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30 000 HOLES ON MARION ISLAND

It is still debated quite what the 'four thousand holes in Blackburn, Lancashire' refers to in the Beatles' classic 'A day in the life'. But for a group of Fitz researchers, the telling lyrics are 'and though the holes were rather small, they had to count them all'.

In 2009, Peter Ryan, Ben Dilley and Genevieve Jones conducted the first survey of White-chinned Petrel burrows on Marion Island in the Southern Ocean. Compared to those of albatrosses and other surface-nesting seabirds, the population sizes of burrowing petrels are poorly known. Most species are nocturnal, their burrows are often concealed in dense vegetation and it's difficult to tell whether a burrow is occupied, and if so, by which species of petrel.

White-chinned Petrels are the largest burrowing petrels. Their burrows are bigger and more conspicuous than those of the other species, but they occur in patches, making it hard to sample the species' distribution and abundance. It requires distinct commitment to count all the burrows on an island of nearly 300 square kilometres. We were motivated by the thousands of dead White-chins we have examined from long-line vessels. This is the species most often killed by fisheries throughout the Southern Ocean, and in order to gauge the impact of this mortality we need an idea of its global population. Estimates have been made of the populations breeding at South Georgia, the Crozets and Kerguelen, leaving South Africa's Prince Edward Islands as the last major breeding site of the nominate race to be counted.

Two weeks of scouring the coastal slopes of Marion produced a total of close to 30 000 burrows. Once Ben had checked how many were occupied, we had enough information to calculate approximately how many White-chins can be killed each year before the population is adversely affected. Equally importantly, we had a baseline against which changes in the population can be measured.

Similar burrow counts have proved successful in tracking population trends in Spectacled Petrels, the close relative of the White-chinned Petrel that is confined to Inaccessible Island, Tristan da Cunha. Following a baseline survey in 1999, a repeat count in 2004 suggested that numbers of Spectacled Petrels were increasing at around seven per cent a year. This was surprising given their known mortality in fisheries off Brazil and their slow rate of reproduction.

In 2009, Peter Ryan and Rob Ronconi, a post-doc at Dalhousie University in Canada, again counted the Spectacled Petrels on Inaccessible Island. Their findings show that the population continues to grow, up approximately 40 per cent from the 2004 count. The increase was evident from the greater number of birds seen in flight each afternoon and their larger breeding range in several areas. It is encouraging that this species, once listed as Critically Endangered, has been able to recover despite mortalities caused by long-line fishing. Its success results from the removal of introduced pigs from the island, as well as ongoing efforts to stem fishing mortality of seabirds. However, there is no doubt that Spectacled Petrels are less prone to being killed in this way than White-chinned Petrels and it remains to be seen whether White-chins can survive the current carnage.

In 'A day in the life' the Beatles poke fun at the Establishment's need to enumerate things. But careful counts are essential to monitor the health of populations and the ecosystems of which they form part. If we wait until the changes wrought by human actions are blatant, it may be too late to remedy the situation.

Counts of Spectacled Petrel burrows suggest that the number of breeding pairs doubled between 1999 and 2009. Because many of the birds arrive at their colonies during the day, the increase is more obvious than changes in the numbers of the burrowing petrels that are strictly nocturnal.

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