

The influence of wind direction on the rafting location of Manx Shearwaters around Skomer Island

Introduction

Few studies have explored the rafting behaviour of Manx Shearwaters, let alone the rafting behaviour of other seabird species. Rafting is the behaviour whereby groups of birds aggregate on the surface of the water. The true reason behind rafting is unknown. However, it has been hypothesised that rafting is important for information exchange (Wiemerskirch et al., 2010), predator avoidance and preening, or they could have incorrectly timed their return and are waiting until nightfall to land ashore (Brooke, 1990).

The aim of this study was to investigate whether wind direction influences the rafting location of Manx Shearwaters around Skomer Island.

Methodology

The study was conducted between August 5th and September 4th, 2016. Four observation stations were selected to maximise coverage (Fig. 1). The order of visits to observation stations was randomised to prevent systematic bias. Rafts were sampled within a 2 km radius of the observation stations two hours before sunset using 8x42 binoculars, a magnetic compass and inclinometer. Altitude and coordinates of observation stations were taken using a GPS. Raft locations and distance of rafts from the centre of the island were calculated using spherical trigonometry. All weather data were taken from Wooltack Point weather station. Data were analysed using circular-circular regression in R.

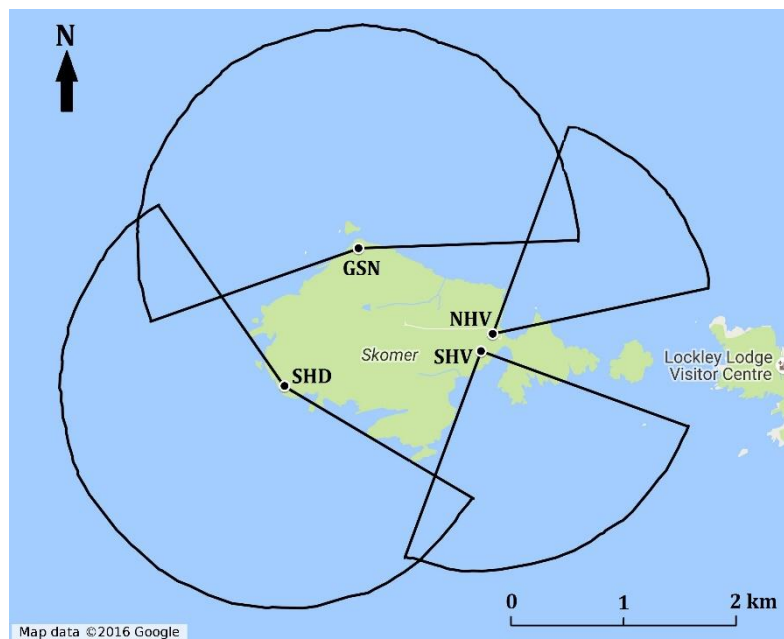


Fig. 1 Observation stations around Skomer Island. Black lines indicate the 2 km observation boundaries

Results

A total of 247 rafts were sampled across 22 sampling days. Mean rafting distance from the centre of the island was 1914.9 ± 352.1 m. Mean raft size was 356 ± 457 birds. The smallest raft

consisted of 5 birds, and the largest raft of 2,900 birds. Rafts were distributed in every direction around the island, yet there were fewer rafts observed in North Haven and South Haven, and none were located closer than 471.0m (Fig. 2). There was no effect of wind on the rafting location of Manx Shearwaters around Skomer (Rho = 0.239, $p > 0.05$).

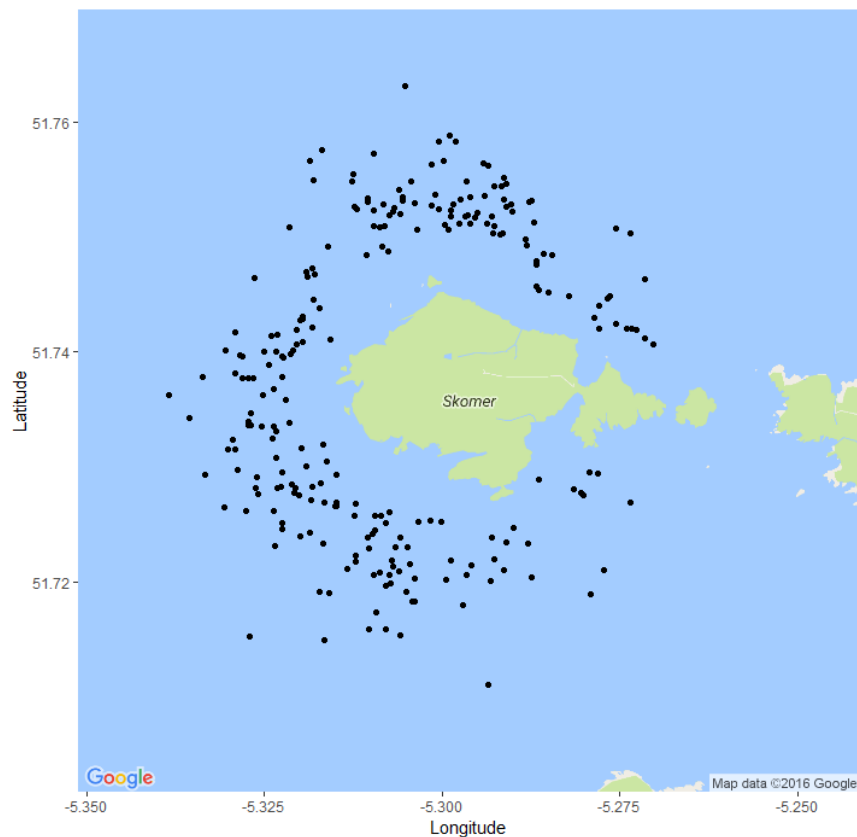


Fig. 2 Rafting locations of Manx Shearwaters around Skomer Island.

Discussion

This study elucidated that wind direction did not determine the rafting location of Manx Shearwaters around Skomer. Anecdotal observations during the study suggested once a raft has drifted a substantial distance, it will take-off and re-align near to its original position. This suggests that Manx Shearwaters actively decide where they raft, regardless of the environmental conditions.

The absence of rafts within ~500m of the island could be explained by predator avoidance. Alternatively, Manx Shearwaters could raft further away from islands with greater altitudes. Anecdotal observations on Copeland Island (average elevation: 22m) suggest that Manx Shearwaters raft considerably closer than Skomer Island (greatest altitude: 76m). However, further investigation is required.

References

Brooke, M. 1990. The Manx Shearwater. Poyser, London.

Weimerskirch, H., Bertrand, S., Silva, J., Marques, J. C. and Goya, E. 2010, 'Use of social information in seabirds: compass rafts indicate the heading of food patches', *PLoS one*, 5, e9928.