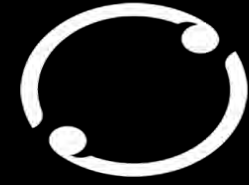


Mice squeak through eradication attempt on Gough Island: what can we learn?



Manaaki Whenua
Landcare Research

Araceli Samaniego

SamaniegoA@landcareresearch.co.nz

GIRP: Gough Island mouse eradication attempt in 2021



© Christopher Jones



The Island

Part of a UNESCO World Heritage Site

Saint Helena, Ascension and
Tristan da Cunha



GOUGH ISLAND

In the remotest UK Overseas
Territory of Tristan da Cunha.

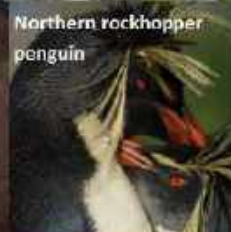
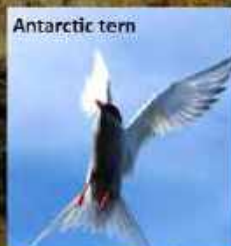


Gough Island is home to 22 species of seabirds and 2 species of land birds



< ENDANGERED >
EN

Tristan albatross



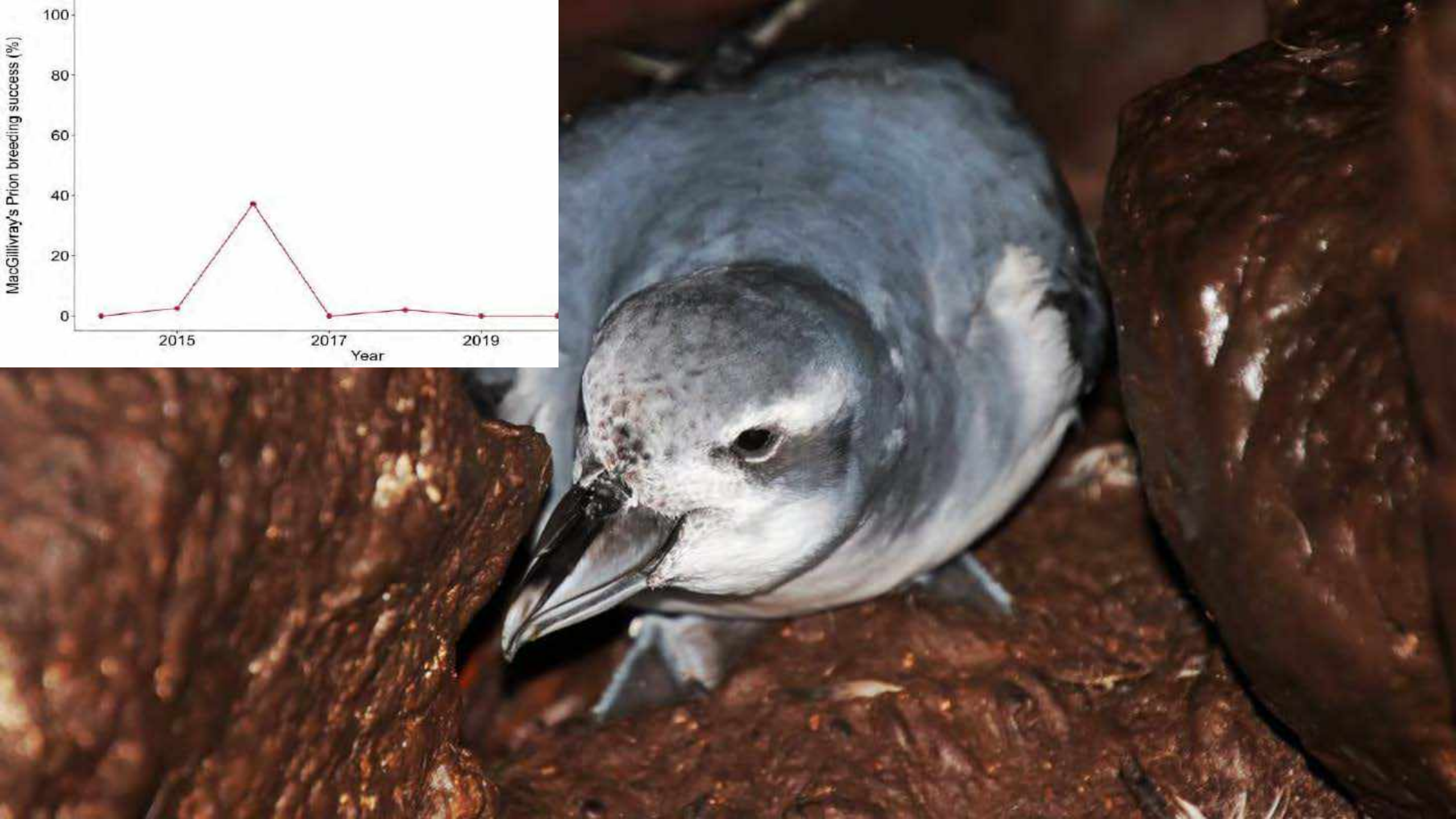
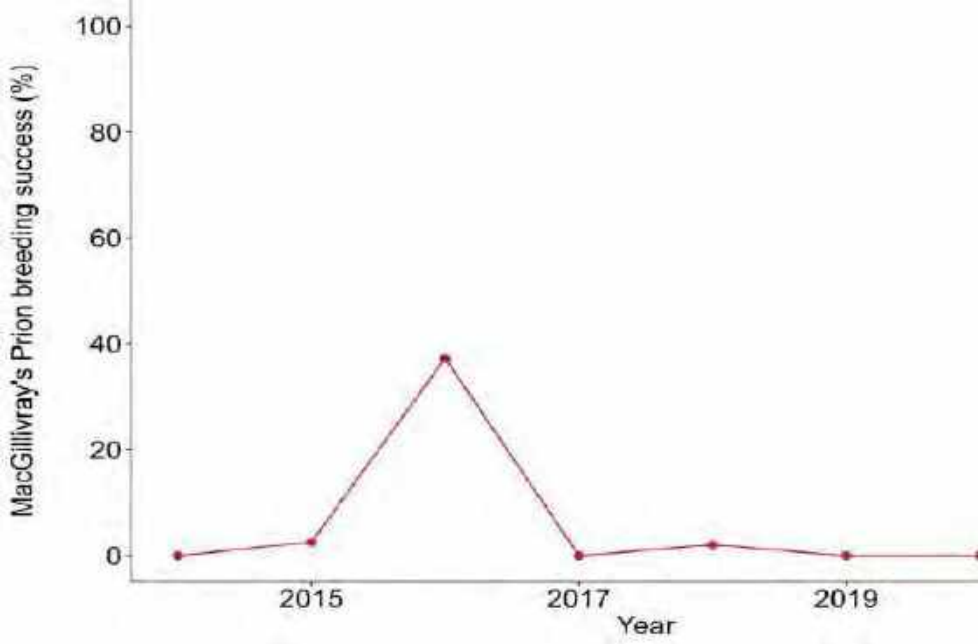
The impacts of introduced House Mice on the breeding success of nesting seabirds on Gough Island

ANTHONY CARAVAGGI,^{1,2*} RICHARD J. CUTHBERT,^{2*} PETER G. RYAN,⁴ JOHN COOPER⁵ & ALEXANDER L. BOND^{2*}

Seabird eggs and chicks lost per year:

APPROX
2 MILLION
across ten species studied due to mouse predation.







The material supplied in this file (including its soundtrack)
is protected by copyright.

LICENCE

FEE: Free of charge

RIGHTS: Non exclusive, standard and non-standard TV News
and Current Affairs broadcasts only, plus 30 day
timeshifted online catch-up services
(commercial rights excluded e.g. download to own)

TERMS: 2 months from first TX

TERRITORY: UK only

All other rights must be licensed, prior to use, from:

RSPB Digital Media, The Lodge Sandy, Bedfordshire, UK

Tel: +44 (0) 1767 680 551

Email: digitalmedia@rspb.org.uk

Gough Island Restoration Programme

Timeline

2000



mouse attacks on seabirds identified

2008



first eradication feasibility study

2017



operational planning began – aerial work tendered

2020



eradication implementation postponed due to COVID

2021

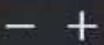


unsuccessful eradication attempt

Gough Island



3D



Several projects in one...



Aviculture
Aerial baiting
Ground baiting
Monitoring

All 2021
Winter 2021
Winter 2021
Ongoing

The aviculture operation





Aerial baiting





112

rspb giving nature a home

HELISPREAD SUPERLIGHT 800

Helia1

AERONAUTIC

002

WARNING

206



Day

Aerial op.

Ground op.

Monitoring

(13th June 2021)

1

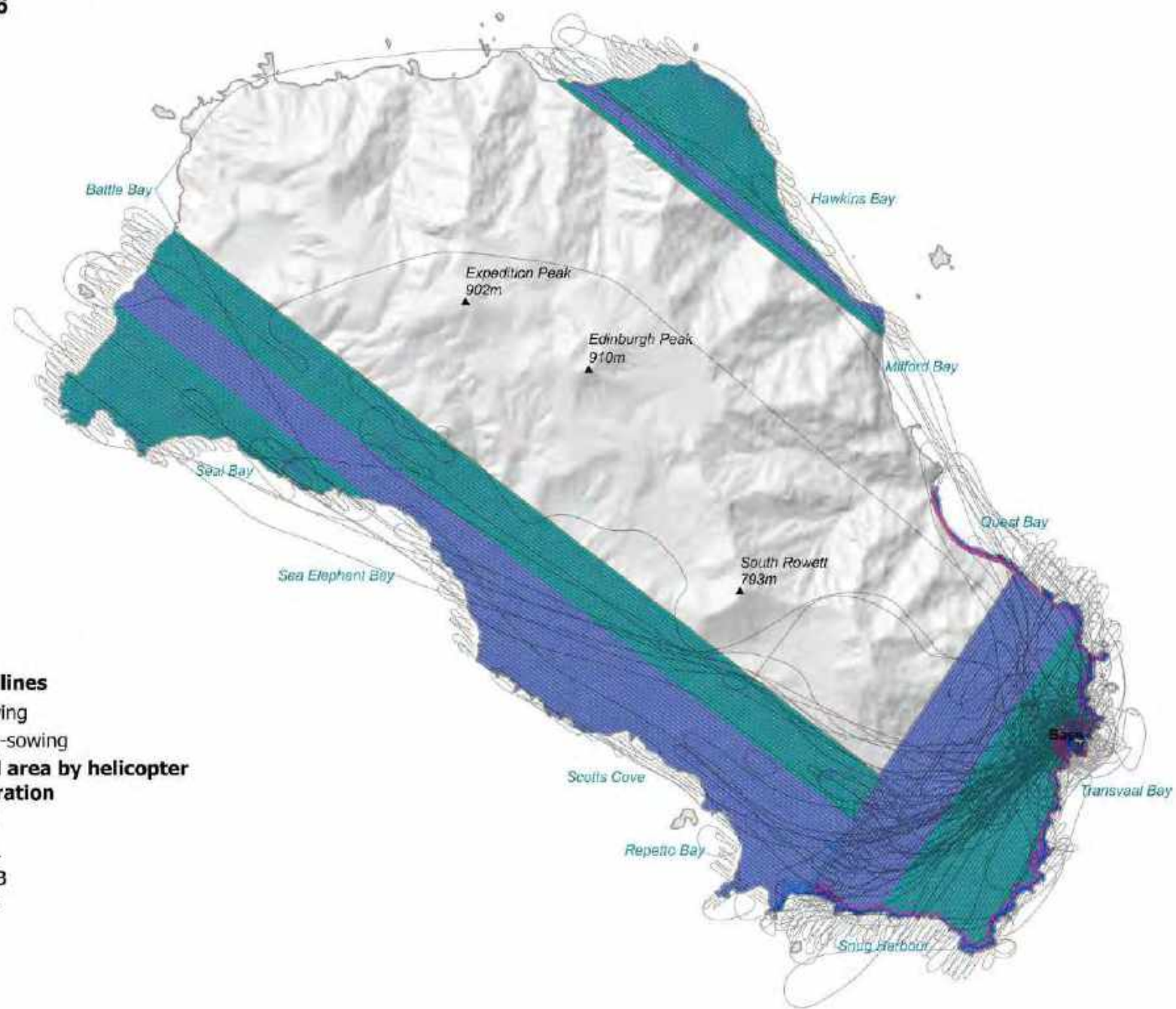
1st drop began

all exclusion zone

Obs., cams, traps*

*Trapping is NOT
an eradication method

First Bait Application Day 1 - 13/06



Flight lines

- Sowing
- Non-sowing

Baited area by helicopter registration

- RBI
- RNL
- RWB
- SEF

Expedition Peak
902m

Edinburgh Peak
910m

South Rowett
793m

Battle Bay

Hawkins Bay

Milford Bay

Seal Bay

Sea Elephant Bay

Quest Bay

Scotts Cove

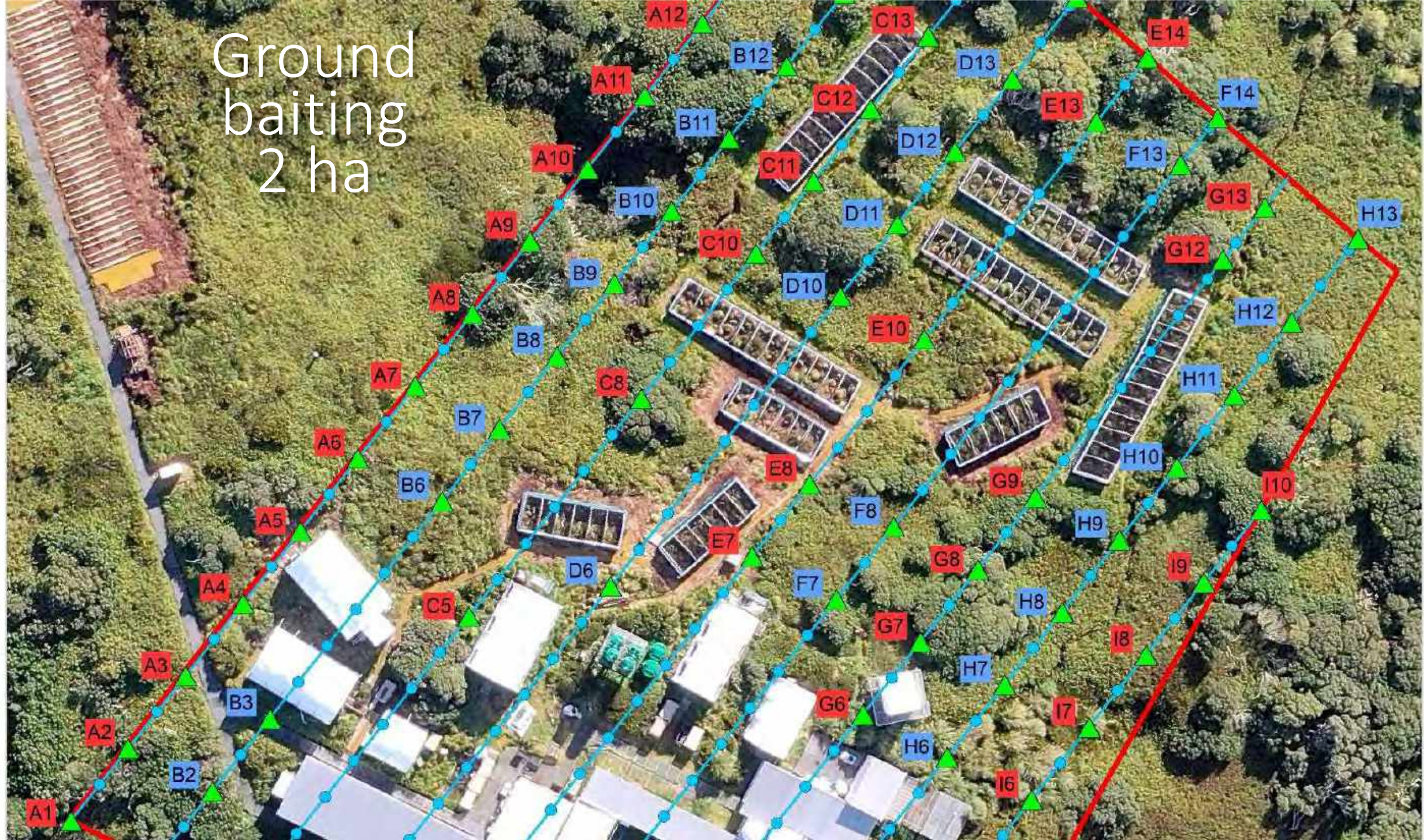
Repetto Bay

Transvaal Bay

Soup Harbour

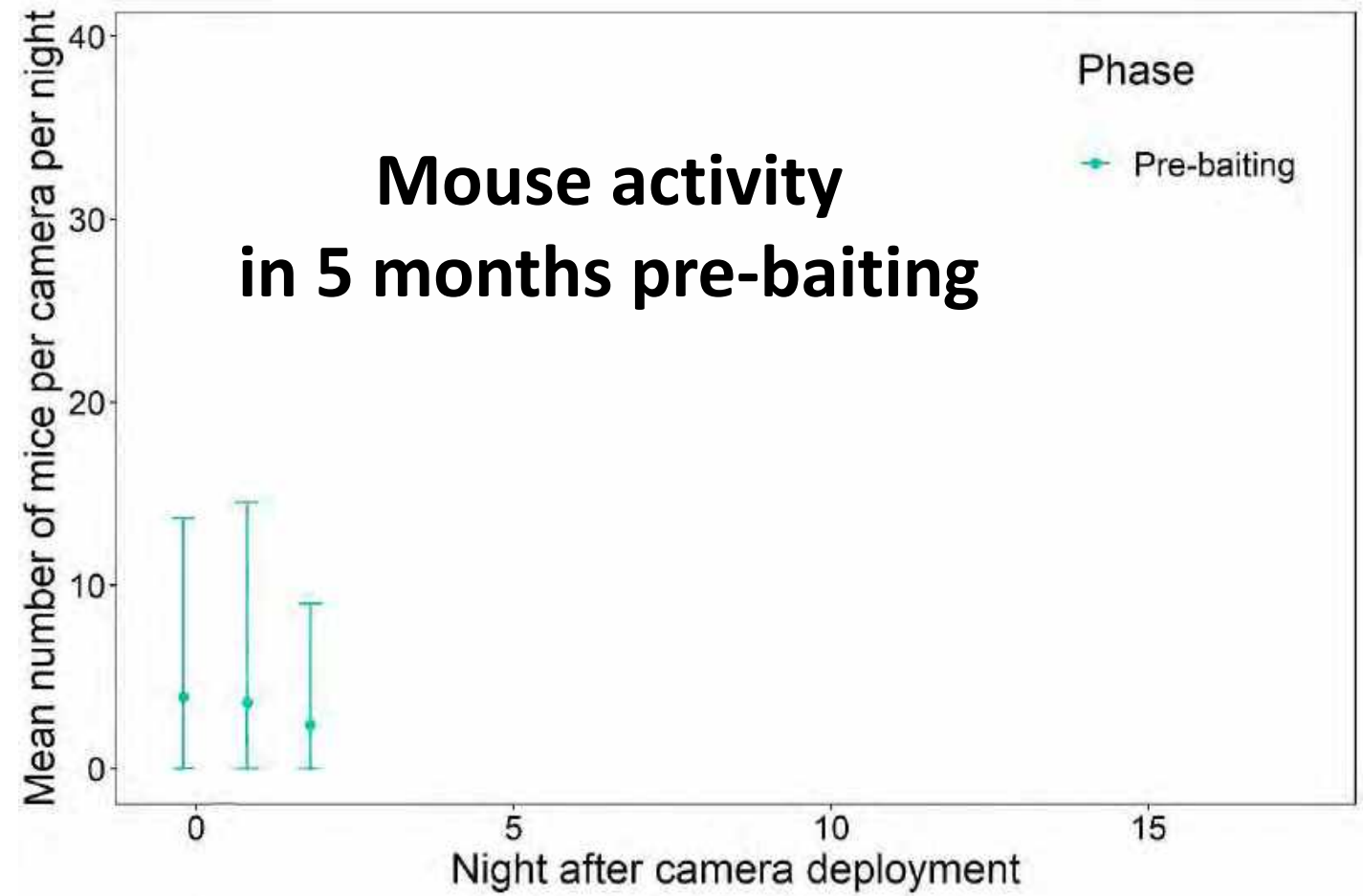


Ground
baiting
2 ha





Monthly camera monitoring

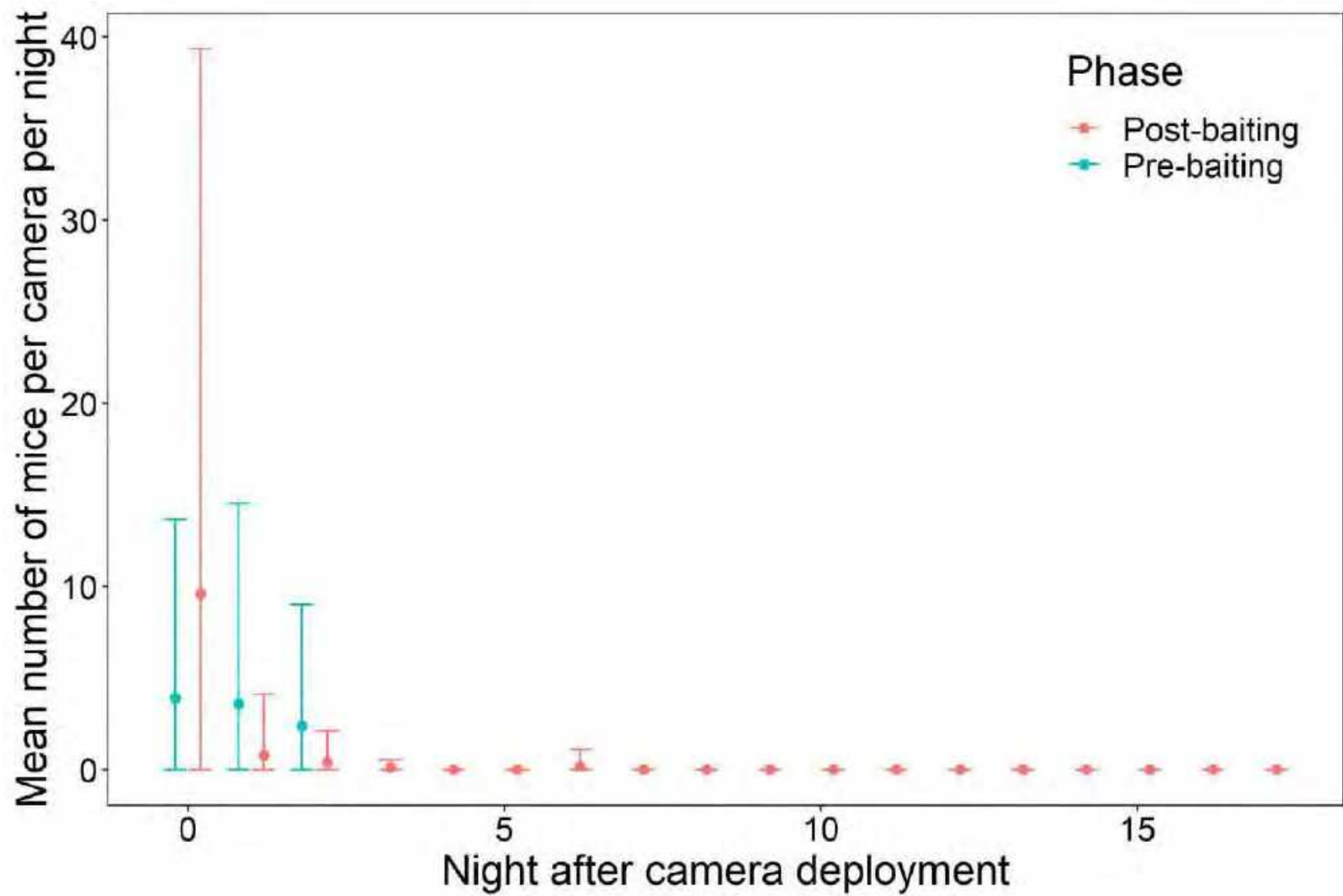


Day	Aerial op.	Ground op.	Monitoring
1	1st drop began	all exclusion zone	Obs., cams, traps
7-10	1 st drop ongoing	no bait take	0 + 0 + 0 mice

Day	Aerial op.	Ground op.	Monitoring
1	1st drop began	all exclusion zone	Obs., cams, traps
7-10	1 st drop ongoing	no bait take	0 + 0 + 0 mice
11	1 st drop completed	no bait take	no mice, bait on tops



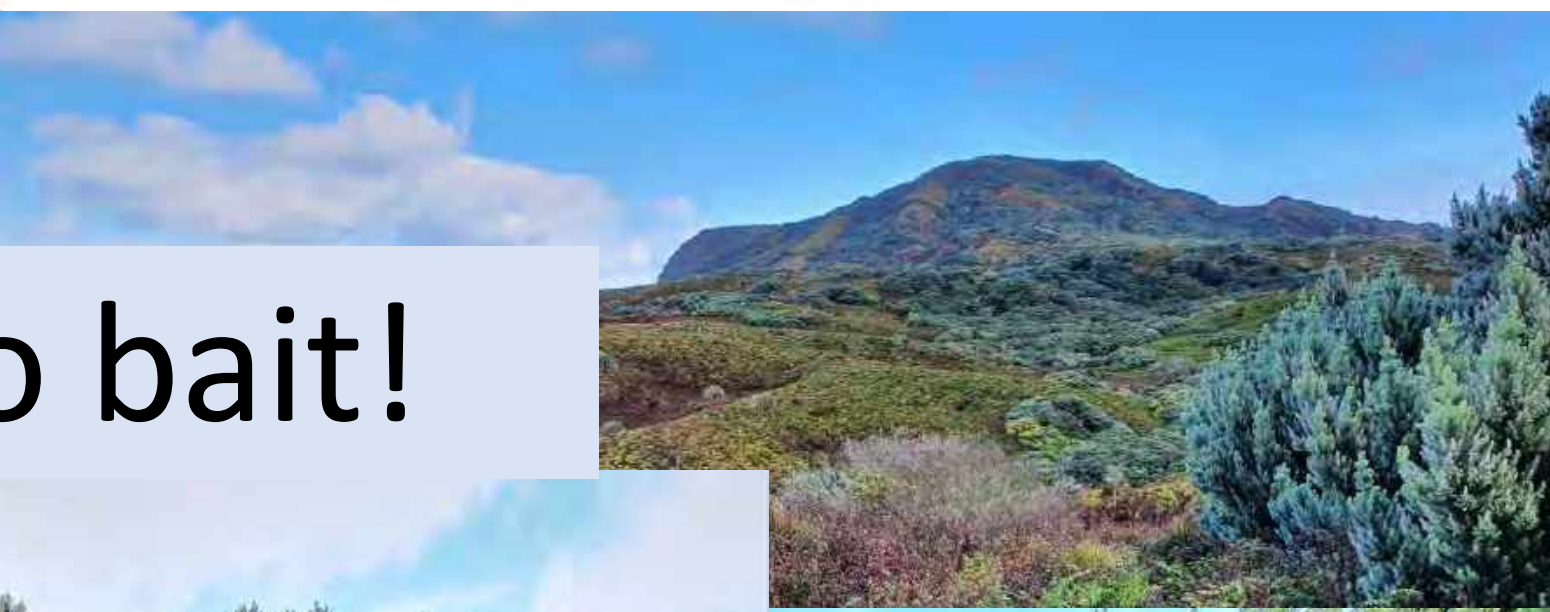
Day	Aerial op.	Ground op.	Monitoring
1	1st drop began	all exclusion zone	Obs., cams, traps
7-10	1 st drop ongoing	no bait take	0 + 0 + 0 mice
11	1 st drop completed	no bait take	no mice, bait on tops
13-23	2 nd drop ongoing	no bait take	0, cams moved, no bait!




Wider monitoring area



No bait!



0 200 m

 Bait loading zone

Day	Aerial op.	Ground op.	Monitoring
1	1st drop began	all exclusion zone	Obs., cams, traps
7-10	1 st drop ongoing	no bait take	0 + 0 + 0 mice
11	1 st drop completed	no bait take	no mice, bait on tops
13-23	2 nd drop ongoing	no bait take	0, cams moved, no bait!
27-30	2 nd drop ongoing	no bait take	plots, 2 mice, slugs?!

Active for days by cave, disappeared with 2nd drop



YouTube: house mice interacting with detection devices



Day	Aerial op.	Ground op.	Monitoring
1	1st drop began	all exclusion zone	Obs., cams, traps
7-10	1 st drop ongoing	no bait take	0 + 0 + 0 mice
11	1 st drop completed	no bait take	no mice, bait on tops
13-23	2 nd drop ongoing	no bait take	0, cams moved, no bait!
27-30	2 nd drop ongoing	no bait take	plots, 2 mice, slugs?!
50-51	3 rd drop (adjusted)	no bait take	0 + 0 mice, plots, slugs!!

No mice, yet
bait gone in
lowlands

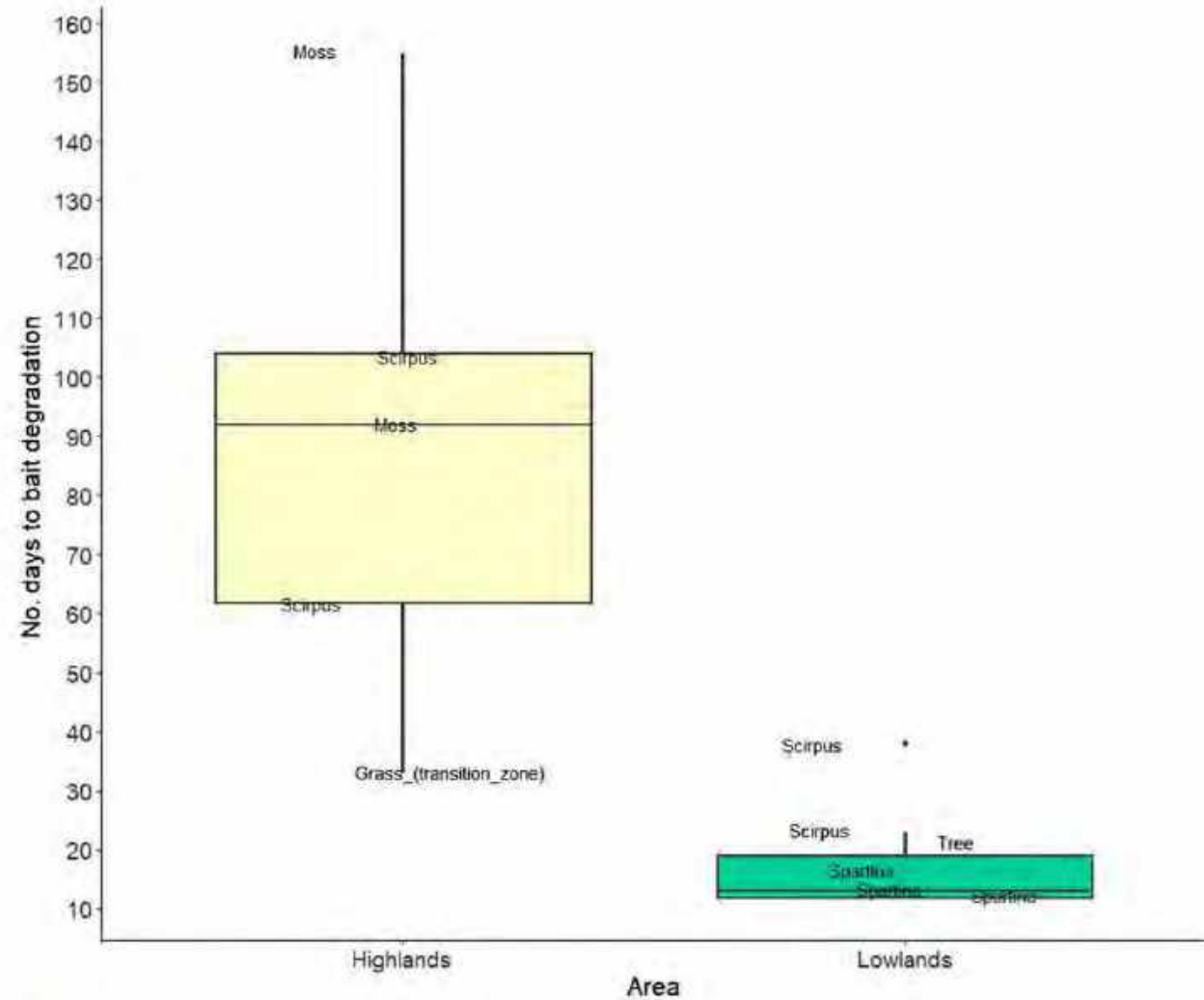


Fig. 2. Days (median, quartiles \pm 95% confidence interval) to 100% bait degradation in the highlands and the lowlands. The microhabitat for the five data points in the highlands and seven in the lowlands are given in Table 2.

Bait eaten by
slugs after
3rd drop!

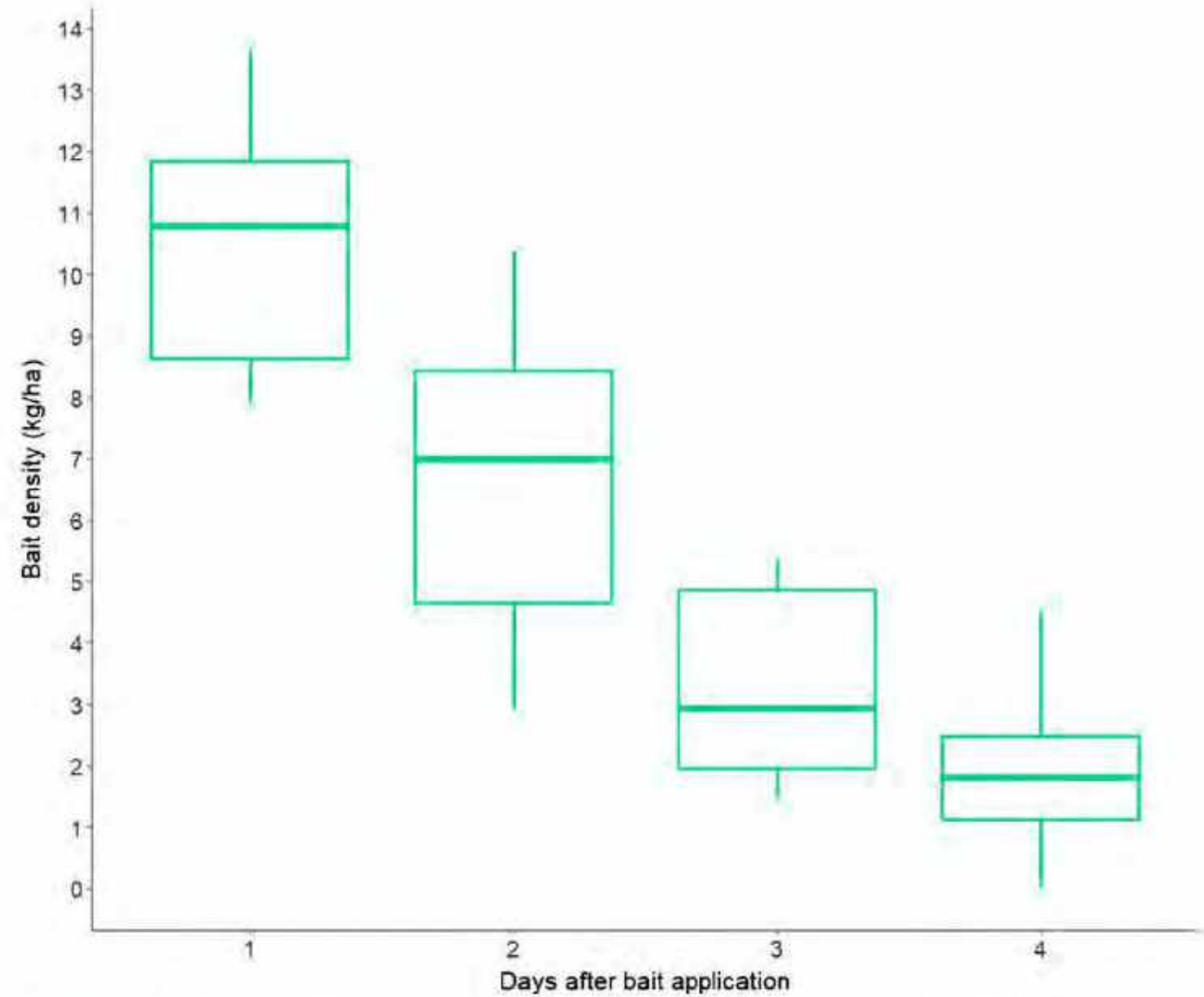


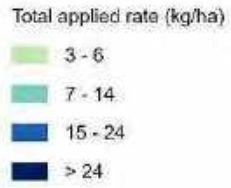
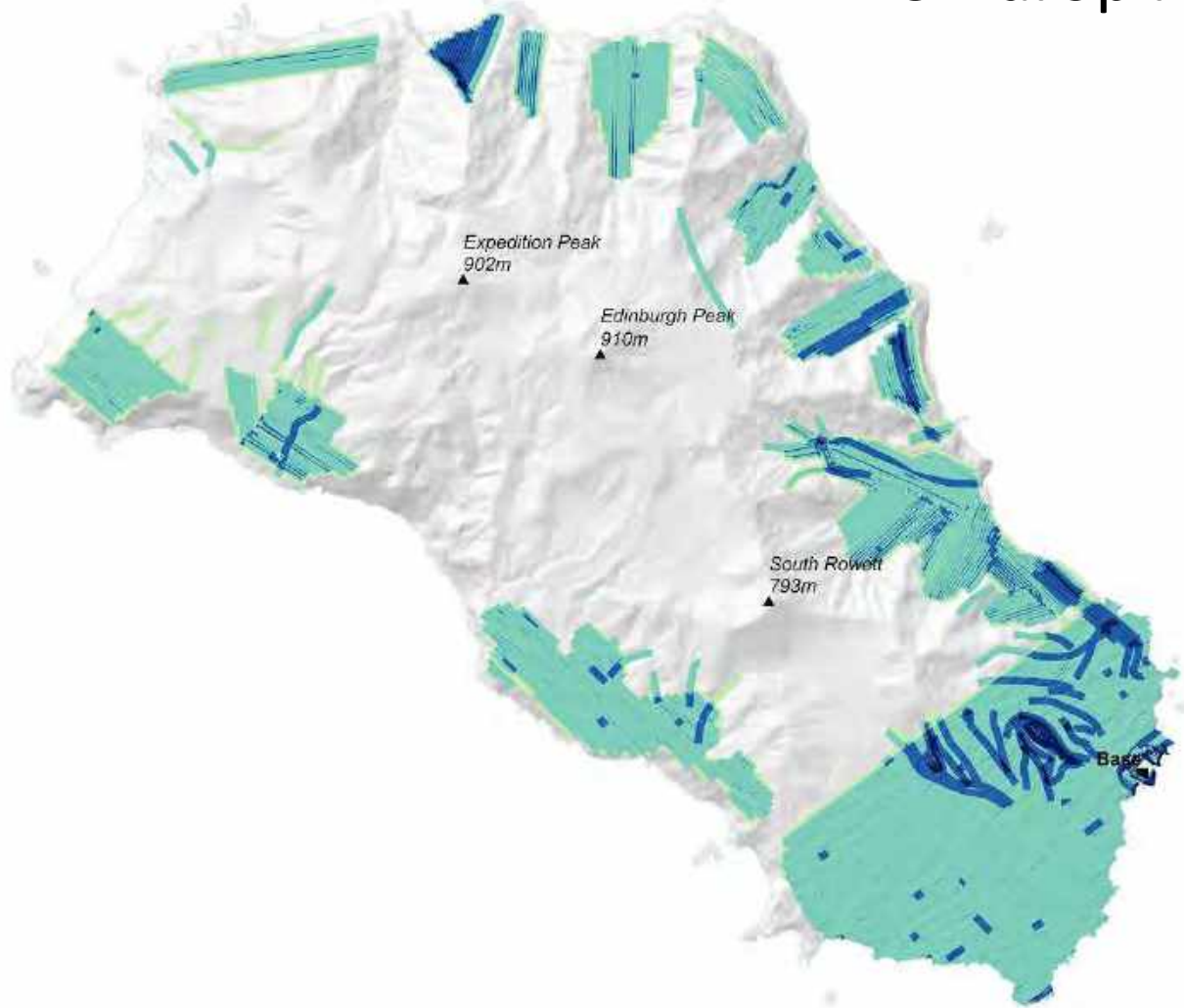
Fig. 3. Bait availability (median, quartiles \pm 95% confidence interval) in the lowlands of Gough Island after the third aerial bait application, when mouse activity was undetectable.

Damaged bait
replicated in
the lab



Fig. 4. Examples of bait pellets (2 g) partially consumed by slugs in the lab (a) and in the field (b).

3rd drop redesigned



Gough Island Bait Supplementary Baiting

Scale at A4: 11:70,000
Gough Island Restoration Program
9/08/2021

A lesson for planning rodent eradications: interference of invasive slugs during the Gough Island mouse eradication attempt in 2021

Araceli Samaniego^{A,*}, Wes Jolley^B and Pete McClelland^C

For full list of author affiliations and declarations see end of paper

^{*}Correspondence to:
Araceli Samaniego
Manaaki Whenua – Landcare Research,
231 Morrin Road, St Johns, Auckland 1072,
New Zealand
Email:
SamaniegoA@landcareresearch.co.nz

Handling Editor:
Penny Fisher

ABSTRACT

Context. House mice (*Mus musculus*) are the most widespread invasive rodent species on Gough Island (6500 ha; 40°21'S, 009°53'W), central South Atlantic. Mice preying on at least 19 bird species triggered a mouse eradication attempt. Gough Island is a volcanic island in the South Atlantic Ocean and part of Tristan da Cunha, a UK Overseas Territory. From June–August 2021 an expert team applied an anticoagulant rodenticide (active ingredient brodifacoum at a concentration 20 ppm) island wide, predominantly via aerial broadcast using helicopters as the island is mainly uninhabited. The largest global attempt targeting only this species operating at such scales are crucial for maximising the success of rodent eradication. The Gough Island mouse eradication attempt was implemented in 2021. We expected poor weather to interfere with the operation. We aimed to assess the impact of expected weather on the eradication operation on Gough Island, named the '2021 Gough Island mouse eradication attempt'. **Aims.** We aimed to assess the impact of expected weather on the eradication operation on Gough Island, named the '2021 Gough Island mouse eradication attempt'. **Methods.** We set up bait degradation plots across the island to assess the impact of expected heavy rain on bait pellets. In contrast to our expectations, no heavy rain occurred. In contrast, trials were set up *ad hoc* in response to unexpected weather events, including heavy rain and the presence of invasive slugs in the lowlands, where both slugs

In press

Detections of house mice on Gough Island approach zero within days of aerial baiting

Araceli Samaniego^{A,*}, Kim L. Stevens^B, Vonica Perold^B, Steffen Opper^B and Pete McClelland^B

For full list of author affiliations and declarations see end of paper

^{*}Correspondence to:
Araceli Samaniego
Manaaki Whenua – Landcare Research,
231 Morrin Road, St Johns, Auckland 1072,
New Zealand
Email: SamaniegoA@landcareresearch.co.nz

Handling Editor:
Andrea Taylor

ABSTRACT

Context. House mice (*Mus musculus*) are the most widespread invasive rodent species on Gough Island (6,500 ha), central South Atlantic. Mice preying on at least 19 bird species triggered a mouse eradication attempt. Gough Island is a volcanic island in the South Atlantic Ocean and part of Tristan da Cunha, a UK Overseas Territory. From June–August 2021 an expert team applied an anticoagulant rodenticide (active ingredient brodifacoum at a concentration 20 ppm) island wide, predominantly via aerial broadcast using helicopters as the island is mainly uninhabited. The largest global attempt targeting only this species operating at such scales are crucial for maximising the success of rodent eradication. The Gough Island mouse eradication attempt was implemented in 2021. We expected poor weather to interfere with the operation. We aimed to assess the impact of expected weather on the eradication operation on Gough Island, named the '2021 Gough Island mouse eradication attempt'. **Aims.** We aimed to assess the impact of expected weather on the eradication operation on Gough Island, named the '2021 Gough Island mouse eradication attempt'. **Methods.** We set up bait degradation plots across the island to assess the impact of expected heavy rain on bait pellets. In contrast to our expectations, no heavy rain occurred. In contrast, trials were set up *ad hoc* in response to unexpected weather events, including heavy rain and the presence of invasive slugs in the lowlands, where both slugs

In press

Human-Wildlife Interactions

The ground baiting component of the Gough Island house mouse eradication attempt in 2021

Araceli Samaniego*, Andrew Callender, Pete McClelland

*Manaaki Whenua – Landcare Research

Abstract: House mice (*Mus musculus*, mice) are among the most widespread invasive rodent species. On Gough Island (6,500 ha), mice preying on at least 19 bird species triggered a mouse eradication attempt. Gough Island is a volcanic island in the South Atlantic Ocean and part of Tristan da Cunha, a UK Overseas Territory. From June–August 2021 an expert team applied an anticoagulant rodenticide (active ingredient brodifacoum at a concentration 20 ppm) island wide, predominantly via aerial broadcast using helicopters as the island is mainly uninhabited.


More coming!

McClelland et al. in prep



December
2021

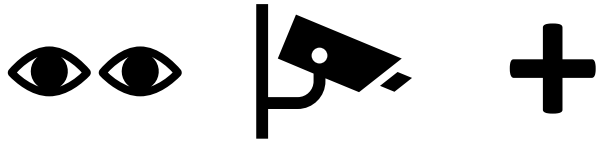
The attempt
had failed –
why?



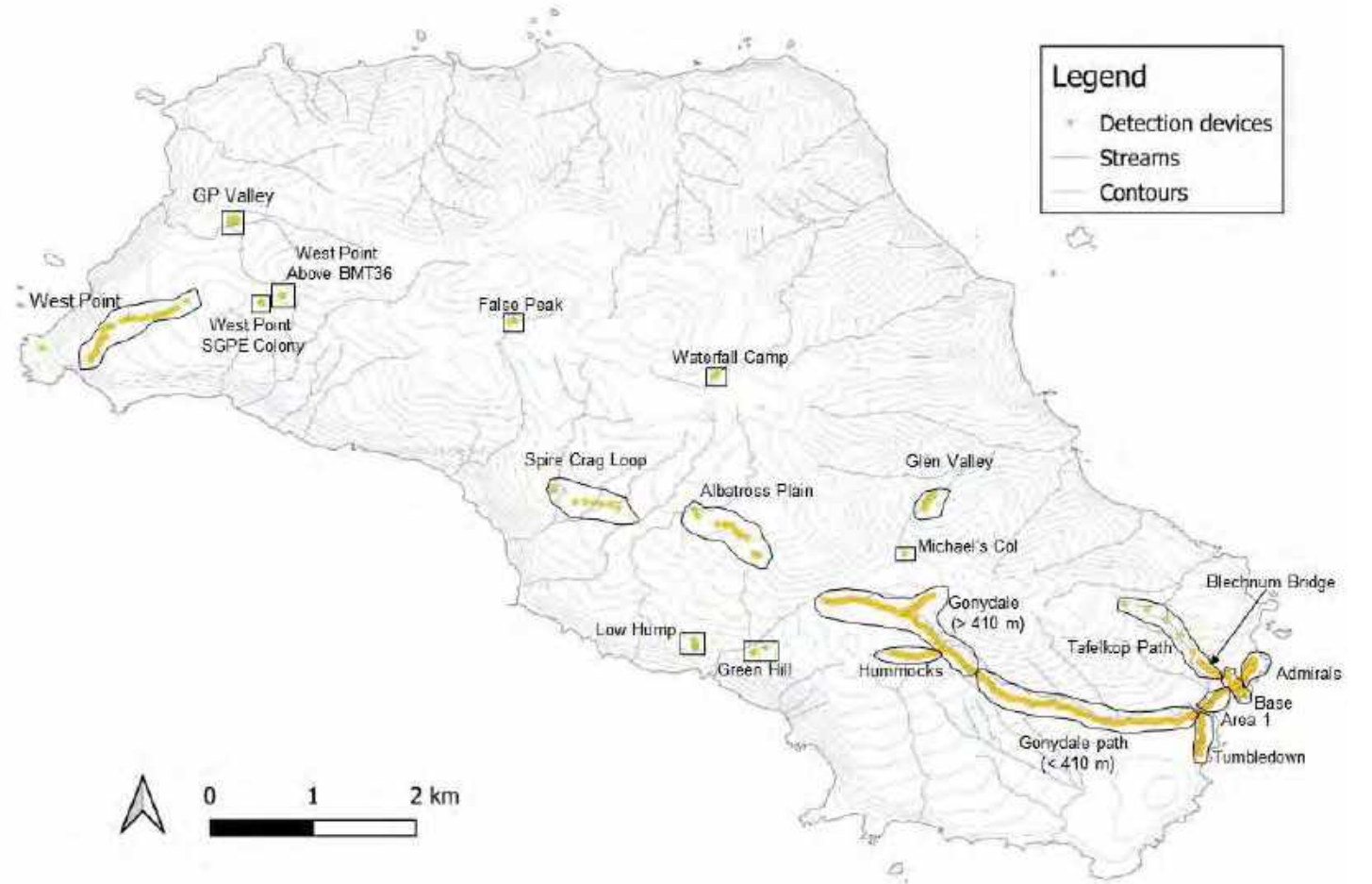
A formal review of the
eradication operation is
ongoing



DISCLAIMER



Post op
mouse
monitoring



Learnings

1. It can be done. Need to improve bait availability
2. Pestoff bait weathers well –better than expected
3. Highland and lowland areas need to be considered separately
4. Slugs: **an overlooked problem!** ...still very little known
5. Having relevant experts on the ground is key
6. Baiting of Base straightforward but needs attention to detail
7. Aviculture doable –but better off island...moorhens only?
8. Project continuity can be improved
9. It is worth trying again –good bird breeding season!

GOUGH ISLAND RESTORATION PROGRAMME

THE MOUSE ERADICATION ATTEMPT IN 2021

The Island

Part of a UNESCO World Heritage Site

Seabird World Association
Member of Centre

Seabird eggs and chicks lost per year:

2 MILLION
around the island
each March & April

Breeding birds:

24
species

22
species of
Endemic birds



The Eradication Operation

Joint Initiative:



Programme budget:



Countries involved:

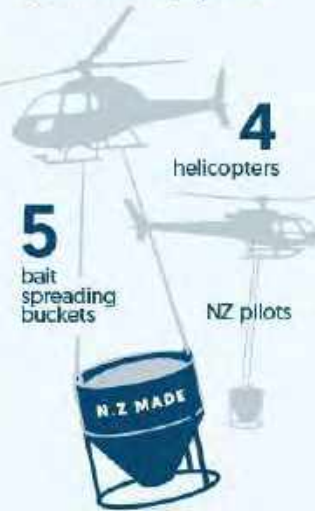
Marine Wales (UK), New Zealand, South Africa



Timeline



Specialised equipment:



Trays (petri dishes) for baiting around Base:

135
in total

Fuel drums:
400

All goods and people for the baiting team arrived and left their island by boat.

Bait spread:

210
tonnes

In 2 island-wide applications plus 1 partial application.

Bait manufacturer:
Orillon (New Zealand).



The Eradication Operational Team

Humans on Gough in winter 2021:

46
5 times higher than usual.

Baiting team:

35

from across four continents. Team members had a dual role of bait loader and something else: medical doctor, rock climber, photographer, mechanic, etc.



Find out more
www.goughisland.com



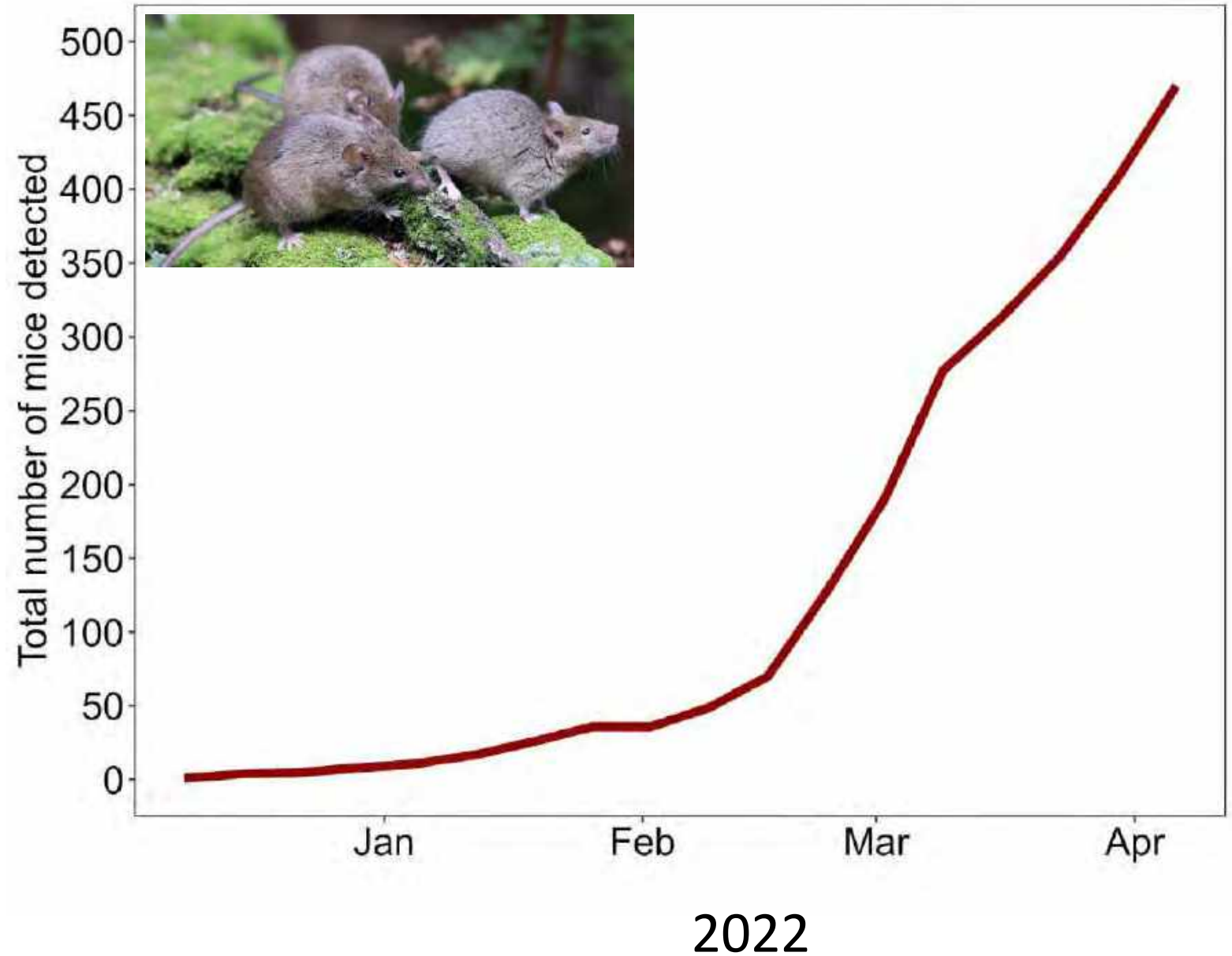
2 million reasons to try again!

Gough Island Restoration Programme 2021

@GoughIsland

#EarthOptimism

Post operation
mouse
detection



Island Restoration News: Gough and Henderson



Welcome | 2

Welcome—Why doing nothing is still not an option

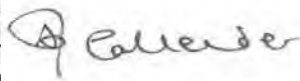
When news broke that a mouse had been found on Gough Island more than four months after we'd hoped we had eradicated them, we were inundated with kind words of support. One in particular resonated with the team: *Devastating news but so important that we try this sort of work. Yes it was difficult and 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 broodiness leading in relation to location and

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 sometimes lost. We are making it not the case with Gough. T is resolute in its commitment to restore, and to other eradication efforts widely including Henderson I Pacific. We will continue to w



Andrew Callender
Gough Island Restoration
Programme Executive



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)

Kia ora/Thank you!

Photo/map/video credits:

Roelf Daling
Chris Jones
Katie Milne
Michelle Risi
Peter Ryan
RSPB
Araceli Samaniego
Kim Stevens



www.goughisland.com



@GoughIsland



@GoughIsland

Araceli Samaniego

SamaniegoA@landcareresearch.co.nz

GoughIsland@rspb.org.uk

A walk from top
to coast































