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

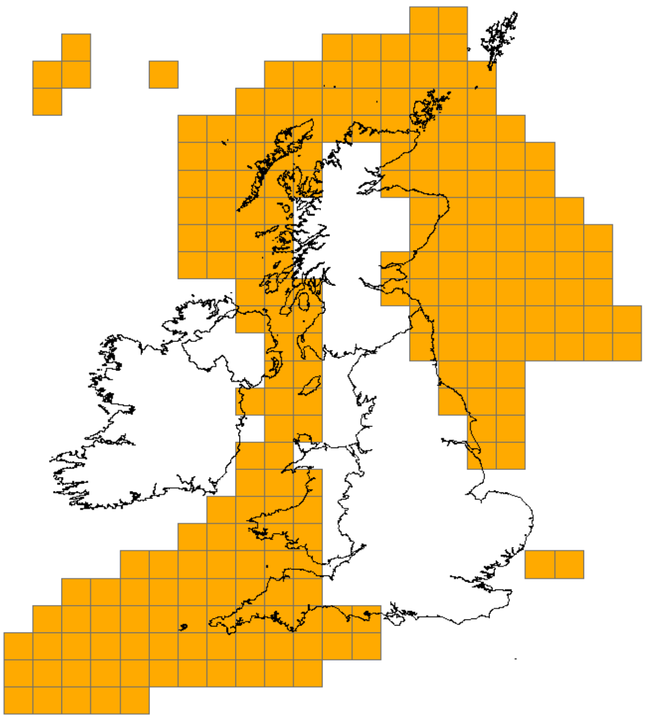
on the implementation of the Directive
from January 2007 to December 2012
Conservation status assessment for

Species:

S1350 - Common dolphin (*Delphinus delphis*)

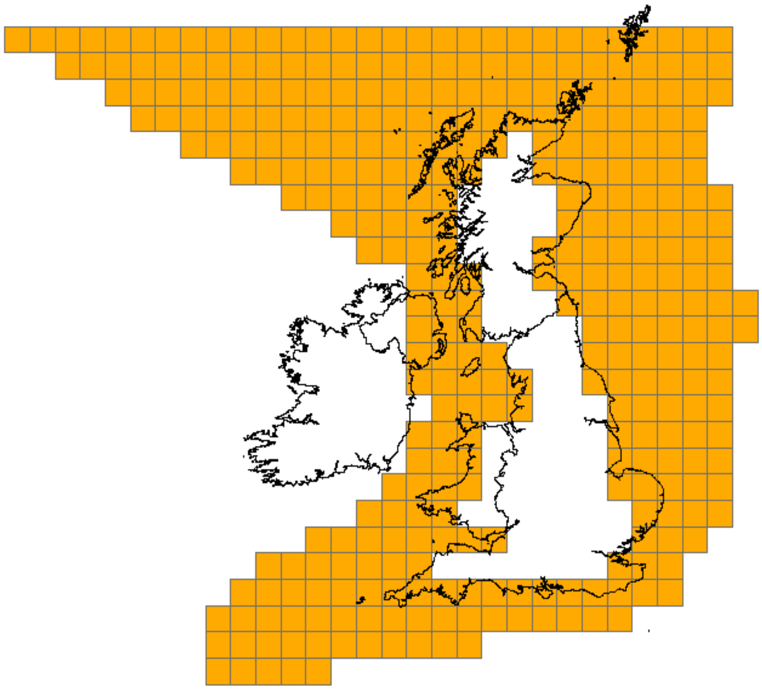
Reporting format on the 'main results of the surveillance under Article 11' for Annex II, IV & V species

Field name	*Brief explanations*	
0.2 Species	**0.2.1 Species code**	**S1350**
	0.2.2 Species scientific name	***Delphinus delphis***
	0.2.3 Alternative species scientific name Optional	
	0.2.4 Common name Optional	

1.1 Maps			
1.1.1 Distribution map		**Sensitive**	**False**
	The distribution map suggests that common dolphins occur in most waters of the UK EEZ with the exception of the most northerly areas, north of the Shetland Islands. The		

	distribution map probably under represents occurrence in offshore waters due to the limited amount of sampling in waters beyond the continental shelf edge. Within the distribution, areas are used differentially, with highest densities regularly occurring in the southern Irish Sea (in the vicinity of the Celtic Sea front), Celtic Sea and southwest Ireland. Although animals do occur in the North Sea, densities are very low.

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 common 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). This presence/absence surface was then mapped against 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. Sightings from the Cetacean Offshore Distribution and Abundance (CODA) survey in July 2007 were also mapped as the survey area lies predominantly beyond the JCP prediction area. These sightings were also converted to presence at a 50x50km resolution.
1.1.3 Year or period	**2006-2012**
	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). Additionally, sightings data from the July 2007 Cetacean Offshore Distribution and Abundance survey were used to look at distribution beyond the continental shelf (CODA, 2009).
1.1.4 Additional distribution map Optional	**False**
	Paxton et al. (in prep) predicted the distribution of common dolphins on mid-August 2010 based on analysis of data collected between 1994 and 2010. The data are from a wide variety of sources but all surveys recorded survey effort 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 assessed for areas of relatively high and low density for this species. The map shows that this species is most commonly found on the west coast of the UK (and Ireland), particularly in the southwest approaches and around the Inner and Outer Hebrides. Predicted densities were very low throughout the North Sea, English Channel and Northern Isles.

1.1.5 Range map	
	Range is based on the predicted distribution, actual sightings and expert judgement. The only part of the UK EEZ considered out with the normal range for this species is north of the Shetland Islands. Although there were only infrequent sightings of common dolphins in the North Sea between 1978 and 1998, the majority of which were in northern British waters (Reid et al. 2003), during the 1990s and 2000s common dolphins were documented (sightings and strandings) in both the North and Baltic Seas in Danish, German, Polish, Finnish, Swedish and Norwegian waters (ICES WGMME 2005). In UK waters, common dolphins have been recorded each summer in the Moray Firth (Scottish North Sea) from 2006 to 2009, with up to 13 encounters and group sizes ranging from 2 to 450+ individuals (Robinson et al. 2010). This summertime presence has continued since 2009 (K.P. Robinson pers. comm.). MacLeod et al. (2005) also reported an increase in the abundance (sightings and strandings) of common dolphins off the northwest Scottish coast during the period 1992 to 2003. Taken together, these data suggest that the distribution of common dolphins is once again expanding into more northern waters, including the North Sea and based on this evidence, is included as part this species range.

2.1 Biogeographical region & marine regions	**MATL**
2.2 Published sources	**Bacon, S. and Carter, D.J.T. 1993. A connection between mean wave height and atmospheric pressure gradient in the North Atlantic. International Journal of Climatology, 13, 423-436.** **Baines, M. E. and Evans, P. G. H. 2012. Atlas of the marine mammals of Wales. Countryside Council for Wales CW Marine Monitoring report No. 68. 2nd edition. 139pp.** **Baker, J. and Smeenk, C. 1987. Time series analysis of Tursiops**

truncatus, Delphinus delphis, and Lagenorhynchus albirostris strandings on the Dutch coast. ECS Newsletter, 1, 14-18.

Barnett, J., Davison, N., Deaville, R., Monies, R., Loveridge, J., Tregenza, N. and Jepson, P. D. 2009. Postmortem evidence of interactions of bottlenose dolphins (Tursiops truncatus) with other dolphin species in south-west England. Veterinary Record 165, 441-444.

Beaugrand, G., Edwards, M., Brander, K., Luczak, C. and Ibanez, F. (2008), Causes and projections of abrupt climate-driven ecosystem shifts in the North Atlantic. Ecology Letters, 11: 1157–1168.

Berrow, S. D. and Rogan, E. 1997. Review of cetaceans stranded on the Irish coast, 1901-95. Mammal Review 27, 51-76.

Brereton, T., Williams, A. and Martin, C. 2005. Ecology and status of the common dolphin Delphinus delphis in the English Channel and Bay of Biscay 1995-2002. In Proceedings of the workshop on common dolphins: current research, threats and issues, Special Issue April 2005,. Kolmarden, Sweden 1st April, 2004. K. Stockin et al. (eds). pp 15-22

Brophy, J., Murphy, S. and Rogan, E. 2009. The diet and feeding ecology of the common dolphin (Delphinus delphis) in the northeast Atlantic. Report to the International Whaling Commission, SC/61/SM14.

Burgess, E. A. 2006. Foraging ecology of common dolphins (Delphinus sp.) in the Hauraki Gulf, New Zealand. MSc thesis, Massey University, Auckland.

Cañadas, A., Donovan, G. P., Desportes, G. and Borchers, D. L. 2009. A short review of the distribution of short beaked common dolphins (Delphinus delphis) in the central and eastern North Atlantic with an abundance estimate for part of this area. North Atlantic Sightings Surveys. NAMMCO Scientific Publications 7, 201-220.

Castège, I., Soulier, L., Hémery, G., Mouchès, C., Lalanne, Y., Dewez, A., Pautrizel, F., d'Elbée, J. and D'Amico, F. 2012. Exploring cetacean stranding pattern in light of variation in at-sea encounter rate and fishing activity: Lessons from time surveys in the south Bay of Biscay (East-Atlantic; France). Journal of Marine Systems. In press.

Clua, E. and Grosvalet, F. 2001. Mixed-species feeding aggregation of dolphins, large tunas and seabirds in the Azores. Aquatic Living Resources 14, 11-18.

Cockcroft, V. G., De Kock, A. C., Lord, D. A. and Ross, G. J. B. 1989. Organochlorines in bottlenose dolphins Tursiops truncatus from the east coast of South Africa. S.Afr. J. Mar. Sci., 8: 207–217

CODA. 2009. Cetacean Offshore Distribution and Abundance in the European Atlantic (CO-DA). 43pp without appendices; 164pp with appendices.

Deaville, R. and Jepson, P. D. 2011. UK Cetacean Strandings Investigation Programme. Final report for the period 1st January 2005 – 31st December 2010. (Covering contract numbers CR0346 and CR0364).

Evans, P.G.H. and Scanlan, G.M. 1989. Historical review of cetacean in British and Irish waters. UK Cetacean Group, c/o Zoology Dept., University of Oxford, South Parks Road, Oxford OX1 3PS, England.

Evans, P. G. H., Anderwald, P., Ansmann, I., Bush, N. and Baines, M. 2007. Abundance of common dolphins in the Celtic Deep / St. George's Channel 2004-06. Unpublished Report to CCW. Oxford: Sea Watch Foundation, 22pp.
Evans, P. G. H. & Scanlan, G. M. 1989. Historical review of cetaceans in British and Irish waters. UK Cetacean Group, c/o Zoology Dept., University of Oxford, South Parks Road, Oxford OX1 3PS, England.

Finneran, J. J., Carder, D. A., Schlundt, C. E. and Ridgway, S. H. 2002. Temporary threshold shift in bottlenose dolphins (Tursiops truncatus) exposed to mid-frequency tones. J. Acoust. Soc. Am. 118 (4): 2696 -2705

Fraser, F.C. 1934. Report on Cetacea stranded on the British Coasts from 1927 to 1932. Trustees British Museum, London, 41 p. + 6 maps.

Fraser, F. C. 1937. Common dolphins in the North Sea. The Scottish Naturalist, 103-105.

Fraser, F. C. 1946. Report on Cetacea stranded on the British caosts from 1933 to 1937. Report on Cetacea 12, London: British Mueum (Natural History).

Goold, J. C. 1996. Acoustic assessment of populations of common dolphin (Delphinus delphis) in conjunction with seismic surveying. Journal of the Marine Biological Association of the United Kingdom 76, 811-820.

Goold, J. C. 1998. Acoustic assessment of populations of common dolphin off the west Wales coast, with perspectives from satellite infrared imagery. Journal of the Marine Biological Association of the United Kingdom 78, 1353-1364.

Goold, J. C. and Fish, P. J. 1998. Broadband spectra of seismic survey air-gun emissions, with reference to dolphin auditory thresholds. Journal of the Acoustical Society of America 103, 2177-2184.

Gosselin, M. 2001. Aspects of the biology of common dolphins

(Delphinus delphis) subject to incidental capture in fishing gears in the Celtic Sea and Channel. MSc thesis, Heriot-Watt University, Edinburgh.

Graham, C.T. and Harrod, C. 2009. Implications of climate change for the fisheries of the British Isles. JournaL of Fish Biology, 74, 1143-1205.

Gray, H. and Van Waerebeek, K. 2011. Postural instability and akinesia in a pantropical spotted dolphin, /Stenella attenuata/, in proximity to operating airguns of a geophysical seismic vessel. /Journal for Nature Conservation /19: 363-367.

Hammond, P.S, Macleod, K., Berggren, P., Borchers, D., Burt, L., Cañadas, A., Desportes, G., Donovan, G. P. , Gilles, A., Gillespie, D., Gordon, J., Hiby, L., Kuklik, I., Leaper, R; Lehnert, K., Leopold, M., Lovell, P., Øien, N., Paxton, C. G., Ridoux, V., Rogan, E., Samarra, F., Scheidat, M., Sequeira, M., Siebert, U., Skov, H., Swift, R., Tasker, M. L., Teilmann, J., Van Canneyt, O., and Vázquez, J. A. In press. Cetacean abundance and distribution in European Atlantic shelf waters to inform conservation and management. Biologcial Conservation

Hassani, S., Antoine, L. and Ridoux, V. 1997. Diets of albacore (Thunnus alalunga) and dolphins (Delphinus delphis and Stenella coerulaeoalba) caught in the Northeast Atlantic albacore drift-net fishery: a progress report. Journal of Northwest Atlantic Fishery Science 22, 119-123.

Hawkins, S.J., Southward, A.J. & Genner, M.J. 2003. Detection of environmental change in a marine ecosystem-evidence from the western English Channel. The Science of The Total Environment 310, 245-256.

Hughes, S.L., Holliday, N.P., Gaillard, F. & the ICES Working Group on Oceanic Hydrography. 2012. Variability in the ICES/NAFO region between 1950 and 2009: observations from the ICES Report on Ocean Climate. ICES Journal of Marine Science 69, 706-719.

Hurrell, J.W. 1995. Decadal trends in the North Atlantic Oscillation regional temperatures and precipitation. Science, 269, 676-679.

Hurrell, J.W., Kushnir, Y., Ottersen, G. and Visbeck, M. 2003. The North Atlantic Oscillation: climatic significance and environmental impact. Geophysical Monograph Series. Washington, DC: American Geophysical Union.

Hurrell, J.W. and Dickson, R.R. 2004. Climate variability over the North Atlantic. Marine Ecosystem and Climate Variation: The North Atlantic, N.C. Stenseth et al., Eds., Oxford University Press, 15-31.

ICES WGMME. 2005. Report of the Working Group on Marine Mammal Ecology, (WGMME), 9-12 May 2005, Savolinna,

	Finland. **ICES WGMME. 2010. Report of the Working Group on Marine Mammal Ecology (WGMME), 12-15 April 2010, Horta, The Azores.** **ICES WGMME. 2011. Report of the Working Group on Marine Mammal Ecology (WGMME), 21-24 February 2011, Berlin, Germany.** **ICES WGMME. 2012. Report of the Working Group on Marine Mammal Ecology (WGMME), 5-8 March 2012, Copenhagen, Denmark.** **IWC. 2009. Annex L. Report of the Sub-Committee on Small Cetaceans 2009. Report of the International Whaling Commission.** **Jepson, P.D., Arbelo, M., Deaville, R., Patterson, I.A.P., Castro, P., Baker, J.R., Degollada, E., Ross, H.M., Herraez, P., Pocknell, A.M., Rodriguez, F., Howiell, F.E., Espinosa, A., Reid, R.J., Jaber, J.R., Martin, V., Cunningham, A.A. and Fernández, A. 2003. Gas-bubble lesions in stranded animals: Was sonar responsible for a spate of whale deaths after an Atlantic military exercise? Nature 425(6958):575-76.** **Jepson, P.D. (ed.) 2005. Cetacean Strandings Investigation and Co-ordination in the UK 2000-2004. Final report to the Department for Environment, Food and Rural Affairs. Pp 1-79. Online. Http://www.defra.gov.uk/wildlife-countryside/resprog/findings/index.htm** **Jepson, P. D. (ed.), Sabin, R. C., Spurrier, C. J. H., Chimonides, P. D. J., Jepson, P. D., Deaville, R., Perkins, M., Cunningham, A. A., Reid, R. J., Patterson, I. A. P., Foster, G., Barley, J., Penrose, R. and Law, R. J. 2005. Trends in cetacean strandings around the UK coastline and cetacean and marine turtle post-mortem investigations, 2000 to 2004 inclusive (Contract CRO 238). Cetaceans Strandings Investigation and Co-ordination in the UK. Report to Defra for the period 1st January 2000 - 31st December 2004. Bristol: Department for Environment, Food and Rural Affairs.** **Jepson, P. D. 2006. Trends in cetacean strandings around the UK coastline and cetacean and marine turtle post-mortem investigations, 2000 to 2004 inclusive. Defra Contract CRO 238.** **Jepson, P. D., Deaville, R., (compilers), Acevedo-Whitehouse, K., Barnett, J., Brownell, R. L., Colloff, A., Clare, F. C., Davison, N., Law, R., Loveridge, J., Macgregor, S. K., Morris, S., Penrose, R., Perkins, M., Pinn, E., Simpson, V., Tasker, M., Tregenza, N., Cunningham, A. A. and Fernández, A. 2009. Investigation of the common dolphin mass stranding event in Cornwall, 9th June 2008. Report to the Department for Environment, Food and Rural Affairs (under a variation to Contract CR0364).**

	Http://randd.defra.gov.uk/Document.aspx?Document=WC0601_8031 TRP.pdf **Jepson PD, Deaville R, Acevedo-Whitehouse K, Barnett J, Brownlow A, et al. 2013. What Caused the UK's Largest Common Dolphin (Delphinus delphis) Mass Stranding Event? PLoS ONE 8(4): e60953. doi:10.1371/journal.pone.0060953** **JNCC, 2010. JNCC guidelines for minimising the risk of injury and disturbance to marine mammals from seismic surveys. Available from http://jncc.defra.gov.uk/pdf/JNCC_Guidelines_Seismic%20Guidelines_Aug%202010.pdf.** **JNCC, 2010a. Statutory nature conservation agency protocol for minimising the risk of injury to marine mammals from piling noise. http://jncc.defra.gov.uk/pdf/JNCC_Guidelines_Piling%20protocol_August%202010.pdf.** **Kannan, K., Blankenship, A.L., Jones, P.D., Giesy, J.P., 2000. Toxicity reference values for the toxic effects of polychlorinated biphenyls to aquatic mammals. Human and Ecological Risk Assessment 6, 181-201.** **Kingston, A. and Northridge, S. 2011. Extension trial of an acoustic deterrent system to minimise dolphin and porpoise bycatch in gill and tangle net fisheries. Report to the MMO under the Fisheries Challenge Fund. Available from: http://marinemanagement.org.uk/fisheries/funding/documents/fcf-acoustic-deterrent.pdf** **Kinze, C. C. 1995. Danish whale records 1575-1991 (Mammalia, Cetacea). Steenstrupia 21, 155–196.** **Kuiken, T., Simpson, V. R., Allchin, C. R., Bennet, P. M., Codd, G. A., Harris, E. A., Howes, G. J., Kennedy, S., Kirkwood, J. K., Law, R. J., Merret, N. R. and Philips, S. 1994. Mass mortality of common dolphins (Delphinus delphis) in south west England due to incidental capture in fishing gear. Veterinary Record 134, 81-89.** **Lambert, E., MacLeod, C.D., Hall., K., Brereton, T., Dunn, T.E., Wall, D., Jepson, P.D., Deaville, R. and Pierve, G.J. 2011. Quantifying likely cetacean range shifts in response to global climate change: implications for conservation strategies in a changing world. Endangered Species Research, 15, 205-222.** **Learmonth, J. A., Santos, M. B., Pierce, G. J., Moffat, C. F., Rogan, E., Murphy, S., Ridoux, V., Meynier, L., Lahaye, V., Pusineri, C. and Spitz, J. 2004. Dietary studies on small cetaceans in the NE Atlantic using stomach contents and fatty acid analyses. BIOCET workpackage 6 - final report. Project reference: EVK3-2000-00027, 99 pp.** **López, A., Santos, M. B., Pierce, G. J., González, A. F., Valeiras, X. and Guerra, A. 2002. Trends in strandings and by-catch of**

marine mammals in north-west Spain during the 1990s. Journal of the Marine Biological Association of the United Kingdom 82, 513-521.

Mackay, A.I. 2011. An investigation of factors related to the bycatch of small cetaceans in fishing gear. PhD thesis, University of St Andrews, St Andrews.

MacLeod, C. D., Bannon, S. M., Pierce, G. J., Schweder, C., Learmonth, J. A., Herman, J. S. and Reid, R. J. 2005. Climate change and the cetacean community of north-west Scotland. Biological Conservation 124, 477-483.

MacLeod, C. D., Weir, C.R., Bego, M, Santos, B. and Dunn, T. E. 2008. Temperature-based summer habitat partitioning between white-beaked and common dolphins around the United Kingdom and Republic of Ireland. Journal of the Marine Biological Association of the United Kingdom. 88(6), 1193–1198.

MacLeod, C. D., Brereton, T. and Martin, C. 2009. Changes in the occurrence of common dolphins, striped dolphins and harbour porpoises in the English Channel and Bay of Biscay. Journal of the Marine Biological Association of the UK 89, 1059-1065.

Macleod,K., Burt, M.L., Cañadas, A., Rogan, E., Santos, B., Uriarte, A., Van Canneyt, O., Vázquez, J. A. and Hammond, P. S. 2009. Design-based estimates of cetacean abundance in offshore European Atlantic waters. Appendix I in the Final Report of the Cetacean Offshore Distribution and Abundance in the European Atlantic. 16pp

Murphy, S. 2004. The biology and ecology of the common dolphin (Delphinus delphis) in the North-east Atlantic. PhD, University College Cork.

Murphy, S., Collet, A. and Rogan, E. 2005a. Mating strategy in the male common dolphin Delphinus delphis: what gonadal analysis tells us. Journal of Mammalogy 86, 1247-1258.

Murphy, S., Mirimin, L., Englund, A. and Mackey, M. 2005b. Evidence of a violent interaction between Delphinus delphis L. and Tursiops truncatus (Montagu). Irish Naturalists' Journal 28, 42-43.

Murphy, S., Herman, J. S., Pierce, G. J., Rogan, E. and Kitchener, A. C. 2006. Taxonomic status and geographical cranial variation of common dolphins (Delphinus delphis) in the eastern North Atlantic. Marine Mammal Science 22, 573-599.

Murphy, S., Northridge, S., Dabin, W., Van Canneyt, O., Ridoux, V., Rogan, E., Philpott, E., Jepson, P., Deaville, R., Reid, B. and Morizur, Y. 2007b. Biological parameters of common dolphin population resulting from stranded or bycaught animals in the

	Northeast Atlantic. NECESSITY Contract 501605 Periodic Activity Report No 2 – Annex 6.2. **Murphy, S., Evans, P. G. H. and Collet, A. 2008. Common dolphin Delphinus delphis. In Mammals of The British Isles. Handbook 4th Edition, S. Harris & D.W. Yalden (eds). [city]: The Mammal Society, 719-724.** **Murphy, S., Natoli, A., Amaral, A. R., Mirimin, L., Viricel, A., Caurant, F., Hoelzel, R. and Evans, P. 2009a. Short-beaked common dolphin Delphinus delphis. In Report of ASCOBANS/HELCOM small cetacean population structure workshop. 8-10 October 2007, UN Campus, Hermann-Ehlers-Str. 10, 53113 Bonn, Germany, 111-130.** **Murphy, S., Winship, A., Dabin, W., Jepson, P. D., Deaville, R., Reid, R. J., Spurrier, C., Rogan, E., López, A., González, A. F., Read, F. L., Addink, M., Silva, M., Ridoux, V., Learmonth, J. A., Pierce, G. J. and Northridge, S. P. 2009b. Importance of biological parameters in assessing the status of Delphinus delphis. Marine Ecology Progress Series 388, 273-291.** **Murphy, S., Pierce, G. J., Law, R. J., Bersuder, P., Jepson, P. D., Learmonth, J. A., Addink, M., Dabin, W., Santos, M. B., Deaville, R., Zegers, B. N., Mets, A., Rogan, E., Ridoux, V., Reid, R. J., Smeenk, C., Jauniaux, T., López, A., Farré, J. M. A., González, A. F., Guerra, A., García-Hartmann, M., Lockyer, C. and Boon, J. P. 2010. Assessing the effect of persistent organic pollutants on reproductive activity in common dolphins and harbour porpoises. NAFO/ICES/NAMMCO symposium ""The Role of Marine Mammals in the Ecosystem in the 21st Century"". Journal of Northwest Atlantic Fishery Science 42, 153-173.** **Murphy, S., Pierce, G. J., Law, R. J., Bersuder, R. J., Jepson, P. D., Learmonth, J. A., Addink, M., Dabin, W., Santos, M. B., Deaville, R., Zegers, B. N., Mets, A., Rogan, E., Ridoux, V., Reid, R. J., Smeenk, C., Jauniaux, T., López, A., Alonso Farré, J. M., González, A. F., Guerra, A., García-Hartmann, M., Lockyer, C and Boon, J. P. 2012. Assessing the Effect of Persistent Organic Pollutants on Reproductive Activity in Common Dolphins and Harbour Porpoises. J. Northw. Atl. Fish. Sci. , Vol 42.** **Murphy et al. 2012a. Assessment of the marine renewables industry in relation to marine mammals: synthesis of work undertaken by the ICES Working Group on Marine Mammal Ecology (WGMME). Available at http://iwc.int/cache/downloads/4r0qft5f9vaccwg4ggk0wggws/Synthesis%20of%20work%20undertaken%20by%20the%20ICES%20WGMME%20on%20the%20marine%20renewables%20industry.pdf** **Murphy, S., Pinn, E.H. and Jepson, P.D., in press. A review of the short-beaked common dolphin (Delphinus delphis) in the North-east Atlantic: distribution, ecology, management and conservation status. Oceanography and Marine Biology: An Annual Review**

Neumann, D. R. and Orams, M. B. 2003. Feeding behaviour of short-beaked common dolphins, Delphinus delphis, in New Zealand. Aquatic Mammals 29.1, 137-149.

Northridge, S., Mackay, A., Sanderson, D., Woodcock, R. and Kingston, A. 2004. A review of dolphin and porpoise bycatch issues in the Southwest of England. An occasional report to the Department for Environment Food and Rural Affairs. St Andrews: Sea Mammal Research Unit.

Northridge, S. and Kingston, A. 2009. Common dolphin bycatch in UK fisheries. International Whaling Commission, SC/61/SM37.

Northridge, S., Kingston, A., Mackay, A., and Lonergan, M. 2011. Bycatch of Vulnerable Species: Understanding the Process and Mitigating the Impacts. Final report to Defra project MF1003. Contract (pp. 1-99). Available from http://randd.defra.gov.uk/Document.aspx?Document=MF1003-FINALRevisedAugust2011.pdf

Northridge, S., Kingston, A. and Thomas, L. 2012. Report to the European Commission on the implementation of Regulation 812/2004 by the United Kingdom for the calendar year 2011.

O'Brien, C.M., Fox, C.J., Planque, B. & Casey, J. 2000. Climate variability and North Sea cod. Nature 404, 142.

Pascoe, P. L. 1986. Size data and stomach contents of common dolphins, Delphinus delphis, near Plymouth. Journal of the Marine Biological Association of the United Kingdom 66, 319-322.

Paxton, C. G. M., Mackenzie, M., Burt, M. L., Rexstad, E. and Thomas, L. 2011. Phase II data analysis of Joint Cetacean Protocol data resource. Report to Joint Nature Conservation Committee contract number C11-0207-0421. Online. Http://jncc.defra.gov.uk/pdf/JCP_Phase_II_report.pdf (accessed 14 March 2012).

Paxton, C. G. M. and Thomas, L. 2010. Phase I data analysis of Joint Cetacean Protocol Data. Report to Joint Nature Conservation Committee on JNCC contract No: C09-0207-0216. Centre for Research into Ecological and Environmental Modelling, University of St Andrews.

Paxton, C.G.M., Scott-Hayward, L., Mackenzie, M., Rexstad, E. and Thomas, L. in prep. Revised Phase III Data Analysis of Joint Cetacean Protocol Data Resource. Draft report to The Joint Nature Conservation Committee. Contract number C11-0207-0421.

Peltier, H., Dabin, W., Daniel, P., Van Canneyt, O., Dorémus, G., Huon, M. and Ridoux, V. 2012. The significance of stranding data as indicators of cetacean populations at sea: Modelling

the drift of cetacean carcasses. Ecological Indicators 18, 278-290.

Peschak, T.P. 2005. Currents of Conract: Life in Southern Africa's Two Oceans. 200 p.

Pierce, G. J., Santos, M. B., Murphy, S., Learmonth, J. A., Zuur, A. F., Rogan, E., Bustamante, P., Caurant, F., Lahaye, V., Ridoux, V., Zegers, B.N., Mets, A., Addink, M., Smeenk, C., Jauniaux, T., Law, R. J., Dabin, W., López, A., Alonso Farré, J. M., González, A. F., Guerra, A., García-Hartmann, M., Reid, R.J., Moffat, C. F., Lockyer, C and Boon, J.P. 2008. Bioaccumulation of persistent organic pollutants in female common dolphins (Delphinus delphis) and harbour porpoises (Phocoena phocoena) from western European seas: Geographical trends, causal factors and effects on reproduction and mortality. Environmental Pollution
153 (2): 401-415

Pikesley, S. K., Witt, M. J., Hardy, T., Loveridge, J., Loveridge, J., Williams, R. and Godley, B. J. 2011. Cetacean sightings and strandings: evidence for spatial and temporal trends. Journal of the Marine Biological Association of the United Kingdom 92 (Special Issue 08): 1809-1820.

Planque, B., and Taylor, A. H. 1998. Long-term changes in zooplankton and the climate of the North Atlantic – ICES Journal of Marine Science, 55: 644–654.

Reid, J. B., Evans, P. G. H. and Northridge, S. P. 2003. Atlas of cetaceans distribution in north-west European waters. Joint Nature Conservation Committee (JNCC), Peterborough.

Robinson, K. P., Eisfeld, S. M., Costa, M. and Simmonds, M. P. 2010. Short-beaked common dolphin (Delphinus delphis) occurrence in the Moray Firth, north-east Scotland. Marine Biodiversity Records, 1-4.

Sabin, R., Jepson, P. D., Reid, P. D. J., Chimindies, R. and Deaville, R. 2002. Trends in cetacean strandings around the UK coastline and marine mammals post-mortem investigations for the year 2002 (contract CRO 238). Report to Defra NO. ECM 516F00/03. London: Natural History Museum.

Santos, M. B., Pierce, G. J., Lopez A, Martinez, M. T., Fernandez, M. T., Ieno, E., Mente, E., Porteiro, P., Carrera, P. and Meixide, M. 2004. Variability in the diet of common dolphins (Delphinus delphis) in Galician waters 1991-2003 and relationships with prey abundance. ICES CM 2004/Q:09.

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

Scott, M., Chivers, S., Olson, R., Fiedler, P. and Holland, K. 2012. Pelagic predator associations: tuna and dolphins in the

eastern tropical Pacific Ocean. Marine Ecology Progress Series 458, 283-302.

Sheldrick, M. C. 1976. Trends in the strandings of Cetacea on the British coasts 1913-72. Mammal Review 6, 15-23.
Silva, M. A. & Sequeira, M. 2003. Patterns in the mortality of common dolphins (Delphinus delphis) on the Portuguese coast, using strandings records 1975-1998. Aquatic Mammals 29.1, 88-98.

Silva, M.A. and Sequeira, M. 2003. Patterns in the mortality of common dolphins (Delphinus delphis) on the Portuguese coast, using stranding records, 1975-1998. Aquatic Mammals, 19(1), 88-98.

Southward, A.J., Langmead, O., Hardman-Mountford, N.J., Aiken, J., Boalch, G.T. et al. 2005. Long term oceanographic and ecological research in the western English Channel. Adv.Mar.Biology, 47, 1-105.

Spitz, J., Mourocq, E., Leauté, J. P., Quéro, J. C. and Ridoux, V. 2010. Prey selection by the common dolphin: fulfilling high energy requirements with high quality food. Journal of Experimental Marine Biology and Ecology, 390, 73-77.

Stockin, K. and Orams, M. B. 2009. The status of common dolphins (Delphinus delphis) within New Zealand waters. Report to the International Whaling Commission, SC/61/SM20.

Stenseth, N.C., Mysterud, A., Ottersen, G., Hurrell, J.W., Chan, K.-S. and Lima, M. 2002. Ecological effects of climate fluctuations. Science, 297, 1292-1296.

Stockin, K. A., Lusseau, D., Binedell, V., Wiseman, N. and Orams, M. B. 2008. Tourism affects the behavioural budget of the common dolphin Delphinus sp. in the Hauraki Gulf, New Zealand. Marine Ecology Progress Series 355, 287-295.

Stone, C. J. and Tasker, M. L. 2006. The effects of seismic airguns on cetaceans in UK waters. Journal of Cetacean Research and Management 8, 255-263.

Stone, C.J. in prep. Marine mammal observations during seismic surveys from 1995-2010. JNCC Report.

Southward A.J. 1963. The distribution of some plankton animals in the English Channel and Approaches. III. Theories about long-term biological changes, including fish. Journal of the Marine Biological Association of the United Kingdom 43: 1-29.

Tregenza, N. J. C., Berrow, S. D., Hammond, P. S. and Leaper, R. 1997. Common dolphin (Delphinus delphis) bycatch in bottom set gillnets in the Celtic Sea. SC/48/SM48. Reports of the International Whaling Commission 47, 835-839.

Tregenza, N. J. C. and Collet, A. 1998. Common dolphin Delphinus delphis bycatch in pelagic trawl and other fisheries in the northeast Atlantic. Reports of the International Whaling Commission 48, 453-459.

Tregenza, N.J.C. and Collett, A. 1998. Common dolphin Delphinus delphis bycatch in pelagic trawl and other fisheries in the North East Atlantic. Report of the International Whaling Commision, 48, 453-459.

U.S. EPA. Exposure Factors Handbook. 1997. Final Report. U.S. Environmental Protection Agency. Washington D.C. EPA/600/P-95/002F a-c, 1997.

Van Canneyt, O., Dabin, W., Demaret, F., Doremus, G. and Gonzalez, L. 2011. Les échouages de mammifères marins sur le littoral français en 2010. Rapport CRMM pour le Ministère de l'Ecologie, du Développement Durable des Transports et du Logement, Direction de l'eau et de la biodiversité, Programme Observatoire du Patrimoine Naturel, 48p.

Viricel, A., Strand, A., Rosel, P., Ridoux, V. and Garcia, P. 2008. Insights on common dolphin (Delphinus delphis) social organization from genetic analysis of a mass-stranded pod. Behavioral Ecology and Sociobiology 63, 173-185.

Wall, D., Channon, N., Williams, D., Enlander, I., Ryan, C. and Wilson, C. 2011. Seasonal distribution of harbour porpoise, common dolphin and minke whale in the Irish Sea as determined from long-term monitoring using commercial ferries. In 19th Annual Conference of the European Cetacean Society, Cadiz, Spain, 21-23 March 2011.

Weir, C. 2008. Short-Finned Pilot Whales (Globicephala macrorhynchus) respond to an Airgun Ramp-up Procedure off Gabon. Aquatic Mammals 2008, 34(3), 349-354

Woollings, T., Lockwood, M., Masato, G., Bell, C. and Gray, L. 2010. Enhanced signature of solar variability in Eurasian winter climate. Geophys. Res. Lett. 37, L20805.

Würsig, B. and Richardson, W.J. 2009. Noise, effects of. Pp. 765–772. In: Perrin, W.F., Würsig, B., and J.G.M. Thewissen, Eds. The Encyclopedia of Marine Mammals, Ed. 2. Academic/Elsevier Press, San Diego, Ca. 1316 pp.

Young, D. D. and Cockcroft, V. G. 1994. Diet of common dolphin (Delphinus delphis) off the south east coast of southern Africa: opportunism or specialization? Journal of Zoology 234, 41-53.

2.3 Range	
2.3.1 Surface area Range	**780779** 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. Although the range of this species varies seasonally (Reid et al., 2003; ICES WGMME, 2005), the map represents the likely greatest extent of this species 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 common 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 common dolphin density on a gridded surface (resolution 5x5sq km) at a variety of temporal and spatial scales. Sightings from the Cetacean Offshore Distribution and Abundance survey (CODA, 2009) were also mapped in ArcMap 10.1 together with the JCP predicted distribution, to provide additional data for UK waters deeper than 300m. These data sources were used to inform judgement about where this species regularly occurs and therefore determine range.
2.3.3 Short-term trend Period	**2001-2012**
2.3.4 Short term trend Trend direction	**stable** This is the first reporting period for which the UK has quantified the area of common dolphin range. It is therefore, not possible to assess any changes within the UK range in a quantitative way. However, the Joint Cetacean Protocol (Paxton et al., in prep) modelled datasets spanning 1994-2010 and covering most of the UK's and Ireland's EEZ up to 300m in depth. Predicted distribution maps for each year in mid-August were generated and were visually inspected for any changes in range. Range within the prediction area remained stable, despite some distributional changes within that range. The JCP analyses do not cover offshore waters, which are an important part of this species range. Changes in use of the range vary seasonally. Incursion onto the shelf of the western English Channel is well documented during winter from sightings (Brereton et al., 2005; MacLeod et al., 2009) and strandings data (Jepson et al., 2005). Similarly, common dolphins present in the Irish Sea from late spring to late summer, appears to shift southwards during autumn and winter, though in the Celtic Deep, where higher densities exist and remain at least until November (Evans et al., 2007, Baines and Evans, 2012, Wall et al., 2011). Goold (1998) noted that the marked decrease in numbers of common dolphins off the west Wales coast between September and October suggests an autumn offshore migration. Sea surface temperature (SST) distribution across the entire region was visualized using infrared satellite imagery, and it was hypothesized from these observations that the offshore migration coincides with a break-up of the Celtic Sea Front (Goold, 1998).
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**	
	Although the overall range of common dolphins in UK waters appears unchanged. There is evidence of changes in the distribution of the NE Atlantic population within the last century, with both an increased occurrence in more northern waters as well as movements into the North Sea. These shifts were observed between the 1920s and 1960s, and also since the 1990s. Increased stranding rates of common dolphins were documented in the southern North Sea during the early to mid-twentieth century along the Dutch (1920s–1960s; Bakker and Smeenk, 1987) and Danish coastlines (1937–1952; including the inner Danish waters, Kinze, 1995), and the east coast of England (1930s–1940s; Murphy et al., 2006). The increase in strandings in the North Sea partially coincided with a decline in strandings along the Irish and south-western English coasts between the late 1930s and mid 1970s (Evans & Scanlan, 1989; Murphy, 2004; Murphy et al., 2006). This may have indicated a shift in the general distribution of the species at that time (Fraser, 1934; Fraser, 1946; Sheldrick, 1976; Evans and Scanlan, 1989; Murphy, 2004; Murphy et al., 2006). Movements of common dolphins into the northern North Sea from the Atlantic occurred in the 1930s, and led to an unusually large number of reported strandings along the Scottish east coast. Notably this took place during an influx of the European flying squid, Todarodes sagittatus, a prey species of the common dolphin into the North Sea (Fraser, 1937, 1946; Evans and Scanlan, 1989; Murphy et al., 2006). It is not known if some of the common dolphins migrated further south to the southern North Sea and later washed up stranded there or if the noted increase in strandings in the southern North Sea was due to movements of individuals through the English Channel (Murphy et al., 2006). There were infrequent sightings of common dolphins in the North Sea between 1978 and 1998, the majority of which were in northern British waters (Reid et al., 2003). Common dolphins were not sighted within the North Sea during either the SCANS or SCANS-II surveys undertaken in July 1994 and 2005, respectively. Conversely, during the 1990s and 2000s common dolphins were documented (sightings and strandings) in both the North and Baltic Seas in Danish, German, Polish, Finnish, Swedish and Norwegian waters (ICES WGMME 2005). Common dolphins have been recorded each summer in the Moray Firth (Scottish North Sea) from 2006 to 2009, with up to 13 encounters and group sizes ranging from 2 to 450+ individuals (Robinson et al., 2010). This summertime presence has continued since 2009 (K.P. Robinson pers. Comm.). Macleod et al. (2005) also reported an increase in the abundance (sightings and strandings) of common dolphins off the northwest Scottish coast during the period 1992 to 2003. Taken together, these data suggest that the distribution of common dolphins	

	is once again expanding into more northern waters, including the North Sea, as apparently occurred in the mid-twentieth century.	
2.3.8 Long-term trend Magnitude Optional	**a) Minimum**	
	b) Maximum	
2.3.9 Favourable reference range	**a) Value in km²**	
	b) Operator for FRR	**approximately equal to**
	The FRR in UK waters is considered to approximately equal the current range. However, it is known that the UK range is only a component of a much larger range of a more widespread population. Seasonal changes in range are also well documented. Analysis of sightings data collated by Reid et al. (2003) indicate that common dolphins are more widely dispersed along the continental shelf edge and in deep offshore waters, as well as in St George's Channel, during the summer (May–October) than in winter (November–April), when there are pronounced concentrations in shelf waters of the western English Channel, St George's Channel, offshore in the Celtic Sea, and also off the coasts of north-west France (western Brittany), south- and north-west Ireland and north-west Scotland (ICES WGMME 2005). These seasonal movements may be related to prey availability and distribution (ICES WGMME, 2005).	
	c) FRR is unknown (indicated by "true")	**False**
	d) Method used to set FRR	**Based on expert judgement, the current range for common 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. However, the range in UK waters is only a proportion of the total range of this species in the Marine Biogeographical region and the required range area is therefore greater than the UK range in isolation. Use of the range also varies seasonally; common dolphins are more widely dispersed along the continental shelf edge and in deep offshore waters, as well as in St George's Channel, during the summer (May–October) than in winter (November–April), when there are**

		pronounced concentrations in shelf waters of the western English Channel, St George's Channel, offshore in the Celtic Sea. The range represented in this reporting period is based on year-round, long-term datasets (1994-2010) to predict range for summer 2010 (Paxton et al. in prep).
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	**9166**
	c) Maximum	**23178**
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 Optional	**a) Definition of "locality"**	
	b) Method to convert data	

	c) Problems encountered to provide population size estimation	
2.4.4 Year or period	**2005-2007**	
	The minimum and maximum abundance are derived from the SCANS-II European continental shelf survey in July 2005 (SCANS-II, 2008) and the offshore CODA survey in July 2007 (CODA, 2009).	
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) and adjoining offshore blocks from the CODA survey in July 2007 (CODA, 2009) were mapped in ArcMap 10.1. The estimated common 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 common dolphins range (area of block within the range multiplied by the estimate of density). 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 intervals were calculated; the lower and upper 95% confidence interval abundance estimates are presented as the minimum and maximum abundance estimates.	
2.4.6 Short-term trend Period	**2001-2012**	
2.4.7 Short-term trend Trend direction	**stable**	
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	**1994-2012**	
2.4.11 Long-term trend	**stable**	

Trend direction Optional		
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**
	c) FRP is unknown (indicated by "true")	**False**
	d) Method used to set FRP	**Common dolphins are one of the most abundant cetaceans in the north-east (NE) Atlantic. Morphometric and genetic assessments indicate that there is only one population in this area (Murphy et al. 2009a) and UK is a small component of it. The estimate abundance calculated for the UK EEZ from the SCANS-II (Hammond et al. in press) and CODA (Macleod et al. 2009) surveys in July 2005 and 2007, respectively, is 14,576 (CV=0.24) common dolphins. Comparatively, the estimate for common dolphin abundance on the European continental shelf, extending from 60N south to the Straits of Gibraltar, from the SCANS-II survey in July 2007 was 52,063 (CV=0.25) (Hammond et al. in press). The CODA (Cetacean Offshore Distribution and Abundance in the European Atlantic) survey, undertaken in July 2007, estimated that there were 116,709**

		(CV=0.34) D. delphis in European offshore waters (beyond the continental shelf, ranging from waters off NW Scotland to NW Spain) (CODA 2009). Highest densities were observed in more southern areas of the surveyed regions, with most sightings along the continental slope off western France and northern Spain. Combining the results of SCANS-II and CODA gives a combined abundance estimate of 180 075 (95% CI: 106 000 – 305 000) (Hammond pers comm. in CP2 report). The abundance of common dolphins in UK waters varies seasonally, with a general peak in autumn but also high numbers in May and June (Paxton, 2011). Paxton et al (in prep) found that there also appeared to be a common dolphin population oscillation on an approximately decadal time scale.
	This is the first time that the 'UK population' of common dolphins has been quantified; previous reports referring to abundance in wider European continental shelf waters. Previous estimates also did not include estimates of abundance in offshore waters since such information only became available after the CODA survey in July 2007 (CODA, 2009). However, there is no evidence of a decline in abundance of common dolphins and therefore, the estimate of abundance presented for this reporting period, is considered approximately equivalent to the FRV.	
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	**780779**
	The suitable habitat for this species is assumed to be equivalent to its range. Common dolphins use different parts of the UK range at different times of the year. For example, the incursion of common dolphins onto the southwest continental shelf during winter has been well documented

	(Brereton et al., 2005; MacLeod, 2009).	
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**
	The distribution of common dolphins is closely linked to the distribution of their prey rather than particular habitat types. Most of the information on diet of common dolphins in the NE Atlantic arises from studies of stomach contents of stranded and bycaught individuals. While these studies have been highly informative they are limited by sampling biases. They provide information on dietary preferences of individuals inhabiting inshore waters primarily during winter, when most strandings occur, and of bycaught dolphins that were either feeding on target prey species of a particular fishery or opportunistically exploiting enhanced prey availability around operating fisheries, including non-target species of those fisheries. For example, common dolphins have been reported to both feed on discards and directly from the codend of trawls, and also inside trawl nets on small non-target prey species. Common dolphins are opportunistic feeders (Young and Cockcroft, 1994), though more recently it has been suggested that they select prey based on energy densities (Santos et al., 2004; Brophy et al., 2009; Spitz et al., 2010). In the NE Atlantic, the diet of common dolphins includes a wide variety of fish and squid species, though it is predominantly composed of a few main species that vary with season and region (Murphy et al., 2008). In areas where preferred prey species are in high abundance, common dolphins tend to select those species. Consequently, diet displays strong inter-annual and seasonal variation (Murphy et al., 2008). During winter, common dolphins in inshore waters prey mainly on shoaling pelagic fishes, whereas in summer, D. delphis caught in tuna driftnets set at night beyond the continental shelf edge, had fed predominantly on squid and mesopelagic fishes, such as lanternfish (Myctophidae). Common dolphins off the southwest coast of the UK consume a wide variety of fish, but primarily sardine *Sardina pilchardus*, mackerel, *Scomber scombrus*, horse mackerel *Trachurus trachurus*, Norway pout, *Trisopterus esmarkii*, other clupeids and various squid species (Pascoe, 1986; Kuiken et al., 1994; Gosselin, 2001). Gosselin (2001) assessed non-empty stomachs from 18 bycaught dolphins that stranded along the south-west coast of the UK between December 2000 and April 2001. Sardine and horse mackerel composed 40% and 37% of the stomach contents, respectively, with Norway pout, mackerel, and Trisopterus sp. found to a lesser extent. Diets were similar to those of bycaught common dolphins that mass stranded along the south-west coast of the UK during the first quarter of 1992 (Kuiken et al., 1994). Mackerel and pilchards (sardines) dominated the diet; the size of the latter was remarkably large ranging from 14 to 30 cm in length. In Scottish waters, fourteen fish taxa and two cephalopod taxa (unidentified Sepiolidae, Alloteuthis subulata) were identified in the stomachs of nine common dolphins that stranded between 2000 and 2003. Mackerel, followed by whiting, were the main prey consumed, together making up more than 40% of the estimated prey weight (Learmonth et al., 2004). In the wild, several distinct feeding strategies have been described for	

	individual common dolphins, including high speed pursuits, 'fish-whacking' (striking with the tail) and 'kerplunking' (rapid tail movement on the surface) (Neumann and Orams, 2003; Burgess, 2006), while cooperative feeding allows dolphins to exploit shoaling prey in an energetically advantageous way (Young and Cockcroft, 1994; Brophy, 2009). Coordinated feeding strategies include carouselling, line-abreast, wall formation, synchronous diving and bubble clouds (Neumann and Orams, 2003; Peschak, 2005; Burgess, 2006). Results from studies of feeding behaviour in New Zealand suggest that variances in prey distribution and productivity, possibly as a result of differing habitats (i.e. shallow waters vs. open ocean), may affect strategy selection (Neumann and Orams, 2003; Burgess, 2006). Common dolphins in the NE Atlantic have been observed in mixed feeding aggregations comprising other cetaceans (e.g. Stenella frontalis, and Tursiops truncatus), large tunas and sea birds (Clua and Grosvalet, 2001). In this region, common dolphins have shown associations with albacore tuna, though it not known how long these associations last. The stomach contents of Delphinus delphis caught in driftnets set for albacore tuna included all the prey species (fish) found in the stomachs of tuna (Hassani et al., 1997). Within the eastern tropical Pacific Ocean the strong associations between yellowfin tuna (Thunnus albacares) and pantropical spotted dolphins (Stenella attenuate) were attributed to the risk of predation, resulting in these species forming large, mixed-species groups, and not due to feeding advantages (Scott et al., 2012).	
	b) Assessment method	**Not applicable.**
2.5.5 Short-term trend Period	**2001-2012**	
2.5.6 Short-term trend Trend direction	**unknown**	
2.5.7 Long-term trend Period Optional	**1994-2012**	
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	
F02: Fishing and harvesting aquatic resources	H	
H03: Marine water pollution	M	
C02: Exploration and extraction of oil or gas	L	
D03: shipping lanes, ports, marine constructions	L	
G01: Outdoor sports and leisure activities, recreational activities	L	
K03: Interspecific faunal relations	L	

A range of traumatic injuries and other causes of death have been diagnosed in common dolphins, with the most significant being bycatch (Kuiken et al., 1994; Deaville and Jepson, 2011). Other impacts include pollution, boat collision (Deaville and Jepson, 2011) and fatal attack from bottlenose dolphins (inter-species aggression) (Murphy et al., 2005b; Barnett et al., 2009).

Common dolphins frequently strand in the northeast Atlantic, especially along the coastlines of Ireland (Berrow and Rogan, 1997; Murphy, 2004), Britain (Sabin et al., 2002; Jepson, 2005; Deaville and Jepson, 2011), France (Tregenza and Collet, 1998; Van Canneyt et al., 2011), Spain (López et al., 2002), and Portugal (Silva and Sequeira, 2003). Recorded strandings of common dolphins have increased in occurrence since 1990, possibly as a result of increased coastal vigilance, a change in the distribution and abundance of common dolphins, an increase in adverse anthropogenic activities, or a combination of these factors. Annual numbers of strandings have fluctuated in recent years in more northern waters, with similar trends apparent in France and the UK (Deaville and Jepson, 2011). Strandings have shown a consistent spatial and seasonal pattern, with pronounced winter peaks (ICES WGMME, 2005), and for most countries, a high proportion of the common dolphins that stranded during these winter peaks exhibited external evidence of bycatch or pathological evidence of bycatch as the most likely cause of death on necropsy (Kuiken et al., 1994; Tregenza and Collet, 1998; Murphy, 2004; Jepson, 2005, 2006; Deaville and Jepson, 2011; Pikesley et al., 2011; Castège et al., 2012; Peltier et al., 2012). Analysis of the age of bycaught dolphins that subsequently stranded along the Irish, UK and French coastlines between 1990 and 2006 showed a higher predisposition to juvenile mortality, with a peak in mortality of three-year olds (Murphy et al., 2007). It is not established what fisheries or type of fishing nets were involved in these incidental mortalities.

A large number and proportion of common dolphins that stranded along the UK coastline were diagnosed as bycatch in most years since 1991, mostly between January and April along the south-west coast of England (Cornwall and Devon) (Deaville and Jepson, 2010). The annual number and bycatch proportion of stranded common dolphins in SW England increased in the late 1990s to a peak in 2004 and then gradually declined thereafter (Jepson, 2006; Deaville and Jepson, 2011). The reasons for the increase and then reduction in numbers (and proportion) of stranded common dolphins that were diagnosed as bycatch in south-west England around 2004 are not fully understood (Jepson, 2006; Deaville and Jepson, 2011), but could in part be due to the ban on pair trawling for bass within 12 nm that came into effect from December 2004 (Fiona Read, pers.comm.).

Conversely, common dolphins have been observed, via an underwater video camera system, inside trawls targeting sea bass in the English Channel during winter. It was suggested that individuals may be actively feeding on small, non-target fish inside the net (Northridge et al., 2004). In addition, dolphins left and entered the trawl net at will, as there were sightings and re-sightings of one or more animals for over an hour (Northridge et al., 2004). Tregenza et al. (1997) suggested that common dolphin may be attracted to gill nets during hauling and shooting, especially when the headline floats strike the steel hoop used to spread the net at the stern of the boat, as this produces a loud rhythmical tonal clatter. Although results from a recent UK study further suggested that interactions with gear during shooting or hauling may have more of an effect on bycatch than gear characteristics, bycatch rates of common dolphins in bottom set-nets may also be driven by a temporal and spatial overlap of animals and fishing gear, rather than specific characteristics (e.g. soak time, mesh size) of that gear (Mackay, 2011).

It is important to identify what age-sex class of individuals are incidentally captured by each fishery in the north-east Atlantic. High mortality of mature (especially pregnant) females, calves and individuals approaching maturity will have a more detrimental effect on the common dolphin population than a high mortality rate of mature males. Analysis of bycaught animals in the predominantly winter European sea bass pelagic trawl fishery revealed a predisposition to capturing juvenile and young adult common dolphins. 85% of aged common dolphins captured by the French fleet were less than 11 years of age, and 90% of aged dolphins caught by the UK fleet were less than 13 years, with a reported peak in the age-frequency distribution at 8 and 9 years (Murphy et al. 2007). These results imply a lack of learned behaviour of juveniles and young mature individuals around nets, whereas mature individuals may have developed suitable behavioural strategies for feeding within trawl nets (Murphy et al., 2007). Alternatively, some older individuals may not partake in this type of foraging behaviour.

See section 3.2 for more detailed information obtained from the bycatch observer programme and work on the mitigation of bycatch through the use of pingers.

Pollutants
Common dolphins are susceptible to the effects of anthropogenic pollutants, such as persistent organic pollutants (POPs), i.e. polychlorinated biphenyls (PCBs), dichlorodiphenylethanes (e.g. dichlorodiphenyltrichloroethane (DDT), a widely used pesticide), hexabromocyclododecane (HBCD), and various heavy metals such as cadmium (Cd) and mercury (Hg). Pollutants enter the body almost exclusively through the diet, and toxins such as POPs are lipophilic compounds that accumulate in the lipid-rich blubber layers of marine mammals. Apart from some heavy metals, pollutants both biomagnify (higher levels higher up the food chain) and bioaccumulate (increase concentration with age). A large number of organochlorine compounds (Ocs), such as PCBs and DDT, are hormone or endocrine disrupting chemicals. Endocrine functions can be altered by these toxins through interference with the synthesis, secretion, transport, binding, action, or elimination of the endogenous natural hormones responsible for homeostasis, reproduction, development, and/or behaviour (U.S. EPA 1997). As animals can be exposed to a complex mixture of compounds, there may be further significant impacts through additive and synergetic effects. Impacts on reproduction: During pregnancy, lipid-soluble contaminants, such as Ocs, may pass from the mother to the fetus. However, the majority (ca 80% of Ocs) of the pollutant burden accumulated by females (primarily prior to sexual maturity) is believed to be transferred to their first-born calf during the first seven weeks of lactation (Cockcroft et al., 1989). In light of this, resting mature females (non-pregnant, non-lactating) with high blubber pollutant burdens and showing signs of recent gravidity may have aborted, or their offspring may have died soon after birth (Murphy et al., 2012).

The most important variable explaining POP profiles in common dolphin blubber was individual feeding history (Pierce et al., 2008). A substantial proportion of individuals in the BIOCET sample had pollutant levels above the threshold 17 mg kg 1 PCB lipid weight (Kannan et al., 2000) reported to have adverse health effects, based on experimental studies of both immunological and reproductive effects in seals, otters, and mink. This threshold was frequently exceeded in common dolphins (40%).

The majority of individuals with contaminant burdens above the threshold level for adverse health effects were resting mature females (83%), with high numbers of ovarian scars (Murphy et al., 2010). This suggests that: (a) due to high contaminant burdens, females may be unable to reproduce, thus continue ovulating, or (b) females are not reproducing for some other reason, either physical or social, and started accumulating higher levels of contaminants (Murphy et al. 2010).

Gas embolism
Between 1992 and 2009, a small number of UK-stranded cetaceans have been diagnosed with acute and chronic forms of gas embolism, including five common dolphins (Jepson et al., 2003; Jepson, 2006; Deaville and Jepson, 2011). The cause of gas embolism is not known but may have a similar mechanism to decompression sickness in humans and experimental animals, and be related to excessive supersaturation of tissues with nitrogen on ascent (Jepson et al., 2003; Jepson, 2006; Deaville and Jepson, 2011).

2.6.1 Method used – Pressures	**mainly based on expert judgement and other data**
	Pressure ranking for common dolphin is mainly based on expert opinion, published literature and data from post mortem of UK stranded animals, which give some indication of the 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	
F02: Fishing and harvesting aquatic resources	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	
D03: shipping lanes, ports, marine constructions	L	
G01: Outdoor sports and leisure activities, recreational activities	L	
K03: Interspecific faunal relations	L	

A large number of pressures and threats have the potential to impact common dolphins in the NE Atlantic, the most significant being adverse fisheries interactions (bycatch). Others include climate change, pollutants

and disturbance. Bycatch, pollution and disturbance are dealt with in the pressures section.
Common dolphins are wide-ranging and have shown a capacity for range expansion. However, the significance of the effects of climate change on the NE Atlantic population is unknown.
The NE Atlantic has a temperate to sub-arctic climate, and around the UK and Ireland common dolphins have been sighted during summer (calving period) in sea surface temperatures ranging between 8.1 and 18.5ºC (mean=14.9ºC; SD=1.6ºC, period: 1983–1998) (MacLeod et al., 2008).

The distribution of the common dolphin in the North Sea fluctuated during the twentieth century. Slight distributional shifts into this sea were observed between the 1920s and 1960s, and also since the 1990s (see 'long-term distributional patterns' section). The water temperatures in the North Sea fluctuated during the last century, with a period of low water temperatures between 1950 and 1979 (Lambert et al., 2011). Following this, an abrupt ecosystem shift, or regime shift, occurred in both pelagic and benthic ecosystems of the North Sea (Beaugrand et al., 2008). Increased water temperature was proposed as the primary factor influencing the distribution and increased occurrence of common dolphins off the north-west coast of Scotland (period: 1992–2003; MacLeod et al., 2005). In these waters, there has been a documented rise in sea water temperature of 0.2–0.4ºC per decade since 1981 (MacLeod et al., 2005). In addition, the recent summertime incursion of commons dolphins into the outer Moray Firth/ north-eastern North Sea was anecdotally attributed to increasing regional sea temperatures (Robinson et al., 2010).

An increase in the observed winter abundance of Delphinus delphis in the western English Channel, between 1996 and 2006 (MacLeod et al., 2009), coincided with an upturn in reported strandings of the species along the south-west coast of the UK (Jepson, 2006; Deaville and Jepson, 2011). During this period, there was a 1ºC rise in the mean annual SST in the western English Channel (1990–2000), which exceeded any other SST change in the area over the last 100 years (Hawkins et al., 2003). In recent years, however, the numbers of stranded common dolphins along the south-west coast of England has declined (Deaville and Jepson, 2010). This could also be partly due to the pair trawling ban within 12 nm for bass for British vessels (Fiona Read, pers.comm.)

Although it has been suggested that temperature is a key limiting factor in the northern limit of common dolphins in western European waters, and individuals may shift their distribution to stay within their thermal niche (Lambert et al., 2011), changes in temperature also affect prey species of the common dolphin, influencing physiological and ecological processes in a number of direct, indirect and complex ways (Graham and Harrod, 2009). The decline in reported strandings off the south-west coast of England between the 1930s and 1970s, after an initial peak in strandings during the 1920s and 30s followed fluctuations in pelagic assemblages (zooplankton and larval fish) during the 1920s and 1930s within the English Channel. Changes were attributed to an increased SST, and a reduced Atlantic flow into the Channel – later known as the Russell cycle – which resulted in a decreased biomass of all higher trophic levels (Southward et al., 2005, and references therein). A decline in the abundance of cold-water fishes in the English Channel was observed at this time (Southward, 1963; Evans and Scanlan, 1989; Southward et al., 2005), with a northward shift in their distribution, and it is believed that common dolphins followed (Fraser, 1934; Evans and Scanlan, 1989; Murphy et al., 2006). The alternation in fish composition during 1926 to 1936 from the cold-water species, herring (Clupea harengus), to the pilchard (Sardina pilchardus), a warm-water species, is seen as a climatically mediated shift (Southward et al., 2005). Within the English Channel, both species have fluctuated in abundance since the 1500s, however on this occasion intense overfishing led to recruitment failure of herring (Southward et al., 2005, and references therein). From the late 1960s onwards, many of the conditions prevailing in the early 1920s returned, along with an increase in common dolphin strandings along the south-west coast of England (Evans and Scanlan, 1989) and the southern and western coasts of Ireland (Murphy, 2004). Since the 1980s however, conditions in the English Channel have changed again, with warm-water species, such as pilchard, increasing in abundance (Hawkins et al., 2003; Southward et al., 2005, and references therein).

Murphy (2004) linked patterns of common dolphin strandings on the Irish coast (1900–2003) with changing oceanographic conditions due to the North Atlantic Oscillation (NAO). The decline in Irish strandings took place during a negative NAO index phase between the mid-1930s to the mid-1970s. Following this, there was a sharp reversal to a highly positive NAO index phase (Hurrell et al., 2003), with an associated increase in common dolphin strandings along the southern and western coasts of Ireland (Murphy, 2004). Changes in

the NAO have had a wide-scale effect on the North Atlantic ecosystem, influencing SST and winds – both linked to alternations in the production of zooplankton – as well as fluctuations in several important fish stocks across the North Atlantic (Planque and Taylor, 1998; O'Brien et al.,2000; Hurrell et al., 2003). Furthermore, the weather conditions associated with the positive phase of the NAO, including an increase in winter storm activity, stronger westerly winds and wave heights (Bacon and Carter, 1993; Hurrell, 1995; Stenseth et al., 2002; Hurrell and Dickson, 2004), could also increase the number of strandings of common dolphins directly, not only by driving carcasses ashore, but also by contributing to the death of diseased or injured individuals. Recent studies have suggested that variability in the NAO index is due to anthropogenic climate change, and this was an explanation for the intensification (strongly positive) of the NAO up to 1997 (Woollings et al., 2010). This period of intensification was abruptly reversed and the NAO was weak and variable between 2000 and 2009, due to shifts in atmospheric pressure patterns, and then strongly negative in the winters of 2010 and 2011 (Hughes et al., 2012).	
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	**Average age at the attainment of sexual maturity was estimated at 11.9 years in males, based on examination of common dolphins sampled by the Irish and French stranding and bycatch observer programs between 1991 and 2003 (Murphy et al. 2005a). Sexually mature males ranged from 195 to 233 cm in length, and 8 to 28 years in age. Applying a single Gompertz growth curve to the male age data produced an asymptotic length of 206 cm (Murphy et al. 2005a). Murphy et al. (2009b) analysed a much larger sample size of stranded and by-caught female common dolphins collected throughout the north-east Atlantic (Scotland to Portugal) between 1990 and 2006. Female body lengths ranged from 91 to 239 cm and the maximum estimated age was 30 years (Murphy et al. 2010). The asymptotic length, estimated using the Richard's model, was 202 cm (Murphy et al. 2009b). Average age and length at sexual maturity was 8.2 years and 188 cm, respectively (Murphy et al. 2009b).** **Based on mortality data from 248 mature females, an annual pregnancy rate of 26% and extended calving interval (gestation, lactation and resting periods) of 3.8 years were determined for the NE Atlantic population. There was no significant difference in the pregnancy rate between different geographical areas (Ireland, UK, France, NW Spain) of the NE Atlantic. The pregnancy rate was also estimated using a control group of 'healthy' individuals, i.e. individuals not suffering from any infectious or non-infectious disease that may inhibit reproduction. As no significant difference was found in proportion of pregnant females between the control group and the whole sample, it appears that the sampling of stranded and by-caught short-beaked common dolphins is adequate for estimating population reproductive parameters.** **In the NE Atlantic, short-beaked common dolphins exhibit reproductive seasonality. A unimodal calving/mating period extends from April to September, with a possibly more active**

	period in July and August (Murphy et al. 2005a, Murphy et al. 2009b). Estimated individual conception dates of sampled fetuses ranged from the 5th April to the 2nd October, though the average date of conception was the 19th July and 40% of individuals were conceived during this month (Murphy et al. 2009b). The gestation period in the population was estimated at 0.99 years (Murphy et al. 2009b). Even though the sample size was small, sexually mature and pubertal females were reported ovulating only during May to September (6 out of 45 individuals examined) (Murphy 2004). Such an extended mating period in the NE Atlantic population allows females to undergo numerous ovulations, with some individuals possibly completing up to five reproductive cycles during this period (Murphy et al. 2010). This provides a substantial buffer for individuals that may not conceive during their first oestrous cycle within the mating period. **Common dolphins are found in a wide range of group sizes, up to 1000 to 5000 individuals (Murphy 2004, and ref. therein). There is evidence that smaller groups are segregated by age and sex, especially during winter, i.e. outside the mating period (Murphy et al., in press)**
2.8.3 Trans-boundary assessment	**Common dolphins are one of the most commonly recorded cetaceans in the northeast Atlantic. In waters adjoining the UK EEZ, those of southwest Ireland have high predicted densities of this species (Paxton et al. in prep). The future prospects of this population are, therefore, dependent most directly on the actions within the adjoining Irish EEZ. Transboundary assessments need to be undertaken in future if the conservation status assessment of this species is to be done effectively and accurately.**

2.9 Conclusions ***(assessment of conservation status at end of reporting period)***		
2.9.1 Range	**a) Conclusion**	**Favourable**
	There has been no evidence of decline in range, and the current range is considered equivalent to the favourable reference range based on best available information and expert judgement. Therefore, the conclusion for this parameter is Favourable.	
	b) Qualifier	
2.9.2 Population	**a) Conclusion**	**Favourable**
	Given that trends in population in the short (2001-2012) and long term (1994-2012) have been assessed as stable, the overall conclusion for this parameter is Favourable.	
	b) Qualifier	

2.9.3 Habitat for the species	**a) Conclusion**	**Favourable**
	Although there is an acknowledged difficulty associated with defining habitats for cetaceans, the judgement of Favourable was based on the relatively high level of spatial and temporal variability in the behaviour and ecology of common dolphins. Additionally, where range and/or population is considered to be in a Favourable condition, it has been assumed that habitat must also be considered to be Favourable.	
	b) Qualifier	
2.9.4 Future prospects	**a) Conclusion**	**Favourable**
	As population, range and habitat are assessed as Favourable, it follows that future prospects for this species is also favourable	
	b) Qualifier	
2.9.5 Overall assessment of Conservation Status	**Favourable**	
	The overall assessment for this species is Favourable given the Favourable status of the range, habitat, population and future prospects. The future prospects for this species are considered Favourable. Although bycatch is an issue, there are various activities within the UK to quantify and minimise this source of mortality. Monitoring by independent observers is regularly carried out under the HD requirements in addition to those required by EU Regulation 812/2004. During 2011, work has focused on monitoring the effectiveness of acoustic deterrent devices in reducing bycatch, and on monitoring a range of fisheries, including some for which monitoring is not required under Regulation 812/2004, but where cetacean bycatch is likely to occur at high enough levels to warrant monitoring under Article 12 of the Habitats Directive. Estimates of cetacean bycatch for gillnets in the Irish Sea, Western Channel and Celtic Shelf during 2011 was 327 (95% CI 175-1673) common dolphins, though caveats apply to these estimates (Northridge et al., 2012). Between 2009 and 2011 the UK trialled alternative pinger types not listed on Annex II of Regulation 812/2004, as part of a scientific investigation as outlined under paragraph 3 Article 2 of the Regulation. This work was a response to a request from the fishing industry to assess the efficacy of using a louder and more robust device that could be attached to the ends of fleets of nets, rather than every 100 or 200 m along the length of each fleet as specified in Annex II of the Regulation. The UK has tested two forms of the same device (DDD-02 and DDD-03L) over a three year period, and has shown that bycatch rates of porpoises can be reduced by 95% when the DDD-03L is deployed at each end of a fleet of nets, provided the fleet is less than 4 km long. Longer net fleets (up to 8 km) showed a non-significant difference in porpoise bycatch rate when compared with unpingered fleets. The results for common dolphin were less clear. A full description of trials with these devices can be found in Kingston and Northridge (2011) and	

	in Northridge et al (2011). After the completion of the field trials, industry was left with a sufficient supply of DDDs for all boats in the locally based fleet (about 16 vessels in 2010-11) to be fully equipped. There are still some remaining concerns related to charging the devices (the DDDs are rechargeable), but the manufacturer has recently supplied (2012) some modified and improved multi-chargers which are being field tested in 2012. The main UK vessels taking part in the bass midwater pair trawl fishery (2 pair teams during early 2011) in the English Channel used a version of the DDD designed for trawl use (DDD-03F); another pair team is reported to have conducted a very limited amount of midwater trawl fishing for bass in 2011, and this team is not known to have used DDDs. Dolphin bycatch remains greatly reduced (about 17 animals in 2011) compared with years prior to 2006 when trials with DDDs began in this fishery. The exact effectiveness of DDDs in this fishery remains unclear because paired control tows with and without pingers have not been made, with pingers deployed on most tows, which obscures the current underlying bycatch rate without pingers. It is therefore unclear whether the observed low bycatch rate at present is due to the mitigation measures being used or due to an overall decreased risk of dolphin bycatch in this fishery. Bycatch rates in the bass pair trawl fishery remain low (less than a tenth of what they were in 2002-2005) but some bycatches (12 animals) were recorded during 2011 in 160 tows equipped with DDDs, a slightly higher rate than in the preceding three or four seasons. The reasons for this are not yet known. The issue previously raised by fishermen concerning the multi-charger units that are supplied by the manufacturer (and which appeared unreliable) is being addressed and the manufacturer has supplied several modified multi-chargers which are being trialled during 2012. Following the completion of an extension trial funded by the Fisheries Challenge Fund (FCF) (Kingston and Northridge, 2011), monitoring of vessels using pingers is being continued under the heading of scientific studies as required by Regulation 812/2004, but at a lower level than during the FCF project. Dolphin and porpoise bycatches are being recorded using GPS positions, as are the locations of DDDs being used on the same fleets. The purpose of this is to improve our understanding of the effective range of the DDD pinger and to assess possible habituation issues. The UK's Marine Management Organisation and the Marine Scotland Compliance Enforcement Unit are currently investigating or about to commence investigation of pinger detection units that may be used to determine compliance. No specific enforcement programme is yet underway, but this is expected during the next year (before June 2013). 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. Monitoring under Regulation 812/2004 is done largely in collaboration with the fishing industry. Bycatch mitigation work is a key complementary programme of work that is intended to ensure any problem that is identified with protected species bycatch can be addressed in an equitable and expedient manner to meet the UK's obligations under Regulation 812/2004 and Article 12 of the Habitats Directive. The observer scheme relies upon good collaborative links with industry. Nevertheless fisheries regulations were enacted in England and Scotland to ensure that there is also a legal obligation for skippers and owners to take observers when asked to do so. Bycatch monitoring in the UK fisheries in IVa and VIa as required by EU Reg 812/2004 has not demonstrated a single cetacean bycatch event since the programme began in 2005. The UK has identified those fisheries that are thought to have highest bycatch rates of cetaceans, and has refocused a majority of observer effort into these segments. Most sampling effort is now directed at under-15 m vessels using static gears in subareas IV and VII. Some sampling under Scientific Studies of over-12 m vessels using pingers is also being continued, though at a lower rate than in recent years. Recorded incidental catches of common dolphin range from 10 to 29 animals per year between 2008 and 2011 (inclusive). These data indicate that common dolphin bycatch in the set gillnet and pelagic trawl fisheries for the Western English Channel and Irish and Celtic Seas (ICES Divisions VII AEFGHJI) range from 200-350 common dolphins per annum. These same fisheries have been monitored for many years and statistical analysis (using a generalised linear modelling approach) does not reveal any significant differences in catch rates between years since 2005. 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 and 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 Department of Energy and Climate Change (DECC, formerly the DTI), 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. This review will be published in 2013. Small odontocetes have been shown to demonstrate the strongest avoidance of seismic survey activity of any cetacean species, with significant increases in fast swimming activity and declines in sightings rates during periods when airguns are firing (Stone and Tasker 2006; Weir, 2008; Gray and Van Waerebeek, 2011). Some evidence of temporary threshold shifts have also been noted (Finneran et al., 2002.). For common dolphins specifically, avoidance reactions to airgun emissions have been noted within the immediate vicinity, although the species is generally able to tolerate the pulses at 1 km distance from the array (Goold 1996; Goold and Fish, 1998). However, the most recent review of responses to seismic surveys in UK waters (Stone, in prep) concluded that common dolphins showed no behaviours that would indicate avoidance of larger airgun noise, although an increase in swimming speed was evident when the airguns were active. 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, and so includes common dolphins. 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 are 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.
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 in the SAC network	**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**