

Acknowledgements

We would like to thank all of our funders and supporters, both organisations and individuals alike.



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Cover image: A MacGillivray's prion with its adult plumage coming through (*R. Daling*)



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Island Restoration News: Gough and Henderson





Thanks to the Gough Island Restoration Programme, the Endangered Atlantic petrel achieved its highest breeding success rate since records began (above: *K. Stevens*, below: *R. Daling*)



Welcome—Why doing nothing is still not an option

When news broke that a mouse had been found on Gough Island more than four months after we'd hoped we had eradicated them, we were inundated with kind words of support. One in particular resonated with the team: *Devastating news but so important that we try this sort of work. Yes it was difficult and yes it could fail but what's the alternative? Do nothing? Doing nothing was never an option—and it isn't now.*

“Why was the Gough eradication unsuccessful?” That has been the obvious and important question ever since the first mouse detection in December (see Figure 1 overleaf), and the subsequent recognition in January that revealed we were likely facing a multi mice, multi-location failure. Indeed, it was this latter recognition that extinguished plans being laid over the New Year of deploying more bait, equipment and people back to the island in January for an attempted targeted mop-up. The reality was this would always have been very optimistic but if it had been just one pocket of mice it would have been worth trying.

Any information that we gather now may help to answer this question and as a consequence, our indefatigable Overwintering Team have been focused on catching mice from as many locations as possible (see Figure 2 overleaf). With these specimens, we hope to assess individual relatedness, age, sex, and brodifacoum loading in relation to location and habitat type. These specimens will need to be sent to New Zealand for testing and analysis, but this will take time, as the first opportunity to transfer samples off the island is currently September. Genetic testing will definitively rule out (or in) the very unlikely possibility of a renewed incursion (as only two additional boats had visited the island post baiting operation) and we will test samples of the bait collected during the operation for toxicity loading, just in case that was an issue. We will also be re-analysing the flight data. We are confident that there weren't any gaps in the flight lines, but we can never be 100% certain where the bait lands.

This all realistically means that we are unlikely to have all the results in before January 2023.

This mouse monitoring effort has sadly—but of course not unexpectedly—confirmed that the mice are now breeding again on Gough. Until late February the population appeared to be heavily dominated by males and the few females that were found did not appear to be breeding. But March has witnessed an acceleration in mouse detections including conclusive signs of recent breeding. Additionally, until mid-March no mice had been detected in upland areas, but at the time of writing, they are now being caught in this habitat up towards Gonydale (the main Tristan albatross study area). Interpreting what this all means will be a challenge in itself.

We caution, however, against expectations that the exact cause of failure will be revealed by these efforts, but it is likely that the evidence gathered in these early weeks will lend weight to some of the possible options and hopefully rule out others. Any evidence that we do glean will, moreover, be reviewed by external, independent experts to make sure that fresh, critical eyes test any theories and advise on solutions.

We will make sure that every lesson possible is learnt, not just to benefit future RSPB efforts, but those of the wider island restoration community. It is natural that people celebrate success and would rather move on as quickly as possible from failures, meaning that crucial opportunities to learn for the future are sometimes lost. We are making sure that that is not the case with Gough. The RSPB remains resolute in its commitment both to see Gough restored, and to other eradications more widely including Henderson Island in the Pacific. We will continue to work closely with our partners, for example, the South African mouse eradication attempt at Marion Island (see page 13), including sharing equipment to make their operation more cost-efficient and of course sharing the relevant lessons from Gough.

I never wanted to sit down to write any of the above. We did not embark on the Gough mouse eradication thinking that we would not succeed – but we were always realistic as to the scale of the challenge and mindful that not every eradication does succeed. We had an amazing team, both those that supported the project through the many twists and turns of the planning phases, and those that participated directly in the eradication in 2021. In that regard, we could not have asked for more or better.

It is, I think, worth reflecting why this work remains so important, and why the RSPB and our partners remain so committed to removing invasive non-native species from islands. The American-based not-for-profit organisation, Island Conservation, summarise the threat, and the urgency of solution, succinctly: 75% of all reptile, bird, amphibian, and mammal extinctions combined have occurred on islands, and by their calculations, invasive species are implicated in 86% of all recorded extinctions on islands. Restoration of terrestrial ecosystems has cascading benefits for marine environments, making it possible to build more

The first mouse detected on Gough after the operation to remove them (RSPB)



resilient oceans, and for local communities that live on or in close proximity to impacted islands. Targeted interventions have the potential to provide some of the most effective, high impact conservation actions. Their outcomes, where successful, can be spectacular, and although island ecosystems make up only 5.3% of the Earth's land surface, they have the potential to make very significant contributions to all our increasingly urgent attempts to halt and reverse the biodiversity and climate crises that are now reaching everyday life.

On Gough, the mouse population may be beginning its recovery, but for this year's seabirds, fledging success appears to have been robust, and offers a glimpse of what it always should be. We have long commented that much of the carnage caused by the mice was happening unseen underground: most of Gough's seabirds breed in burrows and caves yet monitoring this has been challenging. Not so for the colony of MacGillivray's prions in Prion Cave, however. After years of near or absolute breeding failure, the 50 monitored nests of MacGillivray's prions this year have led to the fledging of 41 birds, with the nine failures all suspected of being from natural causes (e.g. the eggs washed away in rainstorms as water entered the cave). A breeding success of 82%! On pages 5 and 6 we expand on the breeding data

across Gough's seabird species that have been recorded since the eradication. I hope that this will lift spirits and give some context as to what we all set out to achieve. As the article comments, we do not know how quickly the predation behaviour by mice on seabirds will reassert itself, though this will become apparent through our ongoing monitoring. But for long-lived seabirds, any recruitment into populations is significant.

In the last newsletter, we promised an update on the aviculture operation that continued on after the eradication team departed in August (see page 7). There was a difficult task, keeping the two captive populations (of Gough moorhens and buntings) alive and healthy to allow the eradication attempt to move forward, and then remaining on island to ensure successful release. While the eradication team did not bait on days of high wind and/or heavy rain/hail, and thus could often remain inside in such weather, the aviculture team had no choice but to refill water and food bowls, clean poo from enclosures and scrub rocks, in every weather on every day. They were a great team.

It is a testament to the Aviculture team's hard work and professionalism and the support of our veterinary lead the Royal Zoological Society of Scotland

(see page 11) that this was achieved: 80 moorhens were returned to the wild and 103 buntings (95% and 99% of the original captive cohort respectively), numbers that far exceeded planning projections. Quite a number of the released buntings have been resighted subsequently, and it was exciting for the team to witness nesting behaviour between birds (both captive and those remaining in the wild) soon after release. The moorhens have in contrast been much more difficult to assess, as the dense vegetation in their fernbush habitat has made observations nigh on impossible. We hope that the birds are breeding successfully, but it will be quite some months before we have a better idea of the survival of this captive cohort. We will, of course, provide updates when we can.

Gough may seem remote, but it is part of our collective responsibilities. It remains one of the world's greatest seabird colonies, and even during the winter when the eradication attempt was underway, the clouds of mainly Atlantic and soft-plumaged petrels that gathered offshore at dusk before streaming overhead to their burrows were a sight to behold. The arrival back of the great shearwaters in September, joining the myriad of other prions, petrels and storm petrels, takes the abundance of birds and cacophony of sound to a much higher level still.

Yes, we have unfinished business, and although our plans point to a renewed attempt on Henderson for which planning starts now, we will return to Gough. Doing nothing is still not an option. I know most if not all the 2021 team remain committed to finishing what we started, and I hope we will have your continued support.

Andrew Callender
Gough Island Restoration
Programme Executive

Monitoring devices (yellow dots) and mouse detections (blue/white mice) on Gough post baiting operation (RSPB/ Google Maps)



Window of opportunity for Gough's seabirds

Although the primary objective of the restoration operation has not yet been met, the mouse eradication attempt has given Gough Island's birds some much-needed respite from mouse predation. For the highly threatened species for that depend almost entirely on Gough, this really is a lifeline.

By now, the light-grey ball of fluff that is an Endangered MacGillivray's prion chick will be well-known to readers of *Island Restoration News*. But a picture of a MacGillivray's prion chick with its adult feathers coming through is a rare sight indeed!

This season, following years of catastrophic and unsustainable breeding failures, we are simply delighted to share that 82% of our monitored nests in Prion Cave have survived to fledge.

Until now, the lives of Gough's MacGillivray's prions have been blighted, predated by mice to within an inch of the population's long-term viability. Indeed, given almost all pairs breed on Gough, this predation puts the viability of the species itself into question.

An Atlantic yellow-nosed albatross chick in the process of losing its fluffy down (*K. Stevens*)



Since monitoring began in 2014/15 just 21 chicks out of 370 monitored nests survived to fledge. In half of the monitoring years, breeding success was recorded as zero. In 2022, 41 of the 50 nests monitored by our team fledged a chick. There were no signs of mouse interference at any of the nests that were unsuccessful.

Assuming this sample is representative, and in light of the continued presence of mice on Gough, this surge of fresh prion blood into the adult population will be critical to the species' survival. Although mice remain on the island, being able to get a good cohort of chicks out to sea will buy the prions time.

Meanwhile, the Endangered Atlantic petrel also had unprecedented breeding success in the near-absence of mice, with more than twice as many chicks fledged this year than last. A whopping 63% fledged in our monitored colonies—exactly what we would have hoped for in a mouse-free environment. Our Overwintering team (who decided to stay for a second year in a row on the island) reported seeing fledglings along the edges of paths near their burrow entrances—something which simply wasn't seen before.

As for the island's albatrosses—the first signs of mouse wounds on Critically Endangered Tristan albatrosses have typically been reported in the first few days of April—just as this edition is going to press. As such, we are not yet able to bring any insight into how their fortune's may change this season, although we have already seen record-breaking high breeding success at two of our most closely monitored sites at the end of 2021 (Gonydale and Tafelkop recorded 70.9 and 92.9% respectively).

We are, however, able to share good news from their cousins, the Endangered Atlantic yellow-nosed albatrosses. This year breeding success in a monitoring site that has traditionally suffered very low breeding success ('Area 2') is at an astounding 75%. No more than one third of chicks have survived to fledge from Area 2 in the past four years—in 2018 just one out of 55 chicks fledged. Across all our monitored Atlantic yellow-nosed albatross colonies breeding success ranges from 74-84%—a hugely successful season.

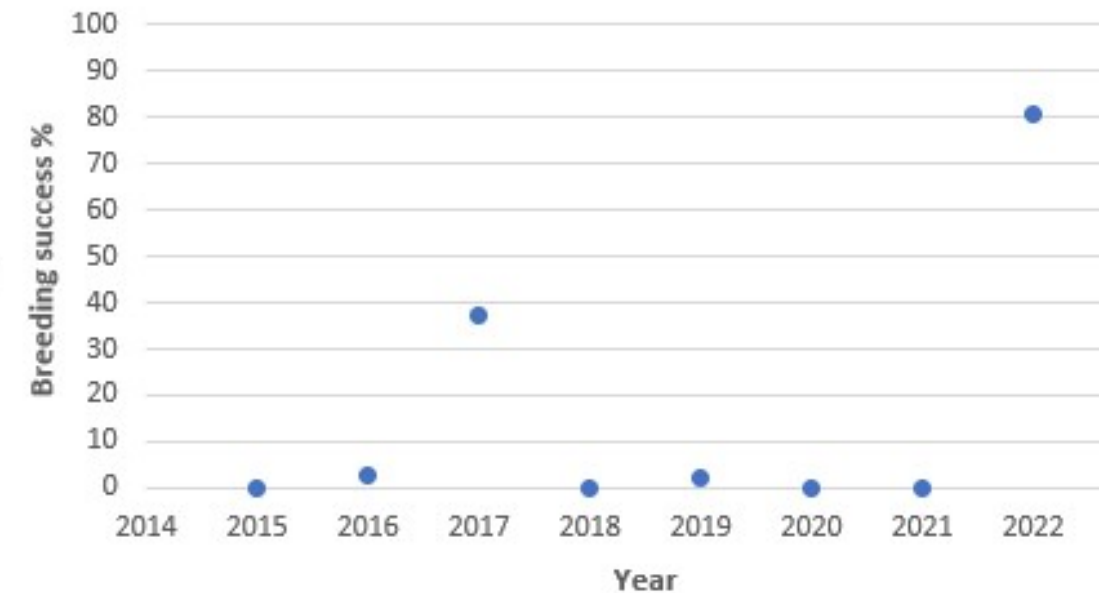
For how long this respite will last, we simply do not know. House mouse predation on larger seabirds is still a very rare phenomenon—Gough remains only one of three islands where this behaviour has been documented. It is possible that the bird-predating behaviour has been lost—for the time being at

least – or that the mouse population will stay for a while at a low enough density for them to find what they need from more easily obtained prey items such as invertebrates.

All we can do at this point is make the most of this

opportunity to learn from the birds' response, the mice and the review of the operation, spread the word on just how much there is to gain from a mouse-free Gough and hope that this window lasts a while longer yet.

MacGillivray's Prion Breeding Success (%)



A rare sight on Gough Island: in 2022 many MacGillivray's prions survived long enough to see their adult feathers come through – and to use them! (*R. Daling*)

A+ is for the Aviculture team

Gough Island really is unique—as are the people who are willing to spend a year there to save it. We look back at the remarkable efforts of those who cared for the island's land birds through hail and snow and wind and lots and lots of rain.

Removing invasive non-native predators from islands can come at a cost to other wildlife and is usually only done when the conservation need is high. On Gough Island we made plans to reduce potential costs to other wildlife as far as possible by bringing into care safeguard populations of the island's two land birds, Gough bunting and Gough moorhen.

In February and March of 2021 Gough welcomed back experienced 'old timers' from the

island whose job it would be to locate, capture and then safely transport land birds back to Base—quite a task given the challenging terrain.

Waiting for them would be our newly completed aviculture facilities and a dedicated aviculture team, who would be responsible for looking after them throughout the baiting operation, keeping them safely out of the way of the bait.

Construction on these temporary facilities had been abandoned in 2020 when the project was postponed, and so a small build team also travelled out early in 2021 to ensure that the remaining structures were in place before the first of the birds arrived.

Over the following few weeks, birds began to be brought in from around the island. Thanks to a brilliant collective effort, we not only exceed the minimum numbers of birds required before

the eradication attempt could begin, but were able to fill our aviculture facilities to their maximum capacity. The support of our veterinary partner RZSS was central to this work (see page 11), ensuring that the birds taken into our care were fit, healthy and adjusted well to their temporary homes.

Almost everyone who went to Gough as part of the restoration effort got their hands dirty at some point helping out with the aviculture work—be it in the daily washing of food and water bowls, scrubbing food waste and excretes off mats to keep enclosures sanitary, gathering branches and vegetation to make the birds feel more at home, making scrambled eggs for their breakfast or searching for

invertebrates and berries so as to liven up their diet from time to time. While the land birds were in our care, the daily tasks seemed endless and almost as soon as one day was done, the next was starting. Unlike the baiting, which could only be done when the weather was clear and calm, the birds needed care and attention whatever the weather.

Whilst everyone did their bit, often around other tasks and priorities, for a few team members in particular keeping the birds in their care fit and healthy was personal. First of the restoration team to arrive and last to leave (indeed, some are still there having decided to stay on for a second overwintering stint), their commitment was

never called into doubt.

At the end of the project, 80 Gough moorhens and 103 Gough buntings were released back into the wild—higher numbers than we had anticipated at the outset and a testament to the dedication of care displayed by the team.

Some of the aviculture team had also spent months away from home in 2020, having been evacuated from Gough after the project's postponement and made invariably convoluted journeys home during global lockdown. We are truly grateful for their commitment to the Gough Island Restoration Project and wish them well in their next adventures.



Joy as the last of the land birds are released into the wild (R. Daling)



Clockwise from top left: One of the Gough moorhens taken into care during the operation in its outside pen, furnished with natural vegetation (*M. Risi*) One of the Gough buntings taken into care during the operation with a *Phyllica* tree branch for a perch (*M. Risi*) A Gough bunting obligingly eats scrambled egg presented on a set of scales, allowing it's weight to be checked at the same time (*M. Risi*) A Gough bunting is released back into the wild weeks after the baiting is completed (*R. Daling*) A Gough moorhen is released back into the wild weeks after the baiting is completed (*R. Daling*)



Building the most remote veterinary hospital in the world

Before the aerial baiting operation could begin on Gough, we needed to take a minimum number of Gough moorhen and Gough bunting into our care to ensure they were kept safely out of the way. But not just any old birds would do—we needed healthy individuals as well as a healthy mix of males, females and juveniles. The role of our veterinary lead partner, the Royal Zoological Society of Scotland (RZSS), was fundamental to success as RZSS veterinary surgeon, Dr Adam Naylor explains.



The Royal Zoological Society of Scotland (RZSS) has been a partner on the Gough Island Restoration Programme since 2014. But why would this wildlife conservation charity in Scotland, who lead Edinburgh Zoo and Highland Wildlife Park, be involved in a conservation project on a remote South Atlantic island more than six thousand miles away?

Between its two zoos, RZSS is home to over 3,000 animals, representing an enormous diversity of species, which in turn requires a diversely skilled team to care for them. RZSS experts also support an incredible range of field projects and direct conservation actions globally, requiring a wide range of additional conservation expertise. From animal keepers and veterinarians, to field biologists and conservation geneticists, this hub of skills puts

RZSS in a great position to assist with the needs of complex conservation projects.

Historically, RZSS staff have assisted with other island projects, including the removal of rats from the Isle of Canna in the Scottish Inner Hebrides and the attempted removal of rats from Henderson Island in the South Pacific. We have also worked directly in the Tristan da Cunha archipelago for many years, assisting with the conservation of Northern rockhopper penguins. Therefore, when we were asked to consult on the ambitious plan to save the birdlife on Gough Island, we were happy to offer our support.

The temporary housing of the Gough bunting and Gough moorhen presented significant challenges from the outset. Very little was known about the health and disease of these species and

how they might respond to temporary captivity. So, to shed light on some of these unknowns, our veterinary team began a process of disease risk analysis to analyse and manage the possible outcomes of situations involving disease. Our experience of managing captive populations at Edinburgh Zoo and Highland Wildlife Park was invaluable, and we could apply our knowledge of avian disease with a literature review of more than 500 scientific publications, to identify risks and most importantly develop plans for how to mitigate them. It was clear that veterinary support would be a critical component throughout the project to maintain the health and welfare of the safeguard populations.

Another important question for the project was how an appropriate ratio of male and female birds could be ensured in the safeguard populations. While adult bunting and moorhens are sexually dimorphic (displaying physical differences between the sexes), this is not the case for juvenile birds. Luckily, laboratory DNA analysis methods have been developed for other bird species which analyse blood samples for sex-specific chromosomes and quickly identify an individual as male or female, but with the nearest laboratory more than 1,600 miles from Gough, an alternative was needed! Here, geneticists at the RZSS WildGenes laboratory stepped in to help, developing reliable sexing techniques for both species and crucially assembling a compact DNA analysis kit which could be transported all the way to Gough.



In early 2020, with all the veterinary and laboratory equipment packed into three large suitcases, I travelled out to Cape Town to join the first of the RSPB teams which would sail to Gough Island. One of my first jobs on reaching Gough was to setup the veterinary tent, easily the most remote veterinary hospital in the world! Despite its humble appearance, it housed blood analysis machines, a genetic laboratory, equipment for faecal parasite assessment, a

bird ICU, and a well-stocked veterinary pharmacy. Essentially we had everything that might be needed to care for the birds effectively.

We were ready to go when sadly, due to the COVID pandemic, the 2020 baiting attempt had to be postponed and the team evacuated. We knew though that the groundwork was in place, and ready for the project to relaunch as soon as we were able.



That time came in February 2021, and RZSS vet Dr Georgina Cole joined the RSPB team returning to Gough to reattempt the project. Thankfully this time things proceeded on schedule and Georgina was on hand to monitor the birds' health as they were brought into their temporary homes. Once the birds were settled, Georgina returned to the UK, and the RZSS veterinary team continued to provide remote support for the fantastic RSPB Aviculture team, communicating bird health updates daily via WhatsApp.

The Gough Island Restoration Programme has been both challenging and rewarding for the RZSS team. We are extremely grateful to the organisations who have assisted us in our role, including the Two Oceans Aquarium in Cape Town, and Zoetis UK and MiniPCR™ who donated specialist (and crucially, portable!) laboratory equipment. Delivering one of the most ambitious island restoration programmes ever attempted has required the help of many international partners, and we have been delighted to have been part of such an important collaborative project.

Like all of those involved, we were extremely saddened to hear that the eradication attempt has not been successful. While this is deeply disappointing, we will continue to learn as much as we can from the project, so as to guide future operations. It is comforting to know also that some respite has been given the amazing species of Gough Island.



A Flock and stock to Marion

Plans to mount a mouse eradication attempt on Marion Island continue full steam ahead, and the year started with a fundraising trip (a.k.a. The Flock) to see the island aboard the *MSC Orchestra*. Meanwhile, various items of stock from the Gough Island Restoration Programme, notably the bait buckets, will be at the disposal of the project. Saving Marion Island's Seabirds Project Manager, Dr Anton Wolfaardt explains more.

Marion Island is an awe-inspiring place. This windswept outpost, located in the southern Indian Ocean roughly halfway between Cape Town and Antarctica, is home to a wealth of seabirds and marine mammals. Marion is the larger of the two islands that together make up the Prince Edward Islands group. Given the global importance of the Prince Edward Islands for seabirds and other wildlife, the island group was declared a Special Nature Reserve by the South African Government in 1995. It is South Africa's only declared Special Nature Reserve, and this highly protected status means that very few people get to visit the island.

In January this year, a group of approximately 1,500 birdwatchers set sail with BirdLife South Africa aboard the

MSC Orchestra to the waters around Marion Island. The "Flock to Marion" voyage provided a once-in-a-lifetime opportunity to experience first-hand the awe and enchantment of Marion Island's seabirds, from the tiny storm petrels to the majestic albatrosses. For some, the voyage provided the first opportunity to experience the magnificence of great albatrosses soaring effortlessly in their ocean environment. Even for those who have witnessed it many times before, the experience recalls the words of Robert Cushman Murphy, arguably the doyen of Southern Ocean seabirds, who, while on a whaling brig in 1913, wrote to his wife: 'I now belong to a higher cult of favored mortals, for I have seen the albatross'.

Lectures on board by world experts such as Peter Harrison (MBE) and Professor Peter Ryan provided fascinating insights into what makes these Southern Ocean seabirds so remarkable. They also revealed that Marion Island's seabirds are facing a grave threat. Accidentally introduced by sealers in the 19th century, a population of stowaway house mice has increased to the extent that they are now inflicting a devastating impact on the ecology of Marion Island, including its globally important seabird populations.

Fortunately, we do have the means to eradicate mice from Marion Island – a one-off intervention that will enable the island's seabird populations to recover and flourish. The Mouse-Free Marion (MFM) Project is

leading a collaborative conservation mission to eradicate mice from Marion Island. The Flock to Marion passengers were so inspired to make this a reality, that just over three million South African Rand was raised in contributions for the project on board the vessel and during events held before and after the voyage. An incredible contribution and testament to the level of public support for this critically important conservation initiative.

The role of partnerships in these sorts of projects is fundamental to their success. In addition to the partnership between the South African Department of Forestry, Fisheries and the Environment and BirdLife South Africa, there are a number of other organisations engaged in and helping to progress the project. This includes a productive partnership with the Royal Society for the Protection of Birds (RSPB), through which lessons from the Gough Island Restoration Programme continue to inform our planning for Marion Island. The RSPB has also kindly made available equipment



from the Gough project, some of which will be making its way to Marion Island shortly with the team who will be undertaking further research and planning work for the MFM Project.

There remains a lot to do before we can undertake the actual baiting operation, not least the need to raise the outstanding funding required. We are working hard to ensure that the

MFM Project has the best chance of success so that we can secure the island's globally important seabirds, and restore the ecological integrity of the island. Only then can it rightly claim its title of the Jewel in the southern Indian Ocean.

If you would like to help support the project and make this happen, please contact Heidi Whitman, the Mouse-Free Marion Chief Philanthropy Officer: heidi.whitman@mousefreemarion.org



Flock to Marion passengers showing their support for the Mouse-Free Marion Project (Mark D Anderson/Michael Mason)



Top: One of the many majestic wandering albatrosses seen during the Flock to Marion voyage (Trevor Hardaker)
Bottom: A mouse-attacked grey-headed albatross chick in a colony on Marion Island (Stefan Schoombie)