

# From farm to forest

50 years of ecological transformation on Mana Island

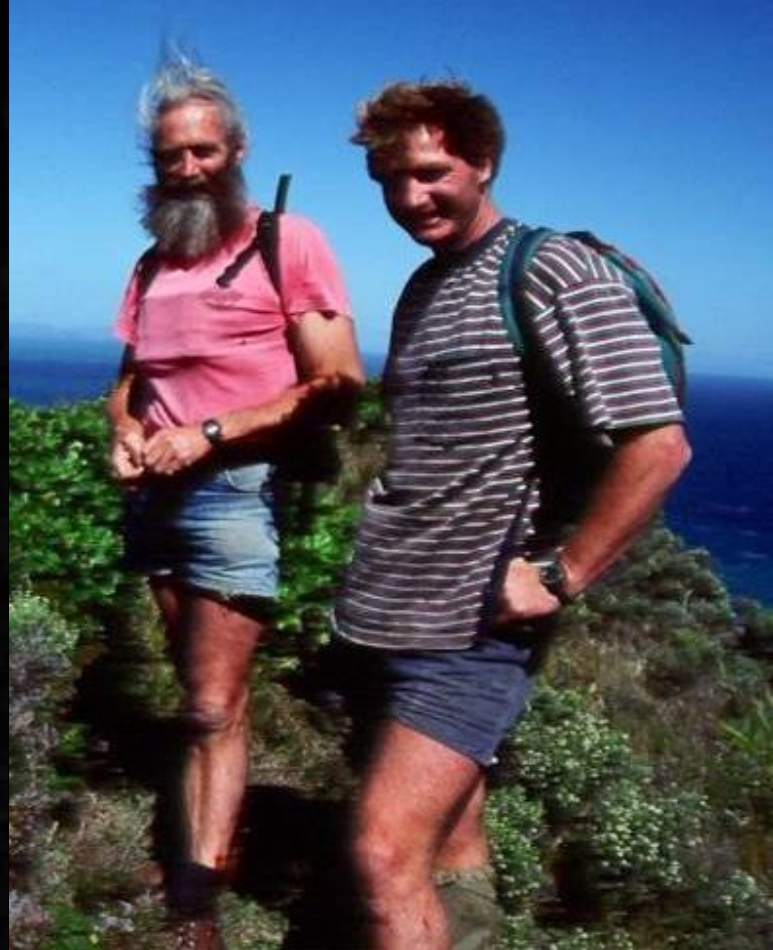


Colin Miskelly





Marieke Lettink



**Tony Whitaker MNZM**  
1944 – 2014

Tony first visited Mana Island  
in June 1972 as an Ecology  
Division DSIR technician







*Sphenomorphus* 'Sail Rock'

"Saw & caught 7 S. "Sail Rock"!!!  
under driftwood & stones near  
shore"

Tony Whitaker notebook  
5 June 1972



"Out at 2000 & first to plantation  
up Gully – 2040 spot-lighted  
"Gold-Stripe" *pacificus* in  
*Muehlenbeckia*"

Tony Whitaker notebook  
29 June 1972



June 1972









February 1986  
Don Newman



Translocated to  
Maud Island 1977  
Then 6 other sites  
1996–2013



1969



2021



Slaughtered sheep in the burial pit on Mana Island, 1978. The D6 bulldozer is filling in the hole. Photo by Alan Julian

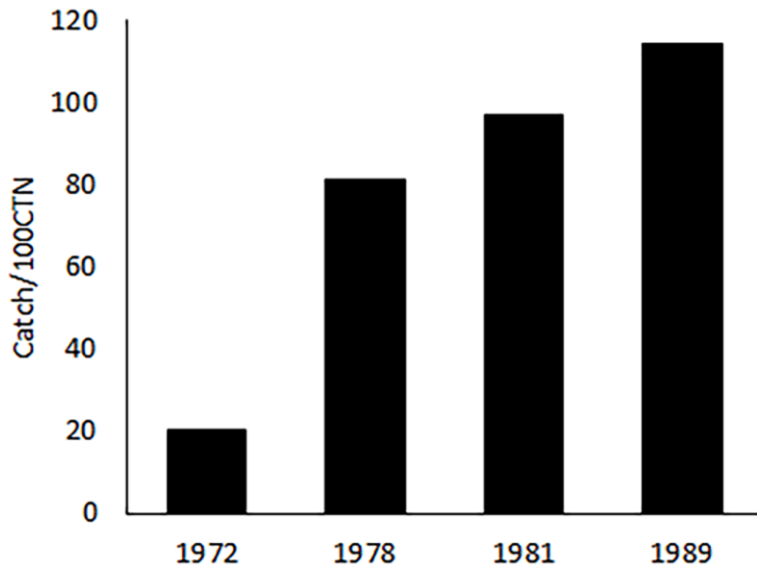
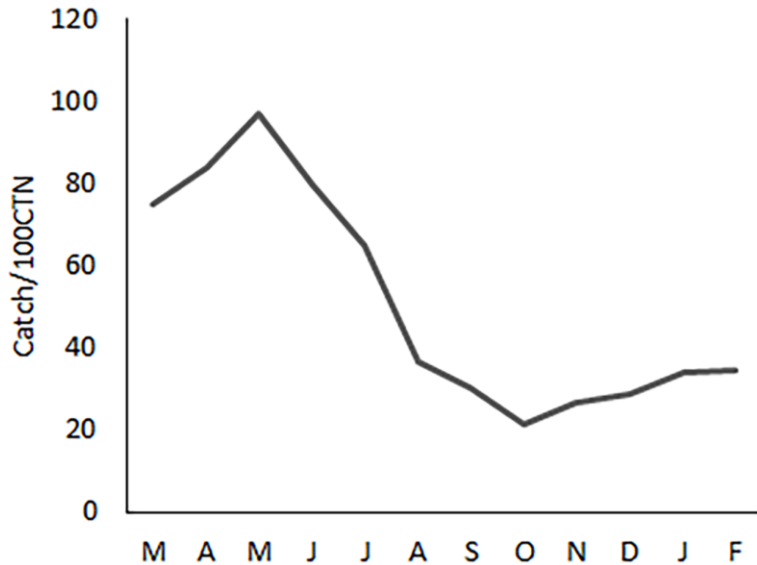


McGregor's skinks discovered north of Shingle Point in 1972

70% of their habitat destroyed in 1984







## Ecological changes that influenced mouse numbers on Mana Island

1974 Coastal slopes fenced and retired from grazing

1978–79 Sheep replaced by cattle

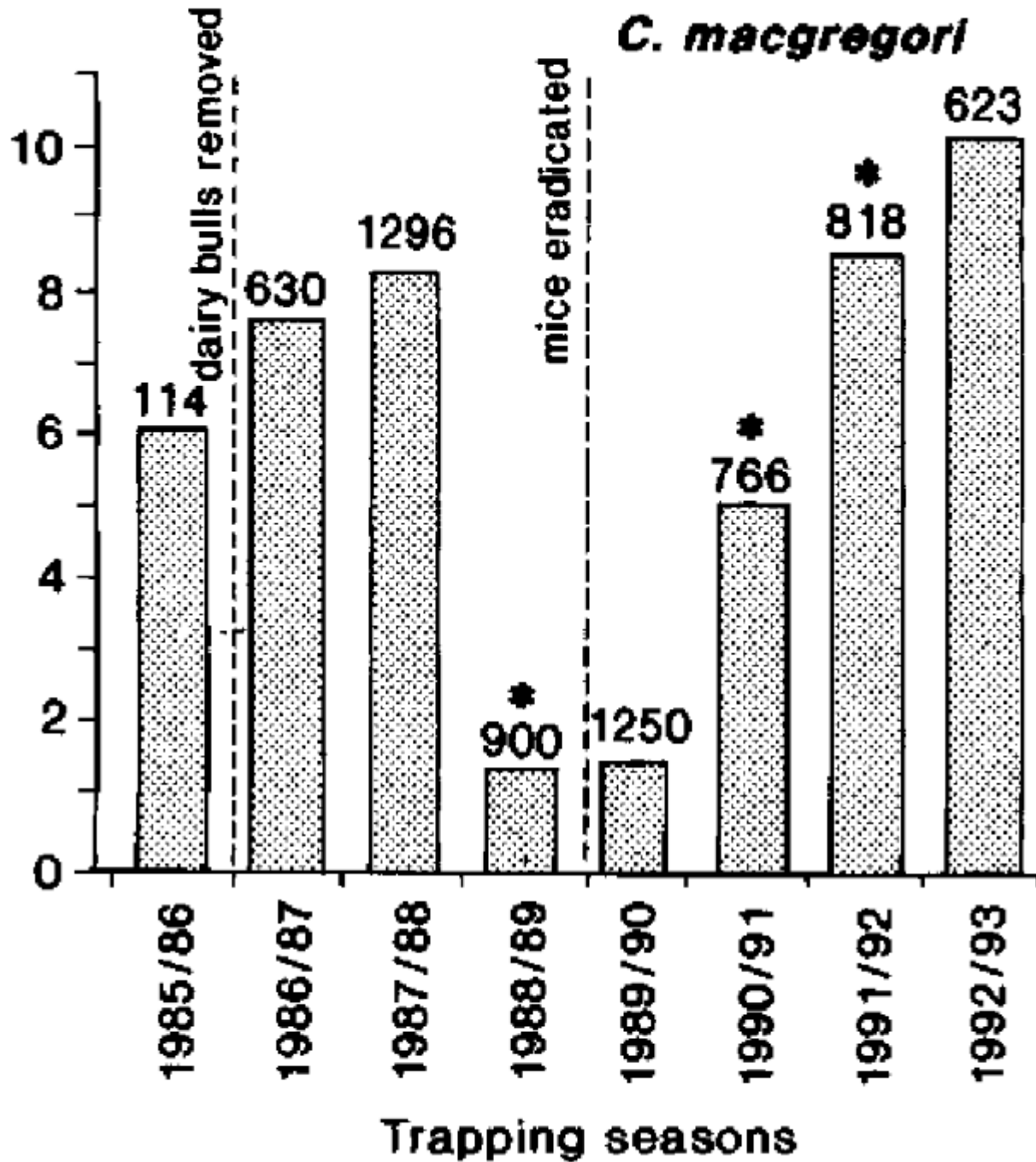
1986 Cattle removed

1989/90 Mice eradicated



Colin Ryder 1946–2021

# *C. macgregori*



Effects of a mouse, *Mus musculus*, eradication programme and habitat change on lizard populations of Mana Island, New Zealand, with special reference to McGregor's skink, *Cyclodina macgregori*

Don Newman (1994)  
*NZ Journal Zoology* 21: 443 – 456







**Table 2.** Significant changes in bird populations on Mana Island following mouse eradication, based on 5-minute bird counts (Miskelly et al. 2022a). Species are listed in decreasing order of abundance (= frequency of records during counts), with shading used to show the predominant diet for each species. Insectivorous species showed the strongest positive response following mouse eradication.

Species	Diet	Autumn	Spring
Southern black-backed gull <i>Larus dominicanus</i>	Marine	No change	No change
Starling <i>Sturnus vulgaris</i>	Insectivore	No change	Increase
Red-billed gull <i>Chroicocephalus novaehollandiae</i>	Marine	Decrease	No change
Goldfinch <i>Carduelis carduelis</i>	Granivore	Decrease	Increase
Skylark <i>Alauda arvensis</i>	Insectivore	Increase	Increase
Silvereve <i>Zosterops lateralis</i>	Insectivore/frugivore	Increase	Increase
Greenfinch <i>Chloris chloris</i>	Granivore	Decrease	Increase
New Zealand fantail <i>Rhipidura fuliginosa</i>	Insectivore	Increase	Increase
White-fronted tern <i>Sterna striata</i>	Marine	No change	Increase
Yellowhammer <i>Emberiza citrinella</i>	Granivore	No change	No change
Swamp harrier <i>Circus approximans</i>	Carnivore	Increase	Decrease
House sparrow <i>Passer domesticus</i>	Granivore	Decrease	No change
Rock pigeon <i>Columba livea</i>	Granivore	No change	No change
Chaffinch <i>Fringilla coelebs</i>	Insectivore/granivore	Increase	No change
Dunnock <i>Prunella modularis</i>	Insectivore	No change	No change
Blackbird <i>Turdus merula</i>	Insectivore/frugivore	Increase	No change
Pūkeko <i>Porphyrio melanotus</i>	Herbivore	Increase	Increase
Paradise shelduck <i>Tadorna variegata</i>	Herbivore	Increase	No change
New Zealand pipit <i>Anthus novaeseelandiae</i>	Insectivore	Increase	Increase
Grey warbler <i>Gerygone igata</i>	Insectivore	Increase	No change
Song thrush <i>Turdus philomelos</i>	Insectivore/frugivore	Increase	Increase
Welcome swallow <i>Hirundo neoxena</i>	Insectivore	Increase	No change

## Changes in the Mana Island, New Zealand, bird community following mouse (*Mus musculus*) eradication

Miskelly, Beauchamp & Oates (2022)  
*Notornis* 69: 243 – 255

### Mouse diet – % invertebrates

1981–82    58% (Pickard 1984)  
 May 1989    7% (Fitzgerald & Cong 1989)

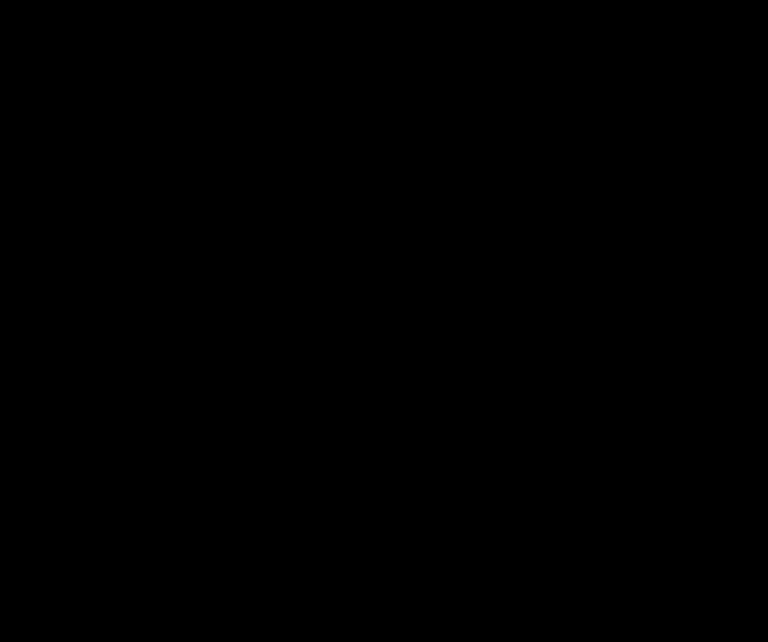
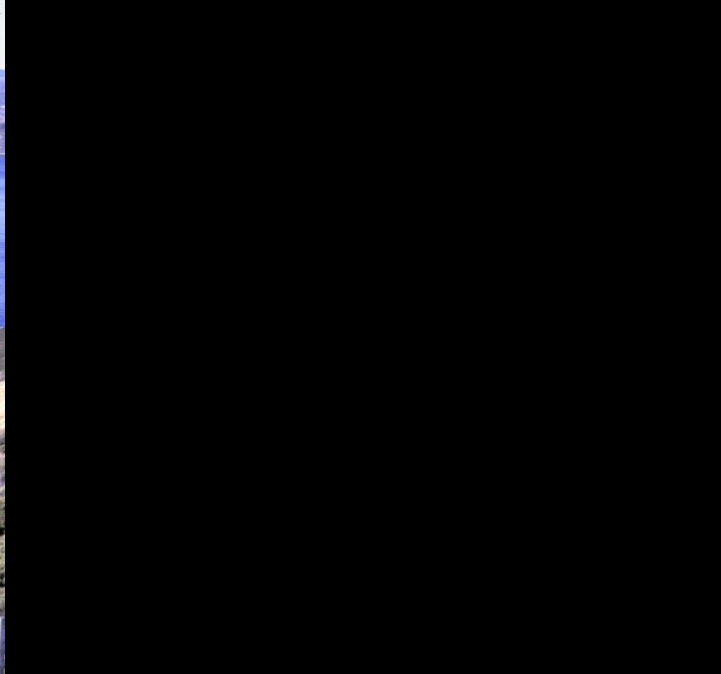


Annemieke Hendriks



Colin Miskelly











# Mana Island ecological restoration plan

JANUARY 1999



Department of Conservation  
*Te Papa Atawhai*



Friends of  
Mana Island

[Home](#) [Visit](#) [Join Us](#) [About Mana Island](#)

Kia ora and Welcome to the Friends of Mana Island Website

[Join Us](#)

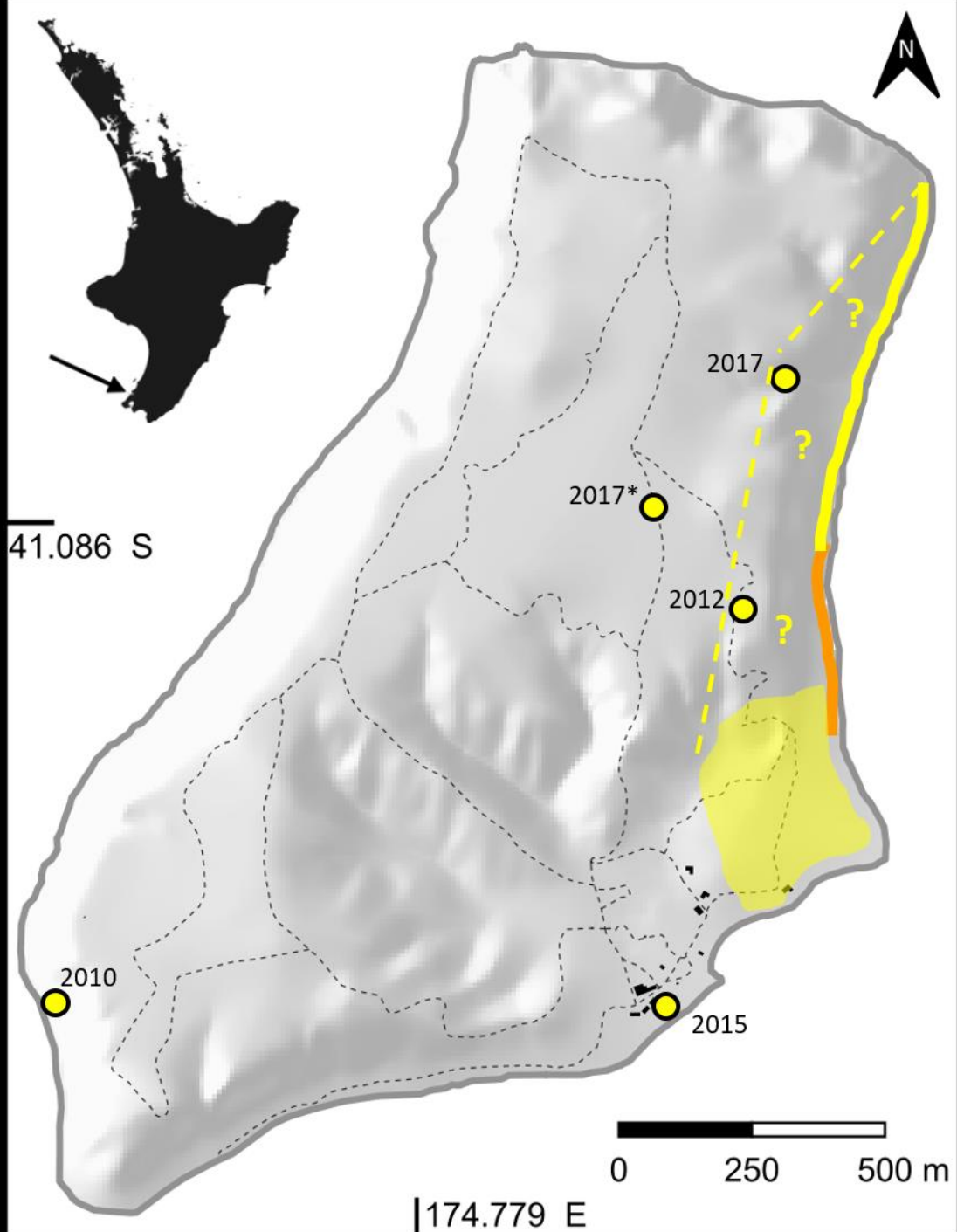
Mana Island is a predator-free island located off the coast of Porirua, New Zealand.

Friends of Mana Island (FOMI) is a volunteer group formed in 1998 to provide support for the Department of Conservation (DOC) in the restoration of Mana Island. We also work in collaboration with Ngāti Toa as tangata whenua. FOMI's volunteers work on restoration projects on Mana Island. FOMI also runs [guided trips](#) to the island for visitors.





Images  
Tony Whitaker (Tohu's gecko, northern spotted skink,  
Newman's speckled skink)  
Annemieke Hendriks (barking gecko, ngahere gecko)



McGregor's skink distribution on Mana Island





Images:  
Leon Berard

# Successful bird translocations to Mana Island

Species	Year(s)	No.
Takahē	1998–2022	48
North Island robin	1995–96	66
Common diving petrel	1997–99	239
Pāteke	2000–01	16
Fairy prion	2002–04 & 2015–16	440
Yellow-crowned parakeet	2004	27
Fluttering shearwater	2006–08	225
Whitehead	2010	37
Bellbird	2010 & 2012	102
Rowi	2012	20
North Island fernbird	2019	40



**Changes in the rankings of the seven most abundant bird species on Mana Island over 80 years. Shading shows endemic and native species.**

<b>Jan 1944</b>	<b>1972 &amp; 1975</b>	<b>Spring 1987–88</b>	<b>Spring 1991–93</b>	<b>Spring 2020–22</b>
Starling	Starling*	Starling	Starling	Bellbird
Chaffinch	House sparrow*	Goldfinch	Skylark	Yellow- crowned parakeet
House sparrow	Blackbird*	Greenfinch	Goldfinch	Whitehead
Blackbird	Song thrush*	Skylark	Silvereeye	Tūi
Australian magpie	Greenfinch*	Yellowhammer	Greenfinch	Starling
Skylark	NZ fantail*	Silvereeye	NZ fantail	Swamp harrier
Song thrush	NZ pipit*	Dunnock	Chaffinch	Goldfinch



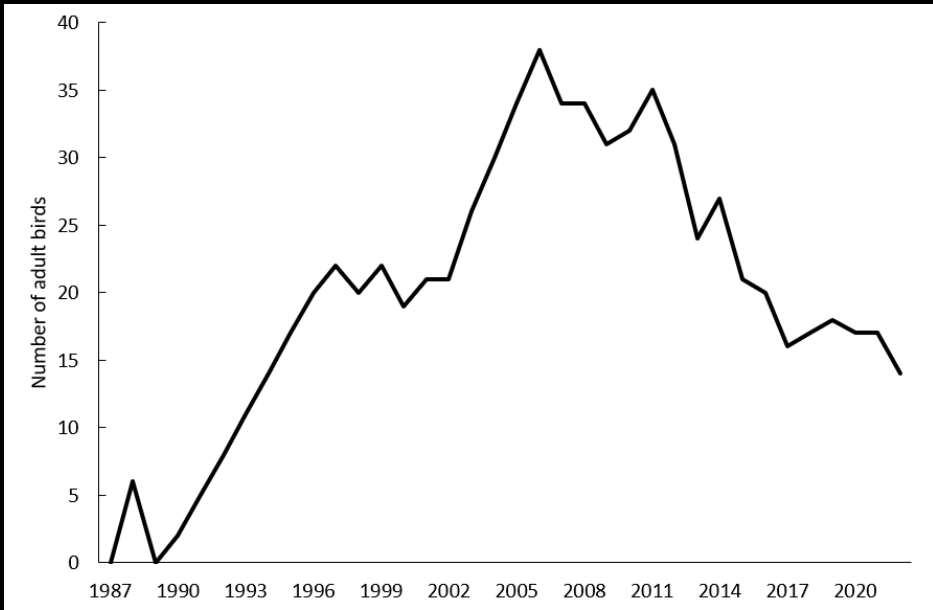
Images:  
Annemieke Hendriks



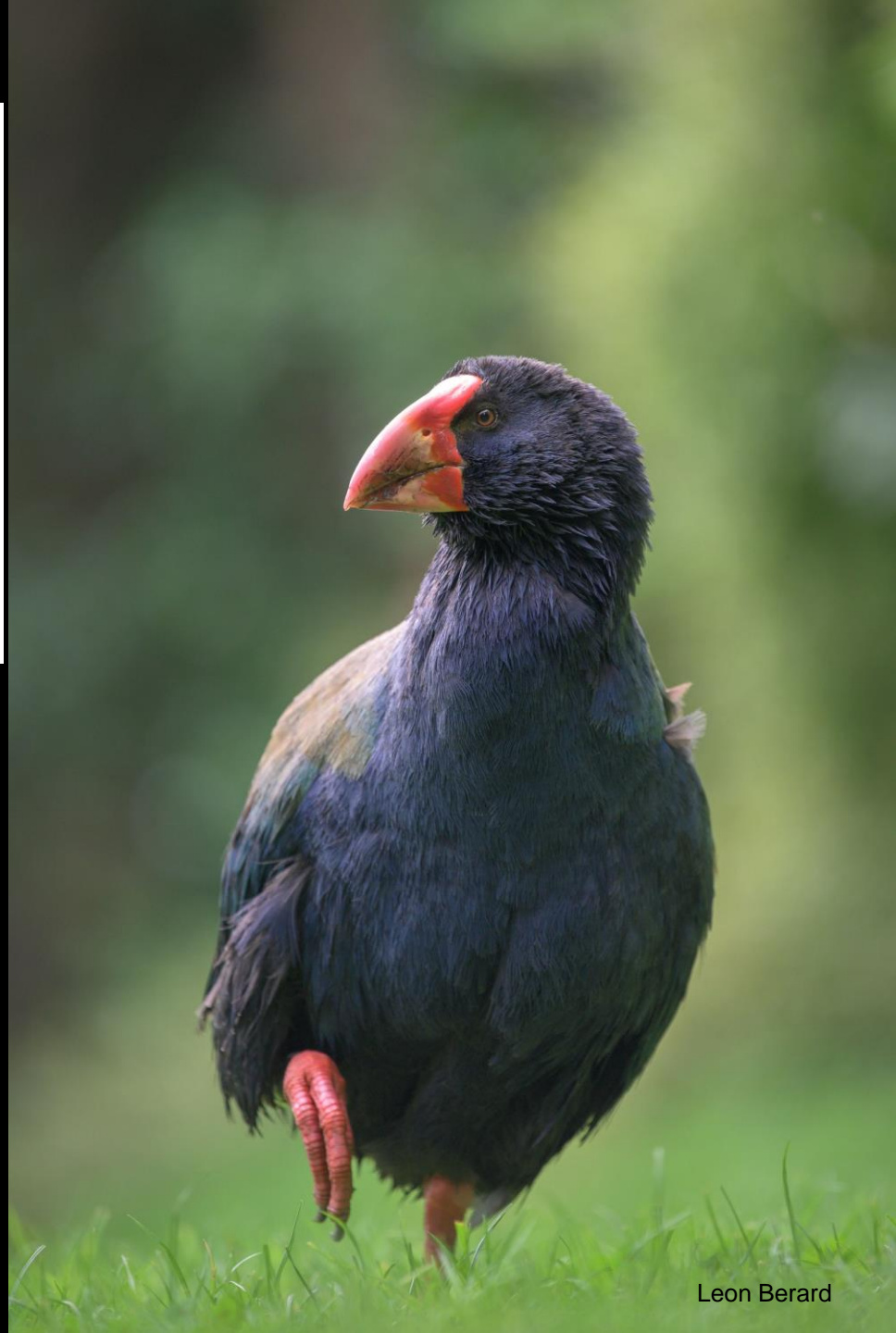
**Common diving petrel 1997–99**  
Minimum of 216 fledglings 1999–2023

**Fairy prion 2002–04 & 2015–16**  
Minimum of 56 fledglings 2006–23

**Fluttering shearwater 2006–08**  
Minimum of 283 fledglings 2011–23



Mana Island takahē population peaked at 42 birds in 2007







Dallas Bishop







January 2015





2010



2016

Maud Island flax seed collected in Jan 2015, grown in the Mana Island nursery, planted out in paired trials in 2017



[Through the lens: Daily life in Tuvalu 1886](#)

[Double photographs: Your other self?](#)

[For family or for Empire? The risks of staying home during war](#)

[Rembrandt comes alive on Collections Online](#)

[A grisly grizzly bear tale for World Animal Day](#)

#### POPULAR TODAY

Sorry. No data so far.

#### POPULAR CATEGORIES

[History](#) (507)

[Collections Online](#) (403)

[Biodiversity](#) (378)

[Exhibitions](#) (459)

[Art](#) (355)

[View all categories](#)

#### POPULAR AUTHORS

[Te Papa](#) (361)

[Leon Perrie](#) (158)

# A plague of flax weevils – a conservation hyper-success story

Posted 13 November 2013 by [Colin Miskelly](#) & filed under [Biodiversity](#), [Bugs, insects and spiders](#), [Field trips](#), [Plants](#), [Research](#), [Science](#).

Most people think of weevils as little maggoty grubs that infest stored grain products. Which is true, but the reality is that the weevil family is the most diverse family of organisms on the planet, with more than 50,000 species. Weevils are beetles, and adults are characterised by having a long snout and antennae bent at right-angles. They range in size from less than 2 mm to about 50 mm long. Weevils all start their lives as eggs from which larvae (grubs) hatch, and it is the larvae of the maize weevil or rice weevil (both in the genus *Sitophilus*) that you might find in your old opened packet of muesli.







Maud Island  
Aug 2017

*Metarhizium anisopliae*

*Beauveria ?pseudobassiana*

Mana Island  
June 2017







Aug 2018







Beauveria trial  
Feb 2020









Oct 2018



Oct 2022

20 weevils per plant March 2020

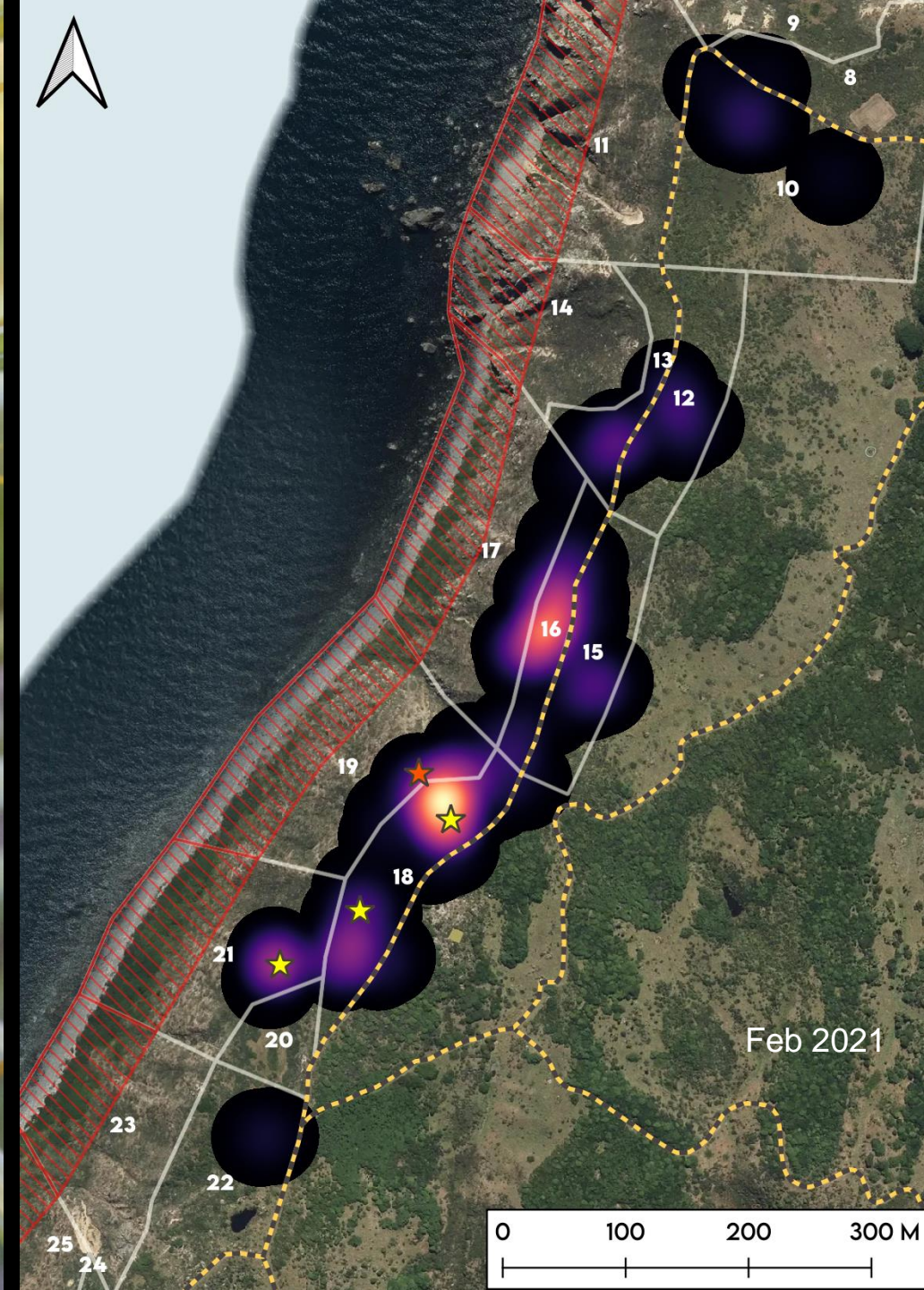


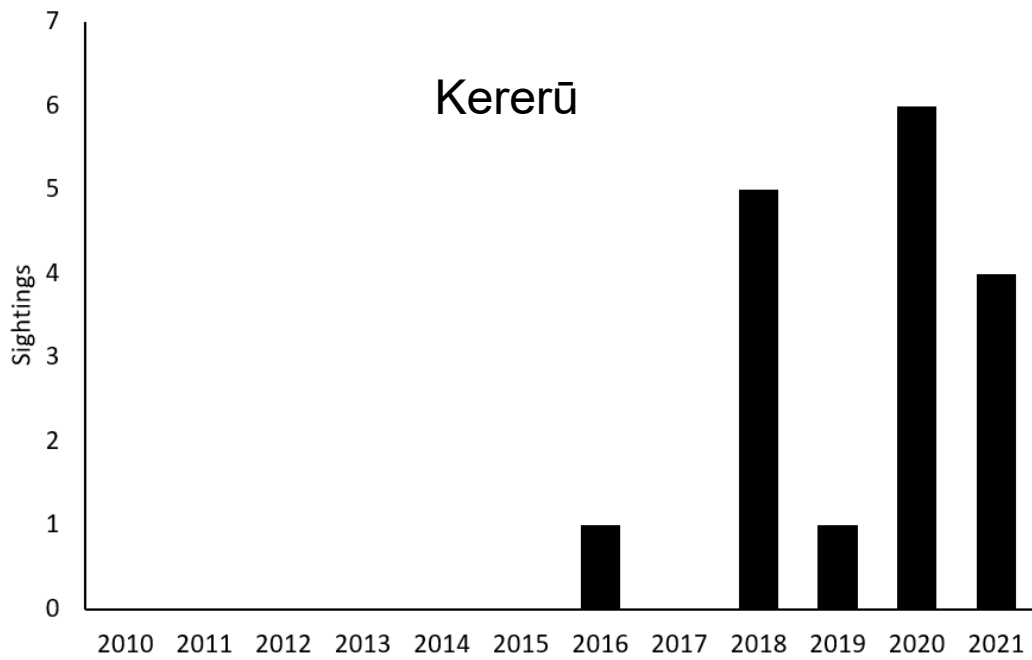
Will Brockelsby

*Beauveria pseudobassiana*

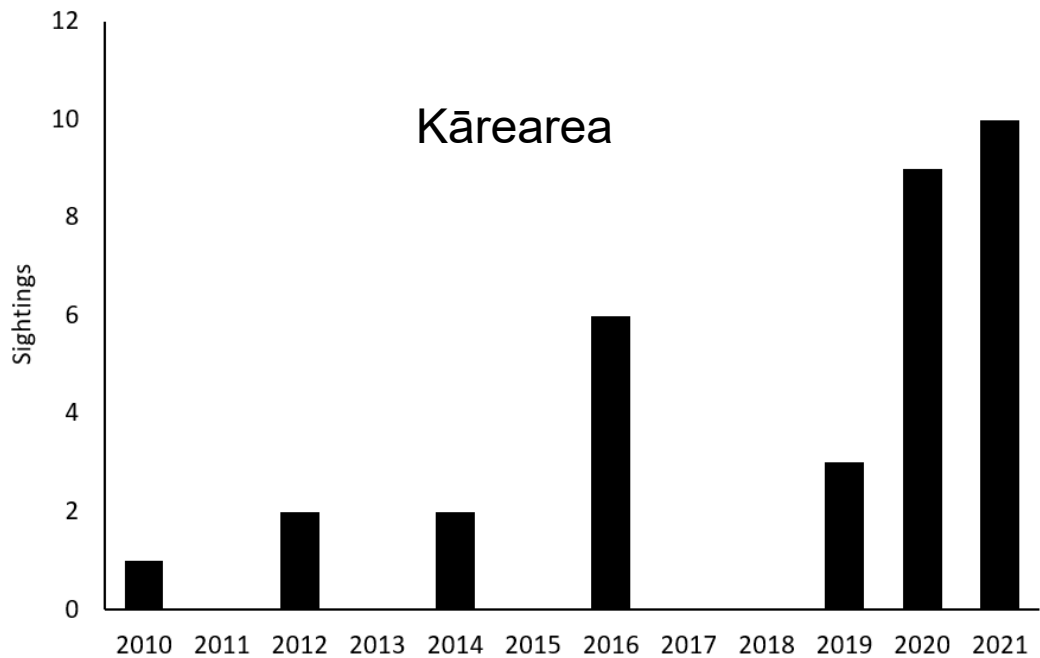


Dallas & Geoff





Annemieke Hendriks



A single kākā seen on consecutive days in October 2021



## From farm to forest – 50 years of ecological transformation on Mana Island, New Zealand

Colin M. Miskelly<sup>1</sup>

<sup>1</sup> *Museum of New Zealand Te Papa Tongarewa, PO Box 467, Wellington, New Zealand*

Corresponding author: Colin M. Miskelly ([colin.miskelly@tepapa.govt.nz](mailto:colin.miskelly@tepapa.govt.nz))

Academic editor: Rodrigo B. Salvador ♦ Received 29 November 2022 ♦ Accepted 13 February 2023 ♦ Published @ ##### 2023

### Abstract

Ecological surveys of Mana Island, Wellington, in 1972 and 1975 confirmed that house mice (*Mus musculus*) were the only pest mammals present, and resulted in nationally significant populations of Cook Strait giant weta (*Deinacrida rugosa*) and of two threatened lizard species being confirmed or discovered. Photographs taken in June 1972 were re-taken in June 2022, and are used to document social and ecological change on the island over this 50-year interval. Mana Island was farmed until 1986, and has been a conservation reserve administered by the Department of Conservation (DOC) since 1987. Mice reached plague numbers after farm stock were removed, and caused a population crash of McGregor's skink (*Oligosoma macgregori*). Following mouse eradication in 1989–90, the island has been free of introduced mammals. A major revegetation effort since 1987 included planting of more than 443,000 trees and shrubs over about 36% of the 217 ha island. For the last two decades, conservation management of the island has largely followed a comprehensive ecological restoration plan that was published in 1999. The Friends of Mana Island was formed in 1998, and has taken the lead role in most conservation initiatives on the island since then, in partnership with Ngāti Toa Rangatira (mana whenua) and DOC. In addition to the revegetation programme, weed control, and recreation of a wetland, 22 animal species have been translocated to the island, and several bird species have colonised naturally. Conservation successes and failures are described, and research relevant to restoration ecology undertaken on the island is summarised.

### Keywords

conservation management, ecological restoration, landscape ecology, translocation, unexpected outcomes, volunteer

### Many thanks to:

DOC, FOMI, Ngāitōa Rangatira, Te Papa, Vivienne Whitaker, Maarten Holl, Mike Daniel, Susan Timmins, Ross Pickard, Don Newman, Trevor Hook, Phil Todd, Jason Christensen, Grant Timlin, Sue Caldwell & Frank Higgott, Jeff Hall, Chris Bell, Nick Fisentzidis & Genevieve Spargo, Pat Elliott, Graeme Taylor, Helen Gummer, Lynn Adams, Phil Marsh, Glen Grieves, Alison Ballance, Mike & Christine Jacobson, Leon Berard, Annemieke Hendriks, Dallas Bishop, Geoff de Lisle, Will Brockelsby, Travis Glare, Dale Shirliff, Jaz Hamilton, Jean-Claude Stahl, and all the mouse-killers, tree-planters, bird-feeders and others who have contributed to the ecological restoration of Mana Island.

Dedicated to the memories of Tony Whitaker, Colin Ryder and Robin Gay.