

# Mason Bay Rat Project Report 2019

New Zealand Deerstalkers Association – Southland Branch in collaboration with the Department of Conservation.



Compiled by DOC Rakiura



Department of  
Conservation  
*Te Papa Atawhai*

## **Scope**

The New Zealand Deerstalkers Association – Southland Branch and the Department of Conservation – Rakiura are in partnership to deliver targeted pest control at Mason Bay. This collaboration is formalised under a 10-year Management Agreement (2013 to 2023) which captures the spirit of the partnership and roles and responsibilities of each party. The Department was proud to co-fund this project through the DOC Community Fund. DOC has undertaken to analyse the field data returned from NZDA trapping teams and produce a report which summarises the season and provides interpretation of the results.

This report covers the 2019 trapping season.

## **Background**

The Mason Bay rat trapping project covers approximately 300ha of coastal forest situated amongst a broader dune ecosystem. The project has been underway since 2006 and was further formalised in 2013 with a Management Agreement which outlines the roles and responsibilities of the NZDA volunteers and the Department of Conservation.

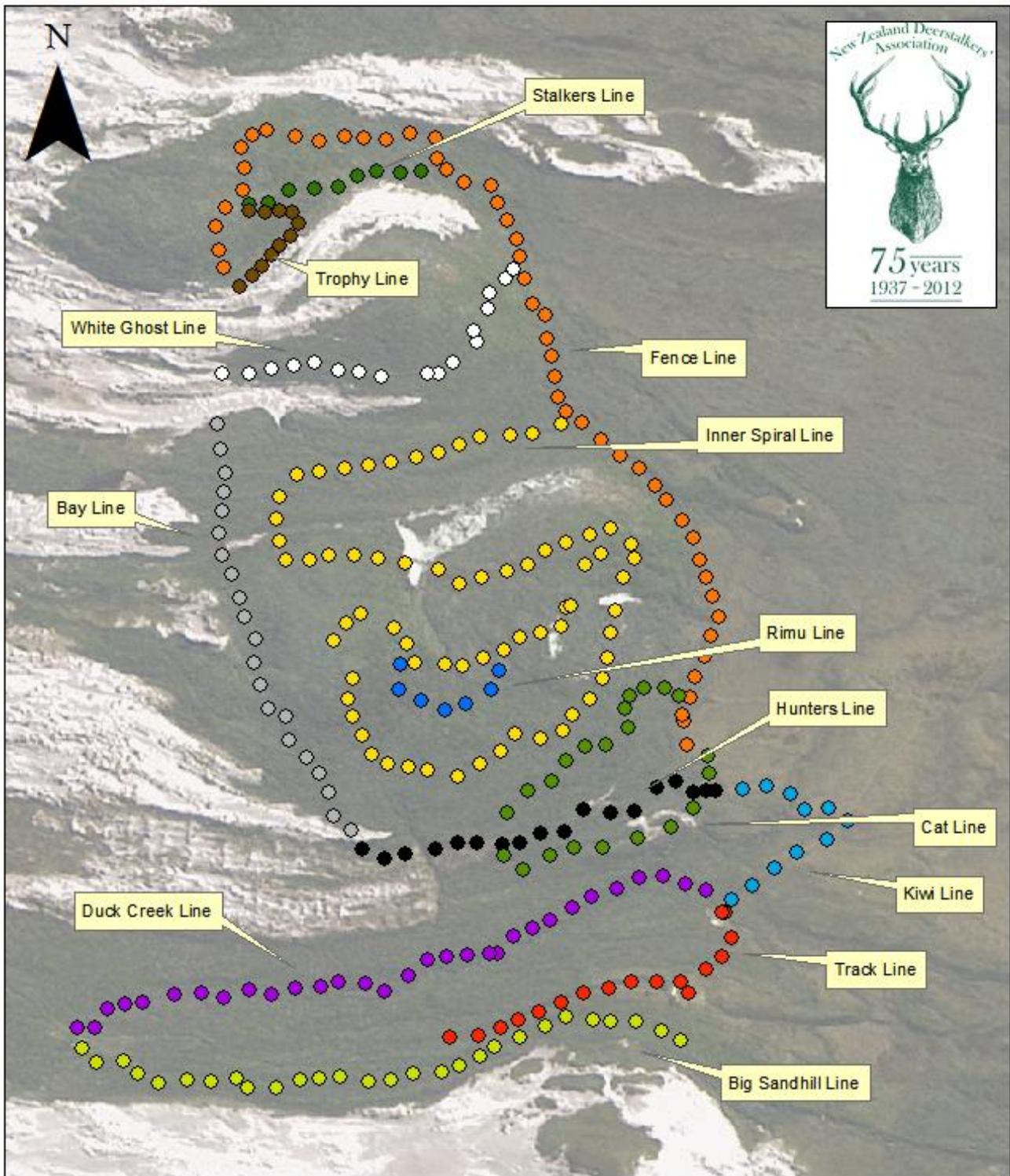
Mason Bay represents some of the only intact temperate dune system in the southern hemisphere, stretching inland up to three kilometres and reaching over 200m in height. It is home to a range of locally endemic plants and animals, including many threatened species. The location is a key wintering site for the critically endangered Southern New Zealand Dotterel which rest here during the high tides before flying across to places like the Freshwater River mouth mudflats to feed during the low tides. It is home to one of the largest and most visible populations of Kiwi in New Zealand as well as a range of forest bird species such as red-crowned parakeet, kereru, kaka, tui, bellbird, tomtit, fantail and more.

NZDA members maintain and rebait a network of 309 victor rat traps every year (see map below). Control trips are targeted to spring and summer and generally range from August to December.

The primary aim of the project is to increase the productivity of nesting forest birds during their vulnerable breeding season by reducing rat density and therefore rat predation of eggs, chicks and disturbance of incubating adults. Volunteers also use live capture cage traps to target feral cats in the area, further reducing predator numbers during the nesting season.

Field data is provided to the Department of Conservation staff based on Rakiura to analyse and collate into an annual report.

# Mason Bay Rodent Control Project



0 0.25 0.5 1 Kilometers

ArcMap 10.3.1  
2011 Aerial Photography  
Map Date: 17/4/19  
User: karter

Q:\GIS Users\Rakiura\Projects\Biodiversity Programme\Assisted Community Programmes\NZDAMason Bay Project

## **Introduction**

Rats are widely recognised as a key predator of vulnerable nesting birds through both raiding nests and directly targeting incubating adults, especially so with smaller bird species such as fantail and tomtits. Rat impacts are twofold in that they also compete with birds for food sources such as seeds and fruit. Rats are also known to eat invertebrates and reptiles.

All three species of rat present in New Zealand are present on Rakiura including the Norway, Ship and Pacific (kiore) rats. The dominance of different rat species depends on the habitat (eg: kiore are often out-competed by more aggressive ship and Norway rats) and each behave in different ways. Norway rats are generally known as swimmers and are often associated with water bodies whilst ship rats are normally more plentiful in forested areas and are known climbers. These characteristics make ship rats of particular concern as they are more likely to locate bird nests.

In ideal conditions of good habitat and plentiful food, every female rat has the potential to give birth to dozens of pups per year. As rats reach sexual maturity after just a few months, a population can grow from 2 to 2,000 in just twelve months, exacting a heavy toll on the ecosystem.

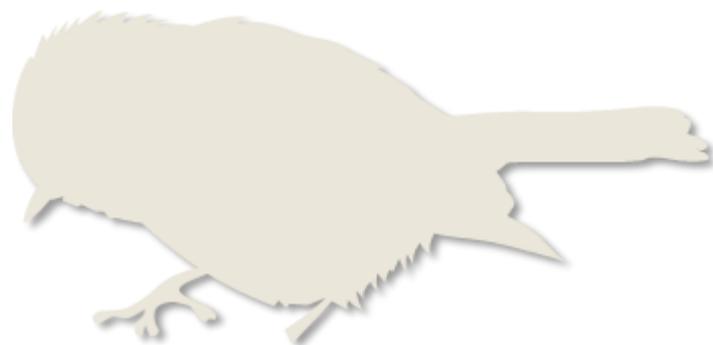
Rat population sizes naturally cycle over the course of any given year, increasingly rapidly through spring and summer after breeding and in response to increasing food availability with plants producing flowers, fruits and seeds. Rat plagues can occur in years when food availability is greater than average. In these years rat pups are more likely to survive through until adulthood which provides a larger breeding population when the cycle starts again.

Bird count data continues to be collected since the first observations in 2012. This has been targeted to monitor 4 specific bird species that are most susceptible to rat predation; bellbird, robin, tomtit and kakariki, which act as a series of indicator species to help us understand and quantify the benefits of the rat trapping programme in terms of increasing bird counts as our overall aim for the project.

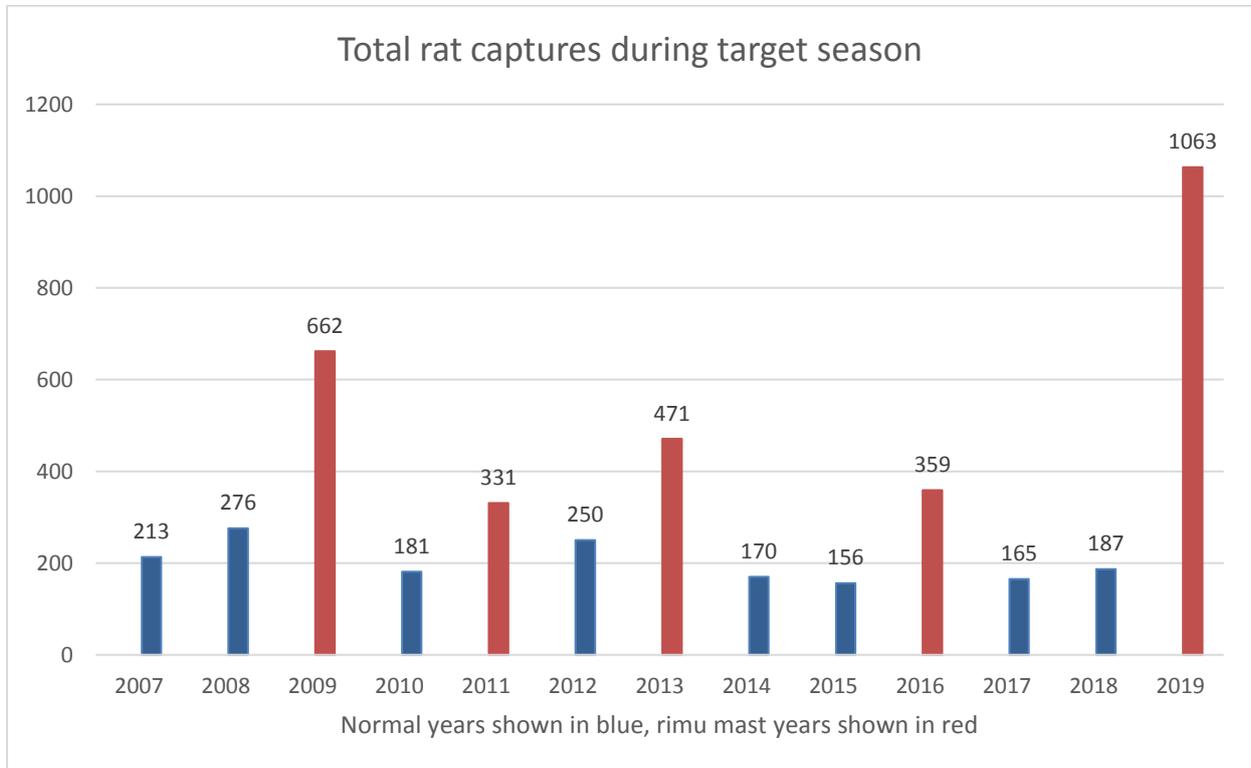
## **2019 results**

It was a huge year for rats following a mega mast event that saw increased fruiting in Rakiura's mixed podocarp forests as well. Volunteers trapped a total of 1063 rats which represents the highest catch ever recorded since the project began and almost twice the next highest record of 662 in 2009.

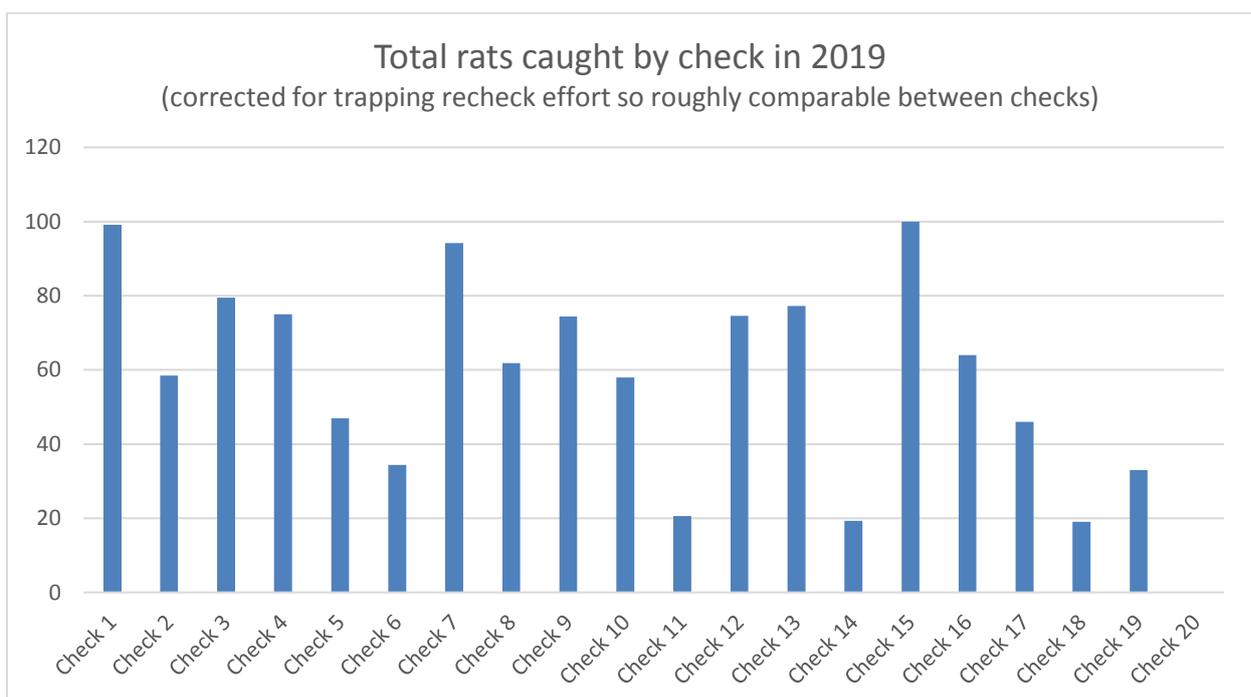
35 cat cage trap nights and 2 kill traps were run this season, however, no feral cats were caught or reported shot.



The target season total has been plotted on the graph below against the season totals over the course of the project. The data shows a clear spike in the raw number of rodent captures. It's important to note that this raw data graph hasn't been corrected for trapping effort and so should be interpreted with caution, see further below for a graph plotting the capture data after being standardised for the number of trap rechecks.

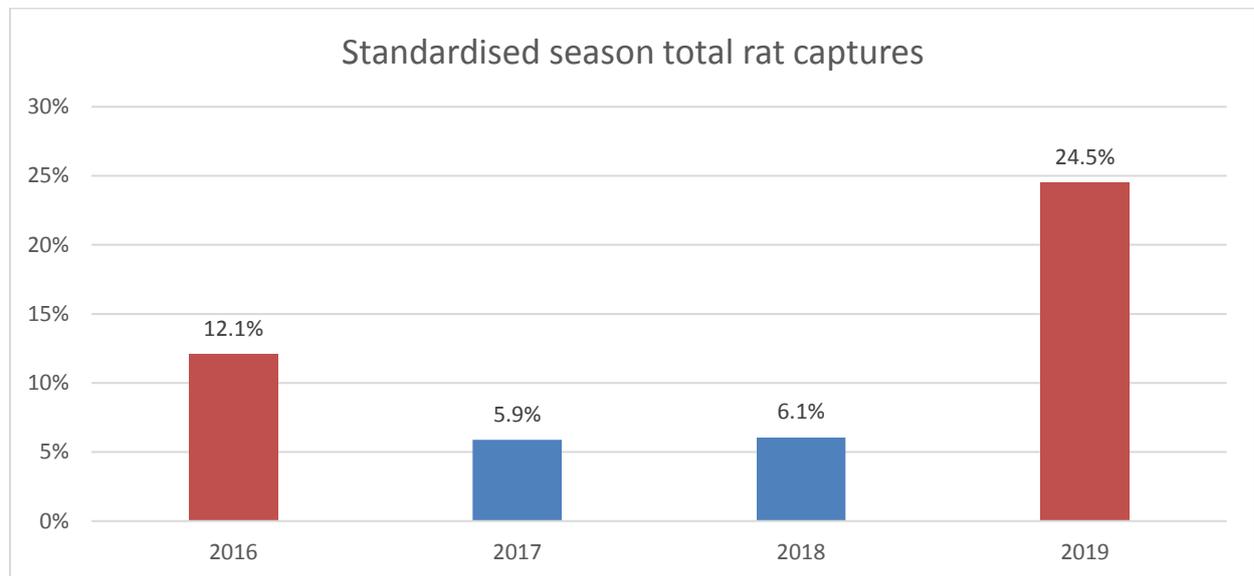


Rat catch results in non-mast years generally show a high catch at the start of the trapping season following by a tailing off and the rodent population declines. We saw this in 2018 but 2019 followed a different pattern as shown below.



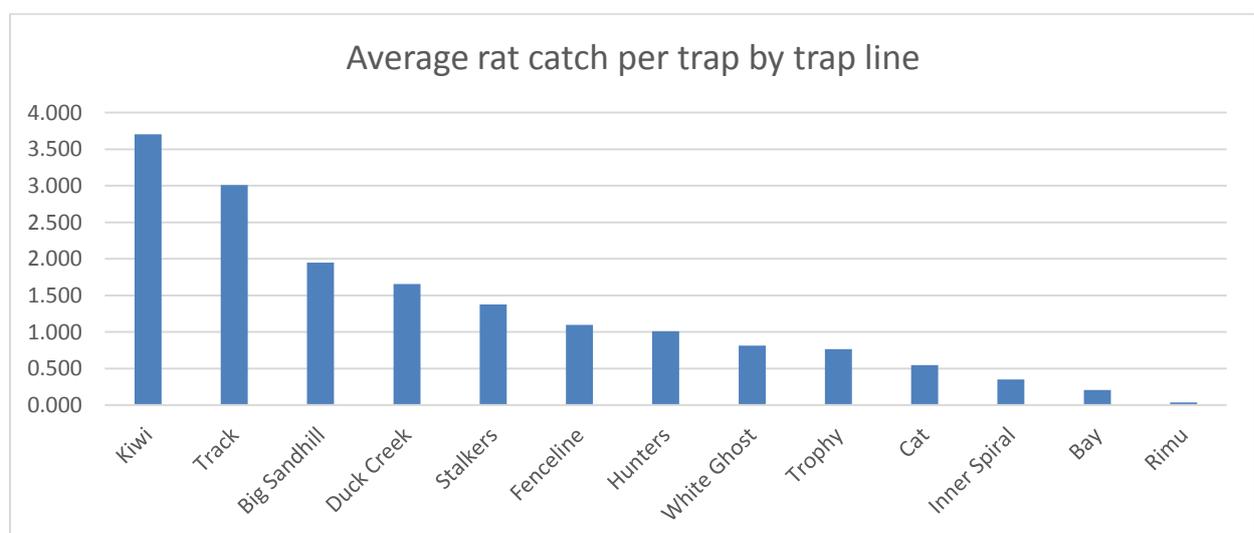
We see that rat captures remained relatively stable throughout the trapping season with some smaller peaks and troughs.

Approximately 4335 trap checks were run through the season which means that the overall catch rate for 2019 is 24.5% - up from 6.1% in 2018. This figure is more comparable between years as it recognises that increased trapping effort generally increases rat capture rates (to a point before it ultimately saturates and you run out of trappable rats).



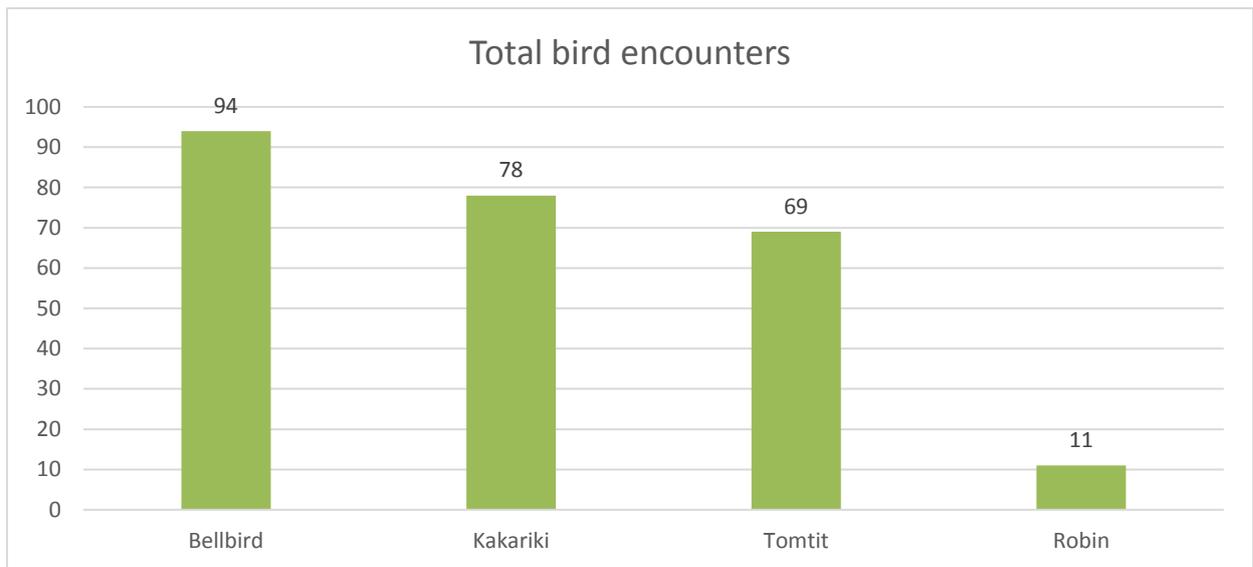
It's important to note that the interval between rechecks can affect the capture rates for any given recheck/round. Longer gaps between rechecks will mean that active traps have been out for more trap nights and so the next recheck is likely to find that more rats have been caught.

Standardised average rat capture by trap line has been broken down on the graph below. Kiwi line saw the most rat catches per trap on average at just over 3.7 rats per trap.

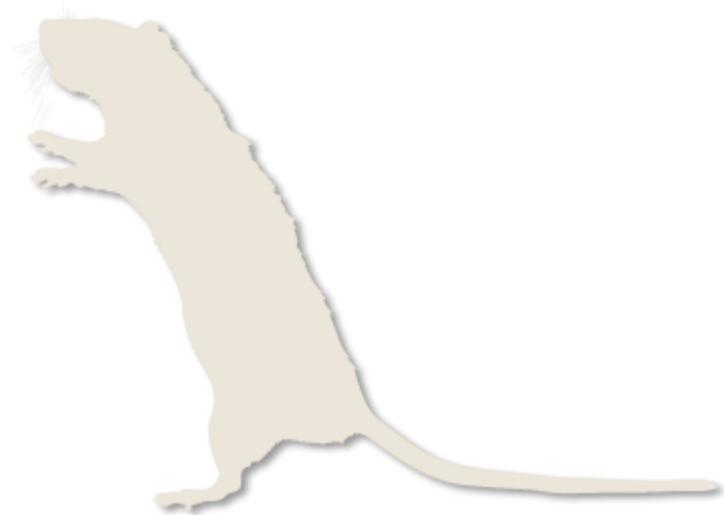
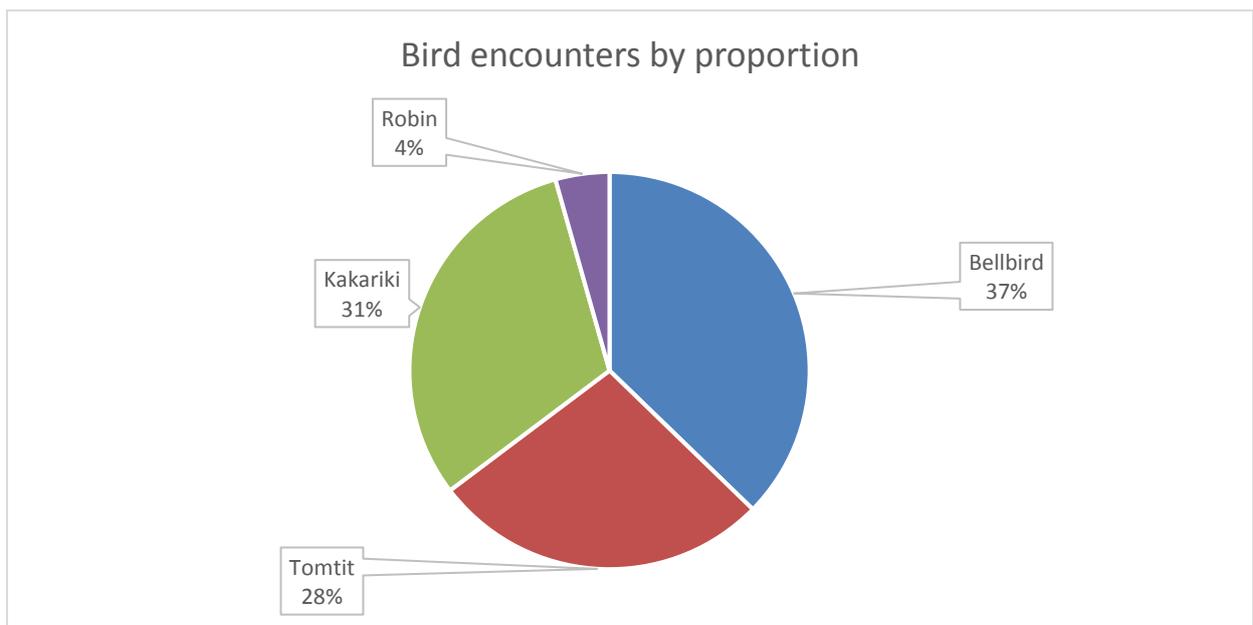


Duck Creek 1 was the highest rat catcher with a total of 16 rats overall and the highest standardised catch at 1.455 of any given trap.

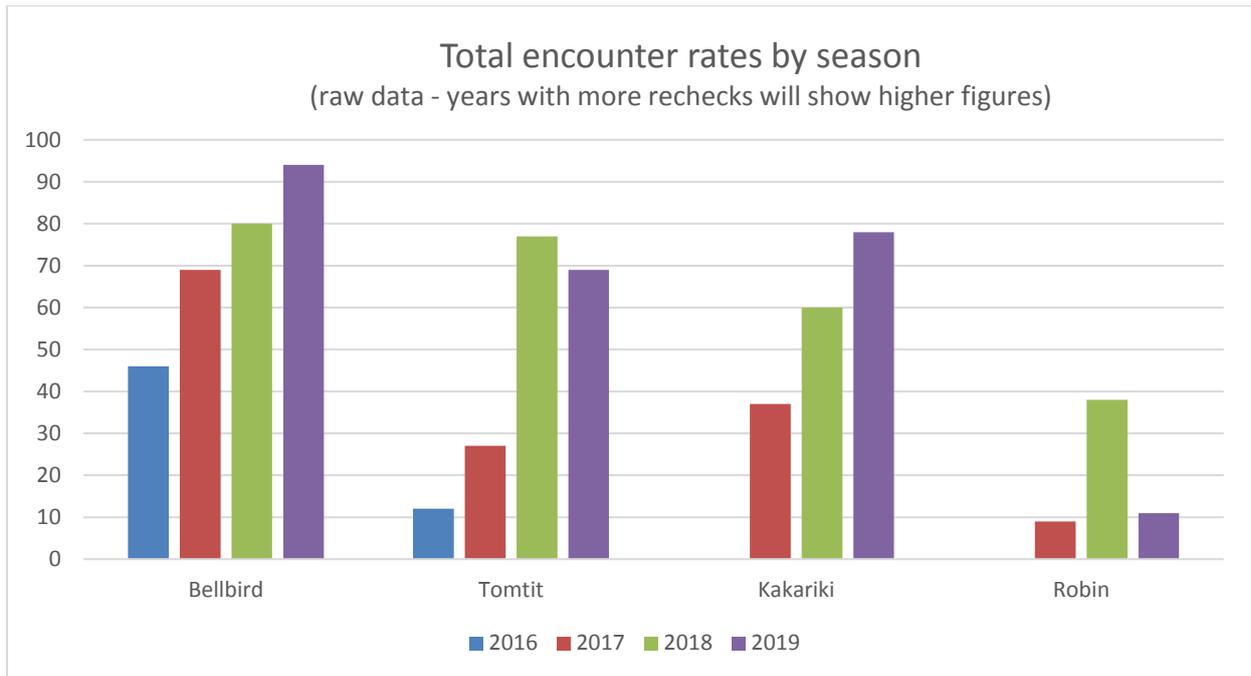
Plenty of native bird encounters were recorded relatively high numbers of tui again this year which aren't included here as they're not one of the four indicator species.



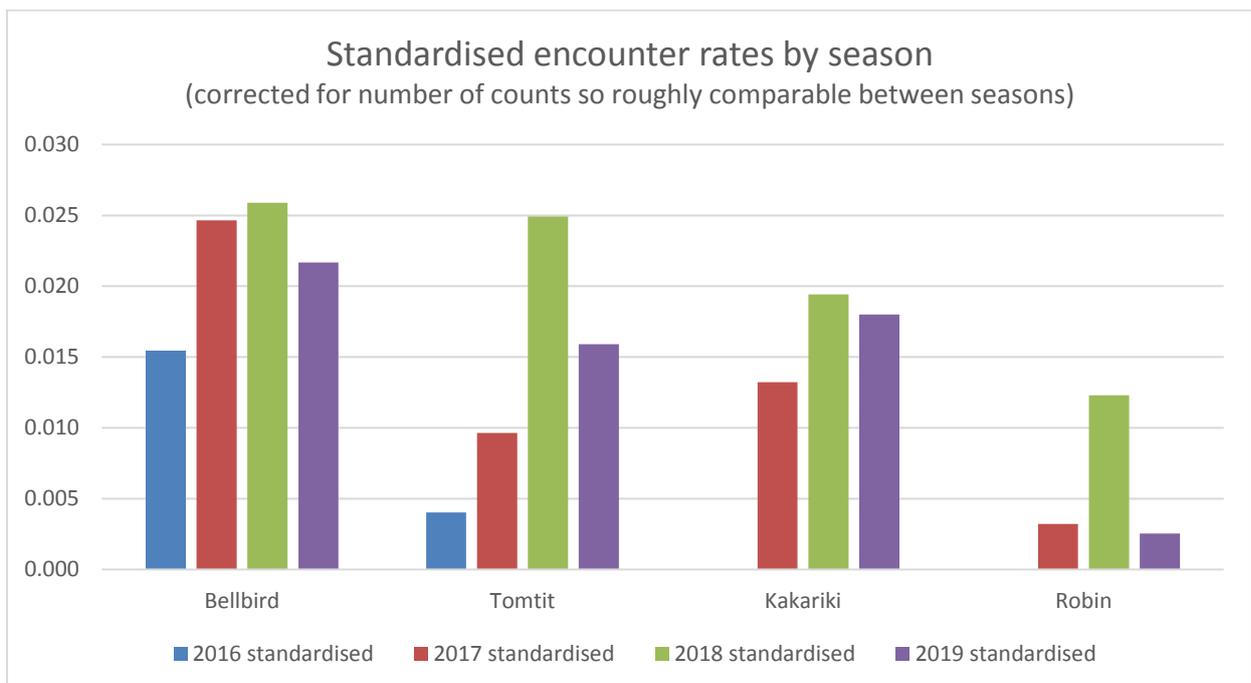
This data is shown as a proportion on the pie graph below.



This is shown in the next graph in context with the previous three seasons.



As with the rat capture data, we need to standardise this to account for the amount of time people were out recording bird encounters so that we can get a more comparable view of the data between years. To do this, we have divided species totals for each year by the number of trap rechecks in that year as this is a good estimate of distance walked. Of course, the slower a trap line is completed the more likely it is that the trapper will encounter a greater number of birds. Weather conditions also play a large role in how many birds are seen or heard on a given trap line check.



Average encounter rates appear to follow a generally increasing trend for each of the four indicator species with robins being a possible exception. As we build a longer-term data set we will be able to more reliably determine trend over time.

### **Discussion points**

#### *Rimu masting*

The rodent population spiked significantly following a more intense mast, described as a mega mast in beech forest systems, as predicted.

#### *Data sheets*

A big thank you to those who digitised their trapping and bird monitoring records via Excel. This made the analysis and reporting much quicker and reduced the likelihood of transcription errors.

Please remember to fill out the total trap nights for cage and kill traps so that we can compare how well the various traps are doing. Start and finish times can also really help calibrate the bird encounter data by allowing for the effect of slower going resulting in more bird sightings.

It's really important that we know which traps were checked and which ones weren't and how many rechecks were done on the traps that were serviced. We didn't have complete information from the field data sheets and so had to make some best guesses in a few places so that we could run the analyses. As such please take the report as a rough guide to how things are going out there.

#### *Walk the Line*

DOC has a GIS mapping tool, the Trapping App, which has been customised for trapping and can be used to capture data using the GPS in a smartphone and an app called "Walk the Line". It automatically captures time stamps and dates and has a form you can fill out on your phone. When you come back into cell phone or wi-fi range the app will automatically sync with the Trapping App and upload all your data. You can also still add data manually to cover any periods where a cell phone wasn't available.

It's a great tool, we use it to manage trapping data on Ulva Island and SIRCET use it for their trapping programme on the Ackers Point peninsula.

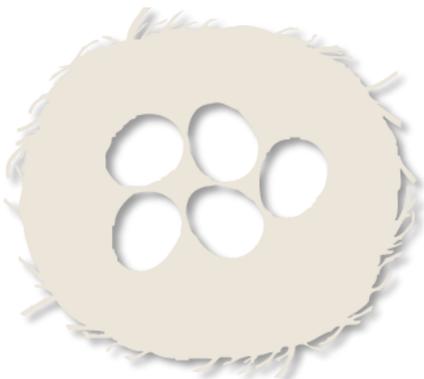
This could be a really useful system for the NZDA volunteers to consider using. DOC would be more than happy to help get it set up. Please let us know if you're interested in taking a look.

## **Conclusion**

The NZDA have completed another successful year of predator control at Mason Bay during a period where our native birds are particularly vulnerable to the effects of predators.

There are some encouraging trends developing with native bird encounters which is very rewarding.

We'd like to thank the hard work of the NZDA members and their continued enthusiasm for protecting the conservation values. We look forward to another season of good results.



**We would like to make special thanks to Invercargill Hunting & Fishing for the generous financial support of the 2019 efforts.**



**We would like to thank the DOC Community Fund for co-funding this project to assist with transportation costs.**

