

Protecting the harbour porpoise in UK seas

*Identifying a network of draft SACs for the harbour
porpoise in the UK*

A report to WWF UK by PGH Evans and JS Prior

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Executive summary

The UK's marine environment supports a broad diversity of cetacean species. Most of these form part of larger north-east Atlantic populations. The harbour porpoise (*Phocoena phocoena*) is the UK's commonest and most widely-distributed cetacean. The species occurs throughout north-west European continental shelf seas, with the seas around the British Isles accounting for a high proportion of the European population.

In the last 50 years, declines in harbour porpoise numbers in various regions of the north-east Atlantic, North Sea and Baltic have been reported. A range of threats to harbour porpoises are identified, with the greatest impact generally considered to be bycatch in fishing gears. Harbour porpoise are particularly vulnerable to getting caught in bottom-set gill nets as a result of their feeding behaviour, and levels of bycatch are regarded to have been unsustainable in north-west European waters. Other known threats, include prey depletion, pollution that can affect the health of animals, and acoustic and physical disturbance. All are considered likely to continue or increase in the near future.

The EU Habitats Directive is currently the most important European legislative mechanism for addressing the conservation of wildlife and habitats. It requires site protection for a range of habitats and species listed in Annexes I and II respectively, and strict protection for a range of species listed in Annex IV. A coherent ecological network of Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) should be established under the title of Natura 2000, and member states are expected to contribute sites in proportion to the representation within their territory of Annex I habitats and Annex II species. SACs have been used widely as a means to help maintain or restore Annex I habitats and Annex II species to favourable conservation status (FCS) across their natural range. A number of species are included in both Annexes II and IV, including harbour porpoise, indicating that the two separate regimes of site protection and strict protection are intended to have different functions for the protection of those species.

The UK is a stronghold for the harbour porpoise within the EU, which gives the UK a particular responsibility for implementing the provisions of the Habitats Directive. The current approach to conserving harbour porpoises in UK seas consists of a five-step plan for assessing and maintaining FCS of harbour porpoises. Key commitments involve the monitoring and surveillance of cetacean populations through participation in Small Cetacean Abundance in the North Sea (SCANS), SCANS II and the Cetacean Offshore Distribution and Abundance in the European Atlantic (CODA) surveys. In addition, a range of techniques, involving strategies, measures, and guidelines are utilised with the aim of reducing identified threats to harbour porpoises as required for those species listed in Annex IV.

While a number of coastal/marine SACs have been identified in recognition of their importance for mobile marine species, none have been identified in the UK, on the basis of harbour porpoise populations. Examples of SACs for cetaceans in the UK include the Moray Firth in Scotland and Cardigan Bay in Wales for bottlenose dolphins, and the Monach Islands in Scotland for grey seals. Other member states have designated Natura 2000 sites on the basis of their importance for harbour porpoises, despite the difficulties of collecting data about aquatic species that range over wide areas. Germany, for example, has designated the Sylt Outer Reef in the North Sea on the basis of its high density of harbour porpoises and mother-calf pairs. If all EU member states comply except the UK, which hosts a significant portion of

the European porpoise population, then it undermines the whole purpose of Natura 2000.

The UK has identified 26 sites in which the harbour porpoise is listed as a non-qualifying feature (i.e. a grade D or non-significant population occurs on the site). Non-significant populations do not, however, enjoy the protective measures afforded under Article 6 of the Directive. So, for example, a developer would not be required to evaluate the potential adverse effects on the harbour porpoise when carrying out an appropriate assessment of a plan or project under Article 6(3) of the Directive. Nearly 20 years after it adopted the Directive, the UK has yet to submit any sites for which the harbour porpoise is a primary reason for site selection or sites on which the species is listed on the site details as a qualifying feature to the European Commission¹.

As harbour porpoises are widely distributed in UK seas, it is difficult to identify individual sites that will be critical for the population as a whole. It is, however, possible to identify a number of sites that are used regularly by a significant number of porpoises, and which provide a network of locations that encompass the range of physical and biological factors that are essential to their life and reproduction – as required under Article 4(1) of the Habitats Directive.

This report develops a methodology based on the procedure set out in the explanatory notes to the EU's Standard Data Form and supplementary guidance agreed in 2000 in relation to the harbour porpoise. On the basis of this methodology, the report recommends six sites for consideration as draft SACs for harbour porpoise in the UK and includes completed EU Standard Data Forms (SDFs) for each site, see section 7 for a map showing the location of the sites recommended for designation and section 8 for the SDFs.

The six sites recommended for designation as draft SACs are:

- Western Scotland and Inner Hebrides
- North & West Anglesey
- South-west Llyn
- Southern Cardigan Bay
- Pembrokeshire Marine / Sir Benfro Forol
- Outer Bristol Channel

A further suite of five sites or 'Areas of Search' that could potentially form part of the SAC network, but which may require further survey work to confirm their importance for harbour porpoise and/ or to define boundaries are identified:

- Northern Isles
- Moray Firth extending to East Grampian
- Eastern England
- Dogger Bank
- Skerries and Causeway (Northern Ireland)

¹ In 2012, the Minister for the Environment and Secretary of State for Northern Ireland approved documentation for a new marine SAC (Skerries and Causeway) for reef (grade B), sandbanks slightly covered by seawater at all times (grade B), submerged or partially sea caves (grade B) and harbour porpoise (grade C) features. The UK Government has indicated that it will formally submit this site to Europe in August 2012. Pers Comm Gary Burrows DOENI.

Inevitably, as harbour porpoise spend a large portion of their lives in open water and rely on oceanographic processes and large-scale habitats, the sites proposed are large. This is also necessary to encompass the various stages of their life cycle and to maintain them at FCS. The Report notes that larger MPAs can enable better integration of management efforts, provide buffering core areas, and dilute impacts in adjacent areas; it also notes that not all activity or development will be 'prohibited' within these areas. Two case studies are included which provide indicative information on the types of activities and the types of management solutions that might be applicable in larger harbour porpoise MPAs. In developing management strategies for potential SACs for wide-ranging species such as the harbour porpoise, it will also be important to work closely with neighbouring member states to ensure a consistent and considered approach.

The report is not exhaustive, but rather it identifies a suite of sites, based on the best currently available information, as being important to maintain FCS for harbour porpoise, and thereby making a contribution to achieving an ecologically coherent Natura 2000 network across the EU.

Acknowledgements

This report has been prepared by Peter Evans and Sian Prior, with guidance from Alison Champion, Carol Day and Anna Heslop at WWF.

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1. Introduction

This report explains the importance of north-west European waters and in particular the UK's seas for harbour porpoise populations, and relevance of the EU Habitats and Species Directives in protecting the EU's most threatened species and habitats across their natural range. It also outlines the issues and difficulties surrounding site protection for highly mobile, aquatic species such as cetaceans – including the harbour porpoise and recognises that wider conservation measures are also important. It develops a methodology for identification of sites important for harbour porpoise based on a range of evidence drawn from both peer reviewed journal publications and from grey literature, and proposes sites for designation as SACs for harbour porpoise, along with 'Areas of Search (AoS)' which may on closer investigation, result in further SACs being identified for the harbour porpoise in the UK. It also features maps showing the proposed SACs and AoSs (see Sections 6 and 7) and completed EU Standard Data Forms (SDF) for each site (see Section 8).

2. Harbour porpoise in NW Europe

2.1 Distribution

The harbour porpoise (*Phocoena phocoena*) is the UK's most common and widely distributed cetacean species. It occurs throughout north-west European continental shelf seas at depths of between 20 and 200m – from the Barents Sea and Iceland south to the coasts of France and Spain (see Fig. 1)ⁱ, and the species frequently uses tidal conditions for foragingⁱⁱ. Historically the harbour porpoise was clearly abundant in many parts of the UKⁱⁱⁱ, however in the 1970s it became scarce in the southernmost North Sea, English Channel and Bay of Biscay and various publications report declines in the 50 years preceding the line transect surveys of 1994 and 2005 (see section 2.2)^{iv}. But since the 1990s, it has apparently returned to the southernmost North Sea, English Channel and French Biscay coast^v.



Figure 1. North Atlantic distribution of harbour porpoise, depicting the areas where the species is thought to occur regularly^{vi}

Although porpoises can be found in deep waters off the edge of the continental shelf, for example within the Faroe Bank Channel^{vii}, they are comparatively rare in waters deeper than 200m.

2.2 Population size

An overall population estimate for harbour porpoises of 341,000 individuals (CV=0.14; 95% CI: 260,000-449,000) was made for the North Sea and adjacent waters during an EU LIFE funded project, Small Cetacean Abundance in the North Sea (SCANS) in July 1994^{viii}. This included the following regional estimates: the North Sea (c. 250,000), Baltic region (36,600 in Kattegat/Skagerrak/Belt Seas/western Baltic Sea), Channel (o), and Celtic Shelf (36,300). The survey area included the Celtic Sea, Channel, North Sea (across to northern Scotland), Skagerrak, Kattegat, Belt Seas, and western Baltic (Fig. 2a). However, not all UK seas were covered and most of the Irish Sea and western Scotland were not surveyed.

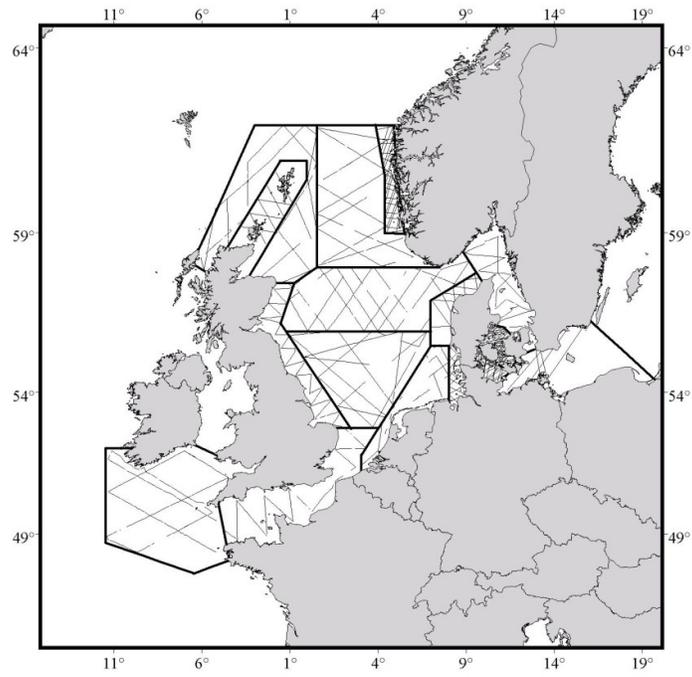


Figure 2a. Survey tracks for SCANS (July 1994)^{ix}

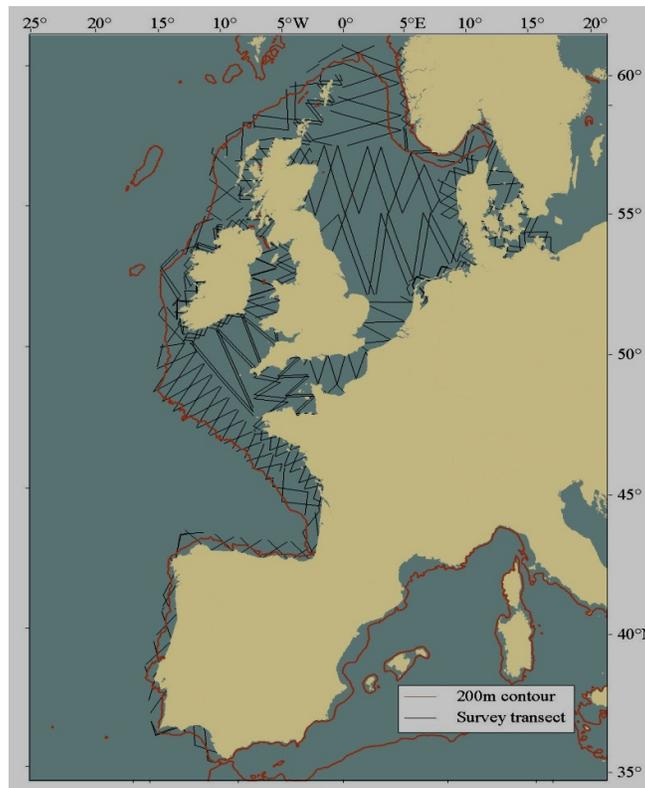


Figure 2b. Survey tracks for SCANS II (July 2005)^x

A repeat survey in July 2005 (SCANS II) covered a wider area: the continental shelf seas from south-west Norway, south to Atlantic Portugal (Fig. 2b). It gave an estimate of 385,600 (CV = 0.20)^{xi}, with regional estimates: North Sea (c. 231,000), Baltic (23,000 in Kattegat/Skagerrak/Belt Seas/western Baltic Sea), Channel (40,900), and Celtic Shelf (58,400).

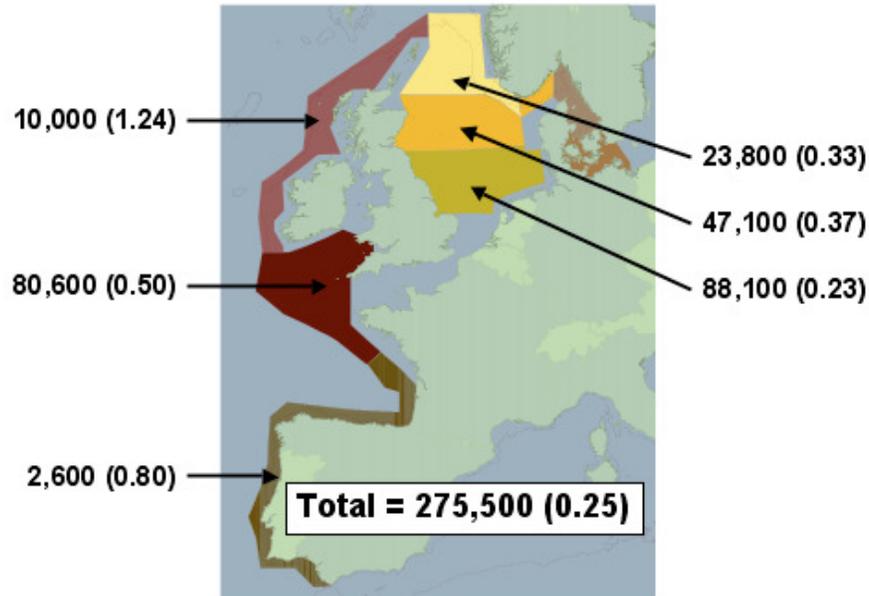


Figure 3a. Abundance estimates (and CVs) for harbour porpoises from the SCANS II shipboard survey (July 2005)^{xii}

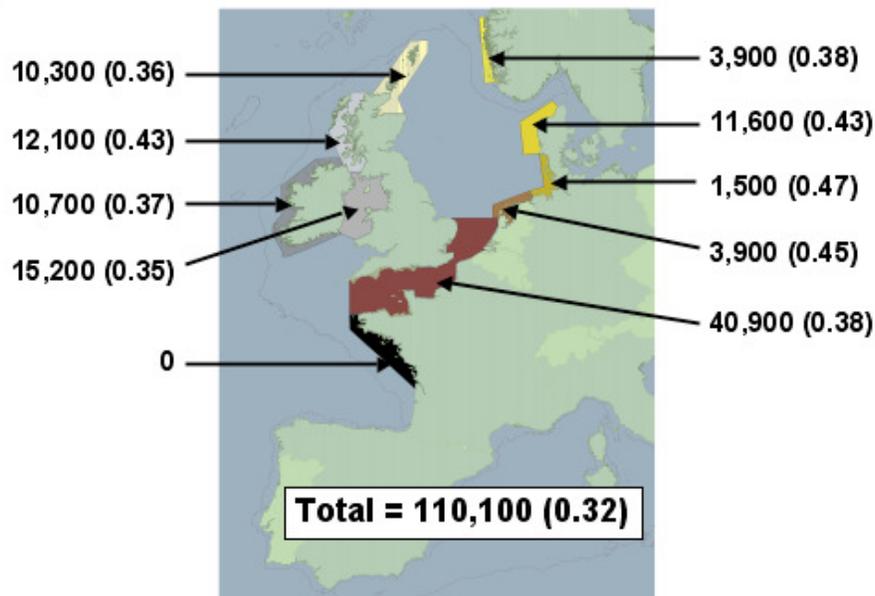


Figure 3b. Abundance estimates (and CVs) for harbour porpoises from the SCANS II aerial survey (July 2005)^{xiii}

Figures 3a and 3b depict the abundance estimates (and associated coefficients of variation) from the SCANS II shipboard and aerial surveys respectively. While care should be taken in comparing two surveys which took place eleven years apart, covering a single month and somewhat differing geographic areas (see section 4.1), the overall number estimated for the North Sea, Channel and Celtic Sea was comparable (341,000 in 1994, and 335,000 in 2005). Numbers in the northern North Sea and Danish waters had declined from 239,000 to 120,000. However, in the central and southern North Sea, Channel and Celtic Shelf, they had increased from 102,000 to 215,000. This is thought to represent a southwards shift in their range, rather than actual changes in population size^{xiv} – at least for the month of July. It also suggests some connection between northern and southern areas. But it is not clear whether these cross the proposed Management Unit boundaries (see section 2.4).

Although assigning abundance estimates to different blocks (see Fig. 3) does not permit an estimate of the numbers of porpoises occurring specifically within UK seas in July 2005, it is clear from these surveys that the seas around the British Isles account for a high proportion of the European population of the species. Data compiled by the European Environment Agency from Habitats Directive Article 17 reporting, indicates a population of 328,200 individuals in UK seas, compared with 122,000 individuals in French waters, 100,000 – 112,000 individuals in Irish waters, 15,000 – 30,000 individuals in Dutch waters, and 1,565 individuals in German waters^{xv}. Thus, the designation of SACs for porpoises by the UK is critical if any network of protected sites within the EU under Natura 2000 is to be realised for this species. If all other EU member states comply but the UK – which hosts a significant portion of the European porpoise population – does not, it undermines the whole purpose of Natura 2000.

2.3 Mobility

The fact that harbour porpoises can occur over wide areas of the European continental shelf poses a particular challenge when establishing SACs for their protection. But the often-used argument that they are somehow unique in being highly mobile is less compelling: individuals of other marine mammal species (such as Atlantic grey seal and bottlenose dolphin) that require special consideration under Annex II of the Habitats Directive have been shown to travel equally large distances.

Radio telemetry studies by the Sea Mammal Research Unit (SMRU) and other research groups have shown tracks of grey seals extending over hundreds of kilometres^{xvi}. And photo-ID studies of coastal bottlenose dolphins have indicated individuals from the Moray Firth being re-sighted on the west coast of Scotland and even as far as western Ireland^{xvii}. Some bottlenose dolphin individuals have been shown to travel all around the coasts of Ireland^{xviii}, and others from the Moray Firth have been photographed as far south as Whitby in North Yorkshire^{xix}. Animals from Cardigan Bay have been regularly re-sighted in the northern Irish Sea including around the Isle of Man, in some cases moving more than 100km within 24 hours^{xx}.

On the other hand, individual dolphins frequently return to the same locations year after year and may occupy areas for extended periods seasonally. The same applies to individual harbour porpoise, which from radio tracking studies in inner Danish waters, have been shown to regularly frequent particular locations^{xxi}. Distinctively marked individuals have also been observed repeatedly through the season and/or from year to year in the same sites – for example, Shetland, Anglesey, and Pembrokeshire^{xxii}. These and other studies highlight the fact that although these marine mammals are very mobile and wide-ranging, they frequently also show fidelity to particular areas.

2.4 Population structure

In 2008, 24 specialists in marine mammal genetics and ecology met at the UNEP campus in Bonn, Germany to review small cetacean population structure within the Agreement on the Conservation of Small Cetaceans of the Baltic and North East Atlantic, Irish and North Seas (ASCOBANS) Area^{xxiii}. One of the primary species under consideration was the harbour porpoise. Using a variety of genetic and ecological evidence, they recognised 15 Management Units (MUs) within the North Atlantic (see Table 1). These included nine MUs within the ASCOBANS Area, and three others (Norway, Iceland and West Greenland) adjacent to these, as well as three in North America. Figure 4 illustrates the geographical areas covered.

Table 1. Supporting evidence for proposed Management Units in harbour porpoise [MU = Management Units; GoM = Gulf of Maine and Bay of Fundy; GoSL = Gulf of St Lawrence; NEW = Newfoundland; WGR = west Greenland; ICE = Iceland; FAR = Faroe Islands; NOR = north-west/central-west Norway and Barents Sea; NENS = north-eastern North Sea and Skagerrak; SWNS = south-western North Sea and eastern Channel; IDW = Inner Danish Waters; BAL = Baltic Sea; CES = Celtic Sea (plus south-west Ireland, Irish Sea and western Channel); NWIS = north-west Ireland and west Scotland; BoB = Bay of Biscay (west France); IBNA = north-west Spain, Portugal and north-west Africa].

√ = evidence for differentiation; x = evidence for no differentiation.

MU	Isozymes	mtDNA	Microsat.	Skeletal	Tooth ultra-structure	Dietary	Contam.	Paras.	Telemetry
GoM		√	√		√			√	
GoSL	√	√	√						
NEW		√	√						
WGR	√	√	√		√	√	√	√	
ICE		√			√	√			
FAR								√	
NOR		√	√	√	√	√	√		√
NENS	√	√	√		√	√	√		√
SWNS	√		√	√		√	√	√	
IDW	√	√	√	√	√	√	√	√	√
BAL		√		√	√		√		√
CES		√	√	√	√	√	√		
NWIS		√							
BoB									
IBNA			√						

At present, a separate MU has been assigned to the Bay of Biscay although porpoises from this region have not been fully investigated (it may be marginal habitat for them anyway). There appears to be a small population occurring year-round along the French Biscay coast^{xxiv}, which is more likely to be linked to porpoises further north than to an Iberian population^{xxv}. Along the north Spanish coast, the shelf is very narrow and there doesn't appear to be a regular porpoise population. This may have created the conditions for genetic differentiation of the Iberian population.

Along the Atlantic coasts of the British Isles and Ireland, various lines of evidence suggest that porpoises in south-west and southern Ireland may be linked to south-west Wales and south-west England, as well as offshore in the Celtic Sea^{xxvi}. Further north, porpoises along the west coast of Ireland from counties Clare to Donegal are

recorded in lower numbers and little investigated. For the time being, these are assigned to a separate MU along with western Scotland, although this needs further study. In the northern North Atlantic, the restricted shelf area around the Faroe Islands supports numbers of porpoises but information on their population structure also remains limited.

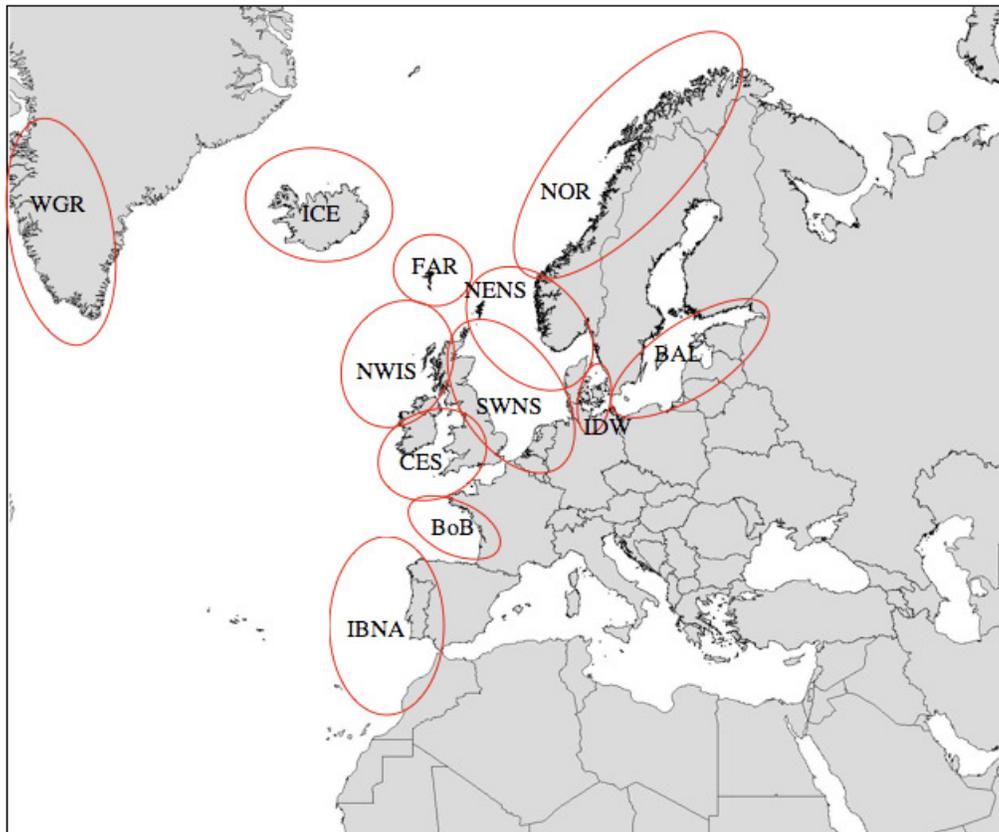


Figure 4. Map showing recommended Management Units for harbour porpoise in the ASCOBANS Agreement Area and Environs^{xxvii}

Up to four porpoise management units are currently recognised in the waters around the British Isles: 1) south-western North Sea and eastern Channel; 2) Celtic Sea including the Irish Sea and western Channel; 3) west Scotland; and possibly 4) Shetland Isles and north-eastern North Sea including Skagerrak (Table 1; Fig. 4). In the case of the last MU, telemetry studies do indicate seasonal movements between the Skagerrak and Shetland^{xxviii}. Over the last decade or so, porpoises have apparently declined substantially in this latter region^{xxix} (Fig. 5). Øien^{xxx} also noted that compared to the previous Norwegian survey conducted in the North Sea in 2004, the most striking feature was the nearly complete absence of harbour porpoise observations in 2009. Based just on numbers of sightings and effort, the sightings rate for 2009 in the northern North Sea was less than 10% of the average from five surveys in 1989, 1995 and 2004, which showed relatively little variation (mean n/L = 0.05 groups per nm, SD=0.008^{xxxi}).

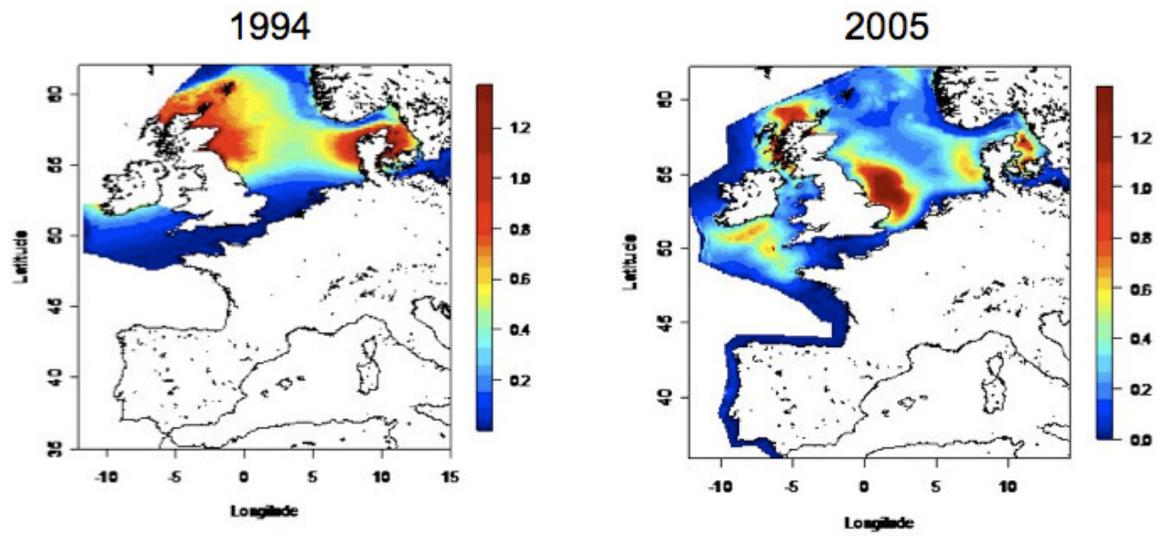


Figure 5. Harbour porpoise estimated density surfaces (animals per sq km) in
a) July 1994 and b) July 2005^{xxxii}

3. Harbour porpoise and the EU Habitats and Species Directive²

The EU Habitats and Species Directive (referred to hereafter as the Habitats Directive) is the most important European legislative mechanism for addressing the conservation of wildlife and habitats. Together with the Birds Directive³, it 'forms the cornerstone of Europe's nature conservation policy'^{xxxiii}. It provides for the protection of over 1,000 animal and plant species and over 200 habitats through a dual system of a network of protected sites and strict protection for particular species. The UK also has obligations for harbour porpoise conservation as a contracting party to the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR Convention), the Agreement on the Conservation of Small Cetaceans in the Baltic, North-East Atlantic, Irish and North Seas (ASCOBANS), and within the UK Biodiversity Action Plan, 1994

Articles 3-6 of the Habitats Directive provide for site protection across a range of habitats and species listed in Annexes I and II to the Directive, including the harbour porpoise. Articles 12-16 provide for strict protection of a range of species listed in Annex IV, including all cetaceans.

Article 3 specifically requires that a European-wide ecological network of Special Areas of Conservation (SAC) is identified. Together with Special Protection Areas (SPA) classified under the Wild Birds Directive, these sites will comprise an ecological network of sites known as Natura 2000. Sites hosting natural habitat types listed in Annex I, and habitats containing species listed in Annex II of the Directive, which includes harbour porpoise, will contribute to the network. Each member state is expected to contribute to the creation of Natura 2000 in proportion to the representation of the habitats and species within its territory (Article 3(2)). The expectation is that each member state will designate appropriate sites as SACs. Article 4 requires that member states propose a list of sites, including sites for particular aquatic species that range over wide areas, where there is a clearly identifiable area representing the physical and biological factors essential to their life and reproduction. While this is not as straightforward for wide-ranging species such as harbour porpoises, it is possible to identify a number of sites that by the nature of their physical features are used regularly by a significant number of individuals. These may form a network of sites representing the range of physical and biological factors essential to their life and reproduction. This places a responsibility on member states in which such species occur, to gather sufficient data to enable them to identify candidate sites.

In elaborating requirements specific to the protection of species listed in Annex IV, which includes all cetacean species, member states are expected to establish a system of strict protection (Article 12), including the prohibiting of all forms of deliberate capture or killing; deliberate disturbance particularly during breeding, rearing, hibernation and migration; and deterioration or destruction of breeding sites or resting places.

3.1 Harbour porpoise and Special Areas of Conservation

Under the Habitats Directive^{xxxiv} all cetacean species are listed for protection, and member states are obliged to identify and designate SACs for both the bottlenose

² Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora.

³ Council Directive 09/147/EC of 30 November 2009 on the conservation of wild birds.

dolphin and harbour porpoise. It is widely recognised that UK seas form an important stronghold for harbour porpoise in north-western Europe, and although site protection measures are more complicated to apply to mobile species, there is good evidence of particular sites being used persistently by this species in UK seas (see section 8).

But, nearly 20 years after its adoption and more than a decade after a High Court case^{xxxv} confirmed that the Habitats Directive applies to the full extent of marine jurisdiction, the UK has yet to submit any sites for the harbour porpoise to the European Commission. This includes sites in which the harbour porpoise is a primary reason for site selection (Grade A or B) and sites where the species is listed on the site details as a qualifying feature (Grade C)⁴. The UK has identified 26 sites^{xxxvi} where the harbour porpoise is listed as a non-qualifying feature (i.e. a grade D or non-significant population occurs on the site). However, according to Guidance on Article 6 published by the European Commission, non-significant populations do not enjoy the protective measures afforded under Article 6 of the Directive. For example, a developer is not required to evaluate the potential adverse effects on the harbour porpoise when carrying out an Appropriate Assessment of a plan or project under Article 6(3) of the Directive^{xxxvii}. Similarly, in drawing up the management measures for SACs under Article 6(1) of the Directive, member states are not required to take account of non-significant populations of Annex II species on the Standard Data Form^{xxxviii}.

3.2 Favourable conservation status

Article 2 of the Habitats Directive requires that measures taken by member states must be designed to maintain or restore natural habitats and species of wild fauna and flora of community interest at 'favourable conservation status'. It defines favourable conservation status of a species as:

'the sum of the influences acting on the species concerned that may affect the long-term distribution and abundance of its populations' within the European territory of member states.

Conservation status will be assessed as favourable when the population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats; the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future; and there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis. If only one of these parameters is considered unfavourable then the overall conservation assessment for the species is reported as unfavourable.

The preamble to the Habitats Directive recognises that the designation of SACs is a prerequisite to ensure the restoration or maintenance of natural habitats and species of community interest at a favourable conservation status. This underlines the legal imperative of identifying a network of sites as the core mechanism through which favourable conservation status for the species is to be achieved and maintained.

⁴ In 2012, the Minister for the Environment and Secretary of State for Northern Ireland approved documentation for a new marine SAC (Skerries and Causeway) for reef (grade B), sandbanks slightly covered by seawater at all times (grade B), submerged or partially sea caves (grade B) and harbour porpoise (grade C) features. The UK Government has indicated that it will formally submit this site to Europe in August 2012. Pers Comm Gary Burrows DOENI.

3.3 Management in SACs

Currently, all SACs must be managed to ensure that the conservation feature (or features) for which the site is identified are provided with adequate protection to meet the conservation objectives of the site. In some cases this means that there is very little restriction on activities taking place. However, it could mean that some activities are restricted at certain times of the year, or are excluded from certain areas within the SAC. In a few cases it is possible that a particularly disturbing activity or development might be excluded from a site completely. In most cases, however, it is unlikely that all activities and all developments would be excluded. The conservation objectives for each site will be site specific, as will the management measures introduced to provide the necessary level of protection for the habitats and wildlife to be protected, including harbour porpoises.

Member States may draw up management measures for SACs under Article 6(1) of the Habitats Directive. This provides the opportunity to devise and implement, with appropriate stakeholder engagement, management plans covering these areas. Article 6 also provides a clear and transparent process to ensure that the potential implications of a proposed plan of a project on Natura 2000 sites are properly identified and evaluated. The Habitats Directive does not block all development; rather it provides a process whereby decisions can be made that respect both the sensitivity and importance of the sites and the public interest nature of certain proposals. Activities/proposals considered to not have any significant adverse effect on the integrity of the site will be able to proceed; others may require modification, through for example the use of temporal or spatial restrictions, or adherence to licence conditions with appropriate mitigation measures to minimise effects. Some activities may be deemed to have adverse effects on the integrity of the site, but there may be no alternative and they may be considered necessary for imperative reasons of overriding public interest (IROPI) or be necessary for human health or public safety. As such, those activities or proposals may also proceed.

3.4 The need for strict protection against threats to harbour porpoise

The Habitats Directive identifies a range of species of community interest that require designation of SACs (Annex II) and/or strict protection (Annex IV) because they are considered to be endangered, vulnerable, rare or endemic. Harbour porpoise is included in Annex II and while this species is the most common cetacean in north-west European waters, numbers have declined over the last half century in several areas including the English Channel, the North Sea, Baltic Sea and Black Sea^{xxxix} (see also Section 2.4).

Bodies such as ASCOBANS^{xl} along with various reports^{xli}, identify threats to the harbour porpoise, including bycatch, prey depletion, pollution, acoustic and physical disturbance, and disease. The most obvious and immediate impact is bycatch of harbour porpoise in fishing gears, which was regarded to have been unsustainable at least in the 1990s for populations in north-west European waters^{xlii}. Harbour porpoise are particularly vulnerable to getting caught in bottom-set gill nets as a result of their feeding behaviour.

In addition, other threats, such as pollution, acoustic disturbance and possibly climate change, are likely to continue or increase in the near future. Although some changes in the abundance of potential prey can be related directly to overfishing, for a number of fish species poor recruitment of juveniles into adult populations is more likely to be the result of climate change effects^{xliii}. Releases of polychlorinated biphenyls into the environment have been regulated for over 20 years. However,

their persistence means that they are likely to have a continuing impact on cetacean populations for some years yet, with levels now stable rather than declining^{xliv}. While the scale of the impact of underwater noise remains poorly understood^{xlv}, there is indication that porpoises may be particularly sensitive to noise disturbance^{xlvi}. Studies^{xlvii} from the development of wind farms in Danish waters have shown marked reductions in porpoise acoustic activity during construction, which have persisted over a wide area (20km radius) and extended over the long term.

3.5 Harbour porpoise as an Annex II and Annex IV species

Some in the scientific community believe that the use of issue based conservation measures, such as those dealing with bycatch, to be the best way of conserving the species. Others firmly believe that both issue based conservation measures and site based protection are needed, and that securing FCS for the harbour porpoise cannot be achieved by wider measures alone nor by designating SACs in the absence of wider measures. A recent paper^{xlviii} claims to provide the first evidence that area-based protection measures can work for marine mammals. It is worth noting that in drawing up the Directive, it was clearly not the intention of the legislators that species would be protected only by the strict protection in Articles 12 and 13, since a number of species are included in both Annex II and IV – indicating that the two separate regimes are intended to have different functions for the protection of those species. A species listed under Annex IV will be afforded strict protection against deliberate disturbance whether it is within or outside an SAC. This protection alone is not sufficient to safeguard the species - it is complementary to the system of protection of the habitats of species contained in Articles 3-6 and Annex II.

It is also worth noting that the species lists that are annexed to the Directive have been drawn up and refined by experts in the field over many years. At no point have these experts considered that highly mobile marine species such as harbour porpoise would be better protected by Articles 12 and 13 alone, and removed them from Annex II and the provisions for site specific protection as afforded by Articles 3-6. In fact, harbour porpoise (and bottlenose dolphin) are specifically included in Annex II whereas all cetacean species are included in Annex IV. Appendix A outlines the various provisions offered to species by the two regimes.

Conservation attempts by the UK focus on wider conservation measures where each threat is considered individually (see Section 4.2). While undeniably important, it is considered that such measures alone will not ensure that UK populations of the harbour porpoise will be maintained at, or restored to, FCS – as required under the Habitats Directive. For example, Regulation 812/2004⁵ only requires that pingers are used on vessels of over 12m in length, and there has been resistance from the industry to their widespread use, while guidelines addressing potential disturbing activities rely on ramp-up or acoustic deterrents whose long-term effects remain unclear rather than quieting technologies (see Section 4.4). While effort should be made to ensure that wider conservation measures are effective, the authors believe that FCS will be achieved through a combination of site protection and wider measures as required by Articles 3 -6 and 12 – 13 of the Habitats Directive.

⁵ Council Regulation (EC) No.812/2004 of 26 April 2004 laying down measures concerning incidental catches of cetaceans in fisheries and amending Regulation (EC) No.88/98

4. Harbour porpoise conservation in UK seas⁶

The UK government's state of UK seas^{xlix}, *Charting Progress 2* published in 2010, assessed the conservation status of the five most abundant cetacean species in UK seas, including harbour porpoise, as favourable. It goes on, however, to conclude that as a group, cetaceans can only be considered to be in a good condition in the northern and southern North Sea and admits that even this assessment does not have a high degree of certainty. *Charting Progress 2* concluded that this group of five cetacean species were in a poor condition in the Eastern Channel though there is a suggestion that they are now starting to recover from decline^l; only in moderate condition in the Western Channel, Celtic Sea, Irish Sea, the Minches and Western Scotland waters, and the condition in the Scottish continental shelf area and offshore waters to the north and west of Scotland is unknown. The report concluded that historic bycatch is the most likely cause of current low densities of harbour porpoise in the Eastern Channel^{li}.

On the basis of the results of SCANS and SCANS II undertaken in 1994 (see figure 2a) and 2005 (see figure 2b), the conservation status of harbour porpoise has been assessed as favourable in the UK's second report on the implementation of the Habitats Directive^{lii}. On the other hand, the findings of the SCANS II survey and other surveys, e.g. Norwegian sightings survey, and Danish studies, showed that porpoise populations in the northern North Sea and Danish waters had either experienced a shift southwards or declined^{liii}. And the European Environment Agency's assessment^{liv} of the conservation status of harbour porpoise at a European level identifies the status as 'unfavourable – inadequate' for all Atlantic biogeographic region waters, including the UK's waters, on the basis of the earlier population decline in the south-eastern distribution range and the continued pressures of gillnet fishery bycatch mortality.

The UK government's approach to conserving harbour porpoises in UK seas was presented by the Joint Nature Conservation Committee (JNCC) in December 2009, with a recently revised version in March 2010. This approach has not significantly changed in the past decade since the publication of a UK conservation strategy for harbour porpoise^{lv}. JNCC identified a five-step plan for assessing and maintaining FCS of harbour porpoises involving:

- identifying and evaluating the risk of key threats;
- monitoring the key threats;
- implementing measures to reduce the identified threats and monitoring their effectiveness;
- undertaking wider surveillance and assessment of the species to prioritise threats in a population context; and
- identifying SACs where they accord with the relevant terms of Article 4.1 of the Habitats Directive and carefully considering management measures within sites and the wider implications outside sites.

⁶ The authors are grateful to Ms L. Sadler for the inclusion of text extracts from an internal report to WWF-UK included in sections 4.1, 4.2 and 4.4.

4.1 Monitoring and surveillance

The three international cetacean surveys with funding contributions from the UK – SCANS⁷, SCANS II and CODA – provided the first broad-scale estimates of porpoise numbers and distribution in European waters. The first SCANS project was conducted in July 1994 (see Section 2.2 and Figure 2a) and a follow-up survey, SCANS II was conducted in July 2005 (Figure 2b). As these surveys were snapshots of distribution in one month, more than ten years apart, they provide no information on temporal changes in porpoise distribution during the year, nor between years. Though providing the first comprehensive surveys, from which management targets could be generated, the surveys lacked fine-scale information necessary to determine, for example, favoured habitats for the porpoise. The Cetacean Offshore Distribution and Abundance in the European Atlantic (CODA) survey was conducted in July 2007 with the aim of estimating the abundance of, and investigating the habitat use of, cetacean species in European Atlantic waters beyond the continental shelf.

In an attempt to produce robust estimates of cetacean distribution and trends in abundance, the Joint Cetacean Protocol (JCP)^{lvi} has been established to undertake four separate analyses in a three-phase approach. The preliminary analysis determined that the Habitats Directive's monitoring objective of detecting a 1% annual decline in abundance or range over a 6-year reporting period was not feasible but that trend detection over longer periods should be possible, and recommended an integrated analysis of all JCP data. In phase 1, datasets from the Irish Sea were analysed to seek spatial and temporal trends in absolute abundance estimates. Declines of 0.3 to 2.2% per year over a 6-year reporting period could actually be detected for the harbour porpoise in this region, but it was anticipated this would only apply in a data rich area such as the Irish Sea. The phase 1 report to JNCC^{lvii} recommended further analysis of the JCP to determine species' range and abundance changes, pointing out that it will still require significant research effort to develop and test adequately the necessary statistical methods to identify spatial and temporal trends in the data. Phase 2 has involved an analysis of datasets from western Britain overall, using refined models. There was heterogeneity in those data sets and the resulting trends over the whole region were less obvious^{lviii}. Phase 3 commenced in late 2011 and has been analysing data from all of UK's EEZ and adjacent waters.

4.2 Strategies, measures and guidelines to reduce identified threats

A number of techniques are being utilised to reduce the identified threats to cetaceans including guidelines to reduce specific impacts, and strategies and measures which address specific problems^{lix}. The following bullet points provide an insight into a range of the wider measures that have been introduced to respond to identified threats.

- The primary piece of legislation relevant to addressing bycatch is Council Regulation (EC) No 812/2004⁸, under which the UK is required to design and implement at-sea observer monitoring schemes to monitor cetacean incidental catches in pelagic trawls (single and pair) and high-opening trawls on vessels of 15 metres or more in length. The UK bycatch observer scheme was introduced in 1996, driven by the ASCOBANS recommendation that bycatch rates of harbour porpoises be quantified to assess potential threat to the species. The observer monitoring scheme currently covers those fisheries

⁷ Small Cetacean Abundance in the North Sea

⁸ Council Regulation (EC) No.812/2004 of 26 April 2004 laying down measures concerning incidental catches of cetaceans in fisheries and amending Regulation (EC) No.88/98

stipulated in Reg. 812/2004, and other fisheries where porpoise bycatch is known or suspected. The scheme must be sufficient to provide representative data for the fishery and enable a reliable estimate of bycatch to be calculated. This generally requires that between 5% and 10% of the fishing effort is monitored if rates are unknown, or that data be collected with sufficient precision to provide bycatch estimates with coefficients of variation (CV) of less than 0.3. The UK publishes annual reports⁹ and submits the information to the Commission.

The observer monitoring scheme is operated by the Sea Mammal Research Unit which also carries out observations of other UK fisheries, in an effort to identify other fisheries which may be having an impact on the harbour porpoise, including vessels of under 12 metres. This research follows ICES recommendations to the EU¹⁰ that more information is necessary on static net fisheries in the southern North Sea and on small vessels in areas to the south and south west of the UK. The UK also carries out monitoring of gillnet fisheries in the North Sea and of tangle-net fisheries in the south west of England known to have porpoise bycatch.

- Acoustic deterrent devices (“pingers”) are mandatory on fishing vessels of 12 metres or more in length, using various bottom-set gillnets and entangling nets (defined by mesh size, and net length in Regulation 812/2004) in the North Sea and in waters to the south and west of the UK.
- The UK Cetacean Strandings Investigation Programme (CSIP) instigated in 1990 coordinates the reporting of cetacean, marine turtle and basking shark strandings around the UK and collects a proportion of carcasses for post-mortem investigation. The Programme has been instrumental in identifying porpoise bycatch in static net fisheries, and a five year programme identified a clear correlation between high levels of organochlorines, particularly PCBs, in harbour porpoises and increased incidence of animals with infectious disease, indicating an immuno-suppressive effect due to high contaminant burdens. The presence of pollutants in harbour porpoises has also been linked to reproductive suppression^{lxi}.
- The production and use of the majority of the pollutants identified through the CSIP investigations have been banned by the OSPAR Commission¹⁰ and the EU. However, because some of the pollutants persist in the environment for example as sealants in buildings, accumulate in food chains and are only declining slowly^{lxii}, and they may continue to affect porpoises for some time. UK research in identifying the effects of these pollutants feeds into international strategies for the control of these substances, and the UK maintains it will continue this research to monitor the phasing out of such pollutants in addition to potentially identifying new pollutants in the marine environment^{lxiii}.
- In 2010 the JNCC, Natural England and Countryside Council for Wales provided advice to marine users, regulators, advisors and the enforcement authorities to assist them when considering whether deliberate disturbance

⁹ www.defra.gov.uk/environment/marine/protect/species/cetaceans

¹⁰ The OSPAR Commission administers the OSPAR Convention for the Protection of the North-East Atlantic.

or injury/death is likely to occur to a protected species¹¹. The advice includes guidance on carrying out a risk assessment to assess the likelihood of committing an offence and whether a license will be required; pursuing alternative methods, locations or times for the proposed activities; and on the adoption of mitigation measures.

- The JNCC has developed guidelines¹² aimed at minimising the risk of injury or disturbance to marine mammals as a result of seismic surveys. The guidelines recommend marine mammal observers, passive acoustic monitoring where visual monitoring is inadequate, equipment soft starts (ramp up) and shut down if animals are detected within a specified range.
- A Protocol¹³ for minimizing the risk of injury to marine mammals from piling noise has been developed by the statutory nature conservation agencies. The aim is to reduce risk of injury or death to animals in close proximity to pile driving. The Protocol provides advice on piling at night or in poor visibility, delay if animals are detected within a pre-established mitigation zone, soft-start (ramp up), and acoustic deterrents to drive animals out of the area prior to starting pile driving.
- The JNCC have also prepared Guidelines for minimizing the risk of injury to marine mammals from the use of explosives which suggests using observers, operations to be carried out preferentially during good visibility, a “ramping up” of explosive power if possible, and indicates that acoustic deterrent devices should be considered prior to detonation of explosives.

4.3 Designation of protected sites

The final step of the JNCC’s five-step plan for assessing and maintaining FCS of harbour porpoises recognised the need to identify SACs where they accord with the relevant terms of Article 4.1 of the Habitats Directive. To date, the UK has identified 26 SACs in which the harbour porpoise is a Grade D feature¹⁴, that is, it is acknowledged that the harbour porpoise is recorded within the SAC but no specific measures are required for its conservation. So far, no SACs have been identified specifically for harbour porpoise (i.e. grade A or B), nor have any SACs been designated where harbour porpoise are considered to be a ‘qualifying feature’ (i.e. grade C)^{lxiv}. The Department of the Environment in Northern Ireland is however proposing one site, the Skerries and Causeway, in which the harbour porpoise is listed as a qualifying feature (Grade C). The JNCC advice to government is that the mobile and wide-ranging nature of harbour porpoise, along with variations in abundance in different regions, means that it is difficult to define important areas for harbour porpoises^{lxv}. More recently, it is understood that data deficiencies are also cited as a reason that no sites have been identified for this species^{lxvi}. Furthermore, it seems likely that the UK’s latest initiative to develop an ecologically coherent network

¹¹ *The protection of marine European Protected Species from injury and disturbance:*

*Guidance for the marine area in England and Wales and the UK offshore marine area*¹¹

¹² JNCC Guidelines for minimising the risk of injury and disturbance to marine mammals from seismic surveys, June 2009.

¹³ Statutory nature conservation agency protocol for minimising the risk of injury to marine mammals from piling noise, August 2012.

¹⁴ On 1st September 2011, the government confirmed that the harbour porpoise had been down-graded from a qualifying feature to a grade D at Dogger Bank SAC. This makes the total number of UK sites in which the harbour porpoise is listed as a grade D or non-qualifying feature to be 26.

of marine protected areas in its waters will inadequately address site protection for highly mobile species throughout much of the region^{lxvii}.

4.4 Further observations on measures to reduce threats

Section 4.2 outlines a wide range of measures aimed at conserving harbour porpoise in UK seas. However, it cannot be assumed that they are all met or that they deliver the envisaged objectives. Few of the measures are being adequately assessed to determine whether they are effective or not. For example, to be more effective, the sampling effort within the targeted fleets covered by the bycatch observer scheme should be higher and all vessels under 12m in length, that could entangle porpoises, should also be monitored at a sufficiently high intensity to derive robust estimates of bycatch. A recent ICES workshop on Regulation 812/2004^{lxviii} noted that vessels of 12m or over that are required to use pingers comprise a very small proportion of set net fleets - in the UK 97% of gillnet vessels are under 12m and are therefore exempt from the Regulation's requirements. The result is that only a very small proportion of the EU fishing fleet is affected by the Regulation. In addition, the deployment of acoustic deterrents on various static fishing gears has been very slow across the EU, with incompatibility of existing pingers with the fishing gear cited as a major reason, combined with the cost and lack of reliability of the devices^{lxix}.

Views differ on the value of the range of guidelines that have been published with the aim of reducing the impact of seismic testing, pile drilling and explosions. While there is no clear evidence that they are effective in protecting cetaceans, since the only way to test them would be to carry out controlled experiments deliberately exposing cetaceans to carefully measured and controlled levels of sound, it is argued that they have served a role in raising the profile of marine mammal conservation within industry, and there have purportedly been changes in industry practice beneficial to cetaceans^{lxx}. Others, however, contend that the Guidelines do not offer adequate protection to marine mammals due to the difficulty of detecting/observing the animals and limitations on monitoring requirements^{lxxi}. Other countries such as the USA and Germany favour the use of bubble curtains and other quieting technologies. However, the UK's Protocol for minimizing the risk of injury resulting from piling noise relies on acoustic deterrents to drive animals out of the impact zone (nominally 500 metres radius from the pile) prior to the commencement of piling^{lxxii}. Acoustic deterrents should also be considered to drive cetaceans from the potential impact area of an explosion, although the value of such an approach is as yet untested. Ramp up is widely adopted in UK seas but its efficacy has never been tested, and if animals are attracted to the exposed area for food, it could actually cause them to remain within range of harmful effects^{lxxiii}.

It is not only the measures to reduce identified threats that have limitations. With respect to monitoring and surveillance, through a programme such as SCANS and SCANS II, the requirement of the Habitats Directive to assess favourable conservation status every six years is not achievable unless the population declines by 60%^{lxxiv}. Secondly, the precision of the estimates are generally low when examined regionally, and should take account of recommended management units. Thirdly, these are point estimates based upon a single month of survey, 11 years apart, and susceptible to a range of potential biases that are difficult to address and account for. They are good for the purpose they were designed for, that of mainly assessing the overall impact of bycatch, assuming that those estimates as well as estimates of abundance, are accurate.

In relation to site protection, the approach of the UK contrasts sharply with the approach taken by other EU member states. A number of member states have

submitted a range of sites for consideration to the EU, which were reviewed at the Galway Atlantic Biogeographic meeting in March 2009. The number of sites proposed ahead of the Atlantic Biogeographic meeting and their grading as A, B, C or D is shown in Table 2. Since that time, it is understood that further sites have been proposed.

Table 2: EU Natura 2000 Database for the harbour porpoise (as at end 2010)

Member state	Sites graded A	Sites graded B	Sites graded C	Sites graded D	Total number of sites
Belgium	0	2	2	1	5
Bulgaria	0	0	10	0	10
Germany	5	6	13	11	35
Denmark	3	13	0	26	42
Spain	2	6	0	3	11
France	0	21	1	16	38
Ireland	0	0	2	0	2
Netherlands	1	4	0	0	5
Portugal	0	1	0	1	2
Sweden	1	1	1	0	3
UK	0	0	0	26	26
Greece	0	2	0	0	2
Romania	0	1	0	2	3
Poland	1	3	0	0	4

In order to bring proposed sites forward for consideration as Natura 2000 protected areas, it is necessary to provide background data. Some member states have undertaken dedicated research (refer to Table 3) to identify and/or confirm appropriate sites for SAC designation. For example, in Germany between May 2002 and December 2003, a number of sites were evaluated that had been identified as areas of particular ecological importance for harbour porpoise on the basis of earlier work^{lxxv}. The study involved repeated aerial surveys in the North and Baltic Seas using standard line-transect methodology, followed by assessment and comparison between study years and areas, of the densities of animals. Subsequently, eight sites were proposed to the EU. In Ireland, dedicated boat-based surveys were undertaken in 2008 to establish density and abundance estimates at six sites^{lxxvi}, in addition to the two sites already identified and proposed for inclusion in Natura 2000 for harbour porpoise. Denmark's identification of sites was based on existing satellite tracking data, complemented by aerial and ship surveys and static acoustics. More recently, Germany, the Netherlands and France are all engaged in regular systematic surveys of their territorial seas as well as extending to cover some UK seas.

Table 3. Research methods used to inform site selection for harbour porpoise SACs^{lxvii}

Country	Systematic vessel / aerial surveys of all of EEZ	Systematic vessel surveys of parts of EEZ	Systematic aerial surveys of parts of EEZ	Non-systematic vessel surveys	Land-based watches	Static acoustics	Telemetry studies
Poland		√				√	
Sweden		√	√	√			
Denmark	(√)	√	√			√	√
Germany	(√)	√	√				
Netherlands	(√)	√		√	√		
Belgium	(√)	√		√			
France	(√)	√	√	√			
UK	(√*)	√*	√*	√*	√*	√*	
Ireland	(√)	√			√	√	
Spain	(√)	√		√	√		
Portugal	(√)	√		√			
Bulgaria		√		√			
Romania		√		√			

√* = no category A/B/C sites selected

(√) = refers to SCANS 2/CODA survey, but not designed to determine SACs

Finally, the UK's state of the seas report, *Charting Progress 2* identified a number of shortcomings in current efforts concerned with the protection of cetaceans in UK seas including the need for:

- a continued strategic monitoring and surveillance programme, essential to meet the requirements of the Habitats Directive;
- a better understanding of abundance and distribution patterns of cetaceans including seasonal variation;
- greater monitoring of static-net fisheries where cetacean bycatch is greatest;
- more information on the potential impacts on cetaceans of other anthropogenic activities that generate noise; and
- possible synergistic effects of chronic exposure of cetaceans to various environmental pollutants.

While these requirements are recognised as being important for all cetacean species in UK seas, they are all highly relevant to harbour porpoise populations.

5. Site selection methodology

Given that the harbour porpoise is widely distributed in European shelf seas, the European Commission's Directorate-General for the Environment (DG Environment) recognised that it might not be feasible to achieve a high level of representation of this species within the Natura 2000 network^{lxxviii}. Following a meeting of experts in Brussels on 14 December 2000, DG Environment concluded that it was possible to identify areas that represent crucial factors for the life cycle of this species, using the following basis for site selection:

- the continuous or regular presence of the species (although subjected to seasonal variations);
- good population density (in relation to neighbouring areas); and
- high ratio of young to adults (in relation to neighbouring areas).

In addition, areas can be important for other biological elements of the life-cycle, for example social or reproductive biology and behaviour.

DG Environment advocated an approach based on the above-mentioned characteristics and recommended that it be applied with a view to site selection for this species^{lxxix}. The Brussels meeting concluded that it was possible to identify areas like those previously described by some Member States that would provide for crucial factors in the life cycle of the species. On this basis, a 'pragmatic' approach would become appropriate, which eventually could lead to protecting these areas. As a result, the criteria were purposely left flexible, although most countries have interpreted them in a broadly similar manner.

On the other hand, the level of information available for site selection has varied greatly between countries. For example, little dedicated survey effort exists in eastern Mediterranean and Black Sea countries, and information has come mainly from casual sightings and occasional boat surveys of limited extent^{lxxx}. Germany, on the other hand, has combined evidence from aerial and vessel-based surveys with, in some areas, the deployment of static acoustic monitoring systems such as T-PODs^{lxxxi}. Denmark has, in addition used satellite tracking of porpoises to identify high use areas^{lxxxii}. However, no European country has carried out regular systematic survey effort throughout its exclusive economic zone in all seasons and over a period of several years.

In site selection for Natura 2000 Annex II species, the Standard Data Forms (SDF) list nine ecological criteria for assessment: estimated population size, continuous or regular presence, population density in relation to neighbouring areas, presence in the breeding season, other relevant biological factors (such as feeding, breeding and mating), overall population grading, conservation issues, isolation, and global assessment.

DG Environment Hab 01/05 guidance^{lxxxiii} recommends that specifically for harbour porpoise, emphasis be placed on the three criteria mentioned above: the continuous or regular presence of the species (although subjected to seasonal variations), good population density, and a high ratio of young to adults (both in relation to neighbouring areas). Several countries have followed this guidance and focused on the three latter criteria, but some have also considered the criteria applied to other Annex II species. All the criteria used in the Standard Data Forms for site selection are reviewed with respect to harbour porpoise, and the adopted approach is outlined in sections 5.1-5.9.

5.1 Estimated population size

Absolute abundance (or density) estimates of porpoises exist only for very few existing or prospective marine SACs. Furthermore, there is no good estimate of the population sizes of porpoises inhabiting specifically UK seas (or its various national seas). Besides the problem of identifying where population boundaries exist and how these relate to political boundaries (see earlier section), the only large-scale abundance survey covering UK and adjacent seas was the SCANS II survey undertaken in July 2005. It is not clear how JNCC arrived at a UK estimate of 150,000 porpoises from the SCANS survey in July 1994 (see page 3 of Hab. 01/05), given that this survey did not cover important areas for porpoises in the Irish Sea and off west Scotland. However, on the basis of that estimate, DG Environment's Habitats Committee gave as an example the fact that "if the percentage to be covered in Natura 2000 should be at least 20% to be accepted, the total number of individuals to be protected in the United Kingdom proposed network would have to be 30,000."

The SCANS II survey estimated abundance in various blocks, assessed either by aerial or vessel surveys (see Figs. 3a and 3b). The blocks do not follow political boundaries, so it is unwise to attempt to split these and extrapolate densities to derive country estimates. This is particularly the case when for 14 out of 15 blocks, the CVs of the estimates exceed 0.3, and in one case is 1.24. The main purpose of SCANS was to arrive at an overall abundance estimate for this (and other) species, and in that respect, it was very successful. It was not, however designed for deriving population estimates at small spatial scales. A further limitation in applying abundance estimates in the context of SAC site selection based on SCANS survey results is that they provide a snapshot picture (confined to the month of July in 2005). However, porpoise numbers vary seasonally in many regions^{lxxxiv} so that an estimate applied at one point in time is unlikely to apply at another.

For the above reasons it is recommended that, except as a rough guide, other criteria should be used.

5.2 Continuous or regular presence (subject to seasonal variation)

This criterion is more straightforward although the temporal scale remains undefined, as does the frequency of sightings required within any time period to be considered continuous. Most countries have interpreted this as meaning the presence of the species for a number of months without necessarily defining what that number should be, or whether the same definition is used across countries. The problem with prescribing a set number of days within a month to represent continuous presence is that this will depend on the amount of survey effort – and that generally varies quite considerably between sites.

Pinn^{lxxxv} proposed the following grading system with respect to consideration of the designation of Dogger Bank as a candidate SAC on the assumption that survey effort covered every month of the year:

- 10-12 months of the year continuous presence: A/B grade
- 5-9 months of the year continuous presence: C grade
- 1-4 months of the year continuous presence: D grade

There still remains no definition of the term 'continuous', but given that in many locations, observations will have been very brief, a conservative interpretation (at least one sighting or acoustic registration in a month) would seem appropriate. Pinn's

grading appears reasonable except that a site could be important to a local population without it necessarily being there for as many as 10 months of the year – particularly if it uses an area for mating, calving or nursing young but then undertakes seasonal movements elsewhere. It also does not differentiate between grades A and B. An alternative scheme that would also more closely reflect the life history of the species would be:

- 10-12 months of the year continuous presence: A grade
- 7-9 months of the year continuous presence: B grade
- 4-6 months of the year continuous presence: C grade
- 1-3 months of the year continuous presence: D grade

More relevant from a conservation perspective is whether the site remains in use by porpoises over a period of years. For most countries, such assessment has been based on surveys for a period of 1-5 years and no more. Evans and Wang^{lxxxvi} examined temporal variation in porpoise occurrence (and relative abundance) on a monthly and annual basis for a 20-year period, and Baines and Evans^{lxxxvii} have compared distributions in the Irish Sea for four 5-year periods (1990-2009). Both analyses showed that where there had been reasonable survey effort over extended periods of time, concentrations of harbour porpoises persisted in a number of localities.

5.3 Good population density in relation to neighbouring area

Most countries have focused on this criterion in particular when assessing sites, although different countries have used different methods and relied on widely differing levels of information. An ideal scenario would be to conduct systematic surveys year-round over the entire national waters for a period of at least 10 years, and then to use modeling techniques and statistical thresholds to assess areas of high population density relative to neighbouring areas. Density metrics would be absolute density (numbers per sq km) or, failing that, numbers per km travelled or per hour of observation. No country has managed to achieve this, and for that reason Denmark adopted an alternative approach using telemetry of a sample of tagged porpoises alongside acoustic monitoring with T-PODs to identify persistent high-use areas^{lxxxviii}.

As noted above, different countries have varied in the data sets used to identify areas of good population density – such as data derived mainly from platforms of opportunity (whale watching vessels, ferries, etc – e.g. Canaries), land-based watches (e.g. Northern Ireland), systematic surveys of particular areas (e.g. Republic of Ireland), and larger-scale systematic surveys (e.g. Germany). Where the data collection process has allowed, density surface mapping with interpolation (either kriging or inverse distance weighting to interpolate missing values in spatial data) has been applied (e.g. Germany)^{lxxxix}.

A similar process of density surface mapping is applied, making use of a very large, long-term data set confined to effort-based systematic survey observations (including SCANS and SCANS II, European Seabirds at Sea, and Sea Watch Foundation surveys, as well as several survey datasets from other research groups) (Fig. 6). These span a period of 30 years (1980-2009), with effort well distributed across all time periods (Figs. 7a & 7b), and with corrections applied for the effect of sea state on detection rates. GIS maps of sighting rates were prepared using a grid with resolution of 10' latitude x 10' longitude. That approach is described in more detail in Baines and Evans^{xc}. The overall results are shown in Fig. 8. Grading of sites is based on a combination of maps at this spatial resolution, as well as at a finer spatial resolution together with published results from a wide variety of surveys. It should be noted that sighting rates presented in Fig. 8 are relative, not actual, values since they have been

standardised for sea state (the main variable considered to affect detection rates). They should not be considered in isolation of other lines of evidence, the latter of which have been used extensively for site selection.

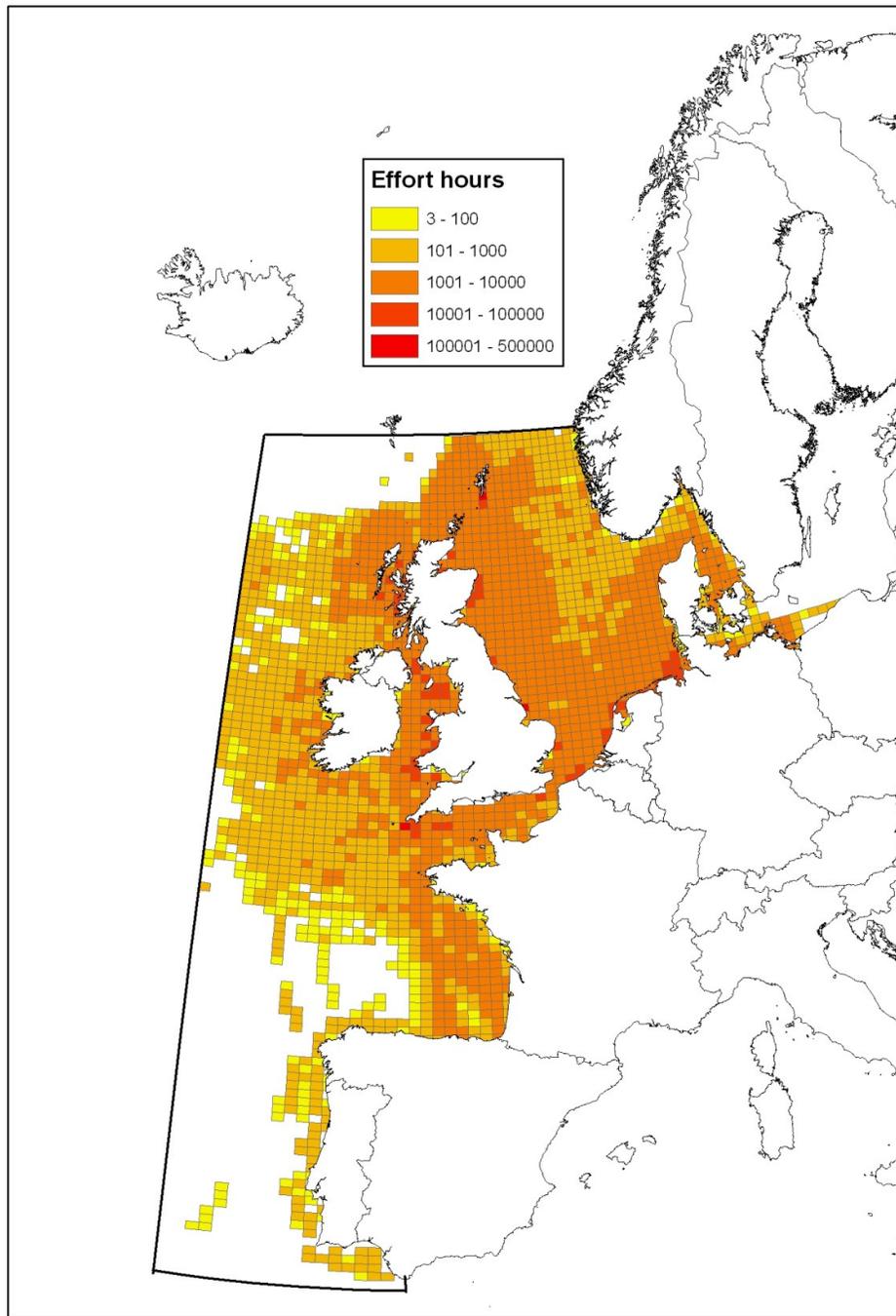


Figure 6. Distribution of survey effort, 1980-2009

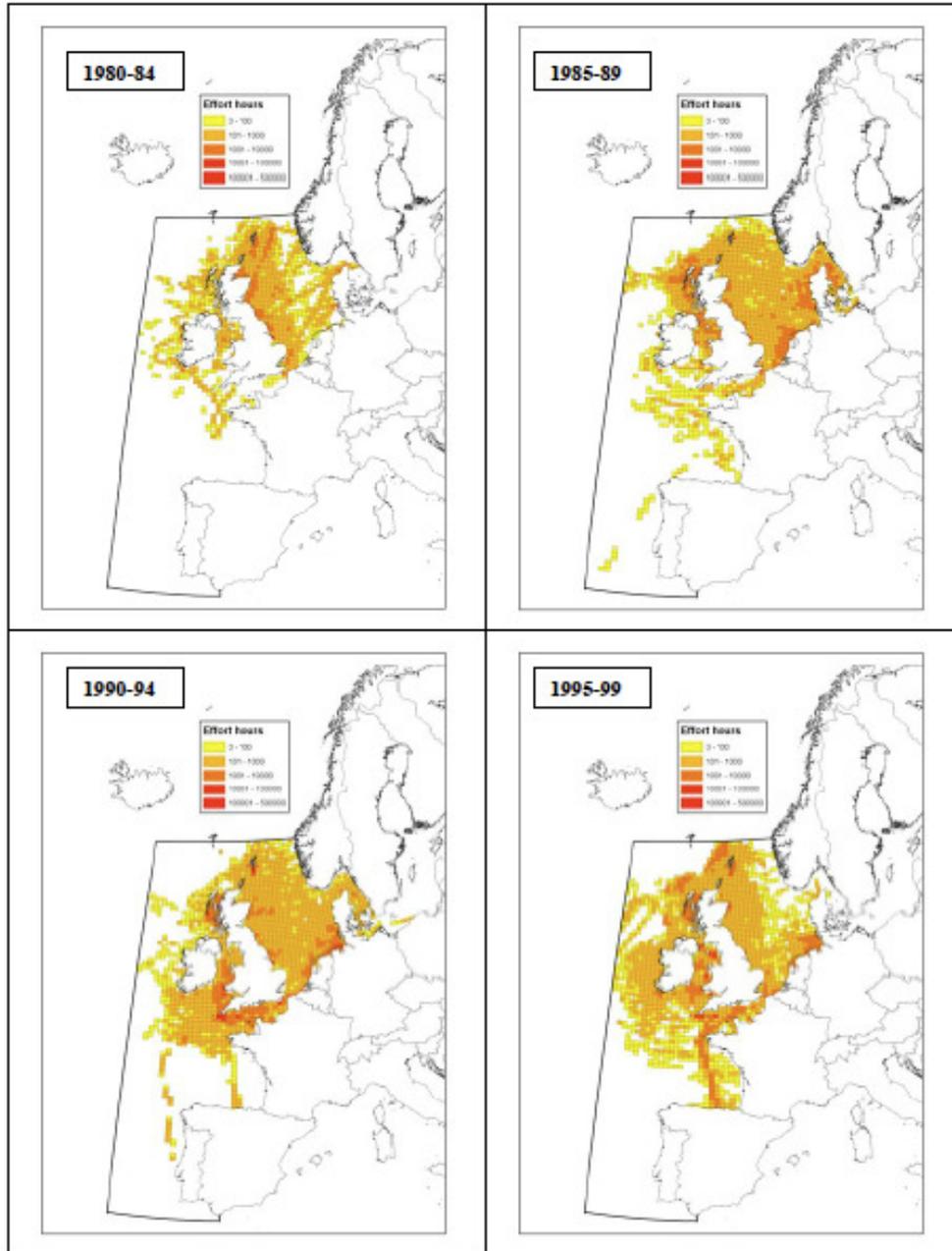


Figure 7a. Distribution of survey effort, 1980-1999

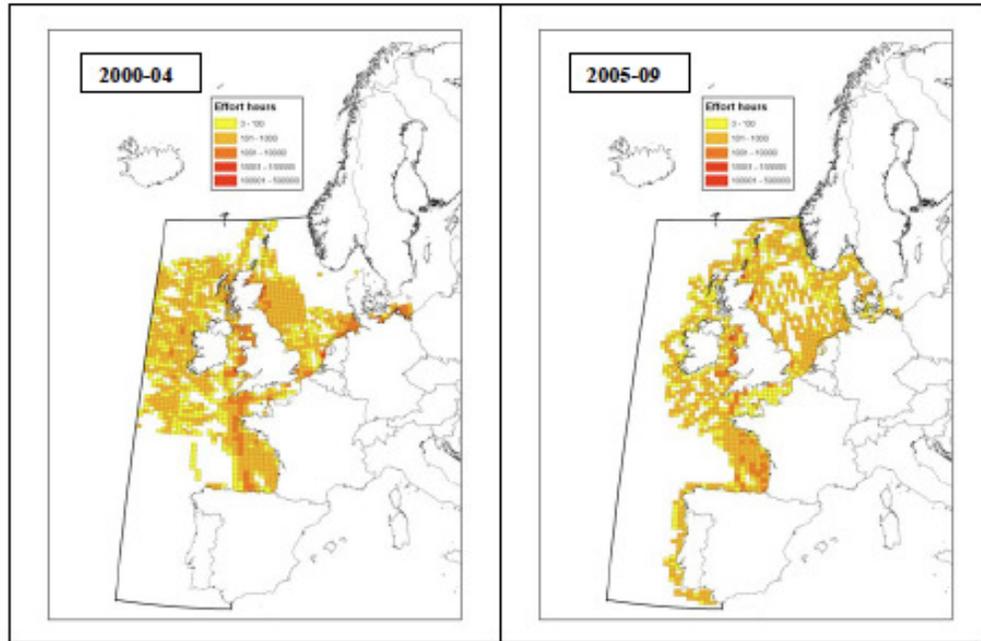


Figure 7b. Distribution of survey effort, 2000-2009

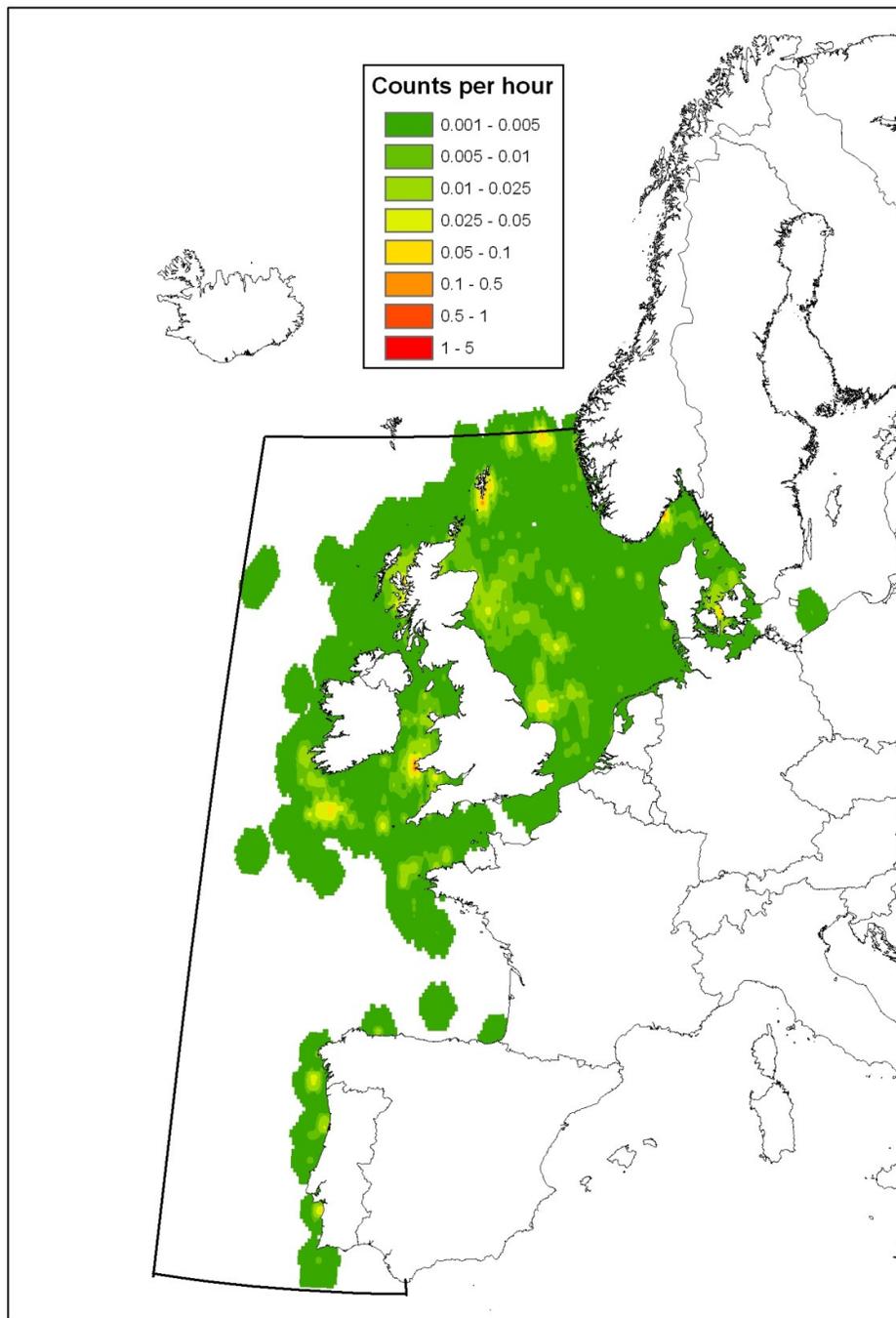


Figure 8. Distribution of harbour porpoises, 1980-2009
 (sighting rates are average over the 30 year period, local changes that have occurred e.g. declines around NE Britain and increases in the southern North Sea and Channel are detailed in the text)

5.4 Presence in the breeding season (relatively high ratio of young to adults)

By comparison with most other cetacean species, the harbour porpoise has a fairly well-defined breeding season^{xci}. On the other hand, it does not show any indication that it possesses defined breeding areas, and calves may be born virtually anywhere within its range^{xcii}.

EU guidance document Hab. 01/05^{xciii} recommends that one criterion in site selection should be a relatively high ratio of young to adults. Where possible, this criterion has been applied here. However, there are significant limitations to using this alone as a measure of the relative importance of an area for breeding. Porpoises tend to be inconspicuous at the surface, revealing only the upper flanks and fin. In the first 1-2 months of life, a newborn porpoise travels very close to its mother and even the most experienced cetacean observer has difficulty detecting its presence, particularly when the view is brief. As the young develops, it spends an increasing amount of time learning to forage for itself, while remaining within the vicinity of its mother from which it still takes milk^{xciv}.

Most porpoises give birth between April and September, with a distinct peak in mid-summer (see Figs. 9a & 9b^{xcv}). Indeed, 70% of all UK porpoise neonates (<90cm length) examined were found in the months of June and July, and this corresponded well with the very sharp increase in testis weight in males, reaching a maximum in August (gestation period for the porpoise is 10 months)^{xcvi}. A similar narrow reproductive season was also found for Danish porpoises^{xcvii}. During late summer (particularly August), aggregations of harbour porpoises may often be seen, when sexual behaviour can also frequently be observed^{xcviii}. It is therefore recommended that the most appropriate way to evaluate whether an area is important for breeding is to examine areas of relatively high density during the period April-September, and particularly May-August. This approach has been included in site assessments by various countries (e.g. Germany)^{xcix}.

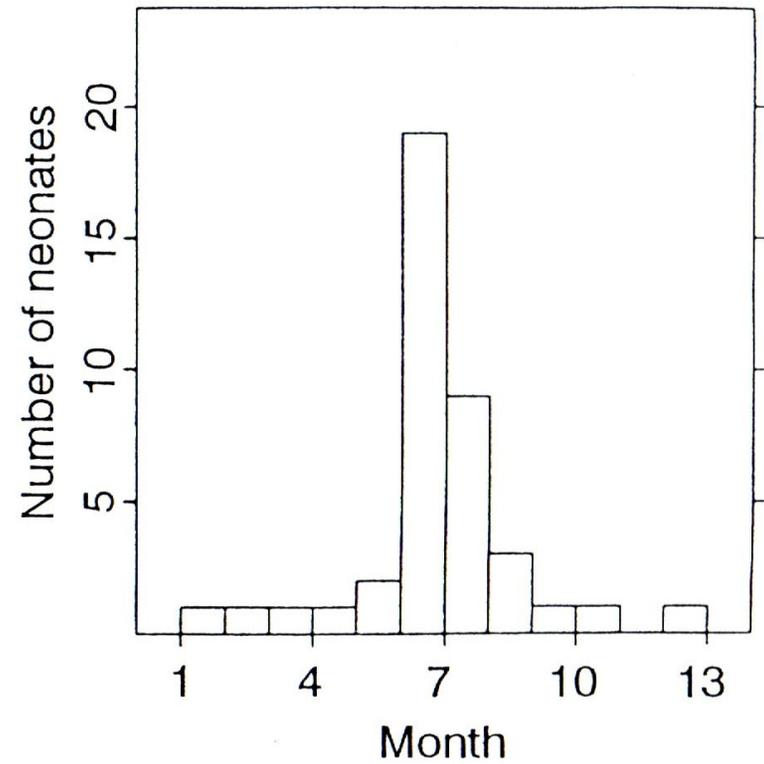
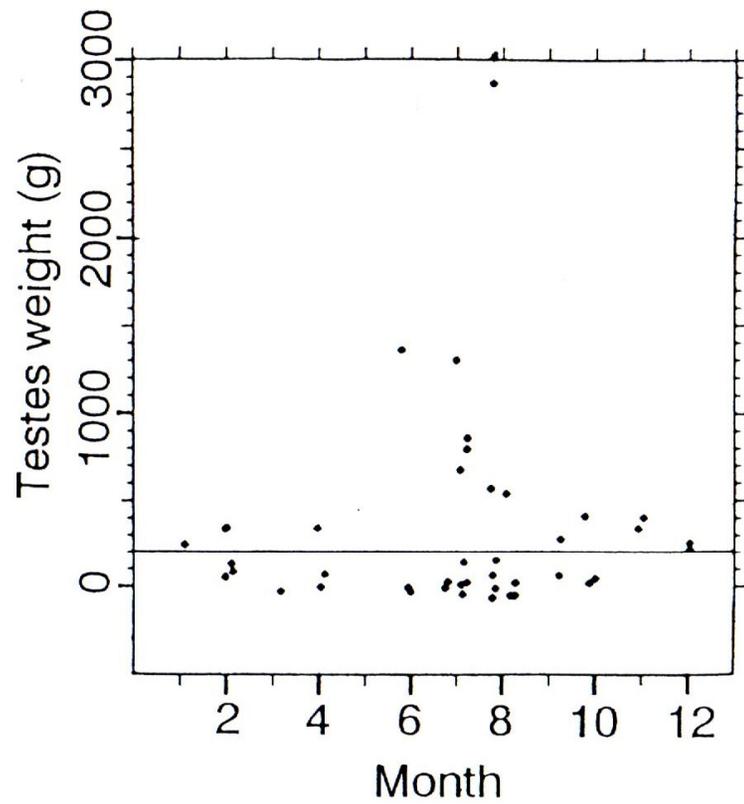


Figure 9. a) Testes weight (g.) by month for male porpoise; **b)** Monthly occurrence of harbour porpoise neonates, in British waters (Source: Lockyer, 1995)

5.5 Other relevant biological features

EU guidance document Hab. 01/05 suggests that consideration should be given also for other biological elements that are characteristics of harbour porpoises in these areas, such as a very developed social and sexual life. The reasoning behind this advice presumably is that there may be periods in the life history of the species, in addition to the breeding season, that make it particularly vulnerable to human activities. These are likely to be situations where animals aggregate for more than a brief period of time, which might be for feeding or social functions (such as mating). Information on these aspects, where known, will as required by the EU be incorporated into the overall population grading.

5.6 Overall population grading

For this, EU guidance^c recommends that 'best expert' judgment should be applied to assign an overall grade for the population based on its size (where estimated) and density present on the site in relation to the population present within the national territory, using the following grading:

- A:** >15% to 100% of national population
- B:** >2% to 15% of national population
- C:** >0% to 2% of national population
- D:** non-significant presence

The harbour porpoise occurs over large areas of continental shelves on both sides of the temperate and subarctic North Atlantic and North Pacific. Abundance estimates are lacking for large parts of the range of the species, particularly the western Pacific and the Black Sea. The global population size of harbour porpoises is considered to number at least 700,000^{ci}, with around 385,000 in the ASCOBANS Agreement Area (see Figs. 3a & 3b^{cii}). As noted earlier, it is rarely possible to provide an actual population size estimate (or an absolute density) for a particular site, or a proportional estimate in relation to the national population (whose size is not known with any accuracy, for reasons given earlier), or its identified management unit. Most countries have therefore had to give their best judgment on this, and that approach is followed here.

5.7 Conservation issues

The harbour porpoise in Europe faces several conservation pressures^{ciii}. The most obvious of these is fisheries bycatch, but others that have been implicated include resource depletion, pollution, acoustic disturbance and vessel strikes. The relative importance of these varies regionally, as well as over time. A major decline between the 1960s and 1980s, particularly in the southern North Sea and Channel, was widely reported, since when a recovery in this region has taken place^{civ}. Some of this change has been attributed to changes in fish stocks although bycatch and pollution have also been proposed as possible causes^{cv}.

For each site, the overall conservation condition of features of the habitat for harbour porpoise is assessed. Following EU guidance^{cvi}, two sub-criteria are considered:

- i) degree of conservation of the features of the habitat important for the species; and
- ii) restoration possibilities.

Grading proposed for the two sub-criteria are:

A: excellent conservation

= elements in an excellent condition, independent of the grading of the possibility of restoration

B: good conservation

= elements well conserved, independent of the grading of the possibility of restoration

= elements in average or partially degraded condition and easy to restore

C: average or reduced conservation

= all other combinations.

With respect to restoration possibilities, which only need to be taken into account when the elements are in an average or partially degraded condition, the following system of grading was recommended in the EU guidance notes^{cvii}:

- i. restoration easy
- ii. restoration possible with average effort
- iii. restoration difficult or impossible

5.8 Isolation

The only truly isolated population of harbour porpoise in Europe occurs in the Black Sea^{cviii}. However, various lines of evidence suggest substructuring of populations, and as summarised earlier, the UNEP/ASCOBANS workshop on small cetacean population structure recognised nine management units within the Agreement Area, up to four of which span UK seas: 1) south-western North Sea and eastern Channel; 2) Celtic Sea including the Irish Sea and western Channel; 3) west Scotland; and, possibly 4) Shetland Isles and north-eastern North Sea including Skagerrak (Table 1; Fig. 4)^{cix}.

EU guidance^{cx} proposes the following grading:

A: population (almost) isolated

B: population not isolated, but on margins of area of distribution

C: population not isolated within extended distribution range

These grades have been adopted here.

5.9 Global assessment

This criterion refers to the global assessment of the value of the site for the conservation of the species concerned. EU guidance^{cxii} proposes that it should be used to sum up the previous criteria and also to assess other features of the site thought to be relevant to the species, such as human activities on the site or in nearby areas that might influence the conservation status of the species. A 'best expert judgment' is recommended for this global evaluation, using the following ranking system, which has also been adopted here:

A: excellent value

B: good value

C: significant value

It is proposed that sites with a global grade A (excellent value) or B (good value) are sites in which the harbour porpoise is identified as a primary reason for site selection (i.e. sites essential to the life and reproduction of the species). Grade C sites (significant value) are sites in which the harbour porpoise is listed as a qualifying feature on the site details (i.e. the species has more than an insignificant presence on the site but it does not support essential components of its life cycle). In some cases, the assessment is given as A/B where it is difficult to distinguish between the two, and grade C should be considered with the qualification that more data are required to confirm whether or not this should be upgraded to A or B.

5.10 Concluding remarks on methodology

For the process of site selection, attention has also been paid to the need to provide a network of sites with geographic representation and inclusion of sites within each of the different porpoise management units identified around the UK and Ireland.

Although harbour porpoises are mobile and widely distributed, there are sound ecological reasons why some locations should be visited more regularly than others. Porpoises are more likely to remain for longer periods of time in areas where there are stable physical features – such as headlands or island archipelagos, particularly where tidal currents operate, and around topographic formations such as offshore banks. This has been demonstrated in several areas from a combination of land-based observations, vessel surveys and acoustic monitoring^{cxii}. Offshore, unless there are such stable physical features as banks, one might expect porpoises not to remain in the vicinity of a particular location for any length of time although they may be recorded on passage.

In many areas around the UK, numbers of porpoises reach a maximum in coastal waters during mid to late summer^{cxiii}. There are several possible reasons for this. Over that seasonal period, shoaling fish such as sandeel and sprat become common in near-shore waters around many parts of the British Isles, where they are exploited by seabirds, porpoises and other marine mammals^{cxiv}. Both sandeels and sprat are high-energy fish regularly occurring in the diet of porpoises where they are available^{cxv}. A study of stable isotopes and trace elements in porpoises has also indicated a shift in feeding habits from pelagic prey species in deep northern waters to more coastal and/or demersal prey in the relatively shallow waters of the North Sea and Skagerrak^{cxvi}.

Another possible reason for a seasonal increase in numbers in near-shore regions is that adults are bringing their young calves into shallower waters so they can more easily learn to forage for themselves^{cxvii}. And in August, there is also more social and reproductive activity, with aggregations that may number 100 or more individuals^{cxviii}. These are additional factors that should be considered in the site selection process from a conservation perspective.

6. Recommendations on harbour porpoise dSACs and Areas of Search

Based on methodology set out in Section 5 and the completed Standard Data Forms (SDFs) (see section 8), six sites are identified as draft SACs for the harbour porpoise. These sites have a global grading of A/B or B in the SDFs and are of primary importance for the harbour porpoise. They are: Western Scotland and Inner Hebrides, South-west Llyn, North & West Anglesey, Southern Cardigan Bay, Pembrokeshire Marine/Sir Benfro Forol, and the Outer Bristol Channel (see figs 10a and 10c). It is recommended that the UK government should progress the submission of these sites to the European Commission as a contribution to the Natura 2000 network.

Figure 10a UK map showing harbour porpoise proposed dSACs (grade A/B)



A further five sites are also important in terms of physical or biological requirement within the life-cycle of the harbour porpoise. These sites have a global grading C in the SDFs, and while they could potentially form part of the SAC network, further survey work is required to confirm their importance for the species and/or identify precise boundaries for them. Those sites are: the Northern Isles (Shetland and Orkney), the Moray Firth (extending to East Grampian), Eastern England, the Dogger Bank, and the Skerries and Causeway in Northern Ireland (see figs 10b and 10c).

seabird populations to inform the identification and classification of marine Special Protection Areas (SPAs), as required under the EC Wild Birds Directive; and even other threatened species such as common skate and spiny dogfish. The sites proposed are necessarily larger than some existing Natura 2000 sites, on the basis that highly mobile, aquatic species range over large areas in order to satisfy the requisite stages of their life cycles, and this provides more effective protection. The value of MPAs and including large MPAs has been recognised by a number of authors^{cxvii}. In addition, the fact that sites for such species will need to be large was recognised during the Marine Natura 2000 Biogeographical Region seminars focused on marine habitats and species (March and November 2009 and May 2010) and in 2009 the European Topic Centre on Biological Diversity^{cxviii} advised Member States to select sites encompassing the wide distribution and seasonal movements corresponding to different life-cycle stages of the species, where particular areas essential to their life and reproduction can be identified.

There is a school of thought that recognises the benefits of larger MPAs in general, including for mobile species, as inevitably they spend a large portion of their lives in open water, rely on oceanographic processes and large scale habitats, and need to encompass the various stages of their life cycle necessary to maintain them at FCS. By protecting large areas, in general, the cost per unit area decreases, providing best value for money. Larger MPAs arguably enable better integration of management efforts, provide buffering core areas, and dilute impacts in adjacent areas^{cxvii}. It is important to recognize, however, that this does not prohibit all activity or development within these areas. Such areas provide a framework for monitoring and survey strategies, which in turn contribute vital information for the decision-making processes, including those associated with management aspects. In developing management strategies for potential SACs for wide-ranging species such as the harbour porpoise, it will also be important to work closely with neighbouring member states to ensure a consistent and considered approach. It is also important to recognise that the borders of these sites may shift over time if ‘core’ areas for porpoises shift – for whatever reason. This can best be ascertained by regular monitoring of the species within the SAC and in neighbouring areas. Ongoing monitoring will also help to refine zoning within large sites in the context of the management plan produced under Article 6(1) of the Directive^{cxv}.

6.1 Case studies on potential management within a harbour porpoise SAC

Please note – these case studies are simply indicative of the types of activities and the types of management solutions that might be applicable. This report does not attempt to identify conservation objectives for a harbour porpoise site or to identify the activities and developments that might need attention.

6.1.1 Example of an existing SAC - Pembrokeshire Marine

The Summary Management Scheme for Pembrokeshire Marine SAC states that “Although the aim of the designation is to protect the internationally important features of the marine environment, this does not mean that we cannot continue to use and enjoy the area’s natural resources. If properly managed, people should be able to benefit from the site without compromising its incredibly rich and varied marine life.” The Pembrokeshire Marine SAC summary management scheme acknowledges that it has a challenging task – that it needs to maintain the important wildlife of the site whilst at the same time “encouraging the site’s use in a sustainable way, so as to meet the needs of its many users both now and into the future.” It recognises that while there are many activities that could have an adverse effect on marine wildlife and

habitats, they should be able to avoid having an adverse effect if they are “kept at appropriate and sustainable levels and in suitable locations”.

The Summary Management Scheme is also quite clear that there is no intention to prevent all activities from taking place and that those which are unlikely to damage the habitats and wildlife and those which have the potential to damage habitats and wildlife but are already well-managed, should be unaffected by the designation and management scheme. It is only those activities which already have a damaging impact on the habitats and wildlife, for which the site has been designated, or those activities and developments which might be introduced in the future and could have a damaging impact that will be required to be managed differently. Even then, in many cases it will not be necessary to prevent the activity from taking place, but instead management will address the way in which it is undertaken, the timing of the activity, or the area where it is undertaken.

For example, the largest port in Wales is located in the centre of the Pembrokeshire Marine SAC and it is anticipated that the volume of shipping using the port will increase in the future. Inevitably, a major port is already subjected to considerable management to ensure smooth and safe operation. However the Summary Management Scheme recognises a few areas for further effort to address issues of concern such as the introduction of no-anchoring or no-mooring zones to protect areas of eel grass beds and maerl.

Similarly, before designation of the marine SAC, fishing activity was already managed, albeit not always successfully, via a range of mechanisms from the Common Fisheries Policy, to historical fisheries arrangements and inshore fisheries regulations. Since designation of the marine SAC, the Summary Management Scheme identifies an action to review the use of trawls and dredges within the SAC to ensure that suitable action is taken to avoid damage to SAC features. It does not prevent fishing from taking place.

Kayaking and power craft have the potential to cause disturbance to seals, seabirds, cetaceans and certain habitats, and are managed within the marine SAC through the use of voluntary codes of conduct.

If harbour porpoises are added to the list of features for which the Pembrokeshire Marine SAC is designated, and the boundary extended to recognise the wider area important for harbour porpoises, it might be necessary to consider the management of:

- seismic exploration including the possibility of restrictions on activity at certain times of the year;
- construction and operation of tidal turbines and other marine renewables and the use of zoning and appropriate mitigations to limit the interactions between developments and wildlife;
- recreational vessel activities and the use of codes of conduct or statutory measures to limit disturbance by requiring vessels to remain a given distance from animals, to not “herd” or chase animals, etc; and
- ships’ routes and areas to be avoided (a shipping designation) to minimise the possibility of ship strikes in the area.

6.1.2 Example of a proposed new site - West of Scotland and Inner Hebrides

It is to be expected that a similar approach would be appropriate for “new” sites such as Western Scotland and Inner Hebrides, which encompasses a number of smaller SACs but for which porpoises are now here a qualifying feature and there is currently no comprehensive management scheme. Existing activities which are unlikely to disturb or damage harbour porpoise, and those activities which have the potential to disturb or damage harbour porpoise but are already well-managed, should be largely unaffected by the designation and management scheme.

Based on experience from existing marine SACs, it is only those activities that could have a damaging impact on harbour porpoise, or those activities and developments which might be introduced in the future and then have a damaging impact, that will be required to be managed differently. Even then, in many cases it may not be necessary to prevent the activity from taking place, but instead management will address the timing, location or manner in which the activity is undertaken.

So, for example, within a Western Scotland and Inner Hebrides marine SAC:

- marine renewable developments might be zoned away from harbour porpoise hot spots, and an appropriate level of mitigations and monitoring applied
- naval exercises using mid frequency sonar would be required to take place outside of the protected area, or zoning might be introduced to keep activities a given distance from areas known to host significant concentrations of animals, or to only take place at certain times of the year when animals are more dispersed and unlikely to be breeding or nursing young;
- recreational vessels might be encouraged (or required if a statutory measure) to keep a specified distance from harbour porpoises and not to chase or “herd” animals, and numbers of vessels in the vicinity of animals at any one time might be limited;
- certain fisheries might be restricted to prey species of less interest to harbour porpoises, or required to use pingers or techniques not likely to result in bycatch of porpoises, including possible temporal measures.

The critical point is that none of the proposed activities should have a negative effect on the achievement of FCS for the harbour porpoise within the SAC – if they do, the protective measures under Article 6(3) and 6(4) of the Habitats Directive are engaged.

7. Conclusion

The Habitats Directive requires that FCS is achieved for harbour porpoise using site protection, wider conservation measures, and strict protection. Article 3(1) of the Habitats Directive confirms that a coherent ecological network of Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) is established under the title of Natura 2000. SACs have been used widely elsewhere in the EU as a means to help Annex I habitats and Annex II species, including the harbour porpoise, to be maintained at, or where appropriate, restored to FCS across their natural range. Article 3(2) requires member states to contribute to the creation of Natura 2000 in proportion to how widely within their territory any Annex I habitats and Annex II species are represented.

The UK government's approach to conserving harbour porpoises in UK seas has not changed in the past decade and follows a five-step plan for assessing and maintaining FCS of harbour porpoises. The five steps are: identifying and evaluating the risk of key threats; monitoring the key threats; implementing measures to reduce the identified threats, and monitoring their effectiveness; wider surveillance and assessment of the species to prioritise threats in a population context; and identifying SACs where they accord with the relevant terms of Article 4.1 of the Habitats Directive whilst carefully considering management measures within sites and the wider implications outside sites.

Despite the fifth step of the JNCC's plan for assessing and maintaining FCS for harbour porpoise relating to the identification of SACs, nearly 20 years after the adoption of the Habitat Directive, the UK government has yet to submit any sites to the European Commission in which the harbour porpoise is listed as either a primary reason for site selection or even as a qualifying feature. The advice to the government from its statutory conservation adviser (JNCC) is that the mobile and wide-ranging nature of harbour porpoises, along with variations in abundance in different regions, means that it is difficult to define important areas for the species. More recently, data deficiencies have been cited as the reason that no sites have been identified for it, although no attempt by government has been made in the last 20 years to address this with regular systematic surveys throughout the region spanning different seasons. Twenty-six SACs recognise the harbour porpoise as a Grade D or non-significant population, but no specific requirements are in place for its conservation as a result. And in the majority of cases, these are not important sites for the species and therefore do not fulfil the aim of Natura 2000.

The UK has, however, identified marine SACs for inclusion in Natura 2000, in recognition of their importance for mobile marine species. Examples include the Moray Firth in Scotland and Cardigan Bay in Wales for bottlenose dolphins. Other member states have designated Natura 2000 sites on the basis of their importance for harbour porpoise, notwithstanding the difficulties imposed by data collection in relation to aquatic species that range over wide areas. Germany, for example, has undertaken dedicated research, including aerial surveys, which have contributed to the designation of the Sylt Outer Reef in the North Sea on the basis of a high density of harbour porpoise and mother-calf pairs. Several other countries have made systematic attempts to identify relatively important areas for the species.

The UK is a stronghold for the harbour porpoise within the EU. This places the UK in a position of particular responsibility with regard to the designation of SACs and, thus, the achievement of FCS for the species across the territory of the EU. This is critical if Natura 2000 is to have any meaning with respect to this Annex II species. If the UK opts out of having SACs for harbour porpoise, then the actions of all other Member States to fulfil the function of Natura 2000 are undermined.

JNCC at the last reporting round (2007) to the EC considered the harbour porpoise to be in FCS. This is based on findings of the two large-scale surveys (1994 and 2005), which showed no significant decline in porpoise overall abundance, and a reduction in the threat of mortality from fisheries bycatch due to decreased fishing effort. Although no comprehensive population surveys were conducted prior to the 1990s, there is evidence of a marked decline in porpoise abundance in some regions. In the northern North Sea, from Shetland across to the Kattegat, there is evidence that harbour porpoises have declined markedly since the 1990s^{cxvii}. In the southernmost North Sea, there is indication that porpoise by-catch has increased substantially in recent years^{cxviii}. The European Environment Agency considers the status of harbour porpoise in the marine Atlantic region to be unfavourable - inadequate. Threats to the harbour porpoise occur at both a population and local level, and include fisheries bycatch, prey depletion, chemical pollution, noise and physical disturbance, ship strikes, and possibly climate change.

The conservation of wide-ranging species, such as the harbour porpoise, represents a challenging task. However, with the considered use of the full range of tools at our disposal, it should be a feasible goal. Other EU countries have risen to the task. The designation of a network of sites that collectively cover areas representing crucial factors for the life cycle of the species can contribute to this goal. Such sites will also play an important role in informing marine planning processes – a tool promoted under the European Marine Strategy Framework Directive. Marine plans also have the potential to play a useful role in the decision-making process associated with the management of mobile species, with regard to both wider measures and in SACs.

This report promotes an alternative approach to the delivery of SACs for the harbour porpoise in the UK. The methodology is based on the procedure set out in the explanatory notes to the EU's Standard Data Form and supplementary guidance agreed in 2000 in relation to the harbour porpoise (Hab 01/05). This report is not exhaustive; rather, it highlights a suite of sites, using the best available data, that are identified as being necessary to ensure that the conservation status of harbour porpoise populations in the North East Atlantic is favourable thereby making an important contribution to achieving an ecologically coherent Natura 2000 network across the EU. It could inevitably be strengthened as a result of greater investment in further survey work utilising consistent methodologies throughout UK seas.

The report recommends:

(i) six sites as draft SACs for harbour porpoise in the UK:

Western Scotland and Inner Hebrides (Grade A/B)

North & West Anglesey (Grade B)

South-west Llyn (Grade B)

Southern Cardigan Bay (Grade B)

Pembrokeshire Marine/Sir Benfro Forol (Grade A/B)

Outer Bristol Channel (Grade B); and

ii) five sites graded C, referred to as Areas of Search, for which additional survey work is recommended to confirm the importance of the site and/ or identify precise boundaries:

Northern Isles (Grade C)

Moray Firth (extending to East Grampian) (Grade C)

Coastal Waters of Eastern England (Grade C)

Dogger Bank (Grade C)

Skerries and Causeway (Northern Ireland) (Grade C)

Figure 10c UK map showing harbour porpoise proposed dSACs and Areas of Search



8. Standard Data Forms

The individual site rationale, based on the methodology set out in Section 5, along with a brief description of each site is set out in the EC's Standard Data Form (SDF) format.

Western Scotland and Inner Hebrides

UK SAC data form

NATURA 2000 STANDARD DATA FORM

FOR SPECIAL PROTECTION AREAS (SPA)
FOR SITES ELIGIBLE FOR IDENTIFICATION AS SITES OF COMMUNITY IMPORTANCE (SCI)
AND
FOR SPECIAL AREAS OF CONSERVATION (SAC)

1. Site identification:

1.1 Type:

1.2 Site code: New site

1.3 Compilation date: 201104

1.4 Update: 201104

1.5 Relationship with other Natura 2000 sites: UK9001231 (Cape Wrath), UK0030192 (Loch Laxford), UK0030230 (Ascrib, Isay and Dunvegan), UK0030041 (Firth of Lorn), UK0017070 (Loch nam Madach), UK0017077 (Lochs Duich, Long and Alsh Reefs), UK0019802 (Sound of Arisaig), UK0019803 (Sunart), UK0030289 (Treshnish Isles), UK9001041 (Shiant Islands), UK9001241 (Handa Island), UK9001431 (Canna and Sanday Islands), UK9003171 (North Colonsay and Western Cliffs), UK 9001341 (Isle of Rum), UK 9001121 (Mingulay and Berneray), UK0030067 (South East Islay Skerries), UK9003053 (Laggan, Islay), UK9020299 (Oronsay and South Colonsay), UK0030364 (East Mingulay).

1.6 Respondent(s): Dr Peter GH Evans, Director, Sea Watch Foundation, Ewyn y Don, Bull Bay, Amlwch, Isle of Anglesey, Wales LL68 9SD

1.7 Site name: West Scotland and Inner Hebrides

1.8 Site indication and designation classification dates:

date site proposed as eligible as SCI:

date confirmed as SCI

date site classified as SPA

date site designated as SAC

2. Site location:

2.1 Site centre location

latitude **longitude**
 57 30 00 N 06 40 00 W

2.2 Site area (ha) -99¹⁵

2.3 Site length (km)

2.5 Administrative region

NUTS code **Region name** **% cover**
 0 Marine 100

2.6 Biogeographic region

Alpine Atlantic X Boreal Continental Macaronesia Mediterranean

3. Ecological information:

3.2 Annex II species

Site assessment

Species name	Estimated population size	Continuous or regular presence	Population density in relation to neighbouring areas	Presence in breeding season	Other relevant biological factors	Overall population grading	Conservation	Isolation	Global
<i>Phocoena phocoena</i>	Unknown for area proposed	A	A/B	A	Feeding, breeding and mating	A/B	B	C	A/B

Where:

Estimated population size:

There is no population estimate for the area proposed, but the SCANS 2 survey (July 2005) estimated the overall west Scottish (Minches and Sea of Hebrides) population south to the Northern Irish coast at 12,100 (CV=0.43).

Continuous or regular presence:

Grade A: Porpoises are present in all months of the year, but with a peak presence in summer (Evans, 1997; Boran *et al.*, 1999; Jeewoonarain *et al.*, 1999; Evans *et al.*, 2003; Evans & Wang, 2005; Marubini *et al.*, 2009; Embling *et al.*, 2010; Hebridean Whale & Dolphin Trust, unpublished data).

Population density in relation to neighbouring areas:

Grade A/B: The site has relatively high densities compared with surrounding areas, particularly in the eastern sector of the Minches and Sea of Hebrides (Evans & Wang, 2005; Hammond, 2008; Marubini *et al.*, 2010). Within the proposed site, there are hotspots (notably north-east of Skye across the East Shiant Bank, around the Small Isles of Rum, Eigg, Canna and Muck, across to Coll and the mainland coast, west of Mull, Sound of Jura, and in the Firth of Lorn) although

¹⁵ -99 refers to “area still unknown”

the relative importance of these can vary seasonally and from year to year (Boran *et al.*, 1999; Evans & Wang, 2005; Marubini *et al.*, 2009; Embling *et al.*, 2010; Harries, 2010). This whole region of relatively high density has persisted over the long term (Evans & Wang, 2005).

Presence in breeding season:

Grade A: The site has high numbers of porpoises including newborns during the peak breeding season (May-August) (Evans, 1997; Boran *et al.*, 1999; Evans *et al.*, 2003; Evans & Wang, 2005; MacLeod *et al.*, 2007; Sea Watch Foundation, unpublished data; Hebridean Whale & Dolphin Trust, unpublished data).

Other relevant biological factors:

The site is used for feeding (year-round), social and mating (July-September) purposes (Evans, 1997; Evans & Wang, 2005; Carlström, 2006; Sea Watch Foundation, unpublished data).

Overall rating for population:

Grade A/B: There are seven existing SACs with a marine component within the area proposed here. However, none of them was established for harbour porpoise, and all are small. The recommendation here is that a much larger region that encompasses the principal high-density areas should form an SAC for the species, and that zoning then be applied for a flexible management approach alongside regular monitoring of spatio-temporal variation in particular hotspots.

Degree of conservation of features of the habitat important for the species concerned and restoration possibilities:

Grade B: The site provides some of the finer-scale oceanographic features associated with good foraging and feeding opportunities, including topographic complexity, and predictable current systems in sounds within island archipelagos and between islands and the mainland providing regular replenishment of food resources (Evans, 1997; Marubini *et al.*, 2009; Embling *et al.*, 2010).

Degree of isolation of the population:

Grade C: This wide-ranging species is not isolated, although the population occupying north-west Ireland and west Scotland has been recognised as a separate Management Unit on the basis of mtDNA studies (Evans & Teilmann, 2009).

Global assessment:

Grade A/B: Although relatively unpolluted with low human population densities and little industrial development, the region still faces some conservation pressures, namely commercial fisheries, shipping, recreation and offshore renewable energy activities (Parsons *et al.*, 1999). Recreational activities in particular are increasing and coincide with the peak breeding period for porpoises. There is a proposal to establish a Coastal and Marine National Park encompassing the area of the Small Isles (Rum, Eigg, Canna, Muck), and Coll, Tiree and Mull, across to the west mainland coast (Scottish Executive, 2006).

Other Annex II and Annex IVa species:

The following species occur regularly: Atlantic grey seal (II), harbour seal (II), bottlenose dolphin (II), minke whale (IVa), killer whale (IVa), Risso's dolphin (IVa), short-beaked common dolphin (IVa), Atlantic white-sided dolphin (IVa), and white-beaked dolphin (IVa). Also occurring on a more casual basis are: fin whale (IVa), humpback whale (IVa), long-finned pilot whale (IVa) and northern bottlenose whale (IVa) (Evans, 1997; Boran *et al.*, 1999).

References:

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NATURA 2000 STANDARD DATA FORM

FOR SPECIAL PROTECTION AREAS (SPA)
FOR SITES ELIGIBLE FOR IDENTIFICATION AS SITES OF COMMUNITY IMPORTANCE (SCI)
AND
FOR SPECIAL AREAS OF CONSERVATION (SAC)

1. Site identification:

1.1 Type:

1.2 Site code: New site

1.3 Compilation date: 201011

1.4 Update: 201011

1.5 Relationship with other Natura 2000 sites: UK9013101 (Holy Island), UK9013061 (Ynys Feurig, Cemlyn Bay & The Skerries)

1.6 Respondent(s): Dr Peter G.H. Evans, Director, Sea Watch Foundation, Ewyn y Don, Bull Bay, Amlwch, Isle of Anglesey, Wales LL68 9SD

1.7 Site name: North-west Anglesey

1.8 Site indication and designation classification dates:

date site proposed as eligible as SCI

date confirmed as SCI

date site classified as SPA

date site designated as SAC

2. Site location:

2.1 Site centre location

latitude

53 25 13 N

longitude

04 31 35 W

2.2 Site area (ha) -99¹⁶

2.3 Site length (km)

2.5 Administrative region

NUTS code

0

Region name

Marine

% cover

100%

¹⁶ -99 refers to "area still unknown"

2.6 Biogeographic region

Alpine Atlantic X Boreal Continental Macaronesia Mediterranean

UK SAC data form

3. Ecological information:

3.2 Annex II species

Site assessment

Species name	Estimated population size	Continuous or regular presence	Population density in relation to neighbouring areas	Presence in breeding season	Other relevant biological factors	Overall population grading	Conservation	Isolation	Global
<i>Phocoena phocoena</i>	309 (CV=0.20)	A	B	A	Feeding, Breeding & Mating	B/C	A	C	B

Where:

Estimated population size:

A population estimate of 309 individuals (CV=0.20) was made for the coastal area proposed, based upon line transect surveys from May-September 2002-04 (Shucksmith *et al.*, 2009). The estimate unrealistically assumed that $g(0) = 1$; it therefore almost certainly under-estimates the actual population size of the site. On a wider scale, the SCANS 2 survey (July 2005) estimated the overall Irish Sea population at 15,200 (CV=0.35) (Hammond, 2008).

Continuous or Regular Presence:

Grade A: Porpoises are present in all months of the year (Shucksmith *et al.*, 2009; Baines & Evans, 2009; Sea Watch Foundation, unpublished data).

Population density in relation to neighbouring areas:

Grade B: The site has relatively high densities compared with surrounding areas (Baines & Evans, 2009), with standardised sighting rates in waters around northern Anglesey of c. 2-5 indivs/hr (Evans & Wang, 2005). This area of relatively high density has persisted over the long-term (Evans & Wang, 2005; Baines & Evans, 2009). Within the coastal strip surveyed by Shucksmith *et al.* (2009), an average density of 0.63/km² (CV=0.20) was obtained (assuming $g(0) = 1$). Areas around Point Lynas and South Stack, and to a lesser extent the Skerries and Middle Mouse have the highest densities (Calderan, 2003; Shucksmith *et al.*, 2009; Baines & Evans, 2009; Sea Watch Foundation, unpublished data).

Presence in breeding season:

Grade A: The site has high numbers of porpoises including newborns during the peak breeding season (May – August), when juvenile to adult ratios of 25-50% occur (Baines & Evans, 2009), cf. 14% recorded in the Sylt-Amrun area off North Germany, selected as an SAC primarily as a nursery ground for porpoises (Sonntag *et al.*, 1999).

Other relevant biological factors:

The site is used for feeding (year-round), social and mating (July-September) purposes (Shucksmith *et al.*, 2009; Baines & Evans, 2009; Sea Watch Foundation, unpublished data).

Overall rating for population:

Grade B/C: More line transect surveys should be conducted further offshore to better establish the limits of relatively high densities, although surveys to date indicate much lower densities there (Pesante *et al.*, 2008; Shucksmith *et al.*, 2009; Baines & Evans, 2009; Sea Watch Foundation, unpublished data).

Degree of conservation of features of the habitat important for the species concerned and restoration possibilities:

Grade A: The site provides several of the finer-scale oceanographic features associated with good foraging and feeding opportunities, including topographic complexity, shallow waters for calf rearing & relatively strong currents flowing around the major headlands of South Stack and Point Lynas, providing regular replenishment of food resources (Pesante *et al.*, 2008; Pierpoint, 2008; Shucksmith *et al.*, 2009; Baines & Evans, 2009).

Degree of isolation of the population:

Grade C: This wide-ranging species is not isolated within the Irish and Celtic Sea population, although differences exist between that population and others in the North & Baltic Seas (Evans & Teilmann, 2009).

Global assessment:

Grade B: There is little pressure from commercial fisheries but there has been strong interest and already some development of renewable energy devices (tidal energy & windfarms) in the region. Recreational activities occur in the region and coincide with the peak breeding period.

Other Annex II & Annex IVa species:

The following species occur regularly: Atlantic grey seal (II), bottlenose dolphin (II) and Risso's dolphin (IVa). Also occurring on a more casual basis are: minke whale (IVa), short-beaked common dolphin (IVa), and killer whale (IVa) (Baines & Evans, 2009).

References:

Baines, M.E. & Evans, P.G.H. (2009) *Atlas of the Marine Mammals of Wales*. CCW Marine Monitoring Report No. 68.

Calderan, S.V. (2003) *Fine-scale temporal distribution by harbour porpoise (Phocoena phocoena) in North Wales: acoustic and visual survey techniques*. MSc thesis, University of Wales, Bangor.

Evans, P.G.H. & Teilmann, J. (editors) (2009) *Report of ASCOBANS/HELCOM Small Cetacean Population Structure Workshop*. ASCOBANS/UNEP Secretariat, Bonn, Germany. 140pp.

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Sonntag, R.P., Benke, H., Hiby, A.R., Lick, R., & Adelung, D. (1999) Identification of the first harbour porpoise (*Phocoena phocoena*) calving ground in the North Sea. *Journal of Sea Research*, 41: 225-232.

NATURA 2000 STANDARD DATA FORM

FOR SPECIAL PROTECTION AREAS (SPA)
FOR SITES ELIGIBLE FOR IDENTIFICATION AS SITES OF COMMUNITY IMPORTANCE (SCI)
AND
FOR SPECIAL AREAS OF CONSERVATION (SAC)

1. Site identification:

1.1 Type:

1.2 Site code: UK0013117

1.3 Compilation date: 201104

1.4 Update: 201104

1.5 Relationship with other Natura 2000 sites: UK00113117 (Pen Llyn a'r Sarnau / Llyn Peninsula), UK9013121 (Aberdaron Coast & Bardsey Island), UK9020282 (Mynydd Cilian, Trwyn y Wylfa, & the St Tudwal Islands)

1.6 Respondent(s): Dr Peter G.H. Evans, Director, Sea Watch Foundation, Ewyn y Don, Bull Bay, Amlwch, Isle of Anglesey, Wales LL68 9SD

1.7 Site name: South-west Llyn (incorporated within Pen Llyn a'r Sarnau SAC)

1.8 Site indication and designation classification dates:

date site proposed as eligible as SCI

date confirmed as SCI

date site classified as SPA

date site designated as SAC

2. Site location: *(as applied to existing Pen Llyn a'r Sarnau SAC)*

2.1 Site centre location

latitude

52 41 29 N

longitude

04 21 50 W

2.2 Site area (ha) 146,023

2.3 Site length (km)

2.5 Administrative region

NUTS code

0

Region name

Marine

% cover

100%

2.6 Biogeographic region

Alpine

Atlantic X

Boreal

Continental

Macaronesia

Mediterranean

3. Ecological information:

3.2 Annex II species

Site assessment

Species name	Estimated population size	Continuous or regular presence	Population density in relation to neighbouring areas	Presence in breeding season	Other relevant biological factors	Overall population grading	Conservation	Isolation	Global
<i>Phocoena phocoena</i>	Unknown for area proposed	A	B	A	Feeding, Breeding & Mating	B/C	A	C	B

Where:

Estimated population size:

There is no population estimate for the area proposed, but the SCANS 2 survey (July 2005) estimated the overall Irish Sea population at 15,200 (CV=0.35) (Hammond, 2008).

Continuous or Regular Presence:

Grade A: Porpoises are present in all months of the year (WDCS, 2002, 2005, 2006; Pesante *et al.*, 2008; Baines & Evans, 2009; Sea Watch Foundation, unpublished data).

Population density in relation to neighbouring areas:

Grade B: The site has relatively high densities compared with surrounding areas (Baines & Evans, 2009), with standardised sighting rates in waters around the South-west Llyn Peninsula of c. 2-5 indivs/hr (Evans & Wang, 2005). This area of relatively high density has persisted over the long-term (Evans & Wang, 2005; Baines & Evans, 2009). The area around Bardsey Island has the highest densities (WDCS, 2002, 2005 2006; Baines & Evans, 2009; Sea Watch Foundation, unpublished data).

Presence in breeding season:

Grade A: The site has high numbers of porpoises including newborns during the peak breeding season (May – August), when juvenile to adult ratios of 20-25% occur (Baines & Evans, 2009), cf. 14% recorded in the Sylt-Amrun area off North Germany, selected as an SAC primarily as a nursery ground for porpoises (Sonntag *et al.*, 1999).

Other relevant biological factors:

The site is used for feeding (year-round), social and mating (July-September) purposes (WDCS, 2002, 2005, 2006; Pesante *et al.*, 2008; Sea Watch Foundation, unpublished data).

Overall rating for population:

Grade B: Information on absolute abundance is lacking from the area and it is recommended that dedicated line transect surveys be undertaken to rectify this. Surveys should also be extended westwards beyond the existing boundaries of the Pen Llyn a'r Sarnau SAC, which has received general survey effort measuring relative abundance (WDCS, 2002, 2005, 2006; Pesante *et al.*, 2008; Baines & Evans, 2009).

Degree of conservation of features of the habitat important for the species concerned and restoration possibilities:

Grade A: The site is encompassed by the Pen Llyn a'r Sarnau SAC, and provides some of the finer-scale oceanographic features associated with good foraging and feeding opportunities, including topographic complexity, shallow waters for calf rearing & relatively strong currents flowing around the major headland of the Llyn Peninsula and in Bardsey Sound, providing regular replenishment of food resources (WDCS, 2002, 2005, 2006; Pesante *et al.*, 2008; Pierpoint, 2008; Baines & Evans, 2009).

Degree of isolation of the population:

Grade C: This wide-ranging species is not isolated within the Irish and Celtic Sea population, although differences exist between that population and others in the North & Baltic Seas (Evans & Teilmann, 2009).

Global assessment:

Grade B: There is little pressure from commercial fisheries but strong interest in development of renewable energy devices (tidal energy & windfarms). Recreational activities occur in the region and coincide with the peak breeding period.

Other Annex II & Annex IVa species:

The following species occur regularly: Atlantic grey seal (II), bottlenose dolphin (II) and Risso's dolphin (IVa). Also occurring on a more casual basis are: minke whale (IVa), short-beaked common dolphin (IVa), and killer whale (IVa) (Baines & Evans, 2009).

References:

Baines, M.E. & Evans, P.G.H. (2009) *Atlas of the Marine Mammals of Wales*. CCW Marine Monitoring Report No. 68.

Evans, P.G.H. & Teilmann, J. (editors) (2009) *Report of ASCOBANS/HELCOM Small Cetacean Population Structure Workshop*. ASCOBANS/UNEP Secretariat, Bonn, Germany. 140pp.

Evans, P.G.H. & Wang, J. (2005) *Re-examination of distribution data for the harbour porpoise on the N.W. European Continental Shelf with a view to site selection for this species*. CCW Contract Science Report No: 64.

Hammond P.S. (2008) *Small cetaceans in the European Atlantic and North Sea (SCANS II)*. Final report to the European Commission under contract LIFE04NAT/GB/000245.

Pesante, G., Evans, P.G.H., Baines, M.E., and McMath, M. (2008) *Abundance and Life History Parameters of Bottlenose Dolphin in Cardigan Bay: Monitoring 2005-2007*. CCW Marine Monitoring Report No. 61.

Pierpoint, C. (2001) *Harbour porpoise distribution in Welsh coastal waters*. Unpubl. report to the International Fund for Animal Welfare. 41pp.

Sonntag, R.P., Benke, H., Hiby, A.R., Lick, R., & Adelung, D. (1999) Identification of the first harbour porpoise (*Phocoena phocoena*) calving ground in the North Sea. *Journal of Sea Research*, 41: 225-232.

WDCS Science Team (2002) *Bardsey Island Cetacean Survey, 2001*. CCW Species Challenge Report No. 01/01/02.

WDCS Science Team (2005) *Bardsey Island Cetacean Survey, 2004*. CCW Species Challenge Report No. 04/01/04.

WDCS Science Team (2006) *Bardsey Island Cetacean Survey, 2005*. CCW Species Challenge Report No. 06/01/03.

Southern Cardigan Bay

UK SAC data form

NATURA 2000 STANDARD DATA FORM

FOR SPECIAL PROTECTION AREAS (SPA)
FOR SITES ELIGIBLE FOR IDENTIFICATION AS SITES OF COMMUNITY IMPORTANCE (SCI)
AND
FOR SPECIAL AREAS OF CONSERVATION (SAC)

1. Site identification:

1.1 Type:

1.2 Site code: UK0012712

1.3 Compilation date: 201104

1.4 Update: 201104

1.5 Relationship with other Natura 2000 sites: UK0012712 (Cardigan Bay / Bae Ceredigion)

1.6 Respondent(s): Dr Peter GH Evans, Director, Sea Watch Foundation, Ewyn y Don, Bull Bay, Amlwch, Isle of Anglesey, Wales LL68 9SD

1.7 Site name: Southern Cardigan Bay

1.8 Site indication and designation classification dates:

date site proposed as eligible as SCI 201104

date confirmed as SCI

date site classified as SPA

date site designated as SAC

2. Site location:

2.1 Site centre location

latitude

52 14 47 N

longitude

04 37 02 W

2.2 Site area (ha) -99¹⁷ (but previously 95860.36)

2.3 Site length (km)

2.5 Administrative region

NUTS code

0

Region name

Marine

% cover

100%

2.6 Biogeographic region

Alpine

Atlantic X

Boreal

Continental

Macaronesia

Mediterranean

¹⁷ -99 refers to "area still unknown"

3. Ecological information:

3.2 Annex II species

Site assessment

Species name	Estimated population size	Continuous or regular presence	Population density in relation to neighbouring areas	Presence in breeding season	Other relevant biological factors	Overall population grading	Conservation	Isolation	Global
<i>Phocoena phocoena</i>	Unknown for extended area proposed	A	B	A	Feeding, breeding and mating	C	B	C	B

Where:

Estimated population size:

Population estimates (from line transect surveys) have been obtained for the existing SAC every summer between 2001 and 2007. These indicate a population (within the SAC boundaries) varying between 167 and 236, with a slight but non-significant increase over that period (Pesante *et al.*, 2007, 2008). There is no population estimate for the extended area proposed, but the SCANS 2 survey (July 2005) estimated the overall Irish Sea population at 15,200 (CV=0.35).

Continuous or regular presence:

Grade A: Porpoises are present in all months of the year, although with a peak presence in winter (Baulch, 2007; Pesante *et al.*, 2008; Baines & Evans, 2009; Simon *et al.*, 2010).

Population density in relation to neighbouring areas:

Grade B: The site has relatively high densities compared with surrounding areas (Baines & Evans, 2009), with standardised sighting rates in the proposed extended area c. 2/hr (Evans & Wang, 2005). This area of relatively high density has persisted over the long term (Evans & Wang, 2005; Baines & Evans, 2009). The southern part of the SAC has the highest densities (Isojunno, 2007; Baines & Evans, 2009; Sea Watch Foundation, unpublished data).

Presence in breeding season:

Grade A: The site has high numbers of porpoises including newborns during the peak breeding season (May-August), when juvenile to adult ratios of 15-20% occur (Baines & Evans, 2009), cf. 14% recorded in the Sylt-Amrun area off north Germany, selected as an SAC primarily as a nursery ground for porpoises (Sonntag *et al.*, 1999).

Other relevant biological factors:

The site is used for feeding (year-round), social and mating (July-September) purposes (Baines & Earl, 1999; Pesante *et al.*, 2008; Sea Watch Foundation, unpublished data).

Overall rating for population:

Grade C: The existing boundaries of the Cardigan SAC do not encompass all the most important habitats of the harbour porpoise in this region, and should be extended southwards to include Newport Bay (Pierpoint *et al.*, 1998; Pierpoint, 2001; Isojunno, 2007; Baines & Evans, 2009).

Degree of conservation of features of the habitat important for the species concerned and restoration possibilities:

Grade B: The site provides some of the finer-scale oceanographic features associated with good foraging and feeding opportunities, including topographic complexity, shallow waters for calf

rearing, and a relatively strong current flowing up and down the coast providing regular replenishment of food resources (Isojunno, 2007; Pesante *et al.*, 2008; Pierpoint, 2008).

Degree of isolation of the population:

Grade C: This wide-ranging species is not isolated within the Irish and Celtic Sea population, although differences exist between that population and others in the North & Baltic Seas (Evans & Teilmann, 2009).

Global assessment:

Grade B: There is little or no pressure from commercial fisheries but some interest in development of renewable energy devices. Recreational activities in particular are increasing and coincide with the peak breeding period.

Other Annex II and Annex IVa species:

The following species occur regularly: Atlantic grey seal (II) and bottlenose dolphin (II). Also occurring on a more casual basis are: minke whale (IVa), short-beaked common dolphin (IVa), Risso's dolphin (IVa), killer whale (IVa), and humpback whale (IVa) (Baines & Evans, 2009).

References:

Baines, ME and Earl, S (1999) *Analysis of sightings for indications of harbour porpoise breeding off the Welsh coast*. CCW Contract Science Report No: 379.

Baines, ME and Evans, PGH (2009) *Atlas of the Marine Mammals of Wales*. CCW Marine Monitoring Report No. 68.

Baulch, S (2007) *Fine-scale spatio-temporal variation and habitat partitioning in bottlenose dolphins and harbour porpoises*. MSc Thesis, University of York. 22pp.

Evans, PGH and Teilmann, J (editors) (2009) *Report of ASCOBANS/HELCOM Small Cetacean Population Structure Workshop*. ASCOBANS/UNEP Secretariat, Bonn, Germany. 140pp.

Evans, PGH and Wang, J (2005) *Re-examination of distribution data for the harbour porpoise on the N.W. European Continental Shelf with a view to site selection for this species*. CCW Contract Science Report No: 64.

Hammond PS (2008) *Small cetaceans in the European Atlantic and North Sea (SCANS II)*. Final report to the European Commission under contract LIFE04NAT/GB/000245.

Isojunno, S (2007) *Coastal habitat use of harbour porpoise (Phocoena phocoena) in Cardigan Bay Special Area of Conservation, Wales*. BSc Thesis, University of Jyväskylä, Finland.

Pesante, G, Baines, ME, Felce, TH, Ugarte, F and Evans, PGH (2007) Trends of abundance of bottlenose dolphins and harbour porpoises in the Cardigan Bay Special Area of Conservation, Wales (2001-2006). *Abstracts*, 21st Annual Conference of the European Cetacean Society, San Sebastian, Spain, 22-25 April 2007.

Pesante, G, Evans, PGH, Baines, ME, and McMath, M (2008) *Abundance and Life History Parameters of Bottlenose Dolphin in Cardigan Bay: Monitoring 2005-2007*. CCW Marine Monitoring Report No. 61.

Pierpoint, C (2001) *Harbour porpoise distribution in Welsh coastal waters*. Unpubl. report to the International Fund for Animal Welfare. 41pp.

Pierpoint, C, Baines, M and Earl, S (1998) *The Harbour Porpoise (Phocoena phocoena) in West Wales*. Report to the Wildlife Trusts and WWF-UK. Nekton, Newport, Pembrokeshire. 35pp.

Simon, M, Nuuttila, H, Reyes-Zamudio, MM, Ugarte, F, Verfuß, U and Evans, PGH (2010) Passive acoustic monitoring of bottlenose dolphin and harbour porpoise with implications for habitat use and partitioning. *Journal of the Marine Biological Association of the United Kingdom*, 90, 1539-1546.

Sonntag, RP, Benke, H, Hiby, AR, Lick, R and Adelung, D (1999) Identification of the first harbour porpoise (*Phocoena phocoena*) calving ground in the North Sea. *Journal of Sea Research*, 41: 225-232.

Pembrokeshire Marine/Sir Benfro Forol

UK SAC data form

NATURA 2000 STANDARD DATA FORM

FOR SPECIAL PROTECTION AREAS (SPA)
FOR SITES ELIGIBLE FOR IDENTIFICATION AS SITES OF COMMUNITY IMPORTANCE (SCI)
AND
FOR SPECIAL AREAS OF CONSERVATION (SAC)

1. Site identification:

1.1 Type:

1.2 Site code: UK0013116

1.3 Compilation date: 201104

1.4 Update 201104

1.5 Relationship with other Natura 2000 sites: UK0013116 (Pembrokeshire Marine / Sir Benfro Forol), UK9014041 (Grassholm Island), UK9014051 (Skokholm and Skomer Islands), UK9014061 (Castlemartin Coast) and UK9014062 (Ramsey Island and St David's Peninsula Coast)

1.6 Respondent(s): Dr Peter GH Evans, Director, Sea Watch Foundation, Ewyn y Don, Bull Bay, Amlwch, Isle of Anglesey, Wales LL68 9SD

1.7 Site name: Pembrokeshire Marine/Sir Benfro Forol

1.8 Site indication and designation classification dates:

date site proposed as eligible as SCI: 201104

date confirmed as SCI

date site classified as SPA

date site designated as SAC

2. Site location:

2.1 Site centre location

latitude

51 43 35 N

longitude

05 36 57 W

2.2 Site area (ha) -99¹⁸ (but previously 138069.45) **2.3 Site length (km)**

2.5 Administrative region

NUTS code

0

Region name

Marine

% cover

100%

¹⁸ -99 refers to "area still unknown"

2.6 Biogeographic region

Alpine Atlantic X Boreal Continental Macaronesia Mediterranean

3. Ecological information:

3.2 Annex II species

Site assessment

Species name	Estimated population size	Continuous or regular presence	Population density in relation to neighbouring areas	Presence in breeding season	Other relevant biological factors	Overall population grading	Conservation	Isolation	Global
<i>Phocoena phocoena</i>	unknown	A	A	A	Feeding, breeding and mating	A/B	A	C	A/B

Where:

Estimated population size:

Although a population estimate exists (July 2005) for the Irish Sea as a whole, where 15,200 porpoises (CV=0.35) have been estimated (Hammond, 2008), no estimates exist specifically for the Pembrokeshire Marine SAC.

Continuous or regular presence:

Grade A: Porpoises are present in all months of the year, but with a peak presence in summer and autumn (Baines & Earl, 1999; Pierpoint, 2008; Baines & Evans, 2009).

Population density in relation to neighbouring areas:

Grade A: The site has relatively high densities compared with surrounding areas (Baines & Evans, 2009), with standardised sighting rates exceeding 5-10/hr (Evans & Wang, 2005). These have persisted over the long term (Evans & Wang, 2005; Baines & Evans, 2009).

Presence in breeding season:

Grade A: The site has high numbers of porpoises including newborns during the peak breeding season (May-August) (Penrose & Pierpoint, 1999; Baines & Evans, 2009), when juvenile to adult ratios of 18-19% have been reported (Baines & Earl, 1999), cf. 14% recorded in the Sylt-Amrun area off north Germany, selected as an SAC primarily as a nursery ground for porpoises (Sonntag *et al.*, 1999).

Other relevant biological factors:

The site is used for feeding (year-round), social and mating (July-September) purposes (Baines & Earl, 1999; Pierpoint, 2008; Isojunno, 2008; Sea Watch Foundation, unpublished data).

Overall rating for population:

Grade A/B: The existing boundaries of the Pembrokeshire Marine SAC do not encompass all the most important habitats of the harbour porpoise in this region, and should be extended westwards to take in the eastern portion of the Celtic Deep, including the area around the Smalls Rocks, and northwards to include Strumble Head (Pierpoint, 2001; Pierpoint *et al.*, 2008; Evans *et al.*, 2007).

Degree of conservation of features of the habitat important for the species concerned and restoration possibilities:

Grade A: The site provides the finer-scale oceanographic features associated with good foraging and feeding opportunities, including topographic complexity and high energy locations (strong currents flowing through Sounds) providing regular replenishment of food resources (Pierpoint, 2008; Isojunno *et al.*, 2009, in press).

Degree of isolation of the population:

Grade C: This wide-ranging species is not isolated within the Irish and Celtic Sea population, although differences exist between that population and others in the North and Baltic Seas (Evans & Teilmann, 2009).

Global assessment:

Grade A/B: There is little or no pressure from commercial fisheries but some interest in development of renewable energy devices (in Ramsey Sound). Recreational activities are increasing and coincide with the peak breeding period.

Other Annex II and Annex IVa species:

The following species occur regularly: Atlantic grey seal (II), minke whale (IVa), short-beaked common dolphin (IVa), and Risso's dolphin (IVa). Also occurring on a more casual basis are: bottlenose dolphin (II), killer whale (IVa), fin whale (IVa) and humpback whale (IVa) (Baines & Evans, 2009).

References:

Baines, ME and Earl, S (1999) *Analysis of sightings for indications of harbour porpoise breeding off the Welsh coast*. CCW Contract Science Report No: 379.

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Outer Bristol Channel

UK SAC data form

NATURA 2000 STANDARD DATA FORM

FOR SPECIAL PROTECTION AREAS (SPA)
FOR SITES ELIGIBLE FOR IDENTIFICATION AS SITES OF COMMUNITY IMPORTANCE (SCI)
AND
FOR SPECIAL AREAS OF CONSERVATION (SAC)

1. Site identification:

1.1 Type:

1.2 Site code: New site

1.3 Compilation date: 201104

1.4 Update: 201104

1.5 Relationship with other Natura 2000 sites: UK0020020 (Carmarthen Bay & Estuaries)

1.6 Respondent(s): Dr Peter GH Evans, Director, Sea Watch Foundation, Ewyn y Don, Bull Bay, Amlwch, Isle of Anglesey, Wales LL68 9SD

1.7 Site name: Outer Bristol Channel

1.8 Site indication and designation classification dates:

date site proposed as eligible as SCI:

date confirmed as SCI

date site classified as SPA

date site designated as SAC

2. Site location:

2.1 Site centre location

latitude

51 43 35 N

longitude

05 36 57 W

2.2 Site area (ha) -99¹⁹

2.3 Site length (km)

2.5 Administrative region

NUTS code

0

Region name

Marine

% cover

100

2.6 Biogeographic region

Alpine

Atlantic X

Boreal

Continental

Macaronesia

Mediterranean

¹⁹ -99 refers to "area still unknown"

3. Ecological information:

3.2 Annex II species

Site assessment

Species name	Estimated population size	Continuous or regular presence	Population density in relation to neighbouring areas	Presence in breeding season	Other relevant biological factors	Overall population grading	Conservation	Isolation	Global
<i>Phocoena phocoena</i>	unknown	A	A	A	Feeding, breeding and mating	A/B	B	C	B

Where:

Estimated population size:

Although a population estimate of 80,600 (CV=0.50) (in July 2005) has been obtained for the Celtic Shelf as a whole (Hammond, 2008), no estimates exist specifically for the Outer Bristol Channel.

Continuous or regular presence:

Grade A: Porpoises are present in all months of the year, but with a peak presence in summer and autumn (Baines & Earl, 1999; Evans *et al.*, 2003; Evans & Wang, 2005; Watkins & Colley, 2005; Baines & Evans, 2009; Sea Watch Foundation, unpublished data).

Population density in relation to neighbouring areas:

Grade A: The site has relatively high densities compared with surrounding areas, with standardised sighting rates exceeding 2/hr (Evans & Wang, 2005; Baines & Wang, 2009). These have persisted over the long term (Evans & Wang, 2005; Baines & Evans, 2009).

Presence in breeding season:

Grade A: The site has high numbers of porpoises and newborns during the peak breeding season (May-August) (Penrose & Pierpoint, 1999; Baines & Evans, 2009), when juvenile to adult ratios of 25-50% have been reported (Baines & Earl, 1999; Baines & Evans, 2009), cf. 14% recorded in the Sylt-Amrun area off north Germany, selected as an SAC primarily as a nursery ground for porpoises (Sonntag *et al.*, 1999).

Other relevant biological factors:

The site is used for feeding (year-round), social and mating (July-September) purposes (Baines & Earl, 1999; Watkins & Colley, 2005; Sea Watch Foundation, unpublished data).

Overall rating for population:

Grade A/B: The general Outer Bristol Channel area includes one existing SAC, Lundy Island, which is designated a Marine Nature Reserve, though much more restricted in area and not established for this species.

Degree of conservation of features of the habitat important for the species concerned and restoration possibilities:

Grade B: The site provides the finer-scale oceanographic features associated with good foraging and feeding opportunities – relatively shallow seas and headlands around which strong currents

flow, providing regular replenishment of food resources (Watkins & Colley, 2005; Evans *et al.*, 2008).

Degree of isolation of the population:

Grade C: This wide-ranging species is not isolated within the Irish and Celtic Sea population, although differences exist between that population and others in the North and Baltic Seas (Evans & Teilmann, 2009).

Global assessment:

Grade B: The main conservation pressures in the region come from commercial fisheries, shipping and recreation (Barne *et al.*, 1996; Evans, 1996). There has also been recent interest in the development of renewable energy (notably tidal energy in the Severn Estuary).

Other Annex II and Annex IVa species:

The following species occur regularly: Atlantic grey seal (II), bottlenose dolphin (II), and short-beaked common dolphin (IVa) (Baines & Evans, 2009).

References:

Baines, ME and Earl, S (1999) *Analysis of sightings for indications of harbour porpoise breeding off the Welsh coast*. CCW Contract Science Report No: 379.

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Northern Isles

UK SAC data form

NATURA 2000 STANDARD DATA FORM

FOR SPECIAL PROTECTION AREAS (SPA)
FOR SITES ELIGIBLE FOR IDENTIFICATION AS SITES OF COMMUNITY IMPORTANCE (SCI)
AND
FOR SPECIAL AREAS OF CONSERVATION (SAC)

1. Site identification:

1.1 Type:

1.2 Site code: New site

1.3 Compilation date: 201104

1.4 Update: 201104

1.5 Relationship with other Natura 2000 sites: UK0012711 (Mousa), UK0030069 (Sanday), UK0030273 (Sullom Voe), UK0012687 (Yell Sound Coast), UK9001181 (North Caithness Cliffs), UK9002011 (Hermaness), UK9002031 (Fetlar), UK9002081 (Noss), UK9002511 (Sumburgh Head), UK9002091 (Fair Isle), UK9002151 (Copinsay), UK9002331 (East Sanday), UK9002431 (Calf of Eday)

1.6 Respondent(s): Dr Peter GH Evans, Director, Sea Watch Foundation, Ewyn y Don, Bull Bay, Amlwch, Isle of Anglesey, Wales LL68 9SD

1.7 Site name: Northern Isles (Shetland and Orkney)

1.8 Site indication and designation classification dates:

date site proposed as eligible as SCI

date confirmed as SCI

date site classified as SPA

date site designated as SAC

2. Site location:

2.1 Site centre location

latitude

59 35 00 W

longitude

01 30 00 N

2.2 Site area (ha) -99²⁰

2.3 Site length (km)

2.5 Administrative region

NUTS code

0

Region name

Marine

% cover

100%

²⁰ -99 refers to "area still unknown"

2.6 Biogeographic region

Alpine Atlantic X Boreal Continental Macaronesia Mediterranean

3. Ecological information:

3.2 Annex II species

Site assessment

Species name	Estimated population size	Continuous or regular presence	Population density in relation to neighbouring areas	Presence in breeding season	Other relevant biological factors	Overall population grading	Conservation	Isolation	Global
<i>Phocoena phocoena</i>	Unknown for area under consideration	A	C	C	Feeding, breeding and mating	C	C	C	C

Where:

Estimated population size:

There is no population estimate for the Northern Isles alone, but the SCANS 2 survey (July 2005) estimated the overall north Scottish (Shetland, Orkney, north-east Scotland including the Moray Firth) population at 10,300 (CV=0.36) (Hammond, 2008). The previous SCANS survey (July 1994) yielded a much higher population estimate of 21,535 porpoises (CV=0.34) in the corresponding block (Hammond *et al.*, 1995).

Continuous or regular presence:

Grade A: Porpoises are present in all months of the year, but with a peak presence in summer and autumn (Northridge *et al.*, 1995; Evans, 1996, 1997, 1998; Evans *et al.*, 1997, 2003; Evans & Wang, 2005). Radio telemetry studies indicate that at least some individuals from Danish waters migrate to spend the winter in Shetland waters (Sveegaard *et al.*, 2011).

Population density in relation to neighbouring areas:

Grade C: For a period of about 20 years during the 1980s and 1990s, the site had relatively high densities compared with surrounding areas, particularly along the east coast of Shetland and southern parts of Orkney (Hammond *et al.*, 1995; Evans, 1996, Evans *et al.*, 1997, 2003; Evans & Wang, 2005). In late summer, aggregations exceeding 100 porpoises have been observed (PGH Evans, personal observations; Sea Watch Foundation, unpublished data). Since the 1990s, however, porpoise abundance in the region has declined markedly (Hammond, 2008), probably as a result of declines in local sandeel stocks with which porpoises were associated (Evans & Borges, 1995; Arnott & Ruxton, 2002). The sandeel declines have also significantly affected seabird breeding success (Wanless *et al.*, 2005; Mavor *et al.*, 2007).

Presence in breeding season:

Grade C: In the past, the site had high numbers of porpoises including newborns during the peak breeding season (May-August). But since the late 1990s in Shetland, this has changed markedly in a negative direction (Evans, 1996; Evans *et al.*, 1997, 2003; Evans & Wang, 2005; Hammond, 2008).

Other relevant biological factors:

The site is used for feeding (year-round), social and mating (July-September) purposes (Evans, 1996; Evans *et al.*, 1997, 2003, 2010; Evans & Wang, 2005; Sea Watch Foundation, unpublished data).

Overall rating for population:

Grade C: There are four existing SACs (three in Shetland and one in Orkney) with a marine component within the area considered here. However, none of them was established for harbour porpoise, and all are very small. The recommendation here is that a larger region might form an SAC for the species, allowing better opportunities to control fishing activities and facilitate the recovery of fish stocks – thus potentially restoring the site for porpoises.

Degree of conservation of features of the habitat important for the species concerned and restoration possibilities:

Grade C: The site provides some of the finer-scale oceanographic features associated with good foraging and feeding opportunities, including topographic complexity, predictable current systems in Sounds (e.g. Mousa Sound, Noss Sound, east of Whalsay in Shetland, and Scapa Flow in Orkney) within island archipelagos and between islands and the mainland providing regular replenishment of food resources (Evans & Borges, 1995; Evans, 1996; Evans *et al.*, 2010). If local fish stocks were to recover, there's no obvious reason why the conditions previously prevailing shouldn't return and the species become common again.

Degree of isolation of the population:

Grade C: This wide-ranging species is not isolated, although the population occupying the North Sea has been designated as two different Management Units, one in the western sector and the other in the eastern sector, on the basis of various lines of evidence including genetics, tooth ultra-structure, and individual movement patterns as revealed from telemetry studies (Evans & Teilmann, 2009).

Global assessment:

Grade C: The region is relatively unpolluted with low human population densities and little industrial development. However, it faces some conservation pressures, namely commercial fisheries, shipping (mainly in relation to the oil and gas industry), recreation and offshore renewable energy activities (wave and tidal energy in Orkney) (Evans, 1996, 1997; Evans *et al.*, 2010).

Other Annex II and Annex IVa species:

The following species occur regularly: Atlantic grey seal (II), harbour seal (II), minke whale (IVa), killer whale (IVa), Risso's dolphin (IVa), and white-beaked dolphin (IVa). Also occurring on a more casual basis are: Atlantic white-sided dolphin (IVa), short-beaked common dolphin (IVa), bottlenose dolphin (II) (Orkney and Pentland Firth), long-finned pilot whale (IVa), and sperm whale (IVa) (Evans *et al.*, 2010).

References:

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NATURA 2000 STANDARD DATA FORM

FOR SPECIAL PROTECTION AREAS (SPA)
FOR SITES ELIGIBLE FOR IDENTIFICATION AS SITES OF COMMUNITY IMPORTANCE (SCI)
AND
FOR SPECIAL AREAS OF CONSERVATION (SAC)

1. Site identification:

1.1 Type:

1.2 Site code: UK0019808

1.3 Compilation date: 201104

1.4 Update: 201104

1.5 Relationship with other Natura 2000 sites: UK9001622 (Dornoch Firth and Loch Fleet) and UK9001623 (Cromarty Firth), UK9001624 (Inner Moray Firth), UK9002471 (Troup, Pennan and Lion's Heads), UK0019808 (Moray Firth), UK9001625 (Moray & Nairn Coast), UK9002491 (Buchan Ness to Collieston Coast), UK9002221 (Ythan Estuary), UK9002271 (Fowlsheugh), UK9004031 (Montrose Basin)

1.6 Respondent(s): Dr Peter GH Evans, Director, Sea Watch Foundation, Ewyn y Don, Bull Bay, Amlwch, Isle of Anglesey, Wales LL68 9SD

1.7 Site name: Moray Firth (extending to East Grampian)

1.8 Site indication and designation classification dates:

date site proposed as eligible as SCI: 201104

date confirmed as SCI

date site classified as SPA

date site designated as SAC

2. Site location:

2.1 Site centre location

latitude

57 49 01 N

57 42 00 N

longitude

03 43 32 W (previously)

02 00 00 W (proposed)

2.2 Site area (ha) -99²¹ (previously 151347.17)

2.3 Site length (km)

2.5 Administrative region

NUTS code

0

Region name

Marine

% cover

100%

²¹ -99 refers to "area still unknown"

2.6 Biogeographic region

Alpine Atlantic X Boreal Continental Macaronesia Mediterranean

3. Ecological information:

3.2 Annex II species

Site assessment

Species name	Estimated population size	Continuous or regular presence	Population density in relation to neighbouring areas	Presence in breeding season	Other relevant biological factors	Overall population grading	Conservation	Isolation	Global
<i>Phocoena phocoena</i>	Unknown for area proposed	A	C	A	Feeding, breeding and mating	C	B	C	C

Where:

Estimated population size:

There is no population estimate specifically for this area, but the SCANS 2 survey (July 2005) estimated the overall north Scottish (Shetland, Orkney, north-east Scotland including the Moray Firth) population at 10,300 (CV=0.36) (Hammond, 2008). The previous SCANS survey (July 1994) yielded a much higher population estimate of 21,535 porpoises (CV=0.34) in the corresponding block (Hammond *et al.*, 1995).

Continuous or regular presence:

Grade A: Porpoises are present in all months of the year, but with a peak presence in summer and autumn (Northridge *et al.*, 1995; Evans, 1997; Evans *et al.*, 2003; Evans & Wang, 2005; Robinson *et al.*, 2007; Weir *et al.*, 2007; Anderwald *et al.*, 2010).

Population density in relation to neighbouring areas:

Grade C: Population density in the region under consideration (Outer Moray Firth and East Grampian) has fluctuated over the last 30 years, but for several periods has been relatively high compared with adjacent areas (Hammond *et al.*, 1995; Evans *et al.*, 2003; Evans & Wang, 2005; Robinson *et al.*, 2007; Hammond, 2008; Anderwald *et al.*, 2010). The SCANS 2 survey in July 2005 indicated much lower porpoise abundance than in the previous SCANS survey of July 1994 (Hammond *et al.*, 1995; Hammond, 2008). This is thought to reflect the changes in fish stocks in the region (Greenstreet *et al.*, 1998, 2006; Arnott & Ruxton, 2002). Within the proposed site, densities have been relatively high close to the southern shores of the Moray Firth from Lossiemouth eastwards, and then along the East Grampian coast south to Montrose (Evans *et al.*, 2003; Evans & Wang, 2005; Robinson *et al.*, 2007; Anderwald *et al.*, 2010).

Presence in breeding season:

Grade A: The site has generally had high numbers of porpoises including newborns during the peak breeding season (May-August), although in recent years (approximately 2003 onwards) a decline has been observed (Northridge *et al.*, 1995; Evans, 1997; Evans *et al.*, 2003; Evans & Wang, 2005; Robinson *et al.*, 2007; Anderwald *et al.*, 2010). The proportion of calves in East Grampian peaked in June at 21% (Weir *et al.*, 2007).

Other relevant biological factors:

The site is used for feeding (year-round), social and mating (July-September) purposes (Evans, 1997; Evans & Wang, 2005; Robinson *et al.*, 2007; Weir *et al.*, 2007; Anderwald *et al.*, 2010; CRRU, unpublished data; Sea Watch Foundation, unpublished data).

Overall rating for population:

Grade C: The proposed site under review extends the area encompassed by the existing Moray Firth SAC, which was established for the bottlenose dolphin. Both species, however, occur regularly and in numbers outside those boundaries, particularly to the east and south (Evans *et al.*, 2003; Robinson *et al.*, 2007; Weir *et al.*, 2007; Anderwald *et al.*, 2010). The recent decline in porpoise numbers requires further investigation, with survey coverage extending over a wider area than the coastal zone so as to establish whether any local shifts in distribution have occurred.

Degree of conservation of features of the habitat important for the species concerned and restoration possibilities:

Grade B: The site provides some of the finer-scale oceanographic features associated with good foraging and feeding opportunities, including topographic features, shallow waters in bays and estuaries for calf rearing, and a relatively strong current flowing up and down the coast providing regular replenishment of food resources (Evans, 1996; Robinson *et al.*, 2007; Weir *et al.*, 2007; Anderwald *et al.*, 2010). If local fish stocks were to recover, there is no obvious reason why the conditions previously prevailing should not return and for porpoises to increase again.

Degree of isolation of the population:

Grade C: This wide-ranging species is not isolated, although the population occupying the North Sea has been designated as two different Management Units, one in the western sector and the other in the eastern sector, on the basis of various lines of evidence including genetics, tooth ultra-structure, and individual movement patterns as revealed from telemetry studies (Evans & Teilmann, 2009).

Global assessment:

Grade C: The Inner Moray Firth is currently within a Special Area of Conservation for which a management plan for the bottlenose dolphin is applied (Scottish Natural Heritage, 2006; Moray Firth Partnership, 2009). Although relatively unpolluted, with industrial development confined to a few centres of population (notably Inverness & Aberdeen), the region faces some conservation pressures, namely commercial fisheries, shipping, seismic exploration, recreation and offshore renewable energy activities (Barne *et al.*, 1996; Scottish Natural Heritage, 2006; Moray Firth Partnership, 2009).

Other Annex II and Annex IVa species:

The following species occur regularly: Atlantic grey seal (II), harbour seal (II), bottlenose dolphin (II), minke whale (IVa), Risso's dolphin (IVa), and white-beaked dolphin (IVa). Also occurring on a more casual basis are: killer whale (IVa), long-finned pilot whale (IVa) and humpback whale (IVa) (Anderwald *et al.*, 2010).

References:

Anderwald, P Evans, PGH, Canning, C, Hepworth, K, Innes, M, Macdonald, P, Sim, I, Stockin, K and Weir, C (2010) *Cetaceans of the East Grampian Region*. Sea Watch Foundation, Aberdeen. 68pp.

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- Barne, JH, Robson, CF, Kaznowska, SS and Doody, JP (Editors) (1996) *Coasts and Seas of the United Kingdom. Region 3. North-east Scotland: Cape Wrath to St Cyrus*. Joint Nature Conservation Committee, Peterborough.
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- Greenstreet, SPR, Armstrong, E, Mosegaard, H, Jensen, H, Gibb, IM, Fraser, HM, Scott, BE, Holland, GJ and Sharples, J (2006) Variation in the abundance of sandeels *Ammodytes marinus* off southeast Scotland: an evaluation of area-closure fisheries management and stock abundance assessment methods. *ICES Journal of Marine Science*, 63: 1530-1550.
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NATURA 2000 STANDARD DATA FORM

FOR SPECIAL PROTECTION AREAS (SPA)
FOR SITES ELIGIBLE FOR IDENTIFICATION AS SITES OF COMMUNITY IMPORTANCE (SCI)
AND
FOR SPECIAL AREAS OF CONSERVATION (SAC)

1. Site identification:

1.1 Type:

1.2 Site code:

1.3 Compilation date: 201011

1.4 Update: 201011

1.5 Relationship with other Natura 2000 sites: UK0013036 (Flamborough Head), UK0030170 (Humber Estuary), UK9006111 (Humber Estuary), UK0017075 (The Wash & North Norfolk coast), UK0030370 (Inner Dowsing, Race Bank and North Ridge), UK0030369 (Haisborough, Hammond and Winterton), UK0019838 (North Norfolk coast), UK9009031 (North Norfolk coast).

1.6 Respondent(s): Dr Peter G.H. Evans, Director, Sea Watch Foundation, Ewyn y Don, Bull Bay, Amlwch, Isle of Anglesey, Wales LL68 9SD

1.7 Site name: Eastern England (coastal waters from Bempton/Flamborough, Yorks to Cromer, Norfolk)

1.8 Site indication and designation classification dates:

date site proposed as eligible as SCI:

date confirmed as SCI

date site classified as SPA

date site designated as SAC

2. Site location:

2.1 Site centre location

latitude **longitude**

53 31 20 00 36 31

2.2 Site area (ha) -99²²

2.3 Site length (km)

2.5 Administrative region

NUTS code **Region name**

0 Marine

% cover

100%

²² -99 refers to "area still unknown"

2.6 Biogeographic region

Alpine Atlantic X Boreal Continental Macaronesia Mediterranean

UK SAC data form

3. Ecological information:

3.2 Annex II species

Site assessment

Species name	Estimated population size	Continuous or regular presence	Population density in relation to neighbouring areas	Presence in breeding season	Other relevant biological factors	Overall population grading	Conservation	Isolation	Global
<i>Phocoena phocoena</i>	Unknown for area proposed	A	B/C	B	Feeding, Breeding	B/C	B/C	C	C

Where:

Estimated population size:

There is no population estimate for the site, but the SCANS 2 survey (July 2005) estimated the overall central North Sea population at 88,100 (CV=0.23) (Hammond, 2008). The survey block had the highest densities in the ASCOBANS area, and porpoise distribution represented a southwards shift compared with the equivalent month in 1994 (Hammond *et al.*, 1995). The delineation of the blocks differed between surveys and so it is not possible to make a direct comparison of regional population estimates, but density surface modelling highlighted this southwards shift in the main area of concentration (Hammond, 2008) and that supported other evidence from more regional surveys (see Evans, 2010 for a review).

Continuous or Regular Presence:

Grade A: Porpoises are present off Eastern England in all months of the year, with a peak presence (once corrected for effort) in spring (Evans, 1995; Northridge *et al.*, 1995; Evans *et al.*, 2003; Evans & Wang, 2005; Sea Watch Foundation, unpublished data).

Population density in relation to neighbouring areas:

Grade B/C: Density surface modelling from the SCANS 2 survey indicates the waters off Eastern England between East Anglia and the Yorkshire coast as having relatively high densities compared with surrounding areas (Hammond, 2008; SMRU Ltd, 2010). However, this derives from relatively low survey effort across the area (see Hammond, 2008). Although the evidence from the first SCANS survey indicates that relatively high densities may not have been the case in the 1990s, there is indication of higher densities in the region over a protracted period (Evans & Wang, 2005).

Presence in breeding season:

Grade B: Observations at coastal sites such as Cromer, Spurn Head, and Bempton/Flamborough Head show numbers peaking at the start of the breeding season (April – May), with newborns regularly observed (Evans *et al.*, 2003; Evans & Wang, 2005; Sea Watch Foundation, unpublished data). To the east, in the German sector of the Dogger Bank, 25% of porpoise groups comprised mother-calf pairs (Gilles *et al.*, 2009). Peak numbers in that area occurred in May, with indications of a north-south shift during summer (Gilles *et al.*, 2009).

Other relevant biological factors:

The general area appears to be used for calving (May-July) as well as feeding (year-round) purposes (Evans, 1995; Evans *et al.*, 2003; Evans & Wang, 2005; Gilles *et al.*, 2009; Sea Watch Foundation, unpublished data). It may also be used for mating purposes since animals are recorded during August and September, the peak period for mating (Evans *et al.*, 2003; Evans & Wang, 2005; Sea Watch Foundation, unpublished data).

Overall rating for population:

Grade B/C: There remains limited data on the relative importance of this site for harbour porpoise, most of it coming from the SCANS 2 survey (Hammond, 2008), although an analysis of long-term survey data mainly from coastal sites indicate relatively high densities (Evans & Wang, 2005; Sea Watch Foundation, unpublished data). It is recommended that offshore surveys of the site and adjacent areas should be conducted to confirm any proposed designation and if appropriate, to then establish boundaries.

Degree of conservation of features of the habitat important for the species concerned and restoration possibilities:

Grade B/C: The protruding headlands at Spurn and Flamborough/Bempton offer some of the finer-scale oceanographic features associated with good foraging and feeding opportunities, including topographic features, shallow waters in and around the Wash for calf rearing, and a relatively strong current flowing up and down the coast providing regular replenishment of food resources (Evans, 1995). Fishing has been generally intensive in the central North Sea; there is some recreational activity in the region, with shipping and some pollution in and around the Humber.

Degree of isolation of the population:

Grade C: This wide-ranging species is not isolated, although the population occupying the North Sea has been designated as two different Management Units, one in the western sector and the other in the eastern sector on the basis of various lines of evidence including genetics, tooth ultra-structure, and individual movement patterns as revealed from telemetry studies (Evans & Teilmann, 2009).

Global assessment:

Grade C: The Central North Sea has long been important for fisheries (Pawson & Robson, 1995; CEFAS, 2007), and recently a large section of the waters off Eastern England has been designated for wind farm development in Round 3 (Crown Estate, 2010).

References:

CEFAS (2007) *Multispecies Fisheries Management: A Comprehensive Impact Assessment of the Sand eel Fishery along the English East Coast*. CEFAS Contract Report MF0323/01.

Crown Estate, The (2010) *Round 3 Offshore Wind Farm Connection Study*. The Crown Estate, London. 109pp.

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- Northridge, S., Tasker, M.L., Webb, A., & Williams, J.M. (1995) Seasonal distribution and relative abundance of harbour porpoises *Phocoena phocoena* (L.), white-beaked dolphins *Lagenorhynchus albirostris* (Gray) and minke whales *Balaenoptera acutorostrata* (Lacepède) in the waters around the British Isles. *ICES Journal of Marine Science*, 52: 55-66.
- Pawson, M.G. and Robson, C.F. (1995) Fish: exploited sea fish. Pp. 103-106. In: *Coasts and Seas of the United Kingdom. Region 6. Eastern England: Flamborough Head to Great Yarmouth*. (Editors J.H. Barne, C.F. Robson, S.S. Kaznowska, J.P. Doody & N.C. Davidson). Joint Nature Conservation Committee, Peterborough.
- SMRU Ltd. (2010) *Approaches to marine mammal monitoring at marine renewable energy developments*. Final Report. SMRU Ltd, Sea Mammal Research Unit, St Andrews. 110pp.

**NATURA 2000
STANDARD DATA FORM**

FOR SPECIAL PROTECTION AREAS (SPA)
FOR SITES ELIGIBLE FOR IDENTIFICATION AS SITES OF COMMUNITY IMPORTANCE (SCI)
AND
FOR SPECIAL AREAS OF CONSERVATION (SAC)

1. Site identification:

1.1 Type:

1.2 Site code:

1.3 Compilation date: 201104

1.4 Update: 201104

1.5 Relationship with other Natura 2000 sites: UK0030352 (Dogger Bank).

1.6 Respondent(s): Dr Peter GH Evans, Director, Sea Watch Foundation, Ewyn y Don, Bull Bay, Amlwch, Isle of Anglesey, Wales LL68 9SD

1.7 Site name: Dogger Bank

1.8 Site indication and designation classification dates:

date site proposed as eligible as SCI: 201104

date confirmed as SCI

date site classified as SPA

date site designated as SAC

2. Site location:

2.1 Site centre location

latitude
54 51 27

longitude
02 13 08

2.2 Site area (ha) 1,233,884

2.3 Site length (km)

2.5 Administrative region

NUTS code
0

Region name
Marine

% cover
100%

2.6 Biogeographic region

Alpine

Atlantic X

Boreal

Continental

Macaronesia

Mediterranean

3. Ecological information:

3.2 Annex II species

Site assessment

Species name	Estimated population size	Continuous or regular presence	Population density in relation to neighbouring areas	Presence in breeding season	Other relevant biological factors	Overall population grading	Conservation	Isolation	Global
<i>Phocoena phocoena</i>	Unknown for area proposed	A	C	B	Feeding and breeding	C	B	C	C

Where:

Estimated population size:

There is no population estimate for the site, but the SCANS 2 survey (July 2005) estimated the overall central North Sea population at 88,100 (CV=0.23) (Hammond, 2008). This represented a southwards shift compared with the equivalent month in 1994 (Hammond *et al.*, 1995). The delineation of the blocks differed between surveys and so it is not possible to make a direct comparison of regional population estimates, but density surface modelling highlighted the southwards shift in the main area of concentration (Hammond, 2008) and this supported other evidence from more regional surveys (see Evans, 2010 for a review).

Continuous or regular presence:

Grade A: Although the site has not been surveyed year-round, porpoises are present off Eastern England in all months of the year, with a peak presence (once corrected for effort) in spring (Evans, 1995; Northridge *et al.*, 1995; Evans *et al.*, 2003; Evans & Wang, 2005; Sea Watch Foundation, unpublished data). In the German sector immediately to the east, surveys have only been conducted during March-November, but during that period porpoises were recorded in April, May, June, August and September (Gilles *et al.*, 2009). It should be noted, however, that survey effort was relatively low (n = 11 transects totalling around 130 minutes of aerial survey effort between 2002-06; Gilles *et al.*, 2009).

Population density in relation to neighbouring areas:

Grade C: Density surface modelling from the SCANS 2 survey indicates the Dogger Bank area as having relatively high densities compared with surrounding areas (Hammond, 2008; SMRU Ltd, 2010). However, this derives from relatively low survey effort across the site itself (see Hammond, 2008). Recent aerial surveys in the German and Dutch sectors of the Dogger Bank have indicated high densities of porpoises in this region relative to surrounding areas (Gilles *et al.*, 2009; M. Scheidat, *personal communication*), resulting in this being proposed by those countries as a Special Area of Conservation for the species. Although the evidence from the first SCANS survey indicates that relatively high densities may not have been the case in the 1990s, there is indication of higher densities in the region immediately to the west of Dogger Bank over a protracted period (Evans & Wang, 2005). Unfortunately, the UK sector of the Dogger Bank site has had very little survey effort over the last 20 years. It is therefore recommended that this should take place in order that the importance of the site and possible boundaries can be fully assessed.

Presence in breeding season:

Grade B: Information is lacking on presence in the site itself during the breeding season, although young have been observed during aerial and vessel surveys in German and Dutch waters (M. Scheidat, *personal communication*). Further west towards the coast of Eastern

England, numbers have peaked at the start of the breeding season (April-May), and newborn have been regularly observed (Evans *et al.*, 2003; Evans & Wang, 2005; Sea Watch Foundation, unpublished data). In the German sector of the Dogger Bank, 25% of porpoise groups comprised mother-calf pairs (Gilles *et al.*, 2009). Peak numbers in this area occurred in May, with indications of a north-south shift during summer (Gilles *et al.*, 2009).

Other relevant biological factors:

The general area appears to be used for calving (May-July) as well as feeding (year-round) purposes (Evans, 1995; Evans & Wang, 2005; Gilles *et al.*, 2009; Sea Watch Foundation, unpublished data). It may also be used for mating purposes since animals are recorded during August and September, the peak period for mating (Evans *et al.*, 2003; Evans & Wang, 2005; Sea Watch Foundation, unpublished data).

Overall rating for population:

Grade C: There remains limited data on the relative importance of this site for harbour porpoise, most of it coming from the SCANS 2 survey, although more extensive surveys by Germany and the Netherlands indicate relatively high densities in adjacent areas to the east, as does an analysis of long-term survey data to the west. It is recommended that offshore surveys of the site and adjacent areas in the UK sector should be conducted to confirm the proposed designation and establish boundaries.

Degree of conservation of features of the habitat important for the species concerned and restoration possibilities:

Grade B: This offshore site was proposed as a sandbank covered at all times by water. The general area serves as an important spawning ground for sandeel and cod (CEFAS, 2007; Fox *et al.*, 2008) as well as formerly of herring (Burd, 1978), which recently has shown signs of recovery, spawning particularly south of the Dogger Bank (ICES, 2010). The presence of significant concentrations of fish known to be important prey of porpoise, and the relatively shallow nature of the location, suggest it may be utilised as a calving ground for the species.

Degree of isolation of the population:

Grade C: This wide-ranging species is not isolated, although the population occupying the North Sea has been designated as two different Management Units, one in the western sector and the other in the eastern sector, on the basis of various lines of evidence including genetics, tooth ultra-structure, and individual movement patterns as revealed from telemetry studies (Evans & Teilmann, 2009).

Global assessment:

Grade C: This offshore region is important for fisheries (CEFAS, 2007), and recently has been designated as the site for a proposed wind farm (JNCC, 2010; Crown Estate, 2010).

References:

Burd, AC (1978) Long-term changes in North Sea herring stock. *Rapports et Procès-verbaux des Réunions, Conseil International pour l'Exploration de la Mer*, 172: 137-153.

CEFAS (2007) *Multispecies Fisheries Management: A Comprehensive Impact Assessment of the Sand eel Fishery along the English East Coast*. CEFAS Contract Report MF0323/01.

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Evans, PGH (1995) Whales, dolphins and porpoises. Chapter 5.15. Pp. 129-131. In: *Coasts and Seas of the United Kingdom. Region 6. Eastern England: Flamborough Head to Great Yarmouth*. (Editors Barne, JH, Robson, CF, Kaznowska, SS, Doody, JP and Davidson, NC). Joint Nature Conservation Committee, Peterborough.

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Evans, PGH and Wang, J (2005) *Re-examination of distribution data for the harbour porpoise on the N.W. European Continental Shelf with a view to site selection for this species*. CCW Contract Science Report No: 64.

Evans, PGH, Anderwald, P and Baines, ME (2003) *UK Cetacean Status Review*. Final Report to English Nature & Countryside Council for Wales. Sea Watch Foundation, Oxford, UK. 150pp.

Fox, CJ, Taylor, M, Dickey-Collas, M, Fossum, P, Kraus, G, Rohlf, N, Munk, P, Van Damme, CJG, Bolle, LJ, Maxwell, DL and Wright, PJ (2008) Mapping the spawning grounds of North Sea cod (*Gadus morhua*) by direct and indirect means. *Proceedings of the Royal Society B*,

Gilles, A, Scheidat, M and Siebert, U (2009) Seasonal distribution of harbour porpoises and possible interference of offshore wind farms in the German North Sea. *Marine Ecology Progress Series*, 383: 295-307.

Hammond, PS (2008) *Small cetaceans in the European Atlantic and North Sea (SCANS II)*. Final report to the European Commission under contract LIFE04NAT/GB/000245.

Hammond, PS, Benke, H, Berggren, P, Borchers, DL, Buckland, ST, Collet, A, Heide-Jørgensen, MP, Heimlich-Boran, S, Hiby, AR, Leopold, MF and Øien, N (1995) *Distribution and abundance of the harbour porpoise and other small cetaceans in the North Sea and adjacent waters*. Final Report to the European Commission under contract LIFE 92-2/UK/27. 242pp.

ICES (2010) *Herring Assessment Working Group (HAWG) Report 2010*. ICES, Copenhagen. 141pp.

JNCC (2010) *Offshore Special Area of Conservation: Dogger Bank SAC Selection Assessment*. Joint Nature Conservation Committee, Peterborough. 32pp.

Northridge, S, Tasker, ML, Webb, A and Williams, JM (1995) Seasonal distribution and relative abundance of harbour porpoises *Phocoena phocoena* (L.), white-beaked dolphins *Lagenorhynchus albirostris* (Gray) and minke whales *Balaenoptera acutorostrata* (Lacepède) in the waters around the British Isles. *ICES Journal of Marine Science*, 52: 55-66.

SMRU Ltd. (2010) *Approaches to marine mammal monitoring at marine renewable energy developments*. Final Report. SMRU Ltd, Sea Mammal Research Unit, St Andrews. 110pp.

NATURA 2000 STANDARD DATA FORM

FOR SPECIAL PROTECTION AREAS (SPA)
FOR SITES ELIGIBLE FOR IDENTIFICATION AS SITES OF COMMUNITY IMPORTANCE (SCI)
AND
FOR SPECIAL AREAS OF CONSERVATION (SAC)

1. Site identification:

1.1 Type:

1.2 Site code: New site

1.3 Compilation date: 201104

1.4 Update: 201104

1.5 Relationship with other Natura 2000 sites: UK0030224 (North Antrim Coast).

1.6 Respondent(s): Dr Peter GH Evans, Director, Sea Watch Foundation, Ewyn y Don, Bull Bay, Amlwch, Isle of Anglesey, Wales LL68 9SD

1.7 Site name: Skerries and Causeway (Northern Ireland)*

* While supporting the proposal by the Department of the Environment in Northern Ireland (DoENI) to designate this site as a Special Area of Conservation, with the harbour porpoise as a qualifying feature, the area should probably be enlarged to be appropriate for harbour porpoise. The proposed northern boundary is currently arbitrary and further survey work may indicate that it should ajoin with the southern boundary of the proposed Hebrides site, thus providing biological continuity. It is recommended that surveys be undertaken over a wider area to better examine variation in densities and thus inform potential boundary amendments.

1.8 Site indication and designation classification dates:

date site proposed as eligible as SCI:

date confirmed as SCI

date site classified as SPA

date site designated as SAC

2. Site location:

2.1 Site centre location

latitude

55 14 82 N

longitude

06 36 97 W

²³ In 2012, the Minister for the Environment and Secretary of State for Northern Ireland approved documentation for a new marine SAC (Skerries and Causeway) for reef (grade B), sandbanks slightly covered by seawater at all times (grade B), submerged or partially sea caves (grade B) and harbour porpoise (grade C) features. The UK Government has indicated that it will formally submit this site to Europe in August 2012. Pers Comm Gary Burrows DOENI.

2.2 Site area (ha) 13686.6ha

2.3 Site length (km)

2.5 Administrative region

NUTS code	Region name	% cover
0	Marine	100

UK SAC data form

2.6 Biogeographic region

Alpine Atlantic X Boreal Continental Macaronesia Mediterranean

3. Ecological information:

3.2 Annex II species

Site assessment

Species name	Estimated population size	Continuous or regular presence	Population density in relation to neighbouring areas	Presence in breeding season	Other relevant biological factors	Overall population grading	Conservation	Isolation	Global
<i>Phocoena phocoena</i>	Unknown for area proposed	A	C	B	Feeding, breeding and mating	C	B	C	C

Where:

Estimated population size:

There is no population estimate for the site itself. The Skerries and Causeway lie on the boundary of two survey blocks covered by the SCANS 2 (July 2005) survey. The overall west Scottish population south to the Northern Irish coast (around Rathlin Island) was estimated at 12,100 (CV=0.43), while that for the remaining entire Irish coastal sector except for the Irish Sea coast was estimated at 10,700 (CV=0.37) (Hammond, 2008).

Continuous or regular presence:

Grade A: Porpoises are present both at the site and in the general area in all months of the year, but with a peak presence in summer (Evans, 1997; Evans *et al.*, 2003; Berrow *et al.*, 2005; Evans & Wang, 2005; Berrow, 2008; Berrow *et al.*, 2010; Irish Whale & Dolphin Group, unpublished data; Sea Watch Foundation, unpublished data).

Population density in relation to neighbouring areas:

Grade C: There has been limited offshore survey effort within and adjacent to the area, so that it is difficult to evaluate population densities here in relation to neighbouring areas (Evans & Wang, 2005; Hammond, 2008; Sea Watch Foundation, unpublished data). On the other hand, regular land-based observations have been conducted at twelve locations in the country as part of the Northern Ireland Environment Agency (NIEA) Cetacean Monitoring Programme and the Irish Whale and Dolphin Group (IWDG) Observer Programme (Berrow, 2008; Berrow *et al.*, 2005, 2010; NIEA, 2010). This includes Ramore Head (the main headland within this site) where 140 effort watches between 2001 and 2010 resulted in an average of 0.314 porpoises per hour. This compares with a maximum average sighting rate of 0.568 porpoises per hour at Portmuck (Co. Antrim), but with a substantially lower sample size of effort watches (n=88), and a

minimum rate of 0.243 (n=117 watches) at Grey Point (Co. Down) (NIEA, 2010). Such effort-based watches provide some measure of relative density but may suffer from problems of spatio-temporal autocorrelation if sightings are not independent of one another. Nevertheless, they remain the only long-term dataset collected at the site.

Presence in breeding season:

Grade B: Although it is not possible to compare abundance relative to adjacent areas, porpoises including newborns are seen regularly at the site throughout the peak breeding season (May-August) (Berrow, 2008; NIEA, 2010; Berrow *et al.*, 2010; IWDG, unpublished data; Sea Watch Foundation, unpublished data). Watches at Ramore Head revealed 20.4% of porpoises as ‘calves’ (5.1%) or ‘young’ (15.3%), while a further 10.2% were classified as ‘juveniles’ (NIEA, 2010). It is not explained how these age group distinctions were made and thus how they can be related to estimates of calf : adult ratios elsewhere (it is likely that ‘young’ are equivalent to what most refer to as calves, i.e. born that calendar year), but clearly breeding occurs in the area, and these ratios are relatively high.

Other relevant biological factors:

The general area is used for feeding (year-round), social and mating (July-September) purposes (Evans, 1997; Berrow *et al.*, 2005; Evans & Wang, 2005; Berrow, 2008; IWDG, unpublished data; Sea Watch Foundation, unpublished data).

Overall rating for population:

Grade C: Information on population abundance and density is largely lacking and so it is recommended that offshore surveys of the site and adjacent areas be conducted before boundaries of any proposed SAC are fixed. The regular presence of the species along with relatively high sighting rates by comparison with other watched sites in Northern Ireland indicate that grade C, as recommended by the NIEA, may indeed be most appropriate.

Degree of conservation of features of the habitat important for the species concerned and restoration possibilities:

Grade B: The site provides a number of the finer-scale oceanographic features associated with good foraging and feeding opportunities, including complex topographic features, and strong current systems around the Skerries and between them and the mainland, providing regular replenishment of food resources (Erwin *et al.*, 1986; Barne *et al.*, 1997; Evans, 1997; NIEA, 2010).

Degree of isolation of the population:

Grade C: This wide-ranging species is not isolated, although the population occupying NW Ireland and west Scotland has been recognised as a separate Management Unit from that in the Irish Sea and Celtic Shelf on the basis of various lines of evidence including genetics, tooth ultra-structure and skeletal variation (Evans & Teilmann, 2009).

Global assessment:

Grade C: The area is relatively unpolluted, with low human population densities and little industrial development. Conservation pressures potentially impacting on porpoises that the region faces include commercial fisheries, sound disturbance and vessel strike from various shipping and recreational activities (Barne *et al.*, 1997; Evans, 1997; NIEA, 2010). The Giant’s Causeway is a World Heritage Site for its unique geo-morphological features.

Other Annex II and Annex IVa species:

The following species occur regularly: Atlantic grey seal (II), harbour seal (II), bottlenose dolphin (II), and minke whale (IVa). Also occurring on a more casual basis are: short-beaked common dolphin (IVa), white-beaked dolphin (IVa), Risso’s dolphin (IVa), and killer whale (IVa) (Evans, 1997; Berrow *et al.*, 2005, 2010).

References:

Barne, JH, Robson, CF, Kaznowska, SS, Doody, JP, Davidson, NC and Buck, AL (editors) (1997) *Coasts and Seas of the United Kingdom. Region 17. Northern Ireland*. Joint Nature Conservation Committee, Peterborough.

Berrow, S (2008) *Review of cetacean sightings and strandings data from Northern Ireland, with recommendations for the designation of Special Areas of Conservation*. The Irish Whale and Dolphin Group, Kilrush. 30pp.

Berrow, SD, Whooley, P and Wall, D (2005) *ISCOPE-Irish Scheme for cetacean observation and public education*. Final Report 2003-2005. The Irish Whale and Dolphin Group, Kilrush.

Berrow, S, Whooley, P, O'Connell, M and Wall, D (2010) *Irish Cetacean Review, 2000-2009*. The Irish Whale & Dolphin Group, Kilrush. 58pp.

Erwin, DG, Piction, PE, Connor, DW, Howson, CM, Gilleece, P and Bagues, MJ (1986) *The Northern Ireland Sublittoral Survey*. Report for the Department of the Environment Northern Ireland, Ulster Museum, Belfast.

Evans, PGH (1997) Whales, dolphins and porpoises. Chapter 5.15. Pp. 129-132. In: *Coasts and Seas of the United Kingdom. Region 17. Northern Ireland* (Editors Barne, JH, Robson, CF, Kaznowska, SS, Doody, JP, Davidson, NC and Buck, AL). Joint Nature Conservation Committee, Peterborough.

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Appendix A: Outline of the various protection measures offered to species by the two protection regimes offered in the Habitats Directive (Heslop, 2011^{cxviii}).

Protection of habitats of species	Protection of species alone
<p>Article 6(1) For all the SACs, member states are required to draw up conservation measures. These are positive and apply to all the natural habitat types of Annex I and the species of Annex II present on the sites, except those whose presence is non-significant according to the Natura 2000 data forms.</p>	
<p>Article 6(2) <i>‘Member States shall take appropriate steps to avoid, in the special areas of conservation, the deterioration of natural habitats and the habitats of species as well as disturbances of the species for which the areas have been designated, in so far as such disturbance could be significant in relation to the objectives of this directive.’</i> It is important to remember that the protection afforded by 6(2) is preventative rather than reactive.</p>	<p>Regulation 41 41.—(1) A person who— (a)deliberately captures, injures or kills any wild animal of a European protected species, (b)deliberately disturbs wild animals of any such species, (c)deliberately takes or destroys the eggs of such an animal, or (d)damages or destroys a breeding site or resting place of such an animal, is guilty of an offence. (2) For the purposes of paragraph (1)(b), disturbance of animals includes in particular any disturbance which is likely— (a)to impair their ability— (i)to survive, to breed or reproduce, or to rear or nurture their young, or (ii)in the case of animals of a hibernating or migratory species, to hibernate or migrate; or (b)to affect significantly the local distribution or abundance of the species to which they belong. (6) Unless the contrary is shown, in any proceedings for an offence under paragraph (1) the animal in question is presumed to have been a wild animal. (8) A person guilty of an offence under this regulation is liable on summary conviction to imprisonment for a term not exceeding six months or to a fine not exceeding level 5 on the standard scale, or to both. (9) Guidance as to the application of the offences in paragraph (1)(b) or (d) in relation to particular species of animals or particular activities may be published by— (a)the appropriate authority; or (b)the appropriate nature conservation body, with the approval of the appropriate authority. (10) In proceedings for an offence under paragraph (1)(b) or (d), a court must take into account any relevant guidance published under paragraph (9). (11) In deciding upon the sentence for a person convicted of an offence under paragraph (1)(d), the</p>

	<p>court must in particular have regard to whether that person could reasonably have avoided the damage to or destruction of the breeding site or resting place concerned.</p> <p>The main thing to note here is that the disturbance must be deliberate. Disturbance under article 6(2) need not be deliberate.</p>
<p>Article 6(2) NOT limited to intentional acts. The example given in the guidance is of fire – as long as it can reasonably be predicted, there is a duty to take reasonable measures to decrease the risk</p>	
<p>Article 6(2) Limit of habitats and species concerned. The appropriate measures concern only habitats and species <i>'for which the areas have been designated'</i>. In particular, the habitats and species concerned by the measures to be taken are those identified in the Natura 2000 standard data forms. The aim is not therefore to take general conservation measures, but rather to take measures focused on the species and habitats which justified the selection of the special area of conservation. The disturbances and/or deterioration will thus be determined by the information which has been communicated by the member states and which has been used to ensure the coherence of the network for the species and habitats concerned.</p>	
<p>Notification When a site is proposed as an SAC, notice is given to competent authorities, persons whose activities are likely to be affected by the classification of the site and any other persons who ought to be notified. It is worth noting that those who have been notified of this pSAC have been notified that harbour porpoise is not a qualifying feature. This may have an effect on the way they conduct their operations in the area.</p>	
<p>Management scheme Under reg 19 of the 2007 regulations a management scheme may be set up by a competent authority. Any competent authority which established the management scheme must take reasonable steps to exercise its functions in accordance with the scheme.</p>	
<p>Management agreements It is open for the relevant nature conservation body to enter into a management agreement with any person who has an interest in land (including land covered by water) for the purposes of management, conservation or restoration of the site. This agreement can impose obligations on the person and is a binding contract. [NB it is not wholly clear whether the term 'European Site' used in the 2010 Regulations intends to include European Offshore Marine Sites or not. The definition given in reg 8 seems to include both, but at various points in the Regs the two are mentioned separately in the same paragraph. If offshore marine sites are not included in the definition for 'European Site' then the management agreement provisions do not apply.]</p>	

<p>Special nature conservation order An SNCO can make an order specifying operations which would be likely to destroy or damage the flora, fauna, geographical or physiographical features of the site, by reason of which the site is notified. Where someone is carrying out or is intending to carry out such operations, a stop notice may be issued, and the operation cannot be carried out without the consent of the appropriate nature conservation body. The nature conservation body must carry out an appropriate assessment of the proposed operation if it is likely to have a significant effect and is not directly related to the management of the site, and can give consent only if it is satisfied that the plan or project will not adversely affect the integrity of the site.</p>	
<p>Restoration orders Where someone carries out an operation in contravention of a stop notice, there is a power within the act for the court to apply a restoration order to restore the habitat to its former condition.</p>	
<p>Byelaws Regulations 30 and 38 contain a power to make byelaws to protect marine sites, including to prohibit or restrict the killing, taking, molesting or disturbance of living creatures of any description in the site.</p>	<p>43.—(1) This regulation applies in relation to the capturing or killing of a wild animal—</p> <p>(a) of any of the species listed in Schedule 4 (which lists those species listed in Annex V(a) to the Habitats Directive, and to which Article 15 of that directive applies, which have a natural range which includes any area of Great Britain); or</p> <p>(b) of a European protected species, where the capturing or killing of such animals is permitted in accordance with these Regulations.</p> <p>(2) It is an offence to use for the purpose of capturing or killing any such wild animal—</p> <p>(a) any of the means listed in paragraph (3) or (4);</p> <p>(b) any form of capturing or killing from the modes of transport listed in paragraph (5); or</p> <p>(c) any other means of capturing or killing which is indiscriminate and capable of causing the local disappearance of, or serious disturbance to, a population of any species of animal listed in Schedule 4 or any European protected species of animal.</p> <p>(3) The prohibited means of capturing or killing mammals are—</p> <p>(a) the use of blind or mutilated animals as live decoys;</p> <p>(b) tape recorders;</p> <p>(c) electrical and electronic devices capable of killing or stunning;</p> <p>(d) artificial light sources;</p> <p>(e) mirrors and other dazzling devices;</p> <p>(f) devices for illuminating targets;</p> <p>(g) sighting devices for night shooting comprising an electronic image magnifier or image converter;</p> <p>(h) explosives;</p> <p>(i) nets which are non-selective according to their principle or their conditions of use;</p>

	<p>(j)traps which are non-selective according to their principle or their conditions of use;</p> <p>(k)crossbows;</p> <p>(l)poisons and poisoned or anaesthetic bait;</p> <p>(m)gassing or smoking out;</p> <p>(n)semi-automatic or automatic weapons with a magazine capable of holding more than two rounds of ammunition.</p> <p>(4) The prohibited means of capturing or killing fish are—</p> <p>(a)poison;</p> <p>(b)explosives.</p> <p>(5) The prohibited modes of transport are—</p> <p>(a)aircraft;</p> <p>(b)moving motor vehicles.</p> <p>(6) A person guilty of an offence under this regulation is liable on summary conviction to imprisonment for a term not exceeding six months or to a fine not exceeding level 5 on the standard scale, or to both.</p>
<p>Compulsory acquisition Where a management agreement cannot be reached with a person who has an interest in land (this includes business and sporting interests, licences, etc) or where a management agreement is breached which impairs the satisfactory management of the site, the appropriate nature conservation body can acquire the interest compulsorily.</p>	<p>53.—(1) Subject to the provisions of this regulation, the relevant licensing body may grant a licence for the purposes specified in paragraph (2).</p> <p>(2) The purposes are—</p> <p>(a)scientific or educational purposes;</p> <p>(b)ringing or marking, or examining any ring or mark on, wild animals;</p> <p>(c)conserving wild animals or wild plants or introducing them to particular areas;</p> <p>(d)protecting any zoological or botanical collection;</p> <p>(e)preserving public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment;</p> <p>(f)preventing the spread of disease; or</p> <p>(g)preventing serious damage to livestock, foodstuffs for livestock, crops, vegetables, fruit, growing timber or any other form of property or to fisheries.</p> <p>(3) Regulations 41 (protection of certain wild animals: offences), 43 (prohibition of certain methods of capturing or killing wild animals) and 45 (protection of certain wild plants: offences) do not apply to anything done under and in accordance with the terms of a licence granted under paragraph (1).</p> <p>(4) Subject to the provisions of this regulation, the relevant licensing body may grant a licence to permit the taking or the possession or control of certain specimens of any of the species or subspecies listed in Annex II(b) (other than any</p>

bryophyte) or Annex IV to the Habitats Directive notwithstanding that the licence is for a purpose not specified in paragraph (2).

(5) Regulations 41, 43 and 45 do not apply to anything done under and in accordance with the terms of a licence granted under paragraph (4).

(6) A licence under paragraph (4) may be granted only to such persons as are named in the licence.

(7) The relevant licensing body may grant a licence under paragraph (4) only if they are satisfied that the grant of the licence would be consistent with the restrictions in Article 16(1)(e) of the Habitats Directive (namely 'under strictly supervised conditions, on a selective basis and to a limited extent' and 'in limited numbers').

(8) A licence under paragraph (4) must specify—
(a) the species or subspecies of animal or plant to which the licence relates;

(b) the maximum number of specimens which may be taken or be in the possession or control of the person authorised by the licence, or which particular specimens may be taken or be in the possession or control of that person; and

(c) the conditions subject to which the action authorised by the licence may be taken and in particular—

(i) the methods, means or arrangements by which specimens may be taken or be in the possession or control of the person authorised by the licence,

(ii) when or over what period the action authorised by the licence may be taken, and

(iii) where the licence authorises any person to take specimens, the area from which they may be taken.

(9) The relevant licensing body must not grant a licence under this regulation unless they are satisfied—

(a) that there is no satisfactory alternative; and

(b) that the action authorised will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range.

(10) A licence under this regulation which authorises any person to kill wild animals must specify the area within which and the methods by which the wild animals may be killed and must not be granted for a period of more than two years.

(11) Where the appropriate authority exercises any functions under this regulation (see regulation 56(3)), the appropriate authority must from time to time consult the appropriate nature conservation body as to the exercise of those functions, and must not grant a licence of any description unless the appropriate nature conservation body has advised as to the circumstances in which, in its opinion, licences of that description should be granted.

(12) Where the Marine Management

	<p>Organisation exercises any functions under this regulation (see regulation 56(2)(a)(i)), it must from time to time consult Natural England as to the exercise of those functions, and must not grant a licence of any description unless Natural England has advised as to the circumstances in which, in its opinion, licences of that description should be granted.</p> <p>(13) It is a defence in proceedings for an offence under section 8(b) of the Protection of Animals Act 1911(1) (which restricts the placing on land of poison and poisonous substances) to show that—</p> <p>(a)the act alleged to constitute the offence was done under and in accordance with the terms of a licence granted under this regulation; and</p> <p>(b)any conditions specified in the licence were complied with.</p> <p>(14) In paragraph (2) ‘livestock’ includes any animal which is kept—</p> <p>(a)for the provision of food, skins or fur;</p> <p>(b)for the purpose of its use in the carrying on of any agricultural activity; or</p> <p>(c)for the provision or improvement of shooting or fishing.</p>
<p>Appropriate Assessment and Imperative Reasons of Overriding Public Interest (IROPI)</p> <p>Before undertaking or giving consent to undertake a plan or project which is likely to have a significant effect on a European Site, and is not directly connected with the management of that site, a competent authority must carry out an appropriate assessment of the implications of the plan in light of the conservation objectives (the conservation objectives cover only those species which are listed as qualifying features on the data form). If the plan or project has no alternative and there are imperative reasons of public interest to carry it out, it may be carried out despite a negative assessment of the implications for the site.</p>	
<p>Review of existing consents</p> <p>Competent authorities must review existing consents and make an appropriate assessment of the implications for the site in view of the conservation objectives, and may then affirm, modify or revoke it.</p>	
<p>Compensation</p> <p>Where a plan or project is agreed despite a negative assessment, or an existing consent is affirmed on review despite its having a negative effect on the site, the appropriate authority must secure that compensatory measures are taken to ensure the overall coherence of the Natura 2000 network.</p>	

<p>Planning conditions Where the plan or project is a planning application, and the authority believes that the adverse effect can be avoided if the planning permission is subject to conditions or limitations, they can impose such conditions or limitations.</p>	
<p>General development orders There is a requirement that for matters covered by a GDO which are likely to have a significant effect and are not directly connected with the management of the site, developers must obtain written notification of approval before they can begin.</p>	
<p>Special development orders Special development orders cannot grant planning permission for a development which is likely to have a significant effect on an offshore marine site (either alone or in combination with other plans or projects).</p>	
<p>Local development orders A local development order may not grant permission for a development which is likely to have a significant effect and is not directly connected with the management of a European offshore marine site.</p>	

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