

## Monitoring the presence and occurrence of bottlenose dolphins (*Tursiops truncatus*) in the coastal waters of Aberdeenshire, NE Scotland (UK)

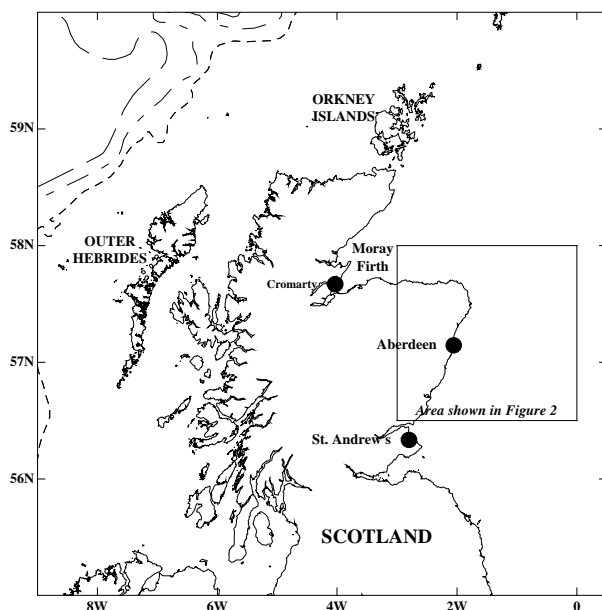
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### Introduction

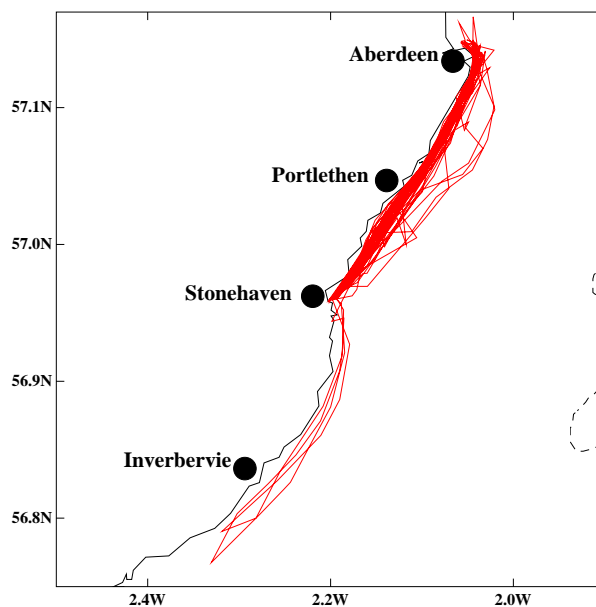
The success of efforts to conserve populations of mobile marine predators depends upon a clear understanding of distribution and home range. The resident population of bottlenose dolphins (*Tursiops truncatus*) in the Moray Firth, Scotland is considered to be of international importance. An area of the inner Moray Firth was recently designated as a candidate Marine Special Area of Conservation (mSAC) specifically for the conservation of this population. However, anecdotal evidence, collected over recent years suggests that the range of bottlenose dolphins from the Moray Firth population extends considerably beyond the boundaries of the Moray Firth.

The current study investigated the presence of bottlenose dolphins in Aberdeenshire coastal waters. Aberdeenshire lies to the south east of the Moray Firth (Figure 1).



**Figure 1.** Location of the study area. Bathymetry: dot (200 m); short dash (500 m); long dash (1,000 m)

Data on occurrence and abundance of bottlenose dolphins were collected over 3 years (1999-2001) using dedicated land- and vessel-based sighting surveys. Land-based effort primarily concentrated on the Aberdeen region, whilst vessel-based transect surveys followed a standardised 24 km coastal transect southwards of Aberdeen. On 2 occasions, transects were also conducted southwards of Stonehaven to Inverbervie (Figure 2).



**Figure 2.** Route plots for the 26 vessel-based surveys conducted in Aberdeenshire waters during 1999-2001

## Methods and survey effort

### Land-based Surveys

- 22,276 min (371.3 hr) of dedicated land-based effort was conducted during the present study.
- 16 locations along the Aberdeenshire coastline were used during the collection of land-based data. Three sites: Aberdeen Harbour, Girdle Ness and Souter Head, Cove were the key study sites, accounting for 77% of the total land-based-survey effort.
- A continuous scanning methodology was used throughout each survey, both with binoculars and the naked eye.
- Environmental and effort data were recorded every 15 min alongside any sightings-related data.

### Vessel-based Surveys

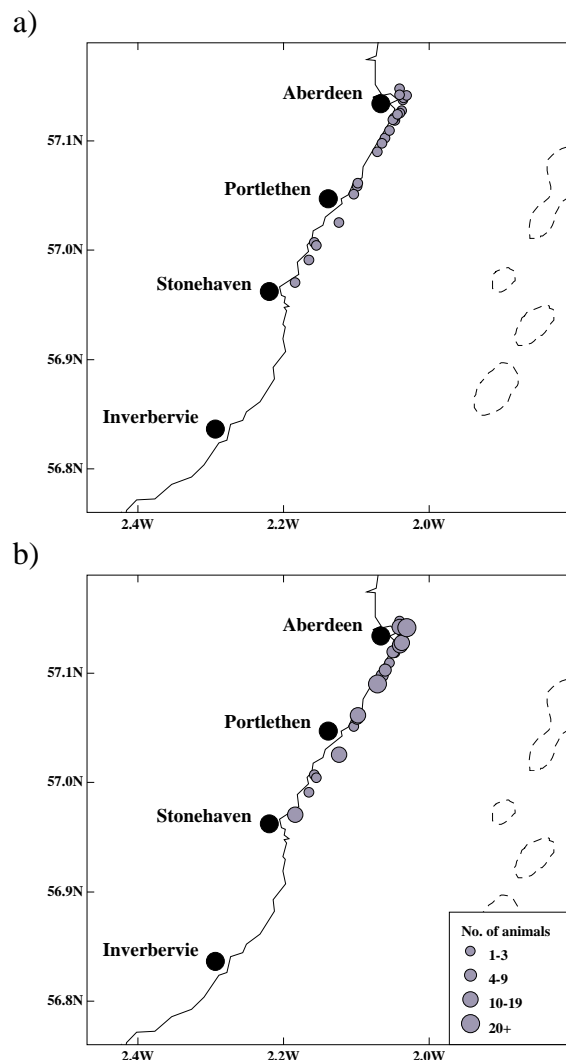
- 26 dedicated vessel-based surveys were conducted along a 24 km stretch of Aberdeenshire coastline during the present study using a 15 m motorised fishing vessel.
- 5,774 min (96.2 hr) of dedicated survey effort were conducted between the months of March and October in sea states of Beaufort 3 or less.
- A minimum of 3 trained observers participated in each survey, alongside either one or both of the authors. A continuous scanning methodology was used throughout each survey, both with binoculars and the naked eye.
- GPS locations and environmental data were recorded every 15 min alongside any sightings related data.

## Results

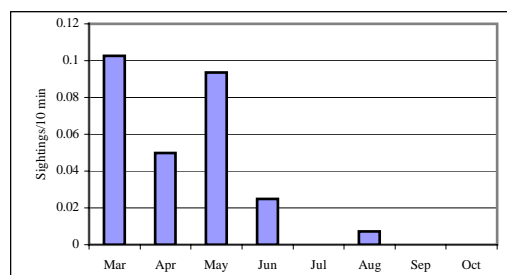
Bottlenose dolphins were the most commonly recorded cetacean species in Aberdeenshire waters, accounting for 47.2% of land-based sightings (n = 300) and 24.5% (n = 23) of vessel-based sightings (Figure 3). Other key species observed within this region include the white-beaked dolphin (*Lagenorhynchus albirostris*), harbour porpoise (*Phocoena phocoena*) and minke whale (*Balaenoptera acutorostrata*).

Bottlenose dolphins exhibited a marked seasonal occurrence within Aberdeenshire waters. 95.7% of vessel-based sightings occurred during the

springtime (March - June) with only one additional sighting (August) occurring outside of this period, despite adequate survey effort throughout late summer (Figure 4).

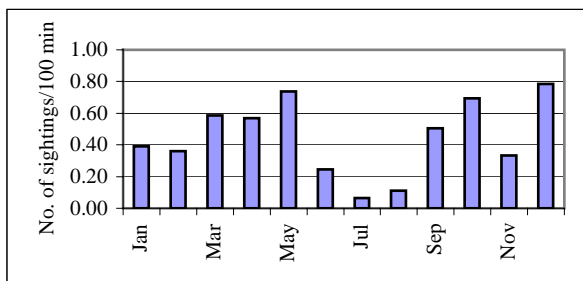


**Figure 3.** Location of bottlenose dolphin (a) sightings and (b) numbers (Data extracted from vessel-based surveys)



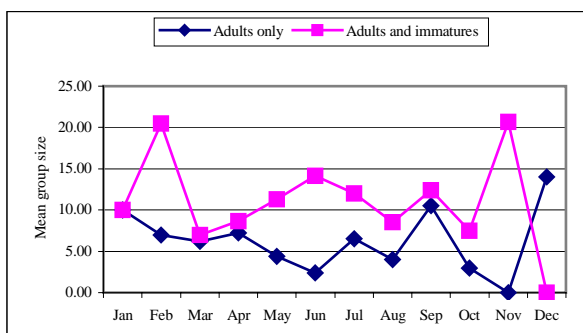
**Figure 4.** Monthly distribution of bottlenose dolphin sightings from vessel-based surveys

A similar trend appears evident in land-based survey data, where both the number of sightings and the number of animals per unit effort sharply decreased throughout the later summer (Figure 5).



**Figure 5.** Monthly distribution of bottlenose dolphin sightings per 100 min unit survey effort for land-based surveys

Land-based sightings data revealed that group size ranged from 1-60 animals, with data being positively skewed towards smaller schools of 1-6 animals. Mean group size = 8 animals per school (Median = 6.0, Mode = 6), but increased to 10.9 animals per school in groups where juveniles and/or calves were present. When analysed over a temporal scale, this trend remained consistent, resulting in a higher mean group size for groups with immature animals present (Figure 6).



**Figure 6.** Monthly mean group sizes for bottlenose dolphin groups containing adults only and those including juveniles (Data extracted from land-based surveys)

The proportionally high presence of calves and juveniles (35% of total sightings) suggests that Aberdeenshire waters may be important for various age groups.

## Conclusions

- Photo-identification has been utilised to confirm that a proportion of the animals

observed in Aberdeenshire waters do form part of the recognised Moray Firth population. Although <3% of animals observed in Aberdeenshire waters have been successfully identified, it is likely that a continuous distribution of bottlenose dolphins exists along the Moray-Aberdeenshire coast and that most animals present in Aberdeenshire waters are from the Moray Firth population.

- The high frequency and regularity with which dolphins were observed during the present study suggests that the Aberdeenshire coast is currently part of the normal range of at least part of the Moray Firth bottlenose dolphin population.
- Despite seasonality, results of the present study reflect an annual presence of bottlenose dolphins along the coast of Aberdeenshire. This may be an important issue given the numerous potential sources of disturbance within this region e.g. heavy shipping traffic, oil and gas development and dredging activities. An increased presence of bottlenose dolphins in Aberdeenshire waters may have important conservation implications for a population, whose numbers are already reported to be in decline (Sanders-Reed, 1999).

## REFERENCES

Sanders-Reed, C.A., Hammond, P.S., Grellier, K. & Thompson, P.M. (1999). Development of a population model for bottlenose dolphins. SNH Research, Survey and Monitoring Report No. 156.

## ACKNOWLEDGEMENTS

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