

# UK Small cetacean bycatch response strategy

A consultation paper outlining the proposed strategy by the Department for Environment, Food and Rural Affairs; the Scottish Executive; the Welsh Assembly Government and the Department of Agriculture and Rural Development in Northern Ireland to reduce the incidental capture of small cetaceans in UK fisheries.

March 2003



DEPARTMENT OF AGRICULTURE  
AND RURAL DEVELOPMENT



Cynulliad Cenedlaethol Cymru  
National Assembly for Wales



SCOTTISH EXECUTIVE



**defra**

Department for Environment  
Food and Rural Affairs

# UK Small cetacean bycatch response strategy

A consultation paper outlining the proposed strategy by the Department for Environment, Food and Rural Affairs; the Scottish Executive; the Welsh Assembly Government and the Department of Agriculture and Rural Development in Northern Ireland to reduce the incidental capture of small cetaceans in UK fisheries.

March 2003

Department for Environment, Food and Rural Affairs  
Nobel House  
17 Smith Square  
London SW1P 3JR  
Telephone 020 7238 6000  
Website: [www.defra.gov.uk](http://www.defra.gov.uk)

© Crown copyright 2003

Copyright in the typographical arrangement and design rests with the Crown.

This publication (excluding the logo) may be reproduced free of charge in any format or medium provided that it is reproduced accurately and not used in a misleading context. The material must be acknowledged as Crown copyright with the title and source of the publication specified.

Further copies of this publication are available from:

Defra Publications  
Admail 6000  
London  
SW1A 2XX  
Tel: 08459 556000  
Email: [defra@iforcegroup.com](mailto:defra@iforcegroup.com)

This document is also available on the Defra website.

Published by the Department for Environment, Food and Rural Affairs. Printed in the UK, March 2003, on recycled material containing 80% post-consumer waste and 20% totally chlorine free virgin pulp.

Product code PB 8049

## Contents

Foreword	v
Executive summary	1
<b>Section 1</b>	
Introduction and purpose	3
<b>Section 2</b>	
Background	5
Small cetacean abundance in UK waters	5
International obligations in relation to bycatch	9
Summary of relevant fishery legislation	11
<b>Section 3</b>	
Consideration of the issues	13
Current level of small cetacean bycatch in UK fishing sectors	13
Bycatch in non UK fisheries impacting on cetacean populations occurring in UK waters	14
Overview of bycatch mitigation methods	15
<b>Section 4</b>	
Tackling the issue	20
Reduction of bycatch in set net fisheries	20
Reduction of bycatch in pelagic trawls	21
Effort reduction	22
<b>Section 5</b>	
Research and monitoring requirements	23
Population monitoring	23
Bycatch monitoring	23
Technical measures	24
<b>Section 6</b>	
Effective implementation and incentives	25
Incentives	25
Enforcement	25
Working through Europe	26
<b>Section 7</b>	
Summary of recommendations and indicative costings	28
Review of the strategy	30
References	31
Glossary	33



## Foreword

I have been concerned for a number of years about the numbers of dolphin and porpoise casualties. I know from the large amount of correspondence that I receive that others share my concern. Their co-operation to date in the trials we have carried out has demonstrated that fishermen are just as keen to find a solution to the bycatch problem. We now need to build on this concern and co-operation to try and find a permanent solution.

We have been tackling the bycatch problem by locating the fisheries in which there is significant bycatch and then developing practical solutions to the problem. We continue to fund a great deal of research into this but I do not want to delay taking action whilst we await definitive results. It is now time to take stock of where our own and others' research has taken us in identifying the bycatch problem and, more importantly, in putting forward recommendations for action. This bycatch response strategy document aims to do just this.

There are areas where our knowledge is still lacking but the strategy is clear on what we believe can be done to fill these gaps. I accept that this strategy can only contribute to a solution to the problem as bycatch occurs in fisheries to which other Member States have access. I have, for some time, been using the findings of our research to press for Community-wide action on this issue. There is now a commitment on behalf of the European Commission to bring forward measures to reduce cetacean bycatch but it may be some time before this is translated into action. In the meantime, we must consider effective action that we can take at a UK level.

I am pleased that Defra and the Devolved Administrations are now in a position to set out recommendations for action in the enclosed document. I very much look forward to receiving your views on this very important issue and our ideas for finding a solution to it.

A handwritten signature in black ink that reads "Elliot Morley". The signature is written in a cursive, flowing style.

The Rt Hon Elliot Morley MP  
Minister for Fisheries, Water and Nature Protection



## Executive summary

Bycatch, the incidental capture of cetaceans during fishing activities, is thought to be the major threat to the conservation of small cetaceans, not only in Europe, but also throughout the world's oceans. This strategy provides a summary of the abundance and distribution of small cetaceans in UK waters, and outlines our international obligations to conserve these species. The strategy reviews fishery interactions with small cetaceans and recommends measures to alleviate bycatch, sets out areas for further research and provides indicative costs for the recommendations.

A considerable amount of work is already underway and it is recognised that this could not have been achieved without the support and cooperation of the fishing industry. Work has been carried out to identify fisheries where bycatch is a problem and to develop practical and cost effective mitigation methods. The strategy aims to identify, draw on and further develop this work. As some of the terms used are technical, there is a full explanatory glossary.

UK waters hold numerous species of small cetaceans. These include harbour porpoise, six species of dolphin (common, bottlenose, white-beaked, Atlantic white sided, striped, and Risso's) and two whales – (the long-finned pilot whale and the killer whale). The Government is under international obligations to address the problems affecting these species in relation to bycatch, including requirements under the Agreement on the Conservation of Small Cetaceans of the Baltic and North Seas (ASCOBANS) and the EU Habitats Directive.

Existing information (including long standing research on stranded animals) enables some assessment to be made of the relative levels of small cetacean bycatch in various UK fishing sectors, including set net fisheries, and pelagic and demersal trawls. This information is important in assessing where effort to reduce mortality is best directed. But it is not simply the UK fleet that is entitled to fish in UK waters, and we also need to consider, where possible, the effects of activities of fishing fleets of other nations.

Potential bycatch mitigation techniques can usefully be grouped into two main areas: gear modifications (which include acoustic deterrents), and fisheries management measures.

Acoustic deterrents (better known as 'pingers') are attached to nets and use sound to deter cetaceans. These are known to be effective in set net fisheries but few trials have so far been carried out in trawl fisheries. Concerns about the widespread use of pingers have been raised; the cetaceans may become too used to them, or may be kept away from important feeding sites. Additionally pingers may cause operational difficulties for fishermen. These issues need to be fully considered to ensure optimum application.

The effect of reflective nets in reducing bycatch has been trialled and work is being carried out on the effect of twine thickness in reducing bycatch. There is ongoing work into the possible use of selector grids in trawl fisheries.

Fisheries management measures can include closures by time or by area, which might be triggered by a particular level of bycatch, but closures may simply move the problem into other areas, if not planned effectively.

A full analysis of these issues allows the strategy to propose targets for specific fisheries in specific areas and recommendations for action (with indicative costings, and with careful consideration of the practicability and proportionality of proposed measures).



## **Executive summary**

These include:

- The compulsory use of pingers on certain fisheries in the Celtic and North Seas
- The need for an effective observer scheme
- Continued research into mitigation methods in pelagic fisheries
- The need for better surveys of cetacean abundance and distribution.

The strategy recognises that the UK cannot address this problem alone, even in UK waters. There is recognition that further action is required at Community level. The new Common Fisheries Policy framework Regulation is a step forward in the move to an ecosystem-based approach to fisheries management, and the proposed establishment of Regional Advisory Councils may provide a means of addressing environmental problems on a broader scale. This coupled with the EU commitment to a Regulation on bycatch mitigation measures are welcomed as further steps in the right direction. However, it can take time for measures to be adopted at Community level, and this should not preclude action by the UK.

The strategy outlines our proposals to tackle the issue, and your comments upon the proposals will help to shape the action required to tackle this important issue.

### Introduction and purpose

1. Bycatch, the unintended mortality of non-target species, is widely recognised as one of the most serious environmental impacts of modern commercial fishing. Bycatch may affect the structure and function of marine systems at the population, community and ecosystem levels. Long-lived vertebrate species with low birth rates, such as marine mammals, are particularly vulnerable to depletion from bycatch.

2. The UK Government is concerned that the current level of small cetacean bycatch in certain European, including UK, fisheries could threaten their populations. For this reason, the UK Government was instrumental in gaining approval at the third Meeting of the Parties to the Agreement on the Conservation of Small Cetaceans of the Baltic and North Seas (ASCOBANS) to a resolution which identifies that cetacean bycatch above 1.7% of the relevant abundance estimate constitutes an unacceptable interaction, as any take above this level would inevitably lead to population decline.

3. The need to reduce the bycatch of small cetaceans in general, and of the harbour porpoise in particular, was recognised to be a key priority in the Ministerial Declaration of the Fifth International Conference on the Protection of the North Sea (the 'Bergen Declaration') of 20-21 March 2002. In this Declaration, Ministers urged the competent fisheries authorities to take all necessary measures to minimise incidental catches and/or damage of non-target organisms. Ministers also agreed to aim at reducing the bycatch of harbour porpoises to below 1.7% of the best population estimate. On the same basis they agreed on a precautionary objective to reduce bycatches of marine mammals to less than 1% of the best available population estimate, and urged the competent fishery authorities to develop specific limits for the relevant species.

4. The aim of this strategy is to identify what measures can be taken to work towards reducing small cetacean bycatch to below the 1.7% target set by the third Meeting of the Parties to ASCOBANS in 2000. Where practicable, the strategy should also work towards the reduction of bycatch to the lowest possible level. This strategy outlines the constraints on effective measures being put in place. The strategy will form part of an ecosystem-based approach to marine management highlighted in the first Marine Stewardship Report, *Safeguarding our Seas*.

5. Actions taken under the strategy will also assist in meeting the targets of the UK Biodiversity Action Plans for small dolphins and the harbour porpoise. These plans have targets to reduce bycatch, and to maintain the range and abundance of these species in UK waters.

6. The strategy will be the subject of consultation with fishery organisations, regulators and non-Governmental organisations within the UK. The views of these organisations on the proposals contained within this strategy will be taken into account before any decisions are taken on implementation.

## Section 1

7. For the purposes of this document, small cetaceans are those species of dolphins and porpoise that occur predictably in UK waters in reasonable numbers. These are: bottlenose, common, striped, Risso's, white-beaked and Atlantic white-sided dolphin, killer and long-finned pilot whale and harbour porpoise. Several further species occur less predictably, but actions to reduce bycatch of the commoner species are likely to reduce any possible bycatch of these rarer species. Several further species of whale occur in UK waters and have on occasion been caught in fishing gear, but these are not considered in this document.

### Background

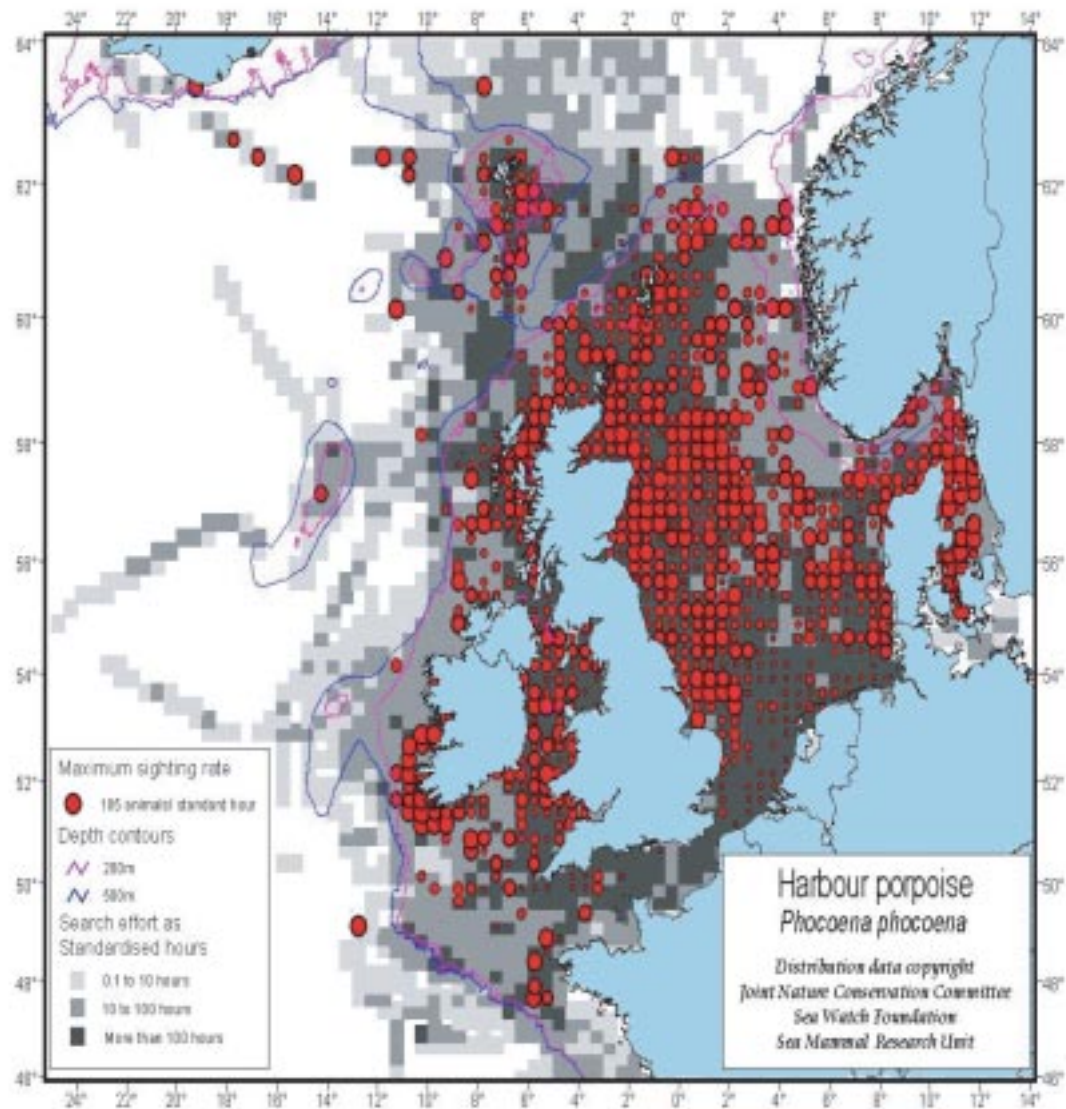
#### Small cetacean abundance in UK waters

8. The following paragraphs review the existing information available on the population and abundance of small cetaceans that occur in UK waters. It should be understood that obtaining population estimates for these species is difficult; firstly, we are not confident of the geographical limits of any biological population of these species and secondly, there is usually a wide margin of error within the abundance estimates. The mobility of small cetaceans is such that they have been recorded in waters away from the core of their ranges described below. The wide margin of error with the population estimates emphasises the need to take a precautionary approach when developing proposals to reduce the impact of bycatch on the population.

9. *Harbour Porpoise* (*Phocoena phocoena*). The harbour porpoise is widely distributed in all continental shelf waters around the United Kingdom, with the exception of the southern North Sea and English Channel where there has been an apparent reduction in numbers. Based on a 1994 census, Hammond *et al* 1995 estimated the population abundance of harbour porpoise in the North Sea and the English Channel (including the waters of all North Sea and Channel states) at ca 269,000 with an additional 36,000 on the Celtic Shelf (including the relevant waters of Ireland, France and the UK). The census carried out in 1994 showed that in the UK waters surveyed, harbour porpoises were most densely concentrated around the Northern Isles of Scotland, and in the offshore waters of the central North Sea between 56°N and 58°N.

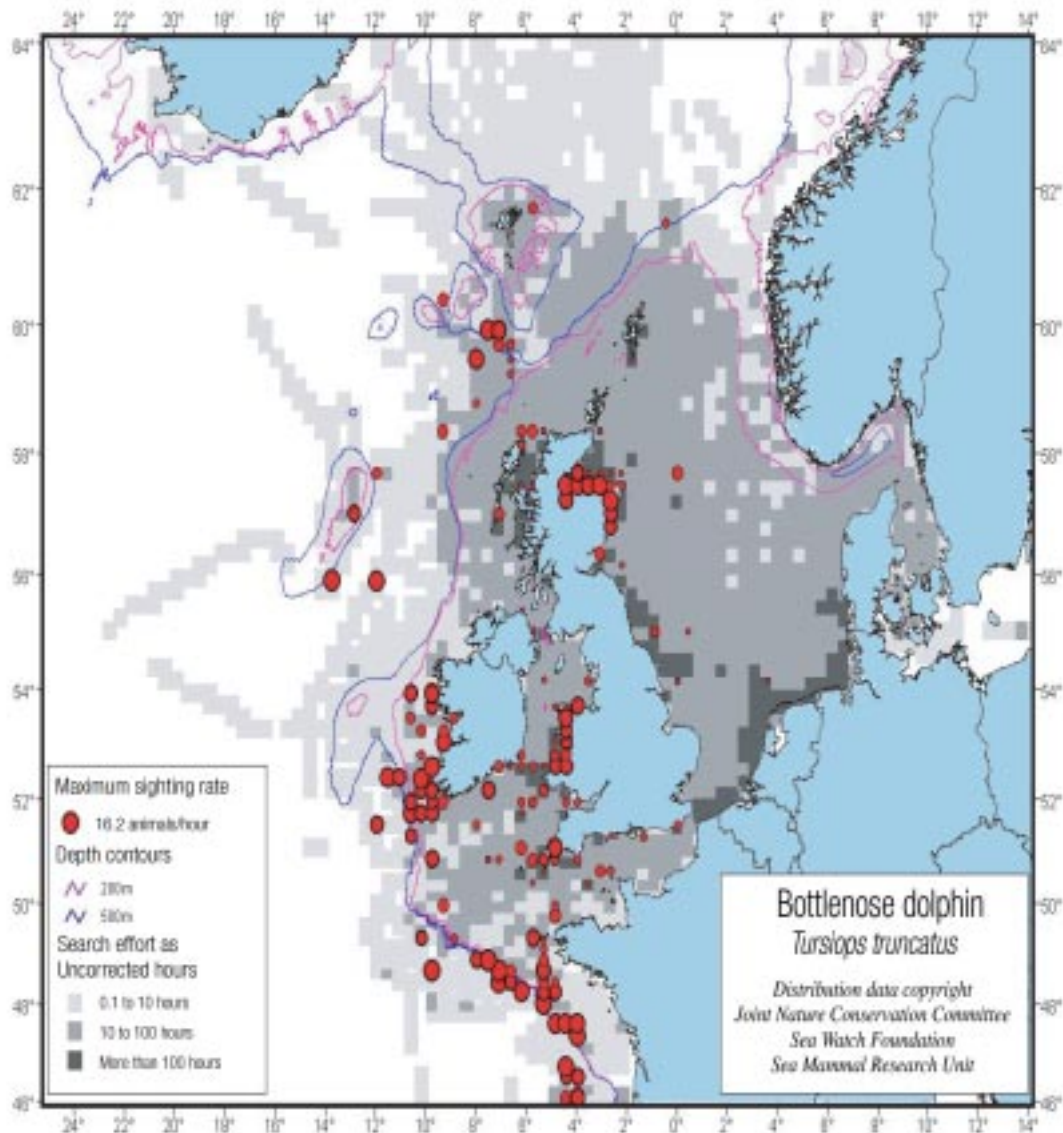
10. Taking the 1994 survey figures as a basis, and noting that the survey covered only an estimated 60-70% of relevant habitat in UK waters, an estimate of the total UK continental shelf (including territorial waters) population would be in the order of 150,000 animals. Therefore the harbour porpoise has a substantial and important population in UK waters and uses both inshore and offshore waters.

## Section 2



11. *Common Dolphin* (*Delphinus delphis*). This species is abundant and widely distributed in the eastern north Atlantic. In UK waters, it is common in the western approaches to the English Channel and the Celtic Sea and, during summer, around the Inner Hebrides north to Skye. There are also records in deeper water north and west of Scotland. It is generally rare in the southern North Sea and eastern portion of the Channel.

12. *Bottlenose Dolphin* (*Tursiops truncatus*). The bottlenose dolphin is locally frequent near shore off the coasts of north-west France, western Ireland, north-east Scotland, the Hebrides, in the Irish Sea (particularly Cardigan Bay and south-east Ireland), and in the English Channel. Brown *et al* 1997 estimated the population for UK inshore waters as 300 – 500 individuals.



13. *White-beaked dolphin* (*Lagenorhynchus albirostris*). This species occurs primarily in the UK sector of the central and northern North Sea (mainly north of Flamborough Head), to the north and west of Scotland and offshore to the west of Ireland. The species is also numerous around Norway and Iceland, but it appears that the UK population is separate from those in these other areas.

14. *Atlantic white-sided dolphin* (*Lagenorhynchus acutus*). In UK waters, distribution is concentrated over and beyond the continental shelf break to the north and west of Scotland. The species also occurs in smaller numbers in the central and northern North Sea, to the west of Ireland and off the south-western approaches.

15. *Striped dolphin* (*Stenella coeruleoalba*). A subtropical and warm temperate species, occurring in the north Atlantic in offshore areas to the west of the Iberian Peninsula and France and in the Mediterranean. In UK waters the species is rare, recorded mainly from the south-west approaches to the English Channel and off Southern Ireland, although occasional sightings and strandings have occurred as far north as Shetland.

## Section 2

16. *Risso's dolphin* (*Grampus griseus*). This species occurs in western UK waters, and appears commonest in the Minch, St. George's Channel, waters north of Scotland and over the shelf break to the west of Scotland and south-west of Cornwall. It occurs sporadically in the North and Irish Seas.

17. *Long-finned pilot whale* (*Globicephala melas*). This is primarily a deep-water species that is commonest over and beyond the shelf break in waters to the north, west and south-west of the UK. It occurs rarely in the northern North Sea and regularly though not abundantly in the western English Channel.

18. *Killer whale* (*Orcinus orca*). This species is commonest in waters north of Shetland, but is encountered frequently in Hebridean waters to the west of Scotland and more sporadically in the northern North Sea, shelf areas west of the Hebrides and the Celtic Sea.

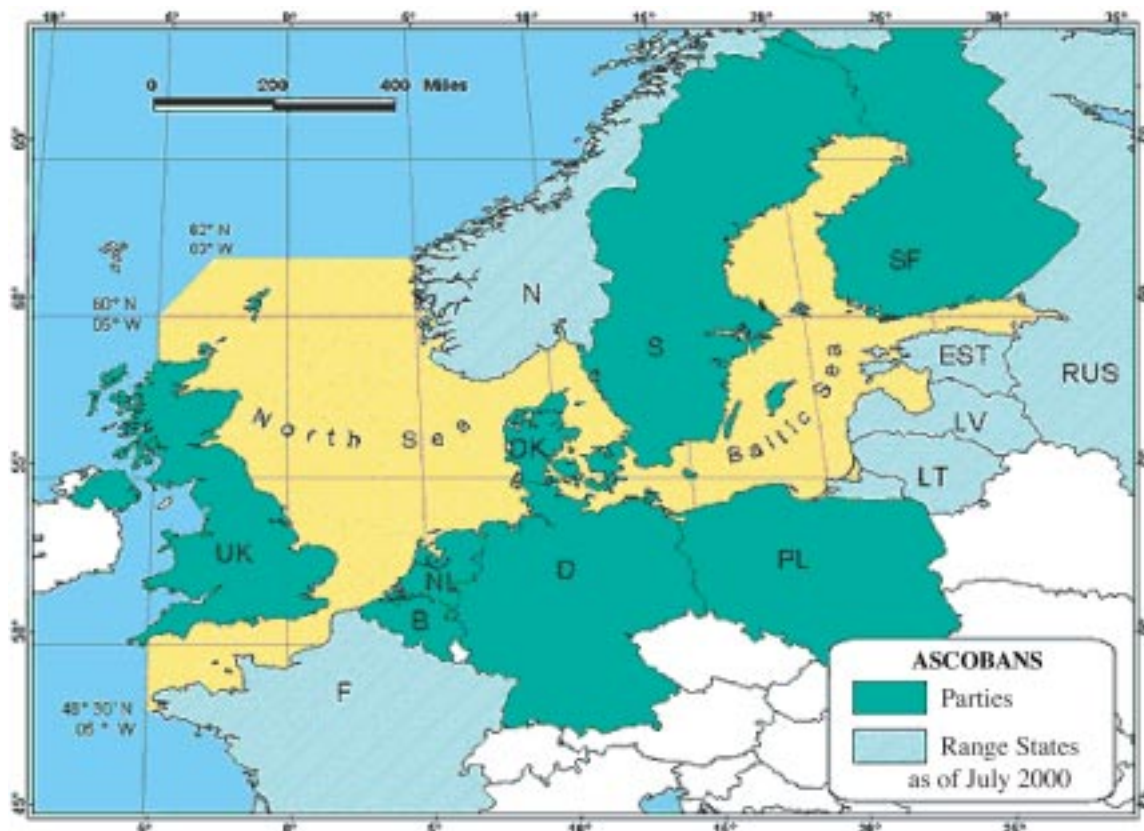
19. The following table uses figures from a 2002 International Council for the Exploration of the Sea (ICES) report to illustrate the latest information on the populations and abundance of cetaceans that occur in UK waters (but note the warnings in paragraph 8 on the error margins of any estimate). The populations are given in terms of ICES areas (see map) or geographical locality.

Species	Year of estimate	ICES Area or Geographical locality	Abundance estimate	95% Confidence limits	Method	Reference
Harbour porpoise	1994	IVa IVb + c VIIf+g+h+j	98,564 169,888 36,280	66,679 – 145,697 124,121 – 232,530 12,828 – 102,604	Ship-based line transect	Hammond <i>et al</i> 2002
Bottlenose dolphin	1992	Moray Firth (southwestern IVa)	129	110-174	Photographic mark-recap. Photographic identification or direct observation	Wilson <i>et al</i> ICES, 2002 ICES, 1996
	2001	French coasts VIIe VIIIa	250-30	na		
	1991-1993	Cornwall	15	na		
	1994-1995	Dorset	5	na	direct	White and Webb, 1995
	2001	Cardigan Bay, Wales	135 213	85-214 183-279	Ship-based line transect	Baines <i>et al.</i> , 2002
White-beaked and Atlantic white-sided dolphins	1994	IVa IVb VIIf+G+h+j	1,685 9,242 833	690-4,113 5,344-15,981 159-4,360	Ship-based line transect	Hammond <i>et al.</i> , 2002
Atlantic white-sided dolphin	1998	Faroes-Shetland channel	21,371	10,000-45,000	Ship-based line transect	Macleod, 2001
	1998 2000	Vla (N) parts of VI a&b VII b/c, VII j&k	74,626 5,490	35,000-160,000 1,134-10,015		O'Cadhla <i>et al.</i> , 2001
Common dolphin	1994	VIIf+g+h+j parts of VI a&b	75,449	22,900-284,900	Ship-based line transect	Hammond <i>et al.</i> , 2002 O'Cadhla <i>et al</i> 2001
Common dolphin	2000 1993	VII b/c VIIj&k Bay of Biscay	4,496 61,888	2,414-9,320 35,461-108,010		
Striped dolphin	1993	Bay of Biscay	73,843	36,113-150,990	Ship based line transect	Goujon <i>et al.</i> ,





## Section 2



21. At the third Meeting of Parties to ASCOBANS in 2001 a resolution was passed which called on competent fishery authorities to ensure that the total anthropogenic removal of marine mammals was reduced as soon as possible to below an unacceptable interaction. An unacceptable interaction was agreed as being above 1.7% of the best estimate of abundance. The resolution also underlined that the intermediate precautionary objective was to reduce bycatch to less than 1% of the best available population estimate. As mentioned in paragraph 3 above, these targets were recently adopted at the 5th North Sea Conference in the Bergen Declaration.

The 1.7% unacceptable interaction was based on work carried out by the IWC/ASCOBANS working group on harbour porpoises. This advised that the maximum annual bycatch that would achieve the ASCOBANS interim target to restore and/or maintain stocks/populations to 80% or more of carrying capacity over an infinite time horizon, assuming no uncertainty in any parameter is 1.7% of the population size in that year. This advice was endorsed by IWC at its 51st meeting in 1999. If uncertainty is considered, such as measurement error in estimating the population size, maximum bycatch must be less than 1.7% to ensure a high probability of meeting the ASCOBANS objective.

Recognising that population estimates for cetaceans were subject to a wide margin of error, ASCOBANS acting in accordance with the precautionary principle also set an intermediate objective of reducing bycatch to below 1% of the best available population estimate.

These targets were accepted by North Sea Ministers in 2002 at the 5th North Sea Conference, and are detailed in the Bergen Declaration.

22. *Food and Agriculture Organisation (FAO) Code of Conduct for Responsible Fisheries*. This Code, which was unanimously adopted on 31 October 1995 by the FAO Conference, provides a necessary framework for national and international efforts to ensure sustainable exploitation of aquatic living resources in harmony with the environment. Article 6 of the Code states that *'The right to fish carries with it the obligation to do so in a responsible manner so as to ensure effective conservation and management of the living aquatic resources'*. It further states that fisheries management *'should not only ensure the conservation of target species but also of species belonging to the same ecosystem or associated with or dependent upon the target species'*.

23. Article 7 of the Code specifically deals with measures to reduce the bycatch of non-target species, which includes cetaceans. The Code says, *'States should take appropriate measures to minimise .... catch of non-target species, both fish and non-fish species, and negative impacts on associated or dependent species, in particular endangered species. Where appropriate, such measures may include technical measures related to fish size, mesh size or gear, discards, closed seasons and areas and zones reserved for selected fisheries, particularly artisanal fisheries'*. The proposals in this strategy build on the measures recommended in the Code.

24. *Council Directive 92/43/EC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the 'Habitats Directive')*. Under Article 12(4) of the Habitats Directive, Member States must introduce a system to monitor the incidental capture and killing of all species listed on Annex IVa – this list includes all cetaceans. In light of the results of this monitoring, Member States are required to undertake further research or conservation measures to ensure that the incidental capture and killing *'does not have a significant negative impact on the species concerned'*. The deliberate capture, killing or disturbance of cetaceans is prohibited by Article 12(1). Member States have a duty under Article 2 to ensure that any measures taken under the Directive are designed to *'maintain or restore, at a favourable conservation status, natural habitats and species of wild fauna ... of Community interest'* (which includes all cetaceans).

### Summary of relevant fishery legislation

25. *Common Fisheries Policy (CFP)*. Council Regulation (EC) 2371/2002 of 20 December 2002 provides the regulatory structure for the CFP. Article 2 of this Regulation outlines that the objectives of the CFP shall be to *'ensure exploitation of living aquatic resources that provides sustainable economic, environmental and social conditions.'* Article 2 further specifies that *'the Community shall apply the precautionary approach in taking measures designed to protect and conserve living aquatic resources, to provide for their sustainable exploitation.. and to minimise the impact of fishing activities on marine ecosystems. It shall aim at a progressive implementation of an eco-system based approach to fisheries management'*.

26. Under the CFP only the Community has competence in fisheries matters. This means that only the European Commission can propose new legislation on fisheries and only the Council of Ministers can adopt that legislation. One effect of this is that neither the UK nor any other Member State can apply their own more stringent national rules to restrict the activities of vessels in its waters other than to those vessels on their own register.

## Section 2

27. However, Article 8 of the CFP Regulation does allow Member States to take emergency measures to restrict or close fisheries if *'there is evidence of a serious and unforeseen threat to the conservation of living aquatic resources, or to the marine ecosystem resulting from fishing activities, in waters falling under the sovereignty or jurisdiction of a Member State where undue delay would result in damage that would be difficult to repair'*. These emergency measures cannot exceed three months, and other Member States have the right to comment on the measures to the Commission. The Commission can then confirm, cancel or amend the measure.

28. Article 9 of the Regulation allows Member States to take measures for the conservation and management of fishery resources and to minimise the effect of fishing on the conservation of marine ecosystems within the 12-mile limit, providing the Commission has not adopted measures addressing conservation and management in that area. Where these measures affect the vessels of other Member States, the Commission, the Member States and Regional Advisory Councils must be consulted before adoption.

29. *Sea Fish (Conservation) Act 1967*. Alongside Community legislation, there is a significant body of UK legislation. An important piece of domestic legislation relating to restrictions on fishing is the *Sea Fish (Conservation) Act 1967*. This Act gives Ministers powers to make regulations to: impose size limits on the landing size and carriage of fish; regulate nets and other fishing gear; license fishing boats including boats involved in transshipment; restrict fishing for sea fish; and prohibit the landing of sea fish caught in certain areas. These powers must be used for fishery management purposes. Devolved Administrations have legislation that provides similar powers to regulate fishing within their waters.

30. The 1967 Act was amended by the *Environment Act 1995* to extend the powers available to fisheries managers to restrict fishing for sea fish for marine environmental purposes, defined as: conserving or enhancing the natural beauty or amenity of marine or coastal areas (including their geological or physiographical features) or any features of archaeological or historic interest in such areas; or conserving flora and fauna which are dependent on, or associated with, a marine or coastal environment.

31. Ministers therefore have wide ranging powers to manage sea fisheries – and place restrictions on UK vessels wherever they fish – both for conventional fisheries management reasons and for marine environmental reasons.

### Consideration of the issues

#### Current level of small cetacean bycatch in UK fishing sectors

32. As at the end of 2001, there were some 7,200 UK fishing vessels and about 15,000 regular or part-time fishermen. Some 738,000 tonnes of sea fish were landed by the UK fleet with a total value of about £574 million. UK vessels use a variety of fishing methods which can be split broadly into two categories: active techniques such as trawling, seine netting or use of passive techniques such as hooks and static (or fixed) nets and pots. Evidence from around the world has shown that all fisheries have the potential to have a cetacean bycatch, and certain fisheries will have different levels of bycatch dependent on the target species they are fishing for. The paragraphs below illustrate our knowledge on the extent of bycatch in UK fisheries.

33. *Drift Nets.* The Atlantic albacore drift net fishery was known to have had a relatively high bycatch of small cetaceans. Since its closure in 2002 the remaining driftnet fisheries in the UK are dominated by small boat fisheries for herring, sprats, mackerel and a few other species close to shore. Nets are generally short and total fishing effort (days at sea) is only about 5% of the total for all gillnets. Limited sampling so far (15 hauls in the herring and 22 in the salmon driftnet fisheries) has not resulted in any observations of cetacean bycatch.

34. *Bottom Set Net Fisheries.* Evidence demonstrates that harbour porpoises can get caught in any sort of gill or tangle net where their range overlaps with a fishery. The harbour porpoise is primarily a benthic feeder and is therefore mainly susceptible to bottom set net capture, but it can also be caught in other fishing gear. In 1992 the European Commission funded the Sea Mammal Research Unit (SMRU) and partners to examine the extent of marine mammal bycatch in gillnet fisheries in the Celtic Sea (Study Contract 92/3503). SMRU deployed independent observers on board UK vessels and estimated that UK gillnet boats in the 15m+ sector took around 740 harbour porpoises per year between 1992-1994.

35. In 1994, the Ministry of Agriculture, Fisheries and Food (MAFF) contracted SMRU to establish an independent monitoring scheme on UK gill and tangle net vessels throughout the North Sea. In 1997 this programme was extended to cover Scottish vessels fishing on the Scottish west coast. The programme estimated the total number of harbour porpoises likely to have been taken by UK gillnet fisheries in ICES Division IVa, b and c and VIa was approximately 1000 animals in 1995, reducing to around 600 porpoises in 2000. The reduction was primarily associated with an overall decline in gillnet fishing effort.

36. *Pelagic Trawling.* Since 2000, SMRU, under contract to Defra, has carried out a number of surveys to estimate the level of bycatch in UK pelagic fisheries. SMRU, in collaboration with the Scottish Pelagic Fishermen's Association, placed observers on board thirteen UK vessels for a total of 190 days at sea, covering 206 trawling operations around the UK. The fisheries that have been covered include herring, mackerel, sprat, pilchard, blue whiting, anchovy and bass. To date, no cetacean bycatch has been seen in any of these fisheries, with the exception of the bass fishery.

37. For the bass fishery, observations were made during 71 days at sea, covering 116 hauls. A total of 53 common dolphins were observed caught in these operations. We do not yet know what proportion of the total fishing effort was observed, and have not

## Section 3

yet estimated the total annual bycatch for 2001, but this is unlikely to be substantially greater than the actual number observed as a high sampling rate was achieved. The number of dolphins caught exceeded the expected level and was, according to the fishermen, higher than in previous years. The UK plays a very small part in this fishery, with the majority of vessels being French. Follow-up work in the same fishery in 2002 recorded 8 common dolphins caught in 66 hauls observed.

38. Further evidence of bycatch in pelagic trawls is obtained from necropsies of stranded animals. Under contract to Defra, the Natural History Museum, Institute of Zoology and the Scottish Agricultural College carry out post-mortem examinations on a sample of all stranded cetaceans which occur on the UK coasts. Data obtained from 01 January 2000 to 30 September 2002 demonstrated that bycatch, most probably from pelagic fishing operations, was identified as the cause of death in 65% of the stranded common dolphins that were subject to post-mortem examination and where cause of death was established.

39. *Demersal Trawling*. There are occasional records of cetacean bycatch in demersal trawling, but these are generally rare and not thought to have a significant impact on the conservation of cetaceans.

40. *Dredging, Potting and Long-lining*. There is no known bycatch problem in dredging fisheries in the UK and only infrequent bycatch of small cetaceans has been noted during potting operations. Long lines have been known to catch porpoises and other cetaceans, but there is very little long-lining by UK vessels and bycatch is therefore thought to be negligible.

### Bycatch in non-UK fisheries impacting on cetacean populations occurring in UK waters

41. There is no doubt that the activities of fishing fleets of other nations have the potential to impact upon cetacean populations that use UK waters. Many of these fleets operate within British fishery limits, including a number that have access to UK territorial waters between 6 and 12 miles and pursue fisheries implicated in bycatch problems. In addition cetaceans caught outside British Fishery limits may form part of populations that also occur in UK waters. Due to the paucity of data on the sizes and stock structure of the populations of species concerned the impact of the levels of bycatch listed below is unknown. It is not possible to judge if this estimated bycatch is an 'unacceptable interaction' in terms of the ASCOBANS targets.

42. Morizur, Y *et al.* 1999 estimated marine mammal bycatch in 11 pelagic trawl fisheries operated by four different countries in the north-east Atlantic. Observers accompanied commercial fishing vessels and monitored 374 tows totalling 1771 hours of towing during 377 days fishing. Two species of cetacean were positively identified in bycatches, white-sided dolphin and common dolphin, and a third, bottlenose dolphin was probably present. Dolphins were caught in four of the 11 fisheries.

43. Tregenza and Collet 1998 estimated annual bycatch totals in a number of pelagic trawl fisheries, including the Dutch horse mackerel fishery, and the French hake, tuna and bass pelagic trawl fisheries based on information on bycatch rates outlined in Morizur *et al* 1996 (the 'BIOECO' report). They estimated that the total bycatch rates for each of the four fisheries derived from the bycatch rates per tow would be 196

white-sided dolphins and 101 common dolphins for the Dutch horse mackerel fishery and 323 common dolphins for the French hake, tuna and bass pelagic fisheries.

44. In 1998 an experimental fishery involving pair trawling for tuna was conducted by the Republic of Ireland and recorded 35 cetaceans caught in 5% of hauls made. In 1999 in the same fishery, 145 cetaceans were taken in 313 observed hauls, of which only 31 hauls had a cetacean bycatch. 98 of the 145 cetaceans were taken in just 10 hauls. Species caught in 1999 included common (127), striped (8), and white-sided dolphins (2) and pilot whales (8) (BIM 2000).

### Overview of bycatch mitigation methods

45. There have been a number of overviews of bycatch mitigation techniques that could be employed in a range of fisheries throughout the world. In 2000, a specific project looking at potential mitigation techniques with relevance to the ASCOBANS area was commissioned by the ASCOBANS Secretariat. This report (Read, A.J. 2000,) identified a number of measures that could be used to mitigate bycatch of porpoises in fisheries within the ASCOBANS Agreement area, and adjacent waters. These mitigation measures can be grouped into three main areas – acoustic deterrents; gear modification; and fishery management (which can include no take zones, cetacean 'quotas', effort management etc).

46. *Gear Modification*. This means that the type of fishing gear used or fishery practice employed is altered to reduce cetacean bycatch. Ideally this should be carried out in a way to ensure no adverse effect on total catch rates for targeted fish. Such modifications could include, for example, acoustic deterrents, changes in net type, acoustically reflective nets, floating head ropes and for pelagic trawling – separator grids (also known as selection grids).

47. Acoustic deterrents, or 'pingers' as they are more commonly known, have been shown to reduce bycatch in gill net fisheries. They probably work by producing a sound that acts to deter small cetaceans from nets. Read 2000 extensively reviewed the use of pingers in US fisheries and reported that, when used in controlled conditions, observed reductions in bycatch rates for certain fisheries were 12-fold for common dolphins and 10-fold in harbour porpoises. Read concluded that '*this level of bycatch reduction would be sufficient to meet most management objectives, even in the absence of other measures*'.

48. Work carried out by SMRU on behalf of MAFF and the EC (Study Contract no 97/095) in the set net fishery in the Celtic Sea demonstrated a 92% reduction in bycatch of harbour porpoises in pingered nets compared to unpinged nets. This work concluded that if a 70% reduction in porpoise bycatch was to be achieved for this fishery, the use of pingers was the only currently viable management option. Work in Danish gill net fisheries (e.g. Larsen 1997) showed similar bycatch reductions when pingers were used. Berggren *et al* 2002 demonstrated that, when tested in a Scottish bay, the use of pingers significantly reduced the number of porpoises within a 500m radius. The results also showed that occasional malfunctioning devices do not compromise the effectiveness of pinger deployment.

49. Despite their obvious effectiveness in reducing bycatch in set net fisheries, there are a number of concerns about the use of pingers. Although there has been no

### Section 3

associated reduction in catch, except in one US fishery for shad, pingers may cause other operational difficulties for fishermen. Read 2000 indicated that the use of pingers in nets could interfere with the setting and hauling procedures, but this is in part dependent on the type of pinger being used and the problems can generally be overcome.

50. Other concerns have been expressed about the potential undesirable consequences of using pingers. It has been suggested, for example, that porpoises might habituate to pingers, rendering pingers ineffective over time, or that pingers might frighten animals away from some areas and so deprive them of foraging ground. Cox *et al* 2001 in field experiments in Canada demonstrated that over a period of some weeks of exposure to a pinger, porpoises began to surface somewhat closer to the pinger's location. However, this apparent change in behaviour did not result in the animals ignoring the device, they simply reacted less severely. Furthermore, Rossman 2000 suggested that the use of properly functioning pingers in US fisheries has not shown that they are any less effective after 6 years of widespread use. Lockyer *et al* 2000 using captive porpoises demonstrated that once the source of the sound emission was removed, porpoises rapidly resumed their former activities. On this basis, porpoises could be expected to move back into areas once pingered fishery operations had finished.

51. Larsen and Hansen 2000 estimated that if all Danish gillnets were equipped with pingers and those pingers excluded animals to a 400m radius with no overlap between adjacent nets, less than 1% of any area of the North Sea would be affected. They also noted that the use of pingers in a Danish trial had not prevented porpoises from getting entangled either in nets set without pingers nearby or in nets set soon afterwards, suggesting a relatively limited degree of exclusion. The possibility that pingers might exclude animals from bays or other inlets if used intensively in coastal areas needs to be considered, and any widespread deployment of pingers in these areas might need to address this concern by considering the possible nature and scale of habitat exclusion for porpoises and possibly other cetaceans.

52. Although pingers have been shown to be effective in reducing bycatch in gill net fisheries, work to date on their use in pelagic trawling has been inconclusive. While carrying out observations in the UK bass fishery, SMRU undertook a preliminary trial to see whether pingers had the potential to reduce the bycatch of common dolphins in this fishery.

53. Pingers were deployed on the trawl of one of the two UK bass pairs during March 2001, once dolphin bycatch had been noticed for the first time in the season. 52 tows were observed during March, and pingers were deployed on 15 of these. Dolphin bycatch rates were not reduced by the use of pingers in this experiment.

54. However, further trials have taken place in the Irish pair trawl fishery. In one trial pingers were deployed further into the body of the trawl and in another a remotely activated device was used to emit a loud deterrent noise at intermittent intervals. The results, though inconclusive at present, were encouraging and suggested that further work with acoustic devices may be productive (BIM – in prep).

55. Concerns have been expressed about the possibility of increased bycatches of cetaceans in fisheries switching from multifilament nets to monofilament or vice versa.

## Consideration of the issues

Research carried out by SMRU compared differing bycatch rates for mono and multi filament nets and concluded that there was no significant difference in the bycatch rate between the two types of net. It would therefore seem unlikely that any changes from or to using mono or multi filament nets would contribute *per se* to any change in bycatch rate. Linked to this work, SMRU has been carrying out a comparison of bycatch rates between nets of different monofilament twine thickness in an experimental fishery of the coast of Yorkshire. Preliminary results indicate that there may be significant differences in bycatch rate associated with the twine thickness used.

56. A number of studies have also looked at whether increasing the reflective qualities of nets would reduce bycatch. Nylon has a density similar to that of water, providing a poor target to echolocating marine mammals. The reflective qualities of the nets would be increased either by attaching materials to the nets, or by incorporating 'reflective' materials into the net filament. These 'reflective' nets could be more easily located by any cetacean in close proximity through echolocation and perhaps avoided.

57. Au and Jones 1991 reported that tests in the United States where gill nets were equipped with a hollow core monofilament to enhance their reflective capabilities proved ineffective in reducing bycatch compared to standard nets. Hembree and Harwood 1987 found similar results when nets were attached with bead chain or air filled plastic tubing.

58. Nets made from nylon that has been impregnated with a metal compound (barium sulphate or iron oxide) have shown more promise. Read 2000 reported that in experiments in the Bay of Fundy, the use of these 'acoustically reflective' nets significantly reduced the level of porpoise bycatch, while no significant difference was recorded in the take of the target species. It is not yet clear whether this bycatch reduction was due to any actual difference in the acoustic properties of the nets, or to some other mechanical property, such as increased stiffness as a result of the metal filler. In the UK, under contract to Defra, SMRU is assessing the effectiveness of reflective nets in reducing bycatch.

59. SMRU has also tested the effectiveness of floating head ropes. Trials however showed that this gear had a higher rate of porpoise bycatch than normal gear. It is possible that this may be due to the impact of the higher buoyancy of the gear on the performance of the net in the water, but other explanations are also possible and the result would require further investigation to be explained.

60. The mitigation methods identified above, with the exception of acoustic deterrents, have been developed primarily with the purpose of reducing bycatch in set net fisheries. There has been less research into gear modifications into reducing bycatch in trawl fisheries. The main method currently under consideration is selection grids. Exclusion devices or selection grids are used in many fisheries around the world to exclude unwanted fish or other animals from the catch. These grids are now widely used, and are even compulsory, in many shrimp fisheries around the world (including the EU) to reduce wasteful killing of fish. A variation of the design is also used to exclude turtles from shrimp trawls.

61. In New Zealand and Tasmania grids have been successfully deployed on an experimental basis in two hoki (blue grenadier) trawl fisheries and a squid trawl fishery



### Section 3

to minimise catches of Hooker's sea lions, New Zealand fur seals and Australian fur seals. The use of this sea lion exclusion device has been shown to reduce sea lion bycatch although trials are not yet complete.

62. In 2001 SMRU was awarded a grant to design and test an exclusion grid to reduce common dolphin bycatch in the bass pair trawl fleet. The gear was developed and tested at sea with the co-operation of the Scottish Pelagic Fishermen's Association but no cetaceans were encountered during the trial. Further research on the use of selection grids will be undertaken in 2003 and SMRU are working with contacts in France and other Member States to secure wider commitment to take forward this research work. The research work will also consider whether dolphins escaping through the grid suffer any trauma that may impact on their subsequent survival – a criticism that has been made of grid trials in New Zealand.

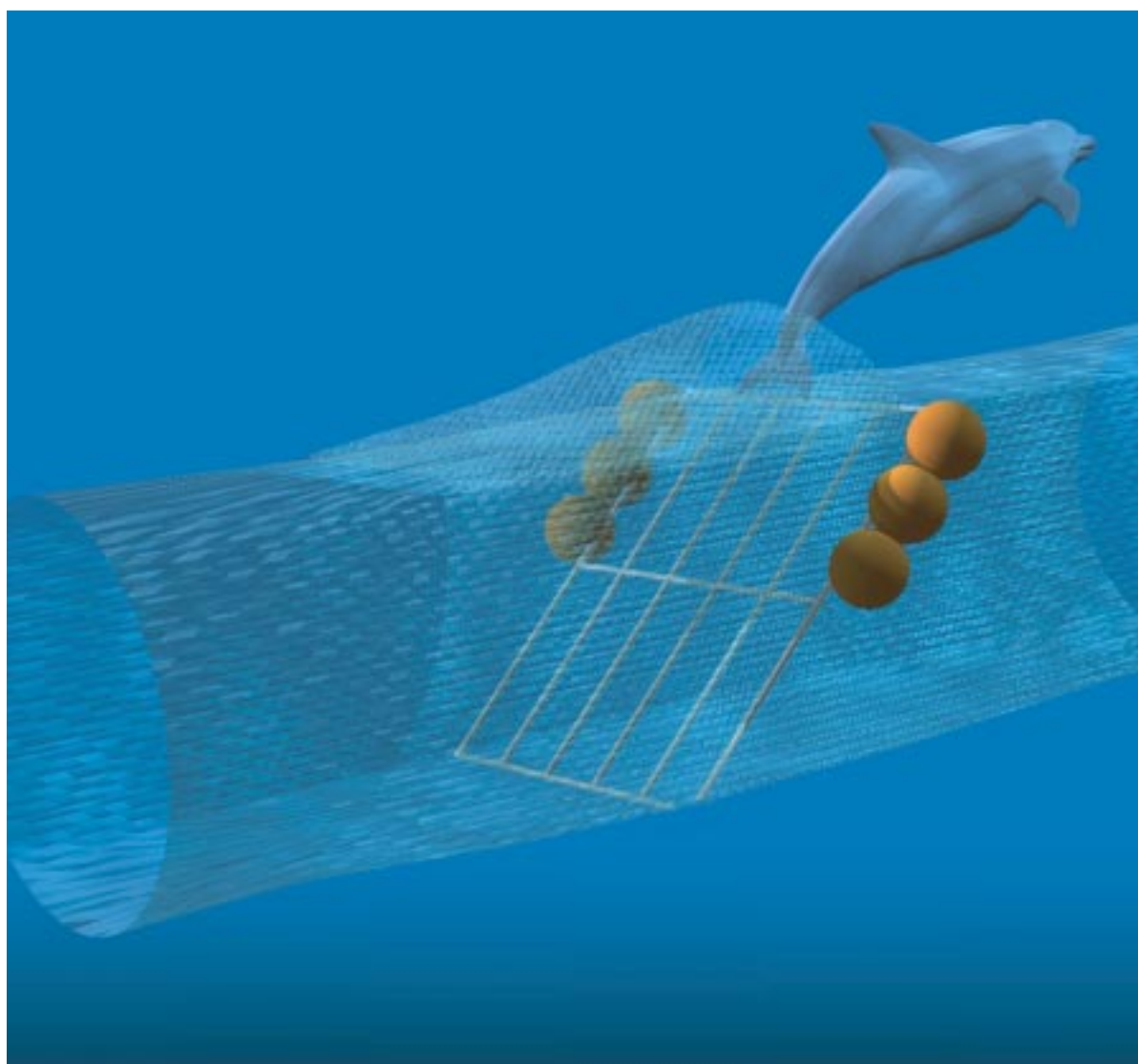


Diagram of a selection grid

63. *Fisheries management.* In fisheries with a significant level of bycatch, there is a direct correlation between fishing effort and cetacean bycatch. Therefore, for these fisheries, any measure to reduce fishing effort would lead to a reduction in bycatch. There are a number of ways in which fishing effort could be reduced – reduction in soak time and/or net lengths, time and area fishery closures and days at sea limitations.

## Consideration of the issues

The method required to reduce bycatch would depend on the nature of the fishery and these forms of fishery management techniques could be used independently to reduce bycatch, or be a part of a wider management strategy limiting catches of fish.

64. *Time/area restrictions.* For closures to work, the spatial or temporal aspects of bycatch rates should be predictable. If an area with a high bycatch rate is identified, managers must be confident that this is not a transient or a random effect, and that fishery closure in that area will have long-term benefits. Continued monitoring is therefore required after the closure is implemented to ensure its efficacy. Temporal closures do not need to be on a monthly or seasonal scale. If, for example, bycatch can be shown to be more prevalent during the day, measures could be introduced to control fishing activity on a diurnal basis.

65. If an area is closed to a particular gear type, either permanently or seasonally, fishermen may either switch to a different and permitted gear type or they may move away from the area and continue fishing with the same gear elsewhere. Only in very special circumstances will there be a total removal of the fishing effort – for example if fishermen are compensated financially to stop fishing. For closures to work suitable times or areas need first to be identified, and then (in most cases) the likely effects of the closure need to be modelled by making predictions on how and to where fishing effort will be redirected. The effects of such redirection of effort then need to be considered in relation to the management goal to determine if the closure will be effective. Such considerations would need to include any possible changes in gear type, relocations of effort or possible changes in cetacean distribution.

66. Read 2000 stated that time/area restrictions are unlikely to be effective in situations where there is little significant spatial or temporal variation in the bycatch rate, or in which there is considerable inter-annual variation in any spatial patterns.

67. Clearly the most effective method of bycatch reduction is closure of the offending fishery with no displacement of fishing effort elsewhere. If all other methods of bycatch mitigation fail, this must be regarded as a possibility. Such fishery closures need not be permanent or long-term, but could be triggered by a threshold of bycatch mortality. Under these circumstances a seasonal or annual cetacean mortality limit could be set for a fishery that, once reached (calculated on the basis of observed bycatch), would cause the closure of the fishery for the remainder of the year/season.

68. A similar system to this is used for the purse-seine tuna fishery in the Eastern Pacific Ocean under the Agreement on the International Dolphin Conservation Program. Under this Agreement per stock, per year, dolphin mortality caps are set for the fishery using the best available scientific evidence – in this fishery 0.1% of the minimum estimated abundance. This is then converted to a dolphin mortality limit for each vessel. Having met this limit, a vessel is not permitted to continue pursuing that fishery. Similar measures are used in certain New Zealand fisheries with respect to sea lion bycatch. Any such system is dependent on the identification of specific fisheries implicated in bycatch and would need rigorous enforcement, EU action and a comprehensive observer programme.

### Tackling the issue

#### Reduction of harbour porpoise bycatch in set net fisheries

69. As mentioned in paragraph 4, the purpose of this strategy is to identify what measures can be taken to work towards reducing small cetacean bycatch to below the 1.7% target set by the third Meeting of the Parties to ASCOBANS in 2000, and where practicable, the strategy works towards the reduction of bycatch to the lowest possible level. In order to meet this objective, targets have been set for certain fisheries in specific areas. These targets have been based on the best available knowledge (as set out in this document) of the population abundance of the species, of the estimated bycatch of UK fisheries of that population, and of the proportion of UK fishing effort within that fishery. However these targets will need to be reviewed and possibly changed in the light of any new data and as the impact of any bycatch reduction measures are assessed.

70. For example, for an estimated population of 170,000 porpoises in a fishery area, a 1.7% bycatch limit for that population would be 2,890. If UK fishing effort in the fishery impacting on the population was 40% of the total fishing effort, the pro-rata UK bycatch limit would be 1,156 animals. The initial target for that fishery would be to reduce the UK fleet's bycatch to below a maximum of 1,156 animals.

71. *Celtic Sea*. Based on the current evidence for bycatch of harbour porpoises in the Celtic Sea and western approaches, immediate measures are required to reduce the bycatch of this species. However, any such mitigation measures should be proportionate to the level of bycatch, and the ability to enforce any regulations. The best available abundance estimate for harbour porpoises in the Celtic Sea area is 36,280. 1.7% of the estimate equates to approximately 620 porpoises. UK registered vessels operating set nets in this area are just one part of this international fishery. The exact proportion of fishing effort carried by the UK set net fishery of the total set net fishery is at present unknown. However, based on the assumption that the UK fishery accounts for approximately one third of the fishing effort, the **target is to reduce the level of bycatch of harbour porpoises by UK licensed fishing vessels in the Celtic Sea to less than 200 animals within 3 years**. In the absence of any EU action to limit bycatch in this area, **there should be a legal requirement for UK fishing vessels, apart from those vessels operating within 6 miles of the coast, using bottom set gill nets in ICES areas VII e, f, g, h and j, to use acoustic deterrents ('pingers') on their nets**.

72. Bycatch of harbour porpoises in the English Channel is thought to be negligible as there are very few porpoises in this area. However, the English Channel historically had a harbour porpoise population, and the large amount of set net fishing in this area may act as a barrier to any recovery of the population. Alternatively, porpoises in this area may have formed a discreet population with little interaction with porpoises further north or west. It is therefore not recommended that a legal requirement should be imposed for the use of pingers in set net fisheries in ICES area VIId, subject to further work, and other non-regulatory measures should be undertaken (see para 91 and 92 below).

73. *North Sea*. In the North Sea in the year 2000, the UK landed 2,162 tonnes of fish with gillnets, whereas Denmark landed 14,507 tonnes (Yearbook of fisheries statistics 2000, Fisheries Directorate Copenhagen). Other nations, apart from Norway, take only negligible amounts of fish by gillnet in the North Sea. Based on this information the UK should adopt a maximum allowable porpoise bycatch of 13% of the total North Sea bycatch limit, (which at 1.7% of an estimated abundance of 268,000 would be 4564 animals) or 593 animals. However, this figure should be revised downwards to take account of the Norwegian gill net fisheries. Therefore, **the target is to reduce the level of harbour porpoise bycatch by UK vessels in the North Sea to less than 500 animals per annum within 3 years.**

74. As with the Celtic Sea, evidence has shown that bycatch of harbour porpoise in the central and southern North Sea is also occurring at unsustainable levels. Bycatch in this area is more prevalent in certain fisheries than others. ICES 2000 identified the turbot fishery as having the greatest absolute bycatch by a single fishery in this area. The Danish turbot fishery uses large mesh sizes (mainly 270mm) and a very long soak time. It also recognised that the UK also has fisheries using large meshes and long soaktimes for turbot, ray and skate. ICES proposed that pingers should be used in all bottom set net fisheries using large meshes. For ease of enforcement, ICES proposed mandatory pinger use for all fisheries using meshes greater than 220mm as this is the minimum mesh size for the fisheries concerned (EC Regulation 850/98). In the absence of any EU action to limit bycatch in this area, **it should be a legal requirement for pingers to be used on all UK set net fisheries using a mesh size greater than 220mm in ICES areas IVb and IVc.**

75. The ICES report also identified a particular bycatch problem with wreck net fisheries in the North Sea. These fisheries are characterised by the short net lengths that are deployed by larger vessels fishing offshore and targeting larger cod that congregate over wrecks and rough ground. The Danish Government has placed a legal requirement to use pingers on nets which individually or linked in fleets are up to 300m long. **There should be a similar legal requirement applied to UK licensed vessels to ensure that the UK offshore wreck net fishery also uses pingers in line with their Danish counterparts.**

76. Any regulations regarding the use of pingers could specify the acoustic operating characteristics of the pingers, the spacing of pingers on nets, and how the pingers should be attached to the nets.

### Reduction of small cetacean bycatch in pelagic trawls

77. Unlike set net fisheries, a clear short-term measure has not been identified to reduce cetacean bycatch in pelagic trawls in UK waters. Further work is required on the usefulness of various acoustic devices and technical measures such as separator grids in pelagic trawls. At this stage, and while trials are underway, the introduction of such technical measures is not recommended except on an experimental basis, but future restrictions on pelagic trawl fisheries are not ruled out.

## Section 4

78. There is no doubt that certain pelagic trawl fisheries can have relatively high levels of bycatch. In section 5, recommendations on future bycatch monitoring are outlined. With adequate bycatch monitoring it may be possible to determine individual bycatch mortality limits for each fishery. Fisheries could then be allowed a certain annual level of bycatch but, once reached, the fishery would be closed. This has similarities to the purse-seine tuna fishery in the Eastern Pacific Ocean under the Agreement on the International Dolphin Conservation Program mentioned in paragraph 68. There would be practical difficulties in establishing such a system in most UK fisheries, where different fisheries involving other Member States operate in the same area alongside one another. For these reasons, this mitigation method would be most effective if operated at European Community level in the light of the results of a comprehensive monitoring scheme. Such a scheme could also be considered as authorising a quota level for bycatch for cetaceans. However, **further consideration should be given as to whether any UK fishery should be subject to mortality limit scheme.**

### Effort reduction

79. *Reduction in fishing effort.* The Council of Ministers in December 2002 agreed significant reductions in EU fishing effort to aid the recovery of stocks at serious risk of collapse. Although it is likely that the reduction in fishing effort will have the benefit of reducing bycatch, it is too early to quantify this. Monitoring of these fisheries will continue in order to assess the impact on levels of bycatch. The UK Government believes that effort reduction must be managed at a European level and that no additional unilateral action on effort reduction by the UK should be undertaken as a part of a strategy to reduce bycatch. Any reduction in fishing effort resulting from the reform proposals that affect those fisheries with bycatch is likely to reduce bycatch. The decommissioning programme to be introduced as part of the recovery process may also contribute to a reduction in bycatch. The impact of the decommissioning programme and other reductions in effort should be monitored to address its predicted effect on cetacean bycatch.

80. As mentioned previously, there are substantial difficulties in identifying specific areas or times where fisheries should be closed to reduce bycatch. Under the EC Habitats Directive the UK is obliged to identify suitable sites to be designated as Special Areas of Conservation (SAC) for the harbour porpoise and the bottlenose dolphin. So far, no suitable sites for harbour porpoise have been found in UK waters, but a number of sites have been identified for bottlenose dolphins. **As a part of the management for any sites identified for these species, consideration should be given to introduce measures to restrict fisheries which impact upon the species for which the SAC has been designated, whether the impact occurs within or outside the SAC.**

### Research and monitoring requirements

#### Population monitoring

81. The major constraint to estimating the effect of bycatch on cetacean populations is the lack of reliable and recent population estimates. The last major survey of cetacean populations around the British coast took place in 1994 (Distribution and Abundance of the Harbour Porpoise and Other Small Cetaceans in the North Sea and Adjacent Waters, known as 'SCANS'), and this survey did not cover the whole of British waters. Another major survey is planned for 2004 (SCANS II). SCANS II aims to estimate the abundance of cetacean populations in European Atlantic waters during the summers of 2004 and 2005. The surveys will cover shelf and offshore waters under European jurisdiction together with the shelf waters covered by SCANS-94, including the Kattegat, Skagerrak and part of the Baltic Sea. The surveyed area will extend to the 200nm European Fishing Zone (EFZ) north and west of Britain, Ireland, France, Spain and Portugal. The northern boundary will be approximately 64°N. The southern limit will be the boundary of the region covered by the Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and contiguous Atlantic Area (ACCOBAMS). It is essential that this survey is undertaken to provide updated abundance estimates of those small cetaceans believed to be subject to high levels of bycatch and **the UK should continue to work closely with the project co-ordinators to ensure adequate funding is secured for this survey.**

82. Such 10-year surveys provide a useful snapshot of cetacean abundance; however, there is a need to develop less costly mechanisms to identify trends in certain small cetacean populations between surveys and **it is recommended that methods to identify trends in populations of harbour porpoise, common dolphin and bottlenose dolphin be identified and set up as a matter of urgency.**

83. When endeavouring to manage bycatch of cetaceans it is important to have an understanding of their population structure and seasonal movements. It is also important to understand whether we are dealing with an interlinked population, or a series of smaller distinct sub-populations, and to be able to monitor any changes in the age structure of the population that might be expected where bycatch is a serious problem. **In order to do this, further work should be carried out on small cetacean population structure and seasonal movement.**

#### Bycatch monitoring

84. Under Article 12(4) of the Habitats Directive, Member States must introduce a system to monitor the incidental capture and killing of all cetacean species. Reliable bycatch monitoring is required both to indicate the current levels of bycatch and assess the effectiveness of any mitigation measures. Previous bycatch monitoring has been carried out on the basis of a series of research projects targeting specific fisheries at time, but this monitoring should now be an ongoing commitment. **In order to ensure adequate bycatch monitoring the UK should develop an expanded bycatch monitoring scheme to assess levels of bycatch in UK fisheries at a statistically valid level.**

85. In order to assess the effectiveness of the use of pingers in these fisheries an appropriate level of monitoring is required. It is not thought that the placement of

## Section 5

compulsory observers on vessels using pingers is necessary at this time and it is recommended **that a voluntary arrangement should be entered into with those fisheries obliged to use pingers to take observers onboard.** However, if the level of cover provided by a voluntary arrangement is deemed inadequate, legal measures should be introduced to ensure that adequate monitoring could be carried out. These observers would not be involved in the enforcement of any fisheries-related regulations. Fishing vessels' compliance with legislation setting any mandatory use of pingers would be monitored as part of the normal activity of the UK inspection authorities.

### Technical Measures

86. As identified in paragraph 52, research into the use of acoustic devices in pelagic trawls is at a less advanced stage than that for set net fisheries. However some experimental work, such as that in the Irish albacore fishery, has shown promise, and further work is required. **We recommend that, preferably in cooperation with other Member States' fisheries, further trials should be carried out on the use of acoustic deterrents in pelagic trawl fisheries with an identified bycatch of cetaceans.**

87. There have been concerns expressed that cetaceans will become habituated to pinger use over time, and the effectiveness of pingers will therefore decline. *Cox et al* 2001 suggested that porpoises habituated to the presence of a pinger. However their experimental protocol involved only one pinger on a mooring, and no conclusion was drawn that the observed behavioural reaction might result in any decrease in the operational effectiveness of deployed in gill net fisheries. Habituation is not therefore currently thought to pose a problem and it is likely that any decline in the effectiveness of pingers would be identified by the use of observer programmes recommended in paragraph 85.

88. Concerns have also been expressed that the wide use of pingers in certain fisheries may result in the exclusion of cetaceans from habitat that may be significant to their survival. However, where pingers have been used there is no evidence that this occurs. If pingers were to be used intensively in coastal areas there may be problems with cetaceans being unable to access (or leave) bays or inlets. **Any intensive deployment of pingers in these coastal areas would need to be supported by a programme of research to identify any potential problems of exclusion.**

89. There is no doubt that the deployment of pingers will be successful in reducing bycatch in set net fisheries, and may have the potential to reduce bycatch in pelagic trawls. The deployment of pingers should not though be seen as the only measure to reduce bycatch, and work should continue to develop other technical measures to reduce reliance on and, if found effective, eventually replace the use of pingers.

90. A range of these technical measures is currently under research. These include the use of separator grids, investigations on the differing levels of bycatch between differing twine thickness, and reflective nets. These are important programmes and **research into separator grids and the use of reflective nets and other net modifications should continue.**

# Effective implementation and incentives

## Incentives

91. UK funding is available under the EU FIFG structural programme to encourage fishermen to adopt more selective fishing methods, such as converting from one fishing method to another. This includes funding to alter fishing practices to reduce cetacean bycatch, such as the purchase of pingers, and would also be made available for separator grids if the current trials prove that these are successful in reducing bycatch. There have been few applications for use of these funds for marine environmental purposes. As a consequence, Defra wrote in August 2002 to a range of organisations to encourage further applications and to highlight the priority the Government gives to improving the sustainability of sea fishing. However, it has not been Government policy to make compensation available to fishermen when introducing regulations to alter fishing practices in order to protect stocks or the wider marine environment from the impact of fishing and mandatory gear, or gear which is to become mandatory, is not normally eligible for grant aid.

EU FIFG funds could be made available towards the costs of data collection and the costs of a project officer or assessor in connection with:-

1. pre-assessment to seek Marine Stewardship Council (MSC) certification;
2. full assessment against the MSC Standard;
3. annual fishery surveillance audits for those fisheries that are successfully certified against the MSC Standard; and
4. re-assessment against the MSC Standard during or on expiry of the certification period.

92. There is public support for cetacean-friendly fishing methods. The success of 'dolphin-friendly' tuna illustrates that given the right information, the right pricing and a choice of product, consumers will pick the one with environmental benefits. The Marine Stewardship Council already provides one example of such a scheme in which the sustainability of fish is judged. The EU FIFG programme can fund certification schemes and eco-labelling. Therefore, **urgent consideration should be given to providing an accreditation scheme for those fisheries adopting, or providing assistance in researching, cetacean-friendly methods of fishing.**

## Enforcement

93. UK fisheries inspectorates are responsible for enforcing UK and EC measures for the regulation of fisheries within British Fishery Limits. In addition, the twelve Sea Fisheries Committees (SFCs) and the Environment Agency, which acts as an SFC in certain estuaries, regulate local sea fisheries around the entire coast of England and Wales out to 6 miles. In Scotland, the Scottish Fisheries Protection Agency is the competent authority for enforcing UK and EC measures for the regulation of fisheries. Local sea fisheries around the coast of Scotland out to 6 miles are regulated by the Scottish Executive Sea Fisheries Inshore Branch. In Northern Ireland there are no Sea Fisheries Committees and enforcement is carried by the Department of Agriculture and Rural Development's Sea Fisheries Inspectorate.



## Section 6

94. Enforcement officers' powers are set out in a number of Acts of Parliament and Statutory Instruments, including the Sea Fish (Conservation) Act 1967 and the Sea Fisheries Act 1968. Their powers apply to all vessels, both British and foreign registered, operating within British Fishery Limits and also cover British registered vessels wherever they may be. Officers have the powers to board vessels and may examine catches and equipment on the boat including fishing gear, fish holds, etc. The penalties for fisheries offences can be severe and include disqualification from holding a fishing licence, fines up to £50,000 and confiscation of catch and fishing gear.

95. The adoption of the measures outlined in this strategy, in part or in their entirety, may require additional resources for the enforcement authorities. Enforcement personnel may require training in the techniques required to ensure pingers are being used correctly in those sectors of the fleet where pinger use is compulsory, and new equipment may be required.

### Working through Europe

96. Fisheries in the waters around the UK are managed under the Common Fisheries Policy. Vessels from other Member States take part in many of the fisheries responsible for cetacean bycatch (such as the offshore bass fishery). European Community action is therefore needed if effective measures are to be taken to reduce bycatch. The European Commission's proposals for reform of the Common Fisheries Policy included an action plan for integrating environmental concerns into the CFP through a number of guiding principles, management measures and a work programme.

97. One element of the action plan will be a new set of technical conservation measures designed to reduce cetacean bycatch to levels guaranteeing a favourable conservation status for cetaceans. The Commission produced a draft working document on this issue in December 2002, and recommended mandatory observers and the use of pingers on certain fishing activities in certain areas which were complementary to those being proposed in this strategy. The UK Government will continue to work with the Commission and other Member States to bring forward Community-wide regulations to reduce small cetacean bycatch, and believe that those measures should be complimentary to those outlined in this strategy as a part of their proposals to reduce bycatch. However, it is unlikely that any formal regulatory proposals from the Commission will be in place before the end of 2004. In the absence of Community-wide provisions to tackle small cetacean bycatch, and in light of any comments received as a part of the consultation on this strategy, the UK Government intends to pursue the proposals contained in this strategy.

98. As a means of increasing the involvement of stakeholders in the operation of the CFP, the new CFP framework Regulation 2371/2002 of 20 December 2002 stipulates that Regional Advisory Councils (RACs) be established. These are to be '*composed principally of fishermen and other representatives of interests affected by the Common Fisheries Policy, such as representatives of the fisheries and aquaculture sectors, environment and consumer interests and scientific experts from all Member States having fisheries interests in the sea area or fishing zone concerned.*' RACs may be consulted by the Commission and Member States in respect of a wide range of types of measure, and they may submit recommendations and suggestions of their own accord to the Commission and Member States concerned. These bodies will be consultative in nature, and the Commission will not be obliged to accept their recommendations.

## Effective implementation

However, it is clear that they are to have a key role in contributing to regional fisheries management, and that it will often be in the Commission's interest to accommodate their views. Fisheries management will be a primary focus for their activities, but this does not preclude the use of the groups to consider the impact of fishing on the wider marine environment, including cetacean bycatch issues. Detailed proposals on the remit of RACs will be discussed over the coming months. **Once established, RACs should be encouraged to consider which fishing sectors within their region have an unacceptable level of bycatch, and suggest measures to reduce bycatch in those fisheries.**

### Summary of recommendations and indicative costings

99. Recommendation 1 (para 71): – **There should be a legal requirement for UK fishing vessels, apart from those vessels operating within 6 miles of the coast, using bottom set gill nets in ICES areas VII e, f, g, h, and j to use acoustic deterrents ('pingers') on their nets.**

100. Recommendation 2 (para 74): – **It should be a legal requirement that pingers should be used on all UK set net fisheries using a mesh size greater than 220mm in ICES areas IVb and IVc.**

101. Recommendation 3 (para 75): – **The Danish Government has placed a legal requirement to use pingers in the North Sea wreck fishery on nets which individually or linked in fleets are up to 300 m long. There should be a similar legal requirement applied to UK licensed vessels.**

102. The indicative cost for recommendations 1 to 3 above is directly related to the number of pingers required for each vessel. This is dependant on the length of net used, and at what spacing the pingers should be attached to those nets. Of course larger vessels, on average, deploy longer lengths of nets and would therefore require more pingers. Assuming that one pinger is required for every 200 metres of net, the cost to place pingers on the over 10-metre fleet has been estimated at an average of £4,000 per boat (assuming £60 per pinger). For the under 10-metre fleet the cost should be around £750 per boat. The total cost for the fleets covered by recommendations 1 to 3 is estimated to be between £650,000 and £900,000. These costs are for the initial purchase of the pingers, and do not take into account training to use pingers or future servicing costs.

103. Recommendation 4 (para 78): – **Consideration should be given as to whether any UK fishery should be subject to a mortality limit scheme.** The cost of such a scheme would depend on the size of the fishery concerned and the details of the scheme – for example where a sample of the fleet was observed or whether the entire fleet was observed. At present, however, there are no firm intentions to introduce a bycatch limit scheme, so this possibility has not been costed.

104. Recommendation 5 (para 80): – **As a part of the management for any sites identified for these species (harbour porpoise and/or bottlenose dolphin), consideration should be given to introduce measures to restrict fisheries which impact upon the species for which the SAC has been designated, whether the impact occurs within or outside the SAC.** At present it is not believed that existing fishing activities have an adverse impact on the populations of the cetaceans for which SACs have been established. This recommendation should only impact on new or altered fishing practices. No additional costs to SAC management are envisaged by this recommendation.

105. Recommendation 6 (para 81): – **The UK should continue to work closely with the project co-ordinators to ensure adequate funding is secured for SCANS II.** The total cost of the project is estimated to be €6 million. Defra has agreed to fund €435K of this project, and is looking to other countries and the European Commission to provide funds for the project. To date, ASCOBANS has agreed to provide €69K and Germany €160K.

## Summary of recommendations and indicative costings

106. Recommendation 7 (para 82): – **Methods to identify trends in populations of harbour porpoise, common dolphin and bottlenose dolphin to be identified and set up as a matter of urgency.**

107. Recommendation 8 (para 83): – **The UK should fund further work on small cetacean population structure and seasonal movement.**

108. Some of the work identified under recommendations 7 and 8 could utilise material collected from the strandings programme (funded by Defra). Sample obtained under that programme could be used to investigate the population structure of dolphins and porpoises. This theme will include the following elements: genetics, feeding, age, condition, and reproduction. Results from this work should help clarify migration and seasonal distribution and could be used to interpret the results emerging from the sightings programme. This work would cost approximately £400k over 5 years.

109. Recommendation 9 (para 84): – **The UK should develop an expanded bycatch monitoring scheme to assess levels of bycatch in UK fisheries at a statistically valid level.**

110. Recommendation 10 (para 85): – **A voluntary arrangement should be entered into with those fisheries obliged to use pingers to take observers onboard. The need for mandatory observers would be reviewed in the light of the success of these arrangements.**

111. The main cost for recommendations 9 and 10 would be in providing observers for fishing vessels. A scoping study to clarify appropriate levels of bycatch monitoring to accurately assess levels of bycatch in the UK fishing fleet has been let at the cost of £5K. Preliminary indications from this work show that in the year 2000 UK gillnet and pelagic trawl fisheries account for some 50,000 and 7,000 days at sea per year respectively. Suggested 5%-10% levels of observer coverage would imply that observations would be needed for between 3000 and 5700 days at sea; assuming a costs of between £300 and £500 per day this would imply a cost of around £900K to £2.8 million per year. However, preliminary analysis also suggests that much lower levels of observer coverage could still be used to monitor catch rates to arrive at statistically sound conclusions.

112. Recommendation 11 (para 86): – **We recommend that, preferably in co-operation with other Member States' fisheries, further trials should be carried out on the use of acoustic deterrents in pelagic trawl fisheries with an identified bycatch of cetaceans.** The cost of these trials would vary depending on whether there was a need to charter vessels to test pingers, the extent of cooperation with other Member States, and whether it would be possible to persuade fishermen to assist with the trials without charge or with limited charges (as was the case with the first separator grid trial). If the work had to be carried out under charter, the cost would be around £6000 per day, plus equipment and observers, and possibly further development costs for remotely controlled devices. The minimum time required for the trial would be one month. The cost would be around £180,000 for vessel charter, plus the other costs identified above bringing the cost of the trial to around £200,000. If fishermen agreed to assist in this exercise using their existing vessels the costs could be very much lower.

## Section 7

113. Recommendation 12 (para 88): – **Any intensive deployment of pingers in coastal areas would need to be supported by a programme of research to identify any potential problems caused by exclusion.** This would probably require a dedicated sighting scheme in the area where pingers were to be deployed. Statistically valid data on the occurrence of cetaceans before, during and after deployment would be required. This could be carried out on an experimental basis in areas where data is sufficient and would cost approximately £50,000.

114. Recommendation 13 (para 90): – **Research into separator grids and the use of reflective and other net modifications should continue.** The Government will continue to fund work into modifications to fishing gear to reduce bycatch of small cetaceans. It will seek to maximise the benefit of this work by, where possible, collaborating with other Member States and working with the fishing industry. It is estimated that for the next five years, research in this area will cost Defra approximately £100k per annum, of which £50k will be used in net trials and £50k on trawl work. It is anticipated that some EU funding will be available to supplement this.

115. Recommendation 14 (para 92): – **Consideration should be given to providing an accreditation scheme for those fisheries adopting, or providing assistance in researching, cetacean-friendly methods of fishing.** All accreditation schemes incur cost, both in the administration of the scheme itself, and the cost of assessing whether fisheries meet the required standard. Probably the best known, and most well established accreditation body for fisheries is the Marine Stewardship Council (MSC). This organisation is primarily funded by donations (£1.48 million for the year ending 31 March 2002), with only a small proportion of funds being directly attributable to logo licensing and accreditation schemes (£17K). The cost of obtaining the MSC accreditation for the Thames herring fishery was estimated to be around £8K, with an annual cost of £1500 for ongoing surveillance. The decision on whether to adopt some form of eco labelling is one for the fisheries concerned to decide. However, the EU FIG programme can provide funds for accreditation schemes and eco labelling.

116. Recommendation 15 (para 98): – **Once established, RACs should be encouraged to consider which fishing sectors within their region have an unacceptable level of bycatch, and suggest measures to reduce bycatch in those fisheries.** This recommendation should not incur any additional costs to those already incurred by the establishment and running of RACs.

## Review of the strategy

117. A formal review of the effectiveness of the measures recommended in this strategy should be undertaken within three years of publication. This does not preclude adjustments in the intervening period in the light of new data or knowledge of the impact of the implementation of existing measures.

## References

- Au WW and Jones I. 1991. Mar. Mamm. Sci. vol 7, No 3, pp 258-273.
- Baines, M.E., Reichelt, M., Evans, P.G.H., and Shepherd, B. 2002. Comparison of the abundance and distribution of harbour porpoises (*Phocoena phocoena*) and bottlenose dolphins (*Tursiops truncatus*) in Cardigan Bay, UK. 16<sup>th</sup> Annual Conference of the European Cetacean Society, Liege, Belgium.
- Berggren, Carlstrom and Tregenza. 2002. Mitigation of small cetacean bycatch; evaluation of acoustic alarms (MISNET). Project No 00/031. Report to the European Commission Directorate General for Fisheries.
- BIM. 2000. Diversification trials with alternative tuna fishing techniques including the use of remote sensing technology. Final report of EU Contract 98/010, Bord lascaigh Mhara (BIM), Dun Laoghaire, Ireland.
- BIM. In prep. Development of Prototype Cetacean Deterrent Systems for the Albacore Tuna Pair pelagic Fishery. Bord lascaigh Mhara (BIM), Dun Laoghaire, Ireland.
- Brown et al. 1997. The habitats directive: selection of Special Areas of Conservation in the UK. Joint nature Conservation Committee Report 270, Peterborough.
- Goujon, M., Antoine, L., Collet, A., and Fifas, S. 1993. Approche de l'impact écologique de la pêche thonière au filet maillant dérivant en Atlantique nord-est. Rapport IFREMER – RI.DRV-93.034. 47 pp.
- Cox, T.M., Read A.J., Solow, A., and Tregenza, N. 2001. Will harbour porpoises (*Phocoena phocoena*) habituate to pingers? Journal of Cetacean Research and Management, 3: 81-86.
- Hammond et al.1995. Distribution and Abundance of the Harbour Porpoise and Other Small Cetaceans in the North Sea and Adjacent Waters.
- Hammond, P.S., Berggren, P., Benke, H., Borchers, D.L., Collet, A., Heide-Jørgensen, M.P., Heimlich, S., Hiby, A.R., Leopold, M.F., and Øien, N. 2002. Abundance of the harbour porpoise and other cetaceans in the North Sea and adjacent waters. Journal of Applied Ecology, 39: 361–376.
- Hembree D and Harwood M B. 1987. Rept. Int. Whaling Commission. 37, pp369 –373.
- ICES. 1996. Report of the Study Group on Seals and Small Cetaceans in European Seas. ICES CM 1996/ N:1.
- ICES. 2001. Report of the ICES Advisory Committee on Ecosystems, 2001. ICES Cooperative Research Report, 249: 3–14.
- ICES. 2002. Report of the Advisory Committee on Ecosystems, 2002.
- Larsen, F. 1997. Effekten af akustiske alamer på bifangst af marsvin I garn. DFU report 44-97. ISSN 1395-8216.
- Larsen, F., and Rye Hansen, J. 2000. On the potential effects of widespread pinger use for the Danish North Sea gillnet fishery. IWC paper SC/52/SM27.

## References

- Lockyer, C., Amundin, M., Desports, G. and Goodson, D. 2000. EPIC – Elimination of Harbour Porpoise Incidental Catches. Project no DG XIV 97/006. Report to the European Commission Directorate General for Fisheries.
- Macleod, K. 2001. The spatial and temporal distribution of cetaceans off the west coast of Scotland in relation to environmental factors: implications for marine management. Unpublished Ph.D. thesis, University of Greenwich, London.
- Morizur, Y., Tregenza, N., Heesen, H., Berrow, S., and Pouvreau, S. 1996. Bycatch and Discarding in Pelagic Trawl Fisheries. Report to the European Commission DGXIV on study BIOECO/93/017. 182pp
- Morizur, Y., Berrow, S.D., Tregenza, N.J.C., Couperus, A.S., and Pouvreau, S. 1999. Incidental catches of marine-mammals in pelagic trawl fisheries of the northeast Atlantic. *Fisheries Research* 41(3): 297-307.
- O’Cadhla, O., Burt, M.L., Borges, A.L., and Rogan, E. 2001. Summer distribution and abundance of cetaceans in western Irish waters and the Rockall Trough. Paper presented to the International Whaling Commission, London, June 2001, O:15.
- Read, A.J. 2000. Potential Mitigation Measures for Reducing the By-catches of Small Cetaceans in ASCOBANS Waters. Report to ASCOBANS.
- Rossmann, M. C., 2000. Effectiveness of time area closures and acoustic deterrents as harbour porpoise bycatch reduction strategies off the Northeast coast of the US. SC/52/SM23.
- Tregenza, N.J.C. and Collet, A. 1998. Common dolphin *Delphinus delphinus* bycatch in pelagic trawl and other fisheries in the North East Atlantic. Report International Whaling Commission 48, 1998 453-459.
- White, R., and Webb, A. 1995. Coastal birds and marine mammals of mid Dorset. Joint Nature Conservation Committee, Peterborough, UK. 48 pp.
- Wilson, B., Hammond, P.S., and Thompson, P.M. 1999. Estimating size and assessing trends in a coastal bottlenose dolphin population. *Ecological Applications*, 9: 288–300.

## Glossary

**Anthropogenic removal:** – the removal of a species by human activities. For small cetaceans, fisheries bycatch is the largest cause of anthropogenic removal of the species. Other causes of anthropogenic removal can include pollution, ship strikes and deliberate capture.

**Benthic feeder:** – a species that feeds on the seabed.

**Decommissioning:** – the formal procedure for removing a vessel from the fishing register and reducing the total tonnage of vessels or vessel capacity units engaged in commercial fishing.

**Demersal trawling:** – a net that is towed on the seabed rather than through mid water.

**Gill net:** – curtains of netting that hang vertically in the water, either in a fixed position (e.g. surface or seabed) or drifting, that trap fish by their gill covers when they try to swim through the net mesh.

**ICES:** – the International Council for the Exploration of the Sea, an independent advisory body to encourage research into commercial fish stocks, their biology and all factors that may affect their abundance.

**Long-line:** – a method of fishing using baited hooks.

**Marine Stewardship Council (MSC):** – a non-governmental organisation that encourages consumers to purchase fish taken from environmentally responsible and sustainable fisheries. All fish products that the MSC judge to be from sustainable fisheries can carry an MSC 'eco label'.

**Monofilament:** – a single strand of nylon (or similar) line that is often translucent.

**Multifilament:** – a form of line made from strands of natural or man made fibre twisted together.

**Pelagic trawl:** – a trawl that is towed in mid water.

**Precautionary approach:** – an approach to fisheries management where a measures are taken based on the possibility of significant environmental damage, even before there is conclusive evidence that damage will occur.

**Seine Net:** – a fishing method using an encircling net.

**Strandings:** – cetaceans that are washed ashore either alive or dead.

**Tangle Net:** – a bottom set net that is attached to a headline much shorter than the length of netting so that the net hangs in loose folds.



**PB8049**

**Nobel House  
17 Smith Square  
London SW1P 3JR**

**[www.defra.gov.uk](http://www.defra.gov.uk)**