R.V. Celtic Explorer: National Oceanography Centre Survey (CE10005)

Cetacean Distribution & Relative Abundance Survey

16th – 22nd September 2010

Surveyor: Lucy Hunt

Ship Surveys Programme
Irish Whale and Dolphin Group

Marine Biodiversity Research Group
Galway-Mayo Institute of Technology

Pilot whales © Joanne O’Brien
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 I), 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; O’Brien et al. 2009). 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 IWDG has conducted cetacean surveys on board commercial ferries since 2001 and on board the Irish Marine Institute’s offshore research vessel ‘Celtic Explorer’ since 2003.

In 2008, the IWDG in collaboration with the Galway-Mayo Institute of Technology commenced PReCAST, a three-year project (2008-2011) which aims to provide robust scientific data to support conservation policy and provide guidance to state agencies in implementing national and international obligations. PReCAST is committed to gaining a more complete understanding of the seasonal distribution, relative abundance and habitat use of cetaceans within the Irish EEZ.

As part of this project a cetacean distribution and relative abundance survey was conducted on board the R.V. Celtic Explorer during the Southampton National Oceanography Centre Oceanography survey in September 2010.
Methods

The survey was conducted on board the *R.V. Celtic Explorer* as an ancillary project of the Southampton National Oceanography Centre from 16th – 22nd September 2010. The survey area covered waters in the Celtic Sea, Abyssal Plain and Porcupine Seabight. The survey areas were opportunistic and based on predetermined locations chosen by the Southampton National Oceanography Centre.

A single marine mammal observer was present on board during the survey and conducted watches from the ‘crow’s nest’ located above the bridge, 18m 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 also included. The observer scanned the area by eye and using 10 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 using Logger 2000 software (IFAW 2000). Sightings were also recorded using Logger 2000. Automated position data were obtained through a laptop computer linked to GPS receiver.

The survey vessel travelled at an average speed of 9 knots when steaming between stations. Surveying varied between steaming from station to station and remaining static for CTD and mooring equipment deployments. In deep water over the Abyssal Plain the vessel remained static for many hours at a time as a CTD station could take in excess of four hours. Surveying was conducted up to Beaufort sea-state 6 and in visibility ≥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 2010).
Results

**Environmental Conditions**

Environmental data was collected at 153 stations. Sea state was ≤3 at 73.8% of environmental stations, ≤4 at 91.5% of environmental stations and ≤5 at 100% of environmental stations. Visibility was >5km at 96% of stations. Rainfall was recorded at 2% of stations. Some excellent survey conditions were experienced over the duration of this survey, however one of the survey days over the Porcupine Abyssal Plain had to be conducted from the Bridge due to sea state 5/6, poor visibility and high winds.

![Graph showing sea state, wind, and swell over the survey period.]

**Cetacean Survey Results**

34.9 hours of survey time were logged with 75.6% (26.4 hrs) of this at ≤ Beaufort sea state three; and 92.6% (32.3 hrs) at ≤ Beaufort sea state four. There were 28 sightings of at least three cetacean species, with a total of 69 individuals recorded. Common dolphins were the most commonly encountered and abundant species.

Identified cetacean species were common dolphin (*Delphinus delphis*), pilot whale (*Globicephala melas*) and fin whale (*Balaenoptera physalus*). Ten sightings of whale blows were downgraded to ‘unidentified whale’, according to the IWDG’s cetacean sightings...
A leather back turtle was also sighted during the survey in the Porcupine Seabight area whilst steaming back to Galway.

Table 1: Sightings, counts and group size ranges for cetaceans sighted during the survey.

<table>
<thead>
<tr>
<th>Species</th>
<th>No. Sightings</th>
<th>No. Individuals</th>
<th>Range of Group Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common dolphin</td>
<td>15</td>
<td>50</td>
<td>1-12</td>
</tr>
<tr>
<td>Pilot whale</td>
<td>1</td>
<td>6</td>
<td>-</td>
</tr>
<tr>
<td>UnID Whale blow</td>
<td>11</td>
<td>12</td>
<td>1-2</td>
</tr>
<tr>
<td>Leatherback turtle</td>
<td>1</td>
<td>1</td>
<td>-</td>
</tr>
</tbody>
</table>

Figure 1: Map of survey effort and sightings during current survey.

**Bird Activity**

Daily species lists were made of all seabird species seen around the survey vessel. Eight seabird species were recorded during the survey: Gannet (*Morus bassanus*), Fulmar (*Fulmarus glacialis*), Kittiwake (*Rissa tridactyla*), Herring gull (*Larus argentatus*), Lesser black-backed gull (*Larus fuscus*), Guillemot (*Uria aalge*), Great Shearwater (*Puffinus gravis*) and Auk species.
References


Appendix I: Previous IWDG Survey Reports


Appendix II: List of cetacean species recorded within the Irish EEZ and adjacent waters.

<table>
<thead>
<tr>
<th>Species</th>
<th>Scientific Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atlantic White-Sided Dolphin</td>
<td><em>Lagenorhynchus acutus</em></td>
</tr>
<tr>
<td>Beluga</td>
<td><em>Delphinapterus leucas</em></td>
</tr>
<tr>
<td>Blue Whale</td>
<td><em>Balaenoptera musculus</em></td>
</tr>
<tr>
<td>Bottlenose Dolphin</td>
<td><em>Tursiops truncatus</em></td>
</tr>
<tr>
<td>Common Dolphin</td>
<td><em>Delphinus delphis</em></td>
</tr>
<tr>
<td>Cuvier's Beaked Whale</td>
<td><em>Ziphius cavirostris</em></td>
</tr>
<tr>
<td>False Killer Whale</td>
<td><em>Pseudorca crassidens</em></td>
</tr>
<tr>
<td>Fin Whale</td>
<td><em>Balaenoptera physalus</em></td>
</tr>
<tr>
<td>Gervais' Beaked Whale</td>
<td><em>Mesoplodon europaeus</em></td>
</tr>
<tr>
<td>Harbour Porpoise</td>
<td><em>Phocoena phocoena</em></td>
</tr>
<tr>
<td>Humpback Whale</td>
<td><em>Megaptera novaeangliae</em></td>
</tr>
<tr>
<td>Killer Whale</td>
<td><em>Orcinus orca</em></td>
</tr>
<tr>
<td>Minke Whale</td>
<td><em>Balaenoptera acutorostrata</em></td>
</tr>
<tr>
<td>Northern Bottlenose Whale</td>
<td><em>Hyperoodon ampullatus</em></td>
</tr>
<tr>
<td>Northern Right Whale</td>
<td><em>Eubalaena glacialis</em></td>
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<tr>
<td>Pilot Whale (long-finned)</td>
<td><em>Globicephala melas</em></td>
</tr>
<tr>
<td>Pygmy Sperm Whale</td>
<td><em>Kogia breviceps</em></td>
</tr>
<tr>
<td>Risso's Dolphin</td>
<td><em>Grampus griseus</em></td>
</tr>
<tr>
<td>Sei Whale</td>
<td><em>Balaenoptera borealis</em></td>
</tr>
<tr>
<td>Sowerby's Beaked Whale</td>
<td><em>Mesoplodon bidens</em></td>
</tr>
<tr>
<td>Sperm Whale</td>
<td><em>Physeter macrocephalus</em></td>
</tr>
<tr>
<td>Striped Dolphin</td>
<td><em>Stenella coeruleoalba</em></td>
</tr>
<tr>
<td>True's Beaked Whale</td>
<td><em>Mesoplodon mirus</em></td>
</tr>
<tr>
<td>White-Beaked Dolphin</td>
<td><em>Lagenorhynchus albirostris</em></td>
</tr>
</tbody>
</table>

† Vagrant  * Recorded only from Stranding