

SOUTHERN *sanctuary*

TEXT PETER RYAN



South Africa's Prince Edward Islands, two tiny specks of land in the vast Southern Ocean, are crucial breeding and moulting sites for millions of seabirds and seals. Though diminutive in size, these islands play an outsized role in global bird conservation.



Volcanic peaks in the 'Roaring Forties'

The Southern Ocean, stretching between 40° and 65° South, covers an expanse more than 30 000 kilometres in circumference and about 3 000 kilometres across. Hydrographers may debate the northern boundary, but the immensity of this expanse of water is undisputed. The only major land masses that edge into it are Tasmania and the southern tips of New Zealand and South America. Even small islands are scarce, with only a handful of sub-Antarctic and peri-Antarctic islands sprinkled across it.

Located 2 000 kilometres south-east of Cape Agulhas, the Prince Edward Islands sit in the 'Roaring Forties', a zone known for powerful westerly winds. Lying near the Antarctic Plate, the islands are 200 kilometres from its meeting point with the African Plate.

The closest land is Îles Crozet, a sub-Antarctic volcanic archipelago 1 000 kilometres to the east.

Prince Edward and Marion islands – together the Prince Edward Islands – are the summits of shield volcanoes that rise more than 3 000 metres from the seabed. Marion, the larger of the two, covers 300 square kilometres and rises to 1 240 metres above sea level. It retains the gently sloping structure typical of shield volcanoes and is still active; the most recent eruption, a small lava flow on the western side, occurred just 20 years ago. Marion's companion, Prince Edward Island, is a mere 45 square kilometres in extent. At 670 metres above sea level, >

LEFT Young adult Wandering Albatrosses display to find a mate. Marion and Prince Edward islands together support almost half of all breeding pairs in the world.

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it is more eroded and less active than Marion, and is considered the older of the two islands.

The islands' climate is hyper-oceanic, with little daily or seasonal variation in air temperature (4–8 degrees Celsius on average) and rainfall occurring year round. In the 1960s it averaged close to three metres per year, but has now dropped to less than two metres. Air temperatures are increasing by roughly 0.3 degrees Celsius per decade, which has led to the recent loss of Marion's ice plateau.

Shaped by seabirds

The islands sit in one of the windiest regions on earth, where gale-force westerlies occur with monotonous regularity.

These winds drive the Antarctic Circumpolar Current, which brings to the surface nutrients that provision rich feeding grounds for the many seabirds and seals that frequent the islands.

Seabirds play a key role in the local ecology. Because the islands have never been connected to a continental land-mass, all terrestrial animals and plants have had to disperse across thousands of kilometres of inhospitable ocean. Some were blown by the wind whereas others were carried by birds. More importantly, seabirds import vast amounts of energy and nutrients from the sea, affecting the vegetation and resultant terrestrial communities. Their burrowing and trampling is another key ecological driver.

Penguins: the most conspicuous residents

Four penguin species breed on the islands: King, Macaroni, Eastern Rockhopper and Gentoo. Although they are outnumbered by petrels, their much larger body mass means that penguins account for most of the seabird biomass; their combined weight exceeds even that of the southern elephant seals and sub-Antarctic and Antarctic fur seals that breed here. All four penguins are at the northern edge of their breeding range and, as global warming intensifies, their populations are likely to decrease.

King Penguins breed along the north and east coasts of Marion Island. Of the four species they are the least agile, requiring gently sloping beaches to access



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their colonies. The population was previously estimated at about 100 000 pairs, representing seven per cent of the global population, but recent drone imagery suggests that some colonies may have been undercounted by as much as 50 per cent.

King Penguins forage mainly on myctophid fish around the Antarctic Polar Front, a commute of roughly 300 kilometres to and from their colonies. This distance is projected to increase to between 500 and 700 kilometres by the end of the century as climate change shifts the front further south and makes it much harder for the penguins to provision their chicks.

The Macaroni Penguin is the most abundant of the penguin species, with about 250 000 breeding pairs, 95 per cent of which breed on Marion Island. This population has decreased by nearly

40 per cent over the past 30 years and declines more quickly in small colonies where the eggs and chicks are more susceptible to predation by Brown Skuas. Feeding mainly south of the islands, Macaroni Penguins, like King Penguins, are placed at risk by climate change. Currently the islands support some five per cent of the global population.

Since 1994, the number of Eastern Rockhopper Penguins, which are closely related to the Macaronis, has decreased by more than 60 per cent, although the rate of decrease has slowed in recent years. The Rockhopper is the most common penguin on Prince Edward Island, with about 38 000, and another 50 000 inhabit Marion Island. These two populations represent some 20 per cent of the world's population. Rockhoppers and Macaronis reduce competition by foraging in different

ABOVE Macaroni Penguins ford one of the fast-flowing rivers on Marion Island's eastern coast.

OPPOSITE At the Prince Edward Islands, Gentoo Penguins breed in winter, unlike further south in their range.

areas, and the former breed several weeks later than the latter. Both are listed as Vulnerable because of their ongoing population decreases.

The Gentoo Penguin is the only penguin that feeds inshore and, given the limited extent of shallow water around the islands, it is the least common with a population of some 1200 pairs. They make up less than one per cent of the global population. Unlike Gentoos farther south in the species' range, these pairs breed in winter and are the only penguins at the islands that occasionally raise two chicks.



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The vulnerability of albatrosses

Albatrosses are the other flagship seabirds breeding here. Four species – Wandering, Grey-headed, Light-mantled and Sooty – breed on Marion Island, while Prince Edward hosts these four in addition to the Indian Yellow-nosed and perhaps a few White-capped (one was found on an egg there in 2008). However, odd things can happen in the dense mollymawk colonies; on Marion, a Black-browed Albatross has bred with a Grey-headed Albatross for more than a decade.

Wandering Albatrosses, famous for their enormous wingspan, breed on flat areas mostly near sea level. The mollymawks, which are smaller, and Sooty Albatrosses all breed on cliffs, the two mollymawk species in dense colonies confined to the south coast of Marion

and north coast of Prince Edward. Only the Indian Yellow-nosed Albatross breeds annually; the other four species typically skip a year following a successful breeding attempt, and might also skip a year if they fail late into the breeding season.

Albatross numbers are modest compared to the large colonies of penguins, with annual breeding populations of some 5200 pairs of Wandering, 9500 Grey-headed, 3200 pairs of Sooty, 450 pairs of Light-mantled and 10 000 Indian Yellow-nosed albatrosses. However they represent significant proportions of the global population for most species: 48 per cent of Wandering, 10 per cent of Grey-headed, 25 per cent of Sooty, two per cent of Light-mantled and 30 per cent of Indian Yellow-nosed albatrosses. These figures are even more important given that Wandering Albatrosses are listed as globally Vulnerable, and Grey-headed, Indian Yellow-nosed and Sooty albatrosses as Endangered. Fortunately, their populations are stable or even increasing here, but the growing impact of house mice on Marion and the threat of avian influenza and diseases such as avian cholera are cause for concern.

Petrel diversity and abundance

The petrels make up the most diverse group of birds, with at least 15 species – 13 procellariids and two storm petrels – breeding here. Only the two giant petrels are readily observed ashore, as they forage along the coast. Southern Giant Petrels are more numerous than Northern, with some 2900 pairs representing six per cent of the global population. They breed in small colonies on open plains, whereas the Northern breed singly, usually in the lee of rocky outcrops. The population of Northern Giant Petrels has been increasing over the past decade and is now close to 1000 pairs, which is four per cent of the global population. Northern lay some six weeks before Southern, but a few male Southern pair up with female Northern and raise hybrid offspring.

The other petrel species breed in burrows or rock crevices and seldom fly during the day, so their populations are poorly known. Burrow-nesting petrels were particularly hard hit by the feral cats that were introduced to Marion to control house mice around the weather station in 1948. Fortunately the cats were finally eradicated in 1990, but not before they had reduced the density of petrels to less than five per cent of that found on predator-free Prince Edward Island. Both Common and South Georgian diving petrels and probably Black-bellied and Grey-backed storm petrels went locally extinct on Marion.

Since the cats have gone, these petrels have returned to Marion and their numbers have risen overall. However, their increase has been slower than expected, probably because of the burgeoning impacts of house mice. Salvin's Prion is the most abundant burrow-nesting petrel, with hundreds of thousands of pairs. This species, which apparently originated as a hybrid between Broad-billed and Antarctic prions, only breeds on the two Prince Edward Islands and Îles Crozet. The Blue Petrel, which breeds in dense colonies, is the next most abundant, with 145 000 pairs on Marion Island alone.

Only two petrel species that breed on the Prince Edward Islands are >



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ABOVE Five albatross species breed in Prince Edward Island's Albatross Valley.

OPPOSITE, CLOCKWISE FROM TOP A Sooty Albatross flexes its wings while advertising to a possible mate; A pair of Southern Giant Petrels, the larger male behind the female; A Light-mantled Albatross in soaring flight off Marion Island's eastern coast.



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to the Prince Edward Islands and Îles Crozet, has a population on the Prince Edward Islands that barely reaches 1000 birds. The local form of Kelp Gull, *Larus dominicanus judithae*, and the terns have even smaller populations. The Near-threatened Kerguelen Tern is restricted to the Prince Edwards, Îles Crozet and Kerguelen Islands, with a global population of some 5000. Antarctic Terns are more widespread, breeding at islands around Antarctica and migrating north in winter. The final seabird of note is the Brown or Sub-Antarctic Skua. More than 900 pairs – some six per cent of the world population – of this predatory species breed on the two islands.

The only other breeding bird on the islands is the Black-faced (Lesser) Sheathbill. It feeds its chicks on food stolen from seabirds, but when not breeding is a supreme generalist and eats anything, including long-dead penguins. The 6000 or so sheathbills on the Prince Edward Islands are an endemic subspecies and make up about 15 per cent of the total global population.

There is no doubt that the Prince Edward Islands are one of the most important sites for seabirds globally, providing the only breeding ground between Africa and Antarctica for many species. We have an obligation to restore the islands by removing introduced house mice from Marion Island. Achieving this goal will make a lasting contribution to the conservation of numerous threatened seabirds. ♦

Emeritus Professor Peter Ryan has served as director of the FitzPatrick Institute of African Ornithology and president of BirdLife South Africa, and is now chair of the Mouse-Free Marion Project's Scientific and Technical Advisory Group. He focuses mostly on seabirds and has been a member of multiple scientific expeditions to Antarctica, Tristan da Cunha, Inaccessible Island and the Prince Edward Islands.



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ABOVE One of the few Antarctic Terns that breed on the islands. They are easily confused with the range-restricted Kerguelen Tern.

TOP A Crozet Shag, endemic to the Prince Edward and Crozet islands, defends its large, downy chick.

OPPOSITE A large King Penguin chick, sometimes called an 'oakum boy', begs from its seemingly indifferent parent.

listed as globally Threatened: the White-chinned and the Grey, which are vulnerable to being caught on fishing gear. The number of White-chinned Petrels on Marion has recovered well and the population of some 24 000

pairs probably outnumbers the population on Prince Edward. The two islands are the third most important breeding site for this species. Grey Petrels remain rare on Marion, probably because they breed in winter and hungry mice are therefore more likely to attack their chicks. Other breeding petrels include Great-winged, Soft-plumaged and Kerguelen, as well as Fairy Prions. A few pairs of Cape or Pintado Petrels were recently found breeding on sea cliffs on Marion's south-eastern coast.

Shags, terns and other species

Five other seabird species breed at the islands. The Crozet Shag, one of a complex of Antarctic shags that is confined

