Annual report on the implementation of Council Regulation (EC) No 812/2004 – 2010

Member State: United Kingdom

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Summary

This report summarises ongoing work on the implementation of Council Regulation 812/2004 during the calendar year 2010 by the UK. The work is focused on two areas, firstly on the development of measures to minimise cetacean bycatch and secondly on monitoring fisheries to estimate the total mortality of cetaceans in relevant UK fishing operations. Estimates of cetacean bycatch for 2010 were of 536 porpoises (UCL 1054) and 287 (UCL 713) common dolphins, though caveats apply to these estimates.

Work on mitigation continues to focus on the use of one specific type of acoustic deterrent device (DDD). These devices (DDD-03F) are being used in the UK component of the midwater pair trawl fishery for bass in the Western English Channel with continued success. A variant of the same device (DDD-03H) is being adopted by the over 12m gill and tangle net fleet in the Western Channel and Celtic Sea. Observations on this fleet segment continue to demonstrate the effectiveness of these devices in minimising porpoise bycatch, but the effect on common dolphins is not yet clear. Most of this fleet segment has now tried using DDDs and it is anticipated that all relevant vessels will be equipped by the end of 2011.

Monitoring was focused on pelagic trawls in ICES divisions VIa and IVb, on the bass midwater pair trawl fishery in Division VIIe, on a wide range of static gear types in subarea VII and on static gear in the North Sea (subarea IV). Bycatches of porpoises and common dolphins are reported from several gear types in subarea VII. Bycatch estimates are presented in the main body of this report for each of the strata as specified in the reporting format, that is by metier and by ICES sub-division. Under these constraints it is estimated that 86 common dolphins and 338 harbour porpoises were killed in UK fisheries in 2010. These estimates are biased low because this level of stratification excludes fisheries and areas where bycatch is known to occur but where no monitoring was done in 2010.

Difficulties encountered are described and discussed together with the UK rational for continued monitoring more widely than is prescribed under Regulation 812/2004.

ACOUSTIC DETERRENT DEVICES

1. General Information

Since 2009 the UK has been trialling alternative pinger types as part of a scientific investigation under paragraph 3 Article 2 of Regulation 812/2004. Previous studies in the UK, France and Ireland, have shown that the existing commercially available acoustic deterrents were unable to meet the rigours of use, at least in the tangle net fisheries of Cornwall and the wider Celtic Sea (Anonymous 2003, Anonymous 2005, Cosgrove et al. 2005, Le Berre 2005).

The UK fishing industry had proposed using a louder device so that fewer devices would be needed and so that each could be individually deployed during net shooting rather than having to remain fixed to the gear. The DDD manufactured by STM in Italy appears to have suitable acoustic properties to meet this requirement. Theoretical considerations suggest that each such device would ensonify a string of nets to the same acoustic level as up to ten quieter devices, thereby limiting the overall numbers required. Prior to deployment under commercial fishing conditions, experimental trials of the DDDs were conducted to determine any potential widescale negative impacts, and it was demonstrated that dolphin and porpoise avoidance was limited to around 2km from the device. Further trials addressing this issue in more detail are ongoing.

During 2010 funds were secured from the Fisheries Challenge Fund for a collaborative outreach programme between the SMRU and the Cornish Fish Producers' Organisation to increase the uptake of DDDs in the over 12m netting sector working in the Celtic Sea and Channel . This work is ongoing and the majority of the fleet have now tested and used DDDs and most operational issues have been adequately explored and resolved where necessary. This project is due to be completed in the Spring of 2011 by which time it is anticipated all relevant (over 12m) vessels will be equipped with DDDs.

The situation in the North Sea is less clear as there are fewer vessels operating there that are required to use pingers under Regulation 812/2004, and the more specific and detailed requirements in Annex 1 of the Regulation for this area (Division IV) involving mesh size and season make it more difficult to determine from logbook data which vessels are required to use pingers.

All UK vessels taking part in the bass midwater pair trawl fishery (2 pair teams during 2010) in the English Channel used a version of the DDD designed for trawl use, and dolphin bycatch remains greatly reduced compared with previous years.

2. Acoustic Deterrent Devices (Article 2 and 3)

2.1 Description of the fleet using pingers

Metier[1]	Fishing Area	No. of Vessels	% vessels using pingers (No.)	No. of trips	Days at sea	Months of operation	Total length of nets	Total soak time
Gill light/Demersal	VIID	1	0% (0)	1	1	Jan-Dec	Unk	Unk
Gill/Demersal	VIIE	20	85% (17)	70	270	Jan-Dec	Unk	Unk
Gill Hake/Demersal	VIIE	1	100% (1)	1	5	Jan-Dec	Unk	Unk
Gill light/Demersal	VIIE	2	100% (2)	6	17	Jan-Dec	Unk	Unk
TangTram/Demersal	VIIE	15	100% (15)	146	280	Jan-Dec	Unk	Unk
TangTram/Shellfish	VIIE	8	100% (8)	29	31	Jan-Dec	Unk	Unk
Gill/Demersal	VIIF	10	90% (9)	26	61	Jan-Dec	Unk	Unk
Gill Hake/Demersal	VIIF	5	100% (5)	9	23	Jan-Dec	Unk	Unk
Gill light/Demersal	VIIF	5	100% (5)	6	18	Jan-Dec	Unk	Unk
TangTram/Demersal	VIIF	3	100% (3)	16	84	Jan-Dec	Unk	Unk
Gill/Demersal	VIIG	15	93% (14)	45	240	Jan-Dec	Unk	Unk
Gill Hake/Demersal	VIIG	8	100% (8)	31	198	Jan-Dec	Unk	Unk
Gill light/Demersal	VIIG	4	100% (4)	5	18	Jan-Dec	Unk	Unk
TangTram/Demersal	VIIG	19	100% (19)	52	435	Jan-Dec	Unk	Unk
Gill/Demersal	VIIH	12	75% (9)	54	281	Jan-Dec	Unk	Unk
Gill Hake/Demersal	VIIH	3	100% (3)	6	27	Jan-Dec	Unk	Unk
TangTram/Demersal	VIIH	11	100% (11)	43	349	Jan-Dec	Unk	Unk
Gill/Demersal	VIIJ	6	67% (4)	10	55	Jan-Dec	Unk	Unk
Gill Hake/Demersal	VIIJ	6	83% (5)	14	108	Jan-Dec	Unk	Unk
TangTram/Demersal	VIIJ	4	75% (3)	7	97	Jan-Dec	Unk	Unk
TOTAL EFFORT	VII defghj	*Not additive as most vessels fish in several sub-divisions and often fish in more than 1 per trip*			2599	Jan-Dec	Unk	Unk
TangTram/Demersal >220mm mesh	IV	2	0%(0)	8	352	Jan-Dec	Unk	Unk
Gill/Demersal<400m	IV	0	-	0	0	Aug-Oct	-	-
PTM/Demersal-bass	VIIE	2 (pair teams)	100%(2)	10	34	Nov-Apr	Unk	Unk

[1] Metiers are described here in slightly more detail than is required by the Commission. This is because it is unwise to include e.g. tangle nets with other set gear, while hake nets and 'light gillnets' have different bycatch rates compared with general gillnets

Table 2.1 includes data on vessels that are required to use pingers under Regulation 812/2004 Article 2, Annex I, as well as some others using such devices on a voluntary basis.

2.2 Mitigation measures

Metier[2]	Fishing area	Pinger characteristics (see http://www.stm-products.com)	Other mitigation measures
GNS	VIIdefghj	DDD-03L	none
GND	VIIdefghj	DDD-03L	none
PTM	VIIe	DDD-03H	none

2.3 Additional information

The DDD-03Ls being tested appear to work well in terms of reducing porpoise and dolphin bycatch, though, to date not enough data on dolphin bycatch in static gear have been collected to be sure of the level of bycatch reduction. Three animals (1 porpoise and 2 dolphins) were reported in static gear that was equipped with pingers during 2010, but at present we are trying to establish the optimal distance between adjacent pingers as the reported animals were all more than 1.5km from the nearest device. Fifteen dolphins caught by one pelagic pair team targeting bass while using DDD-02Fs were likely caused by the deterioration of the batteries of these devices which were four years old. No dolphins were caught by a second team when new DDD-03Hs were in use.

There are several practical issues associated with the full implementation of these devices, which we will be working with the fishing industry to resolve:

- Fishermen were not very happy with the multi-charger units supplied by the manufacturer and an alternative charging device for several pingers is being developed. The devices are rechargeable, obviating the need for battery changes, which is useful, but for longer trips some means of charging all the devices on board will be required.

- At present devices are being attached to each end of a string of nets that may be 4 or 5 km in length. This approach is being taken because attaching devices part way along a fleet requires a crew member to attach and deploy the devices during shooting which is potentially hazardous. In fully implementing and enforcing the use of pingers we will look to find a practical solution.

- Concerns have been raised that the use of these devices may attract seals and lead to an increase in seal-damaged fish. Seal-damaged fish are being systematically recorded in nets with and without DDDs in the same areas in order to allow this assessment to be made. So far the data do not indicate any increase in seal depredation when DDDs are being used.

- During February and March 2010 one of the pair teams fishing for bass which was using DDD02-F devices, began to experience an elevated level of bycatch. When tested these

[2] GNS= set gillnet; GND= drift gillnet (driftnet); PTM= midwater pair trawl (pelagic pair trawl);

devices were shown not to be holding their charge and since they had been used for four seasons they were discarded at the end of March 2010 for new models. This suggests that some type of ongoing quality assessment needs to be integrated with any programme of pinger use to ensure that devices are replaced before they are worn out and become ineffective.

3. Monitoring and assessment

3.1 Monitoring and assessment of the effects of pinger use

- Under the Fisheries Challenge project, dolphin and porpoise bycatches are being reported using GPS positions, as are the locations of DDDs being used on the same nets. The intention is to determine how effectiveness of pingers is related to distance from the nearest device. Trials are also underway to provide more detailed estimates of the exclusion distance of two types of pinger (DDD and Aquamark), which may help determine the optimal pinger spacing, but will also be useful in determining potential habitat exclusion depending on the number of boats that deploy these devices.

3.2. Report on measures to control specifications when pingers are in use by fishermen

- As the industry is still in the process of trialling new devices, no new enforcement measures have been implemented. However, relevant gillnet vessels are regularly inspected at sea. Observers are also monitoring pinger use and quantifying catch, seal damage and bycatch in pingered nets, but are not involved in any enforcement measures. The UK questions whether there is any need to deploy DDDs or other pingers on nets that are set deeper than 200m as previous research has shown that cetacean bycatch rates are close to zero in such deep water (Northridge and Hammond 2000).

3.3 Overall assessment

Pingers or acoustic deterrent devices are effective in reducing cetacean bycatch, but have a number of technical challenges that limit their practical use. Implementing pingers as an effective bycatch reduction measure therefore requires a collaborative and constructive approach with industry to resolve these technical issues, and this is the way in which the UK has undertaken this work.

During 2010 almost all of the UK fleet fishing in the SW has used DDDs, and we expect all of the fleet mandated to use pingers under regulation 812/2004 to be fully equipped with pingers by the end of 2011.

OBSERVER SCHEMES

4. General information on implementation of Articles 4 and 5

Monitoring of protected species in UK fisheries is conducted by the Sea Mammal Research Unit (SMRU) at the University of St Andrews, in collaboration with the Centre for Environment, Fisheries and Aquaculture Science at Lowestoft (CEFAS), the Agri-Food and Biosciences Institute of Northern Ireland (AFBINI) and Marine Science Scotland (MSS).

4.1 Information on legislative or administrative measures following provisions of Art.4 or 5.

Monitoring under Regulation 812/2004 is done largely in collaboration with the fishing industry. Bycatch mitigation work is a key complementary programme of work that is intended to ensure any

problem that is identified with protected species bycatch can be addressed in an equitable and expedient manner to meet the UK's obligations under Regulation 812/2004 and the Habitats Directive Article 12. The observer scheme relies upon good collaborative links with industry. Nevertheless fisheries regulations were enacted in England and Scotland to ensure that there is also a legal obligation for skippers and owners to take observers when asked to do so.

4.2 Provide information on difficulties implementing articles 4 and 5 of Council Regulation (EC) No 812/2004.

The principal difficulties in implementing articles 4 and 5 remain logistic ones. Firstly, targeting sampling at a predefined level, for example at 5% of fishing effort, is difficult to address because of the dynamic nature of fisheries, which means that it is not possible to know in advance for how many days at sea a specific fleet will be fishing. It is only possible to estimate based on the most recent years' data and there are often extreme fluctuations in effort from year to year.

With small boat fleets an additional problem is encountered when a gear type of interest (eg gillnets) is only one of several that are used on a single vessel and when these vessels can switch gears from day to day. Targeting a significant number of trips using relevant gears can be difficult as there are not necessarily any easily identifiable boats using the specified gear at the required time.

Finally, for larger UK flagged vessels that rarely visit UK ports, it is hard to place UK observers on board. In the UK this issue has been addressed by employing observers based in Spain to cover UK flagged boats that operate mainly from Spanish ports.

Regulation 812/2004 requires that the level of monitoring of certain fleets that should be designed to obtain a bycatch estimate with a CV of less than 0.3, for the most commonly caught species. This precision target is not feasible where bycatch rates are very low (for example in most pelagic trawl fisheries see Northridge and Thomas 2003), and this means that monitoring was previously being continued in these fisheries, aiming at the 'pilot' levels of monitoring at 10% and 5% of effort.

As mentioned in the UK's report on the 2009 fisheries (Northridge and Kingston 2010), the UK has decreased observation effort in the pelagic sector, where cetacean bycatch rates are now known to be very low, but is focusing monitoring on other sectors where bycatch is least known or most likely to represent a conservation concern. The UK suggests that a more productive means of monitoring bycatch is to limit the amount of sampling in any one fishery to a level that is sufficient to determine whether or not bycatch levels exceed a pre-specified threshold or reference limit.

4.3 Indicate whether the observer programme is dedicated for the purpose of this Regulation only, or whether the on-board observers are used for other purposes also.

A dedicated monitoring scheme is operated by the SMRU, while collaborative links with the three fishery research laboratories in the UK also allow selected observations from the Discard Sampling Programmes to be included in our assessment of cetacean bycatch. Data from discard surveys conducted by CEFAS, MSS and AFBINI are used with discretion because discard sampling is not always compatible with protected species monitoring. The UK observer monitoring programme is also designed to fulfil the UK's obligations under Article 12 of the Habitats Directive.

5. Monitoring

Fishing effort data for the UK fleet and corresponding observation levels are listed for 2010 by fleet segment as proposed by the Commission in 2010. Fleet segments or metiers are described to at least

Level 5 of Appendix IV of Council Decision 2008/949. This level of disaggregation of effort data, however, would still result in grouping fishery types with very different bycatch rates into the same categories, so we have also – where necessary – separated out in more detail those specific fleet segments that need to be considered separately from others in the same segment at Level 5 of Appendix IV of Council Decision 2008/949. The number of hauls and towing time are not reliably available for the UK fleet, so the most detailed effort descriptor is days at sea. Data are given for towed gears (Table 5.1 – 215 days sampled it total) and for static gears (Table 5.2 – 298 days sampled) separately.

5.1 Description of fishing effort and observer effort in towed gear

		Total fishing Effort				Amount of observer effort achieved									
METIER	GROUND	No of boats	Trips	Days at sea	Season	No. of Vessels	No. of Trips	Days at Sea	Season	No. of Hauls	Total Towing Time	Dolphins	Porpoise	Monitoring[3]	Coverage
>15/OTM/Herring	IIa	10	17	47	W	1	4	11	Dec-Mar	9	N/A	0	0	HDM	23%
>15/OTM/Herring	IVA	18	41	117	S	5	9	23	Apr-Nov	N/A	N/A	0	0	PMS	20%
>15/OTM/Mackerel	IVA	23	67	176	S	6	13	29	Apr-Nov	>2	N/A	0	0	PMS	16%
>15/OTM/Scad	IVA	1	3	10	S										
>15/PTM/Herring	IVA	1	5	20	S										
>15/PTM/Mackerel	IVA	1	1	4	S										
>15/OTM/Herring	IVA	1	1	2	W	1	1	6	Dec-Mar	4	N/A	0	0	PMS	288%
>15/OTM/Mackerel	IVA	1	1	0	W										
>15/OTM/Scad	IVA	1	1	2	W										
>15/OTM/Herring	IVB	1	2	2	S										
>15/OTM/Mackerel	IVB	1	1	0	S										
>15/OTM/Small Pelagic	IVB	2	2	13	S										
>15/OTM/Herring	IVB	1	4	21	S										
>15/OTM/Small Pelagic	IVB	1	1	6	W										
>15/OTM/Small Pelagic	IVC	1	1	0	S										
>15/PTM/Scad	IVC	1	1	0	S										
>15/OTM/Small Pelagic	IVC	1	1	0	W										
>15/PTM/Small Pelagic	IVC	1	1	11	W										
>15/OTM/Blue Whiting	Vb	2	2	8	S										
>15/OTM/Blue Whiting	VIA	2	3	12	S										
>15/OTM/Demersal	VIA	5	6	5	S										
>15/OTM/Herring	VIA	13	22	49	S	1	2	7	Apr-Nov	N/A	N/A	0	0	PMS	14%
>15/OTM/Mackerel	VIA	3	3	33	S										

[3] PMS = Pilot Monitoring Scheme – as indicated in Annex III of the Regulation at 5% or 10% of effort; HDM = Habitats Directive Monitoring; PS = Pilot Study (chiefly under 15m vessels in those sectors defined in Annex III of the Regulation); SS = Scientific Studies – studies on vessels using pingers on the effects thereof.

>15/OTM/Scad	VIA	1	2	6	S										
>15/PTM/Blue Whiting	VIA	0.5	0.5	2	S										
>15/PTM/Herring	VIA	2.5	9	41	S										
>15/PTM/Small Pelagic	VIA	1	1	2	S										
>15/OTM/Blue Whiting	VIA	3	3	11	W										
>15/OTM/Demersal	VIA	7	17	35	W										
>15/OTM/Herring	VIA	1	1	4	W										
>15/OTM/Mackerel	VIA	27	53	253	W										
>15/OTM/Small Pelagic	VIA	1	3	4	W										
>15/PTM/Herring	VIA	0.5	0.5	2	W										
>15/PTM/Mackerel	VIA	2	5	20	W										
>15/PTM/Small Pelagic	VIA	2	11.5	14	W										
>15/OTM/Blue Whiting	VIB	2	2	9	W										
>15/OTM/Demersal	VIIA	10	141	563	S	2	3	16	Jan-Nov	23	N/A	0	0	HDM	3%
>15/PTM/Herring	VIIA	2	16	41	S										
>15/OTM/Demersal	VIIA	9	64	210	W										
>15/MT/Small Pelagic	VIIB	1	1	0	S										
>15/OTM/Herring	VIIB	1	1	3	S										
>15/OTM/Scad	VIIB	2	2	13	S										
>15/OTM/Mackerel	VIIB	16	19	121	W										
>15/OTM/Scad	VIIB	1	2	9	W										
>15/OTM/Herring	VIIC	1	1	3	S										
>15/OTM/Scad	VIIC	2	3	15	S										
>15/OTM/Mackerel	VIIC	1	1	1	W										
>15/OTM/Scad	VIIC	1	1	3	W										
>15/OTM/Herring	VIID	1	1	15	S										
>15/OTM/Scad	VIID	1	1	10	S										
>15/PTM/Scad	VIID	1	2	9	S										
>15/PTM/Scad	VIID	1	3	28	W										
>15/PTM/Bass	VIIE	0.5	1	2	S	2	3	9	Apr-Nov	13	N/A	3	0	PMS	450%
>15/PTM/Herring	VIIE	1	1	5	S										
>15/PTM/Scad	VIIE	1	5	50	S										
>15/PTM/Bass	VIIE	1	7	32	W	2	7	25	Dec-Mar	44	N/A	7	0	PMS	78%
>15/PTM/Scad	VIIE	1	3	11	W										
>15/PTM/Small Pelagic	VIIE	1	1	0	W										
>15/OTM/Small Pelagic	VIIG	1	1	0	S										
>15/PTM/Herring	VIIG	1	1	0	S										
>15/MT/Small Pelagic	VIIH	1	1	9	S										
>15/OTM/Small Pelagic	VIIH	2	2	14	S										
>15/OTM/Mackerel	VIII	1	1	0	W										

>15/PTM/Mackerel	VIII	1	1	3	W									
>15/PTM/Scad	VIII	1	1	1	W									
>15/MT/Small Pelagic	VIIJ	1	3	31	S									
>15/OTM/Scad	VIIJ	1	1	34	S									
>15/OTM/Small Pelagic	VIIJ	4	7	56	S									
>15/PTM/Scad	VIIJ	1	3	43	S									
>15/OTM/Mackerel	VIIJ	16	22	173	W									
>15/OTM/Scad	VIIJ	1	1	1	W									
>15/OTM/Small Pelagic	VIIJ	1	3	24	W									
>15/PTM/Mackerel	VIIJ	2	2	11	W									
>15/PTM/Scad	VIIJ	1	1	10	W									
>15/OTM/Mackerel	VIIK	2	2	1	W									
>15/OTM/Scad	VIIK	1	1	2	W									
<15/OTM/Mackerel	IVA	1	1	0	S									
<15/OTM/Mackerel	IVB	1	1	4	S									
<15/PTM/Demersal	IVC	0.5	0.5	1	S									
<15/PTM/Herring	IVC	1	10.5	11	S									
<15/PTM/Small Pelagic	IVC	1	13.5	14	S									
<15/OTM/Demersal	IVC	1	4	8	W									
<15/OTM/Herring	IVC	1	4	7	W									
<15/OTM/Small Pelagic	IVC	2	23	24	W									
<15/PTM/Demersal	IVC	0.5	0.5	1	W									
<15/PTM/Herring	IVC	1	5.5	6	W									
<15/PTM/Small Pelagic	IVC	1	19.5	20	W									
<15/OTM/Small Pelagic	VIID	1	2	2	W									
<15/OTM/Demersal	VIIE	1	1	1	S									
<15/OTM/Herring	VIIE	1	1	2	S									
<15/OTM/Scad	VIIE	1	1	1	S									
<15/OTM/Small Pelagic	VIIE	3	223	224	S									
<15/PTM/Bass	VIIE	1	1	3	S	2	4	9	Apr-Nov	11	N/A	0	0	PS	300%
<15/OTM/Demersal	VIIE	1	4	4	W									
<15/OTM/Mackerel	VIIE	1	3	3	W									
<15/OTM/Small Pelagic	VIIE	4	143	151	W									
<15/PTM/Bass	VIIE	1	6.5	29	W	2	14	46	Dec-Mar	89	N/A	16	1	PS	158%
<15/PTM/Demersal	VIIE	0.5	0.5	1	W									
<15/PTB/Demersal	IVB	3	127	138	All year	2	2	3	Jul	7	N/A	0	0	HDM	2%
<15/PTB/Demersal	VIIE	2	25	67	All year	2	8	26	Jan-Feb	34	N/A	0	0	HDM	39%
<15/OTB/Demersal	VIIE	216	8960	10514	All year	1	2	5	Apr-May	10	N/A	0	0	HDM	0.05%

5.2 Description of fishing effort and observer effort in static gear[4]

		Total fishing Effort			Amount of observer effort achieved							
METIER	*GROUND*	*Vessels*	*Trips*	*Days at Sea*	*No. of Vessels*	*No. of trips*	*Days at sea*	*Season*	*Total Length of Nets (km)*	*Total Soak Time (KmH)*	*Type of monitoring*	*Coverage*
>15/Gill/Demersal	IVA	1	1	29								
>15/Gill/Demersal	IVB	6	28	176								
>15/Gill/Demersal	IVC	6	22	69								
>15/Gill/Demersal	VIIE	19	45	170	2	2	7	Nov	33	27354	PS	4%
>15/Gill/Demersal	VIIF	11	18	40	1	1	6	Jan	12	10236	PS	15%
>15/Gill/Demersal	VIIG	17	33	180	6	11	52	Feb-Dec	423	1785856	PS	29%
>15/Gill/Demersal	VIIH	17	53	279	1	1	9	Sep	13	10329	PS	3%
>15/Gill/Demersal	VIII	5	16	88								
>15/Gill/Demersal	VIIJ	7	10	55								
>15/Gill Hake/Demersal	VIIA	1	1	1								
>15/Gill Hake/Demersal	VIIC	1	2	16								
>15/Gill Hake/Demersal	VIIE	1	1	5								
>15/Gill Hake/Demersal	VIIF	7	9	23								
>15/Gill Hake/Demersal	VIIG	12	31	198	5	7	14	May-Dec	137	78807	PS	7%
>15/Gill Hake/Demersal	VIIH	4	6	27								
>15/Gill Hake/Demersal	VIII	2	3	8								
>15/Gill Hake/Demersal	VIIJ	8	14	108								
>15/Gill Hake/Demersal	VIIK	1	6	53								
>15/Gill light/Demersal	VIIE	1	1	12	1	1	1	Nov	11	550	PS	8%

[4] This Table also includes metiers that are not listed under Annex III of Regulation 812/2004, that have been monitored by the UK in order to better quantify bycatch in areas where it is known or thought to occur most frequently. This is an obligation under Article 12 of the Habitats Directive (Council Directive 92/43/EEC of 21 May 1992).

>15/Gill light/Demersal	VIIF	6	6	18								
>15/Gill light/Demersal	VIIG	4	5	18								
>15/TangTram/Demersal	IIa	3	3	43								
>15/TangTram/Demersal	IVA	11	25	907								
>15/TangTram/Demersal	IVB	2	2									
>15/TangTram/Demersal	VIA	1	1	0								
>15/TangTram/Demersal	VIB	6	9	292								
>15/TangTram/Demersal	VIIB	1	2	6								
>15/TangTram/Demersal	VIIC	6	11	324								
>15/TangTram/Demersal	VIIE	7	10	70								
>15/TangTram/Demersal	VIIF	3	16	84	1	7	39	Jun-Jul	436	4506990	PS	46%
>15/TangTram/Demersal	VIIG	13	39	322	5	7	40	Apr-Jul	373	3456631	PS	12%
>15/TangTram/Demersal	VIIH	12	41	325								
>15/TangTram/Demersal	VIII	5	26	141								
>15/TangTram/Demersal	VIIJ	4	7	97								
>15/TangTram/Demersal	VIIK	6	12	229								
<15/Drift Oth/Demersal	IVB	5	21	21	1	5	11	Jun-Nov	1	18	SS	50%
<15/Drift Oth/Shellfish	IVB	1	1	1								
<15/Drift Oth/Demersal	IVC	129	703	753	6	6	6	Apr-Aug	12	326	SS	29%
<15/Drift Oth/Shellfish	IVC	7	20	21								
<15/Drift Oth/Demersal	VIIA	1	3	3	1	3	6	Oct	3	16	SS	200%
<15/Drift Oth/Demersal	VIID	50	249	309								
<15/Drift Oth/Shellfish	VIID	6	6	6								
<15/Drift Oth/Demersal	VIIE	40	58	57	1	1	0	Aug	0	1	SS	0.6%
<15/Drift Oth/Shellfish	VIIE	1	1	1								
<15/Drift Oth/Demersal	VIIF	7	7	7								
<15/Drift Oth/Shellfish	VIIF	1	1	1								
<15/Drift Pel/Pelagic	IVC	59	210	212	1	2	2	Feb-Mar	0	1	SS	0.9%
<15/Drift Pel/Pelagic	VIID	3	8	8								
<15/Drift Pel/Pelagic	VIIE	180	672	703								
<15/Drift Pel/Pelagic	VIIF	28	289	336								
<15/Gill/Demersal	IVB	141	625	626	5	17	14	Feb-Dec	25	21366	HDM	2%

<15/Gill/Demersal	IVC	182	666	658								
<15/Gill/Demersal	VIIA	8	12	20								
<15/Gill/Demersal	VIID	346	987	966								
<15/Gill/Demersal	VIIE	433	1416	1559	3	8	5	Jan-Dec	6	14392	HDM	0.29%
<15/Gill/Demersal	VIIF	128	333	368	1	1	2	Mar-Dec	3	2802	HDM	0.46%
<15/Gill/Demersal	VIIG	16	32	86								
<15/Gill/Demersal	VIIH	3	6	23								
<15/Gill/Demersal	VIII	1	2	11								
<15/Gill Hake/Demersal	VIIE	2	2	2								
<15/Gill Hake/Demersal	VIIF	1	2	7								
<15/Gill Hake/Demersal	VIIG	1	1	8								
<15/Gill Hake/Demersal	VIIJ	1	1	7								
<15/Gill light/Demersal	IVB	25	59	59	2	12	9	Jun-Dec	7	1787	HDM	15%
<15/Gill light/Pelagic	IVB	3	11	11								
<15/Gill light/Demersal	IVC	177	1142	1148								
<15/Gill light/Pelagic	IVC	14	17	17								
<15/Gill light/Demersal	VIIA	42	234	235								
<15/Gill light/Pelagic	VIIA	18	32	49								
<15/Gill light/Demersal	VIID	638	4096	4057								
<15/Gill light/Pelagic	VIID	27	62	62								
<15/Gill light/Demersal	VIIE	579	1970	1975	1	7	5	Aug-Dec	9	2719	HDM	0.24%
<15/Gill light/Pelagic	VIIE	58	150	150								
<15/Gill light/Demersal	VIIF	215	626	628	4	6	7	Sep-Dec	9	979	HDM	1.2%
<15/Gill light/Pelagic	VIIF	11	19	19								
<15/Gill light/Demersal	VIIG	15	60	60								
<15/Gill light/Pelagic	VIIG	3	7	7								
<15/Gill light flatfish/Demersal	IVB	36	84	84								
<15/Gill light flatfish/Demersal	IVC	217	1546	1429								
<15/Gill light flatfish/Demersal	VIIA	21	92	92	2	7	7	Jul-Sep	3	19	SS	8%
<15/Gill light flatfish/Demersal	VIID	687	9372	9432								
<15/Gill light flatfish/Demersal	VIIE	306	873	920	2	6	4	Apr-Oct	21	8950	HDM	0.45%
<15/Gill light flatfish/Demersal	VIIF	60	170	171	3	5	3	Oct-Dec	7	1680	HDM	2%

<15/Gill light flatfish/Demersal	VIIG	2	3	3								
<15/Gill light flatfish/Demersal	VIIJ	1	1	1								
<15/TangTram/Demersal	IVB	26	65	65								
<15/TangTram/Shellfish	IVB	60	125	125								
<15/TangTram/Demersal	IVC	166	456	459	1	1	1	May	0	4	HDM	0.22%
<15/TangTram/Shellfish	IVC	50	104	93								
<15/TangTram/Shellfish	VIA	4	10	67								
<15/TangTram/Demersal	VIIA	13	33	34								
<15/TangTram/Shellfish	VIIA	14	37	42								
<15/TangTram/Shellfish	VIIB	2	8	19								
<15/TangTram/Demersal	VIID	249	530	507	1	2	2	Nov	1	70	HDM	0.39%
<15/TangTram/Shellfish	VIID	124	389	378								
<15/TangTram/Demersal	VIIE	518	1887	2092	5	22	38	Jan-Oct	262	2263112	HDM	2%
<15/TangTram/Shellfish	VIIE	231	509	547								
<15/TangTram/Demersal	VIIF	237	825	896	3	9	8	Apr-Dec	27	1391973	HDM	0.9%
<15/TangTram/Shellfish	VIIF	170	417	459								
<15/TangTram/Demersal	VIIG	18	43	183								
<15/TangTram/Shellfish	VIIG	8	20	20								
<15/TangTram/Demersal	VIIH	1	2	24								

6. Estimation of incidental catches

Incidental catches have been observed in 2010 in gillnet and trawl fisheries as indicated below, together with estimates of total bycatch by stratum.

6.1 Incidental catch rates by fleet segment and target species

					Number caught		Incidental catch rate			
Metier	Area	Target	Cet Species	No of incidents	with pingers	without	with pingers	without	total incidental catch estimate	CV
Gill/demersal	VIIG	Pollack, ling, haddock, mixed whitefish	Porpoise	1	0	1	0	0.04348	32	0.97
Gill Light/demersal	IVB	bass, sea trout	Porpoise	1	0	1	0	0.06667	58	0.98
Gill Light/demersal	VIIE	bass, red mullet	Porpoise	0	1	0	0.33333	0	1	0.00
TangTram/demersal	VIIE	anglerfish, turbot, spider crab	Porpoise	3	0	3	0	0.0297	175	0.73
TangTram/demersal	VIIF	anglerfish, turbot	Porpoise	2	0	2	0	0.0274	71	0.97
PTM/Bass	VIIE	Bass	Porpoise	1	1	0	0.02	0	1	0.00
									338	
Gill Hake/demersal	VIIG	hake	Common Dolphin	0	1	0	0.03125	0	1	0.00
TangTram/demersal	VIIE	anglerfish, turbot, spider crab	Common Dolphin	1	0	1	0	0.0099	58	0.98
TangTram/demersal	VIIG	anglerfish, turbot	Common Dolphin	0	1	0	0.02	0	1	0.00
PTM/Bass	VIIE	Bass	Common Dolphin	5	15	11	0.11	0.21	26	0.00
									86	

6.2 Recording of incidental catches

Dedicated marine mammal observers follow a standard data collection protocol. On a haul by haul basis they record the vantage point on the ship from which they are able to make their observations, which depends on the discretion of the master of the vessel and on safety considerations, and make a judgement as to the probability that they would be able to observe a bycaught mammal should one occur.

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

Consideration needs to be given to safety and human health issues when animals are sampled, which means that not all bycaught mammals can be sampled. It is also often the case, especially on small boats, that bycaught cetaceans cannot be brought on board and have to be cut from the net before coming over the net hauler. A substantial proportion also fall from the net as it leaves the water. Animals taken in trawls are easier to sample and handle, but sampling cannot be allowed to contaminate fish that are intended for human consumption. Whether the animal reached the deck or fell from the net is recorded, as is its orientation in the net.

7. Discussion

Bycatch estimates given in Table 6.1 (86 dolphins and 338 porpoises) are substantially lower than in previous years, but this is an artefact of the way in which the data have been aggregated. Reporting for 2010 has followed the guidelines proposed last year by the Commission, with fleet and observer bycatch and effort data presented by major gear class, by ICES subdivision and by major target grouping. This means that for some subdivisions where little or no sampling was done for specific metiers, and no bycatch was reported, bycatch estimates are zero, even though bycatch may have been observed in these sectors in previous years. To provide a more reliable estimate of total bycatch we have examined all data collected since 2000 and provide more reliable estimates of bycatch in Annex 1 for fishery sectors that are more in line with those reported on in previous years.

Bycatch estimates for the bass pair trawl fishery have CVs of zero because the entire fleet (2 pair teams) was sampled. As in previous years Table 5.1 indicates that there have been more days monitored in this fishery than are recorded in the official landings statistics. This is because the fishery operates sporadically and mid-water pair trawls may occur on the same trip as other gear types, while landings of bass may be small compared with those of other fish species, which obscures the true effort in the fishery.

Estimates of porpoise and dolphin bycatch in the set gillnet fisheries of the southwest of England (Western English Channel and Celtic Sea – ICES Divisions VIIaefghji) calculated in the Annex are around 540 porpoises in 2010 and 290 common dolphins with CV's of 0.13 and 0.17 respectively, from 817 observed hauls observed without pingers. These same fisheries have been monitored for many years, and since 2005 under the present monitoring scheme over 4000 net hauls have been observed. A statistical analysis (using a generalised linear modelling approach) did not reveal any significant differences in catch rates between years since 2005, and so we have also used all the data from these six years of observations to estimate total bycatches for 2010.

8. Conclusions

The principal area of concern for cetacean bycatch remains the south-western waters of the Western Channel and Celtic Sea. The situation in the North Sea remains unclear as only one porpoise has been reported caught among 582 observed hauls in the past four years. . Monitoring is now being focused on these two areas and as sufficient data are compiled, more robust estimates of current bycatch rates will become available.

The UK is now undertaking more limited monitoring in its pelagic trawl fleets, except where cetacean bycatch is known to be a concern, or where there is insufficient information to form an assessment of likely take rates. Most sampling effort is now directed at under 15m vessels using static gears in subareas VII and IV, while the over 12m vessels that are involved in ongoing trials of acoustic mitigation devices are also subject to ongoing collaborative study.

In terms of bycatch mitigation, a considerable amount of progress has been made in recent years. Dolphin bycatch rates in the bass pair trawl fishery remain substantially lower than in the years 2002-2005, while efforts are also being made to minimise porpoise and dolphin bycatches in the static net fisheries of the southwest with industry collaboration.

The development and implementation of mitigation measures is a slow process that needs to be conducted in collaboration with the industry if it is to be successfully adopted, but already it is likely that during 2010 some tens of dolphins and porpoises have avoided being bycatch as a result of pinger deployments in the over 12m fleet fishing in subarea VII.

Progress on the testing and deployment of DDD pingers in the static net fisheries of subarea VII is proceeding well, and by mid-2011 a much clearer picture of the efficacy of these devices will be available, by which time it is also hoped that full implementation of the pinger requirements for vessels over 12m using set nets in subarea VII will be well under way.

Although there is at present no evidence of a major conservation issue for either common dolphins or porpoises in our waters, the UK is committed to reducing cetacean bycatch to the lowest level possible and to sustainable fishing practices that minimise damage to the environment, with an overall vision for clean, healthy, productive and biodiverse seas.

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Estimates of bycatch in the main body of this report were calculated using just those metiers in which bycatch had been observed during 2010. This is not a satisfactory method of estimation because in any one year sampling is unlikely to be sufficient to provide a positive or precise estimate of bycatch in all metiers. In order to obtain a more accurate estimate of bycatch we have therefore pooled data over several years to obtain best estimates of the underlying bycatch rate for porpoises, dolphins and seals in all metiers. To achieve this, some statistical modelling was required in order to determine for example whether bycatch rate varies significantly between years or with other covariates.

We have used all SMRU observations made in gill and entangling net fisheries in ICES subareas VII and VIII on UK boats since 2000, except those nets in which pingers had been used. Data were divided into five fixed net metiers as detailed above; drift nets were not included in the analysis as no mammal bycatches have yet been observed in these metiers. The five metiers are tang/tram which includes all entangling gear such as tangle nets for monkfish and trammel nets, hake gillnets, light flatfish gillnets (mainly for sole), light gillnets (mainly for bass, also red mullet etc), and other gillnets for cod, pollack etc. These metiers were based on the stated target species from the observer forms and our own understanding of differences in design and usage among these nets types. We investigated temporal, spatial and fishery related factors that may affect bycatch using a series of generalised linear models (GLMs) and generalised additive (GAM) models.

Sampling by ICES division was not evenly spread, so in order to improve model fits we also grouped ICES divisions into four zones: divisions VIII, VIIj, and VIIh were lumped into one ‘offshore’ zone, VIIg and VIIa into one ‘Irish’ zone, while VIIf and VIIe were treated as north and south Devon/Cornwall respectively. Sampling and effort data from VIId (the central and eastern Channel) were excluded because sampling has been light there, and mainly at the western end of the region and is therefore possibly unrepresentative. We included net length (i.e. fleet length) in our initial analysis, as well as month and year as temporal covariates.

Since 2000 we have observed 4047 unpingered net hauls, with bycatches of 45 porpoises, 27 common dolphins and 21 seals (mainly grey seals but species not always determined). We assumed a binomial distribution in the statistical analysis (hauls either with bycatch or without bycatch), and used a logit link function in the GLM/GAM analyses. For GAMs we used standard thin plate regression splines except for month covariate, where we used a cyclic cubic regression spline, so the expected values for first and last month join up.

We found that for porpoises and dolphins, fleet length (length of netting in the water) was the most significant explanatory variable, though metier came out next best. Unfortunately the net length available in the logbook data for the entire fleet are unreliable, so we cannot use this covariate to extrapolate total bycatch numbers, whereas we can use landings to allocate a metier to each trip in the fleet data. Stratification by metier is therefore feasible at the fleet level, but not so by net length.

We found no evidence of any trend in observed bycatch rate with year after 2005. Before that date our observations were too few to be sure what was going on, but we have excluded these earlier observations from further analysis as the model results indicated that they may introduce a bias with

respect to later years. We found some evidence of seasonal bycatch patterns among observed bycatches of all three mammals, but we have not taken this into account in the subsequent estimates, assuming we have sampled effort by month roughly in proportion to actual effort.

After we had excluded observations prior to 2005 we found that none of the temporal or spatial covariates helped to explain much of the observed variability in bycatch, so we have proceeded to estimate total bycatch by metier alone for all of the ICES divisions (VIIaefghj and VIII) together, using a pooled estimate of bycatch rate for each metier based on observations from 2005-2010. Fleet effort data for 2010 were used to estimate total bycatch figures, having first removed hauls with pingers, all of which were (we believe) observed.

We estimated fishing effort in net hauls based on the number of days at sea reported in the fleet effort database. We used the observer data from 2000-2010 to estimate the number of hauls per day by metier. Further modelling of these data suggested that there is a significant difference in the number of hauls per day between day trips and multi-day trips. We have therefore stratified the fleet data into day trips and multi day trips prior to estimating the number of hauls per day by metier. At this point we have not included the error associated with the estimate of the number of hauls per day in the final calculation of bycatch. This is something that should be addressed in future and will have the consequence of increasing the CV and the upper confidence limit on each estimate, but will not alter the pint estimates.

The three tables below show our estimate of the number of hauls conducted in each of the five set net metiers within the study region (ICES divisions VIIa,e,f,g,h,j, and VIII) during 2010, the estimates of the bycatch rates by metier based on six years of observations, and the estimates of the numbers of animals bycaught within each metier and overall, together with associated one sided upper confidence limits and CVs. Bycatch totals are not dissimilar to those produced for previous years, though we have stratified our estimates somewhat differently this year as described above, but they are higher than those reported in the main body of the report above, where calculations were done only for those metiers where bycatches had been observed in 2010.

Bycatch estimates for porpoises in 2010 for UK set net fishing in VIIa,e,f,g,h,j and VIII

Metier	Estimated Effort (hauls)	Bycatch rate	Bycatch estimate	90% UCL[i]	CV
Gill	15686	0.0113636	179	302	0.239
Gill Hake	738	0.048	35	57	0.183
Gill Light	20034	0.0027624	56	262	0.707
Gill Flatfish	6097	0	0	58	-
Tang/Tramm	21917	0.0118534	265	375	0.151
Totals	64472		536	1054	0.133

Bycatch estimates for dolphins in 2010 for UK set net fishing in VIIa,e,f,g,h,j and VIII

Metier	Estimated Effort (hauls)	Bycatch rate	Bycatch estimate	90% UCL	CV
Gill	15686	0.003409	53	138	0.402
Gill Hake	738	0.024	19	36	0.229
Gill Light	20034	0	0	165	-
Gill Flatfish	6097	0	0	58	-
Tang/Tramm	21917	0.009698	215	316	0.206
Totals	64472		287	713	0.172

Bycatch estimates for seals in 2010 for UK set net fishing in VIIa,e,f,g,h,j and VIII

Metier	Estimated Effort (hauls)	Bycatch rate	Bycatch estimate	90% UCL	CV
Gill	15686	0.001136	19	85	0.659
Gill Hake	738	0	0	9	0.000
Gill Light	20034	0	0	165	0.000
Gill Flatfish	6097	0.003185	19	92	0.790
Tang/Tramm	21917	0.010237	227	331	0.145
Totals	64472		266	682	0.144

[i] A one-sided confidence limit is provided here to be consistent with the approach adopted by Northridge and Thomas 2003, and on the assumption that it is most important to be clear what the maximum potential impact might be.