

- HOME >
- LATEST VOLUME >
- ABOUT THE JOURNAL >
- EDITORS >
- THEME SECTIONS >

 Contact the journal

 Facebook

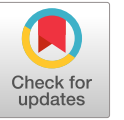
 Twitter

 RSS

 Mailing List

MEPS 725:121-140 (2023) - DOI: <https://doi.org/10.3354/meps14462>

## Seabird abundances projected to decline in response to climate change in Britain and Ireland



J. G. Davies<sup>1,\*</sup>, E. M. Humphreys<sup>1</sup>, T. Evans<sup>2,3</sup>, R. J. Howells<sup>3</sup>, R. O'Hara-Murray<sup>3</sup>, J. W. Pearce-Higgins<sup>4,5,6</sup>

<sup>1</sup>British Trust for Ornithology Scotland, Stirling, FK9 4NF, UK

<sup>2</sup>RSPB Scotland Headquarters, Edinburgh, EH12 9DH, UK

<sup>3</sup>Marine Scotland Science, Aberdeen, AB11 9DB, UK

<sup>4</sup>British Trust for Ornithology, Thetford, Norfolk, IP24 2PU, UK

<sup>5</sup>Conservation Science Group, Department of Zoology, University of Cambridge, Cambridge, CB2 3EJ, UK

<sup>6</sup>School of Biological Sciences, University of East Anglia, Norwich, NR4 7TJ, UK

\*Corresponding author: [jacob.davies@bto.org](mailto:jacob.davies@bto.org)

**ABSTRACT:** Estimating species' vulnerability to climate change is a key challenge in conservation. Many seabird species are particularly sensitive to the negative effects of warming and are thus threatened by climate change. We projected seabird abundance in 2050 in Britain and Ireland, an internationally important region for seabirds, under climate change scenario RCP8.5. Our projections were based on fitted relationships between abundance and both climatic (air temperature, precipitation) and oceanographic (sea surface temperature, potential energy anomaly) variables, estimated using a Bayesian hurdle model with spatial random effects. The most consistent responses to environmental variables were negative relationships between species presence or abundance and breeding season maximum terrestrial air temperature. Although data and modelling issues meant that future projections could be made for only 15 of the 25 species and with low predictive power for spatial abundance, predictive power was high for spatial presence and moderate for temporal abundance change. Projections suggest that seabirds will generally fare poorly under climate change in Britain and Ireland, with 10 species projected to decline in abundance by 2050. Variable model fit and projection uncertainty limited confidence, which was generally greater for declines than for increases. Fulmar, puffin and Arctic tern were each projected to decline by over 70% with higher confidence. For a few species, colonisation of new areas may reduce projected losses, but this is potentially limited by low availability of suitable habitat. Projected abundance change was more negative for marine specialists than for generalists. Our findings highlight the vulnerability and conservation needs of seabirds in a changing climate.

**KEY WORDS:** Population declines · Conservation planning · Climate change vulnerability · Oceanographic variables · Bayesian model

 Full text in pdf format

**Supplementary Material**

**Cite this article as:** Davies JG, Humphreys EM, Evans T, Howells RJ, O'Hara-Murray R, Pearce-Higgins JW (2023) Seabird abundances projected to decline in response to climate change in Britain and Ireland. *Mar Ecol Prog Ser* 725:121-140. <https://doi.org/10.3354/meps14462>

**Export citation**

RSS -  Facebook -  Tweet -  LinkedIn

Previous

Next

Cited by

Published in [MEPS Vol. 725](#). Online publication date: December 21, 2023

Print ISSN: 0171-8630; Online ISSN: 1616-1599

Copyright © 2023 Inter-Research.