European Community Directive
on the Conservation of Natural Habitats
and of Wild Fauna and Flora
(92/43/EEC)

Third Report by the United Kingdom under Article 17

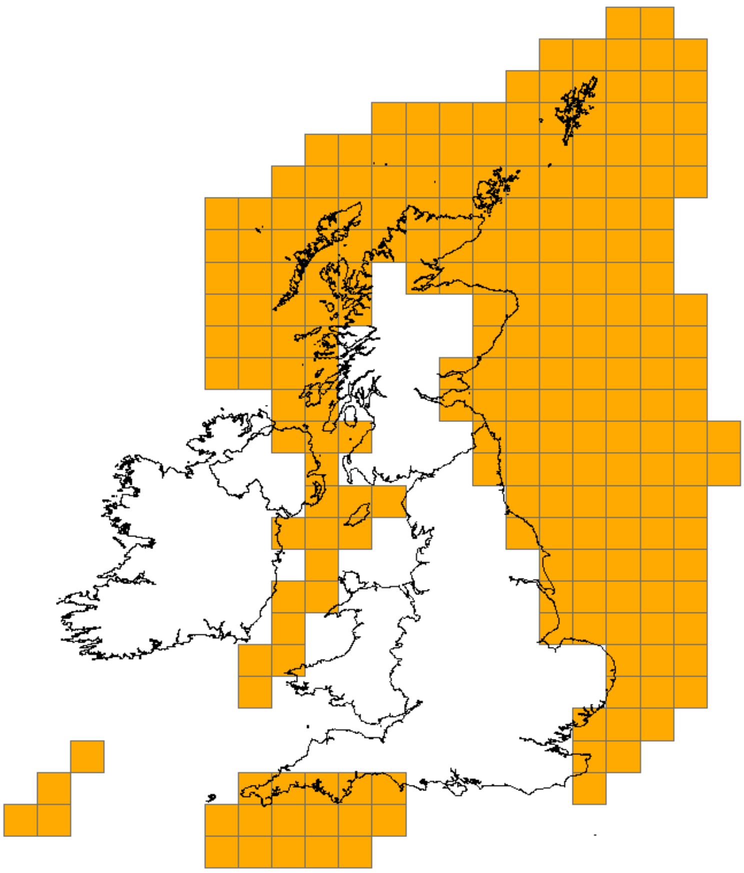
on the implementation of the Directive
from January 2007 to December 2012
Conservation status assessment for

Species:

S2032 - White-beaked dolphin (*Lagenorhynchus albirostris*)

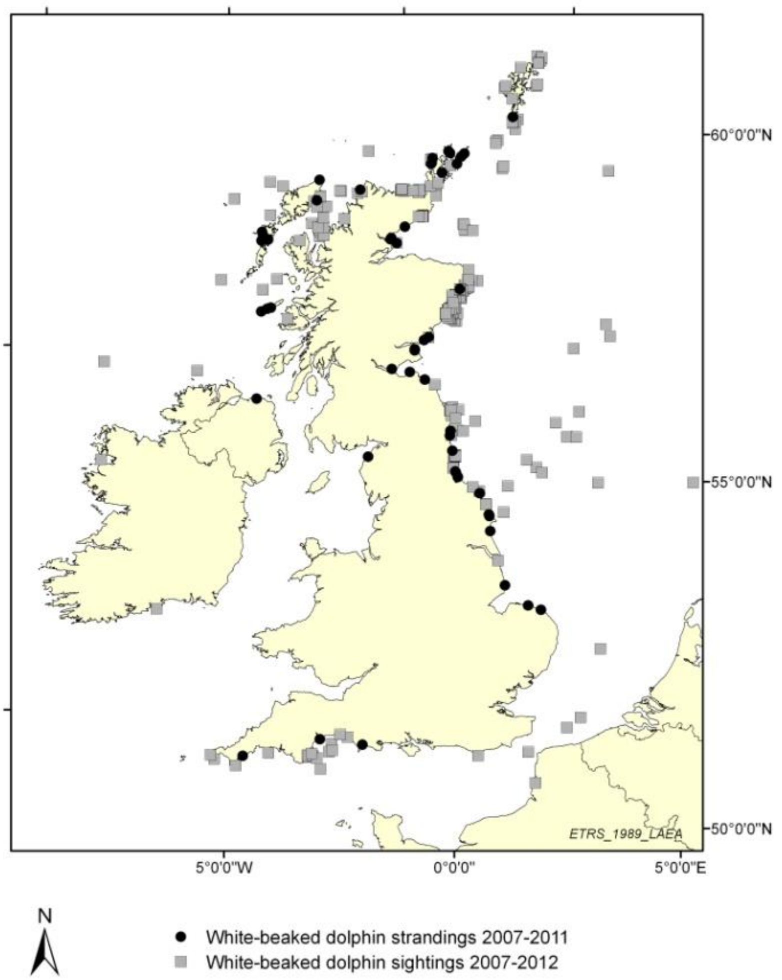
Reporting format on the 'main results of the surveillance under Article 11' for Annex II, IV & V species

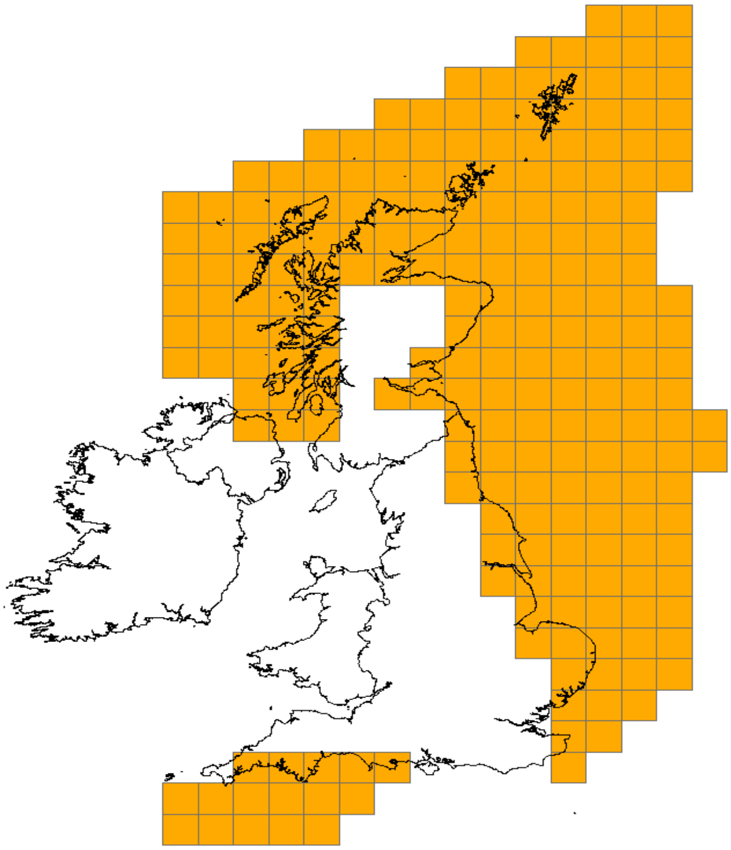
Field name	***Brief explanations***	
0.2 Species	**0.2.1 Species code**	**S2032**
	0.2.2 Species scientific name	***Lagenorhynchus albirostris***
	0.2.3 Alternative species scientific name Optional	
	0.2.4 Common name Optional	

1.1 Maps			
1.1.1 Distribution map		**Sensitive**	**False**
	In UK waters, white-beaked dolphins primarily restrict their range to the continental shelf. The distribution map (based on a model prediction for mid-August 2010; see 1.1.2) shows that white-beaked dolphins may occur in almost all areas of the continental shelf, with the exception of the central Channel and much of the Celtic Sea. However, sightings are uncommon in the Sea of Hebrides (Reid et al. 2003; Paxton et al. 2011) and the Irish Sea		

	(Paxton et al. 2011; Evans et al. 2012). In the southern North Sea and eastern English Channel, this species was also considered uncommon (Reid et al. 2003). However, more recent sightings data suggest that this species occurs relatively frequently in these areas, particularly during spring and winter (Kiszka et al., 2004; van der Meij and Camphuysen, 2006; Brereton et al. 2012). White -beaked dolphins have been observed year-round and sightings are especially frequent between May and October through most of their range (Evans et al., 2003; Reid et al., 2003; Weir et al., 2007; Evans, 2008). The highest number of occasional sightings has been recorded around Orkney and Scotland, with records also in Shetland and southeast Scotland waters. Occasional sightings of relatively large pods (up to 20 individuals) have also been recorded off the UK south coasts of Devon, Dorset, and Sussex (Sea Watch Foundation, website). The frequency of sightings in these areas is greatest in the western English Channel, and their distribution is particularly centred on Lyme Bay where encounters have been recorded annually since 2006; some with groups of up to 200 individuals. They have been recorded year-round, with a preliminary estimate from photo-identification of 200-250 animals utilising the area since 2007 (Brereton et al., 2009). Described in 1987 as the third most commonly reported species in the North Sea strandings and sightings records have declined since 1991. Records between 2000 and 2005 showed that the distribution of strandings had changed, with a decline in records from the southern North Sea and an increase from Yorkshire to the extreme north of Scotland. Distribution of strandings showed a northward shift with all reports in 2000 coming from Orkney, Shetland and the Highlands. In 2001, all recorded strandings came from Scotland (including a mass stranding of 8 animals in Shetland) (Jepson, 2005; Evans, 2008). However, since 2005, the pattern in the strandings data is less clear. Between 2005-2010 a total of 70 individuals stranded along the UK coastline (50 in Scotland, 19 in England) (Deaville and Jepson, 2011); a further 9 stranded in 2011 (5 in Scotland, 4 in England) (Deaville, 2011), and 7 between January and June 2012 (3 in England, 1 in Scotland) (Deaville, 2012). Regionally, MacLeod et al. (2005) found that white-beaked dolphin strandings on the west coast of Scotland were significantly fewer during 1998-2003 compared with 1992-1997. It was suggested that this trend was due to rising seawater temperature as a result of climate change, leading to a northward shift in distribution of white-beaked dolphins and an increase in occurrence (and strandings) of the common dolphin. However, since this study, the decline in frequency of white-beaked dolphin strandings on the west coast of Scotland has not persisted: from the CSIP database for the Scottish west coast only there were 9 strandings (1992-1997), 5 (1998-2003), 14 (2004-2009) and 6 (2010-2011). Also sightings data collected by the Hebridean Whale and Dolphin Trust (HWDT) show fairly regular encounters to the southwest of the Outer Hebrides in the Sea of Hebrides from surveys during 2003-2011 (HWDT, 2012).

1.1.2 Method used - map	**Estimate based on partial data with some extrapolation and/or modelling**
	The distribution map was based on an analysis of effort related survey data spanning 1994-2010 compiled for the Joint Cetacean Protocol (http://jncc.defra.gov.uk/page-5657). Sightings data were standardised and a model fitted using a suite of explanatory environmental covariates (Paxton et al. in prep). The best model was used to predict density of white-beaked dolphins across a prediction grid with a resolution of 5x5km, at a variety of spatial and temporal scales. For the purposes of this reporting period, the predicted density for mid-August 2010 was used to assess distribution of this species. Any grid cell with a density value less than 0.0001/sq km was assigned a zero value (i.e. absence) and cells with density greater than the threshold were assigned a 1 (i.e. presence). A presence surface was then mapped on a grid of 50x50km resolution to summarise distribution; a 50x50km cell was given a

	'presence' code (i.e. 1) if at least 25% of the 5x5km prediction grid cells had a presence (ie. density >0.0001/sq km).
1.1.3 Year or period	**2010**
	The map used to interpret distribution was a mid-August 2010 density prediction derived from modelling a collation of datasets held by the Joint Cetacean Protocol for the period 1994-2010 (Paxton et al. in prep).
1.1.4 Additional distribution map Optional	**Additional Map 1** 
	Paxton et al. (in prep) modelled the distribution of white-beaked dolphins based on an analysis of data collected between 1994 and 2010. The data are from a wide variety of sources but all surveys collected survey effort data and sightings i.e. opportunistic sightings were not used. The data were standardised and corrections applied to account for animals missed during surveys, and detections modelled using a variety of environmental covariates, year, season and latitude and longitude. The best model was used to predict spatial distribution at a 5x5km resolution for mid-August for each year (i.e. 1994-2010) (Paxton et al., in prep). The model output for mid-August 2010 was used to assess areas of relatively high and low density for this species. This shows that this species is most commonly found in the North Minch, on the continental shelf west of the Outer Hebrides and in the north/central North Sea. This compares well with the distribution in the cetacean Atlas of Northwest European waters compiled by Reid et al. (2003).

	Additional map 1 shows the locations of strandings (CSIP database) and sightings (SWF database) for the reporting period. Neither source is corrected for spatial and temporal variations in effort; however, the distribution generally agrees well with that predicted by Paxton et al. (in prep).
1.1.5 Range map	
	Range is based on the predicted distribution (1.1.1), actual sightings and expert judgement. Although the predicted density for mid-August 2010 suggests a presence of white-beaked dolphins throughout much of the continental shelf, it is known that sightings in some of these areas (e.g Irish Sea , Evans et al. 2012) are very rare. The Irish Sea, Celtic Shelf and central Channel are therefore considered outwith the regular range of this species. Sightings in the southern North Sea (Van der Meij and Camphuysen 2006; Brereton et al. 2012) and the eastern (Kiszka et al. 2004; Brereton et al. 2011) and Western Channel (Brereton et al. 2009, 2012) , however, are being recorded regularly and these areas are inclued in the current range for this species.

2.1 Biogeographical region & marine regions	**MATL**

2.2 Published sources	**Anderwald, P. and Evans, P.G.H. 2010. Cetaceans of the East Grampian Region. Final Report for the SeaWatch Foundation. 68pp.** **Banguera-Hinestroza, E., Bjorge, A., Reid, R.J., Jepson, P. and Hoelzel, A.R. 2010. The influence of glacial epochs and habitat dependence on the diversity and phylogeography of a coastal dolphin species: Lagenorhynchus albirostris. Conservation Genetics. 11:1823-1836.** **Brereton, T., Wynn, R., MacLeod, C., Bannon, S., Scott, B., Wharam, J., Lewis, K., Phillips, J., Martin, C. and Covey, R., 2010. Status of Balearic Shearwater, White-beaked Dolphin and other marine animals in Lyme Bay and surrounding waters. Marinelife, Dorset. Available from http://www.marine-life.org.uk/media/24594/brereton_2010_lyme%20bay%20report_natral%20england.pdf** **Brereton, T., MacLeod, C., Kitching, M., Tait, A., Steel, D., Quigley, M. and Scot, C. 2010a. Importance of the Farne Deeps and surrounding waters off the Northumberland coast for White-beaked Dolphin and other cetaceans and seabirds of Conservation Concern. Natural England. http://www.naturalengland.org.uk/Images/Brereton_2010_Northumberland%20Cetacean%20&%20Seabirds_Marinelife_LR_tcm6-21506.pdf** **Brereton, T.M, Lewis, K. and MacLeod, C.M. 2012. Surveys for cetaceans, seabirds and other large marine animals in the English Channel. Unpublished Charm III Project Final Report. Marinelife, Dorset. Available from http://www.charm-project.org/en/** **Canning, S.J., Santos, M.B., Reid, R.J., Evans, P.G.H., Sabin, R.C., Bailey, N. and Pierce, G.J. 2008. Seasonal distribution of white-beaked dolphins (Lagenorhynchus albirostris) in UK waters with new information on diet and habitat use. J.Mar.Biol.Ass.U.K. 88:1159-1166.** **CSIP database. UK Cetacean Strandings Investigation Programme. http://ukstrandings.org/** **Deaville, R. and Jepson, P.D. 2011. Final report for the period 1st January 2005-31st December 2010. UK Cetacean Strandings Investigation Programme (CSIP).** **Deaville, R. 2011. Quarterly report for the period 1st October-30th December 2011. UK Cetacean Strandings Investigation Programme (CSIP).** **Deaville, R. 2012. Quarterly report for the period 1st April-30th June 2012. UK Cetacean Strandings Investigation Programme (CSIP).** **Edwards, D.L. 2010. Habitat selection of dolphin species in**

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2.3 Range	
2.3.1 Surface area Range	**471115.6**
	The range is based on the distributional data for the reporting period (1.1.1) and expert judgement as to the likely boundaries of the species range. Available data suggest seasonal changes in use of their range. Sightings occur year-round on the west coast, but peak between May-October (Reid et al. 2003). Off the Grampian coast, in the northwest North Sea, sightings data suggest a presence only in summer (Anderwald and Evans, 2010); although this might reflect heightened observer effort and better observation conditions in summer months. In the southern North Sea and eastern Channel, most sightings records are from winter and spring (Van der Meij and Camphysen, 2006; Brereton et al. 2012). In the western Channel, particularly in Lyme Bay, sightings occur year-round (Brereton et al. 2009). There are key areas within the range where this species is most common (e.g around the Outer Hebrides and north/central North Sea) with lower densities elsewhere. The surface area as depicted in the range map (1.1.5) represents the likely greatest extent of this species range considering year-round distribution data.
2.3.2 Method used Surface area of Range	**Estimate based on partial data with some extrapolation and/or modelling**
	The range was based on a model prediction of the distribution of white-beaked dolphins during mid-August 2010 (Paxton et al. in prep). A model was fitted to effort-related survey data comprising the Joint Cetacean Protocol (JCP) spanning 1994-2010 and with coverage within most of the UK EEZ, excluding waters beyond 300m depth. The best model was used to predict white-beaked dolphin density on a gridded surface (resolution 5x5km) at a variety of temporal and spatial scales. The predicted density was used to inform judgement about where this species regularly occurs and therefore determine range. The actual sightings (SWF database) and strandings (CSIP database) collected from around the UK was also used to inform this process (see 1.1.4).
2.3.3 Short-term trend Period	**2001-2010**
2.3.4 Short term trend Trend direction	**stable**
	This is the first reporting period for which the UK has quantified the area of white-beaked dolphin range. The outputs of the JCP (Paxton et al., in prep) can be used to look at historical predicted distribution and inferred range for comparison with the current range (2010). The distribution in 2001 and 2005 was mapped and compared with the current distribution shown in maps 1.1.1 and also sightings and strandings, from which range was inferred. There is some variability more recently (2005 v 2010) in the predicted densities in St Georges Channel and the wider Celtic Shelf; however, the fact that predicted densities are very low for these areas (<0.0003 animals/sq km) coupled with the very few sightings (SWF database), meant that these areas were not considered part of this species regular range. Overall, there appeared to be no change in range. Lambert (2012) used habitat and thermal niche modelling to assess historical and future changes in range in response to changing sea surface temperature. The prediction presented for the period 2000-2008 for white-beaked dolphin fails to capture the occurrence of white-beaked dolphins off the south of the UK in the southern North Sea and

	eastern and western Channel (Kiszka et al., 2004; Meijs and Camphysen, 2006, Brereton et al., 2009, 2012; CSIP database; SWF database). Therefore, Lambert (2012) presents a smaller range for the 2000-2008 period than current data suggests and it is therefore problematic to draw firm conclusions from this. Therefore, at least over the short-term there is no evidence for a contraction in range and it is assumed stable.	
2.3.5 Short-term trend Magnitude Optional	**a) Minimum**	
	b) Maximum	
2.3.6 Long-term trend Period Optional	**1994-2010**	
2.3.7 Long-term trend Trend direction Optional	**stable**	
	This is the first reporting period for which the UK has quantified the area of white-beaked dolphin range. The outputs of the JCP (Paxton et al., in prep) can be used to look at historical predicted distribution and inferred range for comparison. The modelled predicted density for white-beaked dolphin for mid-August 1994, 2001, 2005 and 2010 were compared visually to assess range and changes over this time period. Mapping was carried out as described in 1.1.2. Visually, there appears to have been little change in range since 1994. Core areas, west of Scotland and northeast Scotland are used consistently over time albeit changes in density over time and space are evident. This suggests distribution changes within the range rather than a change in overall range. Lambert (2012) predicted distribution of white-beaked dolphins using a thermal and niche modelling approach for the periods a) 1940-1949 b) 1970-1979 and c) 2000-2008. The models predicted that the distribution of white-beaked dolphins was much wider in 1970-1979 than the other two periods which suggests both expansion and contraction of distribution over the entire period, but driven by changes in sea water temperature. The models are based on summer data only for 1974-2007 and between the 1970s and 2000s predict a contraction in range from the south northwards; white-beaked dolphins are predicted to be absent in the southern and central North Sea, English Channel, Irish Sea and western Ireland for the 2000-2008 period. In contrast to these outputs, the occurrence of this species in the southern North Sea and eastern and western Channel has been well documented since 2006 with annual and year-round records (Kiszka et al., 2004; Meijs and Camphysen, 2006, Brereton et al., 2009, 2012). Therefore current data suggests a wider range than the predictions of Lambert (2012) for the 2000-2008 period suggest. The current range (1.1.5) is also larger than might be inferred from the European Cetacean Atlas, where white-beaked dolphins were effectively absent from the entire Channel area based on data from 1979-1997 (Reid et al. 2003). The predictions of Lambert (2012) did however show white-beaked dolphins to be present in the Channel during the 1970s. Therefore, the evidence is not conclusive with regard range (decrease – Lambert 2012; increase	

<table>
<tr><td rowspan="1"></td><td colspan="2">– compared to Reid et al., 2003 and Brereton et al. 2009) and in the absence of a clear trend it is concluded as stable.
On a regional scale, Macleod et al. (2005) also conclude that the range of white-beaked dolphins off the west coast of Scotland has contracted, particularly between the mid 1990's and late 1990s/early 2000s. This conclusion was based on an analysis of strandings data (1948-2003) and two summer seasons (2002 and 2003) of ferry data on fixed routes between May and September through the Minch. The strandings data suggested that climate change is having an impact on the composition of the cetacean community in this area with greater presence of 'warm water' species, such as common dolphin and declining numbers of 'cold water' white beaked dolphin. The authors suggest that the range of white-beaked dolphins is contracting and that this species is now virtually absent from the southern Minch. However, post this publication, the strandings records for white-beaked dolphin do not support a decline on the west coast; from the CSIP database for the Scottish west coast only the number of strandings was 9 (1992-1997), 5 (1998-2003), 14 (2004-2009) and 6 (2010-2011). The island of Tiree seems to represent the southerly edge of the area of 'regular' strandings in the CSIP database (1989-2011) and the 4 strandings that have occurred here have done so since 2002. There are also sightings in the Sea of Hebrides and southern Minch during the current reporting period (SWF database; HWDT, 2012) which shows that this species still occurs in these waters. Therefore, taking into account recent data, it cannot currently be concluded that the range of white-beaked dolphins has contracted in this area.
On the northeast coast of Scotland, Canning et al. (2008) reported that strandings of white-beaked dolphins had increased since the 1970s (until 2003), in contrast to the declines seen in all other areas. The authors suggest that displacement to this area may be occuring, driven by warming sea temperatures around the UK but comparatively cooler waters off the Grampian coast. In contrast, more recent sightings data from boat-based surveys along the Grampian coast suggest that sightings rates have declined (Canning et al. 2008).
The available evidence suggest that there have been changes in regional/local occurence of this species but currently it is not clear whether this represents a redistribution within range, rather then a change in overall range.</td></tr>
<tr><td rowspan="4">2.3.8 Long-term trend Magnitude
Optional</td><td>a) Minimum</td><td></td></tr>
<tr><td colspan="2"></td></tr>
<tr><td>b) Maximum</td><td></td></tr>
<tr><td colspan="2"></td></tr>
<tr><td rowspan="4">2.3.9 Favourable reference range</td><td>a) Value in km²</td><td></td></tr>
<tr><td colspan="2"></td></tr>
<tr><td>b) Operator for FRR</td><td>approximately equal to</td></tr>
<tr><td colspan="2">The FRR in UK waters is considered to approximately equal the current range.</td></tr>
</table>

	c) FRR is unknown (indicated by "true")	**False**
	d) Method used to set FRR	**Based on expert judgement, the current range for white-beaked dolphins in UK waters has all significant ecological variations for the given biogeographical region, and is sufficiently large to be considered suitable for the survival of the species for the foreseeable future. The current range is therefore considered to approximate the FRR.**
2.3.10 Reason for change Is the difference between the reported value in 2.3.1 and the previous reporting round mainly due to…	**a) Genuine change?**	**False**
	b) Improved knowledge/more accurate data?	**False**
	c) Use of different method (e.g. "Range tool")?	**False**

2.4 Population		
2.4.1 Population size estimation (using individuals or agreed exceptions where possible)	**a) Unit**	**number of individuals**
	b) Minimum	**5307**
	c) Maximum	**18379**
2.4.2 Population size estimation (using population unit other than individuals) Optional *(if 2.4.1 filled in)*	**a) Unit**	
	b) Minimum	
	c) Maximum	
2.4.3 Additional information on population estimates / conversion	**a) Definition of "locality"**	

Optional		
	b) Method to convert data	
	c) Problems encountered to provide population size estimation	
2.4.4 Year or period	**2005-**	
	The estimates of abundance are based on the results of the SCANS-II survey of European continental shelf waters in July 2005 (SCANS-II, 2008).	
2.4.5 Method used Population size	**Estimate based on partial data with some extrapolation and/or modelling**	
	Survey blocks from the SCANS-II continental shelf survey of July 2005 (SCANS-II,2008) were mapped in ArcMap 10.1. The estimated white-beaked dolphin range (2.3.2) was mapped on top and the areas of each of the survey blocks within the range were measured. The density estimates per block were used to derive abundance for each portion of the block within the white-beaked dolphin range (area of block within the range multiplied by the density estimate). All the abundance estimates for each block were summed to give a total abundance throughout the entire UK range. The associated CV and 95% confidence interval were calculated; the lower and upper 95% estimates are presented as the minimum and maximum abundance estimates respectively.	
2.4.6 Short-term trend Period	**2001-2010**	
2.4.7 Short-term trend Trend direction	**stable**	
	Paxton et al. (in prep) report trends by comparing average abundance for each species in the area of interest, in three time periods 1) 1994-2000 2) 2001-2006 and 3) 2007-2010. For the assessment of short-term trends, differences between periods 2) and 3) are assessed. The results show that there was no statistically significant trend at the 5% level in average white-beaked dolphin abundance between period 2) 2001-2006 and period 3) 2007-2010.	
2.4.8 Short-term trend Magnitude Optional	**a) Minimum**	
	b) Maximum	
	c) Confidence interval	

2.4.9 Short-term trend Method used	**Estimate based on partial data with some extrapolation and/or modelling**	
2.4.10 Long-term trend – Period Optional	**1994-2010**	
2.4.11 Long-term trend Trend direction Optional	**stable**	
	For the assessment of long-term trends, differences between average abundance of white-beaked dolphins between periods 1 (1994-2000) and 3 (2007-2010) are assessed by Paxton et al. (in prep). The results show that there was no statistically significant trend at the 5% level. Also a comparison of the SCANS abundance estimates shows no signifcant difference in abundance between 1994 and 2005. Estimated abundance in an equivalent area surveyed in 1994 (2005 blocks J,T,U,V) was 10 666 (CV=0.38), compared to 7 856 (CV=0.30) in 1994 (Hammond et al., 2002).	
2.4.12 Long-term trend Magnitude Optional	**a) Minimum**	
	b) Maximum	
	c) Confidence interval	
2.4.13 Long term trend Method used Optional	**Estimate based on partial data with some extrapolation and/or modelling**	
2.4.14 Favourable reference population	**a) Number of individuals/agreed exceptions/other units**	
	b) Operator	**approximately equal to**
	The results from the SCANS surveys in 1994 and 2005, coupled with the lack of evidence of a population decline, suggest that the current population size approximates the FRV.	
	c) FRP is unknown (indicated by "true")	**False**
	d) Method used to set FRP	**The latest population estimate is the result of the 2005 SCANS-II survey and is a sum of broad sea regions that border all**

		countries of the North Sea, Ireland, France and Spain. White-beaked dolphins were found in the northern and central North Sea and west of Britain and Ireland and the total abundance estimate for European Atlantic continental shelf waters was 16,536 (CV=0.30), with the highest densities occurring in the waters of western Scotland (Hammond et al, in prep). From this, an estimate of white-beaked dolphin abundance for the UK waters was derived; 9,876 individuals (CV=0.32). The population estimate from the first SCANS survey in July 1994 indicated an abundance of 7,856 (CV=0.30) individuals in the North Sea and Channel (Hammond et al., 2002). Crucially, the first SCANS did not survey waters to the west of Scotland where density of this species is greatest. However, estimated abundance in the equivalent area surveyed in 1994 (2005 blocks J,T,U,V) was 10 666 (CV=0.38), compared to 7 856 (CV=0.30) in 1994 (Hammond et al., 2002). Paxton et al. (2011) generated density surface models by month for the period 1985 – 2010 for six species of cetacean in the Celtic Sea, the Irish Sea and the west coast of Scotland. For white-beaked dolphin there were no significant changes in abundance over the entire period. Therefore, in the absence of any declines in abundance since 1994, the current population size is considered to be equivalent to the Favourable Reference population.
2.4.15 Reason for change Is the difference between the value reported at 2.4.1 or 2.4.2 and the previous reporting round mainly due to:	**a) Genuine change?**	**False**
	b) Improved knowledge/more accurate data?	**False**
	c) Use of different method (e.g. "Range tool")?	**False**

2.5 Habitat for the species		
2.5.1 Area estimation	**471115.6**	
	The suitable habitat for this species is assumed to be equivalent to its range.	
2.5.2 Year or period	**2010-**	
2.5.3 Method used Habitat for the species	**Estimate based on partial data with some extrapolation and/or modelling**	
2.5.4 Quality of the habitat	**a) Habitat quality**	**Unknown**
	Cetacean habitats (e.g. feeding and breeding areas) vary temporally and spatially and are influenced by natural and anthropogenic factors (e.g. Ingram et al., 2007; MacLeod et al., 2007; Weir et al., 2007). It is often difficult to determine what features characterise cetacean habitats and in quantifying their extent. *Lagenorhynchus albirostris* is restricted to temperate and sub-Arctic seas of the North Atlantic, usually over the continental shelf in waters 50-100 m deep (Evans et al., 2003; Reid et al., 2003; Evans, 2008) and almost entirely within the 200 m isobath (Evans et al., 2003). The distribution of white-beaked dolphin in Lyme Bay off southwest England can largely be explained by seabed sediment type and water depth (Edwards 2010). In this area, preferred waters depths are greater than 50m and with sandy seabeds (Edwards 2010). Off the Aberdeenshire coast, depth (Weir et al. 2007), slope and aspect (Canning et al., 2008) were all found to be significant predictors of white-beaked dolphin distribution. Ultimately, prey is likely to be the main factor driving their distribution. It was suggested that the high density areas for this species identified off western Scotland (northern Minch, south of the Outer Hebrides and west of the Isle of Lewis) may primarily reflect foraging activities (Harries et al. 2012). Analysis of the stomach contents of stranded white-beaked dolphins around Scotland during 1992-2003 showed that haddock and whiting dominated the diet, with some cod and relatively minor quantities of herring and mackerel (Canning et al. 2008). Most sightings in NW European waters take place at sea surface temperatures (SST) of 11-13°C (total range including outliers 3-17°C) (Evans, 2008), and although they are recorded in every month of the year, there is a significant increase in sightings and a more widespread pattern of distribution between May and October, peaking in July. This peak may be linked to the high concentrations of prey. For example, herring spawn during spring and autumn off north-west Scotland and in the autumn off north Scotland (Pollock et al., 2000), while mackerel move inshore during the summer months (Weir et al., 2007). Off west Scotland, MacLeod et al. (2007) found that white beaked dolphins preferentially occur in highly productive waters with higher chlorophyll-a concentration. Increased summer abundance in inshore waters is supported by a peak in strandings. North Sea records show a large number of females stranding in July, while more males strand in August. Females probably move inshore earlier in the summer than males to give birth (Kinze et al., 1997). The importance of inshore waters as calving grounds was also noted in Nova Scotia waters (Simard et al., 2006). This theory is reinforced by the peak in calf strandings and sightings occurring between June and September in Scottish waters	

	(Canning et al., 2008). In UK waters, sea-surface temperature has been linked to variation in group size of this species, with smaller groups associated with higher temperature (Canning et al., 2008). It may also drive niche partitioning between different species in UK waters; white-beaked dolphins are dominant below 13°C, whereas common dolphins dominate above 14°C (MacLeod et al., 2008). Inter-specific competition in relation to prey may also influence habitat preferences. For example, prior to the 1970s, white-sided dolphins (L. acutus) in U.S. waters were found primarily offshore on the continental slope, while white-beaked dolphins were found on the continental shelf. During the 1970's, there was an apparent switch in habitat use between these two species. This shift may have been a result of the increase in sand lance in the continental shelf waters (Katona et al., 1993; Kenney et al., 1996).	
	b) Assessment method	**Cetacean habitats (e.g. feeding and breeding areas) vary temporally and spatially and are influenced by natural and anthropogenic factors (e.g. Ingram et al., 2007; MacLeod et al., 2007; Weir et al., 2007). It is often difficult to determine what features characterise cetacean habitats and in quantifying their extent. White-beaked dolphins are known to prefer continental shelf waters (Evans et al., 2003; Reid et al., 2003; Evans, 2008) and studies have shown a preference for more productive waters (MacLeod et al., 2007; Banguera-Hinestroza et al., 2010) and cooler waters (MacLeod et al., 2007; Brereton et al. 2010a). Although a quantitative assessment of habitat is not possible, the stable range and population suggest that habitat quality is good.**
2.5.5 Short-term trend Period	**2001-2010**	
2.5.6 Short-term trend Trend direction	**unknown**	
2.5.7 Long-term trend Period Optional	**1994-2010**	
2.5.8 Long-term trend Trend direction Optional	**unknown**	
2.5.9 Area of suitable habitat for the species	**a) Value in km²**	
	b) Absence of data indicated as '0'	

2.5.10 Reason for change Is the difference between the value reported at 2.5.1 and the previous reporting round mainly due to	**a) Genuine change?**	**False**
	b) Improved knowledge/more accurate data?	**False**
	c) Use of different method (e.g. "Range tool")?	**False**

2.6 Main pressures		
a) Pressure	**b) Ranking**	**c) Pollution qualifier**
	H = high importance (max 5 entries) M = medium importance L = low importance	
H03: Marine water pollution	M	X
C02: Exploration and extraction of oil or gas	L	
F02: Fishing and harvesting aquatic resources	L	

Between 1991-2010, 84 post mortem examinations were undertaken on white-beaked dolphins. The main causes of death were live stranding (32%), starvation (13%), infectious disease (11%) and bycatch (8%) (Deaville and Jepson, 2011). Of the 9 stranded animals in 2011, 4 post mortem examinations were undertaken. Of these, 2 deaths were due to starvation, and 2 to live stranding (Deaville, 2011). The only dolphin examined in 2012 died from a Streptococcus infection (Deaville, 2012).
Information on pressures and threats to this species is very scarce. There is long history of hunting in Norway and the Faroe Islands, but records date back to the 1980s.
Although there have been reports of bycatch for this species (Reeves et al., 2009), in the UK bycatch observer programme, no white-beaked dolphins have been recorded, which support the conclusion that incidental catches are not thought to be high enough to represent a serious threat to the species (IUCN, website). As other North Atlantic marine mammal species, white-beaked dolphins are contaminated by organochlorines and other heavy metals (Reeves et al., 2009), as were found to have one the highest levels of perfluorinated organochemicals (FOCs) of the marine mammal species stranded along the southern North Sea coast (Van De Vijver et al., 2003).
This species is also susceptible to noise pollution, and show the strongest avoidance of seismic activity of any cetacean species, with significant increases in fast swimming (Stone, 2003) and significant orientation variation, displaying strong lateral spatial avoidance (Stone and Tasker, 2006). This may be due to the species high frequency hearing, the most sensitive of any known dolphin and as sensitive as the harbour porpoise (Nachtigall et al., 2008)

2.6.1 Method used – Pressures	**mainly based on expert judgement and other data**
	Pressure ranking for *Lagenorhynchus albirostris* is mainly based on expert opinion, published literature and data from post mortem of

	stranded animals, which indicate sources of mortality for this species.

2.7 Threats		
a) Threat	**b) Ranking**	**c) Pollution qualifier**
	H = high importance (max 5 entries) M = medium importance L = low importance	
C03: Renewable abiotic energy use	M	
H03: Marine water pollution	M	X
M01: Changes in abiotic conditions	M	
M02: Changes in biotic conditions	M	
C02: Exploration and extraction of oil or gas	L	
F02: Fishing and harvesting aquatic resources	L	

As this species is restricted to temperate and cold waters, and its distribution has been linked to sea surface temperature (MacLeod et al., 2007; Canning et al., 2008; Brereton et al. 2010), climate change may influence its presence in UK waters. A negative relationship has been found between white-beaked dolphin occurrence and warmer sea surface temperatures around some areas of the UK (west of Scotland- MacLeod et al. 2005 & 2007; northeast Scotland and England – Canning et al. 2008; Brereton et al. 2010a). MacLeod et al. (2005, 2007, 2008) conclude that the occurrence of this species decreases substantially in water temperatures greater than 12-14ºC. It has been suggested that warmer sea surface temperatures around the UK, as a result of climate change, may give rise to a contraction in range of the white-beaked dolphin. However, current evidence is unclear as to whether range is retracting or animals are redistributing throughout the range. Also, the restriction of white-beaked dolphins only to cooler waters is challenged by the more recently occurring white-beaked dolphins in Lyme Bay in the western English Channel. In this area, they occur year round and during the summer, water temperatures can increase to 18ºC (Brereton et al. 2010). On the French side of the English Channel, strandings and most sightings of this species tend to occur in winter and spring (Kiszka et al. 2004). White-beaked dolphins do occur further south in the Bay of Biscay and Straits of Gibraltar, but records are scarce (Pollock et al. 2006, 2007, MarineLife data referenced in Brereton et al. 2010). On the west of Scotland, where a retraction in range (decline in white-beaked dolphin sightings and strandings up to 2003) was suggested by MacLeod et al. (2005) is not strongly supported by more recent strandings (CSIP database) and sightings data (SWF database, HWDT, 2012) in the area. Therefore, conclusive evidence of a retraction in range driven by warmer sea surface temperatures is currently unavailable.
Lambert (2012) predicted distribution of white-beaked dolphins using a thermal and niche modelling approach for a number of climate change scenarios for the period 2010-2099. The models predict a general north-eastwardly contraction in range. This contraction occurs progressively on the west coast of Scotland but is variable in the North Sea, this area seeing an expansion of white-beaked dolphin occurrence in the 20s followed by a retraction in the 40s. The 'baseline' for comparison is the model prediction for 2000-2008

and all modelling was based on summer data for 1974-2007. This baseline model does not predict white-beaked dolphins in the southern and central North Sea, English Channel, Irish Sea and western Ireland for the 2000-2008 period. In contrast to these outputs, the occurrence of this species in the southern North Sea and eastern and western Channel has been well documented since 2006 with annual and year-round records (Kiszka et al., 2004; Meijs and Camphysen, 2006, Brereton et al., 2009, 2012). Therefore current data suggests a wider range than the predictions of Lambert (2012) for the 2000-2008 period suggest. Further work is needed to incorporate more recent distribution data on this species.	
2.7.1 Method used – Threats	**expert opinion**

2.8 Complementary information	
2.8.1 Justification of % thresholds for trends	
2.8.2 Other relevant information	**Very little is known about the life history of white-beaked dolphins. In UK waters, calving takes place primarily in summer. A gregarious species, occurring most commonly in groups of up to 10 animals in UK waters, although much larger groups may occur later in summer.**
2.8.3 Trans-boundary assessment	

2.9 Conclusions ***(assessment of conservation status at end of reporting period)***		
2.9.1 Range	**a) Conclusion**	**Favourable**
	There is no evidence for a decline in range for this species. There is some variability in predicted density at the southern extremes of the UK range, but density in these areas is effectively zero. The effects of climate change have been intimated with a change in distribution of this species off the west of Scotland (MacLeod, 2005); however, other results (Paxton et al. in prep) do not support this. The range of this species is large and should be sufficient to enable core areas of this species range to adapt to changing climatic conditions. Therefore, the current range is considered to approximate the FRV and is expected to be stable over the next two reporting periods. The overall assessment for this parameter is therefore Favourable.	
	b) Qualifier	
2.9.2 Population	**a) Conclusion**	**Favourable**
	The current population abundance is considered to approximately equal the FRV. There is no evidence of a decline of the population in the 'truncated EEZ' (EEZ area inclusive of waters up to 300m deep) between 1994-2010 (Paxton et al. in prep). There are no pressures or threats on this species with known population level effects and so the conclusion for this parameter is, therefore, Favourable.	
	b) Qualifier	

2.9.3 Habitat for the species	**a) Conclusion**	**Favourable**
	In the absence of habitat data, the UK has taken the approach of assuming a link between habitat and range and therefore the assessment of habitat follows that of range. The conclusion for this parameter is favourable.	
	b) Qualifier	
2.9.4 Future prospects	**a) Conclusion**	**Favourable**
	According to the EU guidance for the current reporting period, future prospects should be assessed as favourable if all parameters have good prospects. The evaluation matrix within the guidance was used, and all parameters had good prospects and therefore, the overall assessment of prospects is favourable.	
	b) Qualifier	
2.9.5 Overall assessment of Conservation Status	**Favourable**	
	Conservation measures have been undertaken in the UK and adjacent waters, to protect, survey and monitor marine mammal abundance, health and distribution as part of the requirements of the Habitats Directive. It is important to stress that many human activities that have the potential to affect the assessed species are already regulated with the conservation of marine mammals and other wildlife in mind. Assuming that these measures are maintained and further measures are taken, should other pressures emerge or existing pressures change, then the future prospects for cetacean species in UK waters should be favourable. Monitoring of pressures and the effectiveness of mitigation measures is essential and this is underway for major pressures (e.g. bycatch, noise from seismic, pollution). However the effects of lesser understood impacts are hard to predict. Many cetaceans occurring in UK waters will also use waters of other Member States and those of non-Members, so coordination of conservation measures through, for instance ASCOBANS (Agreement on the Conservation of Small Cetaceans of the Baltic, North East Atlantic, Irish and North Seas) is essential to avoid activities in other waters affecting the animals occurring in UK waters. The Habitats Directive is being implemented by identifying and protecting appropriate sites and monitoring bycatch. The UK government funds a national strandings scheme which aims to provide a coordinated approach to the investigation of cetacean strandings in order to assess the number and trends of stranded cetaceans, and potential causes of death. To further implement the directive, a surveillance strategy for cetaceans is being developed linking to the Joint Cetacean Protocol which ultimately aims to enable transboundary approaches to evaluating the conservation status of cetaceans. The JCP Phase III analysis has proved the value of the approach in enabling assessment of range and trends over the short and long-term in the UK EEZ for the first time. Ultimately, the JCP will broaden its data providers to other European Member States. This is reliant on data contributions	

	from European Member States and will be progressed in 2013. An update of the Atlas of cetacean distribution in north-west European waters, published by Joint Nature Conservation Committee (JNCC) in 2003, will result from this project in 2014. In 2005, the UK was a major supporter of the EU LIFE Nature project SCANS-II which completed a survey for cetaceans in the European Atlantic continental shelf to generate precise estimates of abundance, primarily for the purposes of assessing cetacean bycatch. In 2007, the Cetacean Offshore Distribution and Abundance (CODA) project conducted surveys in European Atlantic offshore waters and estimated abundance of cetaceans and investigated habitat preferences in European Atlantic offshore waters. The UK Department of Energy and Climate Change (DECC, formerly the DTI) has provided funding to initiate plans for the third SCANS survey, scheduled for July 2015/16. The UK is implementing the European Council Regulation EC 812/2004, which lays down measures concerning incidental catches of cetaceans in fisheries, and more generally the bycatch obligations within the Habitats Directive. A dedicated monitoring scheme is operated by the SMRU, while collaborative links with the three fishery research laboratories in the UK also allow selected observations from the Discard Sampling Programmes to be included in assessments of cetacean bycatch. Data from discard surveys conducted by the Centre for Environment, Fisheries and Aquaculture Science (CEFAS), Marine Science Scotland (MSS) and the Agri-Food and Biosciences Institute of Northern Ireland (AFBINI) are used with discretion because discard sampling is not always compatible with protected species monitoring. The UK observer monitoring programme is also designed to fulfil the UK's obligations under Article 12 of the Habitats Directive. Currently, monitoring is focussed on gillnet fisheries off the southwest and some effort in the southern North Sea. Previous monitoring of pelagic fisheries in the northern North Sea and West of Scotland showed that the bycatch was extremely low and that observer effort would be better used in other fisheries where bycatch suspected. No white-beaked dolphins have been recorded as bycaught through the UK monitoring scheme (S. Northridge, pers.comm). The main species bycaught are harbour porpoise, common dolphin and grey seals. However, successful trials of the DDD-type pinger in 2009-2011 in the southwest, has led to the industry being supplied with sufficient devices to equip all vessels in the local fleet. Monitoring of vessels using pingers is being continued under the heading of scientific studies as required by Regulation 812/2004 (Kingston and Northridge 2011). The UK's Marine Management Organisation and the Marine Scotland Compliance Enforcement Unit are currently investigating the development of pinger detection units that may be used to determine compliance. No specific enforcement programme is yet underway, but this is expected during 2013. Concern regarding the impact of anthropogenically derived sound on marine mammals has been rising in recent decades. The range of sources of anthropogenic noise in the marine environment is many and varied. Some activities, e.g. shipping and other motorised vessels, use of explosives, drilling, dredging and construction, all produce noise indirectly. Other sources, such as active sonars operating at a variety of frequencies, air guns and boomers used in seismic surveys, pingers and acoustic harassment devices, are sources of deliberately introduced sound in the marine environment. The impact of this noise varies from

	nil (or attraction, e.g. bow riding) to severe depending on the type, frequency and duration of the noise, as well as the relation to the species of concern. Noise can be tolerated, with normal activity patterns being maintained and evidence of an overt response being observed (Würsig & Richardson 2009). Oil and gas exploration and production generates a variety of noise, including initial geophysical surveys (using seismic methodologies), rig construction and drilling, and, finally, structure removal. Of greatest concern is the noise associated with the seismic surveys which use airguns to generate low frequency sound. The Offshore Petroleum Activities (Conservation of Habitats) Regulations 2001 implements the EU Habitats Directive for all oil and gas activities within the UKCS. As part of these regulations any company wishing to carry out a seismic survey must apply for consent from the DECC, the JNCC are consulted on whether consent should be granted for each individual seismic survey and if a consent is granted, a standard condition is that the operator must follow the JNCC guidelines for minimising the risk to marine mammals during seismic surveys (JNCC, 2010). The guidelines advise on conducting marine mammal observations prior to and during seismic activity and utilizing procedures such as soft start (gradually increasing the number of active airguns to allow animals nearby to move away) to reduce and avoid direct harm to animals. Over the years, most recently in 2010, these guidelines have been reviewed and revised in the light of scientific evidence, technical developments and operational understanding. A recent review of the marine mammal observer data collected during 1995-2010 onboard seismic surveys (Stone, in prep.) has demonstrated the effectiveness of soft start approach, which is a key component of the guidelines. The review also includes an analysis of the responses of marine mammals to airguns. White-beaked dolphins showed avoidance to both large (500 cubic inches) and small airgun arrays (Stone, in prep). This review will be published in 2013 The main concern with aggregate extraction is noise generation during survey work. Non-intrusive studies utilise shallow seismic surveys with boomers, which are considerably quieter than the deep seismic surveys undertaken by the oil and gas industry. Currently, consideration is being given to the possible impact of aggregate extraction works on cetaceans with a view to guidelines being developed for UK waters. However, by comparison to other anthropogenic sound in the marine environment, aggregate extraction is not considered to be a major threat at this time. Marine renewable energy generation is a rapidly evolving industry, with some developments amongst the largest offshore engineering projects ever undertaken. The marine renewables industry encompasses three major sectors: offshore wind, tidal-stream and wave energy. The ICES Working Group on Marine Mammal Ecology (WGMME) assessed the effects of construction and operation of windfarms (ICES WGMME 2010), tidal devices (ICES WGMME 2011) and wave energy converters (ICES WGMME 2012) on marine mammals, work that was synthesised by Murphy et al. (2012a). To date, pile driving constitutes the single most important type of impact. In the UK, operators are required to follow the JNCC guidelines for pile driving (JNCC, 2010a). With the amendments to the Habitats Regulations for England and Wales and the new Offshore Marine Regulations in 2007 (and subsequent amendments in 2010), the offences relating to the protection of European Protected Species (EPS) were revised. EPS are

	species listed on Annex IV. In the territorial waters of Scotland and Northern Ireland, the offence of intentional or reckless disturbance has been incorporated together with the deliberate injury and disturbance regulations. In England and Wales, this offence is covered by the Wildlife and Countryside Act 1981 (as amended). The JNCC, Natural England and the Countryside Council for Wales have provided advice on interpreting these regulations from the point of view of nature conservation. Guidance was developed for those carrying out activities in the marine environment, to help determine the likelihood of committing an offence, how this can be avoided, and, as a last resort, whether the activity could go ahead under licence. In addition, good practice guidelines and protocols were developed for specific activities (pile driving, seismic surveys and use of explosives) to minimise the risk of injury and reduce disturbance to cetaceans. With respect to the consequence of certain developments, if the activities involved are not likely to be detrimental to the Favourable Conservation Status of a population but an EPS could still be harmed (injured or significantly disturbed), then the applicant should apply for a licence from the relevant regulator to undertake these activities should mitigation or alternative solutions not be viable. Currently, a draft version of these guidelines is being used by industry until they formally receive Cabinet clearance. Similar guidelines, 'The Protection of marine European Protected Species from Injury and Disturbance' were drafted in 2012 for Scottish Inshore Waters. The impact of military activity and, in particular, use of low- and mid-frequency active sonar of high-intensity has become a major issue in recent years. The UK Ministry of Defence (MOD) has developed a number of measures to address the potential impact of military sonar and noise in the marine environment. The Royal Navy uses a range of measures to mitigate potential impacts on marine mammals including "soft starts" (the gradually progressive ramping up of active sonar source levels to allow animals to move away from the vessel conducting the exercise), use of trained marine mammal observers and reduction of sonar source levels when cetaceans are sighted close to a vessel operating sonar transmissions (data: UK MoD, cited in Jepson et al. 2013). They also require, where ever practicable, naval helicopters and fixed-wing aircraft to maintain a 500m minimum flight altitude if any cetaceans are seen on the surface (data: UK MoD, cited in Jepson et al. 2013). They have also developed a real-time alert procedure for naval training operations. This enables local information on unusual cetacean sightings, such as the presence of a species group closer to shore than usual, to be incorporated into the training schedule and for operations to be relocated if necessary. This was successfully implemented in April 2009, in relation to the presence of short-beaked common dolphin in the Falmouth Bay area. Over 20 dolphins were seen 15 minutes after Royal Navy sonar trials started. The Royal Navy immediately modified the exercise until the group of dolphins had returned to open water several hours later. Subsequently, the real-time alert procedure has not had to be used, indicating the rarity of such events (naval training operations take place for 42 weeks of the year in this area).The rarity of cetacean MSEs in the vicinity of naval exercise areas suggests that such measures are effective. However, this may be dependent on other factors which may contribute to a MSE. The UKs statutory Nature Conservation bodies maintain an open dialogue with the MOD through, for example, their participation on the steering group for the UKs Cetacean Stranding

	Investigation Programme. There is ongoing revision and improvement of mitigation strategies by the military themselves and this is probably the best way to limit future impacts. As a response to the 1992 Convention on Biological Diversity the UK has developed biodiversity action plans (BAP) for all cetacean species. The long term goal of these plans is to increase the range and number of cetaceans in UK waters, ultimately via reducing anthropogenic mortalities and impacts. The UK has been committed to supporting several international agreements and conventions on the conservation of marine mammals and the marine environment in general (e.g. ASCOBANS, The Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR)).
2.9.6 Overall trend in Conservation Status	

3 Natura 2000 coverage & conservation measures - Annex II species ***(only applies to species listed under Annex II of the Directive)***	

3.1 Population		
3.1.1 Population size Estimation of population size included <u>in the SAC network</u>	**a) Unit**	
	b) Minimum	
	c) Maximum	
3.1.2 Method used		
3.1.3 Trend of population size within the network (short-term trend) Optional		

3.2 Conservation measures

Conservation measures taken (i.e. already being implemented) within the reporting period and provided information about their importance, location and evaluation.

3.2.1 Measure	**3.2.2 Type**					**3.2.3 Ranking** H = high importance M = medium importance L = low importance	**3.2.4 Location** where the measure is PRIMARILY applied			**3.2.5 Broad evaluation of the measure**					
	a) Legal/statutory	**b) Administrative**	**c) Contractual**	**d) Recurrent**	**e) One-off**		**a) Inside**	**b) Outside**	**c) Both inside & outside**	**a) Maintain**	**b) Enhance**	**c) Long term**	**d) No effect**	**e) Unknown**	**f) Not evaluated**