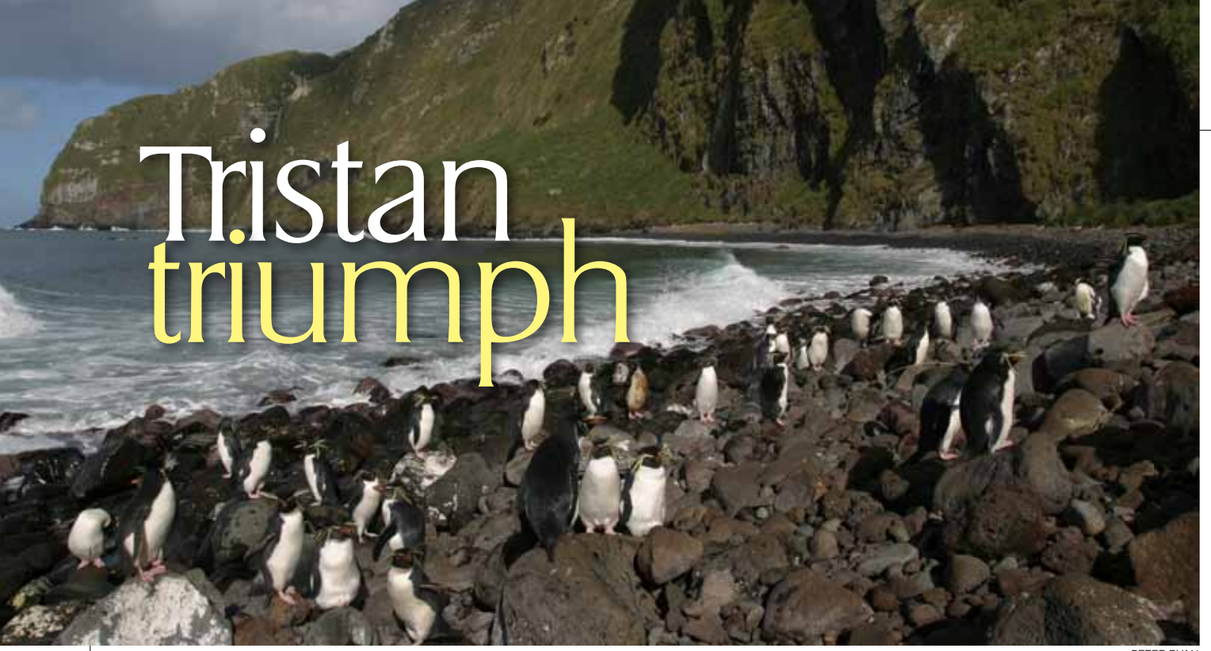

Tristan triumph

PETER RYAN

World's remotest islands become one of the largest wildlife sanctuaries

Tristan da Cunha, a remote island chain in the South Atlantic, has been declared a Marine Protection Zone, safeguarding habitat for millions of seabirds, fish and mammals.

Out of sight doesn't always mean out of mind. Despite being the most remote inhabited island chain on earth, Tristan da Cunha's status as a pristine wildlife haven has not gone unnoticed. In November 2020 a Marine Protection Zone almost three times the size of the UK was established in its waters, thanks to international collaboration between governments, NGOs and the local islanders, at the instigation of the Tristan da Cunha government and the RSPB (BirdLife in the UK). Stretching over 687 247 square kilometres of land and sea, 90 per cent of the marine area will be a total 'no-take zone', where fishing and any other extractive activities are strictly limited.

Beccy Speight, the RSPB's chief executive, said, 'This is a story two decades in the making, starting with the RSPB and the government of Tristan da Cunha initiating a conservation partnership and culminating in the creation of this globally important protected area. The new Tristan Marine Protection Zone will be the biggest no-take area in the Atlantic.

'Tristan da Cunha is a place like no other and the waters that surround it are some of the richest in the world. Tens of millions of seabirds soar above the waves, penguins and seals cram onto the beaches, threatened sharks breed offshore and whales feed in the deep-water canyons. We have massively bolstered efforts to keep this part of the world pristine for future generations.'

An impressive 25 seabird species breed on this isolated archipelago, four of which are unique to the islands as well as being globally threatened: the Tristan Albatross (Critically Endangered), Atlantic Yellow-nosed Albatross and Atlantic Petrel (both Endangered) and the Spectacled Petrel (Vulnerable). The archipelago also includes the World Heritage Site of Gough Island, a renowned albatross stronghold and arguably one of the most important seabird islands in the world, where a large-scale restoration programme is currently under way to remove invasive mice.

None of this could have happened without the advocacy and collaboration of the Tristan islanders themselves, who are proud to lead the way as nature guardians in the relatively unprotected Atlantic Ocean.

In a world full of eco-anxiety, this is one of the most inspiring environmental announcements that emanated during 2020. It will have a major positive impact not just on the ecosystem and local community, but also on the health of the entire planet for future generations. A recent study found that banning fishing in five per cent or more of the ocean would boost global fish catches by at least 20 per cent in the future. Furthermore, the wildlife sanctuary links to the wider global goal to secure protection of 30 per cent of the world's oceans by 2030 in order to tackle the climate and biodiversity crises.

Tristan da Cunha is 2400 kilometres from the nearest land. It takes longer to sail there from Cape Town than it took Apollo 11 to reach the moon. But despite its remoteness, the news is a win for all of us.

JESSICA LAW
BIRDLIFE INTERNATIONAL

above *The majority of Northern Rockhopper Penguins breed on Tristan da Cunha.*

SOMETHING IN THE water

RED-HEADED FINCHES ALBERT FRONEMAN

The discovery of the structure and function of DNA (deoxyribonucleic acid) in the 1950s was one of the greatest scientific advances of the 20th century. Cracking the genetic code of all living things on earth created entirely new scientific disciplines, with molecular approaches underpinning many contemporary fields of biology and medicine. Our knowledge of avian systematics and evolutionary history, for instance, is now largely based on increasingly advanced analyses of DNA and its associated molecules.

An exciting new application for DNA analysis involves environmental DNA (eDNA), the traces of DNA an animal leaves behind as it moves through its environment. This technique relies on the fact that eDNA strands remain present for hours – and sometimes days – in water an animal has been in contact with. Interest in ornithological applications of eDNA began in 2017, when a team of Japanese biologists reported that eDNA extracted from water samples can be used to identify bird species drinking from, or otherwise in contact with, a particular water body. Whereas eDNA had previously been used to establish the presence or absence of aquatic animals like fish and amphibians, this was the first study to apply the technique to birds.

Australian ornithologists working on the Gouldian Finch, a spectacular but elusive finch restricted to the far north of Australia, have subsequently used eDNA to check for the presence of this species at isolated waterholes. The researchers first used captive birds in aviaries to validate the technique, finding that Gouldian eDNA could be detected in a water body within six hours of birds drinking. Thereafter, the eDNA typically persisted for around 12 hours, but sometimes as long as six days if large flocks were involved.

Once the validity of the method had been demonstrated in a controlled, captive setting, the researchers then collected water samples from natural waterholes where the presence or absence of Gouldian Finches was closely monitored. Gouldian Finch eDNA was detected in waterholes from which the finches had been drinking for three consecutive days, but was not detected in waterholes from which the species had been absent for the preceding 72 hours. A more generalised test for the eDNA of finches in general also revealed when species other than Gouldians had been drinking.

Detecting the presence of focal species using nothing more than water samples has a host of potential applications in research, conservation planning and protected area management. The identification of water sources used by threatened species provides information directly relevant to their conservation and to understanding the roles of both natural and artificial water sources in their ecology. The provision of artificial water points is likely to become increasingly important for ensuring the persistence of birds in arid regions as increases in global temperature accelerate, and analyses of eDNA hold great promise for understanding how these water resources are used by desert bird communities.

ANDREW McKECHNIE

Reference
Day et al. 2019. 'Development and validation of an environmental DNA test for the endangered Gouldian finch.' *Endangered Species Research* 40: 171–182.