# Rotoiti Nature Recovery Project Annual Report 2008-09

## Nelson Lakes Mainland Island, Nelson Lakes National Park

FEBRUARY 2010

Department of Conservation
*Te Papa Atawhai*

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**Cover photo:** Shannan Huntly, trainee ranger, setting a DOC 200 trap on the 'middle of the range' trapline. Photo: Anne Brow.

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# Executive summary

## BIODIVERSITY RESTORATION OBJECTIVES

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

Mustelid control is in place within the Mainland Island to reduce predation on kaka, great spotted kiwi and other native birds. Ongoing mustelid control continued in the Rotoiti Nature Recovery Project (RNRP) during the report period. The process of converting Mark 6 Fenn's ™ to DOC 200's continued with every second trap being converted to a DOC 200. This year saw the lowest recorded catch rate for mustelids since 2001 however in conjunction with this, the highest tracking rate of 8% was recorded in February. This is only the second time that the 5% threshold has been exceeded sine 2002.

Kaka monitoring this year used an encounter rate method, carried out as an adjunct to checking trap lines over the spring-autumn. Kaka appear to be most plentiful in Big Bush as has been recorded previously. Future comparisons of encounter rates will be used to assess kaka population trends. No breeding activity was recorded this year.

Mistletoe monitoring of 70 individuals recorded an increase in size and health in all three species. No monitoring of *Pittosporum patulum* was carried out during the report period.

*Powelliphanta* sp. monitoring from alpine tussock plots on the St Arnaud Range indicated a declining trend in live snails and empty shells over the past nine years.

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

Thirteen great spotted kiwi of the RNRP population were recaptured this season and transmitters attached to assist with management. Five kiwi are currently unaccounted for. A kiwi dog, 'Fen', was purchased to assist with location of kiwi in the future and undertook training during the report period. As reproduction rate within the Mainland Island kiwi population has been low it is planned to supplement the population with young birds from Operation Nest Egg (ONE) eggs sourced in the Gouland Downs in Kahurangi National Park. To this end several great spotted kiwi in the Gouland Downs were fitted with 'egg-timer' transmitters in 2008-09 and will be monitored for 'incubation signals' in future breeding seasons.

## LEARNING OBJECTIVES

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

No rodent control was undertaken this year. Experiments on the effectiveness of the current rat bait delivery in the bait stations in the core area is planned for 2009-2010.

Tracking rates for rats and mice have remained below 20% at all sites, control and treatment, during the year.

### 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. Trials by FOR members on distances from poison lines that achieve effective kills of wasp nests indicate that more efficacious poisoning operations are possible in future. Further trials will be undertaken in 2010.

### Test the effectiveness of different translocation methods

No translocations were carried out this year.

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

Five-minute bird counts were undertaken at Lakehead and St Arnaud Range track at Lake Rotoiti and at the non-treatment site at Lake Rotoroa. Analysis of the last 10 years of data was carried out by James Dawber and should be completed shortly. Initial results suggest little difference in abundance measures for the monitored bird species between the control and treatment sites, which may relate to ineffective rat suppression on the treatment site. The most marked effects were related to altitude and affect tui, robin and silvereye. Despite the lack of appreciable effects the five-minute bird counts will be continued as it is one of the best datasets for the national data pool.

#### *Vegetation plots*

Two vegetation plots were measured this year which leaves half of the 32 control and treatment plots to be re-measured on the eight-year re-measurement cycle.

#### *Beech mast*

A partial beech seed-mast was recorded this year. The viability of seed was low however, so the energy contribution to the alpine beech ecosystem was low compared with previous mast-seed events.

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

No system is yet in place to record previously unreported native and non-native species.

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

Five researchers conducted work in the Mainland Island during the report period on a range of native and introduced species but no research was completed during the year.

## COMMUNITY OBJECTIVES

### Increase public knowledge, understanding and support for Mainland Islands and ecological restoration nationally through education, experience and participation

The Friends of Rotoiti (FOR) conservation volunteers continued their mustelid trapping control over more than 5000 ha adjacent to the RNRP as well as 250ha of rat trapping throughout the St Arnaud township, Black Hill and Brunner Peninsula. Members also carried out lizard monitoring within the rat control area. This group of dedicated volunteers contributed 230 work days during this year.

A total of 48 other volunteers (11 international, 37 New Zealanders) also contributed 198 work days during the year. These volunteers assisted with mustelid trapping, tracking tunnel monitoring and kiwi research.

Two editions of the Revive Rotoiti newsletter were published during the year. Promotion of the RNRP continued with displays and distribution of information through the Nelson Lakes National Park Visitor Centre.

A record number of school and university students (1261) received a presentation of the RNRP PowerPoint show during their stay at Rotoiti Lodge, with 37 presentations during the year. This PowerPoint show was also presented 16 times to 470 other visitors to Nelson Lakes. Also, 17 guided Honeydew walks and/or introductions to the RNRP were provided for 284 visitors (primarily secondary school students).

# 1. Introduction

The Rotoiti Nature Recovery Project (RNRP) is a 'Mainland Island' project established in 1996 to enable the recovery of a representative portion of an alpine honeydew beech (*Nothofagus*) forest ecosystem at Lake Rotoiti in Nelson Lakes National Park.

The project began with infrastructure development and baseline monitoring across 825 ha of forest on the western St Arnaud Range. Comprehensive pest control began in 1997. The project was established with control/ treatment sites so responses to management techniques at Lake Rotoiti could be compared with the control (non-treatment) site at nearby Lake Rotoroa. The first annual report covered the 1997-1998 business year.

South Island kaka (Nestor meridonalis meridonalis) were a key focus from the beginning of the project. DOC Science and Research Unit staff put considerable effort into radio-tracking kaka and monitoring nesting success in response to mustelid control. Kaka nesting success improved considerably and adult female mortality declined as a result of predator control when compared with non-treatment sites (Moorhouse et al. 2003).

In 2001-02 the extent of mustelid trapping was increased considerably and now over 5000 ha on the western St Arnaud Range and southern Big Bush is under sustained predator control as part of the Mainland Island. Trapping is also carried out by a local volunteer group, Friends of Rotoiti (FOR) in adjacent areas, encompassing some additional 5000 ha.

In addition to kaka, management of great spotted kiwi (*Apteryx haastii*) began in 2004 with the introduction of adult individuals from Gouland Downs in Kahurangi National Park. Additional introductions have ensured the successful establishment of a population. Some limited breeding has taken place, and kiwi chicks have survived, despite being known to be vulnerable to mustelid predation. The introduction of Operation Nest Egg (ONE) chicks is planned, with adults on the Gouland Downs fitted with transmitters this year in anticipation of egg removal in 2009.

The RNRP has been a leader in large-scale control of introduced wasps (*Vespula* spp.) and, under a Landcare Research experimental use permit, the RNRP has been used as a trial site. Experiments have been undertaken with the toxins Finitron and Fipronil and further work on improving efficacy is ongoing. Use of the toxins is insecure however, and after 2010 they are unlikely to available. It is hoped that new poison will be available after this and the Mainland Island is likely to be a trial site.

Rodent control has had a chequered history in the core area of the Mainland Island. Initial control of rodents, rats in particular, was effective with brodifacoum and 1080 between 1997 and 2000. After a Departmental review of the use of brodifacoum a switch to snap-trapping at a density of one trap/ha proved ineffective at knocking rodent numbers down, especially during rat plagues following a beech mast-seed event. No rodent control has been undertaken since 2007-08, but plans for long

term rat control are underway. Small passerines are expected to benefit from sustained rat control and ongoing use of five-minute bird counts and robin (*Petroica australis*) monitoring provides a response measure for rodent control.

Other pest species under management include possums, feral cats, ungulates, pigs and hedgehogs using a mixture of techniques.

Monitoring of native species' responses to pest control include browse-sensitive plants, three species of beech mistletoe, the critically threatened understory plant *Pittosporum patulum*, and *Griselinea littoralis*. Beech seedfall and *Chionochloa* tussock flowering are monitored as 'ecological drivers' of rodent and subsequent mustelid population increases, and 20 x 20 vegetation plots are monitored to determine the trends and responses of native vegetation to multiple species pest control.

Invertebrate monitoring has included *Powelliphanta* snails, as well as beech scale insects and honeydew production due to their importance as 'ecological drivers' in the honeydew beech forest ecosystem.

In addition to the 'core work' undertaken by RNRP staff, a steady stream of students conduct research in the Mainland Island, which adds to our understanding of the alpine beech forest ecosystem functioning and improves pest control. Some time and money from the RNRP budget is used to support these projects.

The involvement of the local and wider community in the RNRP is essential for the success of the project and there is a strong theme of advocacy and participation. Volunteers have undertaken hundreds of days of work in support of the Project over the past 12 years by FOR, trainee rangers, Conservation Corp crews and the Over-50s tramping club. Staff have also given time for other departmental and community initiatives and attended workshops and conferences to transfer knowledge to the wider community. Advocacy has included presentations to many school and community groups, guided walks, displays in the Nelson Lakes Visitor Centre, information panels within the Mainland Island and various printed media. Many events and achievements from the RNRP have also been picked up by local and national media, including the listing as one of the Top 25 Ecological Restoration Sites in Australasia.

Although day to day work on the Mainland Island progresses in response to annual or multi-annual ecosystem cycles, no operation of this scale can operate without a vision and objectives to provide guidance in the medium term. Therefore the publication of the Rotoiti Nature Recovery Project Strategic Plan for 2008-2013 (Brown and Gasson 2008) has provided the planning framework and goals for the operation for the next four to five years and has highlighted the three major themes running through the project, namely;

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

It is essential these themes remain the core values for ongoing restoration work within the Rotoiti Mainland Island for the future. The Technical Advisory Group and external advisors contribute an essential role in overseeing and guiding these themes.

# 2. Biodiversity restoration objectives

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

### 2.1.1 Introduction

The RNRP Strategic Plan 2008-2013 identifies six threatened species will 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.

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

Populations of kaka, an endemic forest parrot, are declining due to predation by a suite of introduced mammalian predators, principally the stoat (Mustela erminea). Mustelid trapping 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 and DOC 250 traps was commenced as they are more effective and humane than their predecessor. 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. More extensive cat control was established in the 2008-09 year. Other native bird species are likely to benefit from predator control, particularly great spotted kiwi, weka and probably New Zealand falcon, as they are all ground nesters.

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

*Pittosporum patulum* and native snail *Powelliphanta* "Nelson Lakes" populations may also be adversely affected by red deer (*Cervus elaphus scoticus*) and hare (*Lepus europaeus*) browsing alpine vegetation. Detrimental browse of juvenile *Pittosporum patulum* plants has been attributed to red deer. Red deer impact on *Powelliphanta* habitat through concentrated browsing and trampling in the mountain beech/tussock ecotone that is favoured by deer and *Powelliphanta* "Nelson Lakes" alike. Deer and pig sign have been recorded by staff during 2008-09. Hunting was undertaken to target these animals. Deer and pig 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

Twenty-one mustelid trap lines (882 traps/88.2 km of trap line) were maintained, encompassing the 5000 ha project area in 800 ha blocks, as in previous years (Fig. 1). The DOC trap upgrade continued this year, replacing every second Mark 6 Fenn™ trap with either DOC 200 or 250 traps. The spacing between traps remains at 100m. All traps are single set, baited with white hen eggs and enclosed within plywood boxes. The notable difference between the two types of boxes is that the Fenn™ boxes have no base whereas the DOC boxes have a base attached. Both box designs are to DOC 'best practice' lengths for use where weka and kiwi are present. Rocks are placed on the top of the boxes to prevent them being tipped over and exposing non-target species to set traps.

This year the Animal Health Board (AHB) carried out their annual Kawatiri-St Arnaud ferret survey to the west of the Mainland Island, as ferrets can act as vectors for TB. They caught four stoats and three cats in the area between Black Hill, Teetotal and Buller Bridge/State highway. The contractors 'Dead Right Pest Control' undertook the Rainbow ferret survey in the Wairau Valley during April and May.

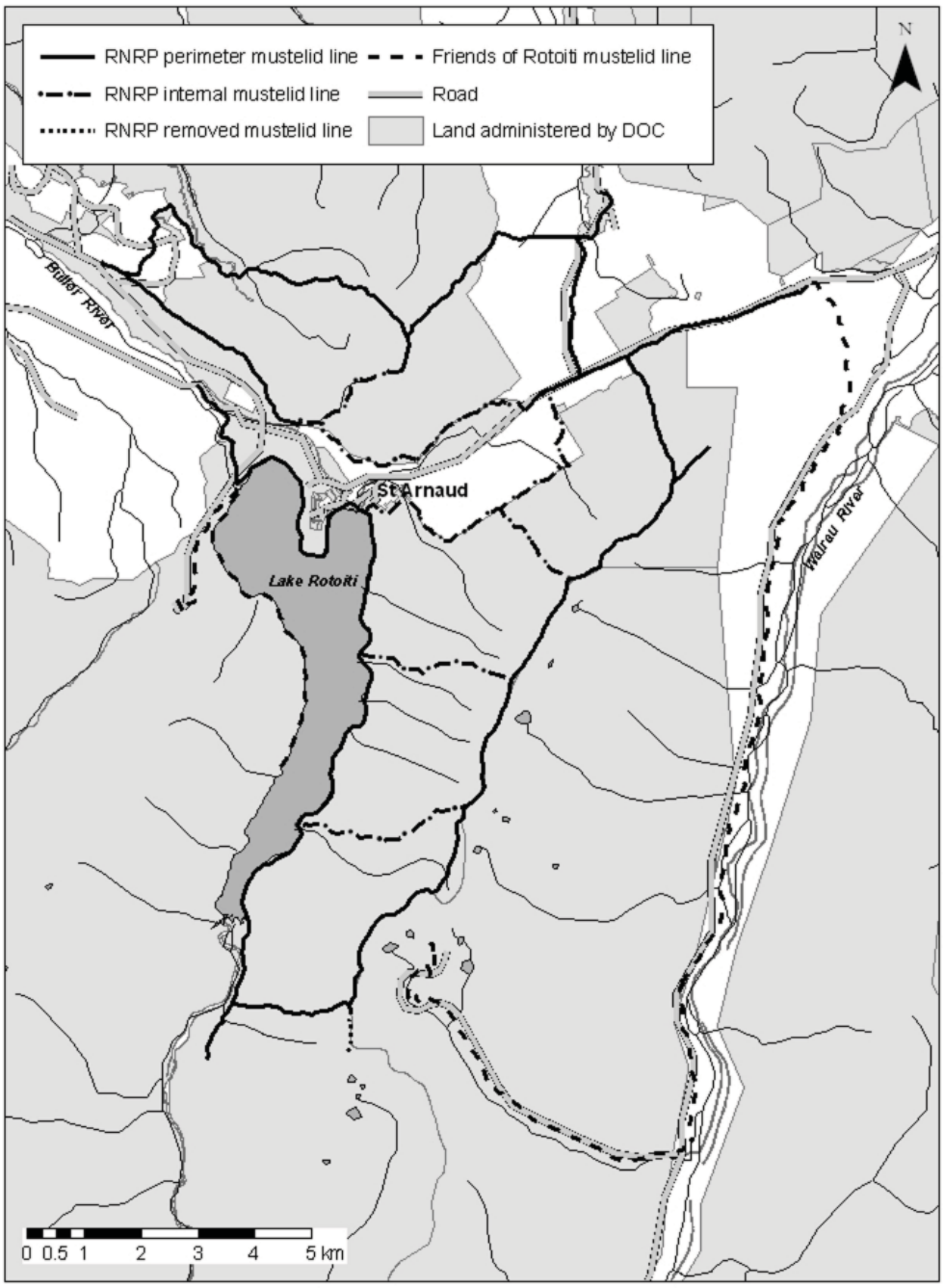
#### *Snow and wind damage*

In August 2008 the Nelson Lakes area had a very heavy snowfall which resulted in substantial amounts of treefall. Where trap-lines went through the red beech and manuka forest in particular, there were extensive areas of clearing required. It was an arduous task for the staff to clear the lines, which took the better half of a year to rectify. Contractors were used also for three days to clear the worst section on traplines DPS and BVS and the lower rat grid. Trap checks have continued where possible to our usual prescription of fortnightly October to April and monthly May to September.

#### *Changes to trap lines*

Traps BVS 6-22 were moved from the fence line/Big Bush boundary uphill 100m now that work has begun on the "Beech Nest" subdivision, otherwise traps would have been within the subdivision boundary. Hopefully the relocation of this section of the line will also curb the vandalism that occurs occasionally. SBF, DPS and GBF trap lines were re-numbered this year to reduce confusion in the field.

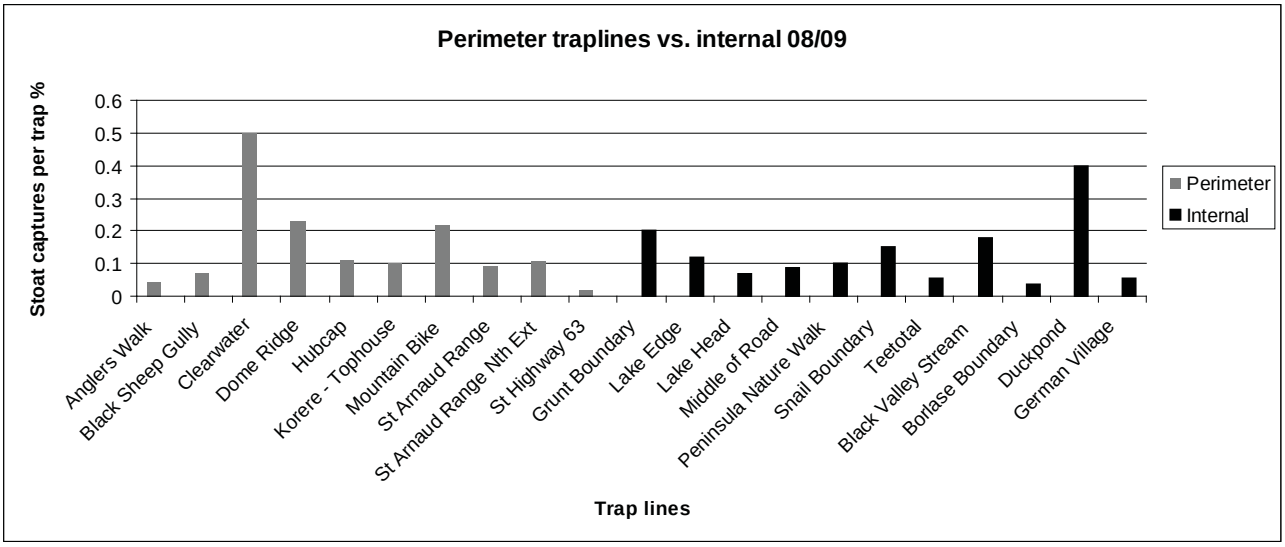
Figure 1: RNRP and FOR mustelid trap locations



### *RNRP mustelid control results*

This year 109 stoats, two weasels and two ferrets were caught (Fig. 2). These figures are the lowest recorded since the project expanded to 5000 ha in 2001.

Figure 2: Percentage captures of stoats in RNRP perimeter and internal traplines over 2008-2009




The perimeter spurs 'Clearwater' 'Dome Ridge' and 'Mountain Bike' and the internal spurs 'Grunt' and 'Duckpond' had the highest catch rates (Fig. 1). 'Clearwater' is on the southern boundary of the Mainland Island so it is not surprising the number of captures were high. The 'Grunt' line results once again should be noted as it is on the southern boundary of the Mainland Island 'core' area, and has two additional trap lines north and south of it as well as from above and below (St Arnaud Range and Lake Edge trap lines). The six stoats caught on this line were all caught in the high altitude beech forest section of traps, which is similar to 2007/08 results. 'Duckpond' had typically had low trap success, but this year became the most productive internal trap line. DOC 200's were put in place on this line prior to the beginning of the financial year as part of a field trial that begun in July 2008. Of the eight stoats caught five were caught in DOC200's.

Other non-target species caught this year were: 267 rats, 253 hedgehogs, eight cats, four blackbirds, one tui and two weka (see the discussion section below).

### *Field trial*

A one year field trial was carried out this year, testing the efficacy of Mark 6 Fenn™ traps compared with DOC 200 traps at catching stoats. The trial was a partial replication of the DOC Te Urewera field trial that took place in 2004-07 (see olddm-767156).

**The design:** 11 trap-lines were included in the field trial (218 Fenns and 214 DOC 200's) they were: DPS, DOF, BSG 1-20, KTF, SHW, HBC, PNW, MTB, GVF, LEF + LHF. The DOC 200 traps were deployed prior to the trials start date in July 2008. These trap lines were serviced to the usual prescription (as stated earlier).

**The capture results:** 28 stoats were caught in DOC200's and 27 in the Mark 6 Fenn traps. The results indicated that new DOC 200 traps captured similar numbers of stoats as weathered Fenn traps. The DOC200s are definitely more humane at killing stoats as well as non-target species, rats in particular. The results for this trial will be written up fully early in the 2009-10 year.

### *Friends of Rotoiti mustelid control methods*

As in the previous year, three mustelid trapping lines have been maintained as a buffer to the Mainland Island project. A total of 319 traps are in operation, spaced at 100m apart.

**Rainbow Valley Line (including a seasonal deployment up the ski-field road):** The longest line with 243 traps is the Rainbow Valley line, including 68 traps which are positioned along the Rainbow Skifield Road during the warmer months. These seasonal traps were put out in November 2008 and removed for the winter in May 2009. In September 2008 all traps on this line were renumbered and GPS readings taken, with all odd numbers being DOC 250 traps and even numbers are Fenn™ traps. Four additional traps were added to this line in October 2008, from the turn-off to the Skifield Road up to the Six Mile Ford. In response to the three weka captures on this line during the summer of 2008-09, the size of the entrance hole in the DOC 250 tunnel boxes has been reduced. Originally the entrance hole was 80mm x 80mm (DOC 250 best practice), and in January and February 2009, all wire mesh entrances on the DOC 250 timber tunnels have been reduced in size to 60mm x 60mm (DOC 200 best practice) to exclude weka. This was achieved by stapling a new section of mesh with the smaller hole directly over the original mesh end.

**Whisky Falls Line:** In October 2008, this line was extended from Whisky Falls along to Coldwater Hut, increasing this DOC 200 trap line from 54 to 81. In December 2008, a bait trial was commenced comparing a long-life rabbit based polymer bait with standard white hen eggs. The 41 odd-numbered traps used the polymer baits and the 40 even-numbered traps were baited with eggs. This trial is to determine which bait type attracts a greater proportion of stoats to DOC 200 traps over a 12-month period. The field work is being carried out by the FOR.

**Mt Robert Line:** The remaining Fenn™ traps on this line were replaced with DOC 200 traps in October 2008, so this line of 17 traps is now all DOC 200s.

The trap checks continue to differ to those in the RNRP with checks occurring weekly in the warmer months of December, January and February, fortnightly during March/April and October/November, and monthly through the remaining colder months of the year. Bait changes occur every eight weeks. Results of trapping are shown below (Table 1 & Figure 3)

### *FOR mustelid control results*

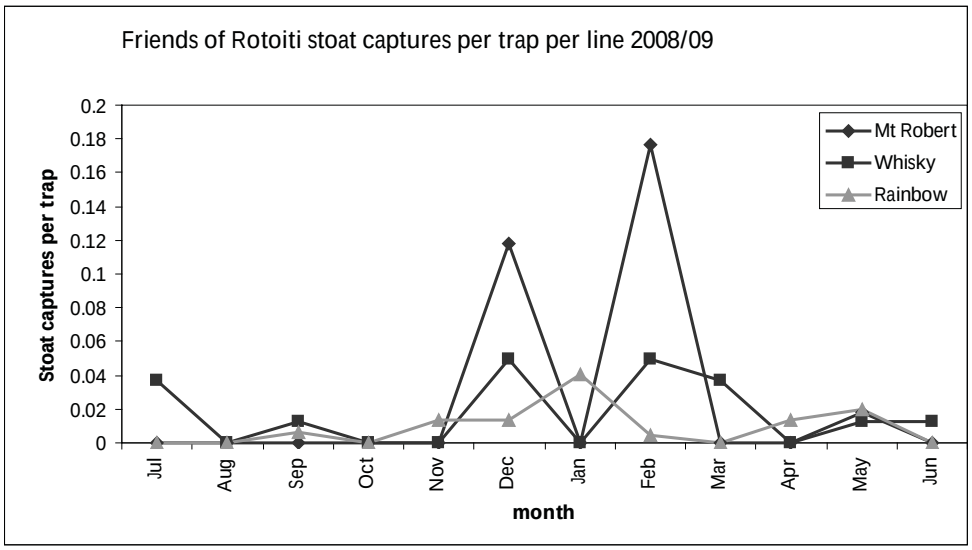
TABLE 1. FRIENDS OF ROTOITI TRAPLINES: MUSTELID CAPTURES 2008-09

| MONTH | STOAT | WEASEL | FERRET |
|---|---|---|---|
| July | 3 | 0 | 0 |
| August | 0 | 0 | 1 |
| September | 2 | 0 | 0 |
| October | 0 | 0 | 0 |
| November | 3 | 0 | 0 |
| December | 9 | 0 | 0 |
| January | 9 | 0 | 0 |
| February | 8 | 0 | 3 |
| March | 3 | 0 | 1 |
| April | 3 | 1 | 0 |
| May | 7 | 0 | 0 |
| June | 1 | 1 | 0 |
| TOTALS | 48 | 2 | 5 |

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

- 83 hedgehogs
- 28 possums
- 118 rats
- 12 rabbits
- 6 cats
- 1 magpie
- 3 weka
- 1 bellbird

Figure 3: Friends of Rotoiti stoat captures per trap per line 2008-09




### *RNRP mustelid population monitoring methods*

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

The mustelid monitoring lines were upgraded to DOC Best Practice in 2008-09. The mustelid monitor is carried out using tracking tunnels with Tracka® cards and rabbit meat bait set in black coreflute tunnels to the best practice method described by Gillies and Williams (2004). Refer to the 'RNRP Field Manual 08-09' for further details.

In 2008-09 the mustelid monitoring was carried out as follows:

- RNRP Core – November, January and February
- Big Bush and Lakehead – November, January and February
- Rotoroa – November, January and February.

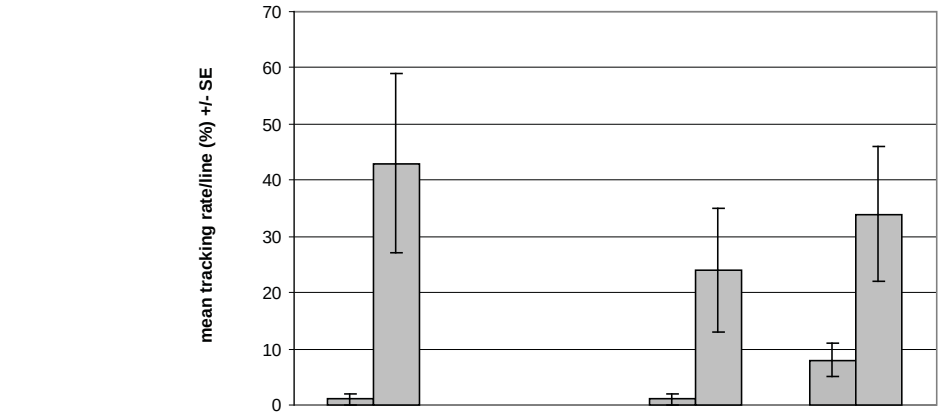
The UE, LE and M lines at Rotoroa have been moved to reduce safety concerns on these lines. The UC, LC UD and LD lines have not yet been realigned and were not run in 2008-09. They are to be realigned in 2009-10 to increase the number of lines and improve the measure of error for results there.

### *RNRP mustelid population monitoring results*

Detailed tracking tunnel descriptions, results and graphs are found in the Excel document 'Tracking Calculator 2008-09'. Detailed tracking rates and graphs throughout the project's history are found in the Excel document 'Tracking Tunnels through time'.

Rotoiti and Rotoroa mustelids track results are shown in Fig. 4.

Figure 4. RNRP MUSTELID TRACKING 2008-09




| | Nov-08 | Dec-08 | Jan-09 | Feb-09 |
|---|---|---|---|---|
| Rotoiti (Core, Lakehead and all Big Bush lines) | 1 | | 1 | 8 |
| Rotoroa | 43 | | 24 | 34 |

### *Discussion*

The low stoat capture rates within the Rotoiti area were encouraging but tempered by the spike in tracking rate to 8% in February. In November and January the mustelid tracking in the Rotoiti area remained below the recommended <5% mean tracking rate/line - the rate below which research has shown to be of most benefit to kaka populations (Greene et al. 2004). This is only the second time that the 5% rate has been exceeded since mustelid monitoring began in December 2002. The lines that were tracked by mustelids in the Rotoiti area were the W line (3 consecutive tunnels) and the X line (tunnels 1 and 7); both of these lines are located at the northern boundary of the Rotoiti area. One tunnel was also tracked within the Mainland Island core area on upper Grunt.

In comparison mustelid tracking at Rotoroa has been moderate compared to previous years with tracking rates fluctuating between 24 – 43%.

The increase in the stoat tracking index and the low stoat capture rates this year seem to be contradicting each other. The stoat capture rates between the two main varieties of trap types (DOC 200's and Fenns) were fairly evenly spread, even though there are still currently more Fenn traps in place. One theory might be that stoat numbers are truly low and that one or two stoats tracked all the tunnels rather than individual stoats tracking a tunnel each. Another theory might be that due to the low rat numbers this year there are a lot of "new/clean" DOC traps present that have not had a "first kill" which appear to improve effectiveness in achieving future kills (Christie et al. 2009). To check the latter possibility, the trap capture success for DOC200s for the year was analysed. It is apparent that once a trap has caught an animal the chance of it re-capturing an animal increases substantially. In fact 74% of the captures

of DOC200's occurred in traps with a previous capture history compared with 26% of single/one-off captures.

Figures were also analysed from the 11 field trial lines (DOC200's that have been in place for a full year) these show that 28% of the DOC 200 traps had a capture of some type, 30% had been sprung off with no capture and 42% of the traps were unaffected.

#### *Weka captures*

Two weka were caught this year in the Mainland Island, one in a DOC250, the other in a Fenn trap. Three additional weka were caught on FOR traplines. The DOC250 box meets the recommended Best Practice lengths, but the entrance hole on the DOC250's is 5mm larger on all sides, due to the wire mesh used (13 x 13 mm not 20 x 20mm mesh as recommended) meaning the hole would have to be made slightly smaller or larger. At the time we opted for the larger hole (to keep catching hedgehogs) but since catching weka we have reduced the hole size by attaching an L shaped piece of mesh making the entrance size 75 x 75mm, smaller than the DOC Best Practice measurements (80 x 80mm). No weka have been caught since the entrance hole was reduced from 80mm2 to 60mm2.

The weka that was caught in the Fenn box had not gone through the internal baffle, and the box was found upside down. Rocks are placed on the top of all of the Fenn boxes to prevent them being tipped over but it appears this one did get tipped over (by an unknown agent) and unfortunately the weka set off the trap.

### 2.1.3 Feral cat control and monitoring

#### *Methods*

A fixed line of twin Belisle Super X220 cat kill-traps set in chimney tunnel boxes on the ground (as per DOC Best Practice) was established along the Lake Edge stoat trap line (LEF) this year. The cat trap line begins at trap site LEF57 and heads south to the end of the LEF line (LEF137) finishing up at Lakehead (LHF 1). The line was originally meant to start at the beginning of the LEF trap line but the first three trap sites (LEF 51, 53 & 55) were not ideal sites for such a large box, due to the slope and thick fern.

The boxes were spaced 200m apart, ~3m from the existing stoat trap sites, and house two kill-traps, one at each end. The traps were baited with Connovation Erayz™ dehydrated rabbit polymer bait. The cat boxes were put out to weather in June 2008, traps installed in February/March 2009 and the first trap check was in April.

#### *Results*

From four trap line checks up to end of June 2009 one cat and 10 possums have been caught.

### *Discussion*

There have been a surprising number of possums caught in the cat traps; it is unknown whether they are resident possums or ones travelling along the Lake Edge track. In time this may become apparent. All but one of the possum captures have been south of the "core" boundary area. Unfortunately these traps are not intended for killing possums and therefore do not generally catch possums humanely. If possum interference continues then some form of localised possum control, Warrior traps or cholecalciferol gel bait for example, may need to be used along this line.

Next year this line is going to be run as a field trial to see if this style of targeted cat control can reduce the by-catch of cats caught in the stoat traps along the Lake Edge Line. Before the trial can begin however the remaining Fenn traps (43) need to be replaced with DOC 200's. The current baiting plan is to check the cat traps monthly year round providing the Erayz™ bait lasts well in summer.

## 2.1.4 Possum control and monitoring

### *Methods*

Kill trapping continued along the 'Borlase Boundary', 'German Village', 'Snail Boundary', 'Grunt Boundary' and 'MOR' trap lines with the intention of protecting the core area. Trap results are presented below (Table 2).

A wax-tag possum index was undertaken in June 2009 using the NPCA wax-tag

monitoring protocol. The resulting 4.6 % indice of abundance indicated possum densities have increased within the RNRP Core since the last monitor in May 2006 which had a result of 2.5 %. For results refer to Docdm-458218

### *Results*

TABLE 2: RNRP POSSUM CAPTURES FOR 2008-09

| MONTH | BORLASE BOUNDARY | GERMAN VILLAGE | SNAIL BOUNDARY | GRUNT BOUNDARY | MOR |
|---|---|---|---|---|---|
| July | 0 | 0 | 0 | 1 | 2 |
| August | 0 | 0 | 0 | 1 | 0 |
| September | 0 | 0 | 0 | 0 | 1 |
| October | 0 | 0 | 0 | 0 | 2 |
| November | 0 | 0 | 0 | 0 | 0 |
| December | 0 | 0 | 0 | 0 | 1 |
| January | 0 | 0 | 0 | 0 | 2 |

| MONTH | BORLASE BOUNDARY | GERMAN VILLAGE | SNAIL BOUNDARY | GRUNT BOUNDARY | MOR |
|---|---|---|---|---|---|
| February | 0 | 0 | 0 | 0 | 1 |
| March | 0 | 0 | 0 | 0 | 1 |
| April | 0 | 0 | 0 | 0 | 0 |
| May | 0 | 0 | 0 | 1 | 1 |
| June | 0 | 0 | 0 | 0 | 0 |
| Rat captures | 0 | 0 | 0 | 0 | 0 |
| **Total possums** | **0** | **0** | **0** | **3** | **11** |
| # Traps | 60 | 23 | 10 | 10 | 12 |
| Capture/trap* | 0.00 | 0 | 0 | 0.3 | 0.9 |

* Not corrected for sprung traps

### *Discussion*

Most possums were caught on the southern boundary (MOR). The next highest capture rates were recorded on 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 AHB possum control areas.

The total number of possum captures declined significantly in the past 12 months. It is possible that the change from aniseed cereal bait to a wooden dowel soaked in cinnamon/aniseed oil has reduced the capture rate or the reduction in frequency of bait changes with wooden dowel lures in place has reduced the encounter rate with the traps by possums.

The current trapping regime has focused on protecting the RNRP Core Area, which is done by trapping the boundaries only with no internal control. The waxtag monitor has indicated an increase in possum densities within this area therefore there is an apparent requirement to increase control within the core area. This increased level of control, and possible change back to the cereal bait, will be initiated in the 2009-10 year.

## 2.1.5 Deer control and monitoring

### *Methods*

The project staff note 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 deer numbers remain an issue on the St Arnaud Range. The number of records of sign was 17 for deer and one for chamois, compared to 16 records for a comparable time last year. Two stags were heard roaring on the MOR spur in late March.

The 'Protocol for Removing Deer' has been used by staff members who were interested in hunting to remove deer from the core area in their own time.

Staff went into the Core to hunt on four weekends during the year. Only one staff member was successful – removing one 12 point stag from the Perculator Spur to the south of the St Arnaud Range track on the 16th of May. A further three hinds and two males were seen on the 16th of May, including a spiker. Pig sign was recorded at Lakehead. A staff member removed a pig in May and Scott Theobold (DOC Dog trainer) searched for pigs at Lakehead in late June.

### *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. Alternative 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

### *Methods*

A kaka encounter rate monitor is run in conjunction with the mustelid trapping programme during the fortnightly cycle trap checks from the beginning of October through to the end of April. Staff/volunteers checking mustelid traps record kaka seen or heard and the location on the trap line.

Information collected during these surveys will provide a long term coarse population trend within the project area in lieu of close-order monitoring, which demands substantial resources and time.

### *Results*

Kaka were encountered at the sites shown below (Fig. 5) and The rate of kaka encounters (seen and heard) per hour on each trap line during the survey period was recorded (Table 3).

Figure 5. Map of Rotoiti Mainland Island showing locations of encounters of kaka (October 2008-April 2009)

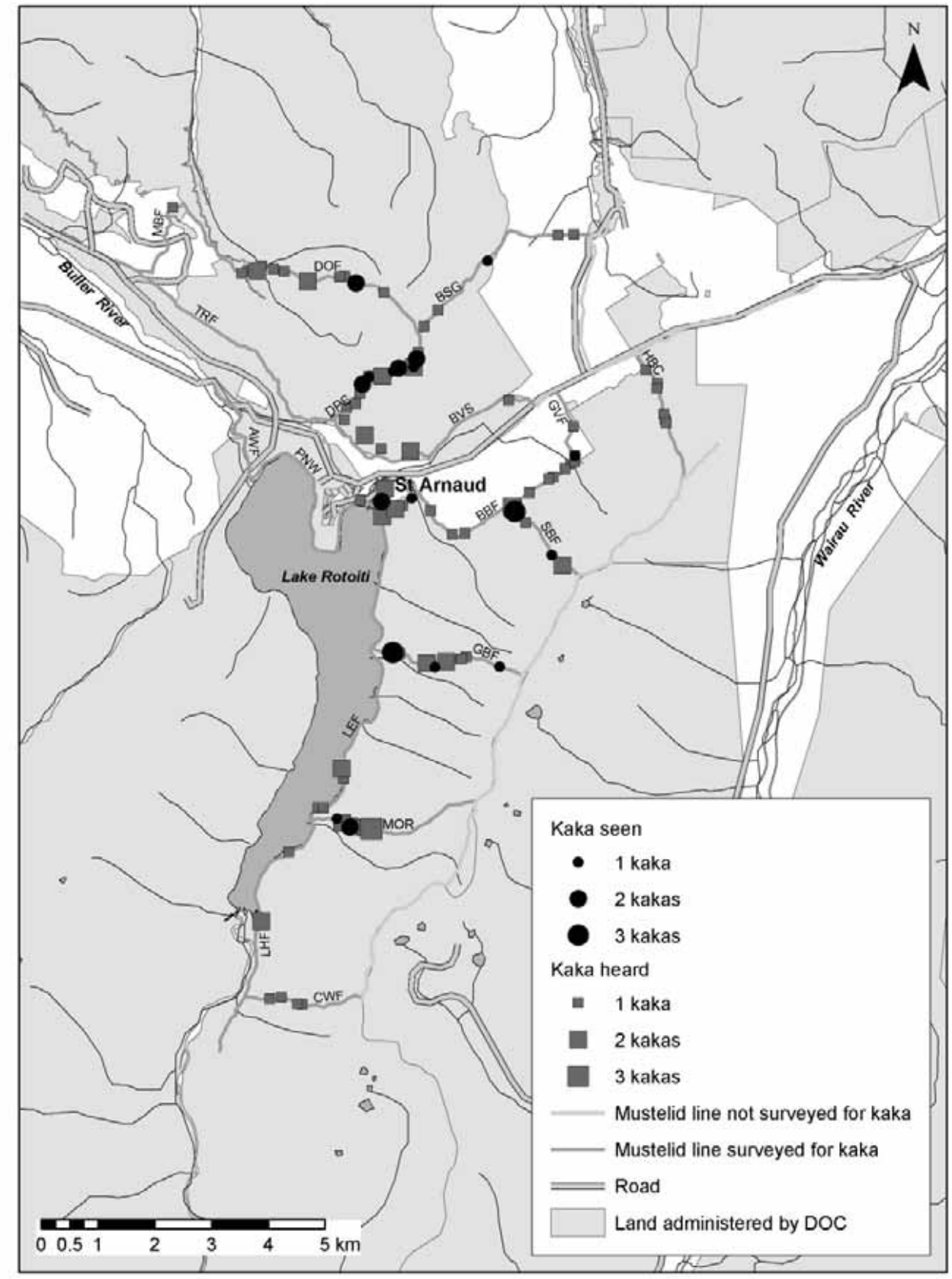


TABLE 3. KAKA ENCOUNTER RATE ON RNRP TRAPLINES (OCTOBER- APRIL 2008-09)

| TRAP LINE (ABBREV.) | HOURS SURVEYED | KAKA SEEN | KAKA HEARD | ENCOUNTER RATE PER HOUR SEEN + HEARD |
|---|---|---|---|---|
| LEF | 53 | 0 | 10 | 0.189 |
| LHF | 21 | 0 | 3 | 0.143 |
| HBC | 24 | 0 | 6 | 0.250 |
| SBF | 27 | 4 | 8 | 0.444 |
| AWF | 13 | 0 | 0 | 0.000 |
| PNW | 24 | 0 | 1 | 0.042 |
| CWF | 26 | 0 | 4 | 0.154 |
| GVF | 15 | 1 | 4 | 0.333 |
| BBF | 32 | 3 | 10 | 0.406 |
| DPS | 22 | 8 | 15 | 1.045 |
| DOF | 39 | 5 | 17 | 0.564 |
| MTB | 24 | 0 | 1 | 0.042 |
| BSG | 39 | 1 | 4 | 0.128 |
| GBF | 22 | 5 | 7 | 0.545 |
| BVS | 38 | 0 | 8 | 0.211 |
| TRF | 40 | 0 | 0 | 0.000 |
| MOR | 27 | 3 | 8 | 0.407 |
| TOTAL | 486 | 30 | 106 | |

### *Discussion*

Kaka were apparently breeding elsewhere in New Zealand this summer but as only two female kaka were fitted with transmitters at Rotoiti it was hard to gauge local success. Both females appeared to prospect nest holes but did not nest. The kaka encounter rate survey showed that DPS then DOF, both in Big Bush, had the highest encounter rate per hour this year. Big Bush has substantial numbers of mature red beech trees, which are favoured by kaka for nest holes. The majority of kaka were seen or heard between October and February.

Kaka, although not as closely monitored as they once were, are still one of the outcome RNRP monitor species for stoat control so the spike in tracking numbers for stoats in February was cause for concern. Keeping the tracking rate below 5% is believed to provide the most benefit to kaka populations (Green et al. 2004).

No kaka were seen or heard on TRF line this year. This line heads alongside the Teetotal farm/recreational area boundary and the Big Bush Conservation area. Sections of the line traverse native bush (beech and manuka) and forestry (pine and gum). No kaka were heard (again) on the AWF. This line follows a public walking track bordering the Buller river and is surrounded predominately by manuka, but with scattered pockets of silver and mountain beech.

Four out of nine kaka observers were the same as last year which provided continuity. It is quite hard to be sure that kaka seen were not also kaka heard at some other point along the line, especially when flying kaka are recorded so results need to be assessed conservatively.

### 2.1.7 Mistletoe (*Alepis* and *Peraxilla*) monitoring

Based on the 'RNRP vegetation review' and recommendations from the Technical Advisory Group and advisors, the decision was made to continue mistletoe monitoring as it was one of the few results from the project that is comparable to monitoring within other Mainland Islands.

The review recommended two lines of mistletoe work;

- Foliar Browse Index (FBI) monitoring in winter tied to possum chew stick monitors as a biological measure.
- Measuring mistletoe recruitment into the RNRP Lower Core area.

It was decided that a minimum of 30 plants per species should be identified for FBI monitoring. A full FBI monitor will be undertaken to coincide with the possum wax tag monitor in August 2009.

Historically, many of the mistletoe discovered within the Core have been marked by staff using flagging tape. This follows in the tradition of a former staff member James (Jimbo) McConochie who had an uncanny knack of finding obscure mistletoe and marking trees with flagging saying "Jimbo's Mistletoe".

To create a baseline from which to measure recruitment a survey was undertaken in 2008-09. Based on historic mistletoe records and flagged mistletoe, the decision was made to survey the following alternate lines of the rat grid for mistletoe – Lake Edge, Aa, B, D, F, H, J, L, N, Borlase Boundary and Grunt Boundary. The survey was undertaken in summer and autumn to coincide with flowering.

The health of tagged mistletoe was checked and any mistletoe marked with flagging tape have now been tagged and bought into the mistletoe records. Records were completed for each plant, a digital photo was taken and filed and a FBI assessment was undertaken to get a baseline measure of health.

The follow plants were located and surveyed:

- 30 *Peraxilla colensoi*
- 28 *Peraxilla tetrapetala*
- 12 *Alepis flavida*

TABLE 4 : MEAN MEASUREMENTS OF MISTLETOE PLANTS LOCATED IN THE ROTOITI MAINLAND ISLAND 2008-09

| SPECIES | HEIGHT (MM) | WIDTH (MM) | DEPTH (MM) | FOLIAR COVER (%) | DIEBACK (WHOLE) | BROWSE (WHOLE) |
|---|---|---|---|---|---|---|
| PERcol | 1438 | 2172 | 1148 | 43 | 0.3 | 0.2 |
| PERtet | 1091 | 1467 | 796 | 40 | 0.5 | 0 |
| ALEfla | 1221 | 1192 | 887 | 26 | 0.7 | 0 |

#### *Results*

Mistletoe plants found within the Mainland Island Core Area are generally very healthy – there are some very large specimens that appear to be thriving (Table 4). Browse was recorded on seven of the *Peraxilla colensoi* plants and one *Peraxilla tetrapetala* plant – all other plants had no browse recorded.

A comparison was done between individual tagged plants surveyed in 2001-02 and 2008-09. The sample size was small for all three species (ALEfla – 8, PERcol – 2, PERtet – 5) but all three species showed a large increase in size and health.

ALEfla and PERtet have shown a three-fold increase in volume while the PERcol has shown a 12-fold increase. It is unclear how much can be attributed to growth and how much is due to reduced browsing.

### 2.1.8 *Pittosporum patulum* monitoring

No monitoring was carried out on *Pittosporum patulum* in 2008-09.

*Pittosporum patulum* monitoring was included as part of the 'RNRP vegetation review'. Field work is planned for 2009-10 based on the recommendations from the Technical Advisory Group and advisors.

### 2.1.9 *Powelliphanta* sp. monitoring

#### *Methods*

*Powelliphanta* 'Nelson Lakes' plots are monitored within the RNRP. The snail plots consist of three 10m x 10m plots (i.e. 12 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* (Walker 1993) is used.

#### *Results*

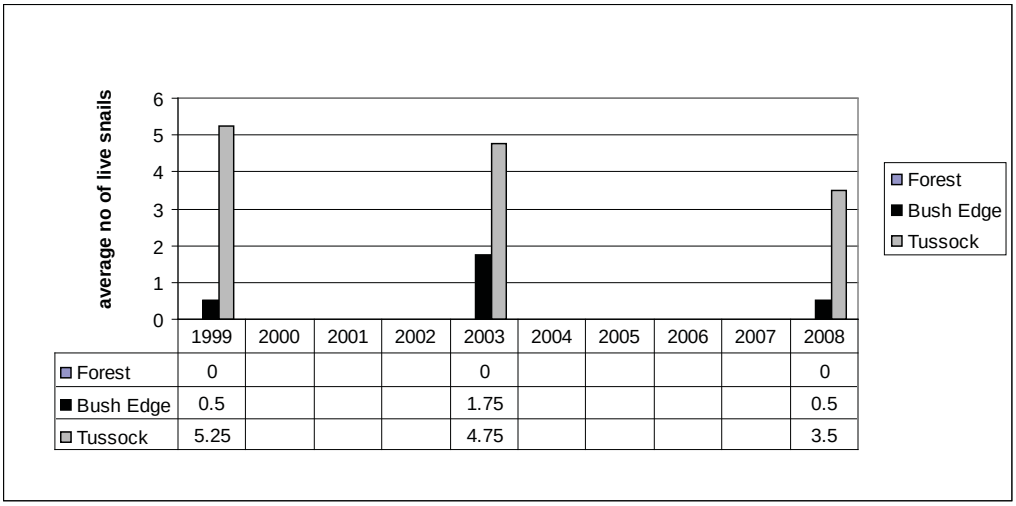
Two of the 12 5m x 5m quadrats (F & L) were resurveyed in autumn 2008-09 – these were the two quadrats left outstanding from 2007-08, completing the snail monitor (Figs 6, 7 and 8).

In total nine live snails were found during the 2008-09 survey.

In total entire two empty shells were found during the 2008-09 survey.

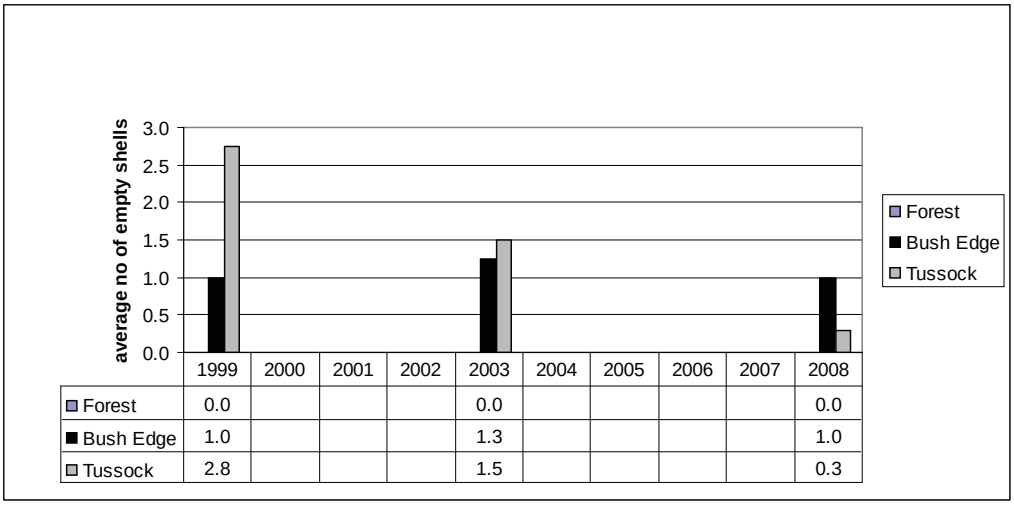
Detailed results and graphs can be found in the Excel document 'RNRP Snail Plot Data'.

Figure 6: Change in numbers of live *Powelliphanta* 'Nelson Lakes' in three habitats 1999-2008



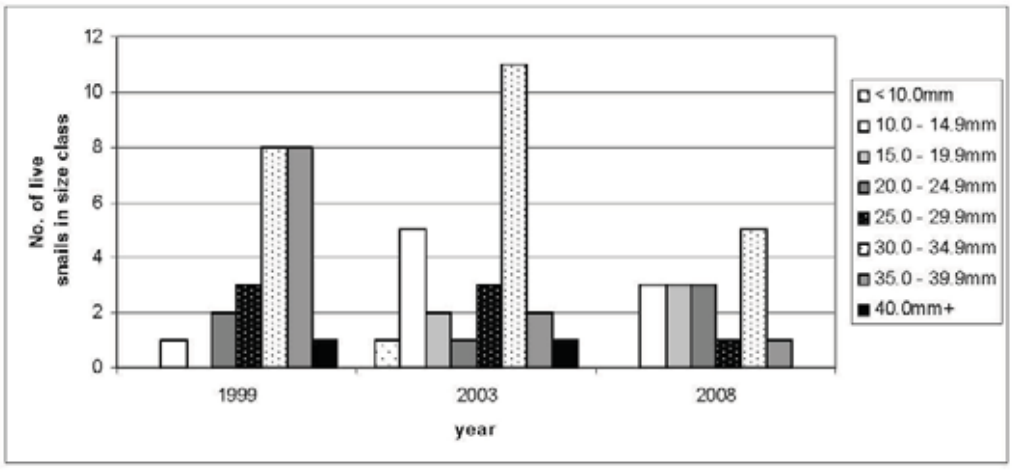

| | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|
| Forest | 0 | | | | 0 | | | | | 0 |
| Bush Edge | 0.5 | | | | 1.75 | | | | | 0.5 |
| Tussock | 5.25 | | | | 4.75 | | | | | 3.5 |

Figure 7: Change in numbers of empty shells of *Powelliphanta* 'Nelson Lakes' in three habitats 1999-2008




| | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|
| Forest | 0.0 | | | | 0.0 | | | | | 0.0 |
| Bush Edge | 1.0 | | | | 1.3 | | | | | 1.0 |
| Tussock | 2.8 | | | | 1.5 | | | | | 0.3 |

Figure 8: Change in size classes of live *Powelliphanta* 'Nelson Lakes' 1999-2008



### *Discussion*

In the tussock plots there is an apparent trend of a decline in live snails (Fig 6), a decline of snails in the 35 mm+ size classes (Fig 8) and a decline in empty snail shells (Fig 7). However given the small number of plots interpretation of these results should be conservative. It could be that the population has not recovered from the last measure or have moved outside the plot. At the bush edge there were substantially fewer live snails and snail shells recorded in comparison with tussock plots and no population trend evident from plots. No *Powelliphanta* snails have been recorded within forest.

A review of the snail work was undertaken by Pete Gaze (TSO) and Kath Walker (Scientific Officer). The review recommends stopping the counts in the forest plot, adding an additional plot in the tussock and to not regard the monitoring of the snails as an outcome monitor for the RNRP unless deer and hare control are implemented.

## 2.2 ESTABLISH AND MAINTAIN POPULATIONS OF GREAT SPOTTED KIWI AND OTHER SPECIES

### 2.2.1 Introduction

Adult great spotted kiwi (*Apteryx haastii*) translocated in 2004 and 2006 have had a high rate of survival with only one known death and one disappearance over the past three years. In this time four chicks/sub-adults have been found, all of which survived to 'stoat-proof' weights above 1.2 kg. One sub-adult is no longer monitored due to transmitter loss and subsequent dispersal out of the natal territory in 2007.

Following the 2009 transmitter changes/kiwi round-up 11 adults and two sub-adults were radio-tagged again. A move has been made toward the use of diagnostic style transmitters, on both females and males, and two of four trial GSK v2.0 transmitters designed by 'Wildtech' have been put on males of likely breeding pairs.

The reproductive rate has been consistently low in the translocated population which is an impediment to establishing a self-sustaining kiwi population in the Mainland Island. This led to a successful bid with the Bank of New Zealand Save the Kiwi Trust to remove eggs from the Gouland Downs population and release Operation Nest Egg (ONE) chicks into the Mainland Island over the next four years. The Project is to begin in the 2009-10 breeding season. As an adjunct to this work, establishment (pair bonding and health) of ONE chicks will be compared with wild hatched chicks to provide data on the efficacy of ONE in assisting the national great spotted kiwi recovery programme.

### 2.2.2 Great spotted kiwi population management

#### *Methods*

There was no direct management of kiwi at Rotoiti in 2008-2009. The first steps toward the ONE operation were taken with the capture of kiwi pairs at the Gouland Downs and attaching egg-timer transmitters to assist in retrieval of eggs in the 2009-10 breeding season. Removal of eggs is planned to be limited to a maximum of four each year over four years.

Predator control in and around RNRP kiwi territories has continued with the added benefit of DOC 200 and 250 traps progressively being deployed and new double-ended cat traps along the Lake Edge, plus a trial bait change to 'ERAYZ'™ rabbit-meat based bait.

#### *Results*

On the Gouland Downs approximate territory boundaries of kiwi near the Gouland Down Hut and further along the Heaphy Track have been determined. This knowledge can be used to add more kiwi to the programme, including the mates of three to four radio-tagged birds yet to be caught. Data streams from the Gouland Downs birds have been coming in monthly from a winter hut-warden on the Heaphy Track. There are plans to get RNRP staff in to the Gouland Downs more regularly to help record data streams during the breeding season. Over time a more comprehensive profile of 'normal' activity for each individual bird will be established, which will assist with confirmation of breeding ('abnormal') activity and guide the timing of egg retrieval.

Both dogs and their owners reported on Lake Edge track were intercepted promptly using the boat. Otherwise most people have recognised and complied with the dog exclusion policy.

#### *Discussion*

The rate of successful hatching from retrieved eggs may not be 100% so it is possible the first couple of years may be slow in introducing ONE chicks unless more Gouland Downs pairs are captured and radio-tagged. Great spotted kiwi have been noted double clutching within a breeding season and any second eggs laid would be left for normal incubation by the parents.

### 2.2.3 Great spotted kiwi population monitoring

#### *Methods*

Seven kiwi dropped transmitters since the last transmitter changes in May/June 2008 so two dog handlers were brought in to recapture kiwi. A dog was purchased by the Department for kiwi work at Nelson Lakes to help cope with the increasing amount of work (with wild hatchlings and ONE likely to increase numbers) and cut down on future costs through employing contractors. Haast Tokoeka egg-timer transmitters

were attached to female and male kiwi in the Mainland Island in order to record activity data.

### *Results*

Following the 2009 transmitter changes/kiwi round-up 11 adults and two sub-adults were radio-tagged again, leaving one sub-adult and four adults not recaptured (excluding 'Onetahua' and 'Rito'). Of these birds the dog handlers located one sub-adult, two adult females and two adult males.

As several transmitters have been being dropped and it was likely that non radio-tagged mates of radio-tagged kiwi and possible chicks nearby would be missed during a capture session, a kiwi dog was purchased. 'Fen' was bought as a pup in August 2008 and is currently being trained by two interim certified handlers with the RNRP. He has now located kiwi on four occasions. If Adele Island is used as a crèche, Fen will be invaluable as an aid for detecting chicks in dense scrub. In addition transmitter harnesses will be changed twice a year to avoid high numbers of transmitters being dropped. As a result of the deployment of more egg-timer transmitters, more time has been allocated to collecting data for subsequent analysis.

### *Discussion*

The use of GSK V2.0 transmitters for future transmitter changes results in spending less time collecting data streams. Two weeks of data are now transmitted instead of one week. The transmitter also stores data, which gives a continuous stream of activity data when downloaded. Plotting nightly activity for each male kiwi often shows lower activity that may vary from night to night, or steadily decline/increase over a longer period. The most notable result was seen in 'Motupipi' (Fig 9). His activity declined sporadically but substantially between September and January 2008 and slowly increased again from February. Compared with Takaka (Fig xx), who made no breeding attempt over summer, Motupipi's activity suggested he incubated this season. His transmitter never entered incubation mode however, as he had no pronounced activity decline. Upon recapture in February, he was found in a shallow burrow alone with no sign of nesting, had lost a lot of weight and was very docile. In retrospect, a swab should have been taken and closer attention paid to his condition to ensure that his low activity wasn't due to illness. His mate at the time has since been found alone in a burrow with no brood patch. Having a kiwi dog present may have meant that Motupipi's non radio-tagged mate and possible chick could have been found in a nearby burrow.

Figure 9: Activity graphs for male kiwi 'Takaka' in the Rotoiti Mainland Island 2008-09

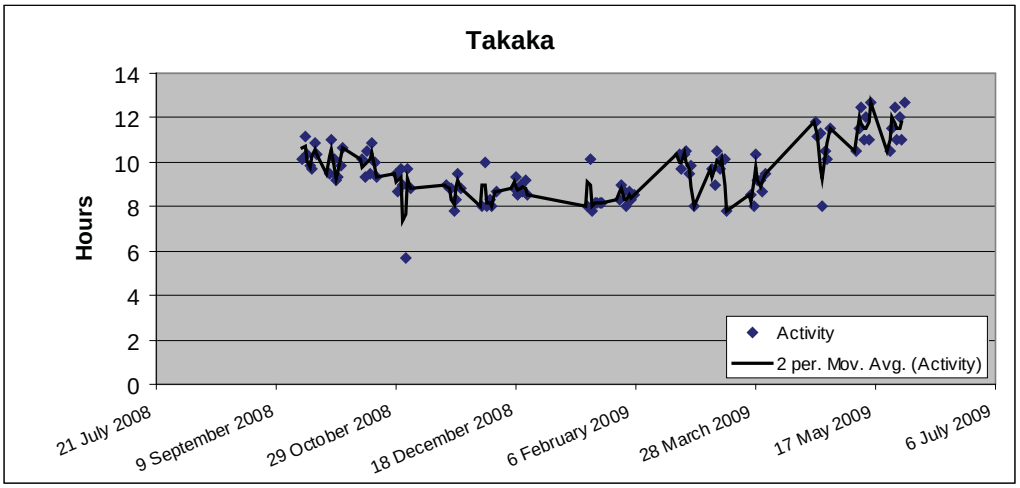
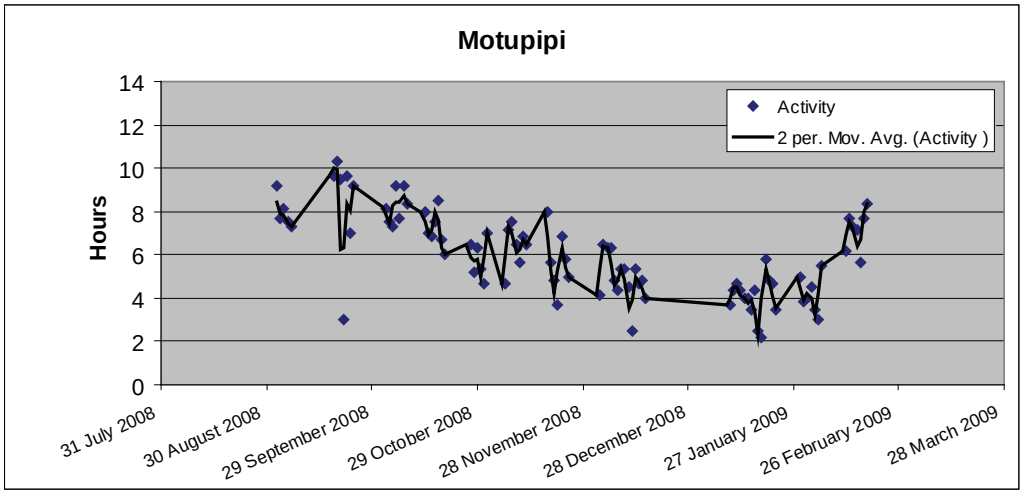



Figure 10: Activity graphs for male kiwi 'Motupipi' in the Rotoiti Mainland Island 2008-2009



# 3. Learning objectives

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

### 3.1.1 Introduction

From 1998 to 2000 rats were controlled in the core area of the Mainland Island using brodifacoum in bait stations. With the Departmental review of brodifacoum use a switch was made to using snap traps at a density of 1 trap/ha, which was trialled from July 2000 to March 2007. Kill-trapping consistently failed to achieve the performance target of a tracking index of <5% so trapping was terminated in 2007. 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. At that stage the intention was to implement a toxin operation in 2007-08 using diphacinone in Defender bait stations, developed by Connovation. Due to staff shortages this did not occur and was delayed until 2008-09.

A target tracking index of 15% was set as an operation trigger for initiation but was not attained, so after Technical Advisory Group consideration it was delayed once more until 2009-10. Defender bait stations went off the market so it was decided to use diphacinone paste (Ratabate™) in bags skewered in the existing philproof bait stations instead.

Although no rodent control was undertaken throughout the 2008-09 year, associated rodent population indexing and South Island robin (*Petroica australis australis*) territory occupancy monitoring (outcome monitoring) continued.

There was a partial beech mast recorded during autumn 2009.

### 3.1.2 Rat control

#### *Methods*

No rodent control was undertaken during the 2008-09 year, however associated rodent population indexing and South Island robin (*Petroica australis australis*) territory occupancy as an outcome monitor was continued.

#### *Discussion*

The proposed diphacinone Ratabate™ control operation was postponed again this year due to low rodent indices in the core area. The operation was planned to go ahead in the core area, excluding the top three lines, once rat tracking rates attained the 15-20% trigger as established by the TAG. The highest rat tracking rate was recorded in May reaching (12% +/-

3%), which was just below the trigger point. As the purpose of the toxin operation was to test its effectiveness at reducing rat numbers to less than 5% and then determine how long rat numbers can be suppressed, it was decided that it would be better tested at no less than the 15% trigger point to add greater value to the research.

### 3.1.3 Rodent population monitoring

#### *Methods*

Tracking tunnels provide an index of rodent numbers in the treatment and control areas of the project. Rodent monitoring is used to compare rodent tracking rates between the Mainland Island Core Area (where rats and mustelids are poisoned/trapped), Lakehead & Big Bush (no rat control but mustelid trapping) and Rotoroa (no poisoning or trapping). This year rat control was not carried out in the RNRP Core so the tracking rate is a background tracking rate for future rat toxin operations.

The rodent monitoring lines were upgraded to Best Practice in 2008-09. Rodent monitoring is carried out using Tracka™ cards and peanut butter set in black coreflute tunnels (Gillies and Williams 2004). Refer to the 'RNRP Field Manual 08-09' for further details. Note that this is a change from previous years in that the tunnels are now baited at the end rather in the centre.

In 2008-09 the rodent monitoring was carried out as follows:

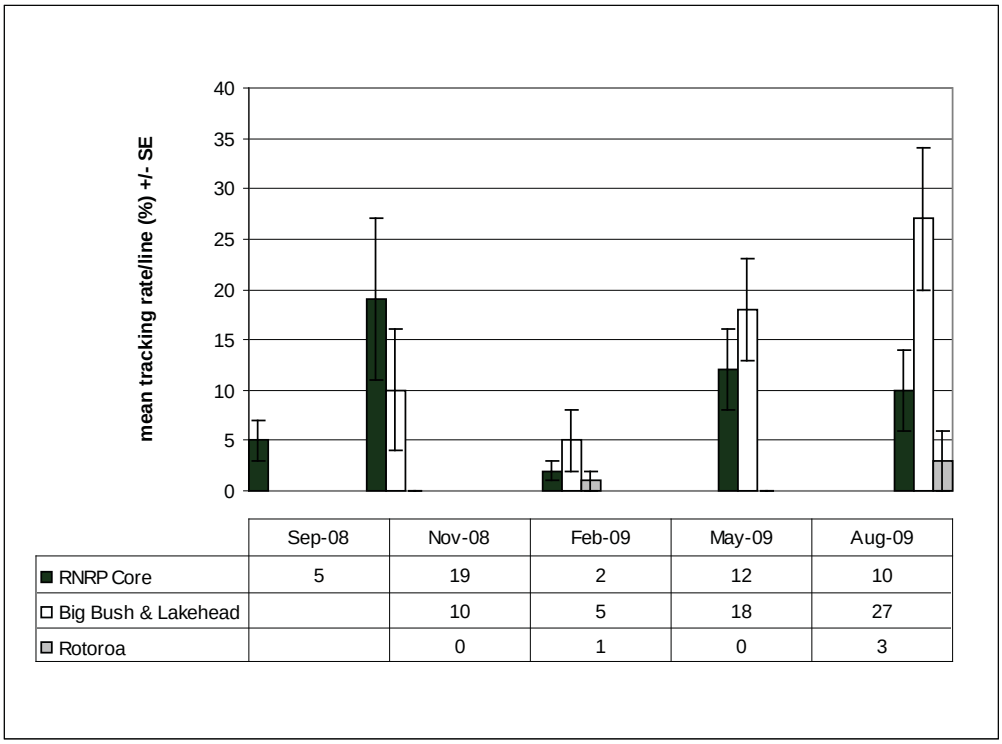
- RNRP Core – September, November, February and May
- Big Bush and Lakehead – November, February and May
- Rotoroa – November, February and May

Rodent monitoring was not conducted in August due to an abnormally heavy snow fall as tunnel lines were lost under persistent deep snow cover. A rodent monitor was carried out in September within the core area of the Mainland Island.

#### *Results*

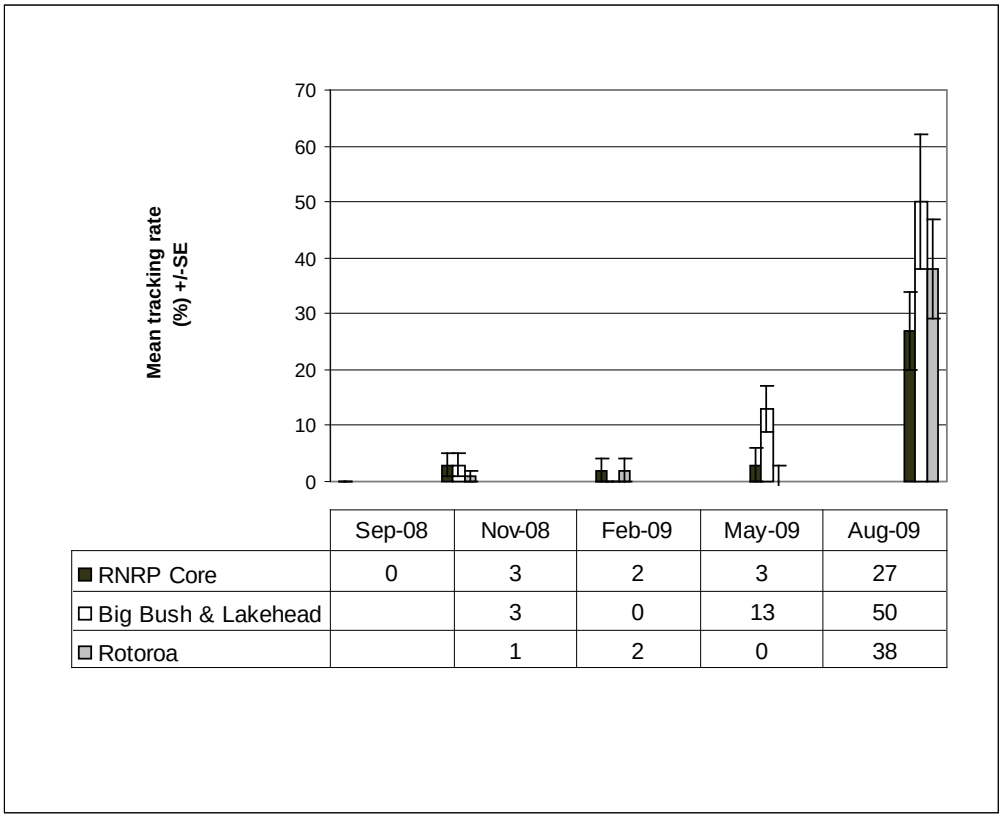
Rodent tracking at all sites was very low (Figs 11 & 12). Detailed tracking tunnel descriptions, results and graphs are found in the Excel document 'Tracking Calculator 2008-09'. Detailed tracking rates and graphs throughout the projects history are found in the Excel document 'Tracking Tunnels through time'.

Figure 11: Tracking rates of rats in RNRP 2008-09




| | Sep-08 | Nov-08 | Feb-09 | May-09 | Aug-09 |
|---|---|---|---|---|---|
| RNRP Core | 5 | 19 | 2 | 12 | 10 |
| Big Bush & Lakehead | | 10 | 5 | 18 | 27 |
| Rotoroa | | 0 | 1 | 0 | 3 |

Figure 12: Tracking rates of mice in 2008-09




| | Sep-08 | Nov-08 | Feb-09 | May-09 | Aug-09 |
|---|---|---|---|---|---|
| RNRP Core | 0 | 3 | 2 | 3 | 27 |
| Big Bush & Lakehead | | 3 | 0 | 13 | 50 |
| Rotoroa | | 1 | 2 | 0 | 38 |

### *Discussion*

The mean rat and mouse tracking rates for 2008-09 have been some of the lowest rates in the project history. There are two possible reasons for the low tracking rates. They could be:

1. Rodent populations are going through a decline phase following the spike in numbers in 2006-07 in response to the beech mast of autumn 2006. This is consistent with the understanding of how rodents respond to beech mast seed events.
2. That best practice tracking tunnel configuration with an 'end baiting' method is less sensitive than 'central baiting' method previously used in the project.

Since rodent numbers have remained depressed at control and treatment sites, it appears to have been a good year to delay a rat control operation within the core area of the Mainland Island as potential biodiversity gains have not been compromised. However, it has been a poor year to generate baseline data on rodent population trajectories in response to a diphacinone rodent control operation due to the low rodent numbers.

The UE, LE and M lines at Rotoroa have been moved to reduce safety concerns regarding the time taken and large river crossings on these lines (refer to Map X for new locations). The UC, LC UD and LD lines have not yet been realigned and were not run in 2008-09. They are to be realigned in 2009-10 to increase the number of lines and improve the error measurement around results at this site.

## 3.1.4 Robin monitoring

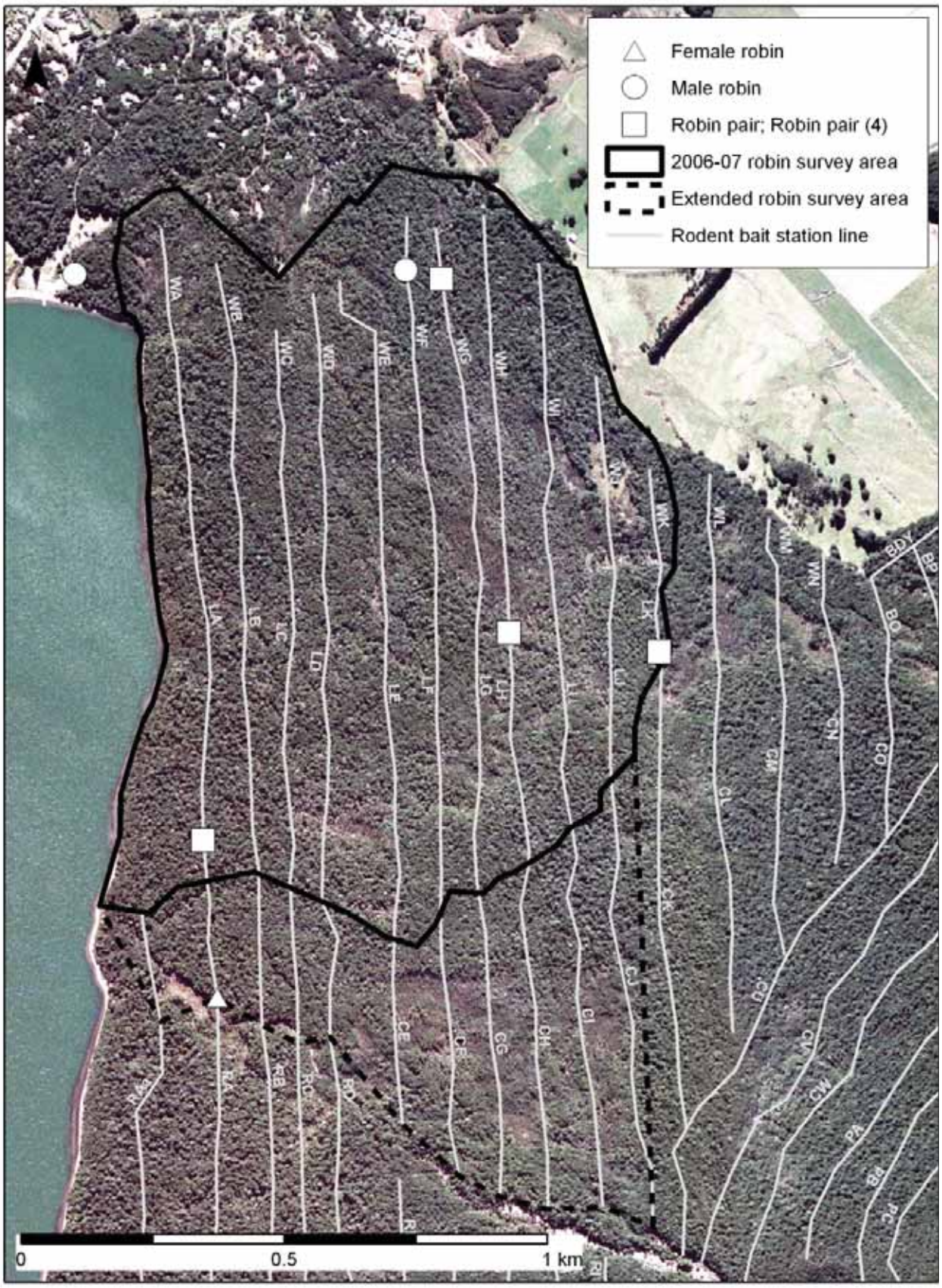
### *Methods*

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

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

The survey area (162.1ha) includes rodent lines A-K in the Loop and Watertank areas, Cedar block lines E-J and parts of the Rata block A-D. This is the second year the Cedar and Rata blocks have been incorporated into the annual survey.

Figure 13: Map of robin locations within the Core Area of the RNRP 2008



Three to four pairs, two single males and a single female were identified during the survey (Fig 13). Three out of the four pairs were observed displaying nesting behaviour, e.g. male feeding female, stashing mealworms and flying off with mouthfuls of worms to suspected nests. Only the female was seen of the fourth suspected pair and her mate was only ever heard singing during the surveys.

A banded male (MY/-) with a badly damaged leg was also seen in the third pair's territory on the LH line and then again at Kerr Bay campground (~800m) where unsuccessful efforts were made to catch him and remove the bands. However he was much too wary to be caught and is now presumed dead as he has not been seen since summer. In the past his territory was on the WA line.

A single male recorded was heard competing in song with the paired male at WG and the single female was observed eating mealworms and collecting nest material which she then flew off with outside the survey area towards RA23.

***Discussion***

Robins have held territories within the survey area without rodent control being undertaken over the past two years, although no fledglings have been noted. The rodent toxin operation planned for late summer was postponed due to low rodent numbers. See the Rodent Population Monitoring for information.

Outside the period of the formal 'robin survey', robin pre-feeding and banding was undertaken within the Mainland Island core area in May and June this year and also around the St Arnaud village to help identify paired robins and their territories for future surveys. Four males have been banded so far within the survey area and staff will need to be assigned to capture more prior to the next survey in September 2009.

## 3.2 TEST THE EFFECTIVENESS OF WASP CONTROL TOOLS

### 3.2.1 Introduction

Common wasps (*Vespula vulgaris*) have been controlled in the Mainland Island Core Area from 1998 using the toxins finitron and fipronil. This work has been carried out in close association with Landcare Research. Of the two substances, fipronil, has proven most effective but unfortunately its legal use for wasp control is not recognised by the company with the patent rights, so Landcare have been supplying it under an experimental use permit to date. Finitron suffers from similar supply and use problems and is currently not available in New Zealand. No wasp control was undertaken during the 2006-07 season due to toxin unavailability. From 2007 through to 2009 Fipronil was again available for experimental purposes, and is likely to be available for the 2009-10 season. Experimentation since 2007-08 has been limited to Catherine Duthie's research on introduced

wasp and ant interactions (refer to section 3.6), which used the Mainland Island core area as a treatment site, and an adjacent untreated area as a control. An experimental transect baiting regime was carried out in the Duckpond Stream area of Big Bush by FOR volunteers and they also ran a transect bait line along the western side of the lake. This work is covered under 4.1.2 Community objectives.

### 3.2.2 Wasp control and monitoring

#### *Methods*

Timing of wasp poisoning was determined by wasp visitation monitoring at protein based non-toxic baits, which gives an indice that ensures the toxic operation will be effective. An average of one wasp visiting per bait at the instant of observation is the trigger for beginning the operational stages. For further detail on wasp monitoring and the decision making process refer to the RNRP 2008-09 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 over 14-15 January and packaged into 1-litre plastic pails. Bait was placed in bait stations on 22 January 2009. Toxic bait was put out in the Mainland Island core area and St Arnaud township/Brunner Peninsula areas, using the established wasp bait station grid (lines 100m apart x 50m spacing). Lines within the township/peninsula areas generally follow roads and walking tracks. Each bait station held 40g of toxic bait. Information regarding the operation is in the RNRP 2008-09 Field Manual.

Some FOR members initiated a field trial to determine the distance from a bait station line required to kill wasp nests. This was done at the mouth of Duckpond Stream in Big Bush and provided some encouraging results for improving the efficacy of current wasp control operations. Results of this trial are in section 4.1.2, Community Objectives. FOR also carried out wasp control on the western side of the lake from Coldwater Hut to West Bay using bait stations at 25m spacing.

Operational performance standards specified that remaining bait is retrieved from bait stations three days after application and it was collected on 26 January, four days after application, because a weekend intervened over the baiting period. Retrieved bait was weighed.

#### *Results*

The average number of wasps observed on non-toxic baits was 4.6 on the 16 January.

Including DOC and FOR operations, 35.750 kg of bait was deployed. Bait take was quite high at 9.6 kg (73%). Wasp activity within the operational area was observed to fall away markedly within a few days and after a couple of weeks few wasps were being seen.

### *Discussion*

The toxic operation was successful in reducing the wasp nuisance around St Arnaud township and in the Mainland Island core area.

One unfortunate incident occurred when a local resident, who is opposed to any sort of toxin use, removed 32 bait stations, including bait, from lines in the eastern part of the township. The police were notified and were able to recover all of the stations and toxic baits. This could be a problem for carrying out future control in the township area and this incident will need to be discussed with the Medical Officer of Health and the Health section of the Tasman District Council when planning the 2009-10 operation. We are not required to obtain a Resource Consent or approval from the MOH or TDC to use fipronil, simply notify them of its use.

Fipronil is known to be effective for controlling wasps when applied in a 200m x 50m grid pattern. The single line bait trial carried out by the FOR indicated that wasp nests can be killed out to a distance of at least 350 m. It would be useful to perform a similar trial in 2009-10 in the RNRP core area using the existing bait station grid.

Richard Toft (Landcare Research) suggested another bait trial where a small group of bait stations at one point are topped up over several weeks, to determine the radius length within wasp nests are killed. This could be done at Lakehead where one monitor line could traverse the length of the Travers Valley and another across the valley up towards bush edge.

Restructuring within Landcare Research has meant Richard Toft has been made redundant. Richard has established his own research company, “Entecol”, and is likely to be able to supply us with fipronil, under an experimental use permit, for another year or two. He intends to continue searching for another landscape-scale wasp toxin, available for public use, due to the probable future unavailability of fipronil.

## 3.3 TEST THE EFFECTIVENESS OF DIFFERENT TRANSLOCATION METHODS

### 3.3.1 Introduction

Although the introduction of great spotted kiwi has been successful with the establishment of a small but reproducing population, the current lack of effective rat control means that reintroductions of species that were once extant in the area, like möhua and red-crowned parakeets, are likely to fail. Effective control of rats in the core area of the Mainland Island will be a focus of the project over the next few years to enable reintroductions of small forest birds to be considered and for current populations of species like robins to increase.

## 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 DOC commitment to measuring long-term biodiversity trends nationwide. 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 a standard technique (Dawson and Bull 1975). Three counts were conducted at the St Arnaud Range Track in the RNRP Core and Lakehead bird count line at Lakehead each session. At Rotoroa two counts were done in November, two counts in February and two counts in May. The bird count line at Rotoroa is on the Mt Misery Track.

#### *Results*

Pivot tables within Excel were used to derive average counts per bird and 95% confidence limits for each species. Counts from May have been used for these results as they best reflect the background population of bird species without additional variation associated with mating behaviour, while still encompassing recruitment from the previous season. This analysis appears in '5 Minute Bird Count Data'.

In addition to this analysis, James Dawber was funded, from the RNRP scholarship and through the Science Advice Fund, to provide a detailed analysis of the 5MBC data. James is a Canterbury University Honours student and has worked closely with Jenny Brown and Ian Westbrooke to design the statistical models. Their brief was to use a simple statistical modelling technique (Generalised Additive Modelling Technique – GAMs) to determine if any significant trends in bird abundance was apparent across the three treatment and control sites. They were also provided with additional data on predator and seedfall indices to investigate possible links with environmental factors affecting population trajectories. A field trip with James and Ian was organised in May 2009 to show them the lines and inform their research.

#### *Discussion*

James Dawber reported that few conclusions could be made from the dataset, even with an excess of 250 counts and 20,000 bird records across the 12 years. It proved very difficult to fit a statistical model to the data due to small counts for individual species. The exception to this was

with bellbirds and silvereyes, however there are issues with analysing silvereye data due to the large flock sizes encountered by counters and variation in flock size estimates. Despite this some general qualitative trends indicated that abundance of bird species from the RNRP is no higher than the same species at Lakehead or Rotoroa.

The modelling also indicated a large altitudinal effect for robin, silvereye and tui. This altitudinal effect casts some doubt on the value of the Mt Misery line as a control site for the RNRP. The concern is that altitude effects could cause unobservable ecological 'nuisance factors' which could influence whether we are able to determine whether any changes in bird abundance are due to predator control alone.

James Dawber suggested that other less conventional statistical techniques might highlight other conclusions and Dave Kelly (RNRP Science Advisor) has shown a willingness to engage in this work.

The lack of a significant treatment effect between the sites raises questions about:

- the value of 5MBC as an outcome monitoring tool and;
- the effectiveness of the control regime at the RNRP for the birds monitored with 5MBC.

Despite these questions, there is value in running 5MBC as it is a significant and important dataset that contributes to the national data pool. There is also value in retaining counts to investigate, with more time, data and likely changes in the management regime, whether changes in bird abundance can become apparent.

Consideration could be given to reducing the count frequency or repeat counts within seasons and using staff time to better monitor native bird species apparently declining within the RNRP Core area. This requires analysis of the count data to determine which count season and frequency would retain the most information without compromising the value of the dataset.

### 3.4.3 Vegetation plot monitoring

#### *Methods*

A further two vegetation plots were re-measured in 2008-09.

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).

#### *Results*

Four 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.

### 3.4.4 Beech seedfall monitoring

#### *Methods*

Beech seedfall monitoring is conducted within the RNRP Core and along the Mt Misery Track at the Rotoroa non-treatment site. There are 20 seedfall 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 removed in late June. The seed is then counted and tested for viability.

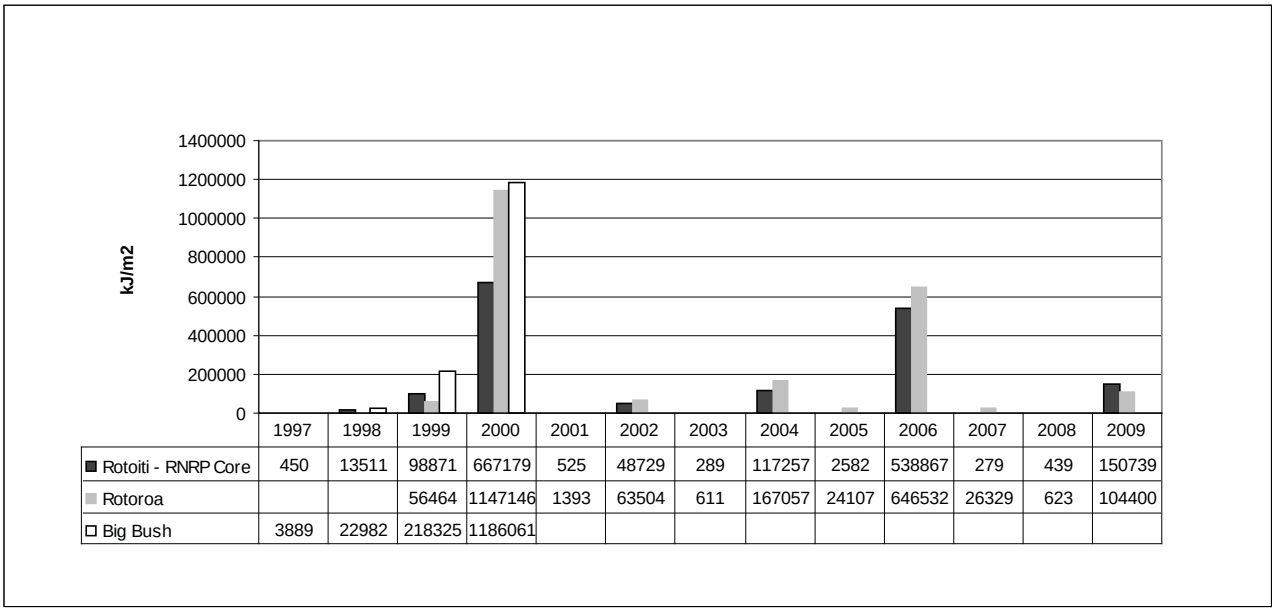
#### *Results*

The prevalence of flowers noted on all the beech species in late summer 2008 suggested a mast-seed event would occur in 2009 (Table 4, Fig 14). A partial mast-seed season was then recorded in autumn 2009.

TABLE 4. TOTAL COUNTS OF BEECH SEED FROM THE RNRP 2008-09

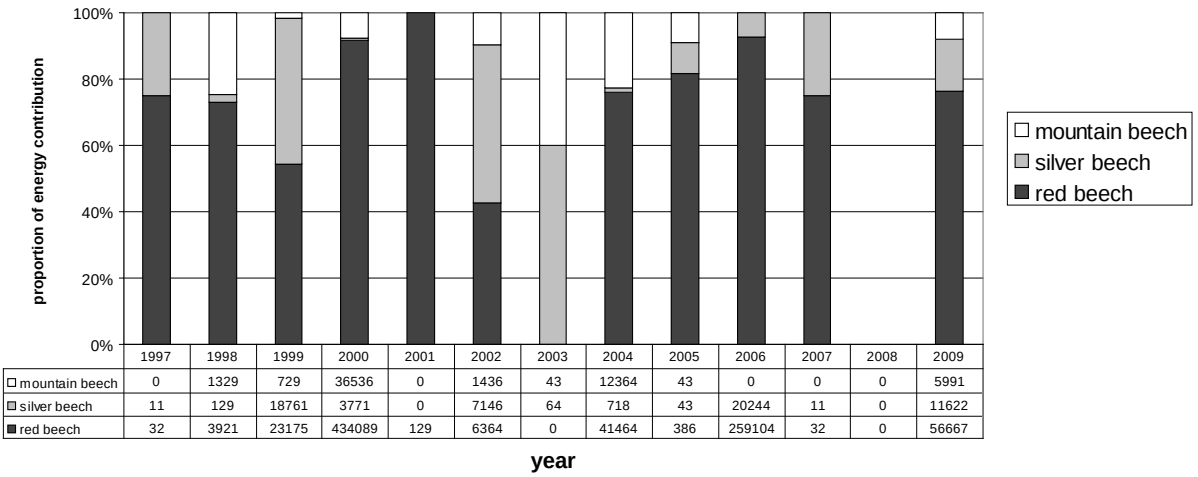
| SITE | | NOTFUS | NOTMEN | NOTSOL |
|---|---|---|---|---|
| RNRP | Total count | 3228 | 2433 | 976 |
| | Total viable seed | 1763 | 1085 | 280 |
| | Percentage viable | 55% | 45% | 29% |
| Rotoroa | Total count | 7796 | 4992 | 1847 |
| | Total viable seed | 5255 | 2291 | 415 |
| | Percentage viable | 67% | 46% | 22% |

Figure 14: Total combined fallen beech seed energy by site 1997-2009




| | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rotoiti - RNRP Core | 450 | 13511 | 98871 | 667179 | 525 | 48729 | 289 | 117257 | 2582 | 538867 | 279 | 439 | 150739 |
| Rotoroa | | | 56464 | 1147146 | 1393 | 63504 | 611 | 167057 | 24107 | 646532 | 26329 | 623 | 104400 |
| Big Bush | 3889 | 22982 | 218325 | 1186061 | | | | | | | | | |

Figure 15: Proportion of energy contribution of viable seed by species, RNRP Core Area, 2009




| | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mountain beech | 0 | 1329 | 729 | 36536 | 0 | 1436 | 43 | 12364 | 43 | 0 | 0 | 0 | 5991 |
| silver beech | 11 | 129 | 18761 | 3771 | 0 | 7146 | 64 | 718 | 43 | 20244 | 11 | 0 | 11622 |
| red beech | 32 | 3921 | 23175 | 434089 | 129 | 6364 | 0 | 41464 | 386 | 259104 | 32 | 0 | 56667 |

### *Discussion*

There was a small partial mast-seed event after several very low seedfall seasons (Fig. 14). Of the beech species, red beech contributed the most energy to the ecosystem as the species produced the largest number of viable seeds and because red beech, in this case, also is the largest seed, with the highest energy value and highest nutrient value of all three species (Fig 15).

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

### 3.5.1 Introduction

No previously unreported native and non-native species were recorded at any sites within the RNRP area.

## 3.6 FACILITATE RESEARCH TO IMPROVE OUR UNDERSTANDING OF THE ECOLOGY AND MANAGEMENT OF BEECH FOREST AND ALPINE SYSTEMS

### 3.6.1 Introduction

The RNRP provides an excellent opportunity for internal and external research to be undertaken given the variation and continuity of the projects with good datasets collected over 11 years. RNRP has identified a full list of research topics, distributed to Auckland and Canterbury University annually. The project often receives enquiries from international students/researchers, and they will be engaged providing the research topics contribute to improving knowledge of the ecology and management of beech forest and alpine systems.

### 3.6.2 Research conducted during 2008/09

Catherine Duthie, Victoria University Ecology & Insect technician.

Catherine continued her PhD research again this year; investigating factors which may promote coexistence between the endemic ants and invasive wasps. The RNRP wasp control project was funded by Landcare Research with support from the RNRP, to assist Catherine's research. Catherine's field work will probably be continuing into 2010.

Becky Bell, University of Canterbury: MSc Seed limitation in Fuchsia excorticata.

Becky completed her field work in the summer. Anticipated completion of her thesis is January 2010.

Rebecca Lawrence, University of Otago: MSc investigating the foraging behaviour and habitat use of ship rats under stoat predation in a beech forest.

*Rebecca began her field work during the summer but due to extremely low numbers of rats had to abandon her project.

Dr. George Perry, University of Auckland: PhD based at Mt Misery/ Rotoroa- Modelling New Zealand's *Nothofagus* forests: pattern, process and coexistence. Research conducted from November 2008-March 2010.

James Dawber, University of Canterbury (honours student), received this years $1000 RNRP research scholarship to undertake detailed statistical analysis of the RNRP 5 minute bird count data. He also received a Science Advice Fund scholarship of $1000. James has completed a draft report.

### 3.6.3 Completed research

None received this year.

## 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

### 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 4.1.4, and includes brochures, newsletters and presentations targeted at non-technical groups.

### 3.7.2 Reports generated during 2008/09

No reports were generated in the 2008/2009 year.

### 3.7.3 Hui and workshops and presentations

Sarah Forder attended the North Island kiwi hui held at Titirangi during June 2008. Dave Rees and Sarah Forder also attended the National Species and Predator Dog Workshop which was held at the Pleasant Point Scout Camp, near Timaru, in late May 2009.

# 4. Community objectives

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

### 4.1.1 Introduction

This year has seen a marked increase in opportunities to meet the project's community objective. The local community group – Friends of Rotoiti – have continued to be a driving force as active conservation volunteers. Visiting volunteers, both individuals and groups, have also benefited from the project, gaining experience in ecological restoration work programmes. Promotion of the project has continued through the Revive Rotoiti newsletter, displays in the Nelson Lakes Visitor Centre and articles in both Murchison and St Arnaud Community newsletters. The educational programme through the Rotoiti Lodge Outdoor Education Centre has continued with RNRP PowerPoint presentations and guided (Honeydew) walks and talks. Support for other community groups, schools and universities was also provided, with over two thousand visitors this year gaining knowledge about Mainland Islands and specifically the RNRP.

### 4.1.2 Friends of Rotoiti

In response to local interest in the RNRP and a desire to assist the project, the FOR community group was formed in 2001, as a partnership with the department. The main goals of FOR are to be actively involved in pest control; to learn about species monitoring and re-introductions; and for members to be trained in best practice techniques. Many members have been involved from day one, with a small number being inducted each year, and the current membership is 75. An important aspect to the group is staying up-do-date with the core FOR activities, as well as developments within the RNRP, and this is achieved through a six-monthly FOR newsletter and six-monthly meetings. This year, the group contributed 230 work day equivalents (one work day equals six hours). Note: FOR mustelid control methods and results are covered in section 2.1.2.

#### *FOR rat control*

The FOR rat control programme has been in operation since December 2001 and encompasses 250 hectares throughout the Brunner Peninsula, Black Hill and Black Valley Stream areas adjacent to the St Arnaud

township. The grid of traps comprises core board tunnels containing Victor Professional snap traps, using a mixture of peanut butter and rolled oats as bait. Trap checks and bait changes are carried out fortnightly throughout the year. This year saw a similar number of rats and mice caught as last year, with 113 rats (112 in 2007-08) and 446 mice (422 in 2007-08). Additional 'by-catch' included 2 stoats, 1 weasel, 1 rabbit and 1 robin. The robin was caught in a trap on Black Valley Stream in April 2009 due to a faulty tunnel where the trap had moved to the entrance hole end. A full audit of all trap tunnels was carried out due to this capture, whereby each tunnel was inspected for the secure presence of a nail in the ply base to keep the trap at the far end from the entrance hole. In July 2008, 41 additional traps were set out at every RNRP stoat trap site on the Peninsula Nature Walk line. These additional traps are set when rat numbers are high.

### *FOR Wasp bait trial*

Members of FOR conducted a field trial from January to March 2009 to determine the effective distance that wasps will carry poison (fipronil) to their nest. The following summary is taken from a report written by Bryce Buckland, one of the FOR volunteers involved in the trial. The location chosen was Duckpond Stream, in the Big Bush Conservation Area, adjacent to Nelson Lakes National Park, which has a valley running primarily due north and south from an altitude of approximately 630 meters to 880 meters. A series of bait stations, 25 metres apart, were placed across the entrance to Duckpond Stream. Wasp nests were then located from the valley entrance up to 800 meters, with 29 nests found and marked. Baseline flight counts were recorded on the first day – based on timed one minute intervals where flights both in and out were counted. On day two, a chicken meat mince bait, dyed blue and laced with fipronil was placed in the 15 bait stations. After three days, the remaining poison bait was found to be dry and caked in the stations – this was removed and returned to DOC for weighing and disposal. Over the following six weeks, four visits were made to the site to record flight counts for each of the 29 nests (Appendix 7).

A number of additional observations were made:

1. Wasps fight off competitor wasps at the bait stations.
2. Larger (dominant) nests appeared to have the largest decline in flight counts.
3. Wasps disregarded smaller fragments of bait in favour of larger pieces. The smaller fragments were left in the bait station.
4. The bait should be made slightly more moist to prevent desiccation.
5. Wasps from nests very close to bait stations did not appear to forage at the newly placed bait station, but continued to forage at some distance from their nest.
6. Some un-flagged nests outside the control area (that had no flight data taken) but were very close to the poison line, had no visible loss of flight activity.

7. By day 41, all nests up to 350 metres from the bait line had no flight activity.

*Summary*

Duckpond Stream runs in a relatively open bed surrounded by mature beech trees that grow quite widely spaced, providing relatively open access with some minor understory growth to hinder the near ground ease of flight of wasps. The results suggest that topography will have an effect on the ability of wasps to carry food and that steepness of terrain and dense undergrowth will combine to impact on the distance. It appears that these wasps can successfully carry food containing the poison fipronil to a distance of 350 metres and an altitude of 100 metres.

### *FOR lizard monitoring*

Since the summer of 2002-03, FOR have been operating a lizard pitfall trapping programme for identifying lizard species present in the FOR rat control area. This programme was set up with the goal of identifying population trends and for FOR volunteers to gain experience with species monitoring.

Following Whitaker's (1994) standard technique for monitoring lizards, 20 pitfall traps over two transect lines are 'opened' for four days each month over the summer period. This 'opening' involved removing the sticks from the pitfall trap and baiting it with pear. It should be noted that the weather was cooler and wetter this year, and this was deemed to be the reason for a lower catch rate than in previous years. In addition, there was some interference by members of the public, who returned the sticks to the pitfall traps during the period of 'opening', which potentially adversely affected the catch rate for that period.

TABLE 5: TOTAL NUMBERS OF LIZARDS CAUGHT ON PITFALL LINES (EXCLUDING RECAPTURES) 2008-09.

| YEAR | MONTH/S | DATES OPEN | WARD STREET | | BLACK HILL | | |
|---|---|---|---|---|---|---|---|
| | | | *O. Nig. pol.*[1] | *O. inf.*[2] | O. nig. pol.[1] | O. lin[3] | O. inf.[2] |
| 2008 | Nov/Dec | 27/11 – 02/12 | 7 | 0 | 4 | 0 | 1 |
| 2008/09 | Dec/Jan | 30/12/08 – 04/01/09 | 3 | 0 | 0 | 0 | 1 |
| 2009 | Jan/Feb | 29/01 – 02/02 | 5 | 0 | 2 | 0 | 2 |

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

## 4.1.3 Volunteers

The project benefited from the highest number of visiting volunteers since its inception. A total of 48 visitors contributed 198 work day equivalents, with eight individual volunteers working from one day to up to six weeks, as well as three group visits by Eastbourne Scout Group (20 people), Pacific Discovery Group (8 people) and NMIT Trainee Rangers (12 people).

(Note: these volunteer hours do not include those contributed by FOR)

### 4.1.4 Advocacy and education

#### *Revive Rotoiti*

The six monthly newsletter Revive Rotoiti was published in spring 2008 and autumn 2009, and all editions are now available on the DOC website. Hard copies were sent out to main stakeholders, with a request to move to an email list, in order to cut down on costs and environmental impacts. Copies of these newsletters are available in the Nelson Regional Visitor Centre and the Nelson Lakes Visitor Centre.

#### *Media releases and other advocacy work*

The RNRP was recognised as one of Australasia's top 25 ecological restoration projects by the international Global Restoration Network. A media release was distributed in April 2009 to celebrate this acknowledgement. The RNRP was among eight New Zealand sites selected by a cross-Tasman panel of ecologists.

Regular articles have been submitted to both the St Arnaud and Murchison community newsletters. The DOC website has several RNRP pages, and these are linked to the project's annual reports, strategic plan and newsletters.

Promotion continued this year at the Antique and Classic Boat Show (March 2009) and updates were given at the Rotoiti District Community Council meetings and Nelson Community forums.

#### *Visitor services*

Information about the project continues to be a highlight for visitors to the Nelson Lakes Visitor Centre, with displays dedicated to the latest project work. The Honeydew Walk remains a focus for visitors wishing to explore the RNRP as it features interpretation panels as interesting educational tools.

#### *Rotoiti Lodge Outdoor Education Centre – RNRP presentations*

This year has seen a marked increase in RNRP PowerPoint presentations to school groups at the lodge, with 37 talks provided to 1,261 students. These students included Year 12/13 students working towards their National Certificate Educational Achievement unit standards on conservation and resource management. Two Victoria University groups with 160 students total, also enjoyed RNRP presentations.

#### *RNRP guided walks and other presentations*

There was also an increase this year in requests for guided walks and/or RNRP PowerPoint presentations to groups not staying at Rotoiti Lodge. In total, there were 17 RNRP Honeydew walks/talks and 16 RNRP PowerPoint presentations with 754 participants, from a range of local secondary schools and community groups.

# 5. Discussion

## 5.1 A DIFFICULT YEAR

The 2008-2009 year was a difficult one. The RNRP was understaffed for most of the period with the departure of Paul Gasson early in the season and the massive snowfall in August meant that months were spent simply clearing track and fixing infrastructure rather than progressing the aims of the project. Despite these impediments advances were still made.

Conversion of traps from Fenn Mk VI to DOC200s continued and the conversion is on track to be completed in the 2009-2010 season. A field trial on the effectiveness of the Fenn versus DOC200 traps was completed in June and will be written up shortly. Further developments with the great spotted kiwi project bodes well for future growth when ONE chicks begin to be added to the population. The addition of the kiwi dog 'Fen' to the crew will greatly assist the project. Mistletoe plants are responding well to possum control which suggests there will be benefits for other browse sensitive species within the Mainland Island. Wasp control was again effective with a good knock-down of population levels in the core area of the Mainland Island and around the township. The trials on effective poisoning distances of wasp nests run by the FOR points toward development of substantially more efficacious wasp control in future and will be followed up with trials within the Mainland Island in 2009-2010. The continued work by FOR and numerous volunteers during the year greatly assisted the outcomes of the RNRP and made the job for the RNRP staff that much easier.

A partial beech mast-seed event this year did not result in a response in rodent numbers to any degree which meant no rodent control was undertaken as the 'trigger' tracking rate was not attained. Stoat capture rates this year were also very low through the usual summer peak, possibly due to the effects of the heavy and persistent snowfall in August on mustelid survival.

## 5.2 CHALLENGES FOR COMING YEARS

Although some of the native species in the Mainland Island appear to be doing well, many species are not thriving. *Powelliphanta* sp., robins and small birds in general appear to be struggling to maintain their populations in the Mainland Island. Although the current trapping regime is suppressing mustelid and possum numbers effectively the smaller predators and competitors like rats are not being controlled at all. In order to foster a fully functioning alpine beech ecosystem these decline agents need to be kept at low numbers, especially through the breeding season when birds are particularly vulnerable. A functioning ecosystem will also

require species to be present that are currently absent so reintroductions are essential, which in turn will mean that the agents that caused their demise initially must be maintained at very low numbers.

An initial start on resurrecting the native bird population should focus on the birds that are present, like robins and weka. Both species are charismatic and their interactions with visitors and residents add substantial value to the community involvement and support for the project. The focus for the near future should be on improving productivity and survival of these two species, before the project looks at reintroductions of absent species.

With the current, and arguably ongoing, constraints on national economic activity, the project is likely to be run with an increasingly restricted budget, which means either less being done or the current job being done more efficiently. Strategic planning on essential outcomes and work over the next five years will have to be undertaken with a view to maintaining the gains made by the project without risking their loss. It is likely some difficult decisions will be made in the near future. With this in mind community support for the project will be even more important for the continuation the RNRP.

The future challenge for the project must focus on improving the biodiversity values within the Mainland Island whilst ensuring the project is sustainable and maintains its value to the community.

# 6. Acknowledgements

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

Thanks to the seasonal fieldworkers.

Ron Moorhouse, Pete Gaze, Scott Nicol, Ian Westbrooke, James Dawber, Simon Moore, Anonymous Research Donor all provided technical or financial assistance.

Trish Grant provided assistance with publicity and getting this report to print.

Pete Gaze put in work for the Top 25 Australasian Ecological Restoration Sites application.

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

The Strategic Advisory Group and Technical Advisory Group provided excellent advice throughout the year (membership listed in Appendix 5). TAG members also provided practical support with fieldwork, planning and editing over and above the normal TAG business. Other staff assisted with mapping, data presentation and formatting, including Geraldine Moore and Charmayne King.

Friends of Rotoiti would like to acknowledge and thank the following for their assistance with this project:

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- Richard Toft, Landcare Research, Nelson
- Bryce and Carol Buckland, Friends of Rotoiti, Nelson Lakes National Park
- Drew and Margaret Hunter, Friends of Rotoiti, Nelson Lakes National Park
- Warwick Ward, Friends of Rotoiti, Nelson Lakes National Park

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Studholme, B., 2000. Ship rat (*Rattus rattus*) irruptions in South Island beech (*Nothofagus*) forest. *Conservation Advisory Science Notes No. 318*, Department of Conservation, Wellington.

Walker, K.J. 1993. Techniques for monitoring populations of *Powelliphanta* land snails. Department of Conservation. Nelson/Marlborough Conservancy Internal Report #11.

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Whitaker 1994 Lizard monitoring protocols

# Appendix 1

## RNRP DATASETS

Datasets referred to in the report, and others that were maintained during the 2008-2009 year are listed below:

INTRODUCED SPECIES

| DATASET DESCRIPTION | FILE NAME AND LOCATION | CONTACT PERSON |
|---|---|---|
| Wasp bait stations | | Dave Rees |
| Possum captures | | Dan Chisnall |
| Possum monitoring results | | Dan Chisnall |
| Rodent tracking tunnel results | | Anne Brow |
| Mustelid table 'perimeter trap lines vs. internal 08/09' | RNRP Fenn database 08-09: DOCDM-293508. Tab – Annual report graphs. | Tamsin Bruce |
| Mustelid tracking tunnel results | | Anne Brow |
| Ungulate sightings | | Anne Brow |

NATIVE SPECIES

| DATASET DESCRIPTION | FILE NAME AND LOCATION | CONTACT PERSON |
|---|---|---|
| 20 x 20 vegetation plots | | Anne Brow |
| Beech seedfall monitoring | | Anne Brow |
| Mistletoe monitoring results | | Anne Brow |
| *Pittosporum patulum* monitoring results | | Anne Brow |
| *Powelliphanta* monitoring results | | Anne Brow |
| Gecko | | Anne Brow |
| Robin map | s/drive-mainland is-robin-maps- Fig 4_Robin_ obsevrtaions_3 | Tamsin Bruce |
| Kaka encounter rate- table | DOCDM-171970-tab- Ann report 09. | Tamsin Bruce |
| Kaka map | s/drive- mainland is-kaka-2008/09 map. See Geraldine for copy also. | Tamsin Bruce |
| Great spotted kiwi monitoring | | Sarah Forder |
| 5-minute bird counts | | Anne Brow |

# Appendix 2

## RNRP REPORTS GENERATED

Nil.

# Appendix 3

## PROJECT REVIEWS

| REVIEW DATE | REVIEW TITLE | FILE NAME AND LOCATION |
|---|---|---|
| | | |
| | | |
| | | |

# Appendix 4

## RESEARCH REPORTS RECEIVED

None received this year.

# Appendix 5

## PROJECT MANAGEMENT

### Budget

| | |
|---|---|
| Staff: | 177,138 |
| Operating: | $67,473 |
| **Total**: | **$244,611** |

### Staffing

Dave Rees, Paul Gasson, Anne Brow, Tammy Bruce, Sarah Forder, Chris Doonan, Athena Irvine, Katrina Hale, Todd Owen, Todd Cooper.

### Technical Advisory Group

Dave Rees, Paul Gasson, Alison Rothschild, Kerry Brown, Pete Gaze, Martin Heine, Craig Gillies and Mike Hawes.

### Advisory Group

Graeme Elliott, Dave Kelly, Mick Clout.

# Appendix 6

## INTERNAL DEPARTMENT OF CONSERVATION DOCUMENTS

(DOC computer document reference numbers in brackets)

1. RNRP Directory (DOCDM-139922)
2. RNRP Field Manual 2008-09 (DOCDM-313312)
3. RNRP Technical Advisory Groups Terms of Reference (DOCDM-139898)
4. Possum captures (DOCDM-102097)
5. Tracking Calculator 2008-09 (DOCDM-311846)
   - Rodent tracking tunnel results
   - Mustelid tracking tunnel results
6. RNRP Fenn Database 2008-09: (DOCDM-293508)
   - Mustelid capture results
   - Mustelid captures –boundary vs. internal lines
   - Field trial results
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 | s/drive-mainland is-robin-maps |
| 4. | Kaka (*Nestor meridionalis*) monitoring - kaka seen heard | s/drive-mainland is-kaka-maps |

# Appendix 7

## FLIGHT COUNTS PER MINUTE (FPM) OF FLAGGED NESTS IN DUCKPOND STREAM

| | 23 JAN 2009<br>TEMP 22°C<br>FINE | 27 JAN<br>TEMP 23°C<br>FINE | 2 FEB<br>TEMP 20°C<br>FINE | 8 FEB<br>TEMP 23°C<br>OVERCAST | 13 FEB<br>TEMP 19°C<br>FINE | 8 MARCH<br>TEMP 18°C<br>OVERCAST |
|---|---|---|---|---|---|---|
| | DAY<br>BEFORE | AFTER<br>3 DAYS | AFTER<br>7 DAYS | AFTER<br>14 DAYS | AFTER<br>25 DAYS | AFTER<br>41 DAYS |
| **Nest/<br>Distance<br>from line** | **Start<br>13.15** | **11.00 am** | **11.00am** | **12.00 am** | **10.20 am** | **14.00** |
| A - 20m | 25 | 8 | 0 | 0 | 0 | 0 |
| 1 | 27 | 8 | 1 | 4 | 0 | 0 |
| 2A | 31 | 0 | 0 | 0 | 0 | 0 |
| 2 | 85 | 36 | 14 | 14 | 0 | 0 |
| 3 | 57 | 10 | 5 | 4 | 0 | 0 |
| 4 | 11 | 8 | 0 | 0 | 0 | 0 |
| 5 - 100m | 53 | 35 | 16 | 13 | 0 | 0 |
| 6 | 86 | 37 | 18 | 10 | 5 | 0 |
| 7 | 45 | 17 | 2 | 2 | 0 | 0 |
| 8 | 46 | 1 | 0 | 0 | 0 | 0 |
| 9 | 49 | 8 | 12 | 13 | 3 | 0 |
| 10 | 76 | 10 | 10 | 10 | 7 | 0 |
| 11 | 61 | 19 | 12 | 8 | 5 | 0 |
| 12 | 26 | 13 | 4 | 9 | 0 | 0 |
| 13 | 22 | 12 | 6 | 2 | 0 | 0 |
| 14 - 350m | 73 | 32 | 16 | 40 | 23 | 10 |
| 15 | 20 | 16 | 16 | 14 | 8 | 10 |
| 16 | 24 | 22 | 18 | 18 | 9 | 3 |
| 17 | 85 | 48 | 50 | 36 | 36 | 8 |
| 18 | 41 | 52 | 48 | 38 | 13 | 3 |
| 19 - 450m | 35 | 21 | 14 | 19 | 2 | 0 |
| 20 | 42 | 48 | 54 | 40 | 19 | 65 |
| 21 | 58 | 47 | 66 | 46 | 54 | 65 |
| 22 | 54 | 47 | 80 | 65 | 25 | 13 |
| 23 | 39 | 41 | 60 | 65 | 28 | 66 |
| 24 | 111 | 66 | 120 | 85 | 68 | 63 |
| 25 | 17 | 20 | 25 | 23 | 6 | 17 |
| 26 | 78 | 30 | 80 | 40 | 46 | 22 |
| 27 | 63 | 53 | 16 | 68 | 17 | 55 |