

SIGHTINGS OF BEAKED WHALE SPECIES (CETACEA: ZIPHIIDAE) IN THE WATERS TO THE NORTH AND WEST OF SCOTLAND AND THE FAROE ISLANDS

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INTRODUCTION

The Seabirds at Sea Team (SAST) of the Joint Nature Conservation Committee has carried out surveys of seabirds in the waters around Britain and Ireland since 1979. The data resulting from SAST surveys has been added to that from similar seabird surveys carried out in other European countries, to form the European Seabirds at Sea (ESAS) database. Data on marine mammals are collected alongside seabird surveys and the resulting ESAS cetacean database is the largest effort-related sightings database for the north-east Atlantic, containing over 10,000 cetacean records of 17 species. The initiation of SAST and European surveys in offshore waters around Scotland and the Faroe Islands during 1995 to 1999 presented a rare opportunity to observe species of beaked whale at sea. Beaked whales (family Ziphiidae) inhabit deep, offshore waters, where they are normally inaccessible to researchers.

METHODOLOGY

The study area lies between latitudes 55°N and 65°N, and longitudes 2°E and 15°W (Fig. 1). The region contains shelf waters around Scotland, Iceland and four island groups, the Faroe, Shetland and Orkney Islands, and the Western Isles. The remainder of the study area is composed of deep water, reaching depths of 1,700 m in the Faroe-Shetland Channel, to over 2,000 m in the Rockall Trough and 3,000 m in the Norwegian Basin.

Surveys were carried out from a number of ‘platforms of opportunity’, using standard methodology for counting seabirds at sea (Tasker *et al.*, 1984; Webb & Durinck, 1992). Cetaceans were recorded opportunistically during the seabird survey whenever they were observed. For each cetacean sighting, the species, number of animals (and age where known), behaviour, direction of travel and distance from the vessel (transect band) were recorded. The vessel’s position, speed and course were recorded or calculated for 10 minute periods using a Global Positioning System (GPS) receiver. Environmental data including wind speed and direction, sea state, swell height and visibility were recorded every 90 minutes, or more frequently if conditions changed.

All data from the ESAS database relating to the defined study area were included in the production of maps. Survey effort data were calculated as total km² survey coverage achieved for each ¼ ICES (International Council for the Exploration of the Sea) rectangle (15' latitude by 30' longitude). Maps of survey effort and cetacean distribution were produced using Dmap for Windows (Morton, 1995).

RESULTS

A total of 94,347 km² survey coverage was achieved in the study area between June 1979 and April 1999. Survey effort prior to 1995 was primarily based along shelf waters of less than 200 m depth, with surveys centred on the North Sea, the west coast of Scotland and shelf waters around the Faroe Islands (Fig. 2). Since 1995, the emphasis of the surveys has moved to the deep, offshore waters of the Faroe-Shetland Channel and a high level of survey coverage (>60 km² per ¼ ICES rectangle) has been achieved along the shelf edge. Coverage has also varied on a seasonal basis; between 1995 and 1999 when dedicated offshore work was carried out, the summer months of June to August received more than double the level of survey coverage than any other season, as a result of longer daylight hours and better weather conditions during the summer months.

Northern bottlenose whale There have been 22 sightings (62 animals) of northern bottlenose whales within the study area; all have occurred since survey work in deep, offshore water commenced in 1995. Within the region, bottlenose whales were associated with deep, offshore waters of over 1,000 m depth (Fig. 3). All sightings of bottlenose whales within the survey area were between March and November, with a peak in both number of individuals and number of sightings during May and June (Fig. 4). Group size also increases during these two months, from an average of 2.8 animals to 3.4 animals (May) and 3.8 animals (June). Animals were recorded north of the Faroe Islands in deep water (>2,000 m) during June and July, and mostly south of the Faroes during the spring and autumn. However, lack of survey coverage at higher latitudes during the other months of the year restricts assumptions regarding seasonal migratory movements in this species. During September, three sightings were made over the Rockall Bank in less than 200 m water depth.

Sowerby's beaked whale Sowerby's beaked whale has been positively identified twice within the survey area (Fig. 5). The first sighting occurred on 5th August 1995, when a single unaged animal was seen in 1,080 m of water to the north-west of the Faroe Bank. The second sighting was recorded on 28 June 1998, when an animal surfaced twice to the south of the Rosemary Bank in 1,700 m water. The close proximity of the animal to the boat (<20 m) allowed a clear view of the head and back, which showed considerable scarring. The position of the teeth half way along the lower jaw, confirmed the animal as an adult male Sowerby's beaked whale.

Unidentified *Mesoplodon* species The majority of beaked whale sightings in the survey area were of animals unidentified to species level. However, the general size and behaviour of the animals and the shape of the head and beak, indicates that these animals belong to the genus *Mesoplodon*. The animals showed considerable variation in colour and morphology, however all were similar in length (3.5–5 m), had a broad base to the dorsal fin, and had distinctly long and narrow beaks. It was generally considered that the majority of these animals were Sowerby's beaked whales. There have been 26 sightings (74 animals) of unidentified species of *Mesoplodon* within the survey area (Fig. 6), all occurring since the commencement of offshore survey work in 1995. *Mesoplodon* species have been recorded throughout the year except for February and March, when survey coverage along the deep waters of the shelf edge was also low due to bad weather. The number of both individuals and sightings shows a clear peak in the month of August, and this is predominantly due to one cruise in August 1998 which recorded 10 sightings of 39 animals. Group size of *Mesoplodon* species ranged from 1 to 10 animals. *Mesoplodon* species have not been recorded further north than 62°30'N, and the centre of their distribution appears to be to the north-west of the Western Isles where 21 of the 26 *Mesoplodon* species sightings have been recorded. This region has a complex seabed topography

encompassing a series of ridges and channels. *Mesoplodon* species were not recorded in water of less than 700 m depth within this area, and seemed to associate predominantly with depths of between 700 and 1,200 m (14 sightings). There were four sightings over water depths of between 1,300 and 1,600 m, and three sightings in water depth of over 1,800 m.

CONCLUSIONS

Surveys carried out to the north and west of Scotland and the Faroe Islands since 1979 have confirmed the offshore habitat of beaked whale species in this region; whales were sighted in deep waters typically greater than 1,000 m depth. Despite the occurrence of strandings of Sowerby's beaked whale in the shallow North Sea (Mead, 1989), dedicated surveys within this area have not recorded any beaked whales. While northern bottlenose whales were widely distributed throughout the survey area, species of *Mesoplodon* showed a distribution pattern centred in an area to the north-west of the Western Isles. The distribution of beaked whale species in deep, offshore waters is probably related to that of their prey species, deep-water cephalopods (Mead, 1989; Bloch *et al.*, 1996).

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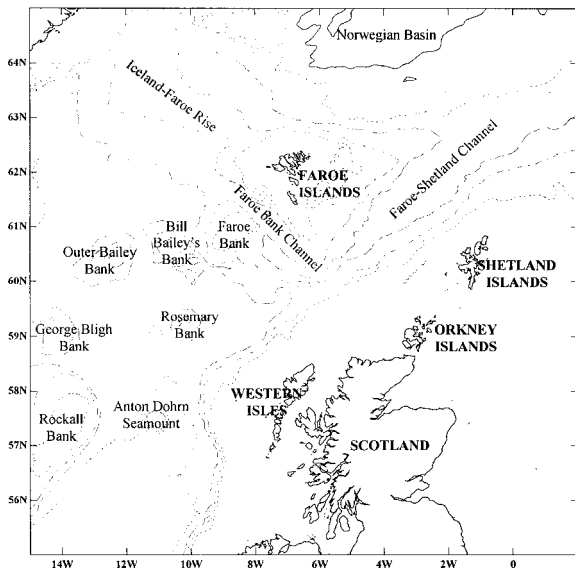
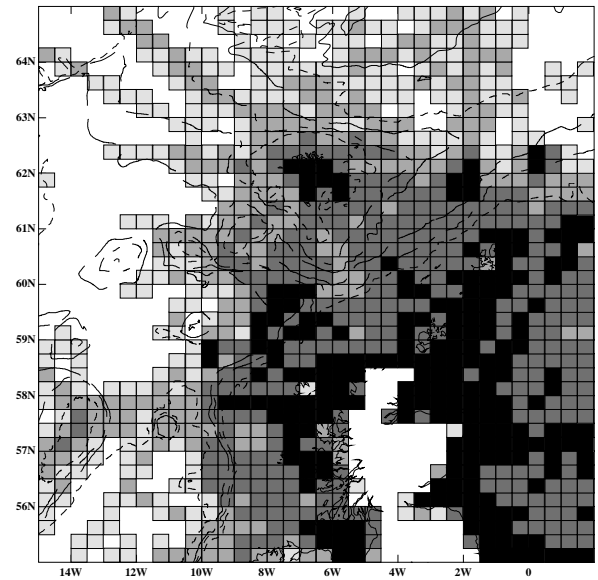


Fig. 1. The study area showing bathymetry and place names
 Bathymetry: dot (200 m); dotdash (500 m); dash (1,000 m); dot (2,000 m); solid (3,000 m)



Effort (km² surveyed):

□ 0.01-9.99 □ 10.00-49.99 □ 50.00-149.99 □ 150.00+

Fig. 2. Distribution of survey effort, June 1979 – April 1999

Bathymetry: dot (200 m); dotdash (500 m); dash (1,000 m); dot (2,000 m); solid (3,000 m)

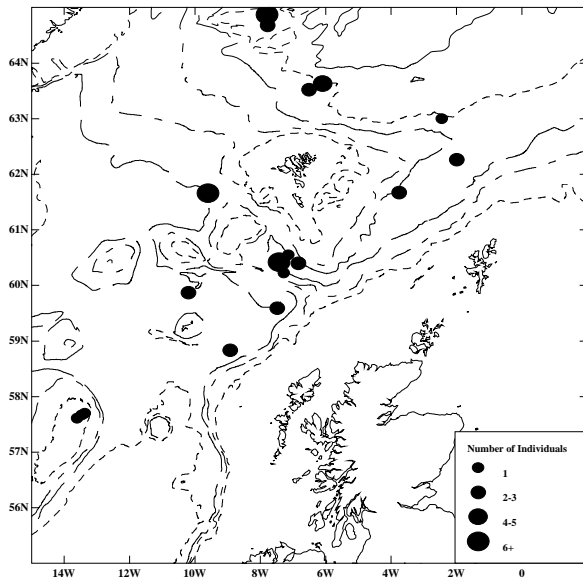


Fig. 3. Location of northern bottlenose whale sightings

Bathymetry: dot (200 m); dotdash (500 m); dash (1,000 m); dot (2,000 m); solid (3,000 m)

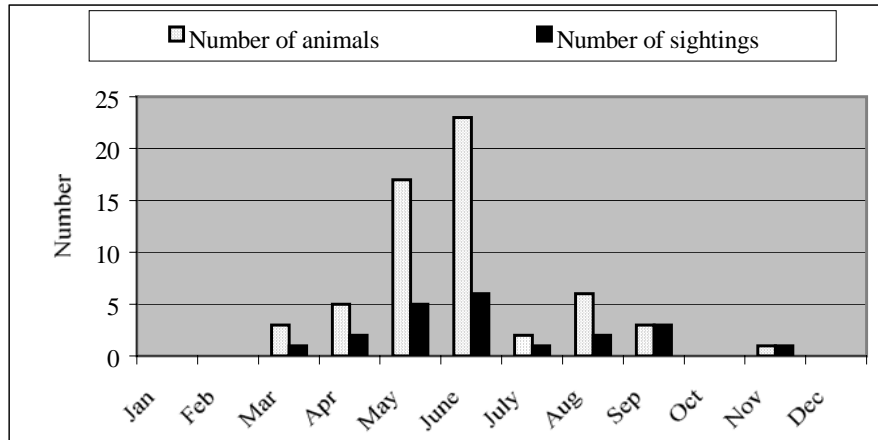


Fig. 4. Seasonal distribution in number of northern bottlenose whales

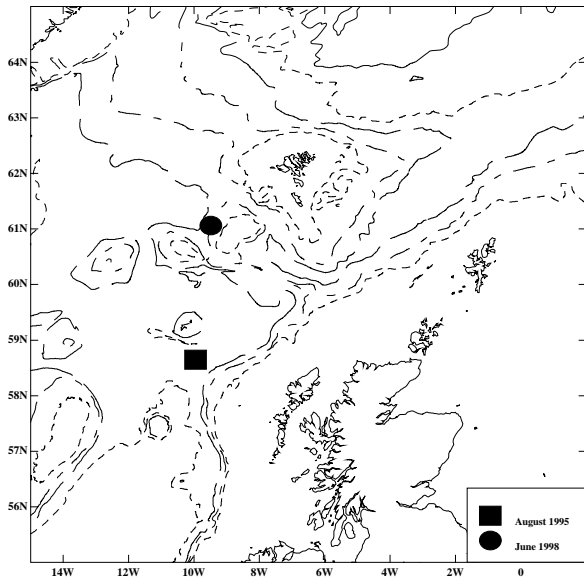


Fig. 5. Location of Sowerby's beaked whale sightings
 Bathymetry: dot (200 m); dotted (500 m); dash (1,000 m); dot (2,000 m); solid (3,000 m)

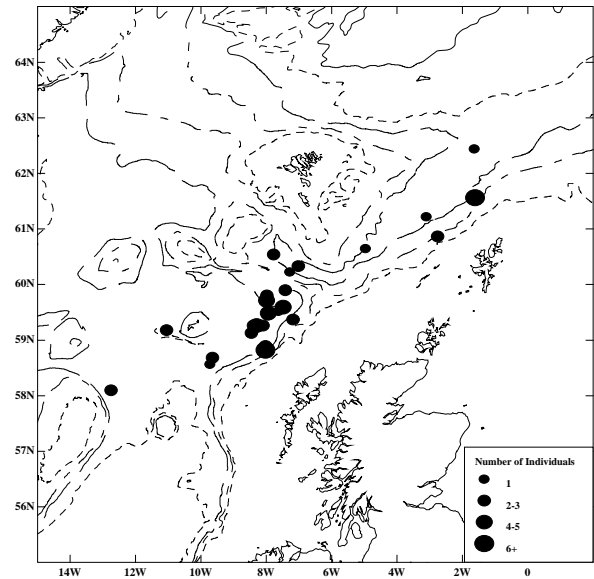


Fig. 6. Location of sightings of unidentified *Mesoplodon* species
 Bathymetry: dot (200 m); dotted (500 m); dash (1,000 m); dot (2,000 m); solid (3,000 m)