishery strata proposed by the Commission. In the annex of the report a more reliable estimate is given, based on data collected since 2000, stratified

in a more inclusive way, and also from fishery segments outside EU Regulation 812. According to this estimate 540 porpoises and 290 common dolphins were taken in 2010 with CV's of 0.13 and 0.17 respectively. Most of these bycatches occur in ICES Subarea VII in both pelagic trawl and gillnet fisheries. The situation in the North Sea is unclear due to the limited sampling.

The UK suggested that a more productive means of monitoring bycatch would be to limit the amount of sampling in any one fishery to a level that is sufficient to determine whether or not bycatch levels exceed a pre-specified threshold or reference limit.

Slovenia: According to the Slovenian report the country has no obligation to monitor bycatches under EU Regulation 812, because the only fishery activities are in the Adriatic Sea which does not fall under the regulation. No bycatch incidents have been observed in the regular monitoring of fisheries resources (no fleet effort or effort related data provided).

Denmark: Pelagic otter trawl and pelagic pair trawls were not observed, because observer programmes in the past have not revealed any cetacean bycatches. The gillnet fisheries in the North Sea and the Baltic were covered by means of the DCR program (on board discards and catch sampling). This amounted to one day at sea in the Baltic and 40 days at sea in all setnet fishery segments in the North Sea. No bycatch incidents were observed.

Six gillnet vessels smaller than 15 m (and therefore outside the scope of Regulation 812) were observed by means of Electronic Monitoring (100% coverage). The vessels operated in the Øresund (IIIc) and the North Sea. During eight months of monitoring, 15 bycatches of porpoises were observed, of which eleven specimens were taken by one vessel operating in IVb and IIIaN.

Sweden: There is no observer programme under EU Regulation 812 in Sweden. Instead a CCTV (or EM) project was initiated, with four systems to be placed on board trawlers and five systems on gillnetters. Ten EM systems were purchased, but only one fisherman was willing to cooperate. The project ended in December with no fishing effort observed.

Portugal: According to the national report on monitoring of pelagic trawlers is required because there are none licensed. There are 108 vessels over 15 m that are licensed to fish with gillnets and these have been monitored (161 days at sea in 2010). The National Report stresses the fact that there are difficulties in monitoring the gillnet fleet overall, not only because of the number of vessels involved but also because many of the them are polyvalent vessels. However, according to the Portuguese Wildlife Society´s report, an observer scheme has been monitoring the polyvalent fleet on vessels over twelve meters that use gillnets/trammelnets (326 vessels in total of which 108 are above 15 metres (as mentioned previously). Thus, 14 polyvalent boats using only gillnets/trammelnets (at the time of observation) were observed not only with observers onboard but also using logbooks completed by skippers. Combining effort covered 161 trips/days of observation and 352 fishing events (0.25% coverage). The observed bycatch was 0.055 dolphins killed per fishing trip/haul. All lethal recorded interactions were with common dolphins. Bycatch estimations for the whole fleet are difficult to obtain based on daily fishing effort, since it is a multi-gear fishery.

Poland: An observer scheme covered five vessels from a large fleet (a few hundred vessels) in Area 23–29. These vessels fished partly with pelagic trawls and with gill-

nets. Thus 56 days with pelagic trawls (0.72–3.83% coverage) and 16 days (0% coverage in Area 25 and 3.70% in 26) with gillnet were observed. The authors note a coverage of 80% would be required to obtain a CV of 0.30, but it is not clear how this was calculated. They suggest trying to attain a coverage of 5% of all fishing days with gillnets and not less than 2% of the fishing days with pelagic trawls.

Netherlands: The Netherlands combine their observer scheme with their DCF monitoring. In 2010, during five fishing trips, the pelagic freezer-trawler fleet has been observed with a coverage of 8.8% and 3.7% in ICES Divisions VI–VIII (January–March and December) and in the rest of the fleet respectively. Thus the targets of the Pilot Monitoring Scheme of 10% and 5% have not been fulfilled. No bycatch of cetaceans was recorded. The observed bycatch rate of 0.00 dolphins per day is in line with the findings in 2006–2009 when the bycatch rate was also 0.00 dolphins per day.

Within this Dutch programme, 39 days and 89 hauls have been observed on trawlers under English flag; 15 days and 31 hauls have been sampled on trawlers under German flag. The data collected during these trips have been sent to the institute carrying out the regulation in its country.

4.3 Pinger use and mitigation

The Working Group reviewed the 2011 reports to the European Commission from EU member states regarding the implementation of Council Regulation 812/2004 during 2010. A summary of each member state's report is given below in addition the summaries in Table 1.

Belgium: There has been no scientific monitoring of pinger use in 2010 (although there had been practical tests in 2009). There are 6–8 vessels using gillnet in VIId and IVc but none is over 12 m, so no pingers are required and pingers are not being used by Belgian vessels. The report states that nets fitted with pingers entangle more easily and that the devices are not very durable. The report concluded that Belgian fisheries only have a limited influence on sea mammal populations and that the use of mitigation devices would not have any significant effect.

Cyprus: Bycatch was reported to be very rare; there was no information on acoustic deterrents.

Ireland: Major uncertainties regarding cost and durability of pingers were noted. The level of uptake in the relevant Irish fisheries is unknown. Several vessels involved in previous pinger trials have retained the pingers used in those trials (Airmar, AquaMark, Fumunda and Savewave devices) but it is not known if they continue to use them. Funding was obtained in 2010 to allow purchase of DDDs for the tuna pair-trawl fishery. Mitigation of bycatch in this fishery has also been developed through careful targeting of tuna rather than indiscriminate towing. The Irish fishery inspectorate has reported no infringements of the pinger regulation, but the number of checks or boardings was not stated in the report. A fishery information notice has been produced to inform fishermen of the regulation's requirements. Derogation for increasing the spacing to 500 m for digital devices has been applied for though this has now lapsed. Use of pingers by fishermen was reportedly sporadic despite the regulation because of operational problems, expense and durability. The report also notes that there are NGO concerns about habitat exclusion and environmental noise resulting from pinger use.

Estonia: There is no fishing effort by Estonian vessels using static nets in areas where pingers are required (Area 24).

France: A total of 117 French vessels of more than 12 m are using nets in the area where pingers are required, and a few of these have been working with experimentally equipped nets. The French report states that the requirement to use pingers under 812/2004 remains a problem for the French fleet. Concerns listed include the reported unreliability of the models on the market and the difficulty in maintaining a working complement of devices. The requirement to use them every 100–200 metres along the net, which interferes with the hydraulic systems, is also an issue and it was suggested that it would be better if they could be used at each end of the net. Pingers are also considered a safety hazard to fishermen. The potential problem of them attracting seals was also noted, especially in relation to the fact that seals are already caught more frequently than porpoises. There were also concerns that they may exclude porpoises from their natural habitat. France would like to see the regulation revised. The French report refers to a recent study (PingIroise) that had examined the effectiveness of three devices (Aquamark 100, Marexi-V2.2 and STM's DDD-02F); the practical problems associated with the use of pingers that had been raised previously were not resolved by these devices. A further study (Le Duc and Le Roy, 2009) had also shown that pingers can be a safety hazard to crew members, but it was suggested one newly available design might overcome this issue. In summary the pingers on the market are generally thought to be unsuitable, and the actual costs of using them would be ten times the initial estimate because of failures. The French report also notes that bycatch is not a function of vessel length and questions why it is only over 12 m vessels that are required to use them, and notes that species other than porpoises are also caught, and that pingers may not be an effective mitigation measure for them.

Germany: German fishing companies have been informed through official notices about their obligations under Regulation 812/2004. The report states that German fishing vessels are using commercial pingers, and that inspections have not revealed any infringements. Eleven inspections were made in 2010. No operational or other problems were noted with respect to pinger use.

In order to check that acoustic deterrent devices (pingers) are being used properly, the staff of the competent authorities of the Federal Government and of the Länder were provided with appropriate testing equipment and trained to use it, in collaboration with the scientists of the national fisheries institutes, the manufacturer, and the Danish fisheries inspectorate. Each fisheries protection vessel of the Federal Agency for Agriculture and Food (BLE) and also the other authorities mentioned have at their disposal the Etec PD1102 Pinger Detector Amplifier. This device will determine whether a pinger in the water is actually emitting signals (digital pingers usually transmit in the inaudible ultrasonic range). The main concern expressed in the German report is that the legal framework for enforcement needs to be optimised. A detailed inspection procedure is required from the legislator so that enforcement officials can properly determine whether an infringement has occurred.

Greece: Reported that there are no Greek vessels fishing in the regulated areas.

Italy: Reported that although pingers are not required under the regulation, 32 of 134 pelagic pair-trawl teams are now using pingers on a voluntary basis. Voluntary pinger trials on pair trawlers (DDD-02F) were initiated by fishermen in 2009. Between September 2009 and June 2010, a research team from ISMARCNR of Ancona carried out additional observations (155 hauls) during fishing activities using a newer model of pingers (DDD-03H). These observations showed a strong short-term effect on dolphins' distribution around the trawlnet. Final results of this study are not yet avail-

able. Concerns were expressed about possible habitat exclusion if all pelagic trawlers were to use DDDs in high density fishing areas.

Latvia: Reported that all of the 18 relevant vessels fishing gillnets in IIIc 22–28 used pingers in 2010. There was no indication as to how this was determined, how the regulation is enforced or any mention of the make of pinger used.

Lithuania: Reported that there were no fishing operations in areas where the use of pingers is mandatory, as Lithuanian vessels only fish in IIId 25–26 and not in Area 24.

Netherlands: Reported only that pingers not required in any Dutch fleet segment.

Poland: Reported that in 2010 there were 17 vessels flying the Polish flag which were equipped with pingers. The regional fisheries inspectorate also uses detection devices for checking the operation of pingers. It was stated that 56% of the 'relevant boats' fishing in IIId 24 used pingers, specifically Aquatec's Aquamark 100 devices. The report also states that the use of pingers by over 12 m boats fishing in Area 24 should be continued, as should bycatch monitoring with a view to possible extensions of the pinger requirements, for example to vessels between 10 and 12 m in length.

Portugal: Reported that no information had been collected regarding Articles 2 and 3 of Regulation (EC) No 812/2004 on ADDs, as the Portuguese fleet does not fish in the areas with the types of fishing gear listed in Annex 1. Ongoing studies by the University of Minho involve the use of ADDs on fishing vessels including 14 gillnet vessels, 14 purse-seiners and two vessels using beach-seines. These studies are to continue for the next five years, and involve the voluntary use of pingers and the use of gillnets and trammelnets impregnated with barium sulphate. Monitoring will be carried out under the direction of the project's technical staff.

In the case of purse-seines, the initial findings were as follows:

- The use of pingers does not affect fish catches.
- Vessels using pingers (especially 70 kHz pingers) have fewer interactions with marine mammals.
- Fewer cetaceans are caught or killed by vessels with pingers (especially 10 kHz ones).

As regards trammelnets, preliminary results indicate that:

- Fish catch per unit of effort (cpues) are identical for vessels with and without pingers.
- Vessels using pingers have fewer interactions with marine mammals.
- Fewer cetaceans are caught or killed by vessels with pingers (especially 10 kHz ones).

It was concluded that Fumunda pingers (F10 and F70) seem to be effective in reducing interactions with mammals, particularly common dolphins. However, the extensive use of such devices still poses many problems of a technical, practical and economic nature; there are plans to purchase some 1000 pingers over the next five years as part of the project.

Denmark: Has 69 gillnet vessels fishing in IIIdc, and 40 in IV. Of these only 28 (five and 23) are more than 12 m and are therefore required to use pingers. The 28 vessels concerned are reported generally to use Aquamark 100 devices which can be spaced at 450 m under derogation. This is the second derogation with Commission approval. Inspection vessels monitor the use of pingers using hydrophones; no in-

fringements have been detected. A porpoise habituation study is being conducted by DTU Aqua with respect to the Aquamark devices. The Danish report notes that the implementation of pinger use has not been an easy process as the quality and lifespan of many of the devices on the market has been low, and there have also been handling difficulties. Nevertheless many fishermen have got to grips with these issues and now report positively on the use of pingers. New devices on the market may also help. Denmark questioned the logic of limiting the pinger requirement to vessels over 12 m because it is not the vessel size but the gear that causes entanglement; this causes resentment for some fishermen who cannot understand why vessels under 12 m are exempt from the requirement to use pingers.

Slovenia: Reported that Slovenian fishermen only operate in the North Adriatic Sea and not in areas in which the use of acoustic deterrent devices is mandatory according to Annex I of the Regulation.

Sweden: reported that in 2007 fishermen operating in areas where pingers are mandatory had been given pingers. But as these pingers had a life-time of about two years it cannot be assumed that they are still working. There is no enforcement of pinger use in this area and fishermen cannot report fishing with pingers in the EU-logbook. There is therefore no information on the current use of pingers by Swedish boats.

United Kingdom: UK reported that its over 12 m gillnet fleet in Division VII is using DDDs which are not on Annex 1 of the regulation, but which have been shown to be effective during sea trials (see below Section 6.1 for further details). Up to 19 gillnet vessels have been using pingers in Division VII during 2010, which represents between 67% and 100% of the UK fleet operating in different subdivisions within VII. It is intended that 100% of the relevant UK vessels will be equipped with pingers by 2011. No enforcement measures have been implemented as the industry is still in the process of adopting the DDDs. The situation in the North Sea (Division IV) is unclear as logbook data do not enable vessels that meet the pinger requirements of Annex 2 of the regulation to be fully identified, but there appear to be at least two vessels that should be required to use pingers. There is no information on compliance by these boats. DDDs are also being used voluntarily by two pair teams that pursue the bass pair-trawl fishery in the Channel during winter. Observations on the use of DDDs by the gillnet fleet in Division VII are being made to determine the optimal effective spacing of DDDs. No porpoise have been caught closer than 1.2 km from a DDD. Some nets are over 4 km in length and DDDs are deployed on the end ropes (i.e. two per fleet of nets) to avoid the need to attach a device to the floatline during deployment, which could be hazardous. Monitoring of seal damaged fish in nets with and without DDDs has not shown any significant difference in depredation rates. One of the bass pair teams using DDDs in 2010 experienced elevated dolphin bycatch rates, but later inspection of the devices concerned showed that they were not holding their charge, suggesting a long-term decline in the battery efficiency.

The Working Group made several observations concerning these reports. Firstly it is clear that the regulation has not been fully implemented in all member states and for a variety of reasons. It is noticeable however, that while some member states seem to have accepted the use of pingers and overcome the various concerns raised; others have still to do so.

The Working Group noted that national reports have not given universally clear accounts of the control measures in force. Furthermore none has reported on inspections of foreign vessels. Only a few member states have provided any indication of

how many inspections have been made, or where and how, yet without such information it is hard to see how reliable the enforcement measures are likely to be. The working group notes that inspections made in ports do not necessarily confirm the use of pingers during fishing operations. It is clear that at least two member states are using electronic devices to test whether or not pingers are working, and this experience should be communicated with the relevant agencies in other member states.

The Working Group noted the concerns again raised in the German report that it is hard to test whether or not the regulation has been infringed by any particular boat, and that further legal guidance is required in this regard.

The Working group also noted that in several cases it is difficult to be sure exactly how many vessels are actually using pingers. It was suggested for example that among Polish vessels, several had been supplied with pingers that either were not required to use them or which were required to use them but may not be doing so. Similarly the Swedish report noted that although pingers had been disbursed to some of the relevant vessels, it is not known how many are actually using them as they are not required to report the use of pingers in their logbooks. Given that several member states also report voluntary pinger use or the use of pingers in field trials, there is therefore a more general concern that member states do not know how many vessels are using pingers or when and where, and will therefore find it hard to assess the conservation benefits of the regulation.

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 under the 812 regulation.

Ireland: One leatherback turtle *Dermochelyscoriacea* was caught, and released alive, ten swordfish *Xiphiasgladius* (Linnaeus, 1758), eight bluefin tuna *Thunnusthynnus* (Linnaeus, 1758), one blue shark *Prionaceglauca* (Linnaeus, 1758), and approximately 40 sunfish *Molamola* (Linnaeus, 1758) were caught on albacore fishing trips.

Spurdog (*Squalusacanthias*), classified by IUCN as vulnerable, was caught on a number of occasions in gillnet fisheries and Stellate smooth hound (*Mustelusasterias)* was also recorded. In the gillnet fisheries observed, lesser spotted dogfish or small-spotted catshark(*Scyliorhinuscanicula*) were frequently discarded in relatively high numbers.

Sweden: In 2008 a project investigating the use of pingers indicated the possibility that pingers may increase the seal fisheries conflict in the Baltic. The results showed that the catch damaged by seals increased with the use of pingers. It is thought that the seals might have used the pingers as a "dinner bell" to find static gear.

Estonia: Estimated 200–300 seals caught by fishing gears (mainly by trapnets) in 2010. 80–90% of these were grey seals (*Halichoerusgrypus*) and the remainder were ringed seals (*Pusahispida*).

Italy: In Italy observers are trained to collect any additional data on bycatch of other protected species (e.g. loggerhead turtles) and species of conservation concern (e.g. sharks and pelagic rays). In 2010, Italy reported 29 loggerhead turtles (*Caretta caretta*), as well as a high number of sharks and rays.

4.5 Further issues

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

Some Member States provide information on bycatch based on strandings data. As it is not specifically requested in the national report, nor are these data collated elsewhere, they may represent another source of data on bycatch.

The Danish report does not mention bycatch of species other than cetaceans, whereas the EM trial with six gillnet vessels did provide evidence of other bycatch.

The national report from Belgium mentions strandings of harbour porpoises and seals. 14 common seals (*Phocavitulina*) and two grey seals stranded in 2010. The cause of death of these animals was systematically investigated. For the porpoises washed up, the cause of death could be established in 13 cases, of which seven were incidentally caught in fishing gear.

According to the information provided by the maritime authorities in Portugal, which register strandings, there are no direct records of cetacean bycatch associated with fishing activities in 2010. There were 35 strandings of dead cetaceans registered, most of which occurred in the central region, between Peniche and Lisbon. The most commonly stranded species was the common dolphin. Additionally, the Portuguese Wildlife Society which coordinates three local stranding networks along the coast (North, centre-western and South coast-Algarve) reported 131 strandings of dead cetaceans for 2010 of which 46% were common dolphins and 56.5% of all the animals showed signs of fisheries interactions.

In the absence of observer schemes, Estonia has conducted interviews with fishermen. No cetacean bycatches were reported.

Estimates of bycatch inferred from strandings data are not reported in the Dutch National report, although a minimum bycatch estimate has been provided in 2010 based on the number of stranded harbour porpoises diagnosed as bycaught, through necropsy.

Specific problems

In the National report of Cyprus it was reported that net damages are caused by bottlenose dolphins. Similarly, Estonia reported net damage by seals.

The UK mentions the problem of inaccurately recorded effort by gear type in the official statistics.

Portugal, mentions that it is particularly difficult to estimate the fishing effort and bycatches with any precision because of the fleet's polyvalent nature (see also paragraph 9.3).

Observer problems and developments

Ireland reported difficulty in justifying the current legal requirements under 812/2004 to continue dedicated observer programmes in pelagic trawling operations for small fish (mackerel, herring, horse mackerel, etc.).

Germany has implemented appropriate training measures for scientific observers under the DCF, in order to ensure suitable observation and precise scientific sampling of marine mammals.

According to the Italian national report it is increasingly difficult to recruit suitable observers, given the fact that this is a highly demanding type of work, in terms of quality of working life (e.g. working hours and environment). Italy notes excessively bureaucratic procedures for obtaining permits of inspecting boats from the Harbour masters.

UK Observers for bycatch are also monitoring pinger use and quantifying catch, seal damage and bycatch in pingered nets, but are not involved in any enforcement measures.

In the UK bycaught animals are sampled whenever possible. One or more teeth are removed for age determination, skin and blubber samples are obtained, sex is determined and girth, length and blubber thickness measurements are taken. The internal temperature of each animal is also recorded to determine very approximate time of death.

For larger UK flagged vessels that rarely visit UK ports, it is hard to place UK observers on board. In the UK this issue has been addressed by employing observers based in Spain to cover UK flagged boats that operate mainly from Spanish ports. The Dutch report mentions that they have been observing on board UK vessels.

In The Netherlands cooperation with the four big fishing companies is sometimes hampered by disagreement between the companies involved about who is going to take the burden of observers on trips where (a lot of) discards are expected. For these trips companies may claim that that they are not able to accommodate an observer, hoping that vessels of the other companies will take an observer instead. This may lead to certain periods with less observer effort, meaning that the coverage is biased towards trips where less discards are to be expected.

Developments Ireland suggests that after five years of work have been carried out under 812/2004 it is now (2010) time for a thorough review of this regulation which results in smarter, more efficient bycatch reduction programs which focus on fisheries where problems actually exist and where achievable targets are set.

In order to obtain an average estimate for bycaught and dead bottlenose dolphins, which could take into account the rarity of these events of the area where they occurred, a five year annual average estimate was calculated by Italy.

In Portugal, it was decided, in cooperation with the fishermen's organisations, to implement self-monitoring, which involves having the masters of the vessels concerned complete logbooks, tagging the mammals caught (SAFESEA project/EEA grants tags have been delivered since 2010), and collecting the dead animals (in one port only so far).

Poland ordered special devices, which detect the operation of pingers. The devices were received in September 2010 from Denmark. They enable a real-time monitoring of pingers operation during fishing. Inspections are carried out with pinger detectors during the monitoring of submerged nets, or visually by inspectors who – during net roll or during controlling nets that are already on board – check if nets are equipped with pingers.

Specific problems Based on comments in the national reports of among others the UK and Portugal, it seems to be particularly difficult to estimate the fishing effort and bycatches of gillnetters with any precision because of the fleet's polyvalent nature.

5 ToR B: Impact of bycatch on population level

The aim of the ToR was to "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". There are a number of stages in assessing impact at the 'population' level: i) assessing the abundance of the management stock ii) quantifying the amount of bycatch within the fisheries operating in the same geographical area iii) determining whether the level of bycatch represents a cause for concern as assessed against an agreed management objective.

For cetaceans in the Northeast Atlantic abundance estimates for some species are available from the large-scale SCANS (Hammond *et al*., 2002; SCANS-II, 2008) and CODA surveys (Macleod *et al*., 2009). Within parts of this area, bycatch of harbour porpoise and common dolphin has been relatively well documented, particularly in gillnets and pelagic trawls respectively. The relevant fisheries data include fleet effort and bycatch rate. Therefore, the basic information to make an assessment of impact, at least for some species and in certain monitored fisheries, is available. An agreed threshold of 'allowable bycatch' beyond which it should be considered unsustainable remains unclear at an EU level; an IWC-ASCOBANS workshop determined that a total anthropogenic removal beyond 1.7% of the best estimate of population abundance should be considered unlikely to meet the management objective of maintaining porpoise abundance at 80% of their carrying capacity (IWC, 2000). This upper limit of bycatch has been agreed in the past by Ministers under the North Sea conference process (NSC, 2002).

One of the fundamental issues in making the assessment of impact is in the processing and marrying of the abundance and bycatch data, both spatially and temporally. Abundance estimates for cetaceans are available within survey blocks and over the entire survey areas; however, the boundaries do not necessarily delineate true biological populations. Additionally, for most cetacean species in the Northeast Atlantic, there is debate about population structure given the scarcity of data and often conflicting results generated by different approaches. Fisheries data in the Northeast Atlantic are collated by ICES regions and subdivisions which have no bearing on cetacean population structure. Therefore, spatial matching of the two types of data needs careful consideration and definition of spatial units for management purposes is more workable and will allow progress to be made toward assessing population level consequences.

5.1 An approach for assessing impact of bycatch; WKREV812

WGBYC reviewed the approach that was developed as part of the WKREV812 workshop in September 2010 to assess the impact of bycatch on cetaceans. The WG considered an example of the assessment of bycatch of harbour porpoises in gillnets in the North Sea undertaken during WKREV812.

A fundamental decision was to define 'Management Regions' (MR) consisting of multiple ICES subdivisions and containing abundance information on porpoise. Stratified porpoise abundance estimates were pooled and prorated by area to match the 'Management Region'; this was an easier process than trying to spatially redefine fisheries data to an ill-defined population area. The North Sea management region was defined as ICES Area IVabc for the purposes of this exercise.

Within the MR, the abundance of harbour porpoise was estimated as ~205 000 animals by pro-rating SCANS II abundance estimates for survey blocks within and straddling the MR. The annual amount of gillnet fishing effort within the MR was estimated at around 34 000 days at sea (for all countries) and given a range of putative bycatch rates (including a maximum of one porpoise/20 days fished, from the UK skate fishery), a total likely maximum take of about 1700 porpoises was estimated within the MR[1]. Applying the 1.7% rule to the known abundance, the maximum sustainable bycatch would be ~3500 harbour porpoise. For bycatch to exceed this level would require average bycatch rates in North Sea fisheries to exceed one porpoise caught for every ten days fished. This seems unlikely given the reported range of bycatch rates.

5.2 Assessment of the WKREV812 approach

Whilst it is a very 'broad-brush' approach, it does offer a means of identifying areas and fisheries where bycatch may be exceeding sustainable levels and therefore provides a means of prioritising resources for further monitoring of fisheries, leading to the introduction of mitigation measures as required. The approach is not limited to assessing cetacean bycatch; where abundance and catch data exist for other taxa, such as turtles, and where the limits to sustainable takes can be estimated, the sustainability of the bycatch could be assessed. However, the application of the approach to other taxa, would generally require definition of the management objective; the 1.7% rule would not necessarily apply.

There is scope to refine the approach to generate estimates for a specific fishery or sector of the fleet. There is also the potential for it to be applied to fisheries where there are no monitoring data (the Spanish fleet for example) by applying a bycatch rate from a comparable fishery within the same general area. Within MRs, several bycatch rates could be used (available) to better represent the range of potential bycatch. Similarly, how bycatch rate is defined (it could be bycatch per tonne of fish landed) could alter the estimated amount of bycatch. This needs to be fully explored.

For some fleets, such as the Portuguese polyvalent fleet, separating the fishing effort by gear type is problematic. However, if this problem could be resolved, then the bycatch assessment approach could be applied to such a fleet.

5.3 Further work for WGBYC

The approach is dependent on the availability of abundance data for the species of interest; generating such data is outside the scope of WGBYC. However, the published literature is an easily accessible source. The WG does collate data on fishing effort and bycatch rates and therefore, calculating bycatch limits and making the comparison with known bycatch within a MR is a reasonable objective of the WGBYC.

It was agreed that this ToR would appear on the 2013 agenda with the specific objective to assess sustainability of harbour porpoise bycatch in the North Sea and adjacent waters (Skagerrak – Inner Danish waters). Some of the tasks identified:

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[1] The estimated bycatch limits for a range of species within the Northeast Atlantic, Mediterranean and Black Sea are given in Tables 2–3a&b.

Repeat and refine the WKREV812 approach for harbour porpoise bycatch in the North Sea gillnet fishery;

Tabulate available bycatch rates within a range of fisheries so that the most appropriate rate can be applied; and

Assess spatial variation in bycatch rates.

The Commission may be able to assist with supplying effort data for the various fleets within the chosen MR.

The WG agreed that there would not be enough time at the 2013 meeting to attempt to apply the approach to other taxa. The work involved to assess turtle or seabird bycatch needs scoping before going forward. However, there are a lot of data available on sea turtles on strandings, the fisheries in which they are caught, the amount of bycatch and for some regions, abundance estimates. Thus, tentative efforts will be made to asses these taxa, namely loggerhead turtles, *Caretta caretta*. Spain and Portugal agreed to prepare the necessary information for future WGBYC meetings and a specific ToR on the subject. To support this interest, recent works and observations from Spain and Portugal are as follows:

Portugal Sea turtle stranding data with detailed evaluation of causes of death are available for the whole coast since the year 2000. However, records increased for the last two years (2010–2011), with indication of fisheries interactions in about 40–50% of the cases. Observation schemes within the SafeSea project-EEA grants (2008–2010) and presently within the Life+ MarPro (2011–2015) give bycatch reports of loggerhead turtles, *Caretta caretta* especially in gillnets and leatherback turtles, *Dermochel scoriacea* in beach-seine and demersal trawling. Also, since 2010, eight live stranded and rehabilitated loggerhead turtles have been released back to the wild off Area IXa with electronic tags in order to get information on species movements and dispersion. Finally, starting in 2011, a PhD project is for the first time addressing the interactions of sea turtles and Portuguese fisheries, what will bring more effort in combining national data in order to improve monitoring and bycatch assessment risks, and eventually propose mitigation measures in areas of most concern such as the southern coast (Algarve).

Spain Sea turtle bycatch in surface longlines is being monitored by different projects focusing on the development of bycatch mitigation measures. In the Mediterranean fishery targeting swordfish, tested measures have reduced bycatch rates of the NW Loggerhead turtle DPS (NOAA, 2012) by over 90% in 2010 and 2011. Monitoring in the context of the LIFE+ INDEMARES project has identified a potential risk for the Mediterranean loggerhead turtle stock due to bycatch in lobster gillnets in the Balearics. The assessment of this risk is however difficult due to the characteristics of the affected fleet, made up of a great number of small vessels.

6 ToR C: Bycatch mitigation trials

The working group heard about several studies that aim to mitigate bycatch of relevant species.

Mitigation of small cetacean bycatch has largely focused on pingers, which have several issues such as high cost and potential habituation. As far as other mitigation measures are concerned, Portugal under the scope of the SAFESEA project (EEA-Grants) that finished at the end of 2010, has acquired "acoustically improved" gillnets and trammelnets that have shown some promise in other studies worldwide (Trippel *et al*., 2006; Larsen *et al*., 2007; Mooney *et al*., 2007). These nets contain a filler, barium sulphate, that increases their acoustic reflectivity and also their stiffness compared with traditional nets, with both factors likely important in reducing bycatch of marine mammals, namely harbour porpoises and common dolphins. A short pilot study has taken place since mid-2011, with two boats using these nets (results to be analysed), although a larger study involving a total of twelve boats will start during 2012. Current and future costs are covered under the framework of the Life+ project MarPro, which will continue for the next four years. Other mitigation measures are to be proposed using a manual of good practices recently compiled under the SAFESEA project (EEAGrants) and to be delivered to the fishing community. Some measures to be suggested to the skippers using gillnets and trammel nets are for example: avoid setting the nets close to cetaceans; avoid setting nets in depths lower than 30 meters; never use semi-driftnets or any sort of buoyant nets; avoid fishing in areas where cetaceans are constantly observed. Aside from this, the use of pingers in problematic areas is strongly suggested, and barium sulfate nets may be recommended as depending of the results from all the trials are compiled. Specific workshops directed to the fishing community will be held in order to promote mitigation.

In Spain, bycatch and depredation mitigation trials are being conducted in the context of the LIFE+ INDEMARES project focusing on the impacts of interactions between *Tursiops truncatus* and gillnet fisheries.

6.1 Pinger trials in European fisheries

In the Netherlands, the Coastal and Marine Union (EUCC) initiated and now coordinates a project, which started at the end of 2010, and in which the general aim is to mitigate harbour porpoise bycatch in Dutch large mesh size trammelnet and gillnet fisheries. Target species are cod, turbot and brill. Under the project the practicality and efficiency of two acoustic devices is being investigated; bycatch is monitored and the landing of bycaught porpoises is facilitated. The project also aims to exchange knowledge and experience with parallel pinger trials and to explore innovative methods to reduce bycatch. The study is selected under the Dutch Operational Programme "Perspectief voor een duurzame visserij" and funded by the Dutch Ministry of Economics, Agriculture and Innovation (EL&I) and the European Fisheries Fund "Investment in sustainable fisheries". The project is a close collaboration between the EUCC, the Dutch Fisheries Organisation (Nederlandse Vissersbond), the expert group on setnet fishery and a group of winter setnet fishers. In 2010, two acoustic devices (the BananaPinger154 Fishtek Ltd. and the STM DDD02) were selected and will be tested in 2011 and 2012. Participating fishers received a permit to land bycaught porpoises. In collaboration with IMARES porpoise click detectors are used to study the efficiency of the devices. A behavioural study on the effect of the BananaP-

inger on a harbour porpoise will be done at the test pool of SEAMARCO in the Netherlands.

In the UK bycatch mitigation work has been focused on implementation trials of the DDD03-H and DDD03-L in pelagic trawls and gillnet fisheries respectively. Trials coordinated by the Sea Mammal Research Unit in collaboration with the Cornish Fish Producers Organisation and some other vessels have examined the efficacy of using DDD03-Ls at each end of a fleet of nets. Fleets can be up to 8 km in length but are typically less than 4 or 5 km in length. Used in this way the devices can be safely attached to the anchor ropes at each end of a fleet with little risk to crew during deployment and no risk of pingers becoming entangled among the meshes of the nets when stored in netpounds or when being shot away. The devices seem robust to this deployment method. Bycatches of porpoises were reduced by only 37% overall but by 95% in nets of 4 km or less, suggesting that at 4 km spacing at least, these devices are effective, but less so with increased spacing. If used at a maximum of 4 km spacing by the UK over 12 m fleet fishing in the western Channel and Celtic sea, then bycatch of porpoises would be expected to decrease in this fleet sector from around 200 animals per year to around ten animals per year. Habitat exclusion was also considered, and it was suggested that even if DDDs were to completely exclude porpoises to a distance of 2 km then they would be excluded from less than 1% of the total area of the Celtic Sea at a time when all the over 12 m vessels were fishing. Further details are available in a recent report (Northridge *et al*., 2011).

In Portugal, mitigation trials are being performed in the polyvalent (GTR – 2.83% of the fleet), purse-seine (14.74% of the fleet) and beach purse-seine (10% of the fleet) fleets. These trials started in 2010 under the framework SafeSea (EEAGrants 2008–2010) and will continue for the next four years under the framework of the Life+ project MarPro. Fishermen are voluntarily using pingers and participating in the trials. Any subsequent legislative or administrative measure will be implemented after the analysis of these trials′ results. The pingers used are Fumunda (both F10 and F70), and experiments compare results with boats with active pingers, inactive pingers and controls (no pingers). For 2010 only, the results looked promising with reduction of interactions and mortality in boats using pingers for all gears, and no effect on cpue or amount of landings when comparing controls and active pingers in the purse-seiners and polyvalent gears tested. There are not enough data to draw conclusions on cpue or landings on the beach-seine fishery. A number of technical challenges and economic issues may limit their wider practical use, although an effort to continue these trials and solve some of these problems is expected, to get reliable information and evaluate whether the use of pingers should be applied everywhere or specifically in areas of the highest bycatch problems (north and central western coasts).

ADDs are not currently used by Spanish fishing vessels. The *Secretaría General de Pesca* conducted a project for testing the efficiency of ADDs in gillnet and purse-seining fisheries (P. TECNO 2006–2010). In parallel this project focused on capacity building of fisheries with regards to Reg. 812/2004 and developing methods to monitor the use of ADDs, looking at a licensing system, digital identification codes and detection (with the assistance of the Danish company ETEC which has on the basis of this work developed the PD1102).

The working group welcomed the results of these trials and noted the importance of designing such trials to limit as much as possible the effects of the many variables that can influence the outcome of the trials, ideally to only one factor, *i.e.* the pinger

signals. In particular, the need for full control of the fishing operations was emphasised.

Habituation and displacement effects are some of the biggest concerns when using traditional pingers in commercial gillnet fisheries. It has therefore been tested if harbour porpoises would habituate to pingers, by monitoring their acoustic behaviour in relation to a single pinger (AQUAmark100). Two setups were made. In DK the setup contained one pinger running in cycles of 23 hours circles and an array of five C-pods placed at 0, 200, 400, 800, 1600 meters distance to the pinger. In Scotland the same pinger was deployed however in a triangular array hawing two C-pods on 0, 200, 400, 800, 1600, 2400, and 3600 meters distance to the pinger. The results from DK showed that the pinger had a significant effect on the detections of porpoises on all distances measured and habituation occurred, where the UK trial only found a significant effect of the pinger on 0–400 meters distance to the pinger.

WGBYC discussed the different results obtained. Here it was suggested to gain information on pinger sound propagation according to different seabeds and rerun the DK trial in order to investigate the possibility of collecting the same results one more time, since the displacement distances are higher than expected.

The working group noted that there is a need for clear definitions of what constitutes habituation in the context of ADDs and research on how it affects the mitigation efficiency of ADDs. Similarly, the term 'habitat exclusion' needs to be defined in the context of ADDs, and research is needed on the population level effects of such habitat exclusion.

To determine a method of harbour porpoise bycatch reduction in the Puck Bay, southern Baltic Sea, where the highest bycatch was recorded during the last 20 years, the Hel Marine Station of the University of Gdansk conducted an experiment with a ten miles long acoustic barrier of Aquamark 100 pingers. The barrier was deployed to keep the animals out of the most intense traditional gillnet fishing ground. Such an arrangement of pingers instead of deploying them on fishing nets restrained the majority of harbour porpoises from entering the bay which was confirmed by the number of animal detections on two parallel POD lines deployed in front and behind the pinger line. During the experiment no bycatch was reported by fishermen from the Puck Bay. The method of using a pinger barrier could be used as a temporary measure of harbour porpoise protection against bycatch in the area of Puck Bay which is a NATURA2000 site and a Baltic Protected Area of HELCOM. It might be recommended in species and habitat management plans until a method has been developed and implemented that does not exclude the animals from the area. This method reconciles the needs of fishermen, which is the traditional use of gillnets, with mitigation of harbour porpoise bycatch. It reduces the mortality of the animals occurring in the Puck Bay most often in winters and springs, which are the seasons of the most intense gillnet fishery in the area.

7 ToR D: Development of bycatch database

Bycatch estimates of protected species submitted by Member States to the WG for 2010 are collated in Table 4. Data were available in National reports and were also provided in spreadsheets by MS scientists using a format agreed in advance of the WG. Data were received from France, Germany, Ireland, Netherlands, Poland, Portugal, and the UK. Data were also received from Denmark but not sufficiently detailed to include in the 2010 report and these data will added to the WG database in 2012. Most data were provided by individual ICES division (e.g. VIIc) as opposed to multiple divisions, which will facilitate more detailed analyses. Métier data above level three were provided in a variety of formats which precludes carrying out detailed analysis of bycatch in relation to gear types. The issue was not resolved at the meeting and it was agreed to discuss this further at the next WG.

Where total bycatch estimates were not provided by MS for a particular stratum, they were extrapolated based on total effort days divided by observed effort days multiplied by number of specimens bycaught. These extrapolated figures produced some relatively high bycatch figures. The representativeness of these figures is unknown however. For example an extrapolated figure of 6137 common dolphins was produced for the Portuguese polyvalent fleet targeting hake and seabream in IXa. However observer coverage of just 0.2% was achieved in this fishery and sampling focused on vessels primarily using setnets rather than other gears because of problems with bycatch associated with this gear type. Available observer data are not considered therefore to be representative of total fishing effort and this highlights the importance of using other methods such as extrapolating bycatch from total landings figures in order to derive more accurate bycatch estimates.

Other notable bycatch estimates include 1460 common dolphins (extrapolated) by the Portuguese purse-seine fishery for small pelagics, 614 bottlenose dolphins (extrapolated) and 80 harbour porpoises (provided) by the Portuguese polyvalent fleet. It is important to note that these figures refer to the number of bycatch events and do not refer to whether the animals were alive or dead when returned to sea. Animals were observed as being returned alive in a number of incidences in these Portuguese fisheries. Some 168 striped dolphins (extrapolated) and 105 common dolphins (extrapolated) were also estimated as total bycatch by the French pelagic trawl fishery for bass and bream in specific ICES divisions, and 34 striped dolphins (extrapolated) and 21 harbour porpoises (extrapolated) by French pelagic trawls targeting small pelagic fish in specific ICES divisions. An estimate of 58 harbour porpoises (provided) was also produced for French vessels using setnets in VIIIb.

The group pointed out that estimates based on extrapolation from the database, highlight fisheries and areas that need further exploration as the sampling carried out may not be representative of the fleet effort used in the extrapolation. For example, in the case of the extrapolated bycatch estimate of 105 common dolphins, France noted that this was probably an underestimate given that no observations occurred in January and February when 80% of bycatch occurred in seabass fisheries in other years. Nevertheless, despite the fact that estimations provided by the authors of the national reports may take issues of representativeness into account, they should be treated with caution.

Development of WGBYC database

The WG met with Henrik Kjems-Nielsen from the ICES DataCentre to discuss development of the database on bycatch monitoring and relevant fishing effort in European waters. The evolution of the data management system to two simple Microsoft Excel spreadsheets on effort and bycatch which are pasted directly to a Microsoft Access database was explained to Henrik. Henrik demonstrated the data management systems used by ICES, specifically Intercatch which is used for DCF catch data and Datras which is used for survey data as well as the form which would need to be completed if data were submitted to ICES. Recent communications from the EC regarding monitoring of bycatch of protected species being carried out under the new DCF instead of dedicated observer programmes were also discussed. It was agreed that the current data management system being used by the WG was fit for purpose and could be hosted on SharePoint as is currently the case. Ongoing attempts to retrospectively improve the quality of data compiled by WGBYC and the future changeover to monitoring under DCF suggest that it would be best to continue using the current database for the moment. This situation can be reviewed going forward in relation to developments under DCF in this regard.

Attempts to populate the database with data provided by ICES division for the previous three years

Three countries, Ireland, Netherlands and UK provided data from 2008–2010 by ICES division (e.g. 27, IVc). Data provided in this standard spatial format will greatly assist in attempts to evaluate the impacts of bycatch on relevant cetacean species at a population level as previously carried out at WKREV812 and the WG will continue to request MS to provide data in this format going forward. Despite clear definition of data required under the EC standard format, some data fields continue to be provided in a variety of different formats. Métier data are particularly heterogeneous and consequently data can only be analysed at métier level 3 e.g. pelagic trawls or nets and this prevents detailed analyses of bycatch in relation to gear types. The WG agreed to discuss these issues further at the next meeting.

Data collated to date were examined with a view to assessing their suitability for use in future evaluations of the impacts of bycatch at population level. The premise here is that a series of estimates of bycatch rates (bycatch/day) can be used to select the most appropriate estimates to populate geographic areas/ICES divisions. These data can be used in combination with total fleet effort data and information on cetacean population status to derive relatively detailed evaluations of impact of bycatch on population status.

It may be possible to combine bycatch rate data from different samples or countries to provide more powerful estimates for a given ICES division. It may also be possible to develop objective criteria for selecting which bycatch rates to use for a given ICES division such as spatial or temporal proximity or number of days observed.

8 ToR E: Collaboration with PGCCDBS/SGPIDS

Simon Northridge attended the Study Group on Practical Implementation of Discard Sampling Plans (SGPIDS) in July 2011 on behalf of WGBYC. The Study Group is focused on the implementation of national discard sampling plans and helps to develop protocols for data collection and data management. Many of the members of SGPIDS are responsible for maintaining national discard sampling databases. Northridge communicated the fact that WGBYC has an interest in analysing data collected under the DCF that relate to protected species, including mammals, birds and protected fish species. SG members pointed out that protocols for collecting data on such species were often imperfectly elaborated, and that it would be difficult to ensure consistency of approach with respect to historical data. It was suggested that members of WGBYC should approach individual national co-ordinators in order to obtain such data. This was the approach that members of WGBYC had in fact adopted in obtaining data on protected fish species intended as a test of this strategy.

SGPIDS devoted considerable effort to discussing sampling protocols, especially with regard to trying to address potential issues of sampling bias. It was noted that many of the concerns that SGPIDS explores, including those surrounding the representativeness of sampling and data validation, are also relevant to WGBYC. It was suggested that WGBYC members could draw on the experience of SGPIDS to further improve monitoring schemes aimed at protected species bycatch. In a similar vein, WGBYC addressed aspects of the practical implementation of monitoring schemes including training and safety issues and collaboration with industry. It was suggested that WGBYC members would benefit from reviewing the report of SGPIDS and that the Working Group should continue to monitor the work of SGPIDS and seek ways to ensure a two-way flow of information between the two groups. Bram Couperus agreed to attend the next SGPIDS meeting and report back to the WG in 2013.

The continuation of the cooperation between the groups has become even more important in the light of the recent communications from the EC (see Chapters 3 and 11).

9 ToR F: Improving methods for monitoring and assessment of impact on populations

9.1 Protected and/or endangered fish species

9.1.1 Developments in the United States: spatial and temporal patterns in ocean bycatch of river herring: developing more effective monitoring and management strategies

River herring (alewife and blackback herring) are important species within the ecosystem of coastal New England. They support traditional, small-scale harvest activities and provide forage for seabirds, and many fish species including striped bass and blue fin tuna. While the exact state of river populations is not clear, what is clear is that many river herring runs have declined along the East Coast to such a degree that collapse of the coast-wide stock is feared.

Although small segments of the East Coast river herring population – such as those that migrate up the Kennebec River in Maine to spawn every spring – have made a comeback due to dam removal and good management practices, historical catch data show that the species are at levels well below historical levels. Since reaching a peak of almost 37 million pounds in New England in 1958, commercial landings of river herring have declined 98 percent to 741 000 pounds in 2007 despite improvements in water quality, restoration of fish passageways, and state-specific landings moratoriums. At 2007 prices, the 1958 catch would have been worth $7 460 000.

In recent years there have been a suite of management responses to the observed declines. In 2006 NMFS designated both species (alewife *Alosapseudoharengus* and blueback herring *Alosaaestivalis*) as "species of concern". In 2009ASMFC passed a default closure of directed fisheries for 2012, with provisions to continue harvest in a river if sustainability could be demonstrated. In response to potential litigation in 2009 ASMFC and MAFMC requested an emergency action from the US Secretary of Commerce. In 2010 and 2011, river herring bycatch was addressed by both councils, NEFMC (Amendment 5 to the Atlantic Herring FMP) and MAFMC (Amendment 14 to the Squid, Mackerel, and Butterfish FMP). In 2011 a petition was lodged with NOAA to consider listing river herring as threatened under the Endangered Species Act. While these actions are ongoing, there is a need to develop robust strategies for management and conservation of the species.

An analysis to determine river herring hotspots at sea from fishery-dependent data was presented as was development of a series of spatial and temporal management options for monitoring/avoidance and protection. In addition, research survey data were used to determine areas where river herring are likely to be encountered and to verify patterns from fishery-dependent data. These analyses are currently before the New England Fisheries Management Council for further consideration.

9.1.2 Data review protected fish species under the Habitat Directive

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

(*Lampetrafluviatilis*and *Lethenteronzanandrai*) and shad (*Alosa* spp.) are listed on 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 being maintained at a favourable conservation status. All of these species/species groups are also listed on Annex II and should be protected through the designation of Special Areas of Conservation.

WGBYC reviewed five marine fish species that are listed in at least one of the Annexes of the Habitats Directive: Twaite Shad, Allis Shad, River Lamprey, Lamprey and Sturgeon.

The data request was set out during last year's meeting in order to test the usability of discard data for DCF schemes, rather than carrying out an extensive assessment. It was therefore agreed that members of the group would bring data from their national discard sampling schemes in formats that were at hand and easy to deliver. Members agreed to deliver data in an Excel sheet with species, number of specimens, month, ICES rectangle, Gear type (up to level 6), effort (any: most adequate for the fleets segment at hand) and preferably notes on target species and sampling protocol. It was noted that even if no records existed for any of these species, sampled effort data by gear type, month and ICES rectangle should be provided to help establish overall bycatch rates.

The data brought to the meeting varied from nothing, or references to published papers or reports, to databases containing the complete National DCF sampling data from the last 15 years. In addition the UK and the Netherlands brought some landing data.

Ireland and France brought working papers in which the data information was summarized (Annex 6). Poland has published some information of shad bycatch (Skora *et al.*, in prep.).

There are mainly records from twaite shad or *Alosa* spp. The other species were found only in a few incidents (lamprey, river lamprey and sturgeon). Hotspots of catches were in ICES Areas VII and VIII (British and French data, mainly gillnets and midwater trawl and to a lesser extent in IVc and IVb (British and Dutch data, gillnets, Scottish seine and beam trawl). Most catch locations were coastal.

Preliminary analysis during the meeting showed some seasonality and interaction with multiple gear types. There were striking differences between DCF sampling data and landings: the majority of landings of shad in Britain came from gillnet and trammelnets, whereas the DCF sampling data found higher catch rates of shads in trawls.

Issues that were identified concerning the availability of the DCF data were (1) that the data reside in different institutes, which causes problems of easy access and (2) that DCF observer schemes are designed to cover metiers in a representative way, hence they do not cover areas in a representative way. Also it is likely that large numbers of specimens are overlooked in fisheries with large catches of the target species: catches are sampled by collecting a few baskets from tens or hundreds of tons of catch (i.e. Dutch freezer-trawlers in the Channel).

Concerning the landings data it is suspected that species identification may not always be to species level. In some cases the species may not be recorded in the landings because the species recorded should be protected under National law.

Despite the limited analysis the group was able to carry out, it was concluded that national DCF sampling - and landings data contain valuable data about the bycatch

of at least shads. It should be noted however that some countries did not or were unable to provide data for this meeting, for example, USA. If made available these data may help better inform the analyses.

Therefore the members of the group are asked to bring data from the DCF sampling scheme and, if available, other sampled fisheries to the meeting in 2013 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 by rectangle by year and month ("sampled hauls" should also include those without catch);
- Number of Habitat Directive specimens of each species by gear type by rectangle by year and by month.

In addition members are asked to bring data on landings:

- Landings of HD species by ICES rectangle by year, by month, by gear.

9.2 Electronic monitoring

9.2.1 Danish EM trial

From May 2010 to May 2011 six Danish commercial gillnetters (10–15 m) fished with Electronic Monitoring (EM) systems. The main aim was to test whether a shift from a landing quota system to a catch quota system (where all catches are counted against the vessels' catch quotas) will work on small vessels. Secondary aims were to determine if EM can be used to reliably document bycatch of marine mammals and birds, and to determine the best practice for analysing the video footage with respect to marine mammal bycatch. The conclusions of the study were that there were no particular problems related to using the EM system on such small vessels, that marine mammal bycatch could be reliably recorded and that the EM system provided a better approximation to the total bycatch than fishermen's records and better than normal DCF observers. Four different methods for analysing the videos were tested but more work is needed to determine the best practice.

9.2.2 Portugal improving methods to increase observation effort

In Portugal, the main difficulties in implementing articles 4 and 5 from Regulation 812/2004 refer to logistics, and neither the research frameworks nor the Portuguese state have enough funds to monitor the fleets in order to achieve the predefined level of 5% of fishing effort using observers only. In order to achieve better observer effort levels other monitoring schemes have been implemented since 2010, such as voluntary logbooks in some polyvalent and purse seine vessels and Electronic Monitoring (EM) systems have been acquired. Three boats (one purse seiner and two polyvalent) are already using EM and a total of 17 boats (three polyvalent, three trawlers, eight purse-seiners and three offshore longliners) will be equipped in the short term. One of the aims is also to test if EM can be used to reliably document bycatch of marine mammals and birds.

9.2.3 SPAIN EM note

In Spain, since 2007 attempts have been made to introduce electronic monitoring in the Mediterranean longlining fleet in order to monitor catch of target swordfish and bycatch of loggerhead turtles. A pilot project of EM is currently being conducted in

the context of the LIFE+ with the purpose of aiding observers collect data during experimental fishing trials, and generating an interest in fishermen to use this tool as an alternative to observer programmes and as a means of defending their quota and backing certification (CMS + *Denominación de Origen*). In longlining, the cost of EM (www.archipelago.ca) is three times less than that of observers, and there is a particular advantage as the system can allow for monitoring small vessels. EM is being introduced as a demonstrative tool on one fishing vessel in the Mediterranean as well as the capacity building ship INTERMARES.

9.2.4 EM in the Netherlands

In the Netherlands a trial with one small gillnet vessel (<10 m) was carried out in 2011. Preliminary results revealed several bycatches of harbour porpoises. The sample size was too small to extrapolate to the Dutch fleet. However this result clearly shows that bycatch of harbour porpoises does occur in Subarea IVc by vessels smaller than 15 m.

9.2.5 Concluding remarks on the application of Electronic Monitoring

After the presentations a short group discussion took place on the advantages and challenges of the EM systems with respect to monitoring of marine mammals:

Advantages

- The EM systems can provide close to 100% coverage of all net hauls.
- Marine mammals are easily identified on video footage and data can be reviewed at up to 12 times normal speed.
- Pinger use is easily recognised; however, testing acoustic functionality of pingers has not yet been developed.
- In many countries the system is cheaper compared to having an observer onboard.
- Fishermen cannot put pressure on observers to have them not reporting bycatches.
- The system can be installed onboard small vessels.
- Fishery observer data collection saturation problems can be resolved.
- Potential for revisiting data.
- Technology improvements with regards to GPS, cameras, software, etc. are very fast; quality can therefore easily be improved.
- Control and security of the system is high, given formats of software and the requirement of fishermen to test the system on a daily basis.

Challenges

- Video footage can be misused and/or misinterpreted.
- Mechanical systems can break down.
- For a given amount of funding the number of vessels covered may be limited, however coverage (%) will still be higher in most countries compared to having onboard observers.
- Can manufacturers keep up? Currently only one company has the EM system on the shelf.
- Convincing the fishers to take EM onboard.

- Storage of the data: video files take a lot of hard disk space.
- Who should be in charge of data access?

9.3 An approach to assess bycatch estimates on polyvalent fleets

The WG discussed the difficulty of assessing bycatch based on daily effort related with the dynamic nature of polyvalent fisheries in countries such as Portugal, Spain and Italy. Bycatch estimates for this fishery based on daily effort (Table 4) could be overestimated and should be treated with specific care. In Portugal for example, the gear types of interest (e.g. gillnets and trammelnets) are only two of the several types of gear used on a single polyvalent vessel, since these vessels may switch gears on a daily/season basis, meaning that it is problematic to use fleet effort data to estimate effort within a specific métier.

The WG suggested that for the polyvalent fishery, an approach to separate gear types and improve bycatch estimates could be using landings of target fish species. Also, in order to obtain better information, cooperative skippers could provide daily gear specific effort records as a reference against which the rest of the fleet can be compared.

10 Other business

10.1 A note on the bycatch of turtles

There is an acknowledged need to broaden the focus of monitoring programmes from Cetaceans only to other taxa as well (chapter 3). In this light the group assessed the bycatch of turtles and the issues to be addressed by WGBYC.

Fisheries bycatch is a primary driver of population declines in several species of marine megafauna (e.g. elasmobranchs, mammals, seabirds, turtles). Characterizing the global bycatch seascape using data on bycatch rates across fisheries is essential for highlighting conservation priorities. A recent comprehensive database compilation on marine turtle bycatch in gillnet, longline, and trawl fisheries worldwide from 1990 to 2008 shows a reported global marine turtle bycatch of around 85 000 turtles. However, given that only a small percentage of fishing effort is observed and reported (typically <1% of total fleets), and given the global lack of bycatch information from small-scale fisheries, this likely underestimates the true total by at least two orders of magnitude (Wallace *et al*., 2010). This global synthesis also highlights an apparently universal pattern across fishing gears and regions where high bycatch rates are associated with low observed effort, which emphasizes the need for strategic bycatch data collection and reporting. This study provides the first global perspective of fisheries bycatch for marine turtles and highlights region–gear combinations that warrant urgent conservation action (e.g. gillnets, longlines, and trawls in the Mediterranean Sea and eastern Pacific Ocean) and region–gear combinations in need of enhanced observation and reporting efforts (e.g. eastern Indian Ocean gillnets, West African trawls; Wallace *et al*., 2010).

Research efforts in the European Union, conducted with the fishing industry and in coordination with international initiatives (Anonymous, 2010), as well as national and international management plans (e.g. U.S. Recovery Plan for the Northwest Atlantic Population of the Loggerhead Sea Turtle, *Caretta caretta*, 2009), provide an important source of data for the management of bycatch management.

Notes on the bycatch of other protected species such as seals, seabirds or turtles found in national reports on the EC Reg. 812/2004 highlight the interest in adopting protocols for recording such data within the 812/2004 monitoring schemes, as well as combining data from other monitoring programmes and data sources such as DCF, LIFE projects, research programmes, stranding networks, etc.

With regards to the fisheries currently addressed in Regulation 812/2004, sea turtle bycatch in pelagic trawls is an issue that needs to be addressed in areas of sea turtle aggregation such as the Adriatic Sea, the Canary Islands, and ICES Divisions, IXb and X. This also highlights the relevance of capacity building of fishermen and fishery observers as turtles caught alive or comatose in short trawl sets would have a high probability of survival if they were adequately handled.

Bycatch in fixed nets is a growing concern in the context of sea turtle conservation programmes. Potential risk focuses in turtle foraging, breeding and migration habitat of special relevance, such as the Adriatic Sea, the Canary Islands, Zones IXa, IXb, X, and the Balearic Islands, Malta, Greece and Cyprus. This type of bycatch risk is extremely difficult to assess and monitor but is nevertheless likely to have an overall greater impact than other fisheries.

Furthermore, within Zone IXa, reports from the Portuguese stranding scheme refer to growing concerns in relation to demersal trawling and the coastal beach-seine fishery.

Summarizing, there are several important issues of sea turtle bycatch that should be addressed by WGBYC. Firstly, with regards to bycatch risk assessment, these include:

- identifying synergies between monitoring data sources;
- improving protocols of data collection;
- facilitating the compilation and analysis of available good quality data.

With regards to bycatch management or mitigation we can highlight that in the context of sea turtle bycatch, numerous research efforts and technical workshops are being conducted worldwide. This reflects the urgency with which the risk of bycatch must be addressed in order to maintain or restore adequate conservation status of the sea turtle population segments. These efforts are providing new knowledge at a fast rate that needs to be distributed to the relevant stakeholders for:

- conducting bycatch mitigation trials and comparing results;
- development programmes to up-grade capacity;
- develop/up-grade management plans and regulations;
- up-grading guidelines on turtle bycatch management (FAO, 2009).

In order to contribute to the WGBYC, the international Working Group for the Conservation of the North Atlantic Loggerhead turtle Distinct Population Segment (DPS) will prepare the necessary background information to develop a ToR on this subject for the 2013 meeting of the WGBYC.

11 Specific tasks for next year's meeting

Protected fish species: The members of the group are asked to bring data from the DCF sampling scheme and, if available, other sampled fisheries to the meeting in 2013 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 by rectangle by year and month ("sampled hauls" should also include those without catch);
- Number of Habitat Directive specimens of each species by gear type by rectangle by year and by month.

In addition members are asked to bring data on landings:

- Landings of Habitat Directive species by ICES rectangle by year, by month, by gear.

Impact of bycatch on populations - cetaceans: As a specific objective within TOR c) in 2013, it was agreed to assess sustainability of harbour porpoise bycatch in the North Sea and adjacent waters (Skagerrak – Inner Danish waters). More specifically:

- Repeat and refine the WKREV812 approach for harbour porpoise bycatch in the North Sea gillnet fishery;
- Tabulate available bycatch rates within a range of fisheries so that the most appropriate rate can be applied; and
- Assess spatial variation in bycatch rates.

Impact of bycatch on populations - turtles: Tentative efforts will be made to assess the impact of bycatch on turtles, in particular loggerhead turtles, *Caretta caretta*. Spain and Portugal agreed to prepare the necessary information for future WGBYC meetings.

12 Issues for the consideration of the Advisory Committee

The European Commission has reviewed the EU Regulation 812/2004 (see Chapter 3 of this report). Following the conclusions of this review, near future TORs of WGBYC will focus on the incorporation of monitoring of bycatch of endangered species into the new DCF. This corresponds with the on-going collaboration with PGCCDBS/SGPIDS. Therefore the group has drafted a new TOR in which the old TOR on the cooperation with SGPIDS and PGCCDBS is included. As the conclusions from the EC put more emphasis on this topic, it was decided to move the new TOR to the top of the list as TOR a).

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Annex 2: Terms of Reference for this meeting and agenda

Terms of Reference

2011/2/ACOM30 The **Working Group on Bycatch of Protected Species** (WGBYC), chaired by Bram Couperus* (The Netherlands) will meet 7–10 February 2012 in Copenhagen at ICES. The terms of reference remain similar to those in previous years:

a) Review 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);

b) 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;

c) 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;

d) Working with the ICES DataCentre, 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;

e) Continue to collaborate with PGCCDBS/SGPIDS on integrating protected species bycatch data with relevant discard survey data; specifically to collate information collected under the DCF on protected fish species for 2012;

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

WGBYC will report by 1 March 2012 for the attention of the Advisory Committee (ACOM).

Supporting information

Priority:	High
Scientific justification and relation to action plan:	a) This is usefull to answer part of the European Commission MoU request to "provide any new information regarding the impact of fisheries on marine mammals, seabirds..." b) 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. c) 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. d) Working with PGCCDBS/SGPIDS will ensure more effective cross-ICES work. e) 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.
Linkage to advisory committee:	ACOM
Linkages to other committees or groups:	WGFTFB, WGMME, WGSE, WGEF, PGCCDBS, SGPIDS, SCICOM.
Linkages to other organizations:	NAMMCO, ASCOBANS, ACCOBAMS, GFCM, EC, IWC

WGBYC agenda–10 February 2012, Copenhagen

Tuesday 7 February

9:00 Installing your laptop and get connected with the network, etc.

10:00 Welcome and routine business/household rules

10:30 Introduction, changes to the agenda and assigning tasks to the participants

11:00 TOR a) and back filling the WGBYC database

12:00 Lunch

13:00 TOR a) and d): time to prepare datasets 2008, 2009 and 2010

16:00 Discussion on the latest communication of the EC on Res. 812/2004

17:00 End of first day

Wednesday 8 February

9:00 Review of 812 reports (Ricardo, Marije, Bram)

10:00 TOR b): Impact of bycatch on populations of species

12:00 Lunch

13:00 TOR c): Mitigation measures

16:00 TOR e) Collaboration with PGCCDBS/SGPIDS

17:00 End second day

Thursday 9 February

9:00 TOR f): Develop, improve and coordinate methods for bycatch monitoring and assessment

12:00 Lunch

15:00 TOR a) and d):Finish the review of annual national reports

16:00 Writing and reviewing texts/Draft Recommendations

Friday 10 february

9:00 Writing and reviewing texts

13:00 End of meeting

Annex 3: WGBYC draft Terms of Reference for the 2013 meeting

The **Working Group on Bycatch of Protected Species** (WGBYC) will meet in 2013 at 4–8 February 2013 in Copenhagen at ICES. Its terms of reference remain similar to those in previous years:

a) Working 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/SGPIDS and Regional Co-ordination Meetings;

b) Review 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);

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 DataCentre, 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 a date to be specified by ACOM.

Supporting information

PRIORITY:	High
Scientific justification and relation to action plan:	a) As requested by the EC.Working with PGCCDBS /SGPIDS will ensure more effective cross-ICES work. b/c) This is required to answer part of the European Commission MoU request to "provide any new information regarding the impact of fisheries on marine mammals, seabirds..." d) 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. e) 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. 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.
Linkage to Advisory Committee:	ACOM
Linkages to other committees or groups:	WGFTFB, WGMME, WGSE, WGEF, PGCCDBS, SGPIDS, SCICOM.
Linkages to other organizations:	NAMMCO, ASCOBANS, ACCOBAMS, GFCM, EC, IWC

Annex 4: Tables

Table 1a–c. Summary of 2011 Annual National Reports on the implementation of EU Regulation 812/2004 covering the calendar year 2010.

1(a): Checklist/summary of 2011 Annual Reports by Member State with respective pinger obligations under regulation 812/2004, as reported.

Coastal member state of EU	Report submitted?	Pingers required	Observer days	No of bycaught cetaceans	Summedprovided estimate
Belgium	Y	N	0	-	-
Bulgaria	N*	-	-	-	-
Cyprus	Y	N	-	-	-
Denmark	Y	Y	41	0	0
Estonia	Y	N†	122	0	0
Finland	N	?	-	-	-
France	Y	Y	705	12	70 (398)#
Germany	Y	Y	48	0	0
Greece	Y	N	-	-	-
Ireland	Y	Y	151	0	0
Italy	Y	N	558	2	49
Latvia	Y	Y	459	0	0
Lithuania	Y	N	0	-	-
Malta	N	N	-	-	-
Netherlands	Y	N	158	0	0
Poland	Y	Y	73	0	0
Portugal	Y	N	161	0	-
Romania	N*	N	-	-	-
Slovenia	Y	N	-	-	-
Spain	N	?	-	-	-
Sweden	Y	Y	0	-	-
UK	Y	Y	513	14	424

* Bulgaria and Romania are not covered by Regulation 812/2004, but have supplied information in the past.

† Estonia reported two gillnetters fishing in IIIc24 in 2009 but these switched to trawling in 2010.

France provided estimate on a part of the fishery segments as other estimates were considered not significant. Number between brackets is the summed extrapolated estimate.

Table 1 b: summary of information on pinger use from member states with possible obligation to use them.

EU COASTAL MEMBER STATE	No of boats requiring pingers	% using them	Enforcement reported?	Using current regulation specs?	Other mitigation being tested	Type of pinger used
Denmark	28	100%	Yes	No-450 m spacing under derogation		Aquamark 100
Finland	No report submitted	?	?	?		
France	117?	0	no	No-concerns about safety, cost, durability		None
Germany	?	?	Yes	Yes		?
Ireland	?	?	Yes	No-500 m spacing under derogation		Airmar, AquaMark, Fumunda and Savewave
Italy	-	-	-	-	Pair trawlers using pingers voluntarily	DDD-02
Latvia	18	100%	?	Yes?		
Netherlands	0	-	-	-	Testing pingers with inshore gillnets	Fishtek Banana
Poland	?30	56% (n=17)	Yes	Yes		
Portugal	0	-	-	-	Testing BaSO4 nets; Pingers in other gears	Fumunda F10 and F70
Spain	No report submitted		?	?		
Sweden	?	?	No	?		
UK	(~22)	67–100% (~85%)	No	No-using DDDs	Pair trawlers using pingers voluntarily	DDD-03

Table 1c: summary of information on observer schemes.

	Observer Coverage of taxa other than cetaceans	Dedicated cetacean observer scheme	Cetacean observer scheme as part of DCF	Additional Comments
Belgium	Unknown	No	No	Observations made during research cruises for discard/biological sampling
Bulgaria	N/A	N/A	N/A	
Cyprus	N/A	N/A	N/A	No fishery to be monitored under 812
Denmark	Unknown	No	Yes	CCTV on vessels <12m . Fish discard.
Estonia	N/A	N/A	N/A	No fishery to be monitored under 812
Finland	No report	No report	No report	
France	Unknown	Yes	Yes	DCF monitoring was on fisheries not listed in Regulation 812
Germany	Unknown	No	Yes?	Bycatch of Delphinus 10jan2010 ROS170 not mentioned
Greece	N/A	N/A	N/A	No fishery to be monitored under 812
Ireland	Yes	Yes	Yes	Record all Endangered, Threatened and Protected species
Italy	Yes	No	No	Report protected species and those of conservation concern
Latvia	Unknown	No	Yes	
Lithuania	No	No	No	
Malta	No report	No report	No report	
Netherlands	Unknown	No	Yes	
Poland	Yes	Yes	No	Marine Mammal monitoring
Portugal	N/A	Yes	Yes	there is monitoring of >12m polyvalent vessels and purse seine and beach seine
Romania	N/A	N/A	N/A	
Slovenia	N/A	N/A	N/A	no fishery to be monitored under 812
Spain	No report	No report	No report	
Sweden	No	No	No	no monitoring carried out
United Kingdom	Yes	Yes	Yes	Protected species monitoring

Table 2. Pooled abundance estimates for each of the Management Regions proposed by the workshop together with the associated 1.7% take limits (Taken from the WKREV812 Final Report May 2011).

SPECIES	REGION	ABUNDANCE	1.70%
Bottlenose dolphin	Atlantic N (V, VI, VII, VIIIa,b)	21 049	358
Bottlenose dolphin	Atlantic S (VIIIc,d,e, IX)	9820	167
Bottlenose dolphin	North Sea	1026	17
Common &/or Striped	Atlantic	343 586	5841
Common (&/or Striped)	North Sea	5022	85
Harbour porpoise	Atlantic N (V, VI, VII, VIIIa,b)	153 977	2617
Harbour porpoise	Atlantic S (VIIIc,d,e, IX)	2831	48
Harbour porpoise	North Sea + Skagerrak (IIIa N)	205 751	3498
Harbour porpoise	Kattegat (IIIa S), Belt Seas	14 030	238
Harbour porpoise	Baltic (inlcuding all of Subdivision 24)	4856[1]	83

Table 3a. Mediterranean: possible abundance levels.

AREA	SPECIES	APPROX ABUNDANCE	1.7% LIMIT
Western Mediterranean	Striped dolphin	120 000	2040
Bottlenose dolphin	10 000	170	
Tyrrhenian Sea	Striped dolphin	100 000	1700
Ionian Sea	Striped dolphin	30 000	510
Adriatic		Striped dolphin	
Bottlenose dolphin			
Total Mediterranean	Striped dolphin	500 000	8500
Bottlenose dolphin	50 000	850	

Table 3b. Black Sea: possible abundance.

SPECIES	APPROXIMATE ABUNDANCE	1.7% LIMIT
Common dolphin	100 000	1700
Harbour porpoise	30 000	510
Bottlenose dolphin	3000	50

Table 4. Cetacean bycatch estimates collated under 812/2004 by EU member states for 2010.

Species	Métier Level 3	Country	Target Species	Fishing Area	Season	Total Effort Days	Observed Effort Days	Coverage %	No of specimens bycaught	Total Bycatch Estimate	Bycatch estimate status	CV(%)
None	nets	France		VIIIb	All Year	682	4	0.006		0	extrapolated	
None	nets	France		VIIIa	All Year	755	3	0.004		0	extrapolated	
None	nets	France		VIIIa	All Year	9048	52	0.006		0	extrapolated	
None	nets	France		VIIIb	All Year	2729	52	0.019		0	extrapolated	
None	nets	France		VIIIb	All Year	106	1	0.009		0	extrapolated	
None	nets	France		VIIIb	All Year	102	1	0.010		0	extrapolated	
None	nets	France		VIIIa	All Year	380	1	0.003		0	extrapolated	
None	nets	France		VIIIa	All Year	1129	2	0.002		0	extrapolated	
None	nets	France		VIIIa	All Year	2733	22	0.008		0	extrapolated	
None	nets	France		VIIIa	All Year	28	1	0.036		0	extrapolated	
None	nets	France		VIIIc	All Year	187	3	0.016		0	extrapolated	
None	nets	France		VIIIa	All Year		7			0	extrapolated	
None	nets	France		VIIIa	All Year		10			0	extrapolated	
None	nets	France		VIIIa	All Year	6648	68	0.010		0	extrapolated	
None	nets	France		VIIIb	All Year	4002	60	0.015		0	extrapolated	
None	nets	France		VIIIa	All Year	3575	33	0.009		0	extrapolated	
None	nets	France		VIIIb	All Year	994	29	0.029		0	extrapolated	
Phocoena phocoena	nets	France		VIIIb	All Year	4542	77	0.017	1	58	Provided	100
Delphinus delphis	Pelagic trawls	France	Bass and bream	VIIIa	All Year	316	12	0.038	4	105	extrapolated	93
Delphinus delphis	Pelagic trawls	France	Bass and bream	VIIIa	All Year	36	6	0.167	2	12	Provided	57

Species	Métier Level 3	Country	Target Species	Fishing Area	Season	Total Effort Days	Observed Effort Days	Coverage %	No of specimens bycaught	Total Bycatch Estimate	Bycatch estimate status	CV(%)
None	Pelagic trawls	France	Bass and bream	VIIe	All Year	29	5	0.172		0	extrapolated	
None	Pelagic trawls	France	Bass and bream	IVc	All Year	2	1	0.500		0	extrapolated	
None	Pelagic trawls	France	sardine anchovy and mackerel	VIIIa	All Year	369	2	0.005		0	extrapolated	
None	Pelagic trawls	France	Bass and bream	VIId	All Year	53	4	0.075		0	extrapolated	
None	Pelagic trawls	France	albacore tuna	VIIIa	All Year	28	2	0.071		0	extrapolated	
None	Pelagic trawls	France	Bass and bream	VIId	All Year	51	3	0.059		0	extrapolated	
None	Pelagic trawls	France	albacore tuna	VIIj	All Year	41	13	0.317		0	extrapolated	
None	Pelagic trawls	France	albacore tuna	VIIId	All Year	76	17	0.224		0	extrapolated	
None	Pelagic trawls	France	Bass and bream	VIIh	All Year	4	3	0.750		0	extrapolated	
None	Pelagic trawls	France		VIId	All Year	3	2	0.667		0	extrapolated	
None	Pelagic trawls	France	sardine anchovy and mackerel	IVc	All Year	8	6	0.750		0	extrapolated	
None	Pelagic trawls	France	sardine anchovy and mackerel	VIId	All Year	433	15	0.035		0	extrapolated	
None	Pelagic trawls	France	Bass and bream	VIId	All Year	298	18	0.060		0	extrapolated	

Species	Métier Level 3	Country	Target Species	Fishing Area	Season	Total Effort Days	Observed Effort Days	Coverage %	No of specimens bycaught	Total Bycatch Estimate	Bycatch estimate status	CV(%)
None	Pelagic trawls	France	Bass and bream	VIIe	All Year	851	20	0.024		0	extrapolated	
None	Pelagic trawls	France	Bass and bream	VIIIb	All Year	126	5	0.040		0	extrapolated	
None	Pelagic trawls	France	albacore tuna	VIIk	All Year	142	37	0.261		0	extrapolated	
None	Pelagic trawls	France	albacore tuna	VIIIc	All Year	16	6	0.375		0	extrapolated	
None	Pelagic trawls	France	albacore tuna	VIIIe	All Year	60	24	0.400		0	extrapolated	
None	Pelagic trawls	France	sardine anchovy and mackerel	VIId	All Year	74	13	0.176		0	extrapolated	
None	Pelagic trawls	France	sardine anchovy and mackerel	VIIh	All Year	72	1	0.014		0	extrapolated	
None	Pelagic trawls	France	sardine anchovy and mackerel	VIIIb	All Year	188	12	0.064		0	extrapolated	
None	Pelagic trawls	France	sardine anchovy and mackerel	VIIId	All Year	12	1	0.083		0	extrapolated	
None	Pelagic trawls	France	sardine anchovy and mackerel	IVb	All Year	0	1			0	extrapolated	
None	Pelagic trawls	France	albacore tuna	VIIIb	All Year	4	4	1.000		0	extrapolated	

Species	Métier Level 3	Country	Target Species	Fishing Area	Season	Total Effort Days	Observed Effort Days	Coverage %	No of specimens bycaught	Total Bycatch Estimate	Bycatch estimate status	CV(%)
Phocoena phocoena	Pelagic trawls	France	sardine anchovy and mackerel	VIIIa	All Year	483	23	0.048	1	21	extrapolated	110
Stenella coeruleoalba	Pelagic trawls	France	Hake	37	All Year	56	1	0.018	3	168	extrapolated	
Stenella coeruleoalba	Pelagic trawls	France	sardine anchovy and mackerel	37	All Year	754	22	0.029	1	34	extrapolated	98
None	nets	Germany		III b, c, d		18329	15	0.001		0	Provided	
None	pelagic trawls	Germany		III a, b, c, d		733	10	0.014		0	Provided	
None	Pelagic trawl	Ireland	HER, JAX, MAC, WHB	VIa	7–9	3	3	1.000	0	0	Provided	
None	Pelagic trawl	Ireland	ALB	VIIk	10–12	42	5	0.119	0	0	Provided	
None	Pelagic trawl	Ireland	HER, JAX, MAC, WHB	VIIb	10–12	103	4	0.039	0	0	Provided	
None	Pelagic trawl	Ireland	HER, JAX, MAC, WHB	VIIb	1–3	177	1	0.006	0	0	Provided	
None	Pelagic trawl	Ireland	HER, JAX, MAC, WHB	VIIg	7–9	47	3	0.064	0	0	Provided	
None	Pelagic trawl	Ireland	HER, JAX, MAC, WHB	VIIj	1–3	253	4	0.016	0	0	Provided	
None	Pelagic trawl	Ireland	HER, JAX, MAC, WHB	VIa	7–9	8	1	0.125	0	0	Provided	
None	Pelagic trawl	Ireland	ALB	VIIk	7–9	202	13	0.064	0	0	Provided	

Species	Métier Level 3	Country	Target Species	Fishing Area	Season	Total Effort Days	Observed Effort Days	Coverage %	No of specimens bycaught	Total Bycatch Estimate	Bycatch estimate status	CV(%)
None	Pelagic trawl	Ireland	HER, JAX, MAC, WHB	VIIa	10–12	3	3	1.000	0	0	Provided	
None	Pelagic trawl	Ireland	HER, JAX, MAC, WHB	VIb	4–6	1	1	1.000	0	0	Provided	
None	Pelagic trawl	Ireland	HER, JAX, MAC, WHB	VIa	1–3	101	4	0.040	0	0	Provided	
None	Pelagic trawl	Ireland	HER, JAX, MAC, WHB	VIa	4–6	10	10	1.000	0	0	Provided	
None	Pelagic trawl	Ireland	HER, JAX, MAC, WHB	VIIg	10–12	123	4	0.033	0	0	Provided	
None	Pelagic trawl	Ireland	HER, JAX, MAC, WHB	VIa	10–12	184	9	0.049	0	0	Provided	
None	Pelagic trawl	Ireland	HER, JAX, MAC, WHB	VIIb	4–6	6	6	1.000	0	0	Provided	
None	Pelagic trawl	Ireland	HER, JAX, MAC, WHB	VIIh	1–3	75	1	0.013	0	0	Provided	
None	Pelagic trawl	Ireland	HER, JAX, MAC, WHB	VIIg	10–12	15	7	0.467	0	0	Provided	
None	Pelagic trawl	Ireland	HER, JAX, MAC, WHB	VIIj	10–12	66	14	0.212	0	0	Provided	
None	Pelagic trawl	Ireland	HER, JAX, MAC, WHB	VIa	10–12	279	14	0.050	0	0	Provided	
None	Pelagic trawl	Ireland	HER, JAX, MAC, WHB	IVa	10–12	58	2	0.034	0	0	Provided	
None	Pelagic trawl	Ireland	HER, JAX, MAC, WHB	VIIj	1–3	144	5	0.035	0	0	Provided	
None	Pelagic trawl	Ireland	HER, JAX, MAC, WHB	VIIj	10–12	84	1	0.012	0	0	Provided	

Species	Métier Level 3	Country	Target Species	Fishing Area	Season	Total Effort Days	Observed Effort Days	Coverage %	No of specimens bycaught	Total Bycatch Estimate	Bycatch estimate status	CV(%)
None	Pelagic trawl	Ireland	HER, JAX, MAC, WHB	VIa	1–3	80	5	0.063	0	0	Provided	
None	Pelagic trawl	Ireland	HER, JAX, MAC, WHB	VIIb	10–12	69	1	0.014	0	0	Provided	
None	Pelagic trawl	Netherlands	hor, mac, bw, her,arg	VIIk	4–11	1	1	1.000	0	0	Provided	
None	Pelagic trawl	Netherlands	hor, mac, bw, her	VIIIb	1–3,12	8	1	0.125	0	0	Provided	
None	Pelagic trawl	Netherlands	hor, mac, bw, her	VIIj	1–3,12	135	9	0.067	0	0	Provided	
None	Pelagic trawl	Netherlands	hor, mac, bw, her	VIIc	1–3,12	132	11	0.083	0	0	Provided	
None	Pelagic trawl	Netherlands	hor, mac, bw, her	VIIk	1–3,12	9	5	0.556	0	0	Provided	
None	Pelagic trawl	Netherlands	hor, mac, bw, her,arg	VIIj	4–11	108	9	0.083	0	0	Provided	
None	Pelagic trawl	Netherlands	hor, mac, bw, her,arg	IVa	1–12	77	15	0.195	0	0	Provided	
None	Pelagic trawl	Netherlands	hor, mac, bw, her	VIIh	1–3,12	3	3	1.000	0	0	Provided	
None	Pelagic trawl	Netherlands	hor, mac, bw, her	VIa	1–3,12	54	25	0.463	0	0	Provided	
None	Pelagic trawl	Netherlands	hor, mac, bw, her,arg	VIIc	4–11	56	1	0.018	0	0	Provided	
None	Pelagic trawl	Netherlands	hor, mac, bw, her,arg	IVb	1–12	7	1	0.143	0	0	Provided	
None	Pelagic trawl	Netherlands	hor, mac, bw, her,arg	VIa	4–11	156	6	0.038	0	0	Provided	

Species	Métier Level 3	Country	Target Species	Fishing Area	Season	Total Effort Days	Observed Effort Days	Coverage %	No of specimens bycaught	Total Bycatch Estimate	Bycatch estimate status	CV(%)
None	Pelagic trawl	Netherlands	hor, mac, bw, her	VIIb	1–3,12	62	1	0.016	0	0	Provided	
None	GNS	Poland	cod	IIId 26		432	16	0.037	0	0	extrapolated	
None	OTM	Poland	herring, sprat	IIId 25		3129	22	0.007		0	extrapolated	
None	OTM	Poland	herring, sprat	IIId 26		3134	24	0.008		0	extrapolated	
None	OTM	Poland	herring, sprat	IIId 27		365	3	0.008		0	extrapolated	
None	OTM	Poland	herring, sprat	IIId 28		209	8	0.038		0	extrapolated	
Delphinus delphis	Polyvalent	Portugal	Hake, seabream, seabass, pouting, monkfish, cuttlefish	Ixa	Jan–Dec	98 800	161	0.002	10	6137	extrapolated	
Delphinus delphis	Polyvalent	Portugal	Trachurus sps, Sardine, Chub Mackerel	Ixa	May–October	2400	80	0.033	6	16	Provided	1
Phocoena phocoena	Polyvalent	Portugal	Trachurus sps, Sardine, Chub Mackerel	Ixa	May–October	2400	80	0.033	5	80	Provided	0

Species	Métier Level 3	Country	Target Species	Fishing Area	Season	Total Effort Days	Observed Effort Days	Coverage %	No of specimens bycaught	Total Bycatch Estimate	Bycatch estimate status	CV(%)
Tursiops truncatus	Polyvalent	Portugal	Hake, seabream, seabass, pouting, monkfish, cuttlefish	Ixa	Jan–Dec	98 800	161	0.002	1	614	extrapolated	
Delphinus delphis	Purse seine	Portugal	Sardine (80 %), (Chub mackerel, Trachurus sps, Anchovy, 20%)	Ixa	Jan–Dec (two months stop)	11 461	369	0.032	47	1460	extrapolated	
None		UK		VIIF	1–12	93	67	0.720		0	extrapolated	
None		UK		VIIH	1–12	253	11	0.043		0	extrapolated	
None		UK		VIID	1–12	1170	2	0.002		0	extrapolated	
None		UK		VIIA	1–12	6	7	1.167		0	extrapolated	
None		UK		IVC	1–12	604	5	0.008		0	extrapolated	
None		UK		VIIE	2–4	20	5	0.250		0	extrapolated	
None		UK		IVB	1–12	511	11	0.022		0	extrapolated	
None		UK		VIIE	1–12	493	2	0.004		0	extrapolated	
None		UK		VIIA	9–10	3	6	2.000		0	extrapolated	
None		UK		IVC	1–12	729	1	0.001		0	extrapolated	
None		UK		IVB	8–12	19	2	0.105		0	extrapolated	
None		UK		VIIG	5–5	11	28	2.545		0	extrapolated	
None		UK		VIIH	6–10	7	11	1.571		0	extrapolated	

Annex 5: Examples of output of sampled protected fish species under the Habitat Directive

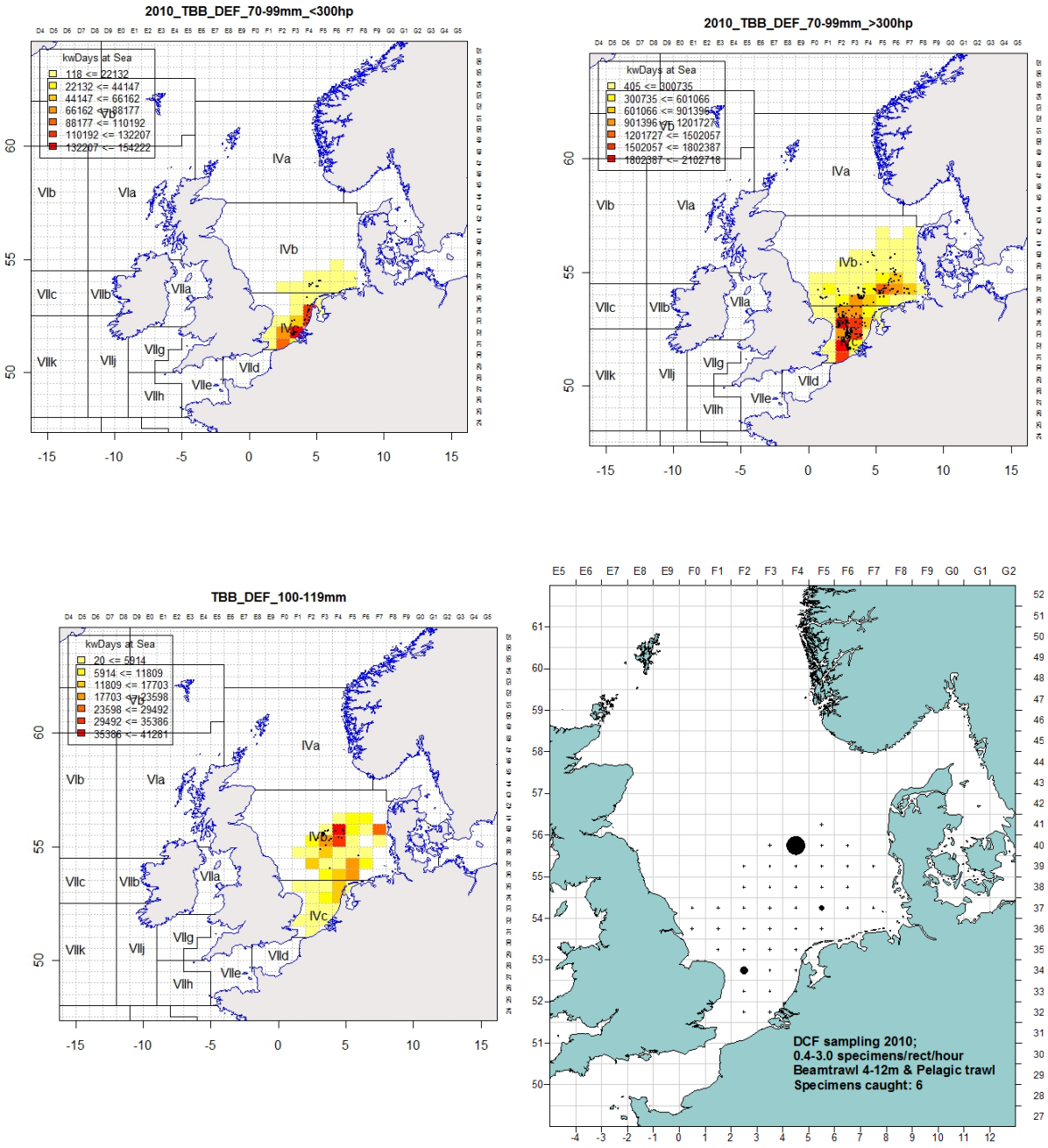

Figure 1. Effort of Dutch demersal fisheries (coloured rectangles) and sampled hauls under the DCF observer scheme in 2010. Right below: catch per hour of twaite shad in 2010 (based on six specimens).

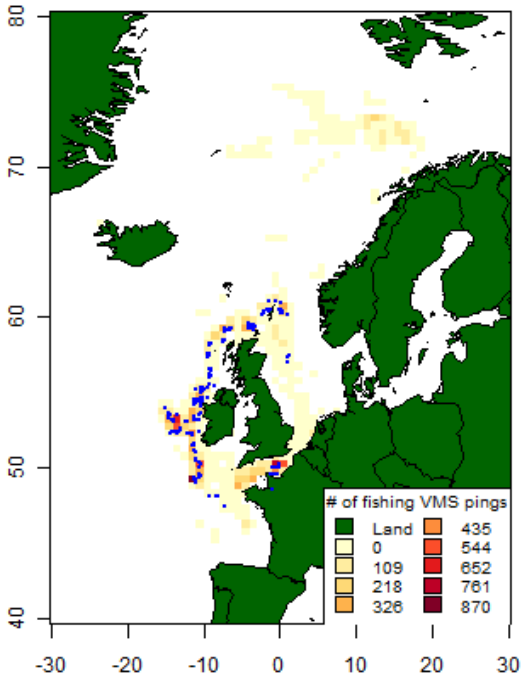

Figure 2. Effort of Dutch pelagic fishery, based on*Vessel Monitoring System*(VMS; coloured rectangles) and sampled hauls in the DCF sampling scheme (blue dots). No specimens of Habitat Directive protected fish species were observed.

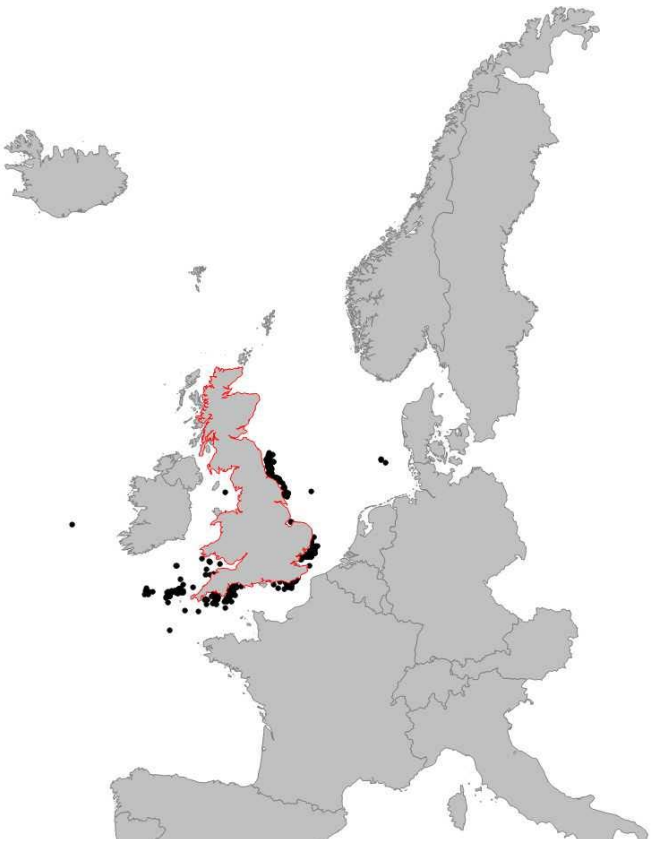

Figure 3. Catches of specimens of protected species under the Habitat Directive (allis shad, twaite shad, lamprey, river lamprey, sturgeon) from 1997 to 2011.

Annex 6: Working papers

Bycatch of 5 marine fish species listed under the Habitats Directive by Irish fishing vessels.

Working Document to the ICES Working Group on the Bycatch of Endangered Species (WGBYC)

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Marine Institute, Galway

2nd February 2012

Introduction

Ireland was asked to provide levels of bycatch of five marine species listed under the Habitats Directive: Twaite Shad (*Alosa fallax*), Allis Shad (*Alosa alosa*), River Lamprey (*Lampetra fluviatilis*), Lamprey (*Petromyzon marinus*) and Sturgeon (*Acipenser sturio*). Data on bycatch numbers, observer coverage under the Data Collection Framework (DCF), and a measurement of fishing effort by metier (to metier Level 6, as defined by the DCF) was also requested.

Bycatch numbers and observer coverage were extracted from data held on the Marine Institute Discard Database. Fleet effort by metier was taken from logbook information provided to the Marine Institute by the Irish Department of Agriculture, Food and the Marine. Data are available from 2003 to 2010. Prior to 2003, a different logbook system was used, which its present format has insufficient resolution to identify Level 6 métiers.

Bycatch

There were no recorded incidents of any bycatch of River Lamprey (*Lampetra fluviatilis*), Lamprey (*Petromyzon marinus*) or Sturgeon (*Acipenser sturio*) during any observer trips from 2003–2010.

Shad were bycaught on eight trips where observers were present. However it was not recorded whether these were twaite or allis shad, and so in this instance have been recorded as Shad–Unidentified. On the trips where shad were caught, most involved one instance with one fish caught each time. There was one gillnet trip where 59 shad were observed caught. The numbers of trips and the numbers of occasions within each trip where the listed species were caught is illustrated in Table 1 below.

Table 1. Number of trips per year where bycatch of shad were observed.

Year	Area	Gear	Number of trips	Number of events	Number of fish caught
2003	VIIb	OTB	1	1	1
2005	VIIg	SSC	1	2	2
2006	VIIb	TWR	1	1	1
2007	VIIg	OTB	1	1	1
2009	VIIg	GNS	1	12	59
2009	VIIg	TWR	1	1	1
2009	VIIa	TWR_g	1	1	1
2010	VIIg	TWR	1	1	1

Fleet effort

Fleet effort is provided as fishing days, by gear and by ICES subdivision. Active fishing days rather than days at sea are used so as to avoid counting days spent travelling, down-time, etc. There will be a small element of double counting where a vessel fished in more than one ICES subdivision, or used more than one gear in one day. However this has been estimated at less than one percent of the total. As these métiers are combined from logbook information, they do not include metiers from vessels smaller than 10 m, or other vessels for which logbooks are not required.

The complete list of métiers and bycatch levels is contained in the Excel spreadsheet Ireland bycatch monitoring table FINAL.xls, attached, for upload to the WGBYC

Some information on observed bycatch of protected fish species in the French fisheries from the Obsmer database

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"In order to test the usability of discards data for DCF schemes, we agreed to bring data from the national discards sampling schemes on five marine fish species that are listed in Annex II and IV of the Habitat Directive: Twaite Shad (*Alosa fallax*), Allis Shad (*Alosa alosa*), River Lamprey (*Lampetra fluviatilis*), Lamprey (*Petromyzon marinus*) and Sturgeon (*Acipenser sturio*). The data have to be delivered in an Excel sheet with species, number specimens, month, ICES rectangle, Gear type (up to level 6), effort (any: most adequate for the fleet segment at hand) and preferably some notes on target species and sampling protocol**. Even if no records exist for any of these species, sampled effort data by gear type, month and ICES rectangle should be provided to help establish overall bycatch rates."**

The French data base Obsmer contains all the informations collected at sea by observers in the DCF and other regulations requirements since 2003. The data base of observations at sea is located at Ifremer. The French scientific institute in charge of these species is the MNHN (lampreys and shads) and CEMAGREF (sturgeon).

A study on the occurrence of these fish species was done in order to identify the métier and fishing areas concerned with bycatch in French fisheries.

1) The presence of each species in the fishing operations of each métier observed at sea in the area was simply summed by quarter and year. The value obtained can only be taken as a semi-quantitative indicator as it does not concern numbers of individuals.

   1.1) The sturgeon *Acipenser sturio* and the river lamprey *Lampetra fluviatilis* were not found recorded in the data base of observations at sea while they are present in the referential list of the recording software. The lamprey *Petromyzon marinus* was found occasionally in one fishing operation of OTM-SPF in the Mediterranean area in 2008 and in 2009 (area G3712) and in GTR-DEF of the Atlantic Area VIIIb (rectangles 16E8, 20E8) in 2008, 2009, 2010.

   1.2) The twaite alosa *Alosa fallax* and the Allis shad *Alosa alosa* were recorded in Mediterranean area in OTM and OTB–SPF.

   1.3) For the Atlantic areas, *Alosa fallax* is recorded several times in IVc, VIId, VIIe,VIIg, VIIh, VIIIa, VIIIb. The occurrence of the twaite alosa seems higher in Areas VIIIa,b in OTB for cutllefish and setnet gears for sole and in VIId in PTM targeting the seabass.

   1.4) *Alosa alosa* was found in IVc, VIIb, VIIc, VIId, VIIe, VIIg, VIIIa, VIIIb, VIIj and possibly VIIh. The occurrence of the Allis shad looks higher in Areas VIIIa,b in setnets for hake, sole, cuttlefish. Some occurrences exists in Area VIId in OTB for mackerel, PTM for seabass and in Area VIIe in GTR for sole.

   1.5) When mixing the two species into *Alosa* spp, several occurrences were found in OTM-SPF and OTB-SPF for the Mediterranean area (Area G3712). It must be pointed out that the distinction between OTM and OTB is not very clear in that area. For the Atlantic areas, the highest occurrence was found in OTB–SPF and PTM-DEF (i.e.

mackerel and bass fisheries) for the VII d area (rectangles 27E9, 28E8, 28E9, 30F1), in GTR/GNS-DEF, GTR –Mol, OTB/OTT-MOL (i.e. hake and mainly culltlefish fisheries) for VIIIa (coastal ICES rectangles), in GNS-DEF and GTR-DEF (i.e. sole fishery) for VIIIb (coastal ICES rectangles).

In this part of the study we have only used the occurrence of the species in the fishing operations by quarter should be mentioned also that all the gears concerned with bycatch of these species are not observed (e.g. the inshore driftnets for alosa, shad and lampreys). The lamprey and river lamprey are also caught in pots with some discards probably alive (pots are not observed in the data base). Shads and lampreys are targeted sometimes in the estuaries of Atlantic sea (Gironde, la Dordogne river, la Garonne river, and in the estuary of the la Loire river)[2]). *Alosa alosa* is fished with driftnets mesh size of 55–60 mm . The lamprey is fished with driftnets 120–300 m long having a mesh size of 36 mm. The river lamprey was recorded targeted by two small boats in 2008.

2) Analysis on the two Alosa species with data raised at the haul level (Data in weight per year/month/rectangle/métier at level5; Years 2009, 2010, 2011; the two alosa species being distinguished).

The two alosa species were distinguished here as the spatial information is used at the rectangle level. The rectangle level can help for a quality assessment of the data recorded by observers;

***Alosa alosa*:** the higher percentage of catch in the coastal rectangle 20E8 (estuary of Gironde), for all the three years. In this rectangle, most of the catch (55%) was observed with métier GTR DEF (sole& miscellaneous) in September for the year 2010. In 2009, most of the catch (89%) was in March with the métier GNS-DEF. In 2011, most of the catch (82%) in that 20E8 rectangle was due to OTB-*Nephrops* in June .The previous list of métiers is depending of the coverage of the observations, and all the métiers are not covered at the same level. In the Channel and in the Mediterranean area, the quantities of *Alosa alosa* are low compared to the rectangle 20E8.

When combining discards and landings in the data base, 95% of the fishing operations of all years in the Area VIII have a weight less than 11 kg and the maximum (discards + landings) was 83 kg; Concerning the Area VII, 95% of the fishing operations have a weight less than 4 kg and the maximum was 10 kg. In the 37.1.2.Medit area, 95% of the fishing operations have a weight less than 2.8 kg and the maximum was 3 kg.

Alosa fallax: In the Channel, the species was found in year 2010 in the offshore rectangle 29E8 in winter but only in one trip (PTM seabass) and present in the discards. In 2009 the species was found also in the same rectangle but only for one haul. In 2011, the species was observed present in one single haul of the rectangle (métier PTM -sea bass). In the Atlantic area (Area VIII) the rectangles the most concerned with the twaite alosa were 19E8, 20E8 and 21E8. These rectangles represent 33% of the observed weight in all seas for the year 2011 mainly in May–June. The métiers are

[2]Girardin, M., Castelnaud, G., and Beaulaton, L., Surveillance halieutique de l'estuaire de la Gironde : Suivi des captures 2004 - étude de la faune circulante 2005. 2006, Rapport CEMAGREF p. 220 pp.

mainly OTB-bass, OTB-cuttlefish. The métier SDN-redbream also catch *Alosa fallax*. The percentage for the three rectangles is only 14% of 158 kg for 2010, 28% of 267 kg for 2009.

In the database, the species *Alosa fallax* was observed more frequently in the Atlantic sea than in the English Channel and the Mediterranean sea. This feature depends on the number of fishing operations sampled in each sea. Observations at sea show that 95% of the fishing operations in Area VII have a weight less than 46 kg and the maximum of catch in a haul was 167 kg. In Area VIII, 95% of the fishing operations have less than 14 kg and the maximum was 24 kg. In the 37.1.2.Medit, 95% of the fishing operations have less than 2.3 kg and the maximum was 7.2 kg.