Annual report on the implementation of Council Regulation (EC) No 812/2004 during 2014

Member State: United Kingdom

Reference Period: 2014

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SUMMARY

Based on the 2014 official fleet effort statistics, between 25 and 27 UK registered vessels may have been fishing in such a way as to require the use of pingers under Regulation 812/2004, to help minimise cetacean bycatch. Most or all of the vessels concerned are now equipped with pingers, and the enforcement authorities have been carrying out inspections to ensure compliance with the regulation.

UK based vessels are mainly using DDD-03 pingers to minimise cetacean bycatch, though other devices may also be being used. The UK authorised the use of the DDD pinger by the over 12 m fishing fleet, if used in accordance with agreed operating procedures, under Article 3 (2) of Regulation 812/2004, and has notified the European Commission accordingly.

Ongoing monitoring of pinger efficacy, as required under Article 2 of Regulation 812/2004, continues in the UK over 12 m set gillnet fleet, with 10 trips and 202 fishing operations monitored during 2014. While bycatch rates of harbour porpoise continue to be much lower in gillnets that are properly equipped with pingers (meaning no clear evidence of habituation yet), it is still unclear whether pingers are having any effect on the bycatch rates of dolphin species or seals in gillnets.

Monitoring during 2014 included 55 days on pelagic trawls and 304 days on static net (gillnet) vessels, as well as 39 days on longline vessels.

Sampling in pelagic trawl fisheries during 2014 focused on small scale fisheries for sprats, sardines and herring mainly in the English Channel, and for blue whiting west of Ireland (VIIC). There was no observer sampling and only three days fishing effort reported in the bass pair trawl fishery in the Channel in 2014.

Sampling of static net fisheries covered a wide variety of gear types and major fishing areas. Roughly 90% of static gear sampling was in the south and west of the UK (Divisions VIIdefghj), and the remainder was in the Irish and North Seas.

An additional 1010 non-dedicated discard sampling days by collaborating institutions have also been collated, including 112 days and 299 net hauls among static net fisheries, without any record of cetacean bycatch. These records are useful mainly for screening for potential protected species bycatch that may indicate a requirement for more focused monitoring in certain places, times or on particular gear types.

Cetacean bycatches recorded under the dedicated sampling programme included seven harbour porpoises and two common dolphins. All cetacean bycatches were recorded from static net fisheries, mainly tangle and trammel nets. Six grey seals were also reported bycaught.

Observed seabird bycatches were: fulmar (n=119), guillemot (n=8), great black-backed gull (n=1), herring gull (n=1) and great northern diver (n=1). Among the elasmobranchs, catches of porbeagle shark, spurdog, tope, blue shark, common skate, undulate ray and black skate were relatively common; less frequently recorded species included angel shark, six-gilled shark and long-nosed skate.

As in previous years, data from 2014 on their own do not enable us to quantify bycatch across a wide range of metiers in a meaningful way, and we have therefore used several years' bycatch data to produce multi-annual bycatch rates which are then used to estimate total takes of common dolphins and harbour porpoises in 2014 across a wider range of fisheries. The estimates are provided in Annex 2.

ACOUSTIC DETERRENT DEVICES

1. General Information

The UK is fully implementing Article 2 of Regulation 812/2004. All relevant vessel owners and masters have been advised of the provisions of the Regulation, and relevant training for enforcement officers has been provided. No additional legislative measures are needed. However, the Marine Management Organisation (MMO) provided full guidance on the implementation of the Regulation and the use of pingers, which is available at: http://www.marinemanagement.org.uk/fisheries/monitoring/regulations_cetaceans.htm

Further, following notification to the Commission in line with the requirements of Regulation 812/2004 (Article 3) the UK now authorises the use of the DDD-03 pinger and has issued a procedure for its use, available at the above web page, to ensure that fishermen choosing this device deploy it correctly to be fully effective.

1.1 Description of the fleet

Official logbook records indicate that 32 UK registered vessels of over 12 m in overall length (LOA) fished with nets described as gillnets or entangling nets during 2014 in relevant fishing areas (ICES Divisions VIIdefghj and Subarea IV). Among these 32 vessels, 26 fished in the Southwest (VIIdefghj), an area where all bottom set or entangling gillnets deployed by over 12 m vessels are required to be with equipped pingers. Of these 26 vessels, 22 smaller boats (under 25 m) predominantly landed to local ports (meaning UK or local French) and 4 larger boats (over 25 m) landed predominantly into Spanish ports or via more distant UK ports to overland the catch. These larger vessels typically fish further from UK coasts, mainly along the continental shelf break, upper slope and deep-water banks.

Among the 26 over 12 m vessels fishing in the Southwest, official logbook records indicate that five used “encircling gillnets” to catch small pelagic fish in VIIe and VIIf. Further enquiries indicated that these vessels were in fact using a type of ring net (similar to a purse seine) to encircle pelagic fish, and such nets do not require pingers under the Regulation. The description used in the official logbook database of “encircling gillnets” is unclear and potentially misleading but it seems unlikely that the type of gear being described would oblige these five vessels to use pingers. Assuming this to be correct, the number of UK vessels requiring pingers in the Southwest area during 2014 was 21.

Eight vessels over 12 m fished with gillnets in the North Sea, two of which also fished in Subarea VII. Of these eight vessels, six reported the use of nets with meshes of more than 220 mm, which would require them to use pingers, while two UK based vessels used smaller meshed nets. These two vessels fished the North Sea throughout the year, including between August and October, and may have been fishing in such a way (i.e. with nets “the total length of which does not exceed 400 m”, indicative of nets fished on wrecks) that would require them to use pingers under the gear categories listed in Annex I of the Regulation. However, official logbook data do not contain this level of detail regarding net fleet lengths and we do not have information about whether these vessels were inspected at sea between August and October, the period during which pingers are required by vessels wreck netting (using short net fleets).

Overall we conclude that between 25 and 27 UK registered vessels may have been fishing in such a way as to require the use of pingers during 2014.

As far as we are aware, the masters of all relevant vessels are aware of their obligations under Regulation 812/2004 and all such vessels are subject to routine inspection at sea.

Table 1.1 Description of the UK fleet required to use pingers under Annex I of the Regulation (na = not available)

Metier	Fishing Area	Number of vessels	Expected % using pingers	Number of Trips	Days at Sea	Months of operation	Total net length	Total Soak time
	Southwest							
GNS-Crustaceans	VIIE	4	100%	5	15	1-11	na	na
GNS-Crustaceans	VIIE	4	100%	5	15	1-11	na	na
GNS-Crustaceans	VIIG	1	100%	1	10	6-6	na	na
GNS-Demersal fish	VIIE	14	100%	179	569	1-12	na	na
GNS-Demersal fish	VIIF	14	100%	90	306	1-12	na	na
GNS-Demersal fish	VIIG	13	100%	178	923	1-12	na	na
GNS-Demersal fish	VIIH	14	100%	118	640	1-12	na	na
GNS-Demersal fish	VIIJ	13	100%	70	643	1-12	na	na
	North Sea							
GNS-Demersal fish	IVA	6	100%	36	2780	3-10	na	na
GNS-Demersal fish	IVB	2	?	29	495	1-12	na	na
GNS-Demersal fish	IVC	1	?	3	29	1-12	na	na

2. Acoustic Deterrent Devices (Article 2 and 3)

2.1 Mitigation measures

As far as we are aware, UK registered over 12 m vessels operating from the South West of England are using DDD-03 pingers routinely. Anecdotal accounts suggest that other pinger models may also be in use by the UK registered Spanish owned fishing fleet. A number of pinger types were noted during inspections by Scottish enforcement officers (see section 3.2 below).

Between 2006 and 2013, the majority of UK vessels fishing in the bass pair trawl fishery in VIIe during the winter were using a trawl version of the DDD-03 (03-H) on a voluntary basis. Cetacean bycatch rates were very low (approximately 1/10th) in this fishery over that period compared with the rates observed in the preceding period, 2000-2006, when pingers were not used. There were just two trips totalling three days fishing effort in this fishery in 2014 and no observer sampling was achieved. The pair trawl fishery was temporarily closed by the EU in January 2015 to protect spawning aggregations of bass.

Table 2.1: Mitigation measures being used in the UK fleet

Metier	Fishing Area	Pinger Characteristics	Other mitigation measures
GNS-Crustaceans	VIIE	DDD-03L and possibly others	None known
GNS-Crustaceans	VIIG	DDD-03L and possibly others	None known
GNS-Demersal fish	VIIE	DDD-03L and possibly others	None known
GNS-Demersal fish	VIIF	DDD-03L and possibly others	None known
GNS-Demersal fish	VIIG	DDD-03L and possibly others	None known
GNS-Demersal fish	VIIH	DDD-03L and possibly others	None known
GNS-Demersal fish	VIIJ	DDD-03L and possibly others	None known
PTM-Bass	VIIE	DDD-03H on a voluntary basis	Negligible effort 2014; fishery banned 2015

- Larger UK registered vessels fishing offshore that are based in Spain rather than the UK are known to be using more than one type of pinger among them, including the DDD-03.
- Details of enforcement actions during 2014 are given below in Section 3.2.
- We continue to examine the data for evidence of effects of DDDs on species other than porpoises; specifically on bycatch rates of common dolphins and on possible effects on seal depredation.

3. Monitoring and assessment

3.1 Monitoring and assessment of the effects of pinger use (Article 2.4)

We have continued to monitor trips by over 12 m vessels that are required to use pingers under Regulation 812/2004. During 2014, 10 such trips involving 202 hauls were observed. We found no evidence of any decline in efficacy of the devices. The guidelines which were produced in 2012 and agreed with industry, state that DDD pingers should be placed no more than 4 km apart, either to the buoy ropes at each end of a net fleet, or if net fleets more than 4 km are used pingers should be attached to the floatline and/or buoy ropes so that no part of the net fleet is more than 2 km from an active pinger.

3.2. Report on measures to control specifications when pingers are in use by fishermen (Article 2.4)

The Royal Navy and relevant national marine enforcement officers have been checking for compliance with Regulation 812/2004 whilst carrying out at-sea inspections; this is a task which is included as a regular inspection requirement in the relevant fishing areas. Inspections of over 12 m gill netting vessels are carried out according to a risk based enforcement approach.

During 2014, thirty seven over 12 m gill netting vessels were inspected at sea and in port. Inspections took place in Subareas IV, VI and VII. Five of these vessels were inspected by Scottish authorities in Subarea VI and eleven in Subarea IV, one by Welsh authorities and twenty by the English authorities.

Marine Scotland's Marine Protection Vessels (MPVs) made a total of sixteen inspections of gill netters in Subarea IV (North Sea), covering 11 individual vessels resulting in the detection of four infringements, three relating to pingers.

During these inspections a number of different pinger types were noted to be in use, although no model details were recorded. Inspection officials did check pinger certificates on board and reported that most inspected vessels were using a mix of both "type 1" and "type 2" devices as set out in Annex II of Regulation 812/2004. As a consequence of one inspection regarding bycatch, a case has been submitted to the Procurator Fiscal.

Following the initial boarding and inspections on gillnet vessels, when some infringements were detected, there was a notable improvement in levels of compliance during 2014 by the vessels concerned in the carriage and use of pingers. Additionally, shore based Fishery Officers witnessed pingers being loaded on some vessels whilst in port.

The MMO in England has also taken steps to employ the use of the ETEC detector, however the small range of some deterrent devices limit the platforms from which the ETEC detector can be used. Options to fully utilise this device will continue to be explored, but at sea inspections (in line with the risk based enforcement model) are the primary monitoring tool in the short term.

3.3. Derogation

In 2012 the UK authorised the use of DDD pingers, if used in accordance with agreed operating procedures, under Article 3 (2) of Regulation 812/2004, and notified the European Commission accordingly. In June 2014, the Commission was notified that the authorisation was to be extended for a further two years, in accordance with Article 3(2) of the Regulation. Certain UK vessels continue to use these devices under this authorisation.

3.4 Overall assessment

As mentioned in previous reports, the lack of detail in logbook and landings records makes it difficult to be certain which vessels are required to use pingers under the specifications listed in Annex I of the Regulation. Specifically, it is not possible to identify vessels using "bottom-set gillnet or entangling net, or a combination of these nets, the total length of which does not exceed 400 metres" from logbook records.

OBSERVER SCHEMES

4. General information on implementation of Articles 4 and 5

No new procedures have been adopted regarding the implementation of the Observer Scheme during 2014. A dedicated protected species bycatch monitoring programme is managed and coordinated 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) and the Agri-Food and Biosciences Institute of Northern Ireland (AFBINI). Data provided by Cefas and AFBINI include those collected through discard sampling conducted under the Data Collection Framework (DCF), data collected under other specific research efforts, and a limited number of dedicated sea days where protected species bycatch monitoring is the main focus for their observers.

The Bycatch Monitoring Programme fulfils UK monitoring obligations under Council Regulation 812/2004, as well as meeting the requirements of Article 12 of the Habitats Directive and international agreements including ASCOBANS, the International Convention on the Regulation of Whaling (ICRW) and OSPAR. Data

collected under the programme are also increasingly being used to assess bycatch of other non-cetacean but protected or potentially vulnerable taxonomic groups or species, through the ICES Working Group on Protected Species Bycatch (WGBYC). The UK participates fully in the work of WGBYC. The EU Action Plan for reducing incidental catches of seabirds in fishing gears also calls on member states to undertake monitoring of seabird bycatch and "to report biennially to the Commission on the level of seabird bycatch observed by fishery and gear type".

5. Monitoring

Tables 5.1 and 5.2 list the fishing fleet effort by métier and ICES Division for mid-water or pelagic trawls and static nets respectively. Sampling focused on small or peripheral pelagic trawl fisheries (e.g. for blue whiting and sprats) among seven métiers sampled. Official logbook records do not necessarily reflect actual fishing effort in these métiers; in one case sampling levels exceeded official recorded levels of fishing effort. UK logbook data do not include sufficient detail to enable us to estimate the number or hauls, tow times, net lengths or soak times by the UK fleet.

Table 5.1 Description of fishing effort and observer effort in towed gear: rows in bold are metiers with observed cetacean bycatch (see Table 6.1)

"Type of Monitoring" codes: SS= Scientific Studies; PP = Pilot project; HDM= Habitats Directive Monitoring; PMS = Pilot Monitoring Scheme.

Metier	Fishing Area	Total fishing effort						Total observer effort achieved						Type of monitoring	Coverage
		No of vessels	No of trips	Days at Sea	Season	Hauls	Time	No of vessels	No of trips	Days at Sea	Season	No of hauls	Total towing time		
>15-OTM-Blue Whiting	Far South	1	1	9	Apr-Nov										
>15-OTM-Blue Whiting	VIA	1	1	6	Apr-Nov										
>15-OTM-Blue Whiting	VIA	2	2	16	Dec-Mar										
>15-OTM-Blue Whiting	VIB	4	4	17	Dec-Mar										
>15-OTM-Blue Whiting	VIIB	1	1	10	Apr-Nov										
>15-OTM-Blue Whiting	VIIC	5	9	40	Dec-Mar			1	1	7	W	7		PMS	18%
>15-OTM-Blue Whiting	VIIJ	1	1	0	Apr-Nov										
>15-OTM-Blue Whiting	VIIK	5	5	33	Dec-Mar										
>15-OTM-Demersal fish	IVA	1	1	2	Dec-Mar										
>15-OTM-Demersal fish	IVB	1	1	2	Dec-Mar										
>15-OTM-Demersal fish	VIIA	5	29	129	Apr-Nov										
>15-OTM-Demersal fish	VIIA	1	1	5	Dec-Mar										
>15-OTM-Herring	IVA	22	92	262	Apr-Nov										
>15-OTM-Herring	IVA	1	1	3	Dec-Mar										
>15-OTM-Herring	IVB	5	6	21	Apr-Nov										
>15-OTM-Herring	IVC	1	1	5	Apr-Nov										
>15-OTM-Herring	VIA	17	26	64	Apr-Nov										
>15-OTM-Herring	VIIA	2	30	64	Apr-Nov			1	3	7	S	10		PMS	11%
>15-OTM-Herring	VIIA	1	1	2	Dec-Mar										
>15-OTM-Herring	VIIE	0	0	0	Dec-Mar										

Metier	Fishing Area	Total fishing effort						Total observer effort achieved						Type of monitoring	Coverage
		No of vessels	No of trips	Days at Sea	Season	Hauls	Time	No of vessels	No of trips	Days at Sea	Season	No of hauls	Total towing time		
>15-OTM-Horse mackerel	IIA	1	1	14	Apr-Nov										
>15-OTM-Horse mackerel	IVA	1	2	27	Apr-Nov										
>15-OTM-Horse mackerel	VIA	1	1	3	Apr-Nov										
>15-OTM-Horse mackerel	VIA	5	9	64	Dec-Mar										
>15-OTM-Horse mackerel	VIIB	1	1	1	Apr-Nov										
>15-OTM-Horse mackerel	VIIB	1	2	28	Dec-Mar										
>15-OTM-Horse mackerel	VIIJ	1	1	18	Apr-Nov										
>15-OTM-Mackerel	Far South	1	1	16	Dec-Mar										
>15-OTM-Mackerel	IIA	3	3	1	Apr-Nov										
>15-OTM-Mackerel	IVA	22	123	339	Apr-Nov										
>15-OTM-Mackerel	IVA	1	2	5	Dec-Mar										
>15-OTM-Mackerel	IVB	1	1	0	Apr-Nov										
>15-OTM-Mackerel	IVB	1	1	2	Dec-Mar										
>15-OTM-Mackerel	VIA	22	86	313	Dec-Mar										
>15-OTM-Mackerel	VIIB	7	7	33	Dec-Mar										
>15-OTM-Mackerel	VIIJ	9	11	64	Dec-Mar										
>15-PTM-Bass	VIIE	1	3	10	Apr-Nov										
>15-PTM-Herring	IVA	1	5	31	Apr-Nov			2	1	12	S	8		PMS	38%
>15-PTM-Herring	IVB	1	5	32	Apr-Nov										
>15-PTM-Herring	VIA	1.5	4	11	Apr-Nov										
>15-PTM-Herring	VIA	2	3	4	Dec-Mar										
>15-PTM-Herring	VIID	0.5	1	1	Apr-Nov										
>15-PTM-Herring	VIIE	0.5	1	3	Apr-Nov										

Metier	Fishing Area	Total fishing effort						Total observer effort achieved						Type of monitoring	Coverage
		No of vessels	No of trips	Days at Sea	Season	Hauls	Time	No of vessels	No of trips	Days at Sea	Season	No of hauls	Total towing time		
>15-PTM-Horse mackerel	IVC	1	3	13	Apr-Nov										
>15-PTM-Horse mackerel	IVC	2	2	4	Dec-Mar										
>15-PTM-Horse mackerel	VIID	1	3	20	Apr-Nov										
>15-PTM-Horse mackerel	VIID	2	3	21	Dec-Mar										
>15-PTM-Horse mackerel	VIIE	1	2	2	Apr-Nov										
>15-PTM-Horse mackerel	VIIE	2	5	37	Dec-Mar										
>15-PTM-Horse mackerel	VIIJ	1	1	14	Apr-Nov										
>15-PTM-Mackerel	IVA	1	2	22	Apr-Nov										
>15-PTM-Mackerel	VIA	1	3	17	Dec-Mar										
>15-PTM-Mackerel	VIID	1	1	2	Apr-Nov										
>15-PTM-Mackerel	VIIH	0.5	1	2	Dec-Mar										
>15-PTM-Mackerel	VIIJ	1	1	4	Dec-Mar										
>15-PTM-Sardine	VIID	0.5	1	1	Apr-Nov										
>15-PTM-Sardine	VIIE	0.5	1	3	Apr-Nov										
>15-PTM-Sprat	VIA	2	18	18	Apr-Nov										
>15-PTM-Sprat	VIA	2	15	15	Dec-Mar										
>15-OTM-Sprat	VIIE	0	0	0	Dec-Mar										
>15-OTM-Sprat	VIIE	0	0	0	Apr-Nov										
<15-OTM-Demersal fish	IVC	2	7	7	Apr-Nov										
<15-OTM-Anchovy	VIIE	3	38	38	Apr-Nov										
<15-OTM-Anchovy	VIIE	3	9	9	Dec-Mar										
<15-OTM-Bass	VIID	1	1	2	Dec-Mar										
<15-OTM-Bass	VIIE	1	1	1	Dec-Mar										
<15-OTM-Herring	IVC	1	12	12	Apr-Nov										

Metier	Fishing Area	Total fishing effort						Total observer effort achieved						Type of monitoring	Coverage
		No of vessels	No of trips	Days at Sea	Season	Hauls	Time	No of vessels	No of trips	Days at Sea	Season	No of hauls	Total towing time		
<15-OTM-Herring	IVC	1	4	4	Dec-Mar										
<15-OTM-Herring	VIIE	1	3	3	Apr-Nov										
<15-OTM-Herring	VIIE	2	27	27	Dec-Mar			1	1	1	W	3		PMS	4%
<15-OTM-Horse mackerel	VIIE	2	2	2	Apr-Nov										
<15-OTM-Mackerel	VIIE	1	1	1	Apr-Nov										
<15-OTM-Mackerel	VIIE	1	3	3	Dec-Mar										
<15-OTM-Sardine	VIIE	1	1	1	Dec-Mar										
<15-OTM-Sprat	IVC	1	12	12	Dec-Mar										
<15-OTM-Sprat	VIID	1	3	3	Dec-Mar										
<15-OTM-Sprat	VIIE	3	175	175	Apr-Nov			1	16	16	S	22		PMS	9%
<15-OTM-Sprat	VIIE	3	68	68	Dec-Mar			1	10	10	W	23		PMS	15%
<15-PTM-Herring	IVC	1	15	15	Apr-Nov										
<15-PTM-Herring	IVC	1	22	22	Dec-Mar										
<15-PTM-Smelt	IVC	1	17	17	Apr-Nov										
<15-PTM-Sprat	IVC	1	16	16	Apr-Nov										
<15-PTM-Sprat	IVC	1	14	14	Dec-Mar										
<15-PTM-Sardine	VIIE	0	0	0	Dec-Mar			2	2	2	W	2		PP	++
All metiers	All areas		995	2356					34	55					2.3%

Table 5.2 Description of fishing effort and observer effort in static gear: rows in bold are metiers with observed cetacean bycatch (see table 6.1)

"Type of Monitoring" codes: SS= Scientific Studies; PP = Pilot project; HDM= Habitats Directive Monitoring; PMS = Pilot Monitoring Scheme.
(Métiers where cetacean bycatch was recorded in 2014 are in bold)

Metier		TOTAL FLEET EFFORT						TOTAL OBSERVED EFFORT						Type of monitoring	Coverage
	Fishing Area	No of vessels	No of trips	Days at Sea	Season	Total length of nets	Total soak time	No of vessels	No of trips	Days at Sea	Season	Total length of nets	Total soak time		
>15-Gill-Demersal fish	IVB	2	11	69	4-12										
>15-Gill-Demersal fish	IVC	1	3	12	1-12										
>15-Gill-Demersal fish	VIIE	9	45	167	1-12										
>15-Gill-Demersal fish	VIIF	8	22	66	1-12										
>15-Gill-Demersal fish	VIIG	10	25	83	2-12			1	1	1	Oct	6	137	SS	2%
>15-Gill-Demersal fish	VIIH	6	45	203	1-12			1	1	5	Nov	15	353	SS	3%
>15-Gill-Demersal fish	VIII	2	4	15	5-12										
>15-Gill-Demersal fish	VIIJ	4	12	51	5-12										
>15-Gill-Large Pelagic Fish	VIIE	2	4	4	9-12										
>15-Gill-Large Pelagic Fish	VIIG	1	2	6	8-8										
>15-Gill-Large Pelagic Fish	VIIH	3	12	64	7-12										
>15-Gill-Large Pelagic Fish	VIII	1	2	7	8-9										
>15-Gill-Large Pelagic Fish	VIIJ	1	1	1	8-8										
>15-Gill Hake-Demersal fish	Far South	1	8	44	1-2										
>15-Gill Hake-Demersal fish	VIIE	2	2	3	2-3										
>15-Gill Hake-Demersal fish	VIIF	7	29	88	1-11										
>15-Gill Hake-Demersal	VIIG	9	93	488	1-12			2	4	14	May-	122	2873	SS	2.8%

Metier		TOTAL FLEET EFFORT						TOTAL OBSERVED EFFORT						Type of monitoring	Coverage
	Fishing Area	No of vessels	No of trips	Days at Sea	Season	Total length of nets	Total soak time	No of vessels	No of trips	Days at Sea	Season	Total length of nets	Total soak time		
fish											Nov				
>15-Gill Hake-Demersal fish	VIIH	5	7	19	3-12			1	1	1	Oct	13	322	SS	4.7%
>15-Gill Hake-Demersal fish	VIII	1	1	4	1-1										
>15-Gill Hake-Demersal fish	VIIJ	7	33	197	1-9										
>15-Gill Hake-Demersal fish	VIIK	1	4	35	11-12										
>15-Gill light-Demersal fish	VIIE	2	8	39	1-4										
>15-Gill light-Demersal fish	VIIF	1	1	2	12-12										
>15-Gill light-Demersal fish	VIIG	2	5	33	1-3										
>15-Gill light-Demersal fish	VIIH	3	7	42	1-12										
>15-Gill light flatfish-Demersal fish	IVB	1	9	69	1-12										
>15-TangTram-Crustaceans	VIIE	2	2	12	7-10										
>15-TangTram-Crustaceans	VIIG	1	1	10	6-6										
>15-TangTram-Demersal fish	Far South	1	3	38	1-2										
>15-TangTram-Demersal fish	IVA	6	36	838	3-10										
>15-TangTram-Demersal fish	IVB	2	8	64	5-7										
>15-TangTram-	VIB	4	6	233	1-10										

Metier		TOTAL FLEET EFFORT						TOTAL OBSERVED EFFORT						Type of monitoring	Coverage
	Fishing Area	No of vessels	No of trips	Days at Sea	Season	Total length of nets	Total soak time	No of vessels	No of trips	Days at Sea	Season	Total length of nets	Total soak time		
Demersal fish															
>15-TangTram-Demersal fish	VIIC	2	8	11	6-11										
>15-TangTram-Demersal fish	VIIE	3	28	143	1-10										
>15-TangTram-Demersal fish	VIIF	3	18	96	3-12										
>15-TangTram-Demersal fish	VIIG	6	30	179	3-8			2	3	7	May-Oct	144	11616	SS	4.1%
>15-TangTram-Demersal fish	VIIH	9	47	313	1-12			1	2	3	Oct-Nov	65	3000	SS	0.8%
>15-TangTram-Demersal fish	VIII	3	23	159	1-12										
>15-TangTram-Demersal fish	VIIJ	7	23	385	1-12										
>15-TangTram-Demersal fish	VIIK	3	20	331	1-12										
<15-Drift Oth-Cephalopods	VIIE	2	2	2	9-10										
<15-Drift Oth-Crustaceans	IVC	3	7	7	6-10										
<15-Drift Oth-Crustaceans	VIID	3	3	3	8-10										
<15-Drift Oth-Demersal fish	IVB	1	1	1	7-7										
<15-Drift Oth-Demersal fish	IVC	46	658	656	1-12			3	3	3	Mar-Jun	5	5	HDM	0.5%
<15-Drift Oth-Demersal fish	VIIA	3	43	43	1-11										
<15-Drift Oth-Demersal	VIID	36	999	1023	1-12			1	1	0	Aug	1	1	HDM	0.0%

Metier		TOTAL FLEET EFFORT						TOTAL OBSERVED EFFORT						Type of monitoring	Coverage
	Fishing Area	No of vessels	No of trips	Days at Sea	Season	Total length of nets	Total soak time	No of vessels	No of trips	Days at Sea	Season	Total length of nets	Total soak time		
fish															
<15-Drift Oth-Demersal fish	VIIE	23	72	72	1-12			1	1	0	Dec	1	1	HDM	0.3%
<15-Drift Oth-Demersal fish	VIIF	6	7	7	1-11										
<15-Drift Oth-Demersal fish	VIIG	1	1	1	5-5										
<15-Drift Pel-Anadromous	IVB	1	28	28	5-8										
<15-Drift Pel-Small pelagic fish	IVC	33	155	155	1-12										
<15-Drift Pel-Small pelagic fish	VIA	1	1	22	7-7										
<15-Drift Pel-Small pelagic fish	VIID	15	70	70	1-11										
<15-Drift Pel-Small pelagic fish	VIIE	48	461	461	1-12										
<15-Drift Pel-Small pelagic fish	VIIF	23	70	70	1-12										
<15-Gill-Deep-water species	VIID	6	16	16	1-12										
<15-Gill-Deep-water species	VIIE	16	53	53	1-12										
<15-Gill-Deep-water species	VIIG	1	1	1	8-8										
<15-Gill-Demersal fish	IVB	16	91	92	1-12										
<15-Gill-Demersal fish	IVC	52	299	298	1-12			2	2	2	Jan-Dec	5	85	HDM	0.7%
<15-Gill-Demersal fish	VIA	1	2	3	5-9										

Metier		TOTAL FLEET EFFORT						TOTAL OBSERVED EFFORT						Type of monitoring	Coverage
	Fishing Area	No of vessels	No of trips	Days at Sea	Season	Total length of nets	Total soak time	No of vessels	No of trips	Days at Sea	Season	Total length of nets	Total soak time		
<15-Gill-Demersal fish	VIIA	9	29	33	1-12										
<15-Gill-Demersal fish	VIID	150	791	788	1-12										
<15-Gill-Demersal fish	VIIE	183	1255	1350	1-12			2	7	7	Jan-Dec	10	252	HDM	0.5%
<15-Gill-Demersal fish	VIIF	117	790	829	1-12			3	11	14	Jan-Dec	35	605	HDM	1.7%
<15-Gill-Demersal fish	VIIG	4	27	74	1-12			1	1	3	Dec	5	85	HDM & SS	3.8%
<15-Gill-Demersal fish	VIIH	2	11	34	4-11										
<15-Gill-Demersal fish	VIIJ	1	1	8	7-7										
<15-Gill-Large Pelagic Fish	VIIE	2	2	2	6-10										
<15-Gill-Large Pelagic Fish	VIIF	1	1	2	6-6										
<15-Gill Hake-Demersal fish	VIIE	1	2	4	5-6										
<15-Gill Hake-Demersal fish	VIIF	2	6	16	1-5										
<15-Gill Hake-Demersal fish	VIIG	1	7	29	1-11										
<15-Gill Hake-Demersal fish	VIIH	1	2	8	9-12										
<15-Gill light-Anadromous	VIIE	1	1	1	6-6										
<15-Gill light-Anadromous	VIIF	1	1	1	7-7										
<15-Gill light-Cephalopods	IVC	2	3	3	4-7										
<15-Gill light-	VIID	70	274	274	3-7										

Metier		TOTAL FLEET EFFORT						TOTAL OBSERVED EFFORT						Type of monitoring	Coverage
	Fishing Area	No of vessels	No of trips	Days at Sea	Season	Total length of nets	Total soak time	No of vessels	No of trips	Days at Sea	Season	Total length of nets	Total soak time		
Cephalopods															
<15-Gill light-Cephalopods	VIIE	13	27	27	4-12										
<15-Gill light-Cephalopods	VIIF	1	1	1	6-6										
<15-Gill light-Demersal fish	IVB	5	26	26	1-12										
<15-Gill light-Demersal fish	IVC	90	1108	1099	1-12										
<15-Gill light-Demersal fish	VIA	1	3	21	6-6										
<15-Gill light-Demersal fish	VIIA	35	385	385	3-11			2	4	4	May-Sep	1	14	HDM	1.0%
<15-Gill light-Demersal fish	VIID	263	3141	3146	1-12			1	1	1	Dec	1	33	HDM	0.0%
<15-Gill light-Demersal fish	VIIE	268	2055	2059	1-12										
<15-Gill light-Demersal fish	VIIF	140	1014	1015	1-12			1	9	4	Jan-Dec	12	131	HDM	0.4%
<15-Gill light-Demersal fish	VIIG	17	184	195	1-12										
<15-Gill light-Small pelagic fish	IVB	4	18	18	6-7										
<15-Gill light-Small pelagic fish	IVC	10	14	14	1-11										
<15-Gill light-Small pelagic fish	VIIA	1	2	4	10-10										
<15-Gill light-Small pelagic fish	VIID	30	112	112	1-12										
<15-Gill light-Small	VIIE	89	405	476	1-12										

Metier		TOTAL FLEET EFFORT						TOTAL OBSERVED EFFORT						Type of monitoring	Coverage
	Fishing Area	No of vessels	No of trips	Days at Sea	Season	Total length of nets	Total soak time	No of vessels	No of trips	Days at Sea	Season	Total length of nets	Total soak time		
pelagic fish															
<15-Gill light-Small pelagic fish	VIIF	48	310	404	1-12			1	2	2	Nov	4	98	HDM	0.4%
<15-Gill light flatfish-Demersal fish	IVB	6	15	15	3-11			1	2	2	Sep	6	105	HDM	13.3%
<15-Gill light flatfish-Demersal fish	IVC	78	1102	1101	1-12			1	1	1	Nov	2	50	HDM	0.1%
<15-Gill light flatfish-Demersal fish	VIIA	13	74	74	2-12			1	2	2	Apr-Jun	1	7	HDM	2.7%
<15-Gill light flatfish-Demersal fish	VIID	240	8944	8951	1-12			10	11	9	Apr-Sep	29	704	HDM	0.1%
<15-Gill light flatfish-Demersal fish	VIIE	156	976	1005	1-12			3	6	3	Mar-Oct	9	260	HDM	0.3%
<15-Gill light flatfish-Demersal fish	VIIF	31	159	159	1-11			2	3	2	Mar-Apr	6	247	HDM	1.3%
<15-Gill light flatfish-Demersal fish	VIIG	1	1	1	11-11										
<15-TangTram-Cephalopods	VIID	1	2	2	9-9										
<15-TangTram-Cephalopods	VIIE	50	157	157	1-12										
<15-TangTram-Cephalopods	VIIF	11	24	24	5-12										
<15-TangTram-Crustaceans	IVB	11	85	85	1-12										
<15-TangTram-Crustaceans	IVC	22	74	74	1-12										
<15-TangTram-Crustaceans	VIA	1	1	36	5-5										
<15-TangTram-	VIIA	3	20	20	6-8										

Metier		TOTAL FLEET EFFORT						TOTAL OBSERVED EFFORT						Type of monitoring	Coverage
	Fishing Area	No of vessels	No of trips	Days at Sea	Season	Total length of nets	Total soak time	No of vessels	No of trips	Days at Sea	Season	Total length of nets	Total soak time		
Crustaceans															
<15-TangTram-Crustaceans	VIID	69	195	195	1-12										
<15-TangTram-Crustaceans	VIIE	95	526	583	1-12			2	5	4	Jun-Jul	12	1994	HDM	0.7%
<15-TangTram-Crustaceans	VIIF	78	838	840	1-12			1	2	2	Jun-Jul	3	588	HDM	0.2%
<15-TangTram-Crustaceans	VIIG	2	5	8	4-8										
<15-TangTram-Demersal fish	IVB	6	12	12	2-7										
<15-TangTram-Demersal fish	IVC	64	399	396	1-12										
<15-TangTram-Demersal fish	VIIA	9	60	60	1-11			**2**	**9**	**10**	**Apr-Sep**	**29**	**2487**	**HDM**	**16.7%**
<15-TangTram-Demersal fish	VIID	111	460	459	1-12										
<15-TangTram-Demersal fish	VIIE	148	1302	1399	1-12			**6**	**56**	**96**	**Jan-Dec**	**459**	**32443**	**HDM & SS**	**6.9%**
<15-TangTram-Demersal fish	VIIF	75	793	827	1-12			**2**	**7**	**5**	**Mar-Jul**	**21**	**1579**	**HDM**	**0.7%**
<15-TangTram-Demersal fish	VIIG	5	16	82	3-10										
<15-TangTram-Demersal fish	VIIH	1	6	28	4-6										
All metiers	All areas		31942	36764					158	208					0.6%

6. Estimation of incidental catches

During 2014, cetacean bycatch reported under the protected species bycatch observer scheme included seven harbour porpoises and two common dolphins. Bycatches were reported in the following metiers (Table 6.1).

Table 6.1 Incidental catch rates by fleet segment and target species

Metier	Fishing Area	Main target species	Incidentally caught cetacean species	No of incidents	No of individuals incidentally caught by species		Incidental catch rates: per haul		Total incidental catch estimate	CV
					With pingers	Without pingers	With pingers	Without pingers		
<15-GNS-Demersal	VIIA	Ray	Harbour porpoise	1	0	1	0	0.031		
<15-GNS-Demersal	VIIE	Anglerfish		3	0	3	0	0.020		
<15-GNS-Demersal	VIIE	Brill		1	0	1	0	0.083		
<15-GNS-Demersal	VIIE	Turbot		1	0	1	0	0.009		
<15-GNS-Demersal	VIIF	Anglerfish		1	0	1	0	0.052		
Totals and Mean rates				***7***	***0***	***7***	***0***	***0.039***		
>15-GNS-Demersal	VIIG	Hake	Common Dolphin	1	1	0	*0.030*	*0*		
>15-GNS-Demersal	VIIH	Whitefish		1	1	0	0.083	0		
Totals and Mean rates				***2***	***2***	***0***	***0.057***	***0***		

No total mortality estimates have been generated by stratum in Table 6.1, as these are too narrowly defined to provide useful estimates of bycatch, and because care is needed in interpreting the bycatch rates in pingered vs. unpingered nets and how these are extrapolated to the total fleet in the absence of information on how pingers were actually being used during fishing operations that were not observed.

Instead synoptic estimates of bycatch of harbour porpoises, dolphins and seals are presented in Annex 2 of the report, based on a larger sample size of observations made over several years and in a wider range of metiers.

Two common dolphin bycatches were recorded from net fleets equipped with DDD pingers, but the majority of hauls observed in these metiers were using pingers, so the comparable rate in unpingered nets at the same time is not known. Furthermore both bycatches were in nets that were more than 4km in length.

6.1 Recording of incidental catches

As in previous years, all bycatches were recorded according to standard data collection procedures by experienced on-board fishery observers. Not all hauls are observed on all trips, especially when hauling is more or less continuous. Wherever feasible, bycaught specimens were sampled at sea (external measurements including length, girth and sex determination and blubber thickness were recorded and teeth and skin samples were collected for age determination and genetic analysis) and some other whole marine mammal specimens (3 grey seals and one porpoise) were returned to shore for more detailed analysis under a complementary sub-project.

During 2014, dedicated sampling effort fell slightly below previous years' levels when target levels have consistently been exceeded. In 2014 a total of 302 dedicated sampling days at sea were achieved on pelagic trawlers, netters and long-liners. These were augmented with 112 selected but non-dedicated days at sea on netters observed by Cefas under the discard programme, meaning a total of 414 days (target 425) days were sampled on pelagic trawlers, netters and longliners. Additionally we have reviewed and tabulated data from a further 898 discard sampling days conducted by AFBINI and Cefas on a variety of other vessel types (See Annex 1). Two further dedicated sampling days were done by SMRU observers on other gear types. We rely solely on the dedicated protected species trips to estimate bycatch rates and produce bycatch estimates for protected species, but the additional discard sampling days are useful to screen other fisheries and areas for potential protected species bycatches that may warrant further focus.

7. Discussion

7.1 Marine mammals

The monitoring target for the protected species monitoring programme in 2014 was 425 days and the achieved total was 414 days. The 11 day deficit was partly due to reduced staffing levels because of observer illness at critical times of the year but mainly because of the winter storms between January and March which restricted our ability to get observers to sea. In most of the

previous years under the bycatch programme annual targets have been exceeded. Sampling in 2014 consisted of 55 days on pelagic trawlers, 320 on gillnetters and 39 days on longliners.

Sampling in the main pelagic trawl fisheries for mackerel and herring has been reduced to a lower level than in preceding years (55 cf 101 days in 2013). The almost complete absence of a bass pair trawl fishery during 2014 was also partly responsible for this relatively low level of sampling effort on this gear type in 2014.

Marine mammals recorded included six grey seals, seven harbour porpoises, and two common dolphins. No marine mammal bycatches were observed in pelagic trawls. Details of estimates of total bycatch of marine mammals in gillnet fisheries are given in Annex 2. Porpoise bycatches in 2014 were all in large mesh tangle/trammel net fisheries targeting several species (turbot, brill, ray, and monkfish). Common dolphin bycatches were all in offshore gillnets set for hake and gadoids. Seal bycatches were in inshore tangle nets and offshore trammel nets.

7.2 Other species

During 2014 we increased our monitoring of longlines to some extent (39 days: 9% of total), specifically with an interest in seabird bycatch. Fulmars appear to be the species most frequently taken in UK registered longline operations that operate mainly in VIA northwest of Scotland (Table 7.1). Elsewhere, guillemots were the most frequently bycaught seabird species, as in previous years, mostly taken in standard (i.e. relatively small meshed) gillnets (Table 7.2). Two gull species and a single great northern diver were also reported (Tables 7.1 & 7.2).

At least six large or prohibited species of shark were recorded, with spurdog, tope and porbeagle dominating the numbers; these were taken in most types of static gear (but noticeably few in tangle nets: Table 7.2). By contrast bycatches of skates were heavily concentrated in trammel nets, with the greatest number of records of common skate and undulate rays. Two shads (spp IND) were also recorded (Tables 7.1 & 7.2).

Although we continue to refrain from extrapolating our seabird bycatch observations, because of concerns over the representativeness of the sampling, we have performed some preliminary analyses in a separate study to examine the distribution of observed seabird bycatch rates and seabird densities to try and identify areas off the South Coast of England that might require further monitoring. Two general areas were identified as candidates for increased seabird bycatch monitoring coverage (Coram *et al* 2015).

Table 7.1 – Species of possible conservation concern identified during 2014 bycatch observations-individuals by ICES Division (numbers of individuals observed)

Species of potential conservation concern	IVA	IVB	VIA	VIIA	VIID	VIIE	VIIF	VIIG	VIIH	VIIJ	Total
Seabirds											
Fulmar	6		113								**119**
Great black-backed gull			1								**1**
Great northern diver		1									**1**
Guillemot		1				2	5				**8**
Herring gull						1					**1**

Sharks											
Angel shark				2							**2**
Blue Shark						2		4	9	8	**23**
Porbeagle shark								12	46		**58**
Six-gilled shark									2		**2**
Spurdog							215				**215**
Tope						3	11	14	53		**81**
Skates											
Black skate								24			**24**
Common skate complex							12	10	124		**146**
Long-nosed skate							1	1			**2**
Undulate ray					14	105					**119**
Other fish											
Shad spp.					1				1		**2**
Total	**6**	**2**	**114**	**2**	**15**	**113**	**244**	**65**	**235**	**8**	**804**

Table 7.2 Species of possible conservation concern identified during 2014 bycatch observations- individuals by gear type (numbers of individuals observed).

Species of potential conservation concern	**Gillnet**	**Long line**	**Tangle net**	**Trammel net**	**Wreck net**	**Total**
Seabirds						
Fulmar		119				**119**
Great black-backed gull		1				**1**
Great northern diver	1					**1**
Guillemot	8					**8**
Herring gull			1			**1**
Sharks						
Angel shark			2			**2**
Blue Shark	5	8		10		**23**
Porbeagle shark	39			13	6	**58**
Six-gilled shark	1			1		**2**
Spurdog					215	**215**
Tope	34		5	20	22	**81**
Skates						
Black skate				24		**24**
Common skate complex				146		**146**
Long-nosed skate				2		**2**
Undulate ray			9	110		**119**
Other fish						
Shad spp.	1				1	**2**
Total	**89**	**128**	**17**	**326**	**244**	**804**

8. Conclusions

Sampling remains focused in the Celtic Sea and English Channel, but increased sampling in 2014 was achieved in static net fisheries in the Irish Sea and in longline fisheries off the northwest of Scotland. The continuing monitoring focus in the southwest reflects our perception that this is the area where most marine mammal bycatch occurs in the UK. This is driven by the overlap of high levels of netting effort and relatively high densities of some mammal species. Sampling over a wider area will be needed to address uncertainties in bycatch rates elsewhere.

An analysis of marine mammal bycatch observations is presented in Annex 2, where we have used statistical models to look for patterns in the observed bycatch rates. We have extrapolated estimates of total bycatch for harbour porpoises, common dolphins and seals (two species), but these estimates need to be considered in the light of the caveats discussed in the Annex.

Annex 1: Other dedicated and non-dedicated sampling.

A1.1: Other dedicated sampling of gear types not required under 812/2004 or 92/43/EEC

Table A1.1: Dedicated monitoring effort not required under 812/2004 or 92/43/EEC.

Category	Nantes Type	Metier Group	Target Group	ICES DIVISION	Vessels	Trips	Days at Sea	Hauls	Season	Mammal Bycatch	Seabird Bycatch
<15	FPO	Pots and Traps	Shellfish	IVb	1	1	1	2	Sep	0	0
<15	OTB	Bottom Otter Trawl	Demersal fish	VIIe	1	1	1	2	Mar	0	0
>15	LLS	Longlines	Demersal fish	IVa	1	1	9	5	Nov	0	6
				VIa	1	3	21	15	Aug	0	114
				VIIj	1	1	9	13	Oct	0	0
TOTAL							41	37		0	120

Two strings of lobster pots and two demersal trawl hauls were monitored opportunistically. Observers are instructed to record data in such instances even though pots and demersal trawls are not a gear type of direct interest to the bycatch monitoring programme at this time.

Five longline trips were also monitored for a total of 39 days, resulting in 120 seabird bycatch records.

A1.2: Non-dedicated sampling.

A further 898 non-dedicated monitoring days were conducted during 2014 on a variety of demersal trawl gear types under the English (Cefas) and Northern Irish (AFBINI) discard sampling programmes (Table A1.2). These data are not incorporated into our annual marine mammal bycatch estimates because we cannot be sure that all bycatches would have been seen or recorded by discard officers as they have different work patterns and commitments while on deck compared with dedicated bycatch observers. Nevertheless these data are summarised and included in the report because they may provide an initial insight into the potential for cetacean bycatch to occur in gear types not routinely covered by dedicated monitoring under 812/2004 and the Habitats Directive.

112 non-dedicated monitoring days were conducted during 2014 in a variety of static net fisheries under the English and Northern Irish discard sampling programmes (Table A1.2). It is worth noting that no cetacean bycatches were recorded in 2014 or 2013 despite the fact that many of the fisheries sampled are the same as those sampled by dedicated observers under the bycatch

programme and from which we have several records of cetacean bycatch occurring in 2014 (26 in 2013 – 9 in 2014). A similar pattern was evident in 2011 and 2012, so this year we have carried out a more detailed comparative analysis of bycatch rates calculated from data collected through dedicated and non-dedicated monitoring and results are presented in the following section (A1.3).

Table A1.2: Non-dedicated sampling conducted by collaborating institutions under DCF and other programmes.

Gear Group	Gear Type	Area	Target	Days	Hauls	Dolphin	Porpoise	Contractor
Demersal Trawl	Beam	IVC	Brown Crab	1	4	0	0	Cefas
Demersal Trawl	Beam	IVC	Brown shrimp	3	18	0	0	Cefas
Demersal Trawl	Beam	VIID	Dover sole	1	5	0	0	Cefas
Demersal Trawl	Beam	VIID	not recorded	8	60	0	0	Cefas
Demersal Trawl	Beam	VIIE	Anglerfish	27	161	0	0	Cefas
Demersal Trawl	Beam	VIIE	Cuttlefish	14	108	0	0	Cefas
Demersal Trawl	Beam	VIIE	Dover sole	4	28	0	0	Cefas
Demersal Trawl	Beam	VIIE	Lemon sole	10	89	0	0	Cefas
Demersal Trawl	Beam	VIIE	Megrim	10	50	0	0	Cefas
Demersal Trawl	Beam	VIIE	not recorded	11	54	0	0	Cefas
Demersal Trawl	Beam	VIIF	Anglerfish	16	108	0	0	Cefas
Demersal Trawl	Beam	VIIG	Anglerfish	6	26	0	0	Cefas
Demersal Trawl	Beam	VIIG	Megrim	10	50	0	0	Cefas
Demersal Trawl	Beam	VIIH	Anglerfish	44	255	0	0	Cefas
Demersal Trawl	Beam	VIIH	Megrim	35	172	0	0	Cefas
Demersal Trawl	Beam	VIIH	not recorded	5	17	0	0	Cefas
Demersal Trawl	Dredge	VIA	Scallop	7	7	0	0	AFBINI
Demersal Trawl	Dredge	VIIA	Scallop	14	119	0	0	AFBINI
Demersal Trawl	Dredge	VIID	Scallop	1	6	0	0	Cefas
Demersal Trawl	Dredge	VIIE	not recorded	2	13	0	0	Cefas

Demersal Trawl	**Dredge**	**VIIE**	**Scallop**	**15**	**102**	**0**	**0**	**Cefas**
Demersal Trawl	**Fly seine**	**VIIA**	**Whitefish**	**6**	**30**	**0**	**0**	**AFBINI**
Demersal Trawl	**Mid water demersal**	**VIIA**	**Nephrops**	**15**	**22**	**0**	**0**	**AFBINI**
Demersal Trawl	**Mid water demersal**	**VIIA**	**Whitefish**	**102**	**163**	**0**	**0**	**AFBINI**
Demersal Trawl	**Otter**	**IVB**	**Bass**	**1**	**2**	**0**	**0**	**Cefas**
Demersal Trawl	**Otter**	**IVB**	**Cod**	**1**	**2**	**0**	**0**	**Cefas**
Demersal Trawl	**Otter**	**IVB**	**Dover sole**	**2**	**5**	**0**	**0**	**Cefas**
Demersal Trawl	**Otter**	**IVB**	**Nephrops**	**1**	**2**	**0**	**0**	**Cefas**
Demersal Trawl	**Otter**	**IVB**	**not recorded**	**1**	**2**	**0**	**0**	**Cefas**
Demersal Trawl	**Otter**	**IVB**	**Whiting**	**3**	**8**	**0**	**0**	**Cefas**
Demersal Trawl	**Otter**	**IVC**	**Dover sole**	**1**	**4**	**0**	**0**	**Cefas**
Demersal Trawl	**Otter**	**VIIA**	**Cod**	**1**	**1**	**0**	**0**	**Cefas**
Demersal Trawl	**Otter**	**VIIA**	**not recorded**	**2**	**5**	**0**	**0**	**Cefas**
Demersal Trawl	**Otter**	**VIIA**	**Skate**	**1**	**2**	**0**	**0**	**Cefas**
Demersal Trawl	**Otter**	**VIID**	**Lemon sole**	**2**	**3**	**0**	**0**	**Cefas**
Demersal Trawl	**Otter**	**VIID**	**not recorded**	**1**	**2**	**0**	**0**	**Cefas**
Demersal Trawl	**Otter**	**VIID**	**Plaice**	**1**	**4**	**0**	**0**	**Cefas**
Demersal Trawl	**Otter**	**VIIE**	**Brill**	**1**	**3**	**0**	**0**	**Cefas**
Demersal Trawl	**Otter**	**VIIE**	**Cuttlefish**	**2**	**5**	**0**	**0**	**Cefas**
Demersal Trawl	**Otter**	**VIIE**	**John Dory**	**4**	**14**	**0**	**0**	**Cefas**
Demersal Trawl	**Otter**	**VIIE**	**Lemon sole**	**12**	**34**	**0**	**0**	**Cefas**
Demersal Trawl	**Otter**	**VIIE**	**not recorded**	**8**	**23**	**0**	**0**	**Cefas**
Demersal Trawl	**Otter**	**VIIE**	**Plaice**	**4**	**11**	**0**	**0**	**Cefas**
Demersal Trawl	**Otter**	**VIIE**	**Ray**	**1**	**5**	**0**	**0**	**Cefas**
Demersal Trawl	**Otter**	**VIIE**	**Squid**	**3**	**11**	**0**	**0**	**Cefas**
Demersal	**Quadruple**	**VIIA**	**Nephrops**	**16**	**38**	**0**	**0**	**AFBINI**

Trawl	Nephrops							
Demersal Trawl	Single Nephrops	IVB	Nephrops	7	11	0	0	Cefas
Demersal Trawl	Single Nephrops	IVB	not recorded	1	2	0	0	Cefas
Demersal Trawl	Single Nephrops	VIA	Nephrops	12	40	0	0	AFBINI
Demersal Trawl	Single Nephrops	VIIA	Nephrops	3	4	0	0	Cefas
Demersal Trawl	Single Nephrops	VIIA	Nephrops	137	450	0	0	AFBINI
Demersal Trawl	Twin Nephrops	IVB	Nephrops	3	4	0	0	Cefas
Demersal Trawl	Twin Nephrops	VIA	Nephrops	60	147	0	0	AFBINI
Demersal Trawl	Twin Nephrops	VIIA	Nephrops	202	567	0	0	AFBINI
Demersal Trawl	Twin Otter	IVC	Cod	1	3	0	0	Cefas
Demersal Trawl	Twin Otter	VIIE	Cuttlefish	1	2	0	0	Cefas
Demersal Trawl	Twin Otter	VIIE	Haddock	9	18	0	0	Cefas
Demersal Trawl	Twin Otter	VIIE	Lemon sole	3	10	0	0	Cefas
Demersal Trawl	Twin Otter	VIIE	not recorded	2	5	0	0	Cefas
Encircling Net	Ring Net	VIIE	Pilchard	2	1	0	0	Cefas
Lines	Handline	VIID	Bass	1	1	0	0	Cefas
Lines	Handline	VIIE	Bass	2	4	0	0	Cefas
Lines	Handline	VIIE	not recorded	1	4	0	0	Cefas
Lines	Handline	VIIE	Pollack	4	16	0	0	Cefas
Lines	Handline	VIIE	Whiting	1	7	0	0	Cefas
Lines	Handline	VIIH	Pollack	3	10	0	0	Cefas
Lines	Longline	VIIE	Plaice	6	5	0	0	Cefas
Midwater Trawl	Midwater	VIIE	Sprat	1	1	0	0	Cefas
Drift Net	Drift	VIIA	Bass	4	8	0	0	Cefas
Static Net	Gill	IVC	Cod	2	4	0	0	Cefas
Static Net	Gill	VIIA	Ray	1	2	0	0	Cefas
Static Net	Gill	VIID	Dover sole	2	5	0	0	Cefas
Static Net	Gill	VIIE	Bass	2	4	0	0	Cefas
Static Net	Gill	VIIE	Gurnard	5	6	0	0	Cefas
Static Net	Gill	VIIE	Haddock	6	10	0	0	Cefas
Static Net	Gill	VIIE	Ling	1	5	0	0	Cefas
Static Net	Gill	VIIE	Mullet	1	2	0	0	Cefas
Static Net	Gill	VIIE	not recorded	1	10	0	0	Cefas
Static Net	Gill	VIIE	Pollack	11	56	0	0	Cefas

Static Net	**Gill**	**VIIF**	**Haddock**	**1**	**2**	**0**	**0**	**Cefas**
Static Net	**Gill**	**VIIF**	**Ling**	**1**	**5**	**0**	**0**	**Cefas**
Static Net	**Gill**	**VIIG**	**Cod**	**4**	**14**	**0**	**0**	**Cefas**
Static Net	**Gill**	**VIIH**	**Pollack**	**6**	**30**	**0**	**0**	**Cefas**
Static Net	**Tangle / Trammel**	**VIIA**	**not recorded**	**1**	**3**	**0**	**0**	**Cefas**
Static Net	**Tangle / Trammel**	**VIID**	**Bass**	**2**	**3**	**0**	**0**	**Cefas**
Static Net	**Tangle / Trammel**	**VIID**	**Dover sole**	**12**	**39**	**0**	**0**	**Cefas**
Static Net	**Tangle / Trammel**	**VIID**	**Plaice**	**6**	**6**	**0**	**0**	**Cefas**
Static Net	**Tangle / Trammel**	**VIIE**	**Anglerfish**	**2**	**5**	**0**	**0**	**Cefas**
Static Net	**Tangle / Trammel**	**VIIE**	**Crayfish**	**2**	**8**	**0**	**0**	**Cefas**
Static Net	**Tangle / Trammel**	**VIIE**	**Gurnard**	**5**	**6**	**0**	**0**	**Cefas**
Static Net	**Tangle / Trammel**	**VIIE**	**Haddock**	**4**	**6**	**0**	**0**	**Cefas**
Static Net	**Tangle / Trammel**	**VIIE**	**not recorded**	**1**	**2**	**0**	**0**	**Cefas**
Static Net	**Tangle / Trammel**	**VIIE**	**Plaice**	**6**	**5**	**0**	**0**	**Cefas**
Static Net	**Tangle / Trammel**	**VIIE**	**Turbot**	**6**	**8**	**0**	**0**	**Cefas**
Static Net	**Tangle / Trammel**	**VIIF**	**Crayfish**	**6**	**7**	**0**	**0**	**Cefas**
Static Net	**Tangle / Trammel**	**VIIF**	**Dover sole**	**4**	**14**	**0**	**0**	**Cefas**
Static Net	**Tangle / Trammel**	**VIIF**	**not recorded**	**1**	**4**	**0**	**0**	**Cefas**
Static Net	**Tangle / Trammel**	**VIIF**	**Skate**	**2**	**6**	**0**	**0**	**Cefas**
Static Net	**Tangle / Trammel**	**VIIG**	**Cod**	**4**	**14**	**0**	**0**	**Cefas**
TOTAL				**1010**	**3464**	**0**	**0**	

A1.3: A comparison of dedicated and non-dedicated bycatch sampling.

In the previous three 812/2004 annual reports (covering 2011-2013 sampling) to the Commission, we have provided comparisons of cetacean bycatch rates produced with data collected under the dedicated bycatch programme with rates produced from data collected primarily from sampling conducted under the DCF. In the 2013 report specifically, we provided a more focussed analysis by comparing rates only from static net fisheries in Subarea VII over the 2011 to 2013 period, because several of those fisheries were monitored under both programmes and thus provide a better basis for comparison. The result of that analysis, which did not stratify the data by specific net type and/or area, showed that the overall cetacean bycatch rate (0.025 animals per haul) in Subarea VII calculated from dedicated monitoring over that three year period was thirty-six times higher than

the rate calculated using non-dedicated observations (0.007 per haul) over the same period and area (Northridge *et al*, 2014). We suggested that this difference was likely to be influenced by a number of factors, including which specific fisheries were monitored and the on deck sampling duties of observers under each programme.

Given current uncertainties about the future direction of protected species (PET) bycatch monitoring and signals from the Commission that PET bycatch monitoring may eventually be subsumed into the DCF, this year we have undertaken a more widespread (extended to Subareas IV, VI, VII & VIII) and longer term (2005 to 2014) analysis of static net data, which we have stratified by broad gear type and area (ICES division). This analysis provides a more robust assessment of potential differences in marine mammal (cetacean and seal) bycatch rates calculated from data originating from the different data collection programmes.

Table A1.3 provides a summary of sampling levels, observed marine mammal bycatches under each programme and an initial comparison of overall bycatch rates calculated from the 10 year and 3 year data time series. We have used the same method of calculation for each dataset but have included seals and Subareas IV, VI & VIII in the broader 10 year analysis.

Table A1.3: Overall bycatch rates

Monitoring type	Obs Hauls 2005-2014	Obs Marine mammals 2005-2014	Mammals rate 2005-2014	Cetaceans Rate 2011-2013
Dedicated	7433	188	0.025	0.025
Non-dedicated	3142	6	0.0019	0.0007

The numbers in Table A1.3 show that the bycatch rate calculated from dedicated sampling was relatively consistent over the two time periods at 0.025 animals per haul, despite seals and a much wider area being included in the 10 year dataset, whereas the rate calculated from non-dedicated data is almost three times higher over the longer time period. The three-fold increase (which results from 3 bycatch records from 2009/2010) in the non-dedicated rate leads to a reduction in the difference between rates calculated from each programme, from thirty-six times higher in dedicated sampling over the 3 year period to thirteen times higher over the 10 year period.

To determine if there are statistically significant differences in observed bycatch rates between the programmes we firstly stratified the full (dedicated and non-dedicated) 10 year dataset by area (ICES division) and broad gear type (gill or tangle/trammel) and then calculated the resulting “metier” specific bycatch rates. These are shown in Figures A1.4 and A1.5 overleaf.

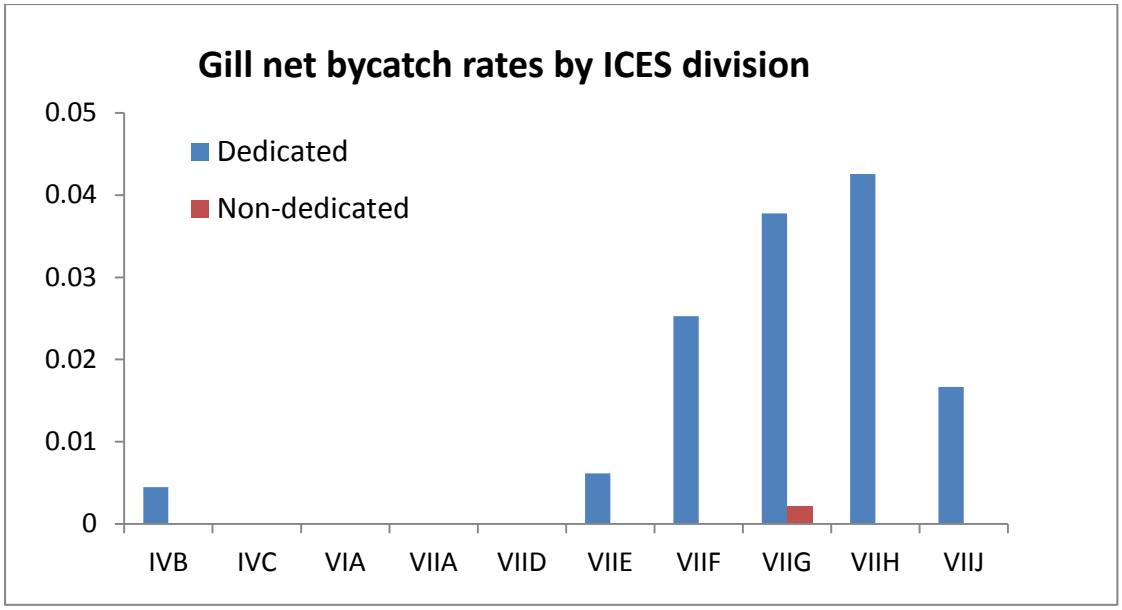

Figure A1.4: Gillnet bycatch rates calculated from dedicated and non-dedicated monitoring.

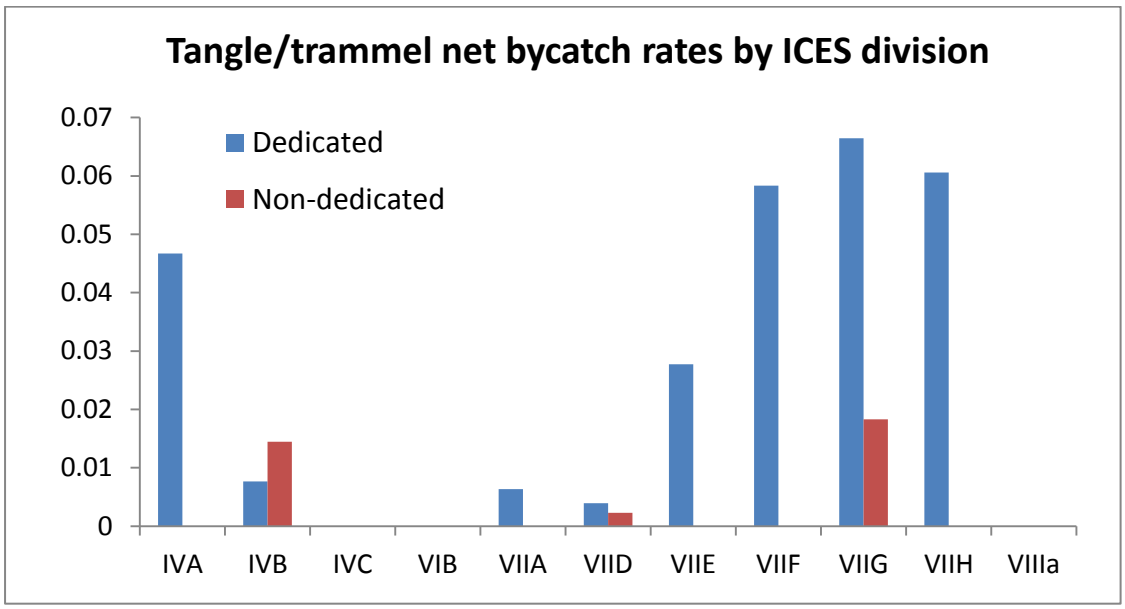

Figure A1.5: Tangle/trammel net bycatch rates calculated from dedicated and non-dedicated monitoring.

We then compared the bycatch rate distributions for each gear type using non-parametric tests (as the data do not follow the normal distribution). The results were values of P=0.028 for the gillnet dataset and P=0.012 for tangle/trammel nets respectively. Both are statistically significant results and demonstrate that differences exist between the calculated marine mammal bycatch rates under each data collection programme. We stratified the data in an equivalent way for each dataset and there was sampling in the majority of metiers under each programme (though not always observed bycatches), so the resulting difference in bycatch rates is likely to be largely driven by differences in

on-board sampling protocols rather than underlying differences in bycatch rates in the various fisheries sampled under each programme. This suggests that attempts to provide accurate advice about fisheries impacts on marine mammals in particular (and potentially other PET species) would be significantly hampered if only data collected under the DCF in its current form was used.

This more comprehensive analysis was designed to determine if there are significant differences between bycatch rates produced using the data collected under each programme. It is certainly not intended to undermine the general quality of data available from different programmes, because each programme is designed to provide information about impacts on different components of the ecosystem. However, the results provide a timely reminder that monitoring programmes and associated sampling protocols should be designed and implemented according to the questions that are being asked.

Annex 2

Statistical analyses and estimates of marine mammal bycatch in UK gillnet fisheries.

As in previous years we have refrained from using the relatively small sample of data collected in 2014 to estimate marine mammal bycatch totals, because we believe this would be misleading and less representative than using a longer time series. Among 121 metiers identified in the UK fleet in 2014 (Table 5.2), 28 were subject to some degree of monitoring last year, but marine mammal bycatch was observed in just five of them. Extrapolating estimates for these 5 metiers alone would be unrealistic. Instead, as in previous years' reports, we have used data since 2005 or since 2010 as described below, to generate estimates for the entire UK fleet. We do not yet consider that we have representative coverage of all 121 metiers listed in Table 5.2, and the estimates presented therefore rely on making assumptions that similar gears will have similar bycatch rates in different areas. Because we have tended to sample in areas which we think have the highest bycatch rates, our overall estimates are therefore likely to be biased high. Nevertheless, they provide some approximate numbers from which to work.

A statistical analysis of porpoise bycatch rates.

Data from 10772 static net hauls were used to examine porpoise bycatch rates by 7 notional metiers and in 13 ICES divisions. As in last year's report, General Additive Models (GAMs) were used to determine the best fitting models using ten parameters. There was little difference from the previous results, which indicated that fleet length is by far the most significant single factor in terms of its ability to describe bycatch rates. Once again, a series of two and three factor models were also run, and again the best fitting model among those tested is one that included fleet length (which features in all the best fitting models) and year with different surfaces for pingers being present or absent. Month also features in some of the better fitting models.

Interpreting the results is not straightforward, but it appears that net length is a key factor in predicting bycatch rate, and is more important than the metier, and that within this framework there have been changes in the bycatch rate by year, which may suggest a change in porpoise distribution, a change in foraging behaviour or subtle changes in gear configurations not revealed by our metier descriptions. There are also noticeable differences depending on whether or not pingers have been used (as one might expect). The results were not appreciably different from those in last year's report and supports the notion that there have been two episodes of higher bycatch within unpingered net fleets, one centred around 2007 among net fleets of at least 4 km in length, and a second centred around 2011 involving unpingered net fleets of between 2 km and 6 km in length. Among net fleets with pingers, higher bycatch rates are only associated with longer fleets i.e. those over 4 km.

Further work is needed to explore these data in more detail, but for now we can conclude, as previously, that net fleet length is a key variable, that pingers have a significant effect on bycatch,

and that there seems to be an effect of year on the porpoise bycatch rate when fleet length is also taken into account.

Estimation of fishing effort – number of hauls per day

We have tried to estimate the bycatch rate of porpoises, common dolphins and seals for the entire UK gillnet fleet for 2014, based on official logbook records of fishing effort (days at sea), and our interpretation of the likely metier based on the most valuable of the species landed on a trip by trip basis. Our bycatch rates are recorded in terms of the number of animals per haul, so in order to extrapolate to the fishing fleet we must also know the number of net hauls per day at sea for each recorded trip or the entire fleet. These data (hauls per day) are not recorded in the logbook or landings data, so we have to estimate them from our observer data. Further modelling of the observer data suggests that a good way to predict the number of hauls per day is to split recorded trips into single and multiday trips. Single day trips are typically made by boats under 12 m in length, while multiday trips usually involve boats of over 12 m in length. Several models were tested including metier, trip type (multi or single day) and ICES Division. As with the dataset tested last year, the best fitting model predicted the number of hauls per day at sea among observed trips on the basis of the metier and trip type. The predicted number of hauls per day by metier (drift nets pooled) and by vessel category was very similar to those predicted last year, is shown below:

Table A2.1 Predicted Hauls Per Day from Observed Trips

METIER	SINGLE DAY	MULTIDAY
DRIFT	**3.6**	**0.9**
GILL	**5.8**	**4.0**
GILL HAKE	**NA**	**2.2**
GILL LIGHT	**5.1**	**2.3**
GILL FLATFISH	**5.1**	**4.0**
TANG/TRAM	**4.8**	**2.6**

There were no single day trips observed for the hake net metier. Note that the number of hauls per day is generally less for multiday trips compared with single day trips. This is partly because multiday trips may involve more time spent travelling to and from fishing grounds, but probably more importantly because, for some of the metiers at least (tangle and hake netting in particular), *larger vessels tend to use much longer net fleets*. The net fleet length difference is less pronounced for gillnets set for pollack, cod and other whitefish. The implications of these predicted differences in the number of hauls per day at sea in different trip categories are very important, and remain to be fully explored. The uncertainty associated with these estimates of hauls per day should also be quantified and included in bycatch estimation but for now we have treated these as unbiased and precise estimates of the haul per day rate. Before we have fully analysed these data, it is important to understand that our current bycatch estimates (see below) do not take account of any difference in net lengths between smaller and larger boats. They are based only on differences in observed bycatch rates between different metiers. The resulting estimates therefore may overestimate the

bycatch per day among single day boats (because they have a greater number of hauls per day, but these are not scaled down by fleet length) and may under-estimate bycatch among larger boats (because they have a lower number of hauls per day, but these are not scaled up by net fleet length).

Porpoise bycatch estimation

Overall, our best estimate at present is that between 1400 and 1700 porpoises were bycaught in UK fishing nets in 2014, little different from and well within the confidence limits of the previous year's estimate. The range is a result of calculations made twice, assuming fully effective pingers on the one hand, or no pinger usage at the other extreme (see explanation below).

Previous analyses have suggested that porpoise bycatch rates may have increased slightly since 2010. We have therefore used just the five most recent years' data (2010-2014) in the present analysis to estimate porpoise bycatch totals in 2014 for the six metiers that we have been using to calculate bycatch totals. Note that since 2010 we have only observed 5 unpingered hauls in the hake fishery, which previously had a high underlying bycatch rate, so for this metier alone we have used data from the entire ten year time series to estimate unpingered bycatch rates for 2014.

Table A2.2 Observed bycatch rates for porpoises in 6 gillnet metiers – All UK vessels observed. Two time periods are shown – Most recent five years and ten years since 2005, with (two-sided) lower and upper 95% confidence limits (LCL and UCL respectively) and one-sided 90% upper confidence limit.

Bycatch rates as observed for hauls without pingers 2010 to 2014							
Metier	obs. hauls	obs. bycatch	Bycatch rate	se	Two-sided LCL	Two-sided UCL	One-sided UCL
Drift	138	2	0.014	0.010	0.002	0.051	0.045
Gill	617	5	0.008	0.004	0.003	0.019	0.017
Gill hake	5	0	0.000	0.000	0.000	0.522	0.451
Gill Light	295	3	0.010	0.008	0.002	0.029	0.026
Gill Light flatfish	544	1	0.002	0.002	0.000	0.010	0.009
Tang Tram	2221	52	0.023	0.004	0.018	0.031	0.029
Bycatch rates as observed for hauls without pingers 2005 to 2014							
Metier	obs. hauls	obs. bycatch	Bycatch rate	se	Two-sided LCL	Two-sided UCL	One-sided UCL
Drift	204	2	0.010	0.007	0.001	0.035	0.031
Gill	1438	14	0.010	0.003	0.005	0.016	0.015
Gill hake	268	13	0.049	0.014	0.026	0.082	0.076
Gill Light	649	3	0.005	0.003	0.001	0.013	0.012
Gill Light flatfish	1041	1	0.001	0.001	0.000	0.005	0.005
Tang Tram	3959	71	0.018	0.002	0.014	0.023	0.022

Estimated total mortality for porpoises in 2014 by Metier – assuming no pingers

Using the observed bycatch rates and associated variances, we can estimate the total bycatch of porpoises by metier assuming no pingers were deployed during 2014. This represents a conservative (high) estimate, not only for the reasons previously mentioned (lack of spatial stratification and crude assumptions on the association between days at sea and lengths of net hauled), but also because we know that pingers were in use by the over 12 m vessels fishing in the southwest at least, as required by the Regulation. Bycatch estimates are given by metier with binomial two-sided 95% confidence limits and a one-sided upper 90% confidence limit.

Table A2.3 Porpoise bycatch estimates for 2014 by metier – assuming no pingers were used.

Metier	Estimated total bycatch	Two-Sided 95% LCL	Two-Sided 95% UCL	One-sided 90% UCL
Drift demersal	93	11	330	289
Drift pelagic	41	5	146	127
Gill	187	61	433	391
Gill hake	89	48	149	139
Gill light	471	99	1359	1204
Gill flatfish	108	4	592	505
TangTram	730	551	949	913

These estimates by metier have also been calculated by ICES division, making no assumptions about underlying differences in porpoise density of bycatch rates between divisions, but purely on the basis of the weight of each of the seven metiers within the fleets fishing in each area.

Table A2.4 Porpoise bycatch estimates for 2014 by ICES division – assuming no pingers used

ICES Division	Estimated total bycatch	Two-Sided 95% LCL	Two-Sided 95% UCL	One-sided 90% UCL
IVA	51	38	67	64
IVB	26	14	50	46
IVC	178	62	479	426
VIB	14	11	19	18
VIIA	33	11	84	75
VIID	434	115	1374	1208
VIIE	478	236	999	909
VIIF	325	186	590	544
VIIG	87	47	156	144
VIIH	35	22	57	53
VIII	11	8	15	14
VIIJ	47	30	71	67
TOTAL No Pingers	1719	778	3959	3568
CV =	0.123			

Impact of the pinger regulation (812/2004) on porpoise bycatch totals

By examining recent observations of gillnets of 4km or less in length used by vessels over 12 m using pingers, we can obtain an estimate of the expected bycatch rate in the over 12 m sector if all boats were using 4km maximum net lengths. We assume for convenience that all over 12m vessels in all areas are using pingers, though the regulation does not apply to a few divisions (see Table A2.5) .

A regression model using the observed bycatch in each metier with and without pingers, weighted by sample size, was used to estimate the expected bycatch rate in each sector if pingers were being used. Applying the unpingered bycatch rate estimates (Table A2.2) to the under 12 m sector and the regression model generates rates to over 12 m vessels, we can calculate the total for each sector. The difference between these estimates and those in table A2.4 represent the numbers of porpoises that might not have been caught as a result of the use of pingers. Entries where zero porpoises are estimated to have been 'saved' represent areas where fishing effort by over 12 m vessels is too low for any effect to be noticeable. The notional 12 and 10 porpoises that might be 'saved' in VIB and VIII assume vessels fishing there continue to use pingers even though not required to do so.

Table A2.5 Estimates of porpoise bycatch (without uncertainty parameters) by fleet segment assuming over 12m boats are using pingers everywhere. Divisions affected by Regulation 812/2004 and where boats should be using pingers are indicated with an asterisk (*).

ICES Division	Under 12m boats	Over 12m boats	Bycatch with pinger	Bycatch without pingers	Porpoises 'saved' by pingers
IVA*	0	6	6	51	45
IVB*	19	1	20	26	6
IVC*	178	0	178	178	0
VIB	0	2	2	14	12
VIIA	32	0	32	33	0
VIID*	434	0	434	434	0
VIIE*	440	9	449	478	29
VIIF*	303	3	306	325	19
VIIG*	15	10	25	87	63
VIIH*	4	6	9	35	26
VIII	0	1	1	11	10
VIIJ*	0	6	6	47	41
	1425	43	1468	1719	250[1]

[1] 250 total assumes pingers used in all areas – total would be 228 if pingers only used where required.

Table A2.6. Estimated total porpoise bycatch with uncertainty parameters if pingers are used on all over 12m boats in all areas

Estimated total	95% two-sided LCL	95% two-sided UCL	90% one-sided UCL	CV
1468	601	4526	4016	0.145

The relatively modest reduction in bycatch that we predict from the use of pingers (228-250 depending on whether just relevant subareas or all subareas are included) is likely under-estimated overall, because bycatch per day at sea is likely underestimated in the over 12m sector. As mentioned previously, this is because no account has been taken of longer fleets of nets in use by such vessels. Further more detailed modelling work will be required to address this and other aspects of the estimation.

Dolphin bycatch

Although six species of dolphin have been reported in UK fisheries since 2005, the numbers have been very low (1 or 2 animals each) for five of these species, and we are only able to address bycatch of the common dolphin.

The numbers of common dolphins observed caught are low, and we would be unlikely to detect any trend in the bycatch rate, unless such a trend was very extreme. We have therefore used pooled observation data from 2005 to 2014 to estimate common dolphin bycatch in set net fisheries in 2014. Only fleets with no pingers were used to calculate these estimates, in case pingers have an effect on dolphin bycatch. The total of 276 animals estimated caught in 2014 is not very different from that in previous years and there is no evidence of a trend in bycatch rate.

Table A2.7. Estimates of common dolphin bycatch by metier for 2014 assuming no pinger effect

Common dolphins				
Metier	Estimated total bycatch	Two-Sided 95% LCL	Two-Sided 95% UCL	One-sided 90% UCL
Drift demersal	0	0	115	94
Drift pelagic	0	0	51	41
Gill	49	11	141	125
Gill hake	42	16	89	81
Gill light	0	0	261	212
Gill flatfish	0	0	205	167
Tang Tram	185	119	275	260
Totals:	276	146	1138	980
CV	0.096			

Table A2.8 Estimates of common dolphin bycatch by vessel size class and ICES division

Division	Under 12m sector	Over 12m sector	Totals
IVA	0	13	13
IVB	4	2	6
IVC	17	0	17
VIB	0	4	4
VIIA	2	0	3
VIID	29	0	29
VIIE	72	7	79
VIIF	59	7	66
VIIG	2	29	31
VIIH	1	9	10
VIII	0	3	3
VIIJ	0	16	16
Totals	186	90	276

Table A2.8 demonstrates one of the caveats mentioned previously, that we have not fully stratified or modelled the bycatch by division. The predicted bycatch of 17 common dolphins in IVC and 13 in IVA (North Sea) is unlikely, as this species is much less frequently found in these areas than it is in divisions VIIe though VIIg (Southwest), and is the result of the simplifying assumption that area is not a driver in determining bycatch rate.

Seal bycatch estimates

Seal bycatch observations are derived largely from tangle and trammel net fisheries. The total is very similar to that seen in previous years. All observations in recent years have been of grey seals, though we suspect that some observations in the North Sea in previous years may have included some harbour or common seals. Species identification of seals by observers at that time was questionable. The total of 417 animals caught in 2014 is not very different from that in previous years and there is no evidence of a trend in bycatch rate.

Table A2.9 Estimates of seal bycatch by metier for 2014 assuming no pinger effect

Metier	Estimated total bycatch	Two-Sided 95% LCL	Two-Sided 95% UCL	One-sided 90% UCL
Drift demersal	0	0	115	94
Drift pelagic	0	0	51	41
Gill	16	0	89	76
Gill hake	0	0	25	20
Gill light	0	0	261	212
Gill flatfish	56	1	310	264
Tang Tram	345	253	461	442
Totals:	417	255	1312	1149
CV	0.12			

Table A2.10 Estimates of seal bycatch by vessels size class and ICES division

Division	Under 12m sector	Over 12m sector	Totals
IVA	0	24	24
IVB	6	2	8
IVC	32	0	32
VIB	0	7	7
VIIA	4	0	4
VIID	82	0	82
VIIE	114	10	124
VIIF	94	3	97
VIIG	1	9	10
VIIH	1	12	13
VIII	0	5	5
VIIJ	0	11	11
Totals	335	82	417

The estimated removal of over 200 seals from waters around Cornwall suggests there may be immigration of animals from further afield, as pup production in this region is low compared to that in Wales or Scotland. The natal origin of bycaught seals in the southwest deserves further attention.

References

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