

Plastic pollution threatens birds far out at sea, according to new research

July 7 2023, by Elizabeth Pearmain and Bethany Clark



Northern fulmar. Credit: Beth Clark, Author provided

Seabirds are one of the world's [most threatened animal groups](#). They already contend with multiple issues, including climate change, accidental capture in fishing gear and being eaten by invasive species like cats and some rodents.

But these birds, which breed on land and forage for food at sea, are now facing another threat: [plastic pollution](#). It's becoming increasingly

common to [find seabirds that have ingested plastic](#) as they forage for food.

A group of seabirds called petrels are particularly at risk. They roam vast areas of the [ocean](#) and cannot easily regurgitate the plastic they ingest. During the breeding season, they may even inadvertently feed this plastic to their chicks.

In our [latest research](#), we [tracked the movements](#) of over 7,000 petrels of 77 different [species](#). We combined this data with existing maps of marine plastic pollution to calculate an "exposure risk score" for each species. These scores enabled us to create a detailed picture of when and where seabirds are most at risk of encountering plastic pollution at sea.

We found that many species spend a lot of time in areas of the ocean with high concentrations of plastic. Plastic exposure risk was highest in enclosed seas where plastic can become trapped, such as the Mediterranean and the Black Sea. These regions accounted for over half of the global plastic exposure risk for petrels, potentially affecting all four of the species studied that forage there.

But many other petrel species are at risk of encountering plastic in remote parts of the ocean, including the north-west and north-east Pacific, south Atlantic and south-west Indian Ocean. This is mainly due to large systems of circulating [ocean currents](#), called [mid-ocean gyres](#), which transport plastic debris thousands of miles from its source—such as the Great Pacific Garbage Patch.

In fact, one-quarter of petrels' plastic exposure risk occurred in the high seas. These areas are not within any country's jurisdiction, so international efforts are required to reduce the threat of plastic pollution to seabirds and other marine wildlife.

Vulnerable birds

Plastic exposure risk varied depending on the species and whether it was breeding or non-[breeding season](#). Notably, there were also differences in plastic exposure risk among populations of the same species.

Some already threatened species scored highly, including the critically endangered [Balearic shearwater](#), which breeds in the Mediterranean. The [Newell's shearwater](#), which is endemic to Hawaii, was also at high risk of plastic exposure.

Another vulnerable species, the [spectacled petrel](#), also scored high for plastic exposure risk. This species nests solely on an uninhabited volcanic island in the south Atlantic Ocean called Inaccessible Island.



Credit: AI-generated image ([disclaimer](#))

Even species with low exposure risk, such as the [northern fulmar](#) and [snow petrel](#), have in the past [been found to eat plastic](#). This goes to show that oceanic plastic pollution poses a problem for seabirds worldwide, even outside of high exposure areas.

Plastic pollution is an issue

Seabirds often swallow plastic by accident, mistaking it for their food. They also ingest plastic that has already been eaten by their prey.

This can lead to injury, poisoning from [toxic chemicals](#) that leach from the plastic and starvation as plastic fills up their stomach. [Research](#) from 2014 found that more than 60% of [flesh-footed shearwater](#) fledglings surpass international targets for plastic ingestion by seabirds. Worryingly, 16% of fledglings failed these targets after just one feeding.

Over time, plastic debris also breaks down into minuscule fragments called microplastics. Research has found that microplastic exposure can cause inflammation in a bird's digestive system—a phenomenon called "plasticosis."

We didn't focus on the impact of plastic exposure on the petrel species studied, but many of these species are already threatened with extinction. Exposure to plastics may further reduce these birds' resilience to the other threats they face.

Beyond national boundaries

Our study marks the first time that tracking data for so many species has been combined with existing knowledge of oceanic plastic pollution.

This represents a big leap forward in our understanding of the threat plastic pollution poses to the natural world.

A significant proportion of plastic pollution accumulates in the [high seas](#), far beyond the waters of the country where a [seabird](#) breeds. Our findings highlight the need for international cooperation to tackle marine plastic pollution, both directly from boats and from plastic waste on land.

Research suggests that [22% of ocean litter](#) is likely to originate from marine sources. Good waste management is therefore crucial to stop plastic waste from reaching the ocean. A key part of this will be improving compliance with the [existing ban](#) (which was adopted in 1973) on discarding any form of plastic from ships.

Protecting seabirds requires more than local solutions. We need [regional and global treaties](#) that address [plastic pollution](#) in both national waters and the [high seas](#). Only by implementing solutions on a large scale can we safeguard the animals that inhabit our oceans.

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