

**ECOREGION****General advice****SUBJECT****Request from EU concerning monitoring of bycatch of cetaceans and other protected species****Advice summary**

1. **Monitoring schemes.** Sampling under the Data Collection Framework (DCF) can contribute to the assessment of bycatch of cetaceans and other species, but is not sufficient on its own as currently implemented by Member States. Not all fisheries are adequately covered and many issues, including design and sampling protocols would need to be modified/extended if DCF monitoring was to be the sole source of information. Monitoring under Regulation 812/2004 is much more specific for cetaceans, and has included the use of dedicated observers and remote electronic video recording. Development of remote electronic video recording seems likely to be a cost-effective way of assessing bycatch in the future.
2. **Acoustic Deterrent Devices (ADDs).** ICES advises that regulation should not inhibit the development of more effective devices to deter harbour porpoises and other marine mammals from fishing gear. The characteristics of existing ADDs, which can deter harbour porpoises from fishing gear, are known. These characteristics cannot though be used to define all effective devices. Further studies would be needed to define standards for harbour porpoises and for ADDs that would be effective for other marine mammal species. To allow further development of ADDs, ICES recommends that a performance standard should be set. For an ADD to become acceptable, it should have a proven ability to reduce bycatch of the relevant species in the setting of a commercial fishery.
3. **Reference points.** Robust methods for setting reference points for bycatch of protected species already exist. ICES recommends that a process involving both managers and scientists be established to set species- and, where relevant, population-specific reference points. ICES proposes that a Bycatch Risk Approach be used to classify fisheries in terms of risk to protected species.

**Request**

ICES has been requested by EU to respond to the following request:

- “1. Assess the extent to which current fishery monitoring schemes, including *inter alia* those conducted under the DCF and Regulation 812/2004, provide an acceptable means of assessing the nature and scale of cetaceans and other protected species bycatch. Consider alternative means and other sources of data that could be used to improve our understanding of the conservation threat posed to cetaceans and protected species by bycatch in European fisheries.
- 2. Advise on how Annex II of Regulation 812/2004 defining technical specifications and conditions of use Acoustic Deterrent Devices could be best revised in light of technical and scientific progress in this field.
- 3. Based on the methodology used and the estimates of bycatch limits (take limits) generated by region at WKREV812 and other relevant analyses, propose effective ways to define limits or threshold reference points to bycatch that could be incorporated into management targets under the reformed CFP. Limits or threshold reference points should take account of uncertainty in existing bycatch estimates, should allow current conservation goals to be met, and should enable managers to identify fisheries that require further monitoring, and those where mitigation measures are most urgently required.”

In the context of this request, ICES interprets “protected species” as those marine species listed in the relevant annexes of the Habitats Directive. The advice may also be relevant to bycatches of other marine species. ICES will be providing further advice on the bycatch of seabirds later in 2013.

**Elaboration of the advice**

1. **Monitoring schemes.** Sampling under the DCF tends to focus on the metiers that discard the most fish; these are not necessarily the same metiers that have the largest catch of protected species. Thus, bottom trawling is generally oversampled with respect to monitoring of protected species bycatch, while in some specific fishing areas setnets, longlines, and purse-seines are undersampled. Some Member States have also undertaken

additional observation schemes to meet the requirements of Regulation 812/2004 and those of the Habitats Directive (92/43/EEC). It would be possible to better define requirements on Member States under the DCF, but much will depend on how other data collection requirements will change under the revised Common Fisheries Policy. Alternatives to monitoring by human observers on-board vessels could include remote electronic video recording (e.g. Remote Electronic Monitoring), monitoring from vessels visiting a fishing fleet, interviews, and fishers' logbooks. Indications of a bycatch problem may be obtained through schemes that examine stranding of protected species on shorelines. Of these alternatives remote electronic video recording seems to have the greatest potential to be developed to meet many of the needs of the existing DCF and also to improve monitoring of bycatch of protected species.

2. **Acoustic Deterrent Devices**. The standards currently listed in Annex II of Regulation 812/2004 are not fully appropriate. ICES advises that several commercially available ADDs have been proved effective in deterring harbour porpoises from fishing gear under specified conditions of use in commercial fisheries (Table 1.5.1.1). Other ADDs with the same specifications (and usage conditions) are therefore likely to be effective. It should be noted that many of these specifications are linked – thus for example, a higher source level ADD would not need to be spaced as close to another ADD as one with a lower source level. Some ADDs have been used to deter other species, and in some cases their efficacy for these species has been demonstrated. It is assumed that ADDs with similar key properties are as effective as those that have been tested. ICES recommends that ADDs targeted at reducing bycatch for these other species and under further development for harbour porpoises should only be authorised under Regulation 812/2004 if they have been proven by rigorous experiment to reduce bycatch rates by at least 80% with a 95% confidence. Experiments should be conducted in such a way that parties with a vested interest in the results cannot influence outcomes; they should include at least one control group and one treatment group. Experiments should be covered 100% by independent on-board observations and bycatch rates should be based on statistically independent bycatch events.

**Table 1.5.1.1** Overview of commercially available ADDs that have proven effective in deterring harbour porpoises from fishing gear. ADDs listed in italics do not have a published study of their effectiveness, but have the same specification as those with such a study. The maximum distance between any netting and the nearest ADD is half the effective distance between ADDs.

ADD type	Source levels dB re 1 µPa rms at 1 m	Signal frequency (kHz)	Pulse duration (nominal)	Interpulse interval (s)	Maximum distance between any netting and the nearest ADD <sup>1</sup>	Reference
Dukane Netmark 1000	132	10	300 ms	4	100 m	Gönener and Bilgin (2009)
<i>Fumunda 10 kHz</i>	<i>132</i>	<i>10</i>	<i>300 ms</i>	<i>4</i>	<i>50 m</i>	
<i>Aquamark 300</i>	<i>132</i>	<i>10</i>	<i>300 ms</i>	<i>4</i>	<i>50 m</i>	
Aquamark 100	145	20–160	200–300 ms	5–30	227 m	Larsen and Krog (2007)
DDD-03 L	174	5–500	0.5–9 s	Random	2 km	Northridge <i>et al.</i> (2011)
DDD-03 N	174	5–500	0.5–9 s	Random	2 km	

3. **Reference points**. Several methods have been used in defining limits or threshold reference points to bycatch of cetaceans (Table 1.5.1.2). The robustness of the various models to uncertain information varies. All rely on a public authority to define the overall conservation objective in terms that can be used in mathematical models, so their derivation requires not just the input of scientists, but also of relevant authorities. ICES cannot therefore provide advice on limits or threshold reference points, but instead recommends that the European Commission establishes a process involving both scientists and managers to derive these limits, using the most appropriate of these approaches for populations of species believed to be at most risk from bycatch. ICES advises that harbour porpoise, and common, striped, and bottlenose dolphin populations appear to be the species most at risk from bycatch in European waters at present.

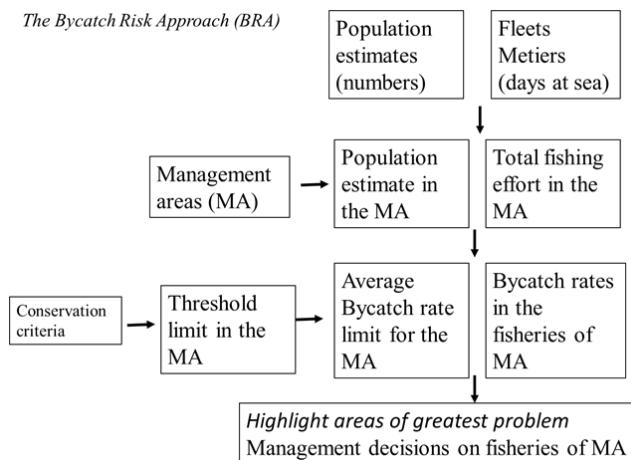
**Table 1.5.1.2** Existing procedures to set limits and reference points for bycatch of marine mammals.

Algorithm	Management framework	Conservation objectives	Simulation timeframe
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<sup>1</sup> Version 2: The values in this column have been corrected.

Catch Limit Algorithm (CLA)/Revised Management Procedure (RMP)	International Whaling Commission	72% carrying capacity on average (50% of the time)	100 years
Potential Biological Removal (PBR)	USA under Marine Mammal Protection Act	50% of carrying capacity (95% of the time)	100 years
1.7% of best available population estimate	ASCOBANS (for harbour porpoises in non-depleted areas)	80% of carrying capacity (95% of the time)	100 years

ICES advises that a Bycatch Risk Approach be used to identify areas and fisheries posing the greatest likely conservation threat to cetacean species due to bycatch (Figure 1.5.1.1). This approach can also be used for protected species other than cetaceans. The approach splits the population numbers of each protected species into different Management Areas (MA) and calculates take limits of species by area for any bycatch threshold level used. By using an expected bycatch rate (numbers per day or per unit of catch) multiplied by the total fishing effort, an approximate total number of bycaught animals can be estimated for each fishery and compared with any proposed take limit (see above).



**Figure 1.5.1.1** The Bycatch Risk Approach.

#### Basis of advice

1. **Monitoring schemes.** The Data Collection Framework (DCF) is currently undergoing review and revision and will become the Data Collection Multi-Annual Programme (DCMAP). DCMAP will guide future fishery monitoring and data collection within the EU, covering a broad range of objectives. The contents of DCMAP are not yet determined, so ICES bases this advice on the current DCF as it seems likely that the principles will apply also to DCMAP. One of the current uncertainties in the DCMAP is the forthcoming EU ‘discards ban’ and how this will be implemented in detail. This ban may have profound consequences for fisheries monitoring in future. It could, for example, result in much greater emphasis on port-based sampling schemes, rather than sea-going observer schemes. It seems likely that bycatch of protected species will continue to be discarded and returned to the sea as they are “non-commercial” and unlicensed possession of such species is illegal in most EU Member States.

In formulating the advice, ICES compared the coverage of current sampling under the DCF and the EU Regulation 812/2004 programmes with known abundances of cetaceans (and approximate indications of abundances of other protected species), with an index of bycatch vulnerability and with minimum estimates of fishing effort by metier (ICES, 2013b). Metiers/areas were identified where the risk to populations of certain species (groups) being adversely affected was greatest, and where coverage of the present monitoring schemes was relatively poor.

2. **Acoustic Deterrent Devices.** Information was extracted from a recent review of the effectiveness of Acoustic Deterrent Devices (Dawson *et al.*, 2013). ICES also approached a small number of underwater acousticians and manufacturers of ADDs and asked them for their views on how Annex II of Regulation 812/2004 could be best revised. A number of existing ADDs are effective in reducing harbour porpoise bycatch, but the full bounds of the technical specifications between an effective and an ineffective ADD are not known. ICES considers important that in advising on effective ADD specifications, there should be no constraints on the development of more effective devices for harbour porpoises or devices effective in deterring other species. ICES thus recommends that rigorous experiments are needed to demonstrate the effectiveness of new ADDs, while prescriptive constraints are unhelpful. ICES bases its advice for an >80% reduction in bycatch on the

results of all the successful pinger experiments listed by Dawson *et al.* (2013), with a minimum confidence level of 95% as suggested/used for scientific studies.

3. **Reference points.** ICES has reviewed the existing procedures to establish limits and reference points (CLA, PBR, and 1.7%) several times in the past decade (SGFEN, 2002a, 2002b; ICES, 2012b). In all cases it was found that the choice of the most appropriate procedure depended on choices by managers in defining precisely the conservation objectives. These objectives essentially describe a societally chosen balance between exploitation of resources and conservation of protected species. The most appropriate way of working is therefore jointly between managers and scientists to explore and define conservation objectives. Furthermore, the choice of the most appropriate procedure to be adopted to achieve the conservation or management goal should be driven by the availability of suitable data.

## Sources

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