



# Patterns of cetacean strandings in NE Scotland (1992 to 2005): How do strandings data compare to live animal surveys?

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## Introduction

To date, systematic studies of wild cetaceans in northeast Scotland have been largely restricted to just a handful of priority coastal populations, but historical records, opportunistic sightings and dedicated surveys from the inshore waters of the outer Moray Firth have identified a number of additional species which are not only present in sizeable numbers but may also be of considerable conservation significance (Robinson *et al.*, 2005). However, due to an inability to adequately monitor year-round occurrences of these animals at sea in this location, owing to often extreme winter conditions, it remains difficult to obtain a complete picture of true species composition. Consequently, in the present study, incidental strandings records have been used to complement existing data gathered from boat survey work to provide a better determination of the biodiversity and occurrence of cetaceans frequenting the inshore waters of the outer southern Moray Firth (57° 41'N, 3° 15'W) (fig. 1).

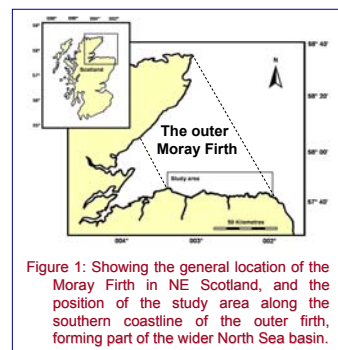


Figure 1: Showing the general location of the Moray Firth in NE Scotland, and the position of the study area along the southern coastline of the outer firth, forming part of the wider North Sea basin.

## Methods

The live survey data were collected between May and October 1997 to 2005 inclusive in an 850 km<sup>2</sup> area lying between the coastal ports of Lossiemouth and Fraserburgh. Surveys were typically carried out from rigid inflatable boats in sea conditions of Beaufort 3 or less, during good light conditions and with a crew of 4 to 7 trained observers. Strandings data for the period 1992 to 2005 were provided by the SAC Veterinary Science Division in Inverness. Data supplied included the date, species (where identifiable), sex, length, location of stranding and number of animals present.

## Results

- Between 1992 and 2005 and 1997 and 2005 respectively, 126 strandings and 1,369 encounters, representing a cumulative total of 5,524 animals, were recorded for 11 species of cetacean including 9 odontocetes and 2 mysticetes (table 1; fig. 2a).
- The temporal trend in strandings showed no significant increase in number of stranded animals with time (fig. 2b), but seasonality was observed, with an annual peak in strandings occurring between the months of April and July (fig. 2c).
- By far the highest number of strandings (72%) were of harbour porpoises (*P. phocoena*) (fig. 2a) which were also the most prevalent species encountered during live surveys (see table 1). For other species, those most frequently sighted in the survey area were also most highly represented in the strandings records; although a few animals that were recorded only intermittently across survey years, such as *O. orca* and *M. novaengliae*, did not occur in the strandings data, and other

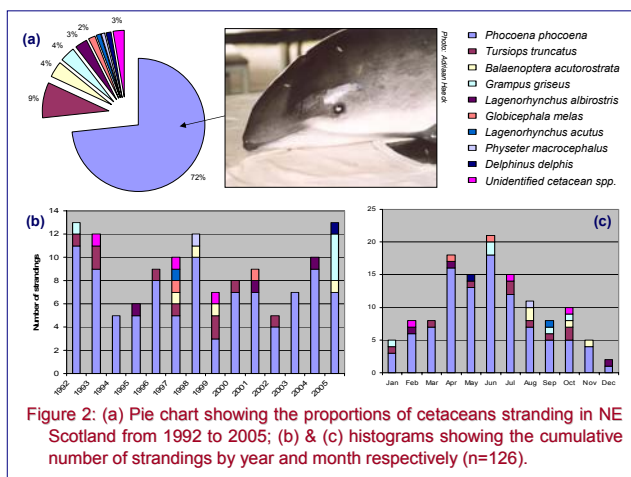


Figure 2: (a) Pie chart showing the proportions of cetaceans stranding in NE Scotland from 1992 to 2005; (b) & (c) histograms showing the cumulative number of strandings by year and month respectively (n=126).

- species occurring in the strandings data, such as *D. delphis*, *L. albirostris* and *P. macrocephalus*, were not encountered at sea.
- The unusual occurrence of 2 warmer-water delphinids (*D. delphis* and *G. griseus*) was observed in the summer of 2005, and in the latter case the strandings data strongly supported the data gathered from live surveys.
- From live survey data, *L. albirostris* has never been recorded in the study area between the months of May and Oct, but strandings data suggests the species may in fact occur in the study area during the colder winter months.

## Discussion

Comparisons with live survey data suggest that the species composition in strandings records largely reflects the composition found in live animal surveys. As such, incidental cetacean strandings can be used to provide a good indication of species diversity and occurrence in a particular region, especially where the size of an animal, its surfacing behaviour, pelagic life history and/or weather conditions may all affect its detectability at sea.

The present results therefore strongly advocate the usefulness of strandings data as a source of information, and particularly where no other data are available. Information from live animal surveys, however, are indispensable for the identification and interpretation of anomalous stranding patterns.

### References:

Robinson, K.P., Culloch, R.M., Duthie, N.J., Eisfeld, S.M., Tetley, M.J., Weare, J.S., Whaley, A.R. & White, D.J. (2005). The summer distribution and occurrence of coastal cetaceans in the outer southern Moray Firth, NE Scotland. 19th Conference of the European Cetacean Society, La Rochelle, France.

Table 1: Animals recorded in the study area during boat surveys and from incidental strandings records. Note: bracketed number = no. of encounters.

Species	Encountered during boat surveys (1997-2005)	Present in strandings data (1992-2005)	Cumulative number of animals encountered	Cumulative number of animals stranded
1) <i>Phocoena phocoena</i>	✓	✓	2,814 (981)	97
2) <i>Tursiops truncatus</i>	✓	✓	2,231 (181)	9
3) <i>Balaenoptera acutorostrata</i>	✓	✓	218 (191)	4
4) <i>Grampus griseus</i>	✓	✓	38 (4)	5
5) <i>Globicephala melas</i>	✓	✓	35 (3)	2
6) <i>Orcinus orca</i>	✓	✗	19 (6)	-
7) <i>Lagenorhynchus acutus</i>	✓	✓	12 (1)	1
8) <i>Megaptera novaengliae</i>	✓	✗	2 (2)	-
9) <i>Lagenorhynchus albirostris</i>	✗	✓	-	3
10) <i>Delphinus delphis</i>	✗	✓	-	1
11) <i>Physeter macrocephalus</i>	✗	✓	-	1
Unidentified cetacean spp.	-	-	-	3
	8	9	5,398 (1,369)	126