

Puffins make poor diet choices when the chips are down

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A new study has shown that Britain's puffins may struggle to adapt to changes in their North Sea feeding grounds and researchers are calling for better use of marine protection areas (MPAs) to help protect the

country's best known seabirds. Britain's coasts support globally important populations of many species of seabird, but they face many challenges as their established habitats change.

Scientists at the University of Southampton and the Centre for Ecology & Hydrology studied the diet and distribution of Atlantic puffins and razorbills on the Isle of May National Nature Reserve, off the coast of southeast Scotland.

They studied the seabirds' over-winter feeding habits and found that during the 2014 to 2015 winter, when conditions were good, both species foraged close to their breeding colony eating a diet consisting mostly of lipid-rich fish such as sandeels. However in the 2007 to 2008 winter, conditions were not as good and the small fish populations were mainly concentrated further out in the southern North Sea. Whilst the razorbills flew farther away from the breeding colony in order to maintain their healthy diet, the puffins stayed closer in, eating a poorer quality diet of crustacea, polychaete worms and snake pipefish. The researchers found that fewer birds survived to return to the colony in the spring of 2008 compared to 2015, with puffins being more severely affected than razorbills.

To determine the birds' most likely foraging locations and position in the [food chain](#), the team used tiny geolocation loggers attached to leg rings and a map developed by the University of Southampton based on the chemicals found in jellyfish in UK waters. These chemicals vary across marine space due to differences in the marine environment's chemistry, biology and physical processes and are transferred up the food chain to the seabirds. The researchers were therefore able measure the natural chemical signals within feather samples and match them to the jellyfish map.

Dr. Katie St John Glew, postdoctoral researcher at the University of

Southampton said: "We still know very little about where some of our commonest seabirds feed and what they eat outside the breeding season. To protect [seabird](#) populations within UK waters and across the globe, marine spatial plans need to consider not only where seabirds spend the summer but also where they are in the winter months. This information is critical for assessing vulnerabilities of seabird species to climatic and environmental change and for designing effective management strategies for these species.

"This combined technique allows us to better refine where different populations are feeding during vulnerable periods of the winter. By measuring the stable isotopes in a bird's feathers, we not only get information on where it was feeding, but also, what it ate."

More generally, the methods used in this research are not only useful for seabird conservation but can also be used to provide diet, movement and point of origin information on a whole host of marine animals.

"Numbers of many seabird species are already declining. Given the increasing threats from climate change and human activities such as fishing, microplastics and offshore windfarms, identifying ways to protect and conserve seabirds when they are at sea are urgently needed" said Prof Sarah Wanless from the Centre for Ecology & Hydrology.

Marine Protected Areas (MPAs) are currently considered best practice in seabird conservation. However, current MPAs are mainly designed to safeguard important foraging areas during the breeding season when birds' feeding options are constrained by the need to return to the nest to incubate their eggs or feed their offspring. So far very few MPAs consider winter foraging locations and how these critical areas can change between years.

The study is published in the journal *Movement Ecology*.

More information: Katie St. John Glew et al. Sympatric Atlantic puffins and razorbills show contrasting responses to adverse marine conditions during winter foraging within the North Sea, *Movement Ecology* (2019). [DOI: 10.1186/s40462-019-0174-4](https://doi.org/10.1186/s40462-019-0174-4)

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