

# a narrow margin

PETER RYAN

## NEW PRION DISCOVERED ON GOUGH ISLAND

Seabirds comprise barely three per cent of the world's birds and, given their popularity with scientists and birders alike, it is surprising when an entirely new species is discovered. There was one such surprise in 2013 when a new storm petrel *Oceanites pincoyae* was described from central Chile (*Auk* 130: 180–191).

In most cases, new species have resulted from species splits (for example, the description of Bryan's Shearwater *Puffinus bryani* from the Hawaiian islands in 2011) or the rediscovery of species long thought extinct, such as the New Zealand Storm Petrel

*Fregetta maoriana*. To discover a new species of prion breeding in vast numbers on Gough Island almost beggars belief.

Gough Island, in the central South Atlantic Ocean, is renowned as one of the most important seabird breeding islands in the world. It is home to virtually all Tristan Albatrosses and Atlantic Petrels, the largest single-island population of Sooty Albatrosses, and globally significant populations of at least 10 other seabird species. Unfortunately Gough has been in the news over the past decade or so following the discovery that introduced house mice attack and kill seabird chicks on the island. The mice have slowly been eroding the island's vast burrowing petrel populations, and have had an especially serious impact on Tristan Albatross chicks.

The new prion was discovered by the research team working to eradicate mice from the island. Karen Bourgeois and Sylvain Dromzée spent a year on the island in 2011/12 as field assistants for the RSPB and

above *Prions are the most abundant seabirds breeding on Gough Island. The recent discovery that two species breed on the island three months apart came as a complete surprise.*

left *The southern part of Gough Island, showing where Broad-billed Prions (white circles) and the smaller-billed birds (black circles) occur. The numbers in parentheses show the average bill width in millimetres at each site.*

the Percy FitzPatrick Institute. When they returned to Cape Town, I was sceptical when they told me there were two types of prions on Gough.

Until then, there had been no hint that anything other than Broad-billed Prions *Pachyptila vittata* occurred on the island. Indeed, Gough is the most important breeding site for this species worldwide, with an estimated 10 million pairs on the island in the 1950s. Despite the impacts of the mice, Gough still supports between one and two million pairs, making prions the most abundant bird on the island.

Karen and Sylvain collected skulls of prions killed by skuas and discovered that the bills of birds collected in Gonydale at 400 metres elevation were narrower than those collected around the island's weather station, close to sea level.

Bill width is important in prion taxonomy and links directly to their feeding ecology. Broad-billed birds have more filtering lamellae – akin to a whale's baleen – than species with narrower bills, and their diets are more specialised. While breeding, Broad-billed Prions on Gough feed mainly on two- to three-millimetre-long copepods and their lamellae are perfectly spaced to filter these tiny crustaceans.

The birds from Gonydale had bills similar in size to those of the enigmatic Macgillivray's Prion *P. [salvini] macgillivrayi*, a large-billed form of Salvin's Prion. Macgillivray's



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Prions formerly were abundant at Amsterdam and St Paul islands in the southern Indian Ocean, but following the introduction of rats only a small number of birds survive, breeding on a stack off St Paul Island. However, newly-fledged prions have narrower bills than adults, so I was concerned that this factor was confounding the local differences in bill size at Gough Island. But I was sufficiently intrigued to make this a top priority when I next had a chance to visit the island in September 2013.

Assisted by Ben Dilley and other members of the relief team, I caught adult prions and collected carcasses of freshly-killed birds at six sites in the south-eastern sector of the island. There shouldn't be any fledglings at that time of year because Broad-billed Prions breed in early spring at Gough, laying eggs mainly in August. At three sites birds had bills averaging 21 to 22 millimetres wide, typical of Broad-billed Prions, but at the other three sites their bills averaged only 18 to 19 millimetres wide, similar to Macgillivray's Prion.

Interestingly, the difference was not linked to elevation. Narrow-billed birds predominated in Prion Cave, which is close to the weather station where prions often gather in spring. And north of the base, typical broad-billed birds were found at 250 metres above sea level.

With hindsight, we should have realised several years ago that something odd was going on. Broad-billed Prions are supposed to have blackish upper mandibles, yet the birds in Prion Cave have variable amounts of blue on the sides of the upper mandible. And in 2009,

Paul Visser and Henk Louw found chicks in Prion Cave in January, several months after Broad-billed Prion chicks fledge. In 2013, Ben was able to confirm that the narrow-billed birds in Prion Cave and Gonydale lay eggs in late November, three months later than the broad-billed birds. This marked difference in breeding season argues strongly that the narrow-billed birds are a new species of prion, rather than just an example of bill polymorphism.

Ironically, the new species appears to have been overlooked in part because prions are the most abundant seabird breeding on Gough. Broad-billed Prions breed around the weather station and along the east coast of the island, where all scientific expeditions land. It seems that because prions are so abundant, ornithologists collected their specimens close to the landing sites and so failed to sample the narrow-billed birds breeding nearby.

This begs the question as to why the two forms are segregated on the island, given that all foraging occurs at sea. For now, we have no idea why this might be. We also need to assess the ranges of the two species on Gough so that we can estimate their populations.

Genetic data are required to determine the relationships between the Gough birds and other prions, especially those breeding in the Indian Ocean. However, it may be that, like the recently discovered radiation of Band-rumped Storm Petrels *Oceanodroma castro*, species pairs have evolved independently at Gough and islands in the Indian Ocean. Temporal segregation in breeding seasons reduces intraspecific competition, and thus may facilitate speciation. Intriguingly, early visitors to St Paul Island reported that the

above, left *A Broad-billed Prion, showing its broad, blackish bill, incubating on a nest in an outbuilding of the Gough Island weather station in mid-August.*

above *By comparison, a medium-billed prion, incubating in Prion Cave in mid-December has a narrower, blue-edged bill.*

prions there had two breeding seasons, one in September and one in November, so there may have been two species there before they were extirpated by introduced predators.

There is no evidence that the small-billed prions breed at the Tristan archipelago, some 380 kilometres away; all birds examined there to date and all observations of the timing of breeding suggest that only Broad-billed Prions occur there. If the new prion is indeed confined to Gough, it provides yet more motivation for eradicating mice from the island.

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*Reference: Ryan, P.G., Bourgeois, K., Dromzée, S. & Dilley, B.J. 2014. 'The occurrence of two bill morphs of prions Pachyptila vittata on Gough Island.' Polar Biology, DOI 10.1007/s00300-014-1473-2*



**WATCH & LISTEN** to the 'new' narrow-billed prion species interacting in the depths of Prion Cave on Gough Island [www.youtube.com/watch?v=aRdulhc1mxE](http://www.youtube.com/watch?v=aRdulhc1mxE).

or scan the QR code to go directly to the link. Courtesy Ben Dilley.

