Rotoiti Nature Recovery Project Annual Report 2007-08

Nelson Lakes Mainland Island, Nelson Lakes National Park

AUGUST 2009

Department of Conservation
Te Papa Atawhai

Rotoiti Nature Recovery Project Annual Report 2007-08

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Published by
Department of Conservation
Nelson/Marlborough Conservancy
Private Bag 5
NELSON, New Zealand

New Zealand Government

Occasional Publication No. 80

May 2008, Department of Conservation

ISSN 0113-3853 (print)
ISSN 1178-4113 (web)
ISBN 978-0-478-14661-5 (print)
ISBN 978-0-478-14662-2 (web)

Cover photo: Great spotted kiwi, by P. Gasson.

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Executive summary

This annual report has been written in a new format using the objectives outlined in the Draft Rotoiti Nature Recovery Project Strategic Plan 2008-13. The main body of the report discusses work done and results obtained but does not attempt to analyse what the current years findings mean in relation to all work achieved before. Project outcomes will be presented separately as science reports or occasional publications.

BIODIVERSITY RESTORATION OBJECTIVES

Restore and maintain populations of kaka, mistletoe, *Pittosporum patulum* and *Powelliphanta* sp.

Mustelid control was sustained in the Rotoiti Nature Recovery Project (RNRP) during 2007-08, and tracking tunnel monitoring showed that the <5% target was achieved in the treatment area, while mustelid numbers during November were high (73%) at the Rotoroa non-treatment site.

A staged upgrade of predator traps - from Fenn™ traps to alternating Fenn™ and Department of Conservation (DOC) series predator traps - was partly completed as planned. The Friends of Rotoiti (FOR) predator control lines were similarly upgraded.

Possum control was sustained but no targeted cat control was undertaken. A kaka encounter rate monitoring project was established to replace intensive monitoring, as intensive monitoring over previous seasons has shown that the current mustelid control regime will protect kaka. Results of this monitoring will be published in a forthcoming DOC Research and Development (R&D) paper. No monitoring of mistletoes or *Pittosporum patulum* was undertaken during 2007-08. There is an apparent increase in the deer population (potential browsers of *Pittosporum patulum*), and a small number of deer were removed. *Powelliphanta* "Nelson Lakes" snail monitoring was largely completed. Preliminary results suggest a decline within the snail monitoring plots. The cause of the apparent decline is unknown.

Establish and maintain populations of great spotted kiwi and other native species.

Survival of radio-tagged great spotted kiwi was 100%. Fourteen adults (translocated to the RNRP in 2004 and 2006) were monitored. Three locally-hatched kiwi (various ages from 0.5 years to 3.5 years) were monitored at the beginning of the year, but transmitter failure meant that one (hatched in 2005-06) was "missing in action" at the end of the year. Only one nesting attempt was detected during 2007-08, resulting in a fourth locally-hatched chick that was located and radio-tagged in June 2008. Great spotted kiwi chicks appear to live in close association with their parents for 1-2 years following hatching.

LEARNING OBJECTIVES

Test the effectiveness of rodent control tools in a beech forest system

There was no significant beech seedfall during autumn 2007 or autumn 2008, and tracking tunnel monitoring showed that the rat population remained low throughout 2007-08. Because of the low rat numbers a proposed field trial of RatAbate™ paste (active ingredient diphacinone) did not commence during 2007-08. South Island robin territory occupancy continues to be used as an outcome measure for rat control. The robin monitoring area was expanded during 2007-08 and, despite the lack of rodent control, there was no observed decline of robins within the standard survey area.

Test the effectiveness of wasp control tools

The toxin Fipronil was available for off-label experimental use through Landcare Research. The wasp population in the core area and St Arnaud township was successfully controlled to low levels, and this facilitated a PhD research project investigating interactions between introduced wasps and native ants.

Test the effectiveness of different translocation methods

Planning commenced for a pilot study to compare the fate of Operation Nest Egg (ONE) reared great spotted kiwi chicks against the fate of in situ reared chicks. Funding for this project was secured from the Bank of New Zealand Save the Kiwi Trust for the 2008-09 year.

Determine long-term trends in bird abundance and forest health in response to ongoing management

Five-minute bird counts were undertaken at Rotoiti Lakehead, on the St Arnaud Range track; and to a lesser extent at the Rotoroa non-treatment site. Work was undertaken to analyse previous years' results. Work in this area is ongoing.

Nine vegetation plots were re-measured, but analysis will not occur until all plots have been re-measured in 2008-09. Direct observation suggests that the plots have been affected by browse. This corresponds with an increase in the number of deer sightings reported.

There was very little beech seedfall detected in 2007-08, despite some flowering of beech trees noted in October 2007.

Systematically record observations of previously unreported native and non-native organisms in RNRP

There was no system in place for recording new species. This system will be set up in 2008-09.

Facilitate research to improve our understanding of the ecology and management of beech forest and alpine systems

Two student thesis projects (introduced wasp and native ant interactions, and foraging behaviour and habitat use of ship rats under stoat predation) were current during 2007-08. Work towards a thesis on factors influencing recruitment and establishment of native fuchsia in Nelson Lakes National Park was completed. A thesis on the role of introduced birds as possible competitors with native species in Nelson Lakes National Park was received.

Analyse and report on the effectiveness of management techniques and ensure that knowledge gained is transferred to the appropriate audiences to maximise conservation gain

Annual reports are ongoing, and work was undertaken to develop a new reporting template, to reflect the objectives in the new Draft Strategic Plan 2008-13. One scientific paper on kaka management in the RNRP was prepared for publication, and an article about great spotted kiwi translocations was submitted for inclusion in a book soon to be published by the IUCN/SSC Reintroduction Specialist Group. Staff also attended a Sanctuaries of New Zealand workshop and delivered a presentation at the South Island Kiwi Hui.

COMMUNITY OBJECTIVES

Increase public knowledge, understanding and support for mainland islands and ecological restoration nationally through education, experience and participation.

Participation remained high with Friends of Rotoiti (FOR) members contributing 322 work days. This involved trapping mustelids over more than 5000ha of land adjacent to the RNRP; and trapping rats over 250ha in St Arnaud township, Black Hill and the Brunner Peninsula. FOR members also participated in lizard monitoring within the rat control area. Non-FOR volunteers also contributed 40 days during the year and participated in a variety of activities including trapping, tracking tunnel monitoring and kiwi transmitter changes.

Advocacy and education work continued with two editions of the Revive Rotoiti newsletter published during the year. There were two media releases providing updates on the kiwi project. The Nelson Lakes National Park Visitor Centre continues to promote the RNRP through displays and the distribution of information. The RNRP PowerPoint show was updated and presented to a total of 873 students staying at Rotoiti Lodge. 190 students benefited from guided walks. A highlight for the year was hosting a LEARNZ “virtual field trip” with live audio-conferencing, web board, diaries, images and video uploading. Over 100 New Zealand schools registered for the programme, and more than 3000 students followed the virtual field trip over a three day period.

1. Introduction

The Rotoiti Nature Recovery Project (RNRP) started with infrastructure development and baseline monitoring across 825ha of honeydew beech forest during spring 1996. Comprehensive pest control began in 1997, and the first annual report covered the 1997-98 business year. The project was established with control/treatment sites so responses to management techniques on the treatment site at Lake Rotoiti could be compared with the control (non-treatment) site at nearby Lake Rotoroa. Ten years later we are reporting on the project's 2007-08 business year, and it is timely to consider the course of the project over the previous decade.

South Island kaka (*Nestor meridionalis*) were a key focus from the beginning, with staff from Department of Conservation's Science & Research unit investing considerable effort into radio-tagging kaka and monitoring nesting success in relation to mustelid (stoat, ferret and weasel) control. Kaka bred in 1997-98, 1998-99 and 1999-2000, and by the end of the third season it was clear that kaka nesting success had increased (and adult female mortality had decreased) as a result of the project's pest control.

In 2001-02 the extent of the mustelid trapping network was increased by an order of magnitude, with the an area of approximately 5000ha on the western side of the St Arnaud Range and southern Big Bush brought into the mainland island under mustelid control, and another 5000ha adjacent to the mainland island (eastern St Arnaud Range) enclosed by Friends of Rotoiti trap lines in the Wairau and Six-Mile valleys. Kaka bred during the 2001-02 redevelopment of the trapping network, and then again in 2003-04. 2004/05 was a non-breeding year for kaka, and finally in 2005-06 the objective of monitoring a total of 30 kaka nesting attempts was achieved. A final report on kaka monitoring and results was completed during 2007-08, and is due to be published shortly (see Appendix 1).

Kaka are not the only beneficiaries of mustelid control. In 2004 great spotted kiwi (*Apteryx haastii*) were introduced to the mainland island, and a second group was released into the site in 2006. The original adults have established themselves in the mainland island. There has been a modest amount of breeding, but good survival of kiwi chicks, which are considered to be particularly vulnerable to predation by stoats. This project has led to increased understanding of great spotted kiwi biology and management requirements. Plans are afoot to experiment with Operation Nest Egg (ONE) to determine how effective this method is for building great spotted kiwi populations.

In addition to breaking new ground in landscape-scale stoat control, the Rotoiti Nature Recovery Project has been a leader in wasp and rodent control. Experiments in wasp control using the toxins Finitron and Fipronil built on previous work by Landcare Research, and have been ongoing in the core area since the beginning of the project. The wasp control operations are the largest scale wasp control operations anywhere in the world. However the programme has been periodically

interrupted due to insecure supplies of toxin. Fipronil was available in an experimental context in 2007-08, and is likely to be available for another two years, after which it is hoped that there will be new wasp control tools or formulations to test. Rodent control consisted of toxins (1080 and Brodifacoum) between 1997 and 2000. Following a Departmental review of the use of Brodifacoum, a switch was made to snap-trapping (targeting rats) in July 2000. Rat trapping was tested for the following six years, but proved to be ineffective at the prescribed density (1 trap/ha) during the rodent plagues that followed beech masting events. No rodent control was undertaken during 2007-08. However rodent monitoring continued, and plans were initiated for a new field trial testing a toxic bait (Diphacinone) from 2008-09 onwards.

Several other pest species have received attention in the RNRP: possums are effectively controlled on an ongoing basis; feral cats have been trapped on a small scale (with plans to increase the trapping effort in 2008-09); ungulates (deer, chamois and pigs) have been removed opportunistically; and hedgehogs have been trapped as by-catch in the predator trap lines.

Monitoring of native species' productivity and response to pest control has extended well beyond kaka and kiwi. Plants monitored include three species of beech mistletoe, and the understory trees *Pittosporum patulum*, and *Griselinia littoralis* – all browse sensitive species. *Chionochloa* tussock flowering and beech seedfall have been monitored as 'ecological drivers' of rodent and mustelid populations, and 20 x 20 vegetation plots are monitored to determine the general trend and response to multiple-species pest control.

Invertebrate monitoring has included weta (collected as by-catch in malaise traps targeting wasps) and *Powelliphanta* snails, as well as beech scale insects and honeydew production (another ecological driver in honeydew beech forests).

South Island robins (*Petroica australis*) have been monitored in relation to rodent control. Five-minute bird counts have been an ongoing method of monitoring the overall response of bird populations to management. Many other species have been surveyed or monitored and previous years' annual reports should be reviewed to gain a full appreciation of the breadth of work that has been undertaken over the past decade.

Besides "core" work there has been a stream of students conducting their own research, adding value and understanding to the project. The RNRP budget has time allocated to supporting research that complements the project, and there is a list of prospective projects and a small scholarship fund available to students.

In addition to the research and fieldwork there has been a strong theme of advocacy and participation. Previous years' annual reports document hundreds of days of volunteer involvement from individuals and groups including Friends of Rotoiti, trainee rangers, conservation corps and the Over-50s tramping club. There has been a substantial amount of time donated to the RNRP through the Royal Society fellowship scheme (the project hosted another Fellow in 2007-08). Staff have also given time

and expertise to other departmental and community initiatives, and have attended various workshops and conferences to transfer knowledge to the wider conservation community. Advocacy has included presentations to dozens of school and community groups, guided walks in the mainland island, a permanent display in the Nelson Lakes National Park Visitor Centre, information panels in the mainland island, and various printed documents such as brochures and newsletters. Local and national media have picked up many of the stories associated with the RNRP, and there has been considerable media coverage of the wasp control and great spotted kiwi management projects in recent years.

From this brief review of the RNRP's progress it becomes apparent that there have been some major themes ongoing from the beginning of the project:

1. Research, learning and knowledge transfer to a growing number of ecological restoration projects.
2. Protecting and restoring biodiversity for its intrinsic value.
3. Advocating the value of ecological restoration projects to the wider public.

These three themes were formally identified as being common to all Department of Conservation's six mainland island projects in February 2005, when a set of eight principles were developed as a strategic context for DOC's mainland islands. A memo to general managers stated that DOC's mainland island programme is characterised by:

1. Site based natural heritage management with a primary focus on learning how to carry out ecological restoration. This is achieved by addressing management questions through rigorous trials and experiments, combined with intensive monitoring and evaluation that follows standardised systems and processes.
2. Results and outcomes are communicated.
3. Sites where research and learning outcomes take precedence over biodiversity outcomes.
4. Sites that contain a number of specific projects, as a secondary objective, aimed at restoring biodiversity through intensive management.
5. Sites where boundaries are identified and can be protected.
6. Systems required to manage these sites are sustainable.
7. Sites that provide opportunities for community involvement and inspire people to support biodiversity recovery and ecological restoration.
8. Sites that inspire people to initiate and develop additional restoration projects elsewhere.

The memo stated that the eight principles can be grouped into learning, biodiversity and community outcomes.

This grouping of outcomes is deliberately used in the proposed new RNRP Strategic Plan 2008-13, which was drafted by Kerry Brown and Paul Gasson during the 2007-08 year. The plan was produced in consultation with Area Office staff, Technical Advisory Group members and Strategic Advisory Group members. It contains ten strategic objectives: two biodiversity objectives; seven learning objectives and one community objective.

The 10 objectives identified in the draft RNRP Strategic Plan 2008-13 are carried through to the annual operational plans; and in preparation for the 2008-09 year staff updated the format of the operational plan accordingly, in consultation with the RNRP Technical Advisory Group. The operational plan identifies tasks and actions that are undertaken in a given year, to meet the objectives identified in the strategic plan.

The annual reports are now expected to directly address the projects strategic objectives. A new template for the annual reports was drafted and agreed upon during the 2007-08 year. This report is the first to be produced using the new template. The main body of the report discusses work done and results obtained under the objectives specified in the RNRP Strategic Plan, and the objectives are reproduced in full, to provide the context.

RNRP Technical Advisory Group members agreed in 2007-08 that subsequent annual reports should be clearly focussed on what was done and learned in a particular year, and that they should not attempt to analyse what the current years findings mean in relation to all that has gone before (this would be the role of detailed reports produced as science reports or occasional publications). Nor should annual reports provide a myriad of detail or speculation. It was agreed however that annual reports should provide information to show where all other relevant information is held.

It was anticipated that this fresh approach to annual reporting would result in a more readable document. Staff have found that the close alignment between the new strategic plan, operational plan and annual report format has made working with these documents a faster and more productive experience. The writing of this annual report was relatively straightforward for staff who could see where their work fitted into the strategic context. It is hoped that the reader, too, will find the 2007-08 annual report to be focused, relevant and useful.

Paul Gasson
Team Leader
Rotoiti Nature Recovery Project

2. Biodiversity restoration objectives

2.1 RESTORE AND MAINTAIN POPULATIONS OF KAKA, MISTLETOE, *PITTOSPORUM PATULUM* AND *POWELLIPHANTA* SP.

2.1.1 Introduction *(Paul Gasson)*

The proposed RNRP Strategic Plan 2008-2013 identifies six threatened species to be actively maintained for their biodiversity values. These populations and their New Zealand Threat Classification System rankings are:

- South Island kaka *Nestor meridionalis meridionalis*, Category 2, Nationally endangered;
- the beech mistletoes *Peraxilla colensoi, P. tetrapetala* and *Alepis flavida* all Category 4, Declining;
- the heteroblastic tree *Pittosporum patulum*, Category 1, Nationally critical,
- the carnivorous land snail *Powelliphanta* "Nelson Lakes", Category 7, Range restricted.

Although the RNRP contains some other threatened species that may benefit from pest control, the above populations were specifically identified in the proposed Strategic Plan 2008-2013 because a considerable amount of work has been invested into monitoring and managing them through the preceding decade.

Populations of kaka, an endemic forest parrot, are declining due to predation by introduced mammalian predators, principally the stoat. Mustelid trapping aimed at stoat control has been shown to protect the local kaka population, and mustelid control will continue for the foreseeable future. In 2007-08 an upgrade from Fenn™ traps to DOC 200 traps and DOC 250 traps was commenced. Feral cat control – although localised to date – may protect fledging kaka chicks which spend up to three days on the ground between emerging from their nest holes and flying. A more extensive cat control project is planned from 2008-09. Other native bird species are likely to benefit from predator control, particularly great spotted kiwi (section 2.2) and perhaps New Zealand falcon, which nest on the ground.

The beech mistletoes, *Pittosporum patulum* and *Powelliphanta* "Nelson Lakes" are all threatened as a result of browsing by the introduced brushtail possum (*Trichosurus vulpecula*). Possum numbers have been reduced and suppressed in the Mainland Island through a sustained poisoning and trapping project. As with mustelid control, possum control is considered to be effective, and will continue for the foreseeable future in order to protect biodiversity values.

In addition to being threatened by possums, *Pittosporum patulum* and *Powelliphanta* "Nelson Lakes" populations may be threatened by red deer (*Cervus elaphus scoticus*). Browsing of juvenile *Pittosporum patulum* plants has been attributed to red deer. Red deer adversely effect *Powelliphanta* habitat through concentrated browsing and trampling in the mountain beech/tussock ecotone that is favoured by deer and *Powelliphanta* "Nelson Lakes". Deer control is currently not part of the RNRP pest control programme, but reported sightings have resulted in some successful hunts undertaken by staff acting on a voluntary basis during 2007-08. Deer control may require more attention in the future to ensure that the biodiversity restoration objectives are met.

2.1.2 Mustelid (stoat, ferret and weasel) control and monitoring

RNRP mustelid control methods *(Tammy Bruce)*

Twenty-one mustelid trap lines were maintained, encompassing the 5000ha project area in 800ha blocks, as in previous years (Fig. 1). Nine traps along the St Arnaud Range southern extension were permanently removed during the summer after discussions about their hazardous locations and low stoat capture rates. The RNRP is currently running 881 traps on over 88km of trap line.

The DOC trap up-grade began this year, replacing every second Mark 6 Fenn™ trap with either DOC 200 or 250 traps. Fenn™ traps on 17 of the 21 trap lines have been or will be replaced with DOC 200 traps. The remaining 4 trap lines have been replaced with DOC 250s due to previously high ferret capture rates. The trap roll-out is due to be completed by the end of 2008.

The spacing between traps remains 100m apart. All traps are single set, baited with white hen's eggs and enclosed within wooden boxes. The notable difference between the two types of boxes is that the Fenn™ boxes are baseless whereas the DOC boxes have the base attached. Both types of box design are 'best practice' designs for use in areas where weka and kiwi are present.

A field trial is due to run during the 2008-09 financial year testing the efficacy of Mark 6 Fenn traps vs. DOC 200 traps at catching stoats. It is a partial replication of the DOC Te Urewera field trial that took place in 2004-07.

NB: External contractors Southern Pest Management carried out ferret control around Kawatiri and Tophouse. From information received they caught <10 stoats in areas bordering the project area. Marlborough District Council also carried out targeted ferret and cat control in the Wairau Valley towards Blenheim.

Figure 1: RNRP and FOR mustelid trap locations

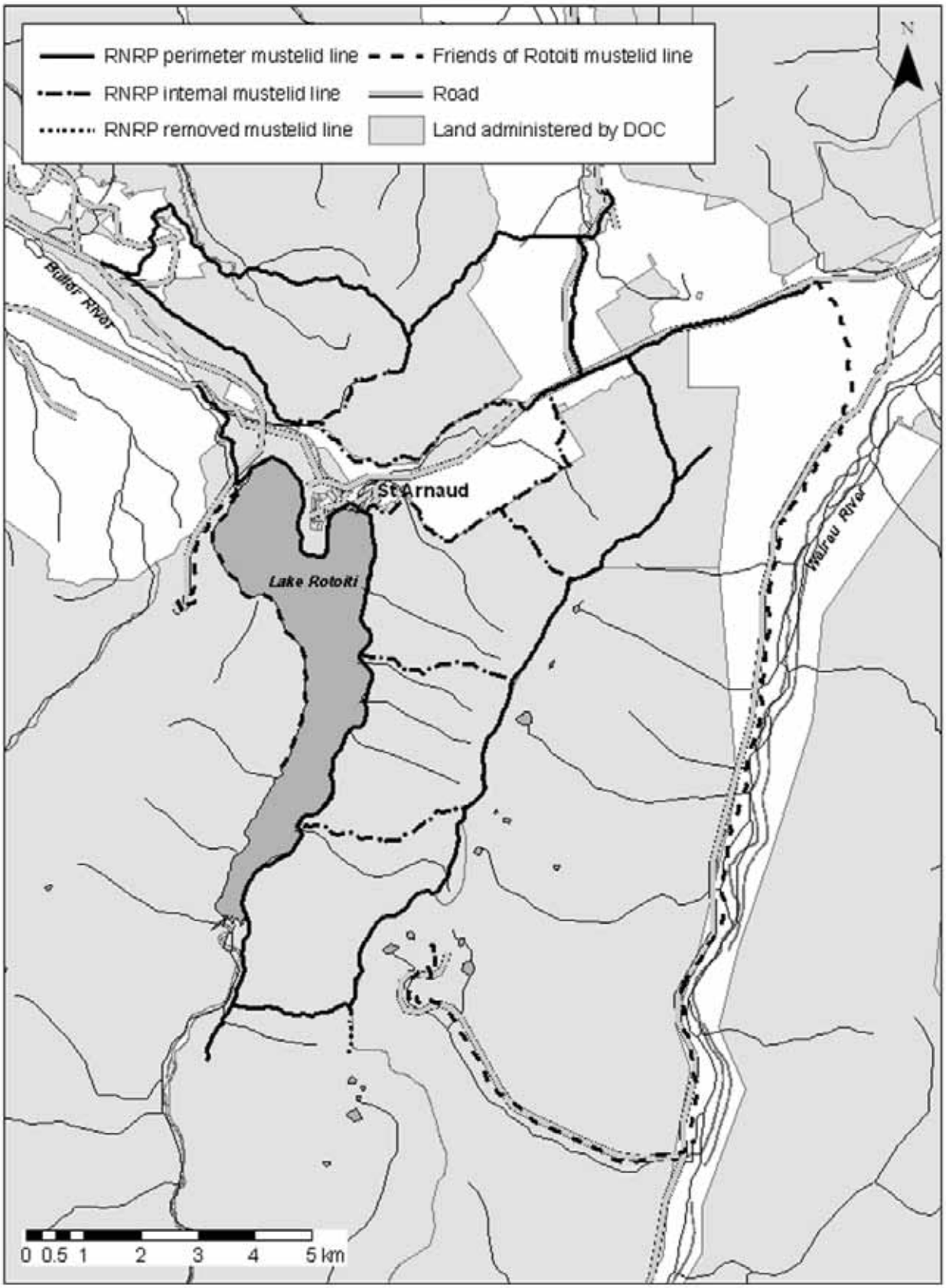
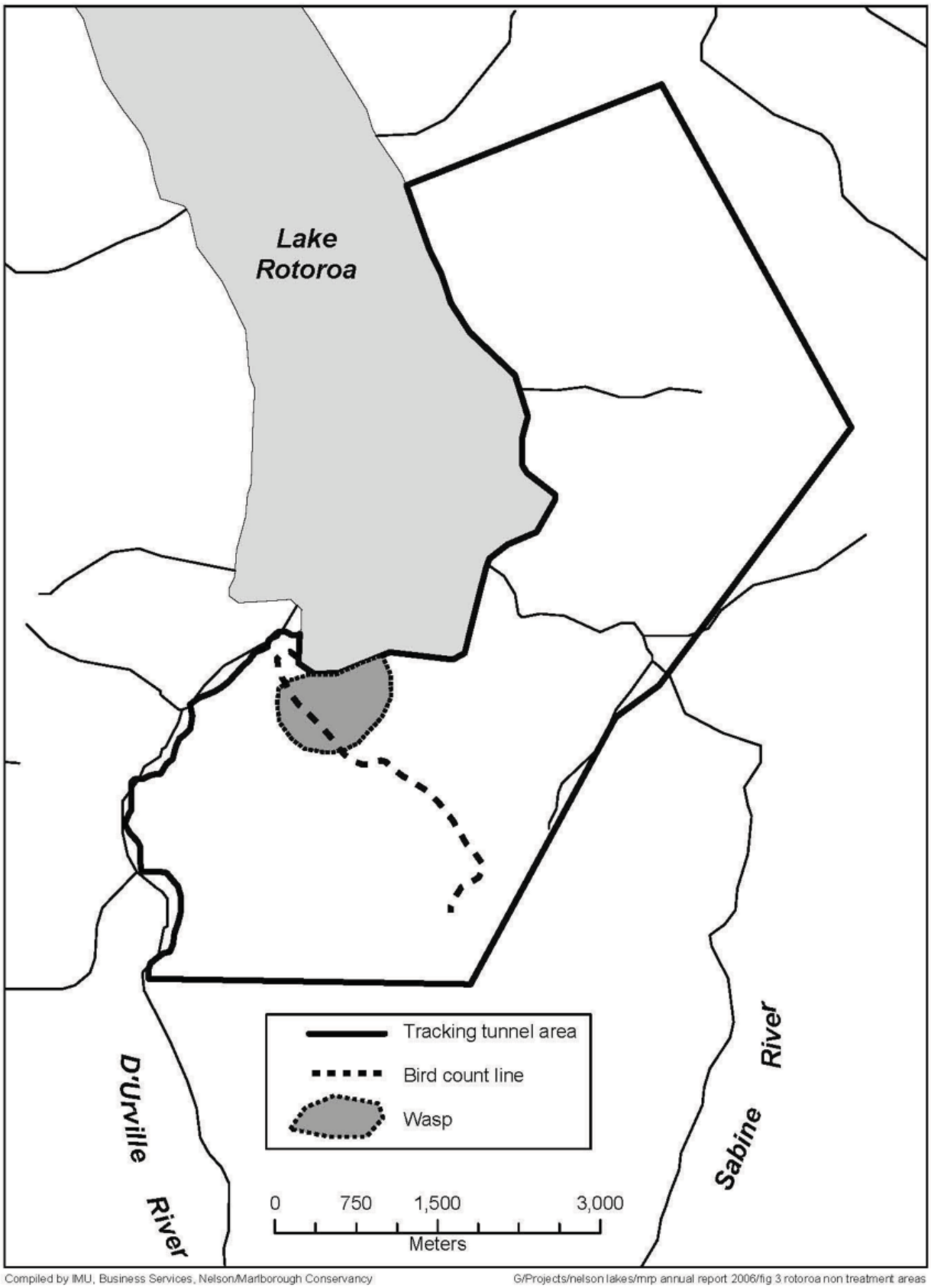


Figure 2: Rotoroa (Mt Misery) non-treatment site



RNRP mustelid control results

TABLE 1: RNRP MUSTELID CAPTURES 2007-08

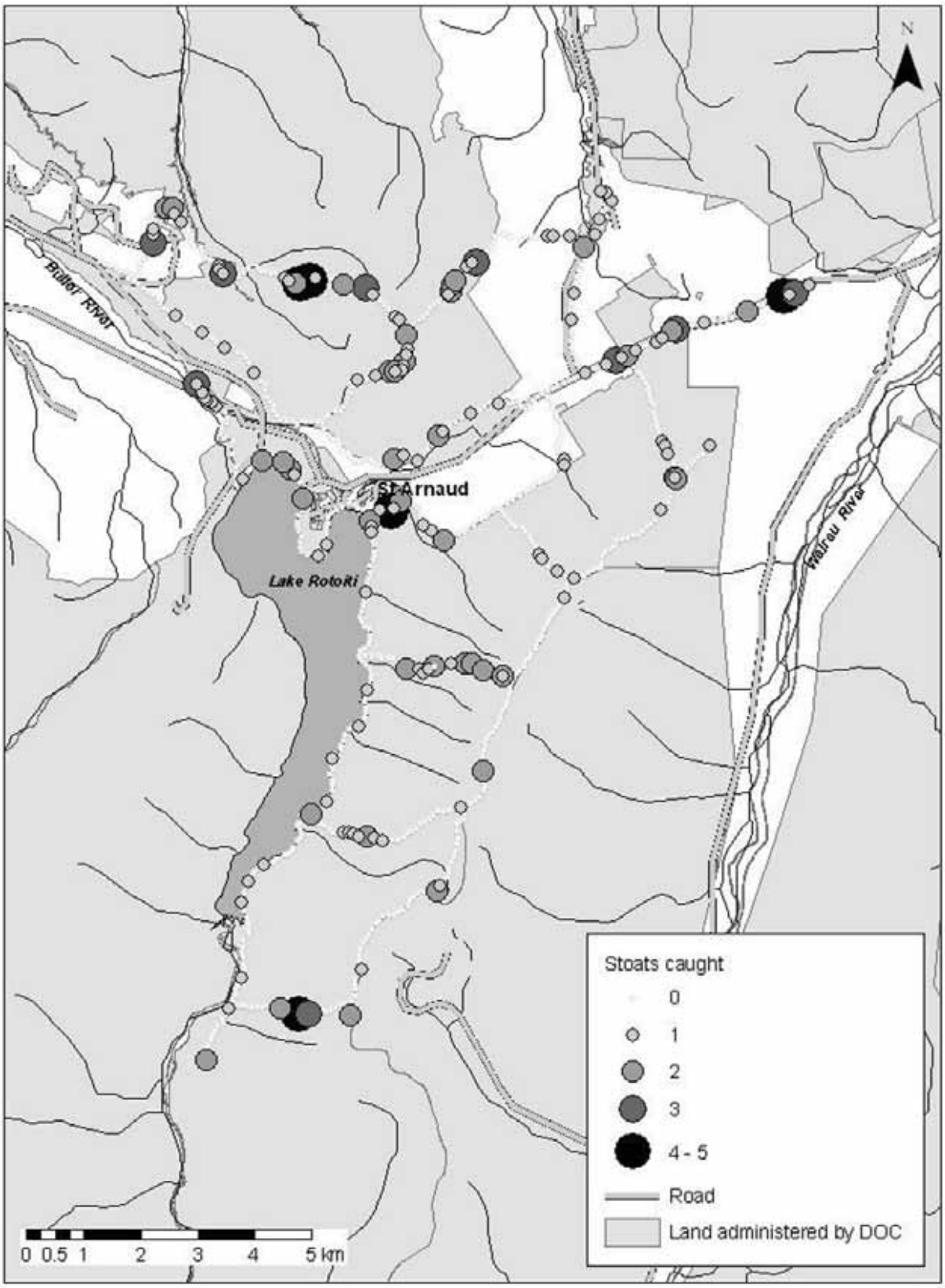
MONTH	STOAT	WEASEL	FERRET
July	10	2	0
August	29	2	0
September	5	4	0
October	15	1	0
November	14	3	0
December	8	1	0
January	49	1	0
February	53	2	2
March	22	0	0
April	18	0	0
May	12	1	0
June	4	0	0
Totals	239	17	2

The following were caught as “by-catch” in Fenn™ and DOC traps:

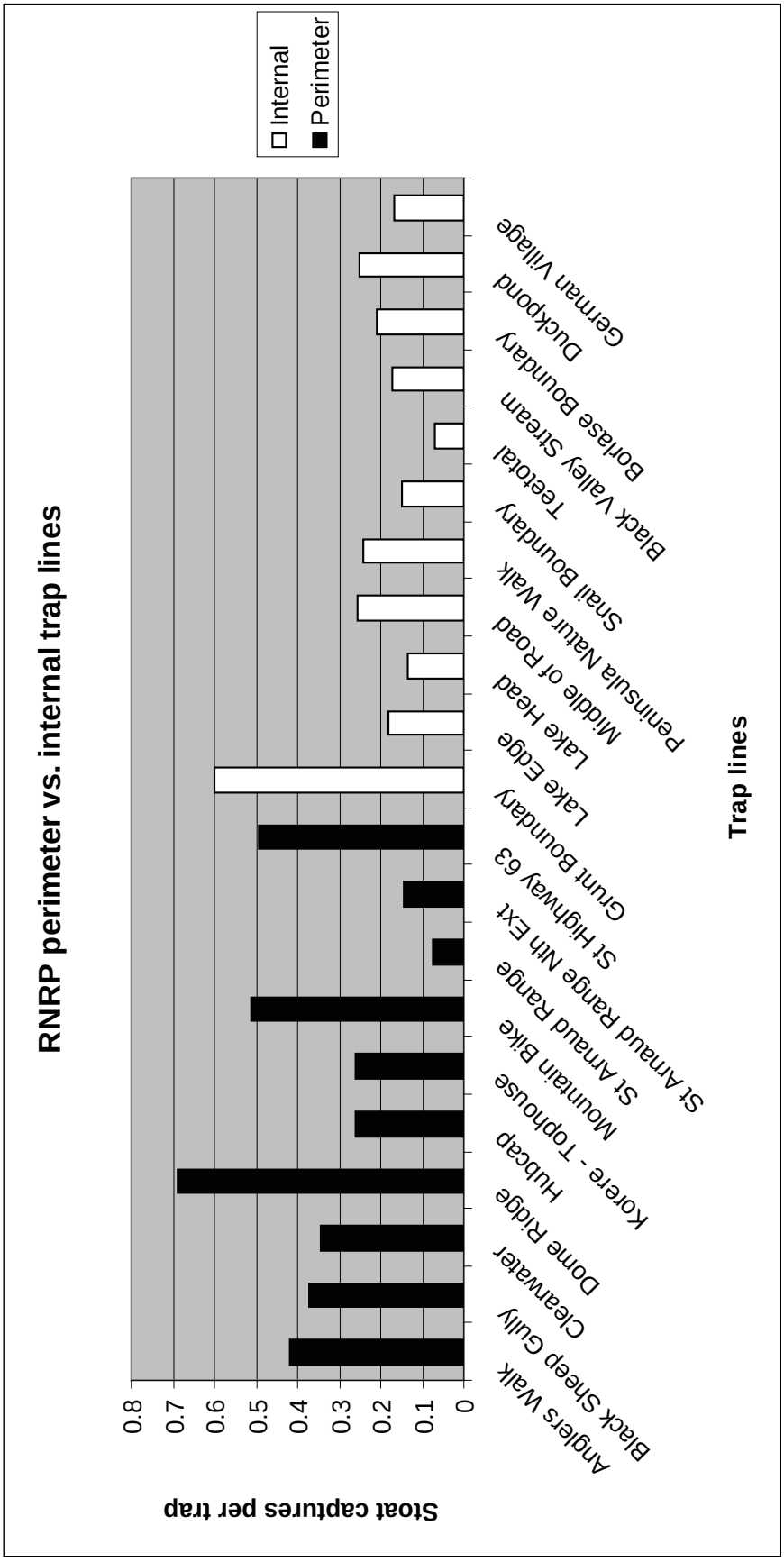
- 8 cats
- 283 hedgehogs
- 3 possums
- 121 rats
- 122 rabbits
- 3 tui
- 1 fantail
- 1 thrush
- 1 sparrow

All the birds listed above were caught in Fenn™ traps.

Figure 3: RNRP stoat captures per trap



Graph 1: Stoat captures - RNRP boundary lines vs internal lines



Internal trap line “Grunt Boundary” recorded the second highest volume of stoats caught this year (Graph 1). Grunt Boundary is buffered by two trap lines running parallel to the south, two to the north, St Arnaud Range and Lake Edge Fenn™ traps. The majority of captures on this line were in the higher reaches of the line nearer the bushline.

Three FOR mustelid trap lines were not included in the RNRP Perimeter vs. Internal trap bar graph but their contribution by buffering sections of the project is noted. The Rainbow trap-line is situated in the Wairau Valley on the eastern side of St Arnaud Range, terminating at the Rainbow ski field and acts as a buffer to the perimeter trap line along the St Arnaud Range. The “Mt Robert” trap line effectively joins trap lines in West Bay and the “Whisky Line” follows the Lake Edge track on the western side of the lake off Mt Robert Rd.

Friends of Rotoiti mustelid control methods *(Sally Leggett)*

Three mustelid trapping lines, comprising 314 traps at 100m spacing, were maintained as in previous years. These trap-lines act as a buffer to the mainland island project. The Rainbow line consists of 243 traps of which 64 follow the Rainbow ski field road. These traps are closed over winter each year. Ski field traps were open over the summer in October 2007 and traps were closed for winter in April 2008. Captures are summarised in Table 2 and Graph 2.

The “Whisky” line comprised of 54 DOC 200 traps whereas the Rainbow and Mt Robert lines consist of the original Fenn™ traps which are presently being replaced with DOC 200 and DOC 250 traps.

In November 2007 every alternate trap on the Mt Robert line was replaced with a DOC 200 trap and every alternate trap on the Rainbow line was replaced with a DOC 250 trap due to historical ferret captures. The spacing between traps remains at 100m apart, all traps are single set, baited with white hen’s eggs and enclosed within wooden boxes. The remainder of the Fenn™ traps on these lines will be replaced in time.

Trap checks differ to those in the RNRP in that traps are checked weekly in December, January and February, fortnightly from March to the end of May and from October to the end of November and monthly through June to the end of July. Bait changes occur every eight weeks.

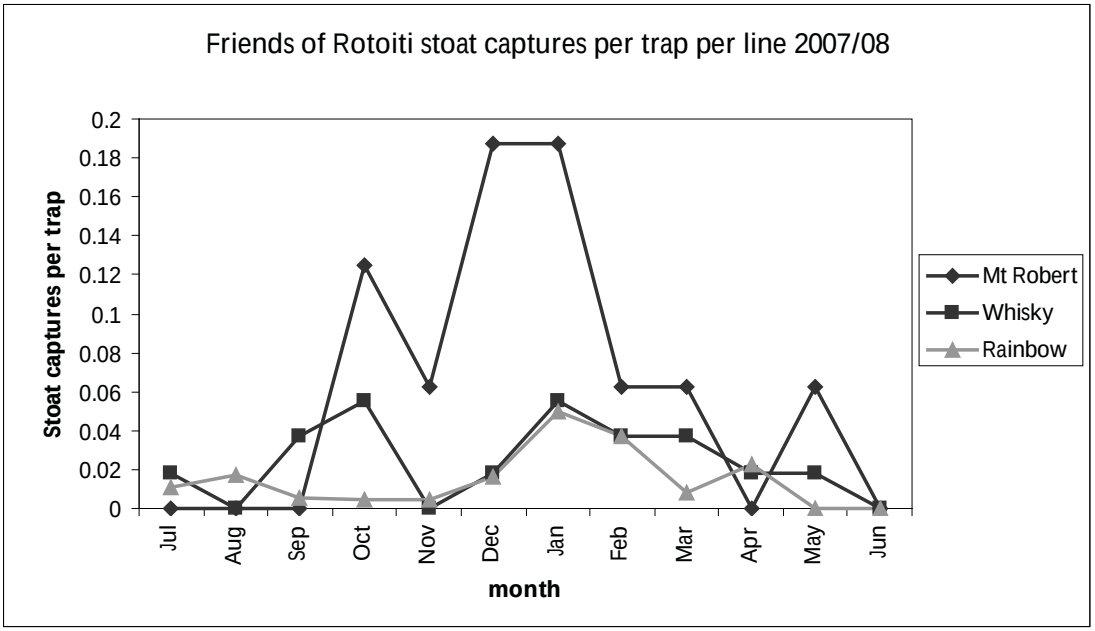
TABLE 2. FRIENDS OF ROTOITI MUSTELID CAPTURES 2007-08

MONTH	STOAT	WEASEL	FERRET
July	3	0	0
August	3	0	0
September	3	1	0
October	6	0	0
November	2	0	0
December	8	0	0
January	18	4	0
February	12	1	1
March	5	0	1
April	5	0	0
May	2	0	0
June	0	0	0
TOTALS	67	6	2

The following were caught as "by catch" in Fenn™ and DOC traps:

- 115 hedgehogs
- 7 possums
- 125 rats
- 20 rabbits

Graph 2: Friends of Rotoiti stoat captures per trap per line 2007-08



RNRP mustelid population monitoring methods *(Anne Brow)*

Mustelid monitoring is used to compare mustelid tracking rates between the Rotoiti site, where an intensive trapping programme is carried out, and the Rotoroa site where no trapping is done. The Rotoiti site includes the RNRP Core, Lakehead and Big Bush lines.

Mustelid monitoring is carried out using tracking tunnels with papers, inked sponges and rabbit meat bait set to the best practice method described by Gillies and Williams (2004). Refer to the 'RNRP Field Manual 07-08' for further details. Note that the tunnels across the three sites are a combination of galvanised and modified coreflute tunnels.

In 2007-08 the mustelid monitoring was carried out as follows:

- RNRP Core – November, December and February.
- Big Bush and Lake Head – November, December and February.
- Rotoroa – November only. The December set at Rotoroa was not carried out due to poor weather. The February set at Rotoroa was abandoned mid-set due to staff receiving a dangerously high number of wasp stings and poor radio reception.

Following the May 2008 rodent tracking tunnel set, all tunnels were replaced with best practice coreflute tunnels. Lines UC, LC, UD, LD, UE, LE and M at Rotoroa will be moved in 2008-09 to reduce safety concerns on these lines.

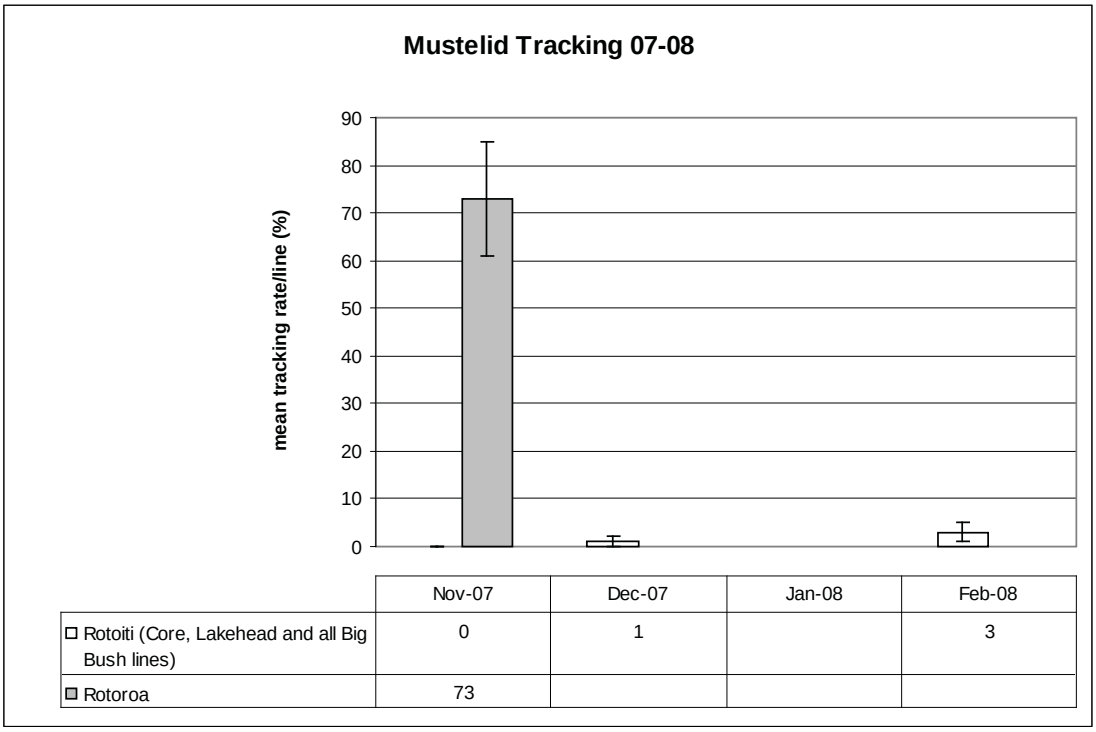
RNRP mustelid population monitoring results

Detailed tracking tunnel descriptions, results and graphs are found in the Excel document 'Tracking Calculator 2007-08'.

Mustelid tracking at the Rotoiti site remained below the recommended <5% mean tracking rate/line throughout 2007-08, which research has shown to be of most benefit to kaka populations (Greene et al. 2004).

Rotoiti and Rotoroa mustelids track results are show below in Graph 3.

Graph 3: Mustelid Tracking 2007-08



	Nov-07	Dec-07	Jan-08	Feb-08
Rotoiti (Core, Lakehead and all Big Bush lines)	0	1		3
Rotoroa	73			

Discussion *(Anne Brow, Tammy Bruce, Sally Leggett)*

The number of stoats caught within the RNRP is similar to previous years, except numbers peaked during January-February instead of December-January. FOR Mt Robert trap line results followed a similar pattern to RNRP. The two other trap lines, Rainbow and Whisky, were similar to previous years' pattern peaking in January-February.

Notably only two ferrets were caught within the RNRP this year which is significantly lower than previous years' rates. Weasel captures were also low but not significantly.

In comparison, mustelid tracking at Rotoroa has been very high. The mean tracking rate/line of 73% is the highest rate/line within the Rotoiti Nature Recovery Project since monitoring began in August 2002.

2.1.3 Feral cat control and monitoring *(Tammy Bruce)*

Methods

Targeted cat control and monitoring were not undertaken during the 2007-08 year, although some were caught as by-catch.

Results

A total of eight cats were caught in Fenn™ traps this year.

Discussion

An unknown number of cats were trapped by St Arnaud residents, but seven cats were caught in cage traps from April to June 2008 by FOR volunteers and DOC staff. Traps were set around the DOC workshop, Ward and Rotoiti Streets and Watertank area.

It is planned to establish a fixed line of Belise cat traps along the "Lake Edge" Fenn™ line during the 2008-09 year, which is where the majority of cats have been caught in Fenn™ and cat traps.

Advocacy work is planned to inform property owners in St Arnaud about the RNRP, benefits of the project, and the existing predator lines, in hope that this will discourage owners from bringing their cats and dogs with them on holidays.

2.1.4 Possum control and monitoring *(Dan Chisnall)*

Methods

Kill trapping continued along the 'Borlase Boundary', 'German Village', 'Snail Boundary', 'Grunt Boundary' and 'MOR' trap lines with the intention of buffering the core area. Trap results are presented below (Table 3).

No wax-tag monitoring was undertaken in the 2007-08 year. This is scheduled for April/May of the 2008-09 year.

Results

TABLE 3. TOTAL POSSUM CAPTURES 2007-08

MONTH	BORLASE BOUNDARY	GERMAN VILLAGE	SNAIL BOUNDARY	GRUNT BOUNDARY	MOR
July	0	0	1	2	0
August	1	0	0	1	0
September	0	0	0	0	1
October	0	0	0	1	0
November	0	0	1	3	2
December	0	0	2	2	4
January	0	0	2	0	6
February	0	0	0	2	4
March	0	0	1	3	2
April	0	0	0	0	0
May	0	0	4	2	1
June	0	0	1	0	3
Rat captures	0	0	1	0	1
Total possums	**1**	**0**	**12**	**16**	**23**
# Traps	60	23	10	10	12
Capture/trap*	0.01	0	1.2	1.6	1.71

* Not corrected for sprung traps

Discussion

Highest numbers of possums were caught on the southern boundary (MOR). The next highest catching line was the southern boundary of the core (Grunt Boundary). This pattern is not surprising as no possum control exists south of MOR, while 'German Village', 'Borlase Boundary' and 'Snail Boundary' lines all border Animal Health Board (AHB) control areas, where possum control operations for TB vector control were undertaken by Southern Pest Management.

The Upper Motueka area was treated with aerially applied 1080 in April 2008 and sub-contracted by Vector Control Services Ltd, and the Upper Wairau was treated with aerially applied 1080 in August 2008 and was also sub-contracted to Vector Control Services Ltd.

It is likely that the RNRP's possum control has been assisted by these AHB operations.

2.1.5 Deer control and monitoring *(Anne Brow)*

Methods

Project staff record deer sign and sightings on the St Arnaud Range while carrying out other work within the project. These signs and sightings are recorded in the Excel document 'Predator and Ungulate Sign'. Sign and sightings are only recorded for the St Arnaud Range as this is where most vulnerable plant species are present.

Results

While the recording of sightings and sign has its limitations as a monitoring technique, it does suggest an increase in deer numbers on the St Arnaud Range. There was an increase in sightings from seven between November and June 2006-07 to 17 between November and June 2007-08. This included reports of roaring stags on the MOR and Clearwater spurs in April 2008.

Given that historical attempts to control deer within the project area have had marginal results, the decision was made to develop a 'Protocol for Removing Deer' to encourage staff who were interested in hunting to remove deer in their own time.

As a result, three deer have been removed from the project area – one breeding hind, one young hind and a two-year old spiker.

Discussion

There is the possibly of becoming more sophisticated with the current sign and sightings. Additional staff training for identifying sign and sightings could generate an encounter rate similar to the method used for kaka encounter outlined in section 2.1.6. Alternatively monitoring techniques, such as the seedling ratio index, could potentially be used as a monitoring tool.

At this stage the removal of deer will remain reactive.

2.1.6 Kaka (*Nestor meridionalis*) monitoring *(Tammy Bruce)*

Methods

A kaka encounter rate survey was established this year and run in conjunction with the mustelid trapping project on 17 of the 21 trap lines, during the fortnightly trap checks from the beginning of October through to the end of April. The following mustelid trap lines are excluded from the survey due to their locations: SHW + KTF (along the highways) SAR + SARN (above the bush line).

Staff recorded the date, time they started and finished a trap line (to bush line), kaka seen or heard, at what trap location and the time. Lunch and tea breaks are included in the net survey time.

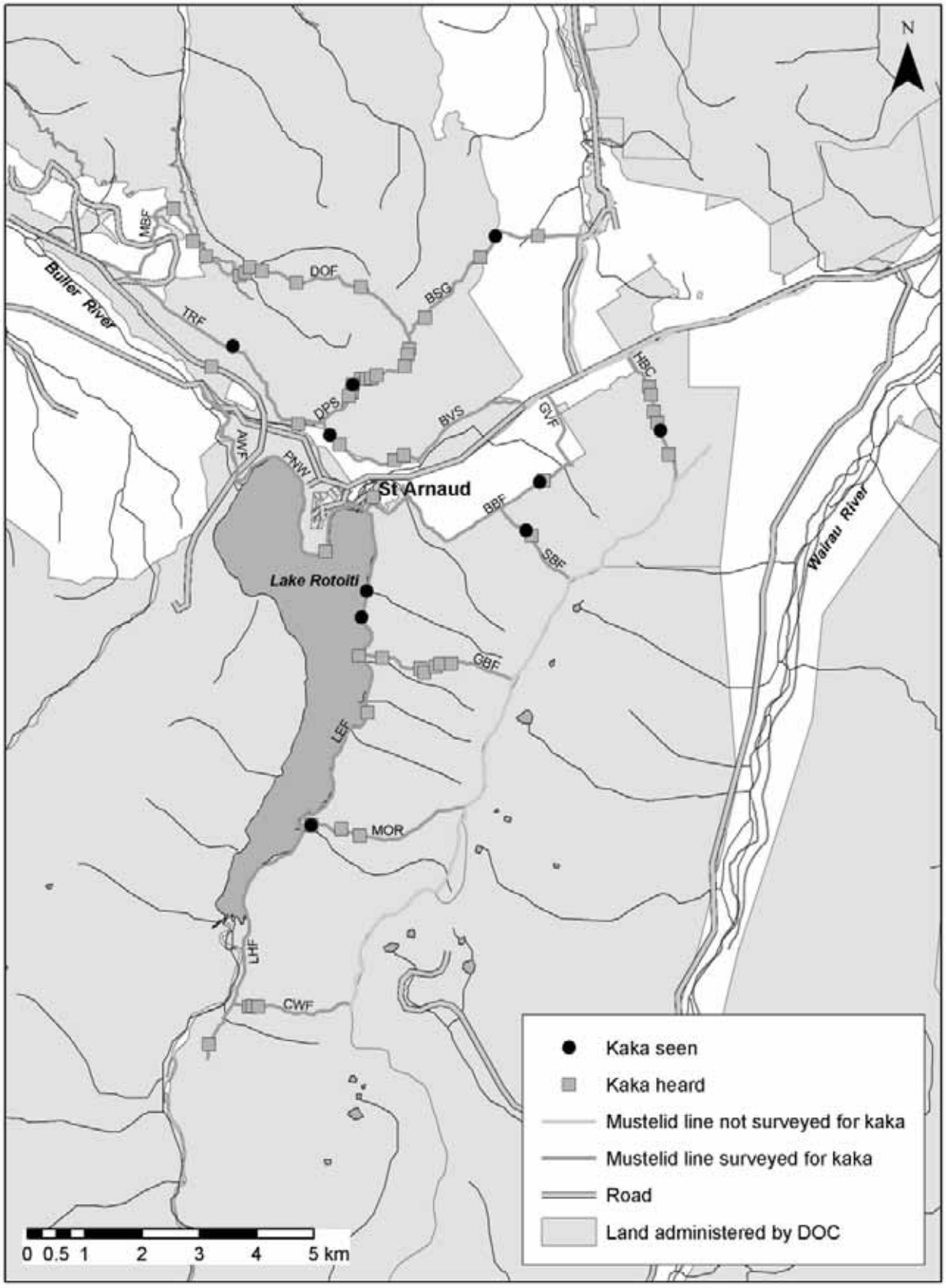
Results

The table below gives the rate of kaka encountered (seen and heard) per hour on each trap line during the survey period.

TABLE 4: KAKA MONITORING RESULTS

TRAP LINE (ABBREV.)	HOURS SURVEYED	KAKA SEEN	KAKA HEARD	ENCOUNTER RATE PER HOUR SEEN + HEARD
LEF	64	2	6	0.125
LHF	27	0	1	0.037
HBC	17	1	5	0.352
SBF	28	1	1	0.071
AWF	13	0	0	0
PNW	23	0	3	0.130
CWF	29	0	6	0.206
GVF	17	0	0	0
BBF	41	1	1	0.048
DPS	26	1	7	0.307
DOF	37	0	11	0.297
MTB	24	0	4	0.166
BSG	37	1	4	0.135
GBF	30	0	8	0.266
BVS	42	1	3	0.095
TRF	40	2	2	0.1
MOR	31	1	3	0.129
Total	465	11	65	

Figure 4: Kaka seen and/or heard



Discussion

Kaka recorded as seen were all noted between October to December 2007, all of the kaka noted as "heard" were heard between October to March with the majority recorded during November. See Figure 4 for a map of these locations.

Information collected during these surveys will provide a general population trend within the project area over the long term.

2.1.7 Mistletoe (*Alepis* and *Peraxilla*) monitoring *(Anne Brow)*

No monitoring was carried out on mistletoe in 2007-08.

Mistletoe monitoring included as part of the 'RNRP vegetation review'. Field work is planned for 2008-09 based on the recommendations from the Strategic Advisory Group and the Technical Advisory Group.

2.1.8 *Pittosporum patulum* monitoring *(Anne Brow)*

No monitoring was carried out on *Pittosporum patulum* in 2007-08.

Pittosporum patulum monitoring was included as part of the 'RNRP vegetation review'. Field work is planned for 2008-09 based on the recommendations from the Strategic Advisory Group and the Technical Advisory Group.

2.1.9 *Powelliphanta* sp monitoring *(Anne Brow)*

Methods

Powelliphanta 'Nelson Lakes' plots are monitored within the Mainland Island. The snail plots consist of three 10m x 10m plots (ie. twelve 5m x 5m quadrats) on the Snail Spur. One plot is located in the forest, one plot is located on the forest edge and one plot is located within the tussock. The standard technique for monitoring *Powelliphanta* developed by Walker (1993) is used.

Results

Ten of the twelve 5m x 5m quadrats were resurveyed in autumn 2007-08.

In total seven live snails were found during the survey. No snails were found in the four forest quadrats, two snails were found in the bush edge quadrats and five snails were found in two of the tussock quadrats (note that two quadrats within the tussock remain to be surveyed in 2009).

In total five empty shells were found during the survey. No empty shells were found in the forest quadrats, four were found in the bush edge quadrats and one was found in the tussock quadrats. Of the five shells found, two were intact, one showed evidence of rat predation and two were classified as 'unknown cause of death'.

Detailed results and graphs can be found in the Excel document 'RNRP Snail Plot Data'.

Discussion

The two remaining quadrats need to be surveyed before accurate conclusions can be drawn. However there looks to be a decline in the population of snails from the 23 live snails found in 1997-1999 and the 26 live snails found in 2003.

2.2 ESTABLISH AND MAINTAIN POPULATIONS OF GREAT SPOTTED KIWI AND OTHER SPECIES *(Paul Gasson)*

2.2.1 Introduction

Sixteen adult great spotted kiwi were translocated to the Mainland Island in 2004 and 2006. Adult survival has been high, and a limited amount of breeding since 2004 has resulted in four known chicks/sub-adults, none of which are known to have died. The size and demographics of the kiwi population are monitored to determine the outcome of past and present management (translocation and pest control) and to identify the need for future management requirements. A low breeding rate has been identified as a possible impediment to the growth of the population. In early 2008 some initial scoping was undertaken to build a case for a possible transfer of Operation Nest Egg (ONE) chicks from a wild site to the Mainland Island within the next one or two years.

2.2.2 Great spotted kiwi (*Apteryx haastii*) population management

Methods

No close-order management of the kiwi population was undertaken during 2007-08. Indirect management that benefited kiwi consisted of threat management, principally control of stoats (refer section 2.1.2).

Domestic dogs are also considered to be a threat to kiwi, and duty officers and rangers with compliance and law enforcement (CLE) roles monitor and manage dog transgressions into the kiwi area. The National Parks Act provides the legal basis for excluding dogs from the kiwi area, and signage is in place to warn dog owners that dogs are not allowed in the National Park. Periodically dogs are illegally taken into the park, for example on boats on Lake Rotoiti, and to the grassy area in Kerr Bay. Dog owners are typically warned by Area Office staff to remove dogs from the National Park, although prosecution is likely in serious incursions into the kiwi zone (a precedent was set with a successful prosecution having been undertaken in 2005).

Results

There are no close-order or direct management results to report. Although there were numerous occasions in which dog-owners were asked to remove dogs from Kerr Bay, no prosecutions were taken in 2007-08. Several dogs were reportedly taken onto Lake Rotoiti in boats, but none were intercepted on the lake.

Discussion

Dog control is an ongoing activity and as visitor numbers to Kerr Bay grow the occasional appearance of dogs in Kerr Bay and on the lake is set to continue. The style, content and placement of the "no dog" signage surrounding the kiwi zone should be reviewed as part of an Area-wide review of orientation and interpretation signage planned for 2008-09.

2.2.3 Great spotted kiwi (*Apteryx haastii*) population monitoring

Methods

Telemetry monitoring and associated recaptures to change transmitters provide basic information about dispersal, survival, relationships and physical condition. Adult females have standard 2-stage kiwi transmitters, smaller single-stage and 2-stage transmitters are used on chicks and juveniles. Multi-output "egg timer" transmitters (programmed for Haast tokoeka) are being trialled on males, to determine whether these will be useful in identifying the onset of incubation to help identify nesting attempts. A limited number of "close fixes" (triangulation) are also undertaken during the breeding season. In order to avoid nest abandonment, nests are not visited before the end of incubation. Avoiding disturbance to nesting kiwi is a priority, and this means that the outcome of a nesting attempt is not always determined. Chicks or sub-adults are occasionally found and radio-tagged at the nest site, or are found sheltering with other kiwi (typically one or both parents). Further detail about the kiwi monitoring methods can be found in the RNRP Field Manual.

Results

Transmitter changes and health checks were incomplete at the end of June 2008 due to a lack of pairs found sharing burrows, an increasing number of adult kiwi living in difficult terrain and becoming adept at avoiding recapture, and poor weather towards the end of the month. This meant that not enough adult weights were obtained during June 2008 to allow a comparison with previous years' weights.

None of the radio-tagged adult kiwi died during 2007-08. Fourteen adults were carrying active transmitters in the RNRP at the end of June 2008. An adult female (Tai Tapu) was unaccounted for due to a transmitter failure, and an adult male (Onetahua) who went missing during 2006 has not been found.

One new kiwi chick was located and radio-tagged during routine transmitter changes in June 2008. The 700g chick was sheltering with Takaka, an adult male transferred in 2004. Based on telemetry observations during the incubation period, the mother was Onekaka (transferred in 2006). Takaka was untransmittered when Haast tokoeka egg timer transmitters were deployed at the start of the year, which meant that no data from egg timer transmitters was able to be reviewed in light of the only known nesting attempt.

One sub-adult kiwi (Rito, hatched in the 2005-06 year) was unaccounted for at the end of June 2008. Rito weighed more than 1.4kg at the beginning of the year and is therefore unlikely to be depredated by a stoat. Ngahere (hatched in the 2006-07 year) was alive and carrying an active transmitter in June 2008. Miharo (initially found as a sub-adult in June 2007) was also alive and carrying an active transmitter. Neither bird was able to be recaptured for weighing in June 2008, but Ngahere weighed 1.39kg in January 2008, and Miharo weighed 2.58kg in February 2008. Ngahere was still associating closely with parents Tata and Wainui throughout the 2007-08 year, whereas Miharo moved more than 2km from the Rata Block in June 2007 to the base of Rito's Ridge (her presumed natal area) in June 2008. Miharo's bill length increased from 103.2mm in June 2007 to 114.2mm in February 2008, beyond the normal range for an adult male, and into the range of an adult female.

Discussion

Sixteen adult kiwi were released between 2004 and 2006. Seventeen kiwi (fourteen translocated adults and three chicks/sub-adults) were confirmed to be living in the Mainland Island during June 2008, with two translocated adults and one locally hatched sub-adult not accounted for. The population is slowly increasing, a low breeding rate is balanced by low mortality.

The detection of only one breeding attempt during 2007-08 is a concern. The Haast tokoeka egg-timer transmitters were fitted to six of the seven adult males, and none of these indicated a sustained period of incubating activity. Unfortunately, the one male that is known to have incubated during 2007-08 (Takaka) was the male without an egg-timer transmitter. More work is needed to determine whether the Haast tokoeka egg-timer transmitter is useful for detecting great spotted kiwi incubation.

A generally low breeding rate may be an impediment to the establishment of a large and robust great spotted kiwi population in the short to medium term. There are currently three known breeding pairs in the RNRP, although the male:female ratio of translocated adults would allow for a possible maximum of seven pairs. The reason(s) for the low breeding rate is not known, and it is not known if this is representative of great spotted kiwi populations in general.

Of four locally-hatched kiwi found in the RNRP between 2006 and June 2008, none are known to have died, although Rito is currently missing.

3. Learning objectives

3.1 TEST THE EFFECTIVENESS OF RODENT CONTROL TOOLS IN A BEECH FOREST SYSTEM

3.1.1 Introduction *(Paul Gasson)*

Following several years of rat (ship rats, *Rattus rattus*) control using toxins (1080 and Brodifacoum), the effectiveness of snap trapping was trialled from July 2000 to March 2007. Throughout that period snap trapping failed to consistently achieve the performance target (sustained rat tracking tunnel index of 5% or less). During the 2006-07 year a "detection and staged response" model using toxins was trialled, but did not provide conclusive results due to the failure of the initial knockdown. Snap trapping was officially abandoned following an RNRP Advisory Group meeting in March 2007. At that stage the intention for the 2007-08 year was to implement a toxin operation using diphacinone presented in Defender bait stations, recently developed by Connovation.

During financial planning and prioritising for the 2007-08 year it became apparent that a new diphacinone operation would not be affordable this year. Following consultation with the Technical Advisory Group and the Strategic Advisory Group, it was decided that no form of rat control would be implemented during 2007-08. This was seen as a reasonable course of action as long as there was no significant beech seedfall and subsequent rodent irruption. Notwithstanding the potential impact on biodiversity values, the opportunity for the rodent population to return to a non-treatment level during 2007-08 is arguably a better scenario for testing the effectiveness of a new rodent control tool in 2008-09.

Although no rodent control was undertaken throughout the 2007-08 year, associated rodent population indexing and outcome monitoring of South Island robin (*Petroica australis australis*) territory occupancy continued. There was no significant beech seedfall in autumn 2007 or autumn 2008.

3.1.2 Rodent population monitoring *(Anne Brow)*

Methods

Tracking tunnels are used to determine the population of rodents within the project area.

Rodent monitoring is used to compare rodent tracking rates between the RNRP Core Area (where rats and mustelids are poisoned/trapped), Lakehead & Big Bush (no rat control but mustelid trapping) and Rotoroa (no poisoning or trapping). See Graphs 4 and 5 for details. This year rat control was not carried out in the RNRP Core Area so the tracking

rate is a background tracking rate for future rat toxin operations. Six lines were dropped from Big Bush on advice from the Technical Advisory Group as they were additional to the number of lines required to track rodents for the area that they monitor. These surplus lines are the result of line realignments in 2006-07.

Rodent monitoring is carried out using papers, inked sponges and peanut butter and oat mix set to the best practice method described by Gillies and Williams (2004). Refer to the 'RNRP Field Manual 07-08' for further details. Note that the tunnels across the three sites are a combination of galvanised and modified coreflute tunnels and the tunnels are centrally baited instead of end baited as per the best practice.

In 2007-08 the rodent monitoring was carried out as follows:

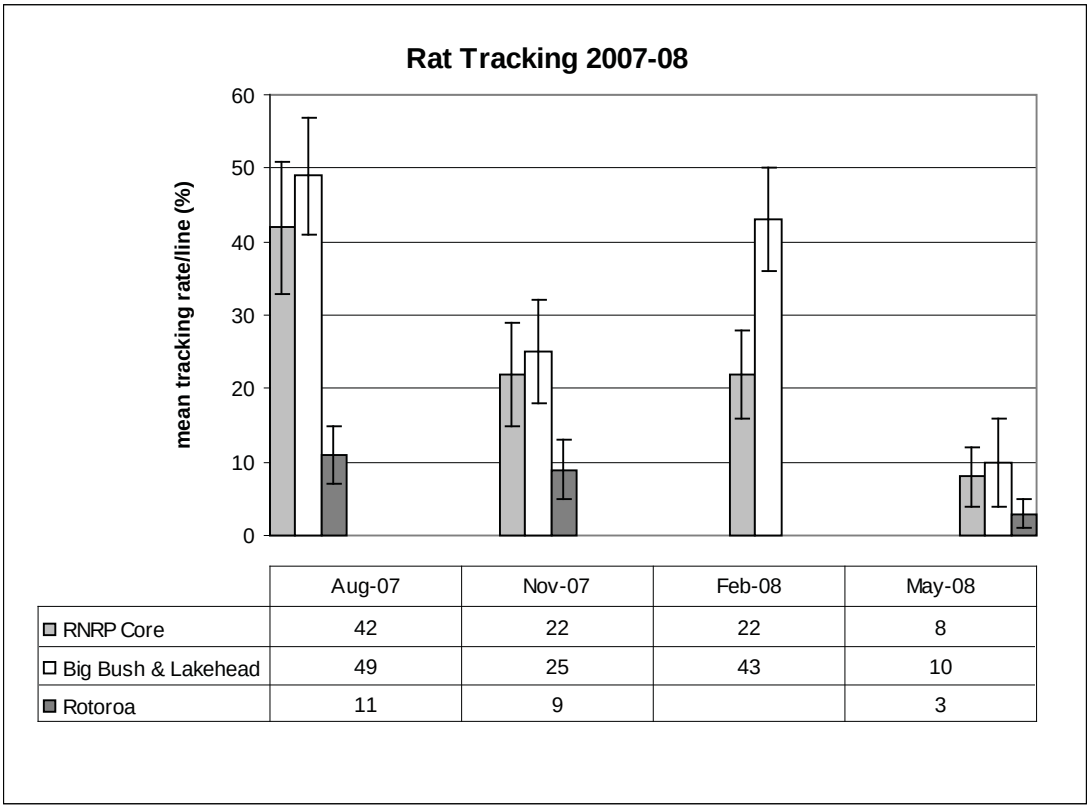
- RNRP Core – August, November, February and May
- Big Bush and Lake Head – August, November, February and May
- Rotoroa – August, November and May. The February set at Rotoroa was abandoned mid set due to staff receiving a dangerously high number of wasp stings and poor radio communication.

Results

Detailed tracking tunnel descriptions, results and graphs are found in the Excel document 'Tracking Calculator 2007-08'. Detailed tracking rates and graphs throughout the projects history are found in the Excel document 'Tracking Tunnels through time'.

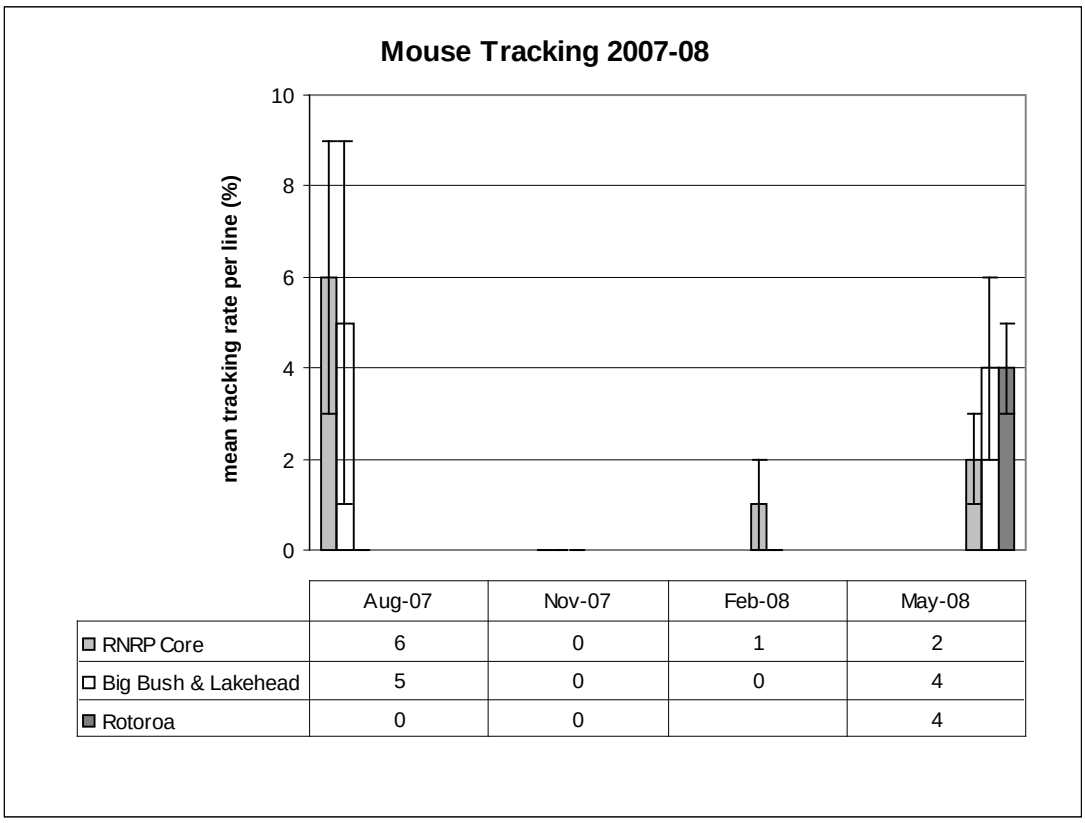
Rodent tracking at all sites was very low (see Graphs 4 & 5 below).

Graph 4: Rat monitoring results



	Aug-07	Nov-07	Feb-08	May-08
RNRP Core	42	22	22	8
Big Bush & Lakehead	49	25	43	10
Rotoroa	11	9		3

Graph 5: Mouse monitoring results



	Aug-07	Nov-07	Feb-08	May-08
RNRP Core	6	0	1	2
Big Bush & Lakehead	5	0	0	4
Rotoroa	0	0		4

Discussion

The rat and mouse mean tracking rates for 2007-08 have been some of the lowest rates in the project's history. The low mean tracking rates per line suggest that rat and mouse populations are going through a bust cycle following the boom in 2006-07 in response to the beech mast of autumn 2006. This is consistent with the understanding of how the pests in beech forests respond to mast years.

Since rodent numbers have remained low at all sites, in hindsight it has been a great year to have not proceeded with rat control within the RNRP Core Area as potential biodiversity gains haven't been compromised. There was no apparent response in rodent numbers to the lack of control this year. Natural decline and lack of population increase were a feature of the season.

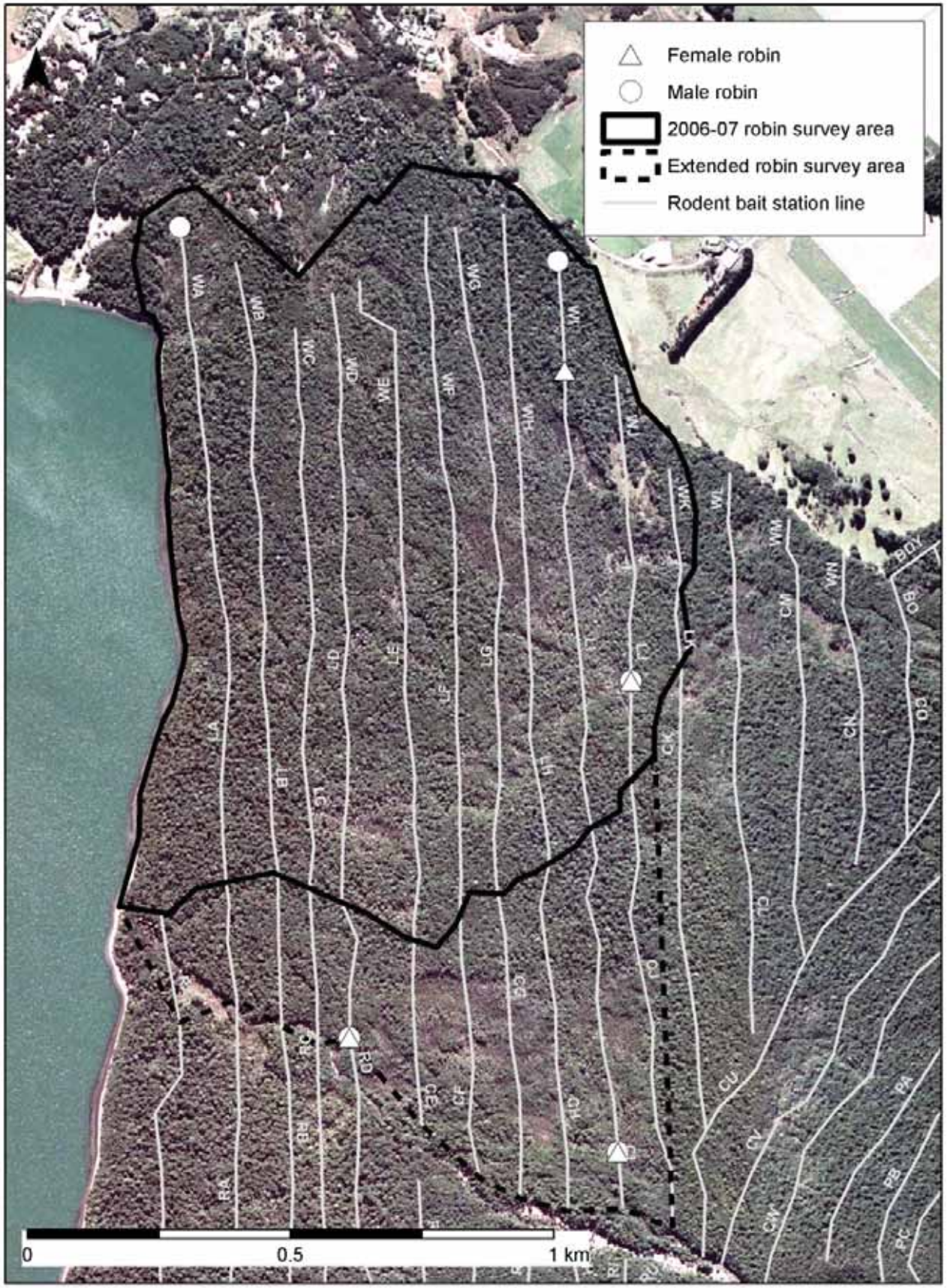
Following the May 2008 rodent tracking tunnel set, all tunnels were replaced with best practice coreflute tunnels. Lines UC, LC, UD, LD, UE, LE and M at Rotoroa will be moved in 2008-09 to reduce safety concerns on these lines.

3.1.3 Robin (*Petroica australis*) monitoring *(Tammy Bruce)*

Introduction

Robins are monitored as an outcome species for rodent control techniques applied within the RNRP Core Area.

Figure 5: Robin locations 2007-08



Methods

The robin survey is conducted four times, a week apart from each other during the month of September. The survey is conducted following Powlesland's protocol (1997).

The "standard" survey area (120.7ha) includes rodent lines A-K in the Loop and Watertank areas. This year the survey area was expanded to include the Cedar block lines E-J and parts of the Rata block A-D (41.4ha) bringing the total area surveyed to 162.1ha.

Results

Four pairs of robins were identified during the survey; two pair in the newly added Cedar/ Rata block. All four pairs were recorded displaying nesting type behaviours e.g. male feeding female, caching mealworms and flying off with mouthfuls of worms to suspected nests.

One single banded male (MY/-) was recorded on the WA line without a mate. This bird was last recorded occupying this territory with a mate during the 2005 survey when he was banded.

Discussion

A decision to expand the robin monitoring area was supported by the Strategic Advisory Group during the 2007 meeting. It was hoped that by increasing the survey area without requiring a greater amount of labour that we would be able to boost the sample size giving us greater confidence in interpreting results with or without rodent control. Interestingly by adding this relatively small area the number of robins encountered was doubled.

The numbers of robins holding territories within the "standard" survey area (in the absence of rat control) are similar to previous year's results when rat control by trapping was applied to the core area. However tracking tunnel results show that rodent indices within the RNRP Core were at an all time low this year.

3.2 TEST THE EFFECTIVENESS OF WASP CONTROL TOOLS *(Paul Gasson)*

3.2.1 Introduction

Common wasps (*Vespula vulgaris*) have been controlled in the RNRP Core from 1998 using the toxins Finitron and Fipronil. This work has been carried out in close association with Landcare Research. Fipronil has proven to be the most effective of the two substances. However access to Fipronil is constrained by commercial restrictions, and nor has Finitron always been available. No wasp control was undertaken during the 2006-07 season due to the unavailability of a suitable toxin. In 2007-08 Fipronil was again available for experimental purposes, and is likely to be available also for the 2008-09 and 2009-10 seasons. Experimentation in

2007-08 was limited to Catherine Duthie's research regarding interactions between wasps and native ants (refer to section 3.6.2), which used the RNRP Core as a treatment site, and an adjacent untreated area for a comparison. An experimental transect baiting regime intended for the western shore of Rotoiti was not able to be implemented due to the unavailability of FOR volunteers. This transect will be baited during 2008-09 and 2009-10.

3.2.2 Wasp control and monitoring

Methods

Wasp poisoning was preceded by monitoring to determine the level of wasp activity at non-toxic protein-based baits to ensure that the toxic operation will be effective. For further detail on wasp monitoring and the decision making process refer to the RNRP 2007-08 Field Manual.

Chicken meat-based toxic bait, containing the active ingredient Fipronil at a concentration of 0.1%, was prepared at the Landcare lab in Nelson on the 29th and 30th of January and was packaged into two litre plastic pails. 33kg of bait was laid in bait stations on the 18 February 2008. Toxic bait was laid in the RNRP Core and St Arnaud township/Brunner Peninsula areas, using the established wasp bait station grid (100m x 50m) and lines. Lines within the township/peninsula areas generally follow established roads and walking tracks. 40g of toxic bait was placed into each bait station. For further information regarding the bait and bait station layout refer to the RNRP 2007-08 Field Manual.

A perceived shortage in bait allocated to the RNRP Core led to a decision that a strip of about 300 metres was trimmed off the southern boundary of the treatment area (Rata Block). Staff found that the large units/containers of bait meant that it was difficult to allocate the correct amount of bait to a given block and to a given line, and it was difficult to monitor bait usage. Because of the perceived risk of a bait shortfall, the decision was made to deliberately trim the margin of the operational area rather than to risk having a hole in the middle of the area.

Operational performance standards specified that uneaten bait must be collected from bait stations three days after application. Bait was brought in from the St Arnaud Township on the 20th of February (two days after application) and the RNRP on 21st of February (three days after application) because staffing levels did not allow for all bait to be brought in on one day. All retrieved bait was weighed.

Results

The average number of wasps observed on arrival at the non-toxic baits was 2.1 on the 21 January, and 5.0 on the 5 February.

Following the toxic operation, a total of 15.76kg of uneaten bait was retrieved from the operational area. This is 47.7% of the total bait applied.

Wasp activity within the operational area was observed by Catherine Duthie to decrease markedly within a week of the toxic operation.

Discussion

Non-toxic bait counts showed that the wasp control operation could have been effective if undertaken during January 2008, however planning and organisational constraints meant that the 11 February was the earliest practicable date. The toxic operation was successful in reducing the wasp nuisance around St Arnaud township and in the mainland island core.

Catherine's work is aimed at identifying potential biodiversity outcomes from wasp control (refer to section 3.6.2 Research conducted during 2007-08).

Fipronil is known to be effective for controlling wasps when applied in a 200m x 50m grid pattern. Staff expect to have access to Fiprinol for two more summer seasons, and transect and spot baiting to be trialled in 2008-09 and 2009-10 will hopefully further our knowledge about the efficacy of various baiting regimes.

3.3 TEST THE EFFECTIVENESS OF DIFFERENT TRANSLOCATION METHODS *(Paul Gasson)*

Great spotted kiwi is the only species to have been translocated by the RNRP to date. Wild-to-wild translocations of adults were undertaken in 2004 and 2006 and have been discussed in previous annual reports and in Occasional Publication number 67 (Gasson 2005). No work has commenced on introducing any other species. In the medium term there is more work that can be done to test the effectiveness of different translocation methods for great spotted kiwi. In April 2008 planning commenced for future translocations of sub-adult great spotted kiwi. It is envisaged that the sub-adults will be procured through an Operation Nest-Egg (ONE) project involving the collection of eggs from a source location in north-west Nelson, with incubation of the eggs at Willowbank Wildlife Park in Christchurch, "creching" the chicks at a predator-free outdoor location, and release of >1kg sub-adult birds into the Mainland Island.

An application for funding was submitted to the Bank of New Zealand Save the Kiwi Trust stating two broad objectives:

- a biodiversity objective to augment the existing founder population with young birds from another site, and
- a learning objective: a pilot study to compare the success of ONE birds to the success of RNRP-hatched birds, with respect to territory establishment, pairing and breeding in the Mainland Island.

The funding application was approved by the Bank of New Zealand Save the Kiwi Trust.

The proposed pilot study is relevant because there is increasing interest in using ONE to manage existing great spotted kiwi populations, and to perhaps establish new populations. The Mainland Island is a site where the fate of ONE birds can be monitored and compared to wild-raised chicks protected by predator control. It is expected that the project will at least be able to give some guidance as to whether ONE birds can be expected to recruit successfully into an existing breeding population, and if so, whether the process (including dispersal and age of breeding) is broadly similar to with wild-raised birds. Project planning, and capture and radio tagging of breeding adults at the source location (yet to be formally identified) is expected to be completed during 2008-09.

3.4 DETERMINE LONG-TERM TRENDS IN BIRD ABUNDANCE AND FOREST HEALTH IN RESPONSE TO ONGOING MANAGEMENT

(Anne Brow)

3.4.1 Introduction

The RNRP continues to play an important role in monitoring bird calls and forest health as part of the Department's commitment to measuring long term biodiversity trends. Monitoring of beech flowering and seedfall adds value to the national picture of forest seedfall and enables the project to plan appropriate management responses.

3.4.2 Five-minute bird counts

Methods

Five-minute bird counts (5MBC) were conducted in November, February and May using the technique detailed by Dawson and Bull (1975). Three counts were done at St Arnaud Range and Lake Head each session. The counts are done on St Arnaud Range Track in the RNRP Core Area and bird count line at Lakehead. At Rotoroa three counts were done in November, one count was done in February due to safety issues surrounding wasps and only two counts were done in May due to boating issues on one count. The bird count at Rotoroa is done along Mt Misery Track.

Results

There was significant progress this year in using pivot tables within Excel to derive average counts per bird and 95% confidence limits for each species. May counts have been used for the analysis as it best reflects the background population of bird species without the added conspicuousness of mating behaviours, while still representing the previous year's recruitment. This analysis appears in '5 Minute Bird Count Data'.

In addition, Ian Westbrooke (Research and Development) and Tim Robinson (a visiting lecturer from Wyoming University) experimented with using a statistical package ('R') to provide a more detailed analysis of the bird count data. The initial analysis using 'R' suggested statistically significant increases and decreases across many of the species at all sites.

Discussion

The trends across the sites do not show a significant impact of differing rodent and mustelid control which raises questions as to the value of 5MBC as an outcome monitoring tool. For example, kaka look to be increasing across the RNRP Core, Lakehead and Rotoroa whereas recruitment studies of kaka within the RNRP Core and Rotoroa (Greene et al. 2004) clearly indicate that recruitment is higher when the mustelid mean tracking rate/line is held below 5%. This raises questions as to whether the 5MBC technique is sensitive enough to detect changes in the conspicuousness of at least some of the birds through time.

Despite these questions for the project, there continues to be value in running 5MBC to contribute to the national pool of data on bird calls. The project could consider dropping November and February bird counts and using staff time to better monitor native bird species that appear to be in decline within the RNRP Core.

3.4.3 Vegetation plot monitoring

Methods

A further nine vegetation plots were re-measured in 2007-08. Eight of these plots were monitored in late April with the assistance of Nelson/ Marlborough Conservancy Office botanists, the Nelson/Marlborough Institute of Technology Trainee Rangers and Christchurch based Research and Development staff.

The vegetation plots were monitored using the updated field protocols for permanent plots and the Recce method (Hurst and Allen 2007). Re-measured plots were updated to reflect the new tree standard of 2.5cm at breast height diameter (previously 3.0cm).

The vegetation plots re-measured include the deer exclosure plot and paired control plot.

Data sheets have been sent to the National Vegetation Survey Databank for entry on to the Landcare System.

Results

Five plots remain to be re-measured within the RNRP Core, ten remain to be re-measured at Lakehead and two remain to be re-measured at Rotoroa. Analysis will not be undertaken until all the plots are fully re-measured.

Discussion

Conservancy botanists noted that plots had been heavily affected by browse which is a further confirmation that deer numbers within the Mainland Island Core Area may be higher than anticipated.

3.4.4 Beech seed fall monitoring

Methods

Beech seedfall monitoring is conducted within the Mainland Island Core Area and along the Mt Misery Track at the Rotoroa non-treatment site. There are 20 seed-fall traps located at each site. The beech seedfall trays are fitted with seedfall collection bags in early March. The bags are replaced in late April and finally removed in late June. The seed is then counted and tested for viability.

Results

2007-08 was a non-mast year. The number of seeds per sample ranged between 0 and 17, with the majority of samples only having one or two seeds. Seeds were generally non-viable. The exception to this was tray number 12 at Mt Misery which had 3561 silver beech seeds (70% viability).

Discussion

Given that there was beech flowering noted in October 2007 it is surprising that there was not at least a partial mast of beech within the project area, although the high seed count at tray 12 at Rotoroa suggests that perhaps some silver beech may have had a partial mast in some locations.

3.5 SYSTEMATICALLY RECORD OBSERVATIONS OF PREVIOUSLY UNREPORTED NATIVE AND NON-NATIVE ORGANISMS IN THE RNRP

(Paul Gasson)

The systematic recording of previously unreported native and non-native organisms is a new objective identified in the proposed RNRP Strategic Plan 2008-13. The intention of this objective is to maximise the learning from observations of species previously unknown to be present, regardless of whether the observation is part of an organised survey or not. Increased knowledge of the native species present in the RNRP is useful. Detection of invasive plants or animals will inform management actions to protect biodiversity values.

There is currently a repository for new information (“Flora and fauna of Lake Rotoiti Recovery Project). Refining the process for entering and sorting new records is a programmed task for 2008-09. No new species were identified during 2007-08.

3.6 FACILITATE RESEARCH TO IMPROVE OUR UNDERSTANDING OF THE ECOLOGY AND MANAGEMENT OF BEECH FOREST AND ALPINE SYSTEMS *(Tammy Bruce)*

3.6.1 Introduction

The Mainland Island continues to be a place of learning for external researchers.

3.6.2 Research conducted during 2007-08

- Catherine Duthie, Victoria University Ecology & Insectary technician, continued her PhD research investigating factors which may promote coexistence between the endemic ant and invasive wasp. This year's wasp control project was funded by Landcare Research, in support of Catherine's research.
- Rebecca Lawrence, University of Otago: MSc investigating the foraging behaviour and habitat use of ship rats under stoat predation in a beech forest. Rebecca has been awarded the Brenda Shore Award for women, in support of her research. Field work is planned to begin summer 2008-2009.

Completed research

- Bartholomew R.: Factors influencing recruitment and establishment of *Fuchsia extcorticata* in Nelson Lakes National Park. Thesis not yet received.
- Schnek D 2007. Role of introduced birds as possible competitors with native species in the Nelson Lakes National Park, South Island, New Zealand. Thesis received. See abstract summary in Appendix 4.

3.7 ANALYSE AND REPORT ON THE EFFECTIVENESS OF MANAGEMENT TECHNIQUES AND ENSURE THAT KNOWLEDGE GAINED IS TRANSFERRED TO THE APPROPRIATE AUDIENCES TO MAXIMISE CONSERVATION GAIN *(Paul Gasson)*

3.7.1 Introduction

Analysing and communicating technical information about the effectiveness of management techniques is a key learning objective, linking directly to national Mainland Island Principle 2: "Results and outcomes are communicated". The RNRP transfers technical information to target groups through various documents including annual reports, field trial reports, and occasional publications, as well as through presentations to technical audiences and input to periodic workshops and hui. Technical analysis and communications need to be distinguished from advocacy work which is discussed in section 4.1.3., and includes brochures, newsletters and presentations targeted at non-technical groups.

3.7.2 Reports generated during 2007-08

Annual reports continue to be produced, and a new template developed at the end of the 2007-08 year is now used to speed up the reporting process, and to align annual reports with the proposed RNRP Strategic Plan 2008-13.

One scientific paper: (Taylor, G., Moorhouse, R., Moran, L. Kemp, J., Elliot, G., and Bruce, T.: Kaka (*Nestor meridionalis*) management in the Rotoiti Nature Recovery Project, Nelson Lakes National Park, New Zealand) is to be published in the Nelson/Marlborough DOC internal series.

An article by Paul Gasson about the great spotted kiwi translocations was submitted for publication in a forthcoming book to be published by the IUCN/SSC Reintroduction Specialist Group.

No field trials or field trial reports were completed under the Standard Operating Procedure for Field Trials for Animal Pest Operations.

3.7.3 Hui, workshops and presentations

Paul Gasson attended the Sanctuaries of New Zealand workshop (www.sanctuariesnz.org) at Silverstream, Wellington during September 2007, and, as acting Programme Manager, during November 2007 attended the Mainland Island Programme Managers' meeting in Wellington. Paul also attended the South Island Kiwi hui at Kaiapoi during April 2008 and presented a PowerPoint presentation outlining the establishment of the great spotted kiwi population in the RNRP.

4. Community objectives

4.1 INCREASE PUBLIC KNOWLEDGE, UNDERSTANDING AND SUPPORT FOR MAINLAND ISLANDS AND ECOLOGICAL RESTORATION NATIONALLY THROUGH EDUCATION, EXPERIENCE AND PARTICIPATION *(Sally Leggett)*

4.1.1 Introduction

This year the project's community objective has been achieved through the continued support of the local community group the Friends of Rotoiti (FOR), providing 'one-off' volunteering opportunities for groups and individuals, promoting the project through the "Revive Rotoiti" newsletter and media releases, continuing the educational programme at the Rotoiti Lodge Outdoor Education Centre and providing guided walks, talks and support to community groups, schools and universities. This year we were also able to increase advocacy for the project through a virtual field trip provided by the LEARNZ website.

4.1.2 Friends of Rotoiti

The FOR community group was set up under the department's direction in 2001 in response to local interest in the RNRP and a desire for involvement. The group's objectives are to provide opportunities for the community to be involved in pest control, species monitoring, re-introductions and for members to receive training from the department in best practice techniques in these areas. The group has over 80 members to date. Two meetings were held over the year and members completed 322.5 work day equivalents (one work day equals six hours). NB. For FOR mustelid control methods and results refer to section 2.1.2.

FOR rat control

This year the group continued to maintain their 250 hectare rat control programme which is situated throughout the Brunner Peninsula, Black Hill and Black Valley Stream areas adjacent to St Arnaud township. Rat control consists of Victor Professional snap traps in core board tunnels. Trap checks and bait renewal is carried out on a fortnightly basis year round. During 2007-08 the traps caught 112 rats, 422 mice, one rabbit, five stoats, three weasels and one finch. Rodent captures for the 2007-08 year were considerably lower then the previous year where 253 rats and 1405 mice were caught. This reflects the low tracking tunnel rates recorded within the RNRP Core Area and at Rotoroa this year.

FOR lizard monitoring

FOR lizard pitfall trapping is a useful programme for identifying lizard species present in the FOR rat control area. It has the potential for identifying population tends and is a successful educational tool for volunteers.

As in previous years, members operated two transect lines of 20 pitfall traps which were opened for four days in November, December and January and baited with pear. Due to adverse weather conditions the planned opening of the traps in February did not occur. The standard technique for monitoring lizards developed by Whitaker (1994) is used.

TABLE 5: TOTAL LIZARD CAPTURES (EXCLUDING RECAPTURES) ON THE FRIENDS OF ROTOITI PITFALL TRAPPING TRANSECTS DURING 2007-08.

YEAR	MONTH	DATES OPEN	MAX TEMP RANGE ºC	TOTAL RAINFALL MM	WARD STREET		BLACK HILL		
					O. nig.[1] pol.[1]	O. inf.[2]	O. nig. pol.	O. lin[3]	O. inf[3]
2007	November	9 - 12	14.2 – 17.9	0.0	7	1	2	3	0
2007	December	14 - 17	15.3 – 20	9.6	6	0	0	0	0
2008	January	18 - 21	18.8 – 22.7	0.0	11	0	2	0	1

[1] Oligosoma nigriplantare polychrome Common skink
[2] Oligosoma infrapunctatum Speckled skink
[3] Oligosoma lineoocellatum Spotted skink

4.1.3 Volunteers

The RNRP received 40 volunteer work days this year from two individuals (one being a Gateway student) and a group from the Pacific Discovery New Zealand Conservation Volunteer Programme.

4.1.4 Advocacy and education

Revive Rotoiti

Two editions of “Revive Rotoiti” were published in the year (spring 2007 and autumn 2008), and copies were sent out to the main stakeholders. Copies were also made available in the Nelson Regional Visitor Centre and the Nelson Lakes Visitor Centre.

Media releases and other advocacy work

Media releases this year included the discovery of Miharo in 2007 and the discovery of another chick during the annual health checks in June 2008. The 500th stoat trap check was also celebrated in the media which generated public interest in the form of a donation. As in previous years regular updates were included in the local newsletters. The RNRP has several web pages on the DOC website dedicated to it. From these pages are links to the projects annual reports and newsletters. This year the project was promoted at the Antique and Classic Boat Show and updates

were given at Rotoiti District Community Council meetings and Nelson Community forums.

Visitor Services

Nelson Lakes Visitor Centre staff continue to distribute information about the project and promote the Honeydew Walk through the project and a useful information resource due to the interpretation panels situated around it. Most requests for information come from school and tertiary students. The visitor centre displays dedicated to the project were updated on a regular basis with news from the project.

Rotoiti Lodge Outdoor Education Centre – RNRP presentations

The Rotoiti Lodge RNRP PowerPoint presentations continued this year with a total of 32 Year 8-Year 12 and second year university classes from Nelson/Marlborough and Wellington receiving the presentation (873 students in total).

RNRP guided walks and other presentations

Guided walks on the Honeydew Track also continued this year. Twelve Year 12 Nelson/Marlborough biology/geography classes received guided walks as part of their NCEA unit standards on conservation and resource management and two university classes received guided walks, one from Canterbury and the other from the USA (190 students in total).

Other presentations included ten talks to secondary schools not staying at the Rotoiti Lodge, several community groups and four Nelson/Marlborough primary schools who were using the RNRP Resource Kit – 'A Day at Rotoiti' (300 students/people in total).

LEARNZ virtual field trip

LEARNZ is an online education programme for students in New Zealand state, private and integrated schools. The organisation offers virtual field trip experiences to students who stay at school but visit places they would never otherwise go to and interact with people they would never meet. Students' participation is supported by online background materials and activities, and is enabled using live audio-conferencing, web board and diaries, images and videos uploaded daily.

The LEARNZ team visited the RNRP in June and carried out a three day field trip. Five staff had input into the field trips, audio-conferences and the 'ask an expert' web based question board. Field trips filmed included the history of the project and where it's heading now, a kiwi health check and the biodiversity of the beech forest and management tools used.

The field trip was a great success with over 100 schools in New Zealand registering. Over 3000 students followed the virtual field trip over the three day period. At the time the LEARNZ team were also helping to set up a LEARNZ-type programme in Thailand so several Thai schools also registered and followed the field trip. The field trip will stay on the LEARNZ web site for other schools to utilise throughout the 2008 year.

5. Discussion *(Paul Gasson)*

5.1 HIGHLIGHTS OF THE 2007-08 YEAR

The RNRP made good progress in a number of areas during 2007-08 despite having a depleted complement of permanent staff at times. Much progress was made "behind the scenes" in improving the planning and reporting documents and associated systems, with considerable support from the Technical Advisory Group. Staff also worked closely with the Conservancy Information Management Unit (IMU) to create and upgrade maps of management areas and infrastructure.

Biodiversity values in the Mainland Island – particularly kaka and kiwi populations, are likely to have benefited from the upgrade of the predator trapping network that commenced in 2007-08. A significant number of old Fenn™ traps have been systematically replaced with the new "best practice" DOC series traps. Despite very high stoat numbers recorded at the Rotoroa non-treatment site during November 2007, the great spotted kiwi chick known to have hatched during the 2007-08 breeding season survived to the end of the year and is on track to reach the nominal "safe weight" of 1kg during late winter/early spring in the 2008-09 year. Recently completed work with kaka means that we can assume that the kaka population is secure.

The RNRP continued to focus strongly on learning during 2007-08. An opportunity was taken to design the upgrade of the predator trap network as a field trial for comparing the efficacy of DOC series traps vs Fenn™ traps. More data was gathered about great spotted kiwi biology, including chick growth and behaviour, and planning commenced for a pilot study to compare the fitness of Operation Nest Egg chicks to the fitness of wild-raised chicks. Progress was made in re-measuring vegetation plots, and this work included trainee rangers and DOC staff from the Research and Development as well as RNRP field staff.

Community participation and interest remains strong, and the Friends of Rotoiti have upgraded predator trap lines during 2007-08. Community interest was reflected in strong media uptake of stories about the kiwi project, as well as in media interest shown in the 2007-08 wasp control operation. A highlight for the year was the LEARNZ virtual field trip which reached over 3000 students.

5.2 CHALLENGES APPARENT IN 2007-08

While kaka and kiwi appear to be thriving due to the RNRP, other biodiversity values may not be faring as well. *Powelliphanta* snail monitoring in 2007-08 suggested a decline in the population, although further monitoring is necessary to confirm this. Visiting botanists observed

that the 20 x 20 vegetation plots show visible sign of browsing by deer. These observations correspond with an increase in deer sightings and it remains to be seen what these observations mean for the local *Pittosporum patulum* population. Robin numbers are low and this is likely due to the inability of trapping to control rats by trapping.

We did not learn all that we hoped to this year. Limited progress was made with implementing the proposed rodent poisoning programme during 2007-08. On the ground, the RNRP team struggled to make progress with upgrading the rodent bait station layout because of resource pressures due to gaps in the staff complement. Financial pressures delayed the purchase of toxin. A wasp bait station line for testing the effectiveness of Fipronil applied on a bait station grid was not able to be utilised due to issues with timing and volunteer availability.

While we know that there is good community support for the ecological restoration work of the RNRP, feedback from the community does not always indicate a good understanding of the RNRP's primary role as a site for learning and how this can influence the setting of ecological restoration objectives. For example, while the lack of rodent control during 2007-08 is acceptable from a learning point of view, potentially allowing the rodent population to return to "normal" prior to the proposed field trial of a new toxin, it could be viewed negatively from a biodiversity restoration point of view with a potential increase in rodent numbers implying a corresponding loss of biodiversity. Uninformed observers, thinking that the RNRP is primarily an ecological restoration project, could be forgiven for viewing the suspension of rodent control as irresponsible. This issue was managed proactively, but through various discussions with stakeholders during 2007-08 it was apparent that the RNRP is commonly regarded by members of the public as, first and foremost, a biodiversity restoration project.

6. Conclusions *(Paul Gasson)*

The RNRP is a Department of Conservation mainland island and is thus subject to eight strategic principles that can be grouped into learning outcomes and community outcomes. The eight principles give priority to learning outcomes, including research and communicating results. Restoring biodiversity is a secondary objective. Learning and biodiversity outcomes are complemented by community outcomes around community participation and inspiration. The proposed RNRP Strategic Plan 2008-2013 contains ten objectives that set the direction of work within the framework provided by the eight principles.

Learning is entrenched in the way that the project operates, but care is needed to ensure that the correct opportunities are taken up and maximised. Ongoing review is needed to ensure that effort is invested where it is most likely to produce a return. After 2010 the RNRP may not have access to an effective wasp control toxin, and a challenge for 2008-2009 and 2009-2010 is to determine what useful and generally applicable information can be learnt about wasp control from using an effective tool that may thereafter be unavailable. Information about great spotted kiwi biology is new and interesting, but can be hard-won. Good prioritisation and attention to detail will maximise knowledge gains without unnecessary expenditure of resources.

The RNRP has demonstrated good outcomes for two large forest birds, but more work is needed to demonstrate positive outcomes for flora and invertebrates. Positive outcomes are apparent in a secure kaka population and a growing great spotted kiwi population. More work is required to demonstrate positive outcomes for the beech mistletoes, although it is likely that these are thriving under currently low possum numbers. Mistletoes will be monitored during 2008-2009, and this work will hopefully confirm the expectation that populations are secure or improving. Further monitoring of *Powelliphanta* snails and *Pittosporum patulum* is needed to determine the trend of populations in the RNRP. Results of a partial monitor of snails in 2007-2008 are cause for concern and further work is required in 2008-2009. A higher number of deer sightings coupled with evidence of browse seen in the 20 x 20 vegetation plots imply that *Pittosporum patulum* may not be adequately protected, and monitoring is required.

Community support is strong, and participation – particularly through the Friends of Rotoiti – is high. In addition to maintaining this momentum, the project must continue to focus on communicating the message that learning outcomes are a strategic priority within the DOC mainland island programme, and that only through learning can we develop conservation "best practice". It is important that the community's expectations are aligned with the project's strategic direction. Anything less could result in diminishing public support for the project at times when learning objectives need to take precedence over ecological restoration. The learning role of the RNRP, and DOC mainland islands generally, needs

to be actively promoted as a “point of difference” distinguishing mainland islands from restoration projects per se.

Finally, the sixth mainland island principle “systems required to manage these sites are sustainable” warrants a special mention in the context of 2007-2008. Progress on improving planning and reporting systems has been a feature of 2007-2008, and this has benefited operations by focussing and streamlining many aspects of our work. In a year when vehicle fuel prices and carbon emissions have been debated widely in the public arena, the RNRP’s physical accessibility, the project’s limited reliance on expensive helicopter transport, and the vast number of kilometres that staff are willing and able to cover on foot, are all positive features. With the increasing pressure on resources the changes implemented this year have set a framework in place to prioritise, implement and monitor our programme effectively.

7. Acknowledgements

The Rotoiti Nature Recovery Project relies on support from fieldworkers, volunteers, technical staff and experts.

Thanks are due to seasonal fieldworkers Craig Brown, Todd Cooper, Sarah Forder, Ruth Garland and Liz Gunning (Trainee Ranger) who contributed hundreds of hours of field work, often in harsh weather and high wasp numbers. Kris Thomas and Pablo Purez contributed time as volunteers, and Ken Ross contributed hundreds of hours as a Royal Society Fellow and volunteer. Trainee Rangers from Nelson/Marlborough Institute of Technology also assisted with various tasks including vegetation plot monitoring and upgrading the rodent control grid.

Much assistance was received from the Department's Research and Development division during 2007-08. Ian Westbrooke (R&D Christchurch) provided statistical advice relating to five-minute bird counts and wasp monitoring, and introduced us to Associate Professor Tim Robinson of the University of Wyoming. Tim participated in the above discussions. Kate McNutt and Madan Gautam (R&D Christchurch) provided technical and field assistance with the re-measuring of 20 x 20 vegetation plots, as did Technical Support Officers Shannel Courtney, Cathy Jones and Simon Moore (Nelson/Marlborough Conservancy).

Richard Toft of Landcare Research in Nelson provided a substantial amount of assistance and advice relating to wasp control in RNRP, and Jo Rees supervised the preparation of toxic wasp bait at Landcare's facilities in Nelson.

The Strategic Advisory Group and Technical Advisory Group (TAG) provided excellent advice throughout the year – refer to Appendix 5 for group membership. TAG members also provided practical support, including fieldwork, planning and editing, over and above the normal TAG business. Other staff from Nelson/Marlborough Conservancy assisted with mapping, data presentation and formatting, including Charmayne King and Geraldine Moore.

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Walker, K.J. 2003. Recovery Plans for *Powelliphanta* land snails: Threatened Species Recovery Plan 49. Department of Conservation, Wellington.

Whitaker 1994 Lizard monitoring protocols.

Appendix 1

RNRP REPORTS GENERATED

One major report was completed during 2007-08. This paper is soon to be published in the Nelson/Marlborough internal series:

Taylor, G., Moorhouse, R., Moran, L., Kemp, J., Elliot, G., and Bruce, T.: Kaka *(Nestor meridionalis)* management in the Rotoiti Nature Recovery Project, Nelson Lakes National Park, New Zealand.

This paper documents the effect of mustelid (in particular stoat, Mustela erminea) control on South Island kaka (*Nestor meridionalis*) nesting success and recruitment in the Rotoiti Nature Recovery Project, Nelson Lakes National Park, South Island, New Zealand, from 1997-2006. Fifty-seven percent of kaka nests were successful, and 79% of nesting females survived, at sites with predator control compared to 0.2% nesting success and 16% female survival at sites without predator control. Predator control kept stoat abundance at <5% tracking indices and possum abundance close to 0% Residual Trap Catch/WaxTag® chews. A level of predator control sufficient for the local recovery of a kaka population was achieved through trapping alone, although the use of brodifacoum to control rodents and possums probably killed additional stoats through secondary poisoning. A population model indicated that controlling predators within 825 ha of kaka habitat had a 40% chance of causing a local kaka population recovery whereas controlling predators within 2000 ha of kaka habitat had an 80% chance of doing so. Stoats (*Mustela erminea*) were the main cause of death of nesting adult females, nestlings and fledglings, but possums (*Trichosurus vulpecula*) were also important predators of adult females, eggs and nestlings.

Appendix 2

PROJECT REVIEWS

The following projects were formally reviewed by the RNRP Technical Advisory Group during the 2007-08 business year:

REVIEW DATE	REVIEW TITLE	FILE NAME AND LOCATION
April 2007	RNRP Robin Monitoring Review	RNRP Robin Monitoring Review dme://docdm-143057
October 2007	Vegetation Monitoring Review	RNRP Vegetation Review dme://docdm-210907
October 2007	20 x 20 Vegetation Plot Review (management, treatment, monitoring, research)	20 x 20 Vegetation Plot Review dme://docdm-210926

Appendix 3

RESEARCH REPORTS RECEIVED

Schnek D 2007. MSc thesis 'Role of introduced birds as competitors of native species in the Nelson Lakes National Park, South Island, New Zealand. University of Applied Sciences, Dresden, Germany.

Due to the broad nature of the topic chosen and a limited timeframe blackbird (*Turdus merula*) and the South Island robin (*Petroica australis australis*) were selected as comparison species due to overlaps in their ecology and feeding behaviours. Observations were made of other species as encountered and noted.

Below is a summary of results from Daniela's abstract:

Territory mapping, habitat use observation and invertebrate trapping were used to assess interrelations. Competition between the two species seemed to be minimal during the chosen timeframe (September and January). Patterns of territory use show strong interspecific interrelations. Results suggest that blackbird is a habitat generalist and that robin prefers specific structures within the forest. Populations of both species seem to be independent of each other. Other factors like predators or unfavourable habitat seem to be more important factors in limiting the robin population.

Appendix 4

PROJECT MANAGEMENT

Budget

2007-08 BUSINESS PLAN BREAKDOWN BY MAIN TASKS

ACTIVITY	STAFF HOURS [1]	OPERATING COSTS ($)	TEMPORARY WAGE COSTS ($)
Predator management	1250	$1,000	$32,600
Wasp control	554	$3,000	$0
Management of rodents	300	$0	$0
Vegetation monitoring	200	$0	$0
Native fauna monitoring	230	$0	$0
Small mammal monitoring	690	$3,000	$8,200
Project management	3859	$8,517	$0
Kiwi management	850	$8,500	$0
Possum control	161	$0	$0
Research Support	80	$0	$0
Advocacy	550	$2200	$0
Total	8724	$26,217	$40,800

[1] Does not include volunteer hours or R&D/technical support staff hours. Refer to Acknowledgements section for more detail.

Staffing

There were four permanent staff on the RNRP team during 2007-08: Paul Gasson (Team Leader), Anne Brow, Tammy Bruce and Andrew Taylor (Rangers - Biodiversity RNRP). The project was also supported by a Biodiversity Programme Manager who has approximately 50% of their time allocated to RNRP management. Following the departure of incumbent Brian Paton in November 2007, David Rees was appointed to the Programme Manager position in March 2008.

One field staff member was absent for approximately half of the year; and this gap plus two smaller gaps (a period of leave without pay and a period of one staff member performing higher duties) were generally filled through the appointment of temporary field staff. Two seasonal positions (a 5-month position and a 10-month position) were more or less filled as planned during 2007-08. Refer to the Acknowledgements (Section 7) for a comprehensive list of seasonal staff members.

In addition to "core" staff there were other Nelson Lakes Area Office staff who contributed hours to the running of the RNRP, particularly: Sally Leggett (Community Relations Ranger), John Wotherspoon (Community Relations Programme Manager), Sandra Wotherspoon (Biodiversity Ranger), Dan Chisnall (Biodiversity Ranger) and Dave Seelye (Ranger, Murchison).

Technical Advisory Group (TAG)

In early 2007 the establishment of a RNRP Technical Advisory group (TAG), comprising Nelson/Marlborough technical support staff, Nelson Lakes Area staff and a mainland island expert from R&D, was proposed to support the new RNRP team leader. This proposal was accepted in principle by the Nelson/Marlborough Conservator, Neil Clifton. The TAG met on 30 April 2007 to establish a Terms of Reference and provide advice on technical issues prior to 2007-08 business planning. The 'Rotoiti Nature Recovery Project Technical Advisory Group Terms of Reference' include the following roles and anticipated results:

TAG Roles

- Support the RNRP Team Leader by providing technical advice around detail and in establishing systems
- Provide quality technical direction
- Peer review work programmes
- Maintain and enhance the relationship with the RD&I mainland island coordinator
- Provide direction in the development of a strategic plan
- Provide the framework and input into the write-up of reports and scientific papers
- Provide the framework and input into the development of the planning, reporting, reviewing system
- Peer review and prioritize research proposals
- Integrate advice with that of the RNRP Advisory Group

Anticipated results

- A strategic plan for the RNRP by June 2008
- A system for planning, reporting, reviewing and tracking all trials and ongoing monitoring within the RNRP by June 2008
- Prioritized, well designed and implemented trials, monitoring and research programmes
- Effective integration with national initiatives
- Effective information transfer

TAG members during 2007-08 were:

- Paul Gasson (RNRP Team Leader)
- Alison Rothschild (Nelson Lakes Area Manager)
- Brian Paton (Nelson Lakes Programme Manager Biodiversity until end 2007)

- David Rees (Nelson Lakes Programme Manager Biodiversity 2008 onwards)
- Kerry Brown (Nelson/Marlborough Technical Support Officer - Weeds & Biosecurity)
- Peter Gaze (Nelson/Marlborough Technical Support Officer – Vertebrate Species)
- Mike Hawes (Nelson/Marlborough Technical Support Supervisor – Animal Pests)
- Craig Gillies (Research & Development – Scientist – Predators and Mainland Islands)
- Martin Heine (Nelson/Marlborough Technical Support Manager) also has an open invitation to attend TAG meetings.

The TAG also met during the business year on the 28 August 2007 and the 27 February 2008. Agendas and minutes of TAG meetings can be located through the RNRP Directory on the Department's Document Manager System DOCDM-139922

Strategic Advisory Group (formerly RNRP Advisory Group)

The RNRP Advisory Group has consisted of a number of external scientists and experts, as well as several Departmental staff with relevant expertise. In the past, RNRP Advisory Group meetings have been held annually, immediately prior to business planning in April. The RNRP Advisory Group met in March 2007 prior the 2007-08 business year, and discussions at this meeting led into the formation of the Technical Advisory Group.

Following the formation of the TAG a discussion was held about the role of the RNRP Advisory Group, and whether the group should consider longer ("strategic") timeframes rather than meeting prior to annual business planning ostensibly to give direction to the upcoming business plan. It was suggested that the RNRP Advisory Group could meet later in the year, and that this would allow the group to review the whole of the past field season, as well as considering the ideas and opportunities that could be developed over the coming year, to lead into action the following year. This suggestion received a favourable response, and the RNRP Advisory Group met again in July 2008, immediately following the completion of the 2007-08 year. During that meeting, a proposal to change the RNRP Advisory Group's name to 'Strategic Advisory Group" was discussed and endorsed.

The 2007 RNRP Advisory Group meeting was the final for three long-serving RNRP Advisory Group members; Dave Butler, Jacqueline Beggs and Peter Wilson. For various reasons, these members resigned after many years of service. Bruce Burns and Mick Clout were invited to join the group.

Strategic Advisory Group members in 2007-08 were:

- Bruce Burns, Landcare Research, Hamilton
- Mick Clout, Professor of Conservation Ecology, University of Auckland

- Graeme Elliot, Scientist, Department of Conservation, Nelson
- David Kelly, Assoc. Prof. Department of Plant and Microbial Sciences, University of Canterbury
- Eric Spurr, Landcare Research, Lincoln.

TAG members are included in the Strategic Advisory Group meetings. The TAG met immediately after the Strategic Advisory Group meeting, in order to translate discussions from the strategic meeting into actions with timeframes. This approach worked well.

Appendix 5

INTERNAL DEPARTMENT OF CONSERVATION DOCUMENTS

(DOC computer document reference numbers in brackets)

1.	RNRP Directory	(DOCDM-139922)
2.	RNRP Field Manual 2007-08	(DOCDM-77980)
3.	RNRP Technical Advisory Groups Terms of Reference	(DOCDM-139898)
4.	Possum captures	(DOCDM-102097)
5.	Tracking Calculator 2007-08: • Rodent tracking tunnel results • Mustelid tracking tunnel results	(DOCDM-186233)
6.	RNRP Fenn Database 2007-08: • Mustelid capture results • Mustelid captures –boundary vs. internal lines	(DOCDM-157346) 'Ann report' tab
7.	Predator and ungulate sign	(DOCDM-148952)
8.	Historic tracking tunnel data	(DOCDM-194250)
9.	Friends of Rotoiti stoat captures	(DOCDM-102508)
10.	RNRP wasp poisoning decision maker - scan of Landcare Research document	(OLDDM-622541)
11.	RNRP species lists – flora & fauna	(DOCDM-172620)
12.	Beech seed data	(DOCDM-60998)
13.	RNRP snail plot data - *Powelliphanta* monitoring results	(DOCDM-77964)
14.	Great spotted kiwi monitoring results	(DOCDM-156428)
15.	Kaka (*Nestor meridionalis*) monitoring – kaka encounter rate	(DOCDM-171970)
16.	5-minute bird count data	(DOCDM-196645)

Location of RNRP 20 x 20 vegetation plot data – Vegetation Plot Ring Binder in the RNRP office

Location of maps in Nelson Lakes office shared drive:

1.	Mustelid (stoat) trap line locations	s:/drive-mainland is-maps
2.	Mustelid captures per trap	s:/drive-mainland is-maps
3.	Robin (*Petroica australis*) monitoring locations	
4.	Kaka (*Nestor meridionalis*) monitoring - kaka seen heard	s:/drive-mainland is-maps