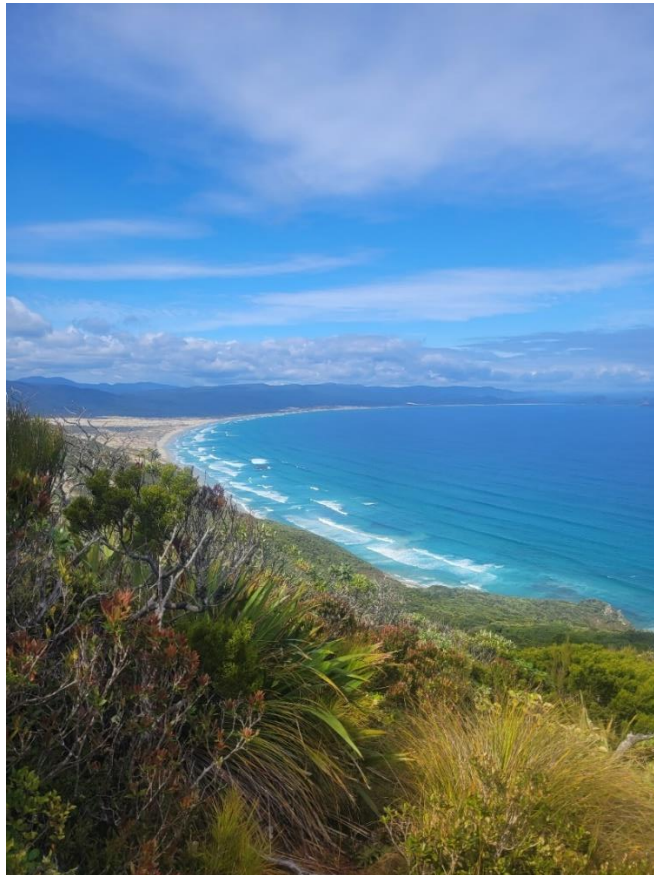


Mason Bay Rat Project Report 2024

New Zealand Deerstalkers Association – Southland Branch

in collaboration with the Department of Conservation



Compiled by DOC Rakiura



Scope

The New Zealand Deerstalkers Association – Southland Branch (NZDA) and the Department of Conservation Rakiura (DOC) are in partnership to deliver targeted pest control at Mason Bay. This collaboration is formalised under a renewed 10-year Conservation Agreement (2023 to 2033) which captures the spirit of the partnership and roles and responsibilities of each party. DOC has undertaken analysis of the field data returned from NZDA trapping teams and produced the following report which summarises the season and provides interpretation of the results.

This report will cover the data collected from the 2024 trapping season.

Background

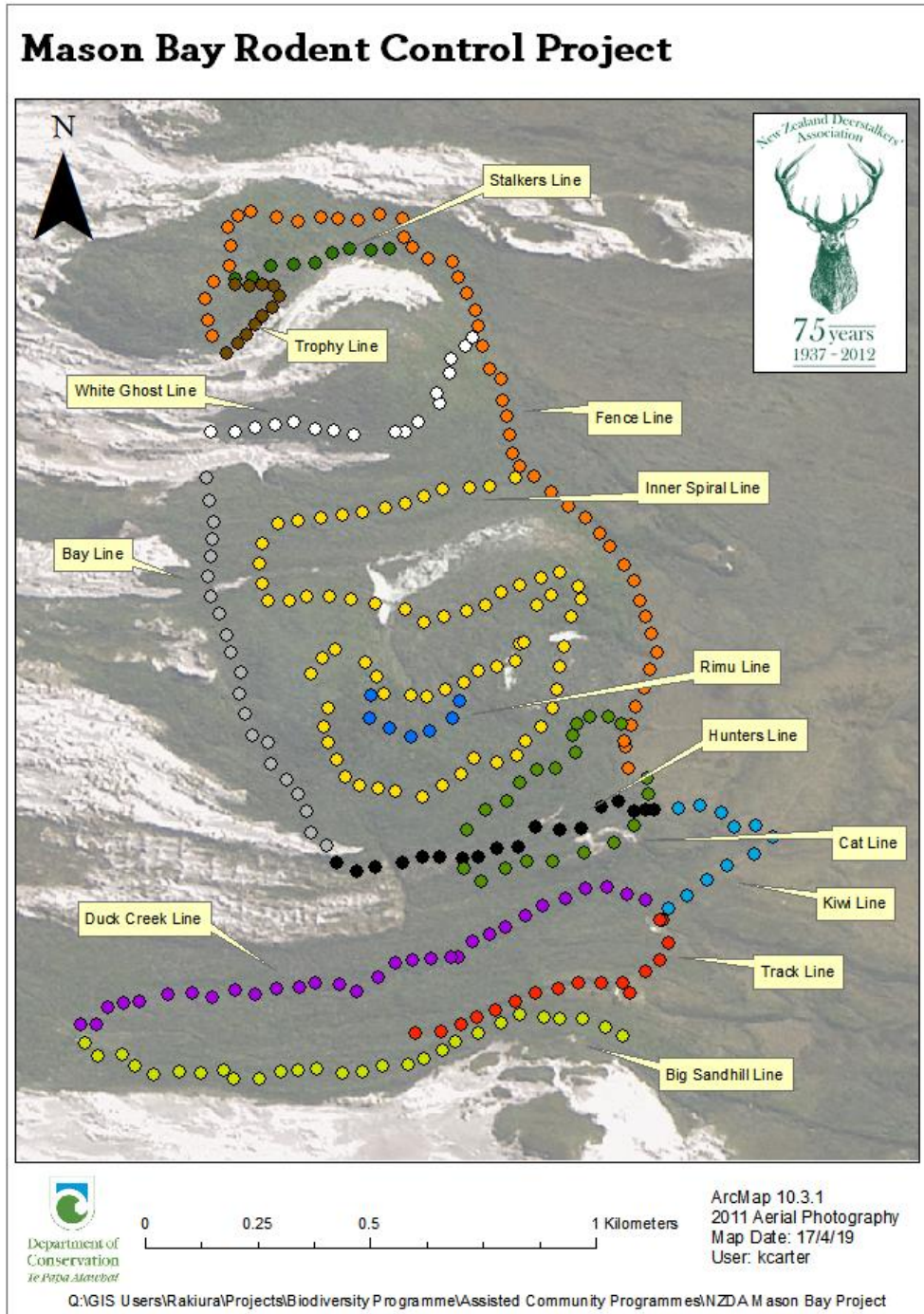
The Mason Bay rat trapping project covers approximately 300ha of coastal forest situated amongst a broader dune ecosystem. The project has been underway since 2006 and was further formalised in 2013 with a Management Agreement, renewed in 2023, which outlines the roles and responsibilities of the NZDA volunteers and the Department of Conservation.

Mason Bay represents some of the only intact temperate dune systems in the southern hemisphere, stretching inland up to three kilometers 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 Pukunui/Southern New Zealand Dotterel which rest there during the high tides before flying across to places like the Freshwater River mouth mudflats to feed during the low tides. Mason Bay is also 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, kererū, tūī, bellbird, tomtit, fantail and more.

NZDA members maintain and rebait a network of 309 victor rat traps every year (see map below). Trapping 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 and kill traps to target feral cats in the area, further reducing predator

numbers during the nesting season. Feral cats are the biggest threat to the critically endangered dotterels, making this work more critical than ever.

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



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, Norway, Ship and Pacific (kiore) rats, are also on Rakiura. The dominance of different rat species depends on the habitat (e.g.: kiore are often outcompeted 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 wetlands and waterways, whilst Ship rats are generally arboreal and more plentiful in forested areas. These characteristics make Ship rats of particular concern as they are more likely to prey on 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 in the absence of any other limiting factors like competition, food availability and so on, taking a heavy toll on the ecosystem.

Rat population sizes naturally cycle over the course of any given year, increasing 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 to 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 four specific bird species that are most susceptible to rat predation; bellbird, robin, tomtit and kākārīki, which are species that can 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.



2024 results

Cat catches

Cat kill traps were set for approximately 94 nights, and cage traps were set for 140 nights. No cats were caught in kill traps, 2 cats were caught in cage traps and 2 cats were shot outside of traps.



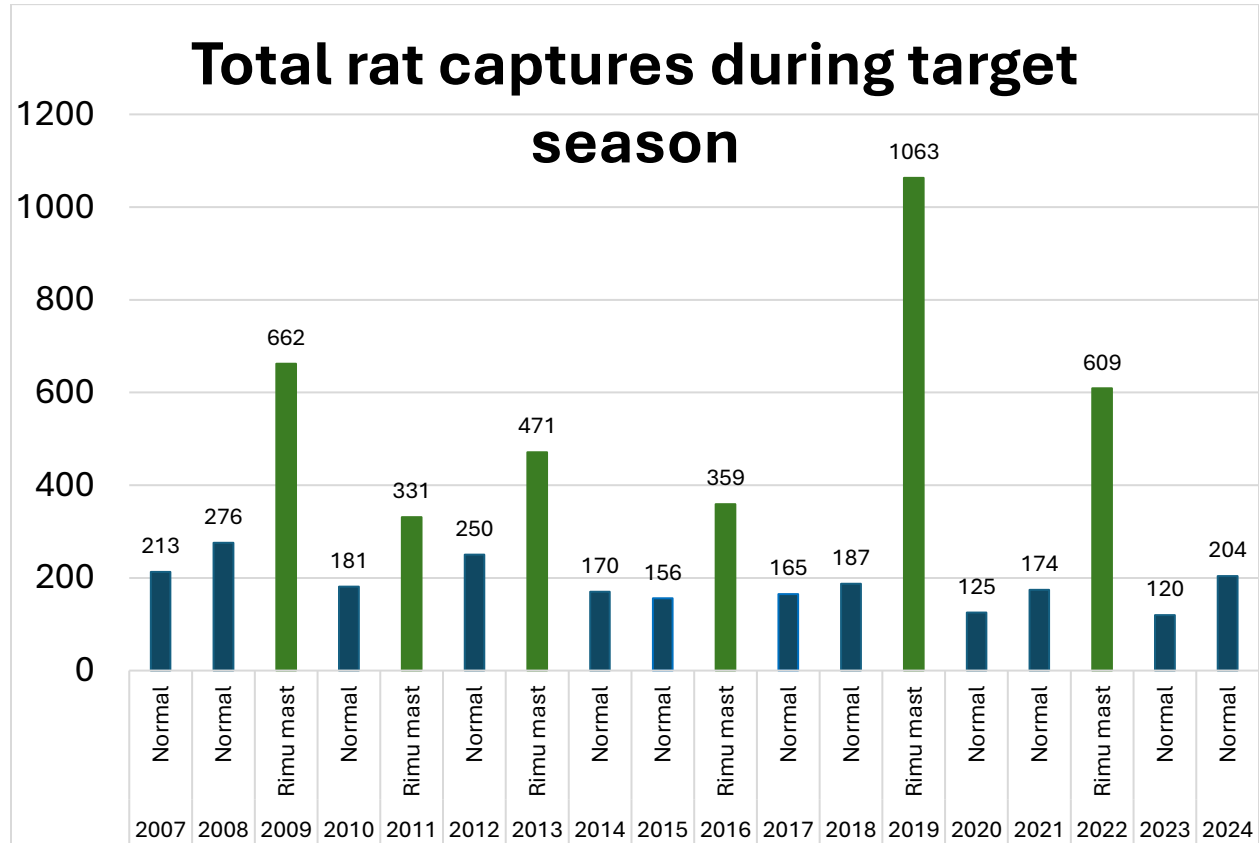
Rat catches

This year saw a slight increase in the numbers of rats caught compared to last year. Volunteers trapped a total of 204 rats between August and November compared to the 120 rats caught in 2023.

Approximately 3,696 trap checks were done in 2024, with 204 rats caught, a catch rate of 5.5%, an increase from 2023's 4.1%.

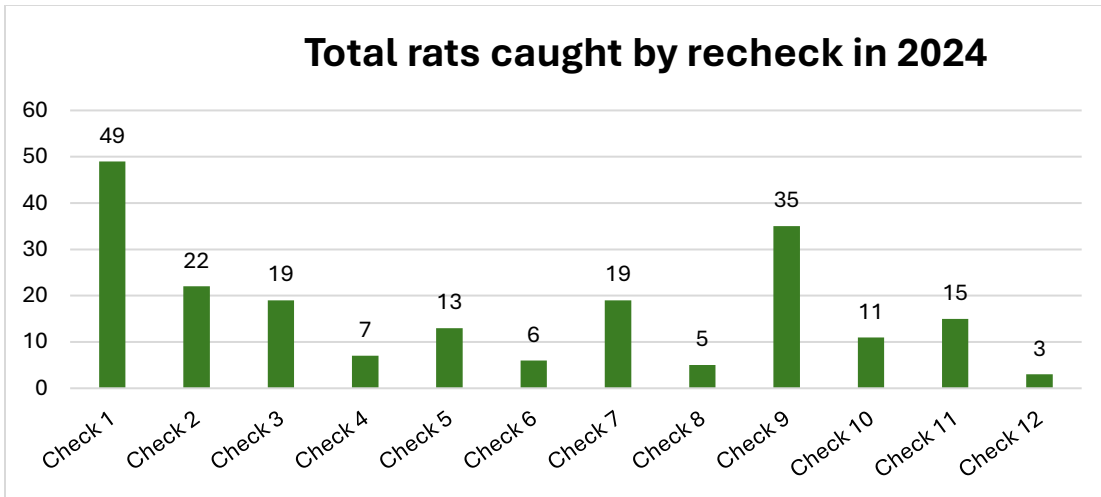


The 2024 rat trapping season results are plotted on the graph below against previous season's results. It's important to note that this graph only shows raw data and hasn't been corrected for trapping effort and so should be interpreted that way.

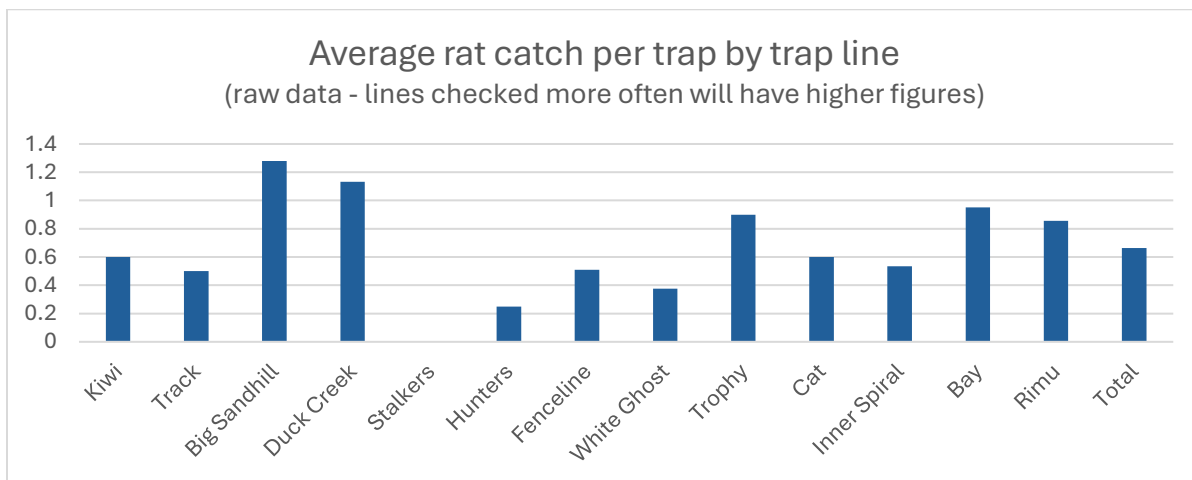


Rat catch results in non-mast years generally show a high catch at the start of the trapping season following by a tailing off of catches. This trend is not apparent in the 2024 season, as seen in the graph below. This shows that although there is a maximum number of rats caught on the first trip, there is a variation of rat numbers caught throughout the time period.





Between lines, the most rats were caught on Inner Spiral (38), while the least were caught on Stalkers (0). Per trap, the most rats were caught on Big Sandhill (1.8 per trap), while the least were caught on Stalkers (0) and Hunters (0.25 per trap), shown in the graph below. Overall, the trapping success of the entire network is around 0.7 rats per trap.

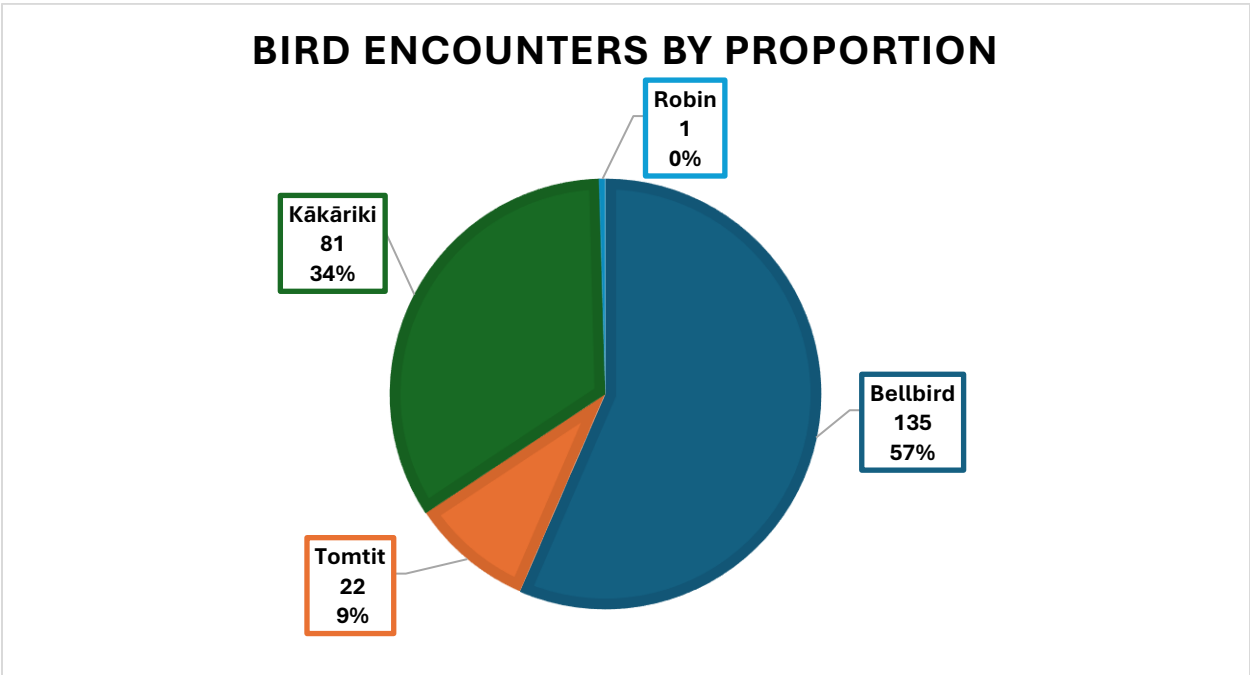


Bird encounters

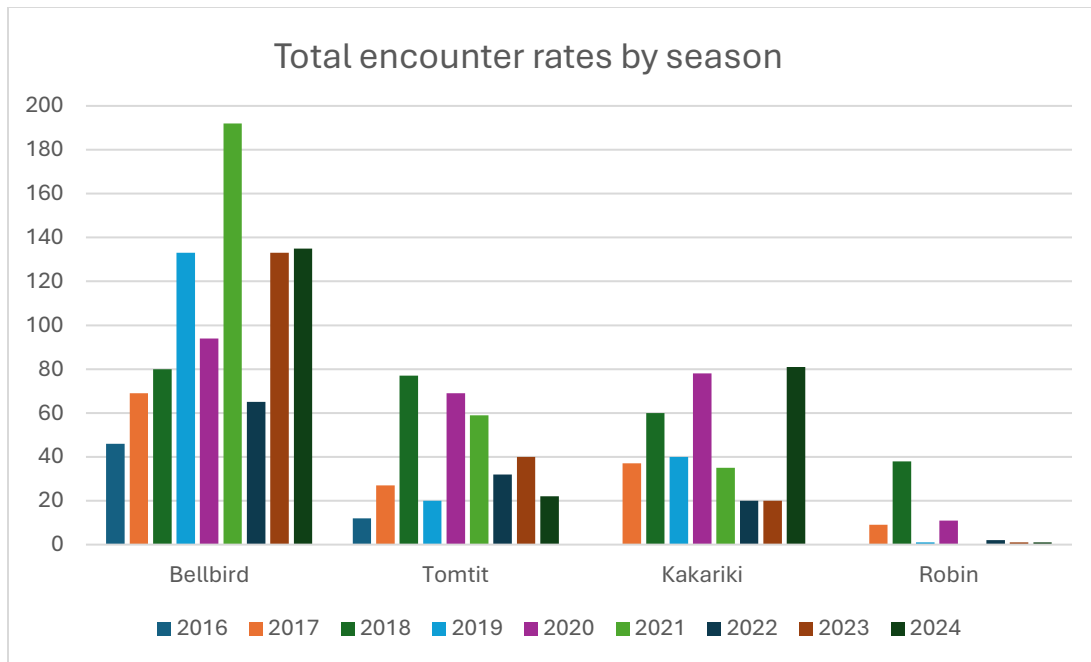
Four key indicator bird species were used to compare the number of birds encountered on rat trapping lines each season. The bird species chosen were Korimako/Bellbird, Kākāriki/Parakeet, Miromiro/Tomtit and Toutouwai/Robin. These four bird species are deemed to be sensitive to predation by mammalian predators such as rats, cats and possums, so are a good indication of the impacts these predators are having on their populations.



The total number of individual birds per species encountered this season is shown in the pie chart below. Bellbirds were the most seen birds, recorded 135 times throughout the 2024 period. Kākāriki were the second most recorded species, sighted 81 times between the six teams.



A comparison of the numbers of each key bird species per year from 2016 to 2024 is shown in the graph below. This data has been standardised for the number of trap checks, so it is roughly comparable between years and species.



Bellbird sightings are consistently the most recorded species throughout the 2016-2024 period. Kākāriki sightings were the highest recorded in 2024 (this season), with an increase of 61 sightings from 2023, and robin numbers are consistent, in that not many are being seen in the area.

Discussion points

A note on observational variation

There are several variables when recording bird observations, like the individual’s ability to identify between similar species such as robin and tomtit and the speed in which the particular trapline is walked, which change the likelihood of bird encounters. Female tomtits and juvenile bellbirds may also be more difficult to correctly identify. Weather conditions also play a large role in how many birds are seen or heard on a given trap line check. There is no discernible trend in bird sightings over the season, with numbers fairly variable between trips and species.

Encounter results

Comparing the number of key indicator birds (Bellbirds, Kākāriki, Tomtits and Robins) encountered each trip over a number of years gives us an idea of the effectiveness of the

NZDA trapping program. The data from the 2024 season showed an increase in two of the four bird species from the previous year, and this appears to be a continuing trend, which is very promising. Robin numbers remain low with only one bird encountered this season, the same as last season.

The rat trapping data showed a slight increase in the number of rats caught this year. As this year was a non-mast year it is unlikely that there would be a large increase in the rat population with similar quantities of food available.

Conclusion

The NZDA has completed another busy year of rat and cat trapping at Mason Bay during a period where our native birds are particularly vulnerable to the effects of predation.

We would like to make special thanks to Invercargill Hunting & Fishing for the generous financial support which covers about half the transportation costs of the project. We would also like to thank the NZDA hunters and volunteers who cover the remaining associated costs and carry out the annual trap checks and monitoring, and for their continued enthusiasm for protecting our native fauna and flora. We look forward to future seasons of good results.

