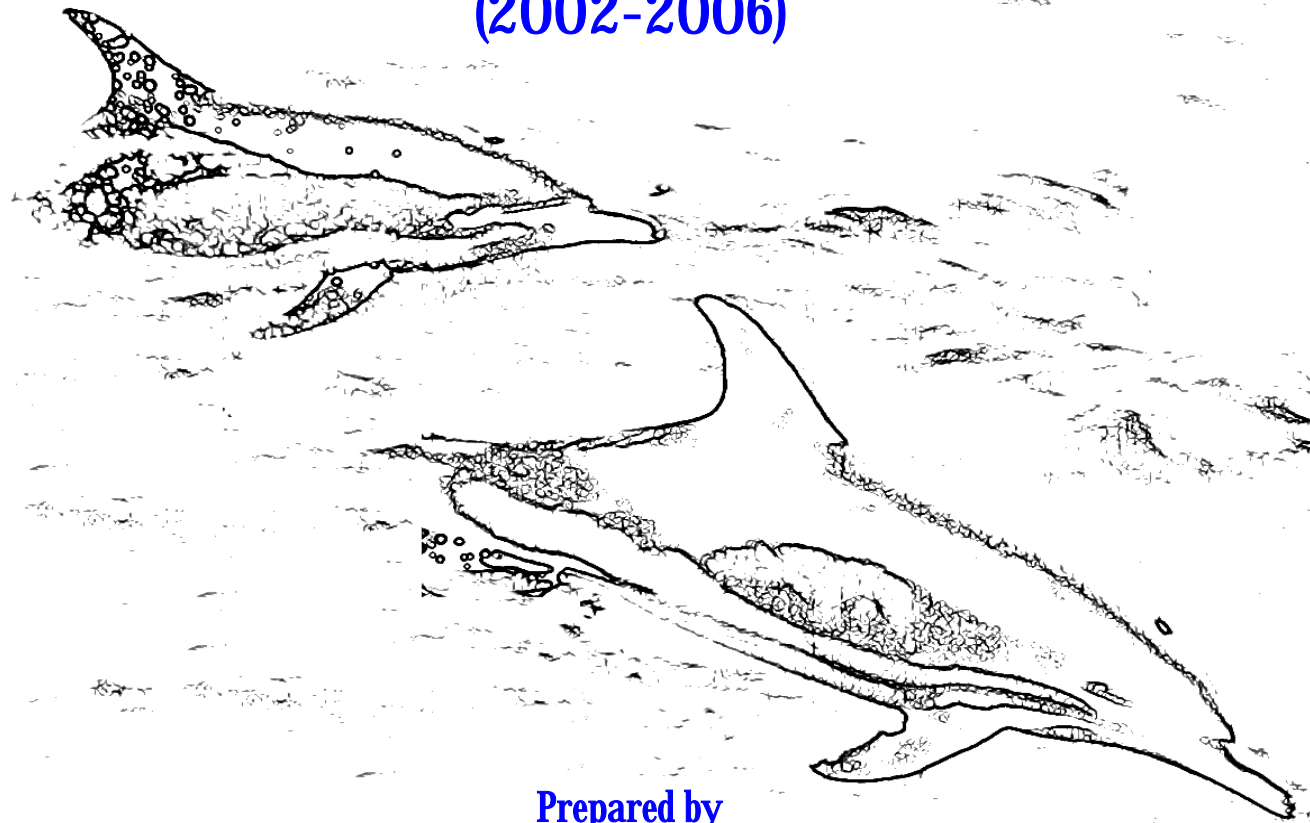


# Northern North Sea Cetacean Ferry Surveys (NORCET)

An Analysis Of Cetacean Information  
Collected In The First Five Years  
(2002-2006)



Prepared by

Colin D. MacLeod (University of Aberdeen), Ian Hay (East Grampian Coastal Partnership) and Kevin Hepworth (South Grampian Seawatch Group).

For More Information Contact: [c.d.macleod@abdn.ac.uk](mailto:c.d.macleod@abdn.ac.uk)

# Summary

NORCET ferry surveys were set up to collect data on cetacean occurrence and distribution in the northern North Sea between Aberdeen, Orkney and Shetland in summer 2002 to build on the already existing network of cetacean surveys conducted from passenger ferries. It was originally set up as a student project through the University of Aberdeen and has since expanded into a joint project between researchers at the University of Aberdeen, the East Grampian Coastal Partnership and the South Grampian Seawatch Group. While in early years, the coverage was sporadic, this has grown into a more continuous coverage throughout summer months (April to September) thanks to a growing team of volunteers willing to take part in the surveys. NORCET surveys provide regular coverage of an area of UK waters that is not regularly surveyed by any other research projects, and therefore provides valuable information about the occurrence, distribution and relative abundance of cetacean species in the northern North Sea. In addition, as it uses a compatible method, its data can be compared to those collected by ferry surveys conducted in UK waters (such as on the west coast of Scotland, the Irish Sea, English Channel and the Bay of Biscay) to help monitor whether and how the occurrence and distribution of cetacean species are changing over time over a large spatial scale at relatively little cost.

In the first five years, surveys were been conducted on over 100 days and 383 sightings of 1,148 individual cetaceans recorded. These sightings represent 10 different species. The most commonly sighted species was the harbour porpoise (164 sightings), and these sightings were recorded throughout the region. Minke whales were the second most commonly recorded species (55 sightings) and were most commonly sighted in deeper waters in early summer and in more coastal waters in later summer. The third most commonly seen species was the white-beaked dolphin

(53 sightings). Again this species was recorded through out the study area, but was most commonly sighted in July and August in coastal waters. Thirty-nine groups of bottlenose dolphins were sighted, but this species was almost exclusively sighted close to shore as the ferry passed along the coast of mainland Scotland. Only harbour porpoises, minke whales and bottlenose dolphins were recorded in all summer months. The remaining species sighted were the Atlantic white-sided dolphin (10 sightings), the common dolphin (9 sightings), the Risso's dolphin (6 sighting), the killer whale (3 sightings), the fin whale (3 sightings) and the humpback whale (1 sighting). NORCET would like to thank Northlink Ferries for their support of this project through the provision of free access to the *MV Hascosay* to conduct the surveys and to all the volunteers and students who have taken part in surveys over the years.

# Introduction

In the light of our current understanding of how human activities can affect the marine environment, and the animals which occur within it, it is becoming increasingly important to regularly monitor the occurrence, distribution and abundance of marine animals. While some types of animals are relatively easy to monitor (for example counting the number of breeding seabirds in a colony), others, such as whales, dolphins and porpoises, are not as easy to monitor due to their occurrence in waters away from the coasts. Large ocean-going vessels are often required to conduct surveys in such areas and these can be expensive to operate. However, researchers can obtain information from more offshore areas at relatively little cost by 'hitching a ride' on vessels that are operating in an area of interest for another reason. Passenger ferries are particularly favoured as they can provide repeated (sometimes daily) coverage of the same area allowing researchers to gather data that can be used to look at how the occurrence, distribution and abundance of cetaceans changes within and between years. Since the mid-1990s there has been a rapid increase in the number of ferry surveys conducted by various research groups around the United Kingdom (UK). These groups often use comparable methods to collect their data, meaning that although each individual route surveyed only covers a limited area, together they form a network that can be used to work out what is going on over a much wider area.

By the early 2000s, one of the few major ferry routes around the UK which was not routinely covered by cetacean researchers was between Aberdeen, Orkney and Shetland. Therefore, in 2002 Ian Hay and Colin MacLeod, with financial assistance from the South Grampian Seawatch Group conducted a preliminary survey on the P&O passenger ferry running between Aberdeen and Shetland. This proved sufficiently successful that in 2003 a student project was set up through researchers at the University of Aberdeen and an agreement reached with Northlink Ferries (which had just taken over running of the route) to allow surveys to be conducted on the *MV Hascosay* (the freight ferry which regularly runs between Aberdeen Orkney and Shetland). Since this time, the project has expanded into Northern North Sea Cetacean Ferry Surveys, or NORCET for short, a joint collaboration between researchers from the University of Aberdeen, the East Grampian Coastal Partnership

(EGCP) and the South Grampian Seawatch Group (SGSG). Surveys are conducted by a mixture of volunteers from the SGSG and other local organisations, members of the public and students from the University of Aberdeen studying for a variety of degrees throughout the months when daylight and weather allow (primarily April to September).

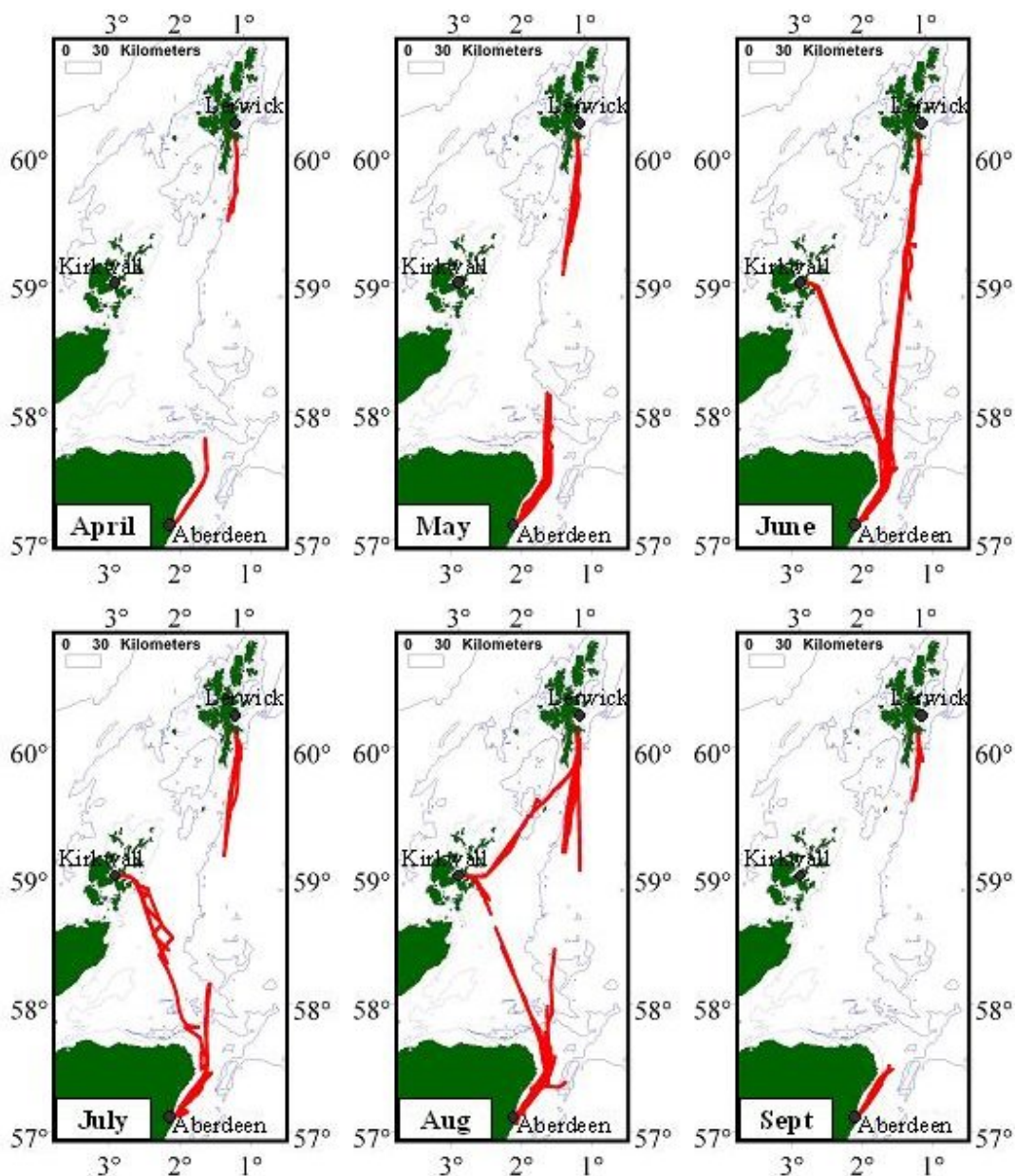
As these surveys are conducted in a comparable way, the information obtained can be compared to data from other ferry projects around the UK and help expand the coverage of this network into the northern North Sea for the first time. In addition, data can be provided to a variety of other interested parties, such as, the North East of Scotland Biological Records Centre, the Shetland Sea Mammal Group, the Atlantic Research Collation and the National Seawatch Foundation Database.

The aim of this report is to summarise the data that has been gathered in the first five years of NORCET surveys and is intended to form the basis of an annual report describing what species have been recorded where and how this changes over time.

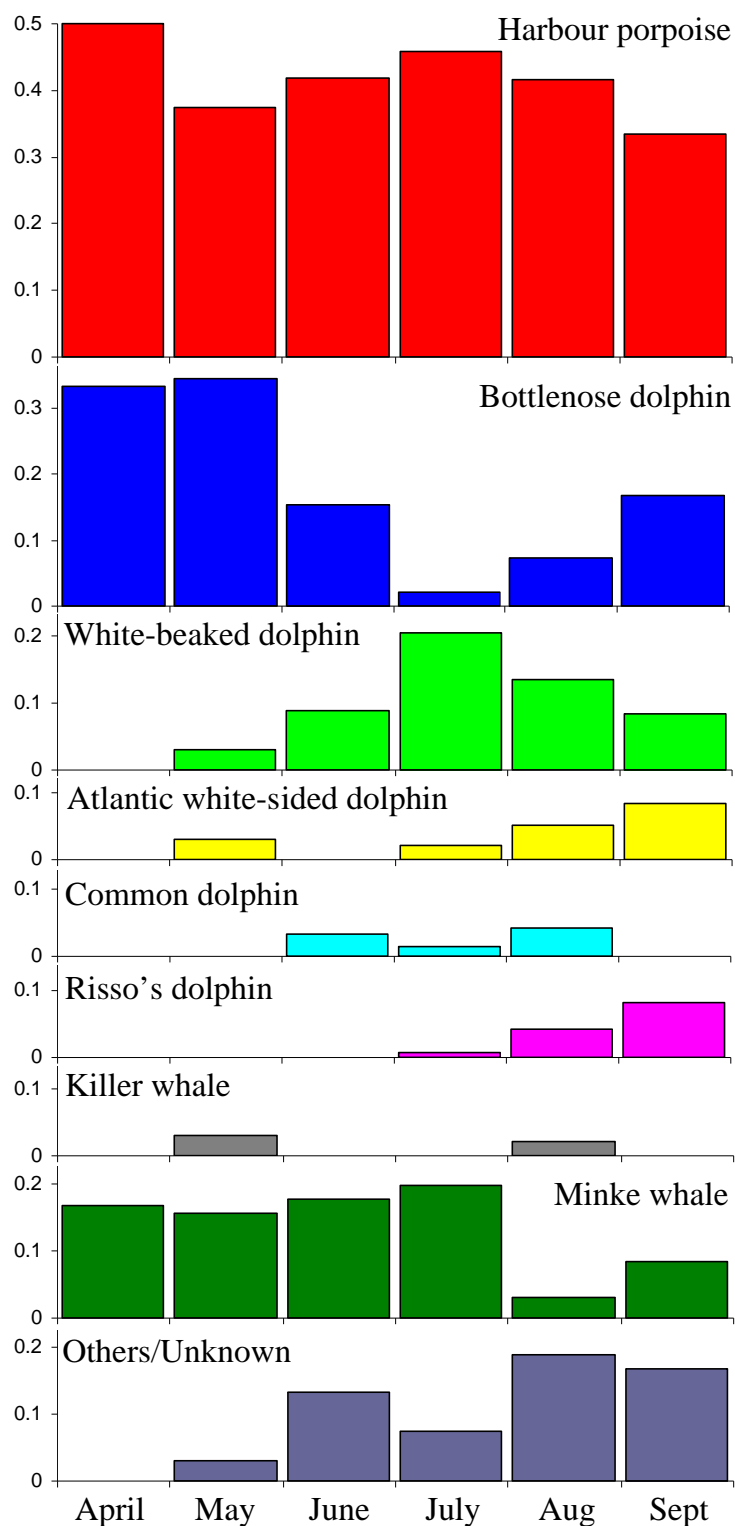
## **Data Collection**

Surveys were conducted from the bridge of the *MV Hascosay* during daylight hours as it travelled between Aberdeen, Orkney and Shetland following its usual timetable. Teams of between one and three observers were used, although two observers were present during most surveys. The areas ahead and to the side of the vessel were scanned on a regular basis using both the naked eye to detect nearby animals and binoculars to detect more distant groups. Every 15 minutes, the position of the ship was recorded using its onboard GPS system, along with information on the ship's speed and direction of travel. In addition, data were collected on environmental conditions that might affect the ability to detect cetaceans such as sea state, swell height, precipitation and visibility. By joining these positions together, it was possible to map the geographic areas covered by the surveys (figure 1).

When a group of cetaceans were detected, the position of the ship was recorded along with environmental information. The size of the group of the animals was estimated and the species identified to the lowest level of taxonomic certainty. For example, if a sighting could be 100% positively identified as a white-beaked dolphin it was recorded as such, but if the species ID was less than 100%, but it could be certain the animals were definitely dolphins, it was recorded as a dolphin spp. In addition, notes were taken on the behaviour of the animals and the presence of any seabirds around the group of cetaceans.



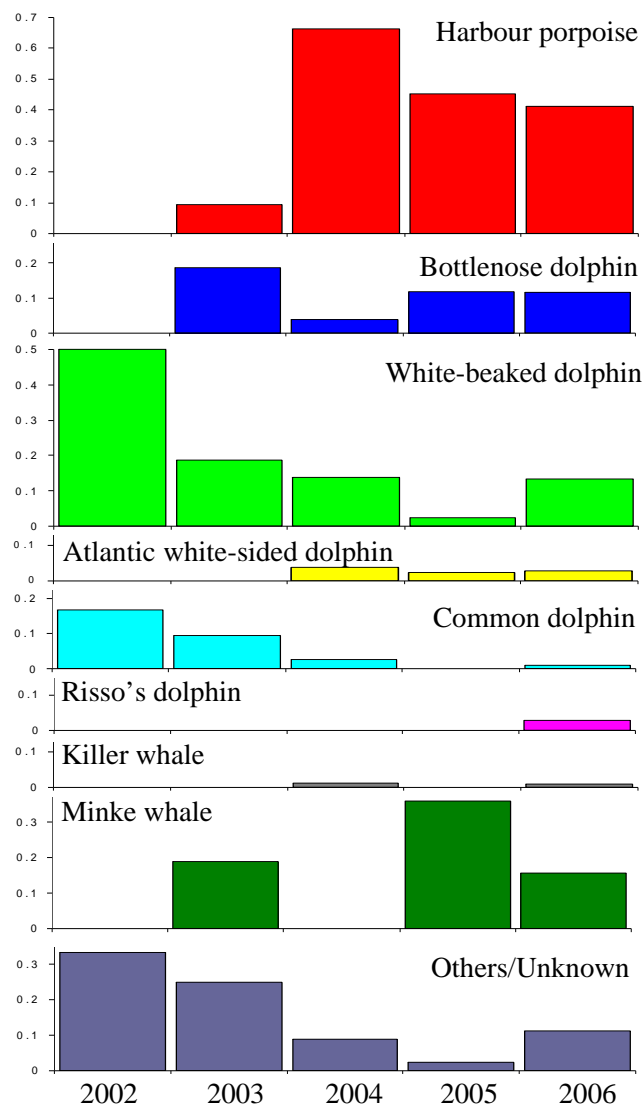
**Figure 1:** Area of survey coverage from April to September. Note: Due to the timetable of the ferry the central section of the route between Aberdeen and Shetland is always travelled in darkness, meaning no survey effort can be covered. The actual extent of this unsurveyed area is determined by day length and it is greatest in September and April and least in June and July.



**Figure 2:** A Comparison of the occurrence of the main species recorded across summer months from the NORCET surveys as a proportion of all sightings of all species within a month. NOTE: These are not corrected for effort or sea state and only provide information on the relative occurrence of species in each month.

# Occurrence And Distribution Of Individual Species

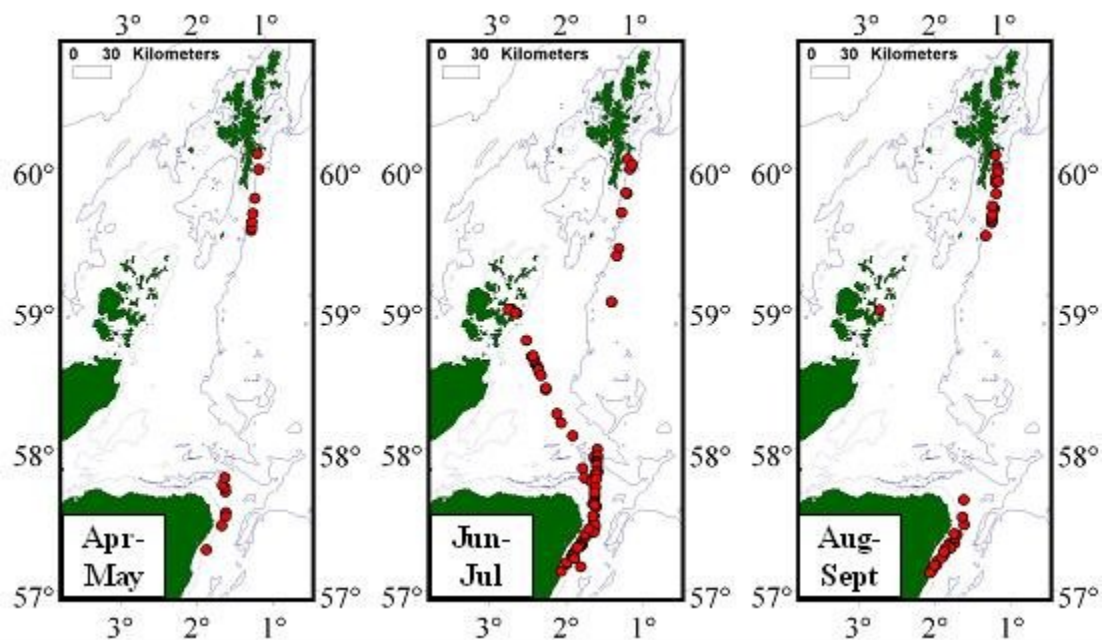
During over 100 days of surveys conducted in summer months between 2002 and 2006 (see figure 1 for survey coverage in different months), 383 groups of cetaceans, consisting of 1,148 individuals, were sighted. A total of 10 different species were recorded. These were, in order of the number of sightings, the harbour porpoise, the minke whale, the white-beaked dolphin, the bottlenose dolphin, the Atlantic white-sided dolphin, the common dolphin, the Risso's dolphin, the killer whale, the fin whale and the humpback whale.



**Figure 3** A Comparison of the occurrence of the main species recorded across all summer months for each year from the NORCET surveys. NOTE: These are not corrected for differences in effort or sea state and only provide information on the relative occurrence of species in each year.

### ***The Harbour Porpoise (Phocoena phocoena):***

One hundred and sixty four groups of harbour porpoises have been recorded during NORCET surveys, making this the most commonly recorded species. Recorded group sizes ranged from one to six, with an average of two. There was no variation in average group size across the summer months, but the maximum group size peaked in August and was lowest in April and September. In addition, this species was recorded through out the region (figure 4) and in all months (figures 2), with no obvious changes in distribution over time.

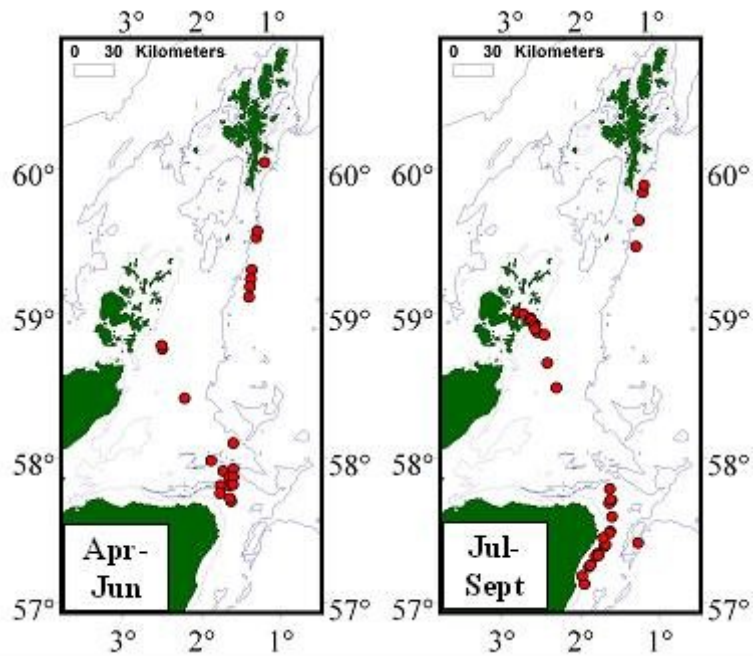


**Figure 4:** *Distribution of harbour porpoise sightings across summer months* **Left:** April and May; **Middle:** June and July; **Right:** August and September.

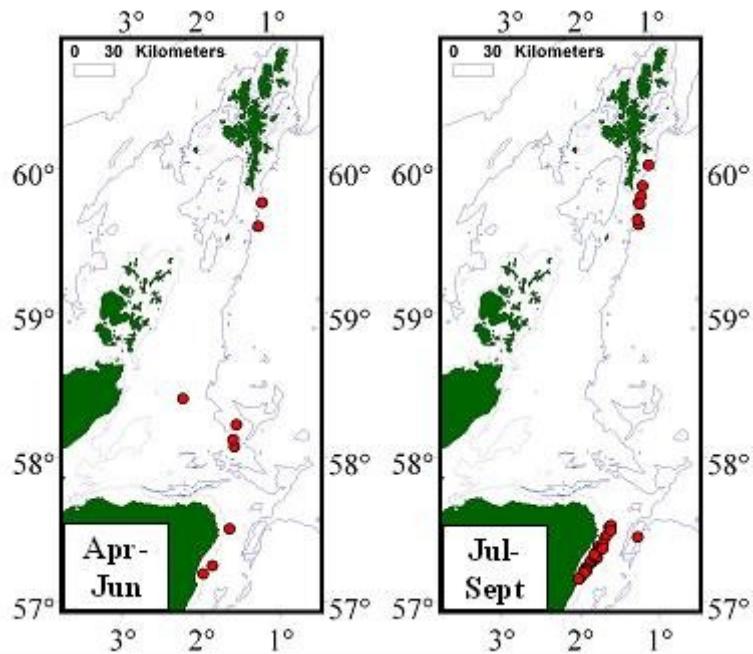
### ***The Northern Minke Whale (Balaenoptera acutorostrata):***

There were 55 sightings of minke whales during the NORCET surveys, making it the second most commonly sighted species. While minke whales were recorded through out the region and in all months, there were seasonal changes in where they occurred (figure 2). In particular, minke whales were recorded most frequently in more offshore waters in April to June, but in more coastal waters in July and September

(figure 5). This shift into more coastal waters, which are not as widely covered by NORCET surveys, may explain why this species makes up a smaller proportion of sightings in these late summer in comparison to earlier months (figure 2).



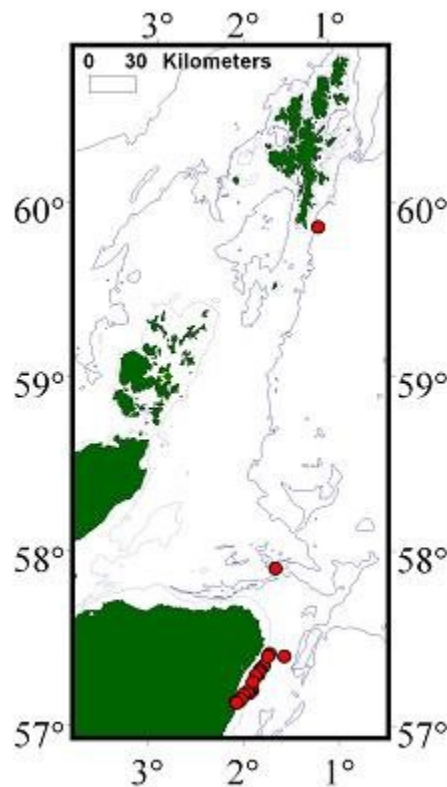
**Figure 5** Distribution of minke whales sightings across summer months *Left: April to June; Right: July to September.*



**Figure 6:** Distribution of white-beaked dolphin sightings across summer months *Left: April to June; Right: July to September.*

### ***The White-beaked Dolphin (Lagenorhynchus albirostris):***

Fifty-three sightings of white-beaked dolphins were sighted during NORCET surveys, making this the most commonly-sighted species of dolphin. Group sizes ranged from one to 20, with an average of five individuals per group. White-beaked dolphins were the only species of cetacean recorded in all years when surveys were conducted (figure 3). White-beaked dolphins made up the highest proportion of sightings in July, where almost 20% of all sightings were of this species and were not recorded in April (figure 2). White-beaked dolphins were recorded through out the study, but were recorded more frequently in more coastal waters, such as along the coast of mainland Scotland, in the late summer and early autumn (figure 6).



**Figure 7:** *Distribution of bottlenose dolphin sightings across summer months.*

### ***The Bottlenose Dolphin (Tursiops truncatus):***

Thirty-nine sightings of bottlenose dolphins were recorded, making it the fourth most commonly sighted species in the region. The average group size was five individuals,

but groups ranged from one to 25 individuals. Bottlenose dolphins were one of only three species to be recorded in all surveyed months (figure 2). However, bottlenose dolphins were not sighted evenly throughout the study area, and the sightings were concentrated in the region along the coast of mainland Scotland, and particularly in the waters around Aberdeen Harbour (figure 7). This is consistent with studies conducted in the outer Moray Firth and along the Aberdeenshire coast that bottlenose dolphins primarily use coastal waters in this region, and suggests that this population of bottlenose dolphins rarely use the deeper, more open waters of the outer-most Moray Firth and the northern North Sea. In addition, it suggests that bottlenose dolphins rarely, if ever, occur in the coastal waters around Orkney and Shetland.

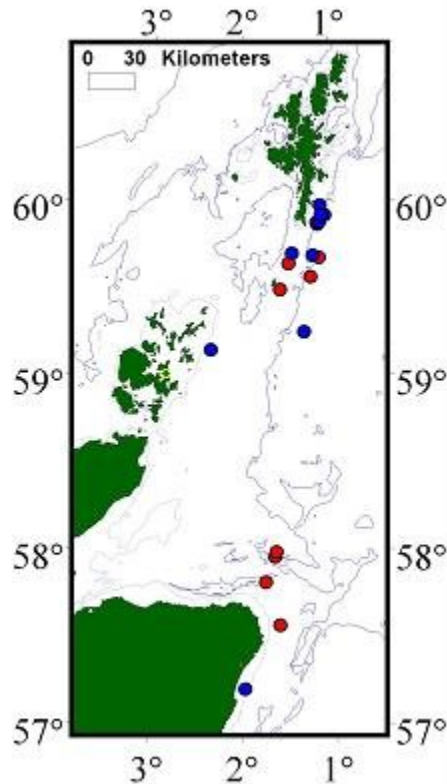
### ***The Atlantic White-sided Dolphin (Lagenorhynchus acutus):***

Atlantic white-sided dolphins were recorded on nine occasions in groups of between one and 50 individuals. The majority of these sightings have occurred in the more northern part of the study area around Shetland and this species was only once recorded near the Scottish mainland coast (figure 8). The sightings primarily occurred between July and September, with a single sighting being recorded in May (figure 2). Therefore, this species is a seasonal but regular member of the cetacean assemblage of the northern North Sea, and primarily occurs in the more northern waters of the study area. This is consistent with frequent records of this species towards the shelf edge and into deeper water as the northern part of the study area is closer to deeper water than more southern sections.

### ***The Common Dolphin (Delphinus delphis):***

Nine groups of common dolphins, ranging in size from one to 25 animals, were recorded during NORCET surveys. These sightings have all occurred from June to August (figure 2) and this species was recorded in every year except 2005 (figure 3). This species primarily occurred in relatively coastal waters near Shetland and north-east Scotland (figure 8). Therefore, common dolphins appear to be a regular, if rare and seasonal, member of the cetacean assemblage of the northern North Sea.

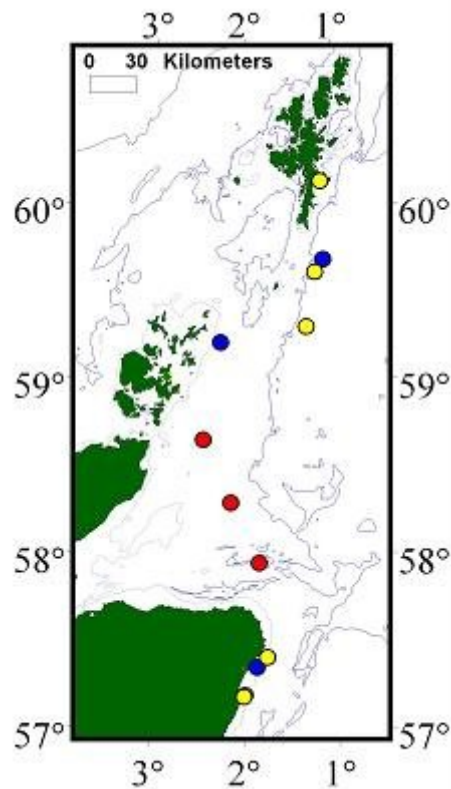
However, given observed changes in the distribution of this species in on the west coast of Scotland in recent years (as recorded by ferry surveys conducted in that region), thought to be associated with increasing water temperatures, this species may become a more frequent seasonal visitor to the northern North Sea in future.



**Figure 8:** *Distribution of Atlantic white-sided dolphin (blue) and common dolphin (red) sightings across summer months.*

### ***Risso's Dolphin (Grampus griseus):***

Risso's dolphins were sighted on six occasions, with group size ranging from one to four individuals. These sightings all occurred in 2006 (figure 3). These sightings were either in relatively coastal waters close to Shetland or north-east Scotland (figure 9). While it may be that this species was present in previous years and not identified (for example, there was a probable sighting in 2005), it may also reflect a change in the occurrence of Risso's dolphins within this region.



**Figure 9:** *Distribution of killer whale (blue), Risso's dolphin (yellow) and fin whale (red) sightings across summer months.*

### ***The Killer Whale (Orcinus orca):***

Killer whales were encountered on three occasions in groups ranging from one to five individuals. Two of these encounters were in August (in 2004 and 2006) and one was in June 2006 (figure 3). This suggests that killer whales are rare, but regular members of the cetacean community in the northern North Sea.

### ***The Fin Whale (Balaenoptera physalus):***

Three groups of fin whales were recorded during NORCET surveys, all in the outer Moray Firth region (figure 9). However, these were all only a single survey in June 2006 and may represent a small number of stray animals rather than indicating the regular occurrence of this species in the northern North Sea in small numbers.

## ***The Humpback Whale (Megaptera novaeangliae):***

One group of humpback whales, consisting of two adults and one juvenile, was seen in July 2005. While this species was once almost completely absent from the North Sea due to the depletion of the North Atlantic humpback whale population by whalers, this species is now becoming regularly recorded in the North Sea in small numbers possibly as a result of a recovery in the North Atlantic population.

## **Conclusions**

The first five years of the NORCET surveys augment our existing knowledge of the diversity of species that occur in the northern North Sea. In addition, they have provided important additional information on the occurrence and distribution of cetaceans in areas away from the coast that are not regularly covered by other surveys. The data confirm, as has long been suspected, that bottlenose dolphins are primarily only recorded in coastal waters around mainland Scotland and that they do not regularly occur in deeper, more offshore areas such as the outer-most Moray Firth. The surveys have also increased our knowledge of white-beaked dolphins in the northern North Sea, something that is becoming increasingly important as the occurrence of this species decreases in other parts of their range, such as the west coast of Scotland. Seasonal changes in species occurrence have also been highlighted for species such as bottlenose dolphins, minke whales and white-beaked dolphins. Finally, changes in cetacean occurrence between years have also been found. In particular, Risso's dolphins were only recorded in 2006 and not in any other year. The reasons for this remains unclear, but may become clearer with additional surveys in future years. Together, these data have provided an invaluable picture of cetacean occurrence, distribution and abundance in the northern North Sea and has greatly expanded our knowledge of cetaceans within this region. When combined with data from similar surveys from other parts of the UK, these data will be critical for assessing how, when and why cetacean occurrence and distributions may change in the coming years.

# Acknowledgements

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