An overview of the state of bycatch monitoring and mitigation measures being implemented in European fisheries

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ABSTRACT

This paper briefly reviews European member states' obligations with respect to the monitoring and mitigation of cetacean bycatch. It then summarises recent information from member states on the extent to which required mitigation measures are being implemented and enforced. It also summarises the extent of monitoring of relevant fisheries by EU member states, and concludes with a summary of the likely main conservation concerns. All of this is based on the work of an ICES expert group and a workshop held by ICES in September 2010, the reports of which are cited and provide more detailed information. In general both monitoring and mitigation lag some way behind the expectations that might be derived from the two main legislative instruments in this area.

Introduction

Member States in the European Union have been required by Council Directive 92/43/EEC (the 'Habitats Directive') to establish a system to monitor the incidental capture and killing of all European protected species, which includes all cetaceans. In the light of the information gathered, Member States are then obliged to take further research or conservation measures as required to ensure that incidental capture and killing does not have a significant negative impact on the species concerned. In reality few countries have addressed this obligation.

Council Regulation 812/2004 (concerning incidental catches of cetaceans in fisheries) was agreed in 2004, and stipulates fisheries that need to be monitored by European member states and also those fisheries in which bycatch mitigation measures must be implemented.

A European Directive requires member states to implement national legislation to meet the objectives of the Directive, while a Regulation becomes law in member states as soon as it has been passed by the Council of Ministers. It seems that Council Regulation 812/2004 was put forward by the Commission in part due to the poor uptake of national obligations under the Habitats Directive.

Since 2006, all member states have been required to submit annual reports on their activities under CR 812/2004, covering on board observer monitoring, bycatch mitigation and 'all other appropriate information'. ICES has provided the European Commission with annual reviews of these reports since 2008. In 2010 ICES also convened a special workshop to provide specific advice to the

Commission on areas outside the scope of CR 812/2004 where further measures would be necessary.

In this summary I have used the reports of the ICES Study Group on the Bycatch of Protected Species (SGBYC), its successor the Working Group on Bycatch of Protected Species (WGBYC) and the Workshop to Evaluate Aspects of EC Regulation 812/2004 (WKREV812) to summarise what cetacean bycatch monitoring and mitigation measures have been accomplished by European Member States.

Legal Requirements

The monitoring requirements of Council Directive 92/43/EEC are not specified. (Northridge and Thomas 2003) have argued that, because the stated aim of Article 12 of the habitats directive is to "ensure that incidental capture and killing does not have a significant negative impact on the [cetacean] species concerned", that monitoring schemes should at least enable authorities to determine whether or not significant negative impacts are occurring. This would imply sufficient monitoring to be reasonably sure that bycatch rates did not exceed some predefined bycatch 'reference limit'. The fisheries with the highest known cetacean bycatch rates within Europe are gillnet and pelagic trawl fisheries and it is these fisheries that are specified in CR 812/2004 for monitoring.

CR 812/2004 requires member states to monitor pelagic trawl fisheries throughout most European waters, but bottom set gillnet fisheries are only specified for a few places including the Bay of Biscay (ICES Divisions VIIIabc), the Baltic, the areas west of Scotland and Ireland and the Irish Sea (Via, VIIa,b). Monitoring schemes are not stipulated for the North Sea, the English Channel, Celtic Sea, Mediterranean, Iberian Peninsula outside the Bay of Biscay, nor the Black Sea. Drifnets (which are widely used and legal provided that nets do not exceed 2.5 km in length and provided they are not targeted at certain listed large pelagic species) are also listed in Annex III of the Regulation but require monitoring only in the North Sea (IV), west of Scotland (VIa) and the Channel and Celtic Sea (VII excluding VIIc,k).

CR812/2004 specifies that member states should monitor all MS flagged vessels of 15m or more in order to achieve a bycatch estimate of the most commonly caught cetacean species with a CV of less than 0.3; failing this, levels of 5% and 10% of fishing effort for these fleet segments are specified. The Regulation also requires member states to establish 'appropriate scientific studies or pilot projects' to collect data on incidental catches of cetaceans for all boats under 15m in the same fleet segments as listed in Annex III.

Overall, therefore, a patchwork of areas and fleets are identified in Annex III of the regulation as being in need of monitoring, some with specified or implied levels of sampling, and others as 'scientific studies'.

Mitigation measures are also stipulated for certain gillnet fisheries, where pingers are required for all set gillnet and entangling net fisheries in some eastern parts of the Baltic, the Skagerrak and North Sea, and the Channel and Celtic Sea, and for driftnets in some parts of the Baltic until 2008. Under Article 9 all driftnets were to be phased out of use in the Baltic by 2008. It seems that the areas specified reflected those areas for which porpoises bycatch estimates were available at the

time the Regulation was drafted. Once again a length limit was imposed, whereby the Regulation regarding pinger deployments should only apply to vessels of 12m or more.

Regulations for pinger use in the North Sea were more complex than elsewhere, such that just two fisheries were targeted for pinger use. These were set nets with a mesh size of 220mm or more (which was intended to specific large mesh tangle nets for skate and turbot), and also any bottom set nets 'the total length of which does not exceed 400m', and for this net type only between August and October. This was intended to target wreck net gillnets uses in the third quarter, where relatively high porpoise bycatch rates had previously been observed (Vinther 1999).

Review of compliance

ICES has reviewed the implementation of this regulation annually since 2008 and the results are available in reports of the WGBYC, SGBYC and WKREV812. The assessment of how well member states have carried out their obligations under Regulation 812/2004 was initially hampered by the lack of any consistent reporting format until 2010. Member states' annual reports, when they were submitted, varied from detailed tabulated data to a short letter to the Commission. More recently the Commission has specified a standard annual reporting format, but even this has been fraught with difficulties as different nuances of interpretation of the reporting format have still hampered an efficient overview of monitoring levels and mitigation uptake.

Use of Pingers:

Several EU member states have noted that the pinger models stipulated in the Annex II of Regulation 812/2004 have caused problems for industry. Reports from field trials have documented a number of operational problems associated with pinger breakages and interference with fishing operations, as well as issues concerning crew safety (Anonymous 2003, 2005, Cosgrove et al. 2005, Le Berre 2005). As a result, implementation of the pinger requirements of the regulation has been slow.

The most recent (2010) national reports to the European Commission were summarised by WGBYC (ICES 2011a), and related to the calendar year 2009. For some member states including Lithuania, Belgium, Netherlands, Portugal and all Mediterranean states, there are apparently no vessels covered by the Regulation that require pingers to be used. For other member states the degree of compliance is unclear. In Latvia it was reported that only a very small part of the gillnet fishery operates in the part of the Baltic where pingers are required and it was 'assumed' that all the vessels concerned use pingers. In Estonia two vessels operate in the regulated area, and according to interviews with skippers, pingers were being used. In Poland it was reported that inspectors have made visual observations of the use of pingers and there were no cases of infringement. In Sweden it was noted that a majority of the few vessels affected by the regulation had purchased pingers but that there had been no inspection of use or reliability. The Danish authorities had issued a derogation to enable Danish vessels affected by the regulation to increase the spacing of pingers to 455m (cf 200m in the Regulation) between devices, following field trails that had shown such spacing was effective (Larsen and Krog 2007); but there was no indication of any enforcement in the National Report. Germany reported nine inspections of vessels that were deemed to be required to use pingers with no detected infringements. In the UK there are ongoing trials of alternative deterrent devices that are louder and can be spaced more widely on nets, but no mention of enforcement or the number of proportion of affected boats currently using any sort of pinger.

Ireland reported that there was no information on the number of vessels using pingers during 2009, but alluded to inspections that had led to the detection of an unspecified number of infringements of the regulation. There was no information on the number of French vessels using pingers, but 'no violations' were reported for 2009. Similarly in Spain no information on the use of pingers was reported.

Voluntary trials of pingers in pelagic pair trawl fisheries were reported in Italy and in the UK. Voluntary trials of pingers on gillnets were also reported for the Netherlands.

It is clear that uptake of the use of pingers has been patchy in most European fleets, and that enforcement has not been straightforward. Reluctance by industry has clearly been an important factor in the slow uptake of pingers, but industry concerns were not without foundation, which may explain the apparent low key approach to enforcement within the EU. Meanwhile several member states have been trialling alternative approaches involving louder devices (UK, France) or wider spacings (Denmark, Ireland, France) of 'Annex II' devices. A concerted European approach to enforcement and control appears lacking.

An important consideration highlighted at the ICES workshop in September 2010 (ICES 2011b) regarding pinger use, is that only a very small minority of EU gillnet vessels are affected by the regulation, as most gillnetters in European waters are small vessels under 12m in length, and fishing in national waters (inside 12nm), where the authority for fishery management rests mainly with member states and not at a European level.

Information available to the ICES Workshop on the fleet composition by size class for most European member states is reproduced below in Table 1. It is not known how the pinger requirements are likely to reduce overall bycatch rates because relative fishing effort and bycatch rates in the over-12m and under-12m sectors are either not known or have not been calculated. It was pointed out that the propensity for gillnets to entangle porpoise and other marine mammals is not related to the size of the vessel deploying such nets (though smaller boats generally use less netting).

Table 1: size distribution of European fishing fleets: above and below the 12m cut-off for mitigation

ALL GEAR TYPES: includes but not limited to static nets				
Nation	<12m	>12m	Fleet Size	% <12m
Denmark	2317	512	2829	82%
Germany	1358	363	1721	79%
Sweden	1169	232	1401	83%
Poland	589	203	792	74%
Finland	3174	97	3271	97%
Lithuania	146	48	194	75%
Estonia	861	85	946	91%
Latvia	685	103	788	87%
GILLNETTERS	ONLY			
UK	1462	40	1502	97%
Ireland	22	49	71	31%
France (Atlantic)	744	144	888	84%
France (Mediterranean)	442	15	457	97%

The Regulation makes no mention of mitigation measures for pelagic trawls. Nevertheless trials of various acoustic deterrent devices have been made by Ireland, France, the UK and Italy. For the UK bass pair trawl fishery most operations use acoustic deterrent devices on a voluntary basis.

Monitoring:

Obtaining an overview of the amounts of bycatch monitoring by EU member states has proven tantalisingly difficult to collate because of differences in reporting formats. Nevertheless it is clear that most member states have failed to live up to the required levels of monitoring.

One problem has been that the requirement to monitor pelagic trawl fisheries at a level sufficient to obtain bycatch estimates with a CV of less than 0.3 has not been practicable, because for most pelagic trawl fisheries – excluding those for sea bass and for tuna – bycatch rates are too low to be detected at any operationally realistic sampling level. Several member states have therefore scaled back sampling in this sector. Among the gillnet fleets, relatively little monitoring has been done in areas where it is required, but equally none is required in many areas where cetacean bycatch is known to occur regularly because (limited) mitigation measures are supposed to be in place, and in such areas monitoring was not required by the Regulation.

A summary of bycatch monitoring during 2009 by EU member states is reported in Table 6 of the ICES WGBYC report (ICES 2011a).

Bycatch estimates have been provided by several member states for several fisheries. Most recently for 2009 bycatch *rate* estimates were available for a selection of fisheries for striped dolphins (France), bottlenose dolphins (France), common dolphins (France, Spain, UK) and for harbour porpoises (France, Spain, UK and Denmark). Extrapolated estimates of total bycatch in 2009 were available for some of these observed fisheries. Estimates for 2009 were reported for striped dolphins (about 870), for common dolphins (around 1500), for bottlenose dolphins (ten) and for harbour porpoises (about 1100).

It is clear that these totals provide only a very patchy overview of total cetacean bycatches in Europe for several reasons: firstly, for several fisheries even where bycatches have been observed, data have been deemed too patchy or unrepresentative to provide a reliable bycatch estimate; secondly because only a minority of fisheries has been sampled, and thirdly because most of the attention is being devoted to over 15m vessels that form a minority of the fleet, for gillnets at least.

Delivery on the 'scientific studies' of the under 15m sector required by the regulation has been limited, but there are no guidelines in the regulation to determine what levels of monitoring are required for such scientific studies. As a result, and just as with the Habitats Directive, this requirement appears to be given low priority by member states.

It is also worth noting that several member states either do not currently have bycatch monitoring schemes at all (i.e. are ignoring the regulation), or include protected species bycatch monitoring under other monitoring activities (fish discard or biology schemes) which may compromise their efficiency.

Other issues:

The ICES Workshop in September 2010 also identified a number of other issues about the focus of Regulation 812/2004. Recognising that bycatch rates for most cetaceans species remain very poorly documented in European fisheries as a whole, it is impossible to provide substantive estimates of total takes on a regional basis. The Workshop adopted a precautionary but expedient measure of determining the likely level of threat to cetaceans by fishery management region. To this end, the European marine zone was split into five management areas, namely the Baltic (but including ICES Baltic Area 24 at the western end), the Belt Seas and Southern Kattegat (ICES 21, 22, 23 and southern IIIa), the North Sea (IV and IIIa(N)), the North Atlantic and the Mediterranean. For consideration of harbour porpoises the European Atlantic was further divided with ICES divisions VI,VII and VIIIab (Northern area) separated from the Southern or Iberian region (VIIIcde,IX). In each of these areas the approximate expected number of animals (based on pro-rated abundance estimates by SCANS-II and CODA blocks) was compared with any reported bycatch rates for that species within the same area, and an estimate of the total amount of fishing effort. This enabled the Workshop to compare potential or likely annual removals against the current 1.7% *de facto* take limit accepted by some European member states.

The results of this exercise are explored in the report of the Workshop (ICES 2011b). There were no recent estimates of bycatch of porpoises in the Baltic Sea, but this population is widely recognised as critically endangered so there is no point in trying to guess the number of animals being killed annually. Instead the ICES workshop concluded that bycatch reduction measures should be implemented more widely and especially in the western end where porpoise densities appear highest.

The Belt Sea and southern Kattegat may hold, according to SCANS II estimates, about 14,000 harbour porpoises, but estimated minimum fishing effort and observed bycatch rates in that area indicate that the take is likely to exceed 1.7% of this number, again suggesting mitigation measures should be targeted here (none is required for most of this area under Regulation 812/2004).

In the North Sea overall fishing effort by gillnets has declined over the past ten years or more, though there have been local increases. Assuming an abundance estimate of around 206,000 animals in this region, and an estimated 35,000 days at sea among all commercial gillnet vessels (including Norwegian) then an overall bycatch rate of more than one animal per ten days at sea would be required to exceed the 1.7% limit of 3500 porpoises per year. Given the bycatch rates that have been observed over the past 15 years in several North Sea gillnet fisheries, this seems unlikely. However the Workshop did note that there is also a large undocumented coastal recreational gillnet fishery on the continental shoreline of the southern North Sea which would undermine any confidence that current bycatch rates may be sustainable.

In the Atlantic when considering the French, Irish and UK sectors, current fishing effort is thought to amount to about 94,000 days at sea, observed bycatch rates have been from an extreme of 1 animal per five days in one relatively small study in Ireland, to a mean of one animal per 22 days at sea in the UK and 1 per 62 days in France. It is not hard to derive an estimate of more than 1.7% of the assumed abundance level in this region (1.7% of 154,000 being 2,600), and the workshop suggested intensified monitoring of relevant fisheries here.

The situation around Iberia seems starker. An abundance estimate of less than 3000 animals and observed porpoises densities an order or magnitude or more lower than in more northerly regions, coupled with a minimum estimate of at least 760,000 days at seas by gillnet boats suggest that bycatch totals are very likely to exceed the 1.7% limit of 48 animals per year. The very low animal densities, very high fishing effort and very limited bycatch observations despite a monitoring obligation that has been in existence for over 15 years led the Workshop to suggest immediate mitigation measures should be implemented.

For pelagic trawls, there was no suggestion of any cetacean bycatch concerns in the North Sea or the Baltic or the Belt Seas. Pelagic trawl bycatch of dolphins (mainly short beaked common dolphins) seems to occur mainly in two fisheries – the bass and the albacore pair trawl fisheries. Common and striped dolphins were considered together for the Atlantic region as a whole. Records of bycatch events and estimates of bycatch rates of these two species have been obtained from a wide range of static net fisheries in the Atlantic region, as well as other gear types (demersal and high rise otter trawls, beach seines). Total gillnet effort exceeds 850,000 days at sea per year, which, based on a range of observed bycatch rates (1 per 53-247 days at sea), and when coupled with recent estimates of annual bycatch in the tuna and bass pair trawl fisheries over 1300 animals, suggests that annual bycatch totals could exceed 1.7% of 344,000 animals – or about 5800. More focused and extensive monitoring is suggested.

In the Mediterranean there is an almost complete lack of useful or relevant data at the regional level. The workshop noted that bycatch rates of bottlenose dolphins had been reported at 0.29 animals per vessel per year in one small scale study, and that if such a rate were to be applied to the entire western basin then bycatches would number in the thousands per year for this species, whereas sustainable take levels are more likely to be in the hundreds. The Workshop concluded that "given the lack of adequate effort data and the virtual absence of any bycatch monitoring among gillnet fleets in the Mediterranean, this is clearly an issue that should be addressed as a matter of urgency".

The conclusions from the Workshop are summarised below:

Table 2 – taken from ICES 2011b – Table 18

GILLNETS		
Species	Management area	Comment
Harbour porpoise	Baltic	Mitigation measures recommended (Species depleted)
	Kattegat/Belt Seas	Mitigation measures recommended
	North Sea	Develop monitoring programme especially in the North Sea
	Atlantic (North)	Improve monitoring programme. ?Mitigation?
	Atlantic (Iberian)	Mitigation measures recommended (pop likely decline needs further research)
Common dolphin	Atlantic waters including Alboran Sea	Continue monitoring
Bottlenose dolphin	Western Mediterranean	Insufficient information but sub-structured population adds to risk

PELAGIC TRAWLS		
Species	Management area	Comment
Common dolphins	Atlantic waters	Mitigation measures recommended for bass and tuna fisheries
Striped dolphin	Mediterranean	Insufficient information
Bottlenose dolphin	Mediterranean	Mitigation measures probably recommended, low information
LONG SURFACE SET NETS		
Striped dolphin	Mediterranean	Mitigation measures probably recommended, low information.

Finally, the workshop also pointed out that regulation 812/2004 has ignored not only static nets in the Mediterranean, but also all cetacean bycatch issues in the Black Sea, and both of these areas should be addressed under Regulation 812/2004, as they are under the Habitats Directive.

It should also be noted that despite the shortcoming of the Regulation, these are mainly due to patchy implementation of the Regulation by Member States, as with the Habitats Directive, while it remains true that we know a lot more about the nature and scale of cetacean bycatch, and more is being done to alleviate its effects, than was the case before the Regulation was drafted.

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