

Distribution and habitat use of white-beaked dolphins (*Lagenorhynchus albirostris*) along the east Grampian coastline, Scotland, with new information on diet

CM 2005/R:27

Sarah J Canning¹, M Begoña Santos¹, Robert J Reid², Peter GH Evans³, & Graham J Pierce¹

¹ School of Biological Science (Zoology), University of Aberdeen, Aberdeen. ² SAC Veterinary Science Division, Inverness. ³ The Sea Watch Foundation, Oxford



Introduction

White-beaked dolphins are found in temperate and sub-Arctic waters of the North Atlantic, occurring over much of the European continental shelf and are the most numerous dolphin species in the North Sea (Hammond *et al* 2002). Most sightings in UK coastal waters are between June and October (Evans 1992).



Methods

Boat surveys (N=76) were carried out throughout the year along the east Grampian coastline (Scotland) between May 2002 - October 2004. Two routes were followed: (I) during the day, from Stonehaven to Aberdeen (12 miles), (II) in the evening covering part of route I (6 miles). Two additional surveys headed directly off-shore from Stonehaven (14 miles), and 5 went south to St Cyrus (13 miles). Distance from shore varied between 0.5-5 miles. Position of the boat, sea state and visibility were recorded every 15 minutes and for each sighting, species, group size, number of calves and position at 15 minute intervals were also recorded. Sightings were analysed in relation to tidal state and time of day, start positions were plotted against sediment type and depth using ArcView.

Dolphins stranded on the Scottish coast between 1992-2003 were examined and non-empty stomachs (N=22) were analysed. For a detailed explanation of the methods for diet analysis see Santos *et al.* (2005).

Results

All sightings (except one October 2004) were recorded between June and August. Group sizes ranged from 1 to 18 with an average of 4.6. Average group size did not vary with month, but did increase to 5.9 if calves were present. Calves were only recorded during July and August with 30% of sightings including calves. There were significant associations between sightings and (I) tidal state ($\chi^2=65$, 3df, $p<0.001$) and (II) time ($\chi^2=72$, 3df, $p<0.001$) (fig.1), with more sightings at low and ebb tide and during evening surveys. Most sightings (65%) occurred over areas of sand (fig.2) with an average depth of 20m. The distance from shore varied between 0.66-4.4km with an average of 1.2km.

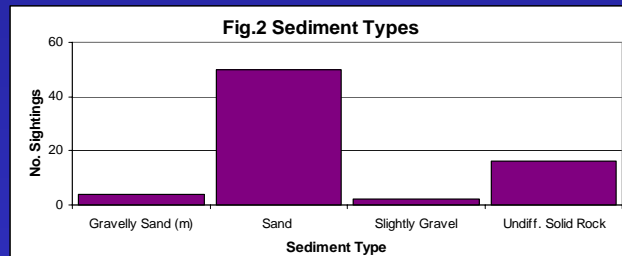
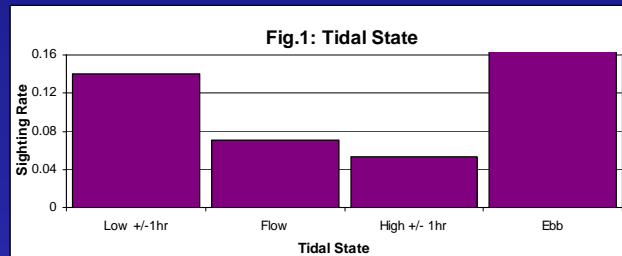
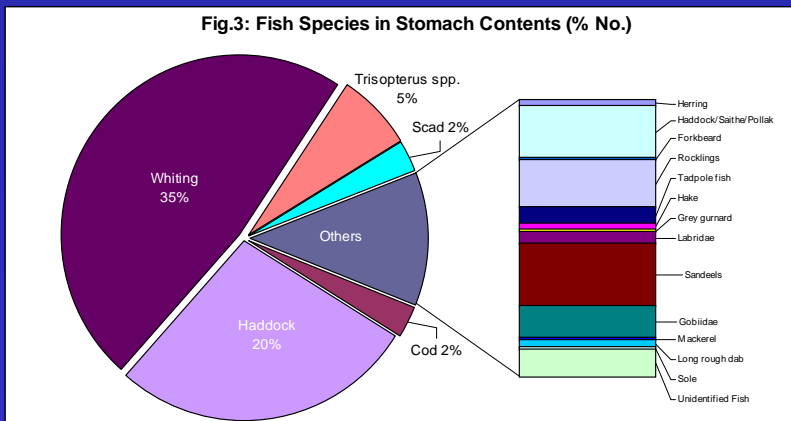


Fig.3: Fish Species in Stomach Contents (% No.)



Stranded dolphins were found throughout the year with the majority found during the summer months (45%) and on the east coast (77%). 70% of calves (<160cm) were found June-August. A wide variety of prey species were identified in the stomachs with fish representing 95% of the diet (fig.3). Haddock and whiting were the most abundant species found, mackerel made up less than 1%. Most haddock ranged between 265-285mm total length while whiting ranged between 155-165mm total length.

Discussion

Both haddock and whiting are prevalent in the North Sea and whiting in particular is associated with coastal waters, explaining the large numbers of both found in the stomachs. The behaviour of these fish may explain the habitat type predominantly used by the dolphins, as they are both known to feed on sandeels. White-beaked dolphins reported in the Outer Hebrides (West Scotland) are often associated with mackerel shoals, and our sightings coincide with mackerel appearing in coastal waters but it did not feature strongly in the diet suggesting other reasons for the dolphins coming into coastal waters during the summer. One reason could be to give birth, given the number of calves seen and stranded during the this period. Time of dolphin sightings could relate to diurnal movement of fish in the water column. It could also be easier to catch fish at low tide as the difference in height between low and high tide in this area can be as much as 4 m, which can have a large impact on overall depth in such shallow waters.

References:

Evans, P.G.H., 1992. Status Review of Cetaceans in the British Isles. University of Oxford, UK Mammal Society Cetacean Group report to the UK Dept. of the Environment. Hammond, P.S., Benke, H., Berggren, P., Borchers, D.L., Buckland, S.T., Collet, A., Heide-Jørgensen, M.P., Heimlich-Boran, S., Hiby, A.R., Leopold M.F. & Oien, N., 2002. Abundance of harbour porpoise and other cetaceans in the North Sea and adjacent waters. J. Appl. Ecol., 39:361-376. Santos, M.B., Pierce, G.J., Ieno, E.N., Addink, M., Smeenk, C., Kinze, C.C. & Sacau, M., 2005. Harbour porpoise (*Phocoena phocoena*) feeding ecology in the eastern North Sea. ICES 2005/CM R:15.