Environmental correlates of behaviour and group composition of bottlenose dolphin in Cardigan Bay, Wales

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Introduction

It has been previously shown that bottlenose dolphin encounter rates and distribution in Cardigan Bay have a non-random distribution (Pesante et al., 2008; Barba Villaescusa et al., 2008). Dolphins are encountered more frequently in shallow waters over a sandy substrate mixed with gravel or cobbles. Here, we extend these analyses and consider variation in specific behavioural states, group size and composition in relation to spatial distribution of bottlenose dolphins within Cardigan Bay using data from 2007-10.

Methods

Behavioural sampling was undertaken during land and boat based surveys (line transect and ad libitum). Data relating to group size, group composition and main behaviours were collected at 6 minute intervals in favourable weather conditions (Beaufort 3). A random subset of these data was selected for analysis. Data manipulation, statistical analysis (Chi Square, Kruskal Wallis test) and mapping were conducted within Matlab (Mathworks Inc.).

Results

The Chi Square Test shows that the frequency of observed behaviours is not statistically independent of group size (P<0.001). Swimming behaviours were the most frequently observed overall with an increase in larger groups of animals.

Conclusions

The results of this study indicate that group size is dictated by distance to coast and that behaviour is strongly associated with group size and to a lesser extent with distance from coast. As previously observed (Pierpoint et al., 2009), group sizes inshore tend to be small (<3 individuals) whereas group sizes vary more widely offshore. Swimming and feeding behaviours were most frequent for all group sizes with an overall increase in swimming behaviour with group size. Further studies are necessary to determine the causal link between behaviour and group size. Isolated incidents (outliers) of feeding offshore could also indicate a relationship between seasonal pelagic prey availability and behaviour (Baines et al., 2008).

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