

***R.V. Corystes –Nephrops Assessment Survey (C03109)***

**Cetacean Distribution & Relative Abundance Survey**

30<sup>th</sup> July – 2<sup>nd</sup> August 2009



*Common Dolphins (© Clare Murray)*

**Surveyor: Clare Murray**

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**ISCOPE II  
Ship Survey Project  
Irish Whale and Dolphin Group**

## 1. Introduction

The waters of Ireland's Exclusive Economic Zone (EEZ) are thought to represent one of the most important cetacean (whales, dolphins and porpoise) habitats in Europe. To date 24 species of cetacean have been recorded (Appendix II), with seven of these having been confirmed as calving within the Irish EEZ, while a number of other species are possibly calving (e.g. minke whale and northern bottlenose whale) (Berrow, 2001). In recognition of their importance for cetaceans, the Irish government declared all Irish waters (within the EEZ) to be a whale and dolphin sanctuary in 1991 (Rogan and Berrow, 1995). Despite this recognition, information on the distribution and relative abundance of cetaceans within the Irish EEZ, especially in offshore waters, is very limited (Wall *et al.* 2006).

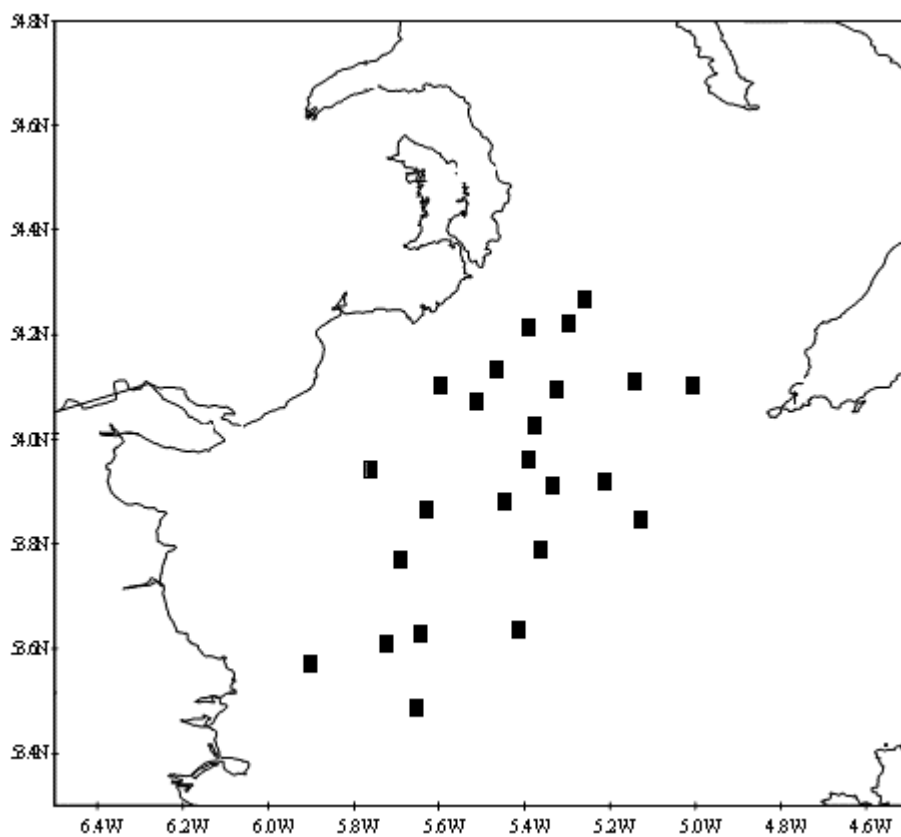
The Irish Whale and Dolphin Group (IWDG) have been collecting data on the distribution and relative abundance of cetaceans in Irish waters (including Northern Ireland) since 1991. The IWDG casual and constant effort sightings schemes record data mainly from land-based sightings and surveys (Berrow *et al.* 2001). The Group has conducted cetacean surveys on board commercial ferries since 2001, on board the *Irish Marine Institute* offshore research vessel *Celtic Explorer* since 2003 and on foreign research vessels commencing in 2007.

In 2003, the IWDG initiated the Irish Scheme for Cetacean Observation and Public Education (ISCOPE), which aimed to promote better awareness and knowledge of cetaceans (whales, dolphins and porpoises) in Irish waters, by encouraging public participation in cetacean recording. Under ISCOPE II, the IWDG are committed to filling in data gaps that exist in our knowledge of the seasonal distribution and abundance of cetaceans in offshore habitats.

As part of this project the IWDG conducted a cetacean distribution and relative abundance survey on board the *R.V. Corystes* during the 2009 *Nephrops* assessment survey (C03109).

## 2. Methods

The survey was conducted on board the *R.V. Corystes* as an ancillary project of AFBINI (Agriculture Food and Environmental Science Division) *Nephrops* assessment survey (CO3109), between 30<sup>th</sup> July and 3<sup>rd</sup> August of 2009. The survey commenced in Belfast and covered Northern Irish Sea and Irish waters. The survey aimed to primarily investigate the population dynamics of Irish Sea *Nephrops*, by targeted otter and beam trawling and camera surveys. Survey lines were opportunistic and based on predetermined locations chosen by the AFBINI.



**Fig. 1** Western Irish Sea *Nephrops* stations.



### **Otter Trawl Deployment and Hauling**

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#### **2.1. Visual Survey**

A single marine mammal observer was present on board during the survey and conducted watches on bridge decks and from the bridge, c8m above sea level. Observer effort focused on a 90-degree arc ahead of the ship; however sightings located up to 90 degrees to port and starboard were included. The observer scanned the area by eye and using 7 X 50 binoculars.

Bearings to sightings were measured using an angle board and distances were estimated with the aid of distance measuring stick. Environmental data were recorded every 15 minutes Logger 2000 software. Sightings were also recorded using Logger 2000 and automated position data were obtained through a laptop computer linked to a GPS. Sightings recorded over 90 degrees to port and starboard and sightings outside logged hours were also recorded as auxiliary sightings.



**Visual survey positions on bridge and bridge deck**

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The survey vessel travelled at an average speed of 10 knots when steaming and 3 to 4 knots while trawl sampling. The vessel remained stationary during deployment of fishing gear. Surveying was conducted up to but not including sea-state 6 (Beaufort scale) and in moderate to good visibility, which was not less than 500m.

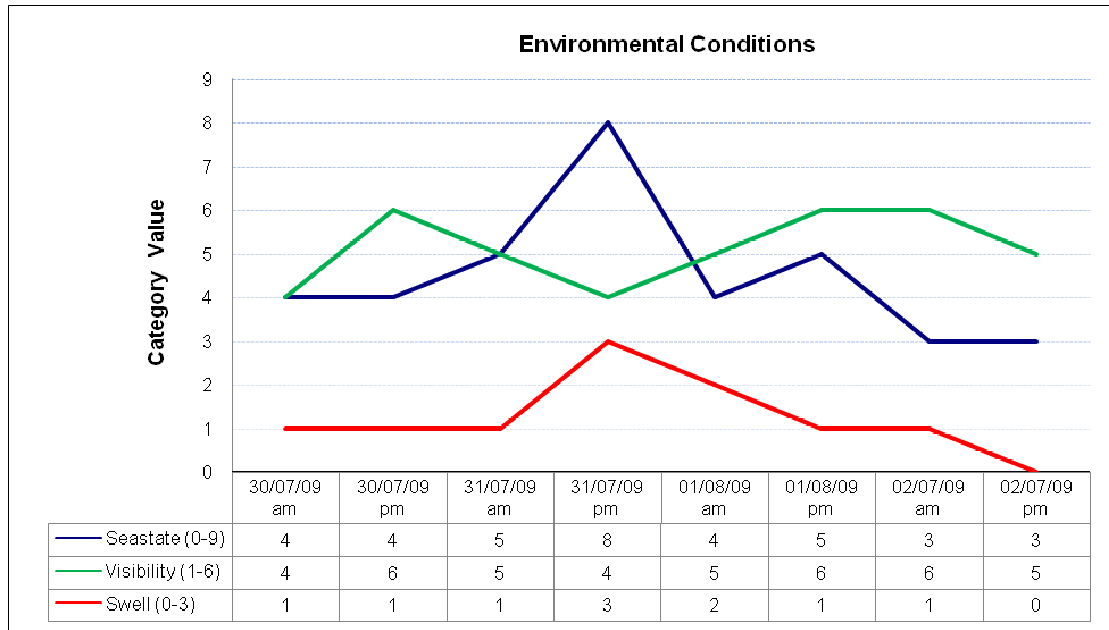
As this was a survey onboard a vessel of opportunity, the survey was conducted in 'passing mode' and cetaceans sighted were not approached. Sightings were identified to species level where possible, with species identifications being graded as definite, probable or possible. Where species identification could not be confirmed, sightings were downgraded (e.g. unidentified dolphin / unidentified whale / unidentified beaked whale etc.) according to criteria established for the IWDG's cetacean sightings database (IWDG, 2008).

### **3. Results: Visual Survey**

#### **3.1. Environmental Conditions**

Environmental data were collected at 133 stations. Survey conditions were moderate to poor, with sea state  $\leq 3$  at 22.6% of environmental stations and sea state  $\leq 5$  to  $\geq 3$  at 77.4 % of stations. 51.9% of stations were recorded at sea state

4. Once conditions reached a sea state > 5 surveying was discontinued. Visibility was very good (>16km) at 88 % of stations and good (11-15km) at 12 % of stations. Swell conditions of less than 1m or no swell were recorded for 18.8 % of stations, at 1m for 56.4 % of stations and at 1-2m for 24.8 % of stations. One full day of surveying was lost due to gales at a sea state of Force 7/8.



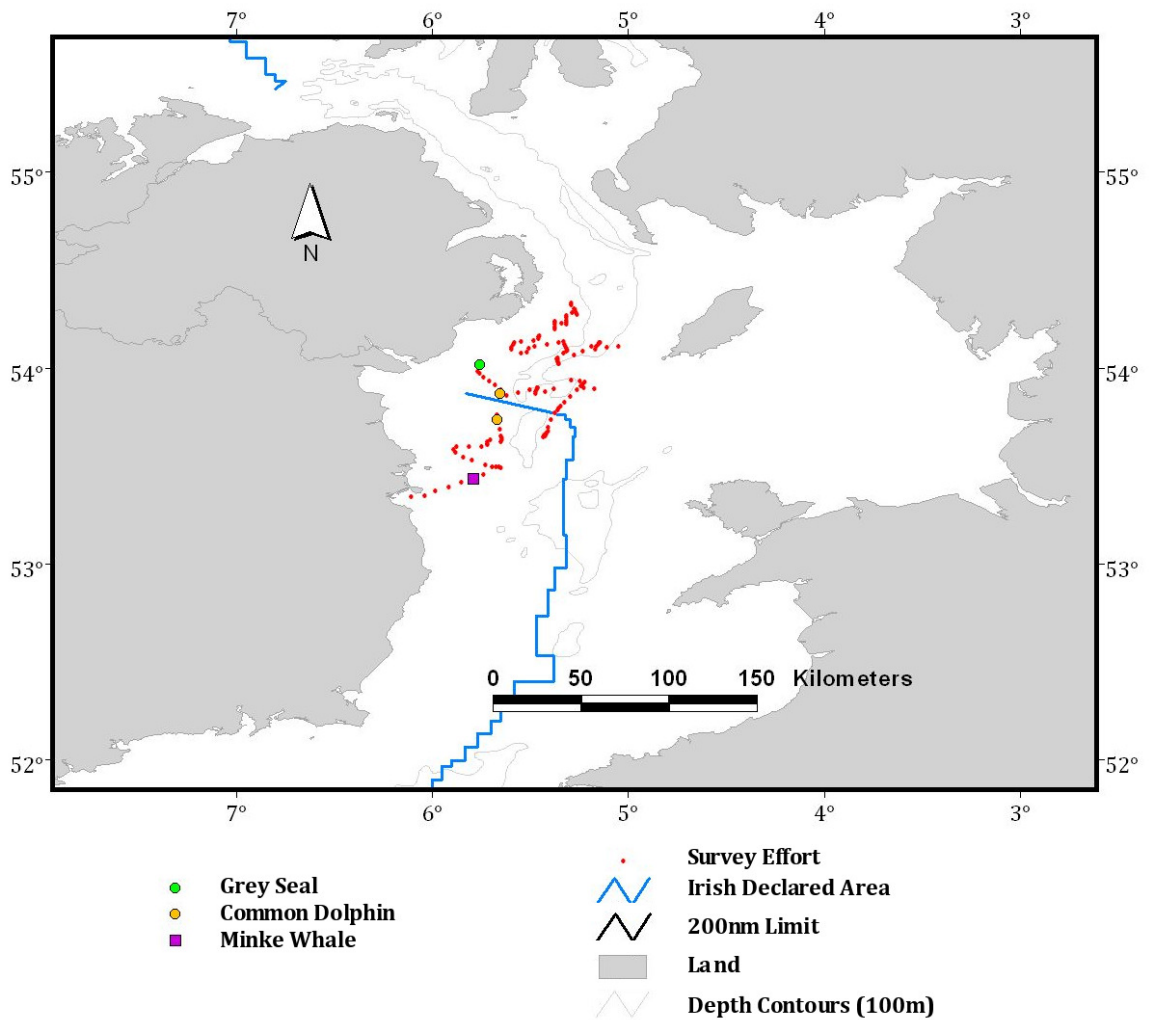
**Fig. 2** Morning and afternoon sea state, visibility and swell measurements during the 4 day survey.

### 3.2. Cetacean Survey Results

Approximately 28 hours of survey time were logged over a four-day period. Identified cetacean species were common dolphin (*Delphinus delphis*) and minke whale (*Balaenoptera acutorostrata*). Two sightings of common dolphins, totalling at least 5 individuals were recorded at a seastate of 4. These dolphins were approximately 2.5m in length and were identified by hourglass body markings. One sighting of a minke whale (*Balaenoptera acutorostrata*) was also recorded estimated at approximately 8 to 9 m in length. This sighting was noted at sea state 3 and was identified by a small, well-defined curved dorsal fin located two-thirds along its back. A blow was not visible. One sighting of two grey seals (*Halichoerus grypus*) feeding around the survey vessel was also recorded.



*Grey seals* (© Clare Murray)



**Fig. 3** Visual survey effort, cetacean and pinniped sightings recorded during the current survey.

### 3.3. Seabird Activity

Lists were made of all seabird species on a daily basis seen on and around the survey vessel, although bird counts were not conducted. Although seabird diversity was low, abundance was high within the areas surveyed. During these four survey days, eleven sea bird species were recorded: shearwater species (*Puffinus*), kittiwake (*Rissa tridactyla*), lesser black-backed gull (*Larus fuscus*), guillemot (*Uria aalga*), cormorant (*Phalacrocorax carbo*), gannet (*Sula bassana*), shag (*Phalacrocorax aristotelis*), fulmar (*Fulmarus glacialis*), herring gull (*Larus argentatus*), greater black-backed gull (*Larus marinus*) and manx shearwater (*Puffinus puffinus*).

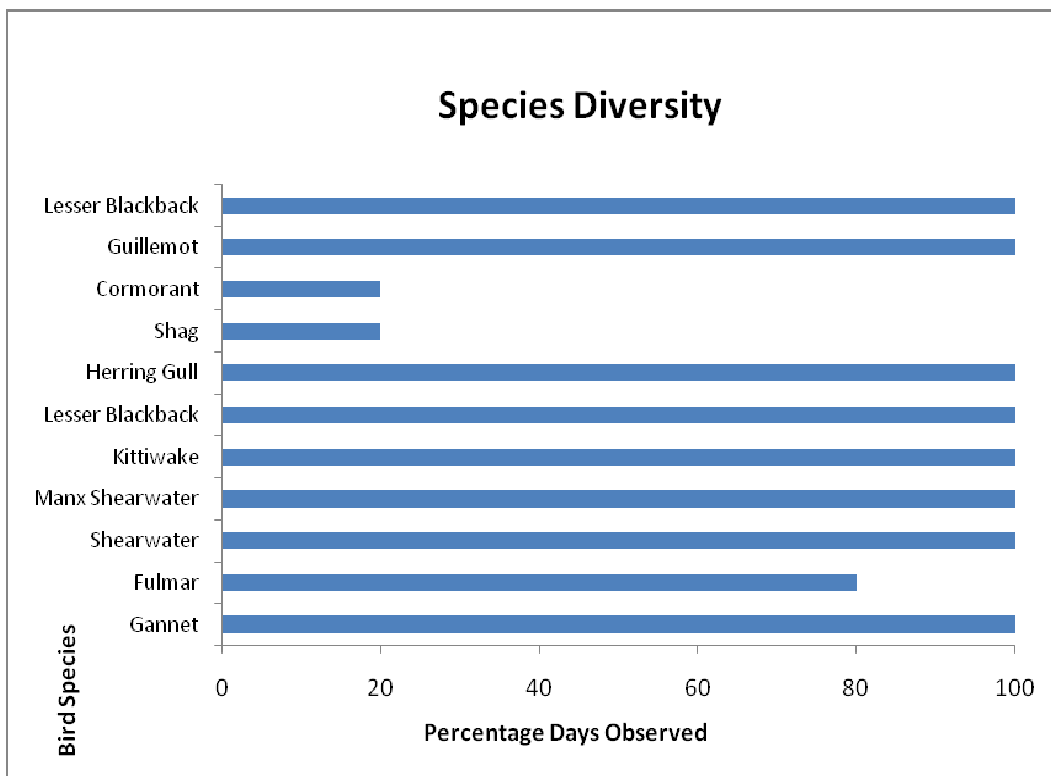


Fig. 5 Percentage of days on which seabird species were recorded during the 4 survey days.



***Kittiwake (left) and Fulmar (right)***

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***Juvenile, sub adult and fully mature gannets***

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## **Acknowledgments**

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## References

**Berrow, S.D., Whooley, P. and Ferriss, S. (2001)** Irish Whale and Dolphin Group cetacean sighting schemes: development of a system to record sightings of cetaceans (whales, dolphins and porpoises) in Irish waters. *Final report to the Heritage Council (Ireland), Kilkenny.*

**IFAW (2000)** Logger 2000 software. *Inter-national Fund for Animal Welfare, London.*

**IWDG (2009)** IWDG Cetacean Sightings Database (Rep. Ireland & Northern Ireland). <http://www.iwdg.ie/Iscope/>

**Ó Cadhla, O., Mackey, M., Aguilar de Soto, N., Rogan, E. & Connolly, N. (2004).** Cetaceans and Seabirds of Ireland's Atlantic Margin. Volume II – Cetacean distribution & abundance. *Report on research carried out under the Irish Infrastructure Programme (PIP): Rockall Studies Group (RSG) projects 98/6 and 00/13, Porcupine Studies Group project P00/15 and Offshore Support Group (OSG) project 99/38. 82pp.*

**Rogan, E. and Berrow, S.D. (1995)** The management of Irish waters as a whale and dolphin sanctuary. *In A.S. Blix, L. Walløe and Ø. Ulltang (eds), Whales, seals, fish and man, 671..81. Amsterdam. Elsevier Science.*

**Wall D., O'Brien J., Meade J. & Allen B.M. (2006)** Summer distribution and relative abundance of cetaceans off the west coast of Ireland. *Biology and Environment: Proceedings of the Royal Irish Academy, 106B (2), 135 - 142.*

## **Previous IWDG Survey Reports**

(All reports can be downloaded at [www.iwdg.ie/shipsurveys/](http://www.iwdg.ie/shipsurveys/))

**Murray C. (2009)** Cetacean Distribution and Relative Abundance Survey during the AFBI Summer Herring Acoustic Survey 2009. *Cruise Report to the Agriculture, Food and Biosciences Institute, Belfast.*

**Kavanagh L. (2009)** Cetacean Distribution and Relative Abundance Survey during FSS Northwest Herring Acoustic Survey 2009. *Cruise Report to the Marine Institute, Oranmore, Galway, Ireland.*

**Wall D. (2009)** Cetacean Distribution and Relative Abundance Survey during the NUI Galway, Climate Change Survey 2009. *Cruise Report to National University of Ireland, Galway, Ireland.*

**Murray C. (2009)** Cetacean Distribution and Relative Abundance Survey during the AFBI Juvenile Gadoid Survey 2009. *Cruise Report to the Agriculture, Food and Biosciences Institute, Belfast.*

**Wall D. (2009)** Cetacean Distribution and Relative Abundance Survey during the NUI Galway, Coralfish Survey 2009. *Cruise Report to National University of Ireland, Galway, Ireland.*

**Wall D. (2009)** Cetacean Distribution and Relative Abundance Survey during the LE Emer April Patrol 2009. *Cruise Report to Irish Naval Service, Haulbowline, Cork, Ireland.*

**O'Brien J. (2009)** Cetacean Distribution and Relative Abundance Survey during the Tridens Blue Whiting Survey 2009. *Cruise Report to the Dutch Ministry of Agriculture, Nature and Food Quality (LNV), Den Haag, The Netherlands.*

**Murray C. (2009)** Cetacean Distribution and Relative Abundance Survey during the AFBI Groundfish Survey 2009. *Cruise Report to the Agriculture, Food and Biosciences Institute, Belfast.*

**Wall D. (2009)** Cetacean Distribution and Relative Abundance Survey during the Marine Institute Oceanographic Survey 2009. *Cruise Report to the Marine Institute, Oranmore, Galway, Ireland.*

**Tuffy P. (2009)** Cetacean Distribution and Relative Abundance Survey during AFBI Gadoid Survey 2009. *Cruise Report to the Agriculture, Food and Biosciences Institute, Belfast.*

**Murray C. (2009)** Cetacean Distribution and Relative Abundance Survey during the Marine Institute Nutrient Survey 2009. *Cruise Report to the Marine Institute, Oranmore, Galway, Ireland.*

**Wall D. (2009)** Cetacean Distribution and Relative Abundance Survey during the LE Niamh January Patrol 2009. *Cruise Report to Irish Naval Service, Haulbowline, Cork, Ireland.*

**Wall D. (2008)** Cetacean Distribution and Relative Abundance Survey during the LE Róisín December Patrol 2008. *Cruise Report to Irish Naval Service, Haulbowline, Cork, Ireland.*

**Tuffy P. (2008)** Cetacean Distribution and Relative Abundance Survey during IFREMER Groundfish Survey 2008. *Cruise Report to the French Institute for the Exploitation of the Sea.*

**Murray C. (2008)** Cetacean Distribution and Relative Abundance Survey during CEFAS Groundfish Survey 2008. *Cruise Report to the Centre for Environment, Food and Agriculture Sciences, Suffolk, England.*

**Tuffy P. (2008)** Cetacean Distribution and Relative Abundance Survey during AFBI Groundfish Survey 2008. *Cruise Report to the Agriculture, Food and Biosciences Institute, Belfast.*

**Wall D. (2008)** Cetacean Distribution and Relative Abundance Survey during FSS Southwest Herring Acoustic Survey 2008. *Cruise Report to the Marine Institute, Oranmore, Galway, Ireland.*

**Wall D. (2008)** Cetacean Distribution and Relative Abundance Survey during FSS Deep Water Survey 2008. *Cruise Report to the Marine Institute, Oranmore, Galway, Ireland.*

**Murray C. (2008)** Cetacean Distribution and Relative Abundance Survey during AFBI Nephrops Assessment Survey 2008. *Cruise Report to the Agri-Food and Biosciences Institute, Northern Ireland.*

**Wall D. (2008)** Cetacean Distribution and Relative Abundance Survey during NIOZ Cold Water Coral Fish Survey 2008. *Cruise Report to the Royal Netherlands Institute for Sea Research and the Marine Institute, Oranmore, Galway, Ireland.*

**Wall D. (2008)** Cetacean Distribution and Relative Abundance Survey during FSS Blue Whiting Acoustic Survey 2008. *Cruise Report to the Marine Institute, Oranmore, Galway, Ireland.*

**Baer J. (2008)** Cetacean Distribution and Relative Abundance Survey during CEFAS Irish Sea Plankton Survey 2008. *Cruise Report to the Centre for Environment, Fisheries & Aquaculture Science and the Marine Institute, Oranmore, Galway, Ireland.*

**Wall D. (2007)** Cetacean Distribution and Relative Abundance Survey during FSS Southwest Herring Acoustic Survey 2007. *Cruise Report to the Marine Institute, Oranmore, Galway, Ireland.*

**Wall D. (2007)** Cetacean Distribution and Relative Abundance Survey during FSS Deep Water Survey 2007. *Cruise Report to the Marine Institute, Oranmore, Galway, Ireland.*

**Wall D. (2007)** Cetacean Distribution and Relative Abundance Survey during NIOZ Canyons Survey 2007. *Cruise Report to the Royal Netherlands Institute for Sea Research and the Marine Institute, Oranmore, Galway, Ireland.*

**Wall D. (2007)** Cetacean Distribution and Relative Abundance Survey during Rockall Trough Oceanographic Survey 2007. *Cruise Report to the Marine Institute, Oranmore, Galway, Ireland.*

**Wall D. (2007)** Cetacean Distribution and Relative Abundance Survey during FSS Northwest Herring Acoustic Survey 2007. *Cruise Report to the Marine Institute, Oranmore, Galway, Ireland.*

**Wall D. (2006)** Cetacean Distribution and Relative Abundance Survey during FSS Southwest Herring Acoustic Survey 2006. *Cruise Report to the Marine Institute, Oranmore, Galway, Ireland.*

**Wall D. (2006)** Cetacean Distribution and Relative Abundance Survey during FSS Deep Water Survey 2006. *Cruise Report to the Marine Institute, Oranmore, Galway, Ireland.*

**Wall D. (2005)** Cetacean Distribution and Relative Abundance Survey during FSS Southwest Herring Acoustic Survey 2005. *Cruise Report to the Marine Institute, Oranmore, Galway, Ireland.*

**Wall D. (2005)** Cetacean Distribution and Relative Abundance Survey during Irish Seabed Survey: Leg 17. *Cruise Report to the Marine Institute, Oranmore, Galway, Ireland.*

**Wall D., O'Brien J., Meade J. & Allen B.M. (2004)** Summer Distribution and Relative Abundance of Cetaceans off the West Coast of Ireland. *Final report to the Heritage Council, Kilkenny, Ireland.*

**O'Brien J. (2004)** Cetacean Distribution and Relative Abundance Survey during FSS Northwest Herring Acoustic Survey 2004. *Cruise Report to the Marine Institute, Oranmore, Galway, Ireland.*

**O'Brien J. (2004)** Cetacean Distribution and Relative Abundance Survey during FSS Blue Whiting Survey 2004. *Cruise Report to the Marine Institute, Oranmore, Galway, Ireland.*

**Wall D. (2004)** Cetacean Distribution and Relative Abundance Survey during the Celtic Sea Herring Acoustic Survey 2004. *Cruise Report to the Marine Institute, Oranmore, Galway, Ireland.*

## Appendix II: List of cetacean species recorded in Irish waters.

Atlantic White-Sided Dolphin	<i>Lagenorhynchus actus</i>
Beluga	<i>Delphinapterus leucas</i> <sup>†</sup>
Blue Whale	<i>Balaenoptera musculus</i>
Bottlenose Dolphin	<i>Tursiops truncatus</i>
Common Dolphin	<i>Delphis delphis</i>
Cuvier's Beaked Whale	<i>Ziphius cavirostris</i>
False Killer Whale	<i>Pseudorca crassidens</i>
Fin Whale	<i>Balaenoptera physalus</i>
Gervais' Beaked Whale	<i>Mesplodon europaeus</i> *
Harbour Porpoise	<i>Phocoena phocoena</i>
Humpback Whale	<i>Megaptera novaeangliae</i>
Killer Whale	<i>Orcinus orca</i>
Minke Whale	<i>Balaenoptera acutorostrata</i>
Northern Bottlenose Whale	<i>Hyperoodon ampullatus</i>
Northern Right Whale	<i>Eubalaena glacialis</i>
Pilot Whale (long-finned)	<i>Globicephala melas</i>
Pygmy Sperm Whale	<i>Kogia breviceps</i>
Risso's Dolphin	<i>Grampus griseus</i>
Sei Whale	<i>Balaenoptera borealis</i>
Sowerby's Beaked Whale	<i>Mesplodon bidens</i>
Sperm Whale	<i>Physeter macrocephalus</i>
Striped Dolphin	<i>Stenella coeruleoalba</i>
True's Beaked Whale	<i>Mesplodon mirus</i>
White-Beaked Dolphin	<i>Lagenorhynchus albirostris</i>

<sup>†</sup> Vagrant \* Recorded only from Stranding