

1 Supplementary information

2 Manuscript title: Influence of wind on kittiwake *Rissa tridactyla* flight and offshore wind turbine
3 collision risk

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5 Submitted to: Marine Biology

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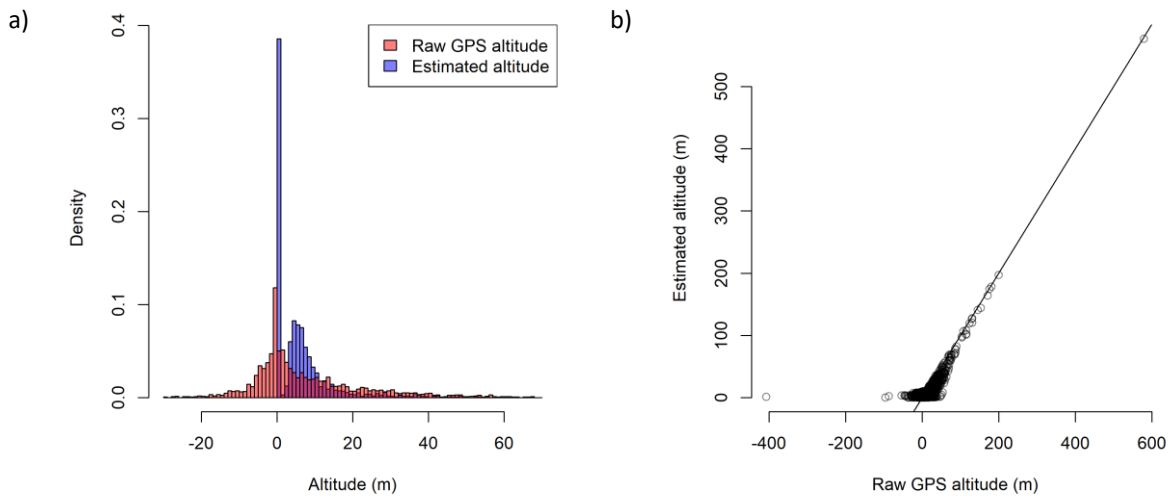
7 Author names & affiliations:

8 Jacob G. Davies^{1*}, Philipp Boersch-Supan², Gary D. Clewley¹, Elizabeth M. Humphreys¹, Nina J.
9 O’Hanlon¹, Judy Shamoun-Baranes³, Chris B. Thaxter², Ewan Weston⁴ & Aonghais S.C.P. Cook²

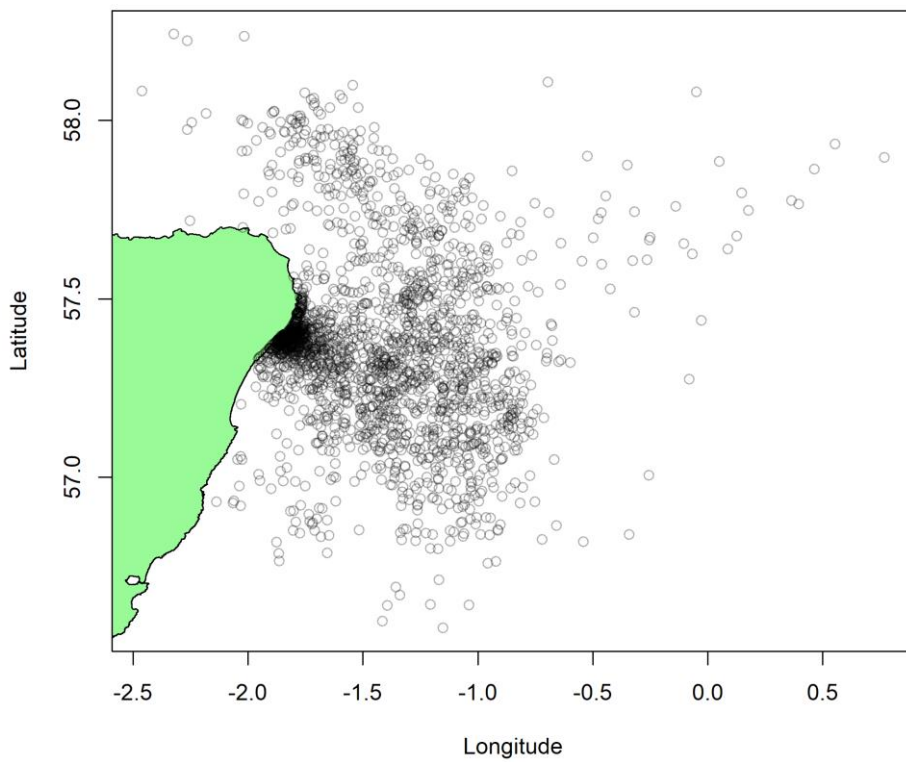
10 ¹British Trust for Ornithology Scotland, Stirling, UK; ²British Trust for Ornithology, Thetford, UK; ³
11 Institute for Biodiversity and Ecosystem Dynamics, University of Amsterdam, The Netherlands; ⁴
12 Comers Wood Croft, Midmar, UK.

13 * Corresponding author. Email jacob.davies@bto.org

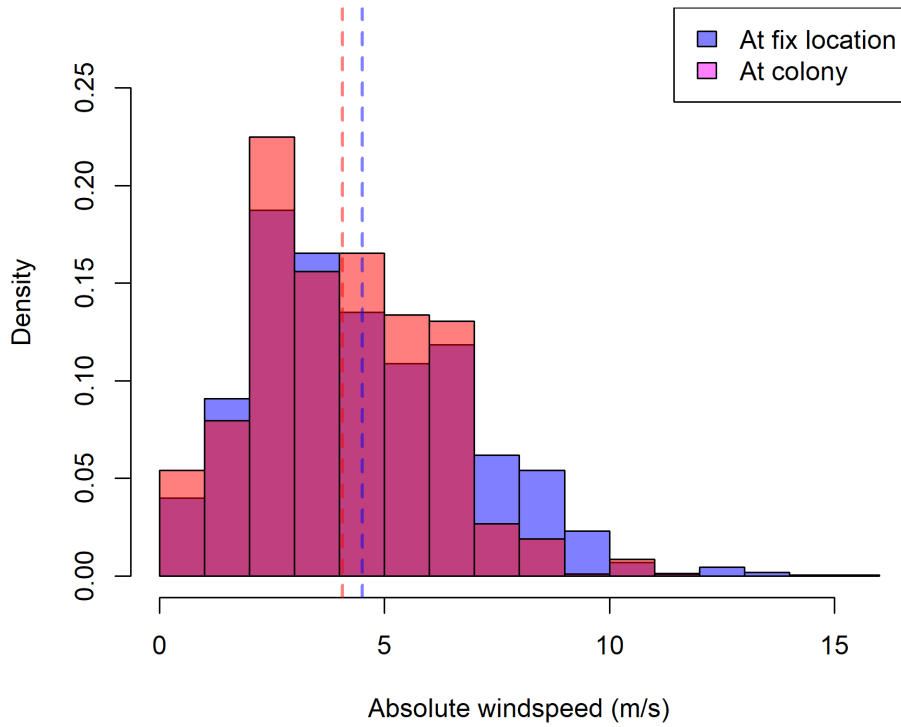
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15 **Fig. S1** Effects of application of GPS altitude error model: a) frequency distribution of kittiwake altitudes before
 16 and after application of GPS error model (only shown for raw GPS altitudes between -30 m and +70 m); b)
 17 altitude before vs altitude after application of GPS error model (black line: $y = x$).
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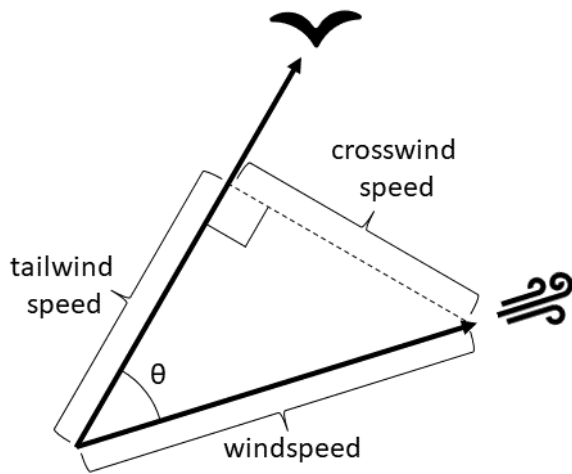


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 20 **Fig. S2** Locations of fixes in tracking dataset after data filtering and resampling (2214 fixes from 653 tracks
 21 from 20 individual kittiwakes). Land polygon from <http://gadm.org>.



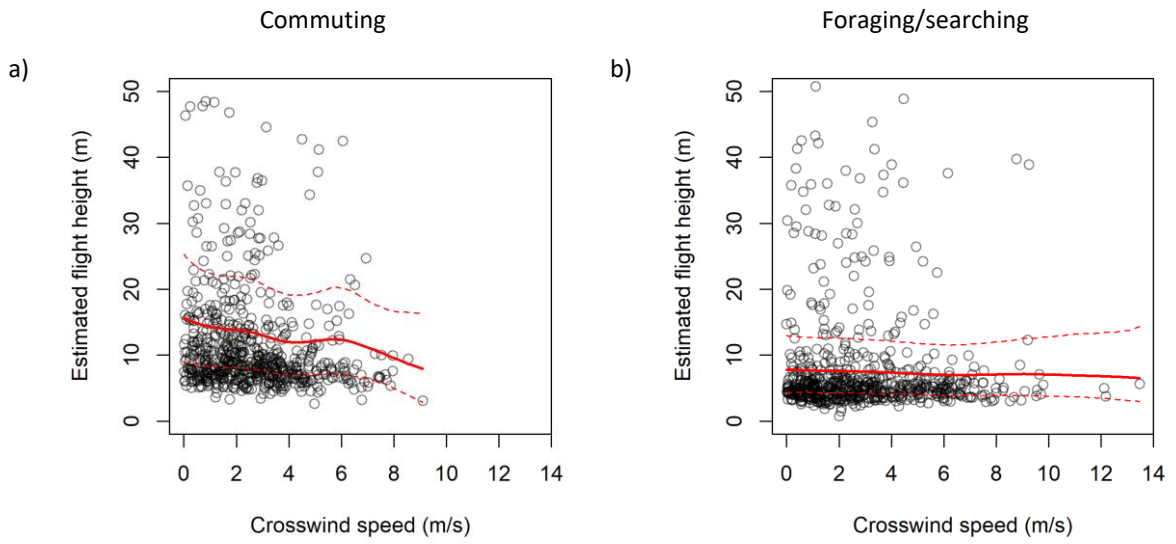
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Fig. S3 Frequency distribution of windspeed: blue = at fix location (blue line = mean); red = at colony (red line = mean) (n = 2214).

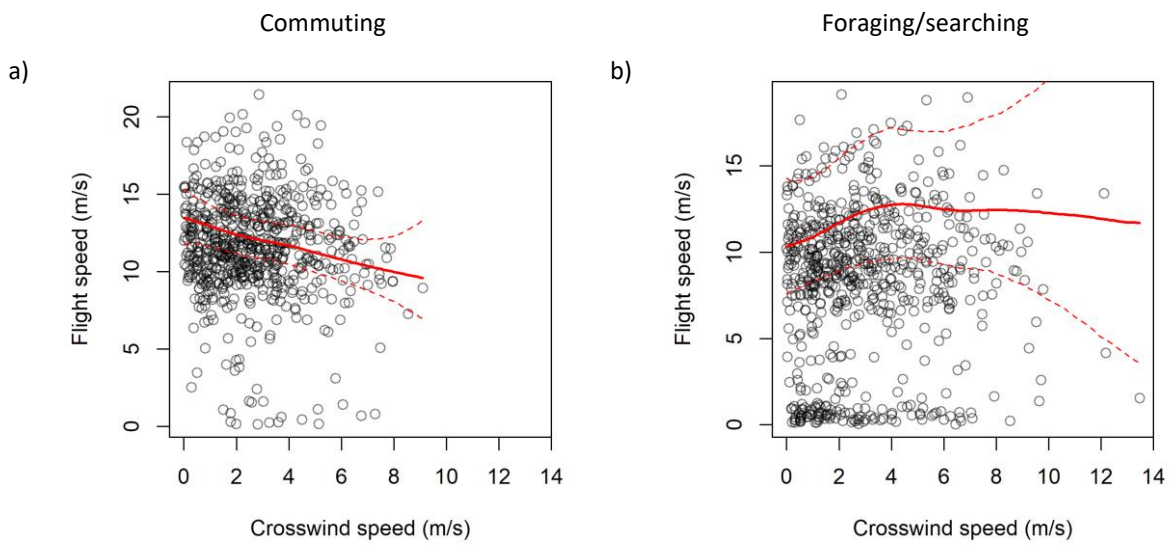


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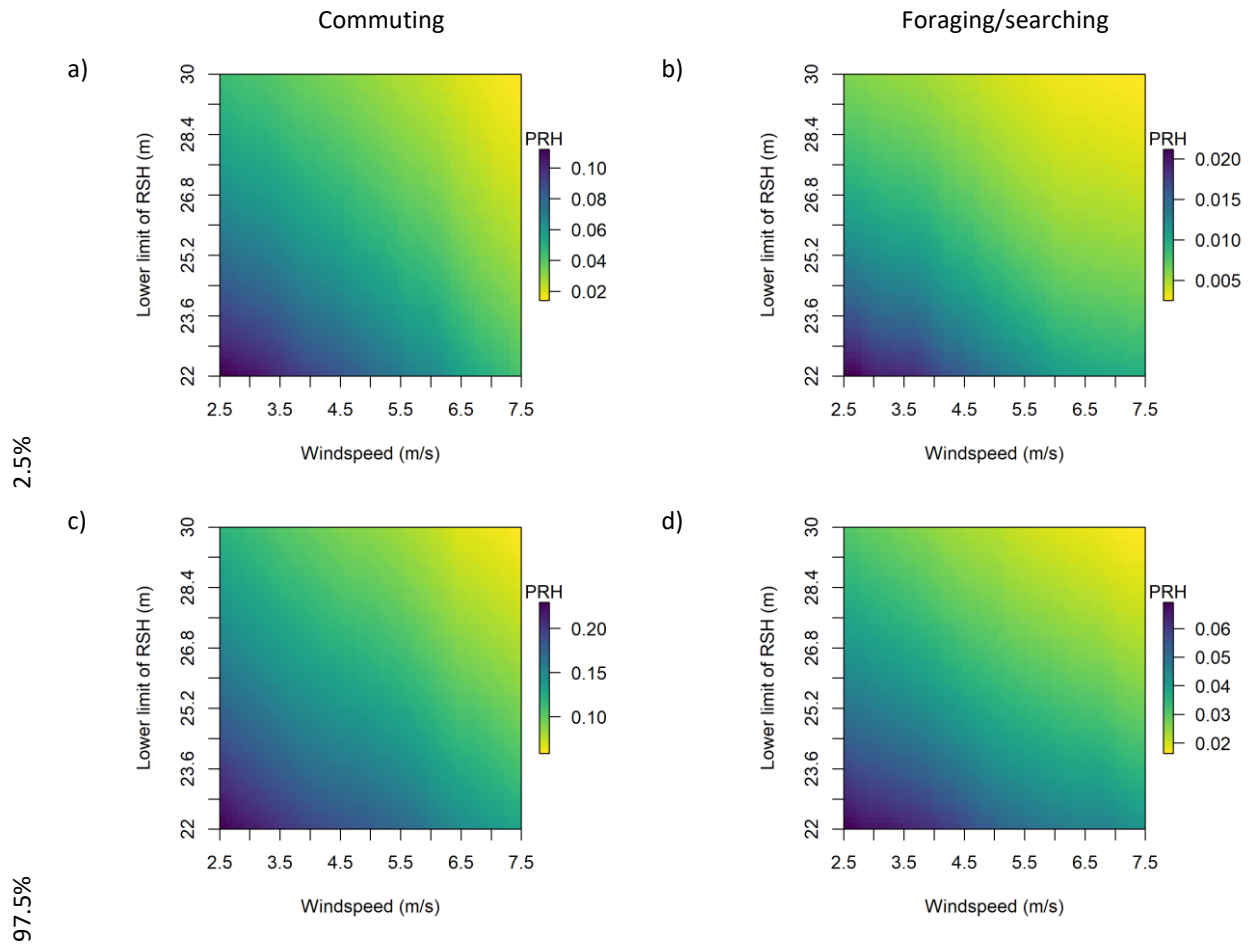
Fig. S4 Definition of tailwind speed. Bird arrow = direction of travel of bird; wind arrow = wind direction.



29 **Fig. S5** Effect of crosswind on flight height. For clarity, y-axis is limited to [0,50]: this interval omits 3.6% of fixes
 30 for commuting flight, and 1.2% of fixes for foraging/searching flight.
 31



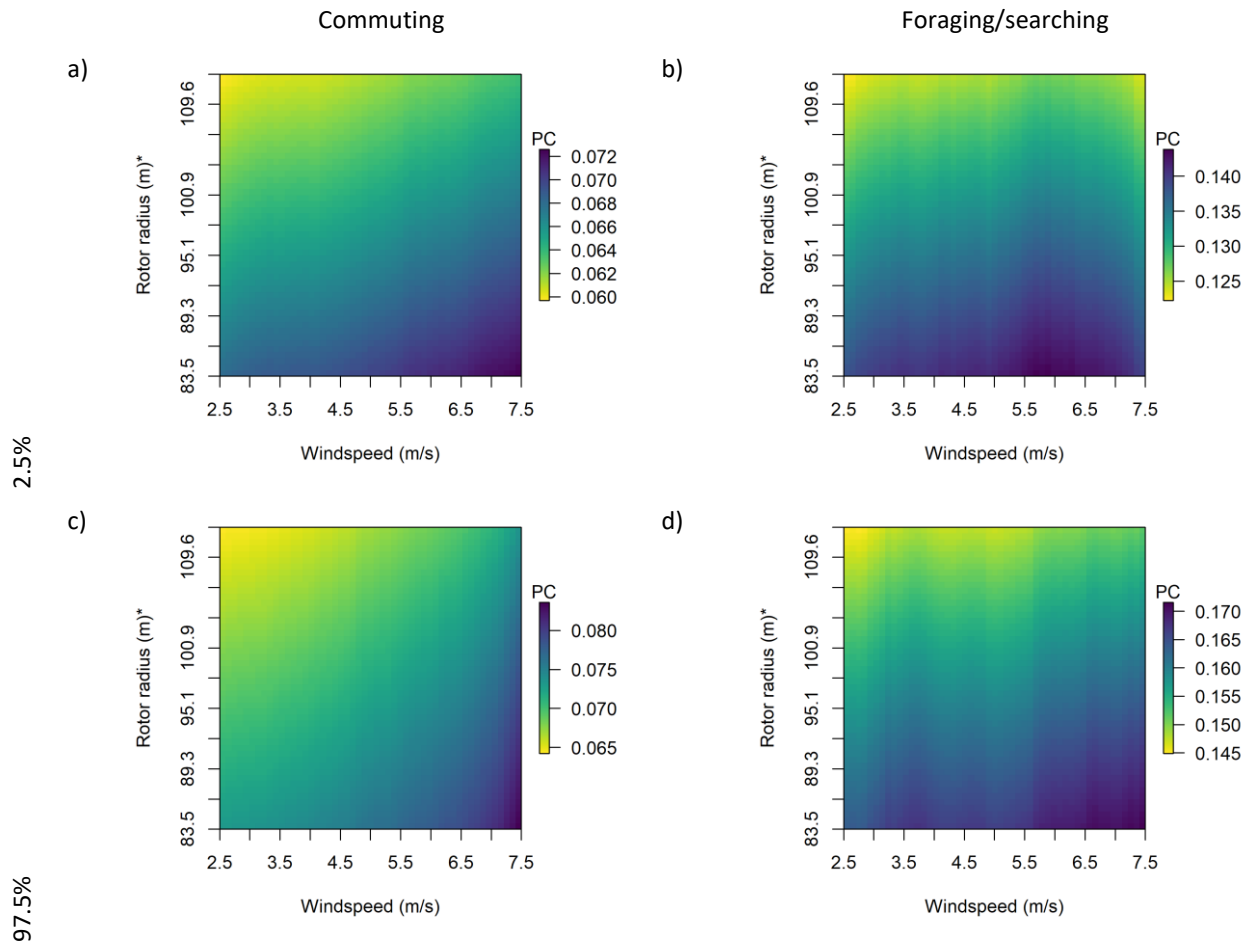
32 **Fig. S6** Effect of crosswind on flight speed.
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35 **Fig. S7** 95% credible intervals (CI) for effects of windspeed and the lower limit of rotor-swept height on
 36 proportion of flight at risk height (PRH): a) commuting flight, 2.5% CI; b) foraging/searching flight, 2.5% CI; a)
 37 commuting flight, 97.5% CI; b) foraging/searching flight, 97.5% CI. NB colour scales differ between panels.

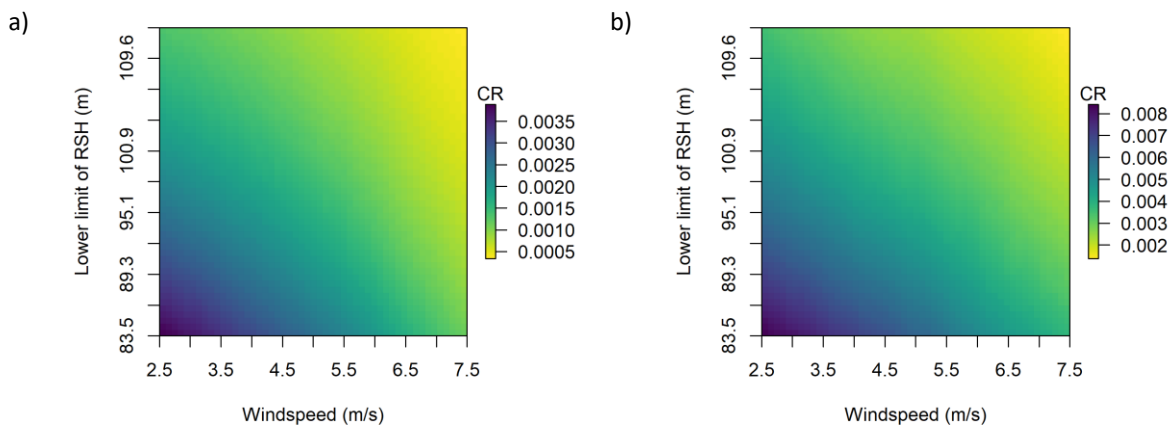
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40 **Fig. S8** 95% credible intervals (CI) for effects of windspeed and turbine size on probability of collision (PC): a)
 41 commuting flight, 2.5% CI; b) foraging/searching flight, 2.5% CI; a) commuting flight, 97.5% CI; b)
 42 foraging/searching flight, 97.5% CI. * blade width and rotation speed also vary with rotor radius (Table S1).

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44 **Fig. S9** 95% credible intervals (CI) for effects of windspeed and turbine size on combined collision risk: a) 2.5%
 45 CI; b) 97.5% CI. NB calculation of collision risk assumed uncorrelated errors, and so uncertainty may be
 46 overestimated (see Methods).

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