

Mustelid and possum control and monitoring in the Rotoiti Nature Recovery Project in 2021-22.

Introduction

Landscape-scale ground-based mustelid control has been carried out for many years in the RNRP with the aim of suppressing mustelids (Stoats, *Mustela erminea*, and weasels, *M. nivalis*) to a tracking rate below 5%, which is considered the level that will enable kākā and other native birds to breed successfully (Greene 2004; Taylor et al. 2009). The Friends of Rotoiti community group also maintains several trap lines in areas outside the RNRP, which act as a buffer to help minimise reinvasion. In 2018/19, the RNRP network of traps was upgraded to double-set trap boxes with Tiakina Ngā Manu funding. This included undertaking a trial that compared two double-set trap box designs. This trial was finished in March 2020 and the complete report can be found at (Waite et al. 2021).

Traps are currently checked monthly in the RNRP. This requires 13 person days each month to check and rebait all 902 traps. In the winter months trap catches are very low and adverse weather conditions can make it more unsafe for rangers. Less frequent trap checks that result in the same trap catch would free up ranger time to complete other work. A trial in Abel Tasman of trap check frequency every second month showed no effect of stoat captures (i.e., same numbers of stoats caught when traps checked every second month as caught when checked monthly). This setup also uses double set DOC200 traps. In a single month the average saturation rate of the traps in Abel Tasman was 14% (11.1% rats, 0.5% mustelids, 0.2% other species, 3% Sprung). The trial found that a maximum saturation of 45% could be reached without influencing the number of stoats caught. Most often the saturation rate would be less than 25% after two months – well within the 45% threshold. An additional benefit observed in this trial was that traps that had already caught something were more likely to attract a predator to be caught in the second trap.

Through April and May of 2021, we measured the saturation rates of the trap lines in the RNRP. The saturation rate average over 24 trap lines for two months was 11.5%, This is including traps sprung due to captures or sprung without a capture. From all trap lines only Snail, Cedar and Borlase Edge had over 25% of sprung traps



total, after two months. As seen in the Abel Tasman trial the saturation rate is well below 45%.

Possum control

Possum control has been undertaken in the RNRP since 1997 using a combination of toxins and kill traps. Possum control is carried out to maintain possums at low numbers to allow the recovery of threatened plant species that are damaged by possum browse and provide protection to nesting kākā that are at risk from possum predation (Moorhouse 2003).

Monitoring to determine the effectiveness of possum control in the RNRP is undertaken 2-yearly using 7-night wax tag monitoring. The target of the possum control programme within the RNRP is to keep the Possum Activity Indices (PAIs) below 5%. This monitoring is next scheduled for March 2024.

Friends of Rotoiti

A total of 375 mustelid traps are maintained by FOR as a buffer to the RNRP.

- 89 DOC 200s on the Whisky Falls line
- 48 DOC 200s on the Speargrass and Mt Robert Road lines
- 43 DOC 200s on the Tophouse Road line
- 200 DOC 200s on the Rainbow/Skifield lines, all of which are maintained in summer and 160 of which are maintained in winter.

FOR has been using Sentinel kill traps along its possum trap lines since 2010. There are 38 traps in the Rainbow Valley, 42 on the Whisky Falls line, 24 on the Speargrass line and 8 on the Mt Robert Road line.

Additionally there are approximately 300 Victor traps in the Village rat trapping network that are checked fortnightly.

Methods

CONTROL MUSTELIDS

RNRP mustelid trap lines cover approximately 5000 ha to the east and north of Lake Rotoiti, running along the boundaries and within the RNRP at intervals of 1–3 km (Figure 2). The network is comprised of 902 double-set DOC 200 traps, spread at 100m intervals along 24 trap lines. The traps are checked monthly in the summer months and baited with Erazz. For the first time we proposed all trap line are checked every second month in the winter months. Trap checks were split so that Big Bush is completed one month, and the St Arnaud range is completed the next month. We started with Big Bush in July. Since the SAT/CED line had the highest

saturation rate this line was checked monthly to ensure we were maintaining control in this area.

CONTROL POSSUMS

Sentinel kill traps are set at 100-m spacings along existing mustelid trap lines below the bush line in the RNRP. An additional trap line runs up the Travers Valley to limit reinvasion into the control area from the south.

The Sentinel traps are attached to trees 1500 mm above ground level and fitted with white coreflute covers to help prevent non-target bycatch. The traps are baited with Connovation Possum Dough on the bait clip attached to the trap, and Kiwicares Blue Blaze is used as a lure on the tree leading up to the trap. Trap checking and rebaiting are undertaken in conjunction with the monthly (every second month in the winter months) mustelid trap checks.

FRIENDS OF ROTOITI

The Mt Robert Road, Speargrass, Whisky Falls, and Tophouse Road lines are checked fortnightly during spring/summer (November to April) and then monthly during autumn/winter (May to October), while the Rainbow lines are checked fortnightly from October to April and fortnightly or monthly during the colder months depending on catch rates. Erayz is used in all baited traps.

Sentinel traps are baited with Connovation Possum Dough on the bait clip, and Kiwicares Blue Blaze is used as a lure on the tree leading up to the trap. Traps are checked and rebaited monthly.

MONITORING

The effectiveness of the RNRP mustelid control is monitored by calculating the tracking tunnel index over 3 nights in November and February each year (Gillies 2013). Five coreflute tracking tunnels are spaced at 200 m intervals along lines spaced a minimum of 1 km apart in the Rotoiti treatment site (trapping) and Rotoroa non-treatment site (no trapping) and fresh rabbit lure is placed in the middle of the card for 3 fine nights. As different mustelid species cannot be reliably distinguished by footprints, the tracking index is for all mustelid species combined.

Results

CONTROL MUSTELIDS

In total, 70 stoats, 11 weasels and 2 ferrets were caught in the RNRP in 2021/22 (Table 1, Figure 1). High numbers of rats (*Rattus rattus*) were also caught in the RNRP and is often an indication of low mustelid numbers. Mustelids are generally

caught in the traps lines that are on the boundary of the RNRP (Figure 2). The number of weasels and ferrets remains low throughout the year, while the number of stoats caught increases through the summer months (December to March) when stoats are breeding (Figure 3).

Table 1. Total trap catches in the Rotoiti Nature Recovery Project from 1 July 2021 to 30 June 2022 by trap box design.

| Species | Modified Through | Run | DOC200 | Total |
|----------|---------------------|-----|--------|-------|
| Stoat | 40 | | 30 | 70 |
| Ferret | 2 | | 0 | 2 |
| Weasel | 5 | | 6 | 11 |
| Rat | 327 | | 248 | 575 |
| Bird | 1 | | 0 | 1 |
| Cat | 0 | | 2 | 2 |
| Hedgehog | 48 | | 49 | 97 |
| Rabbit | 6 | | 0 | 6 |
| Hare | 0 | | 1 | 1 |
| Mouse | 0 | | 8 | 8 |
| Other | 8 | | 6 | 14 |
| Sprung | 5 | | 7 | 12 |

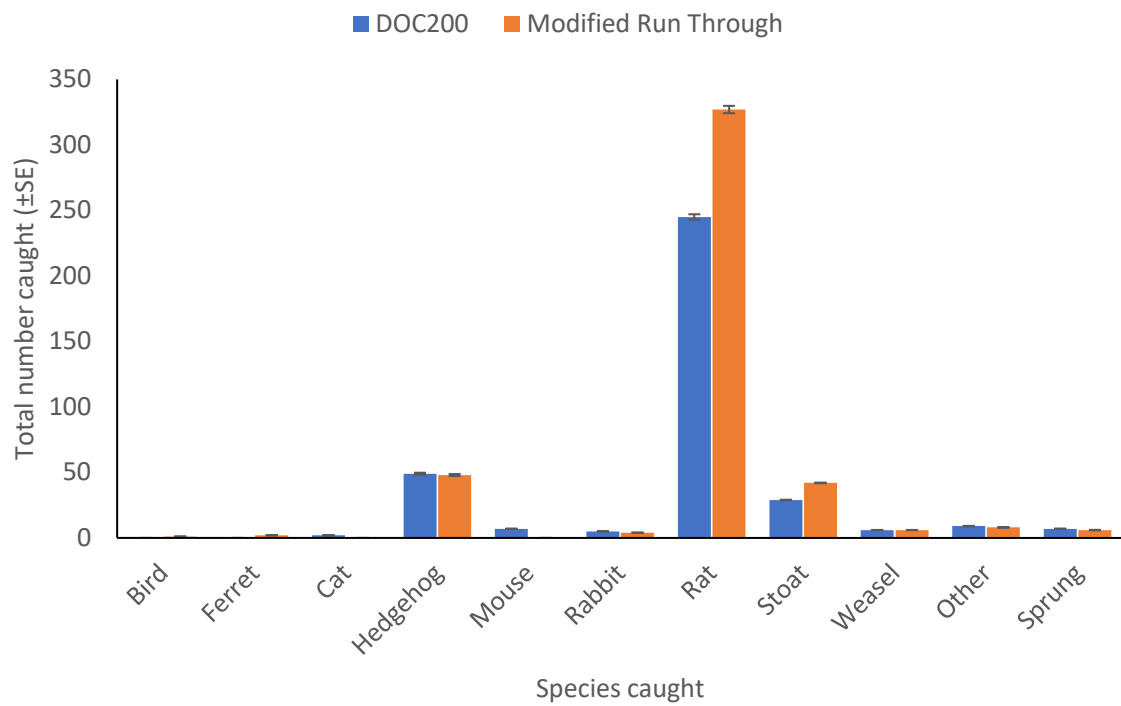


Figure 1. Total number of each species caught (\pm SE) for each trap box design in the Rotoiti Nature Recovery Project from 1 July 2021 to 30 June 2022.

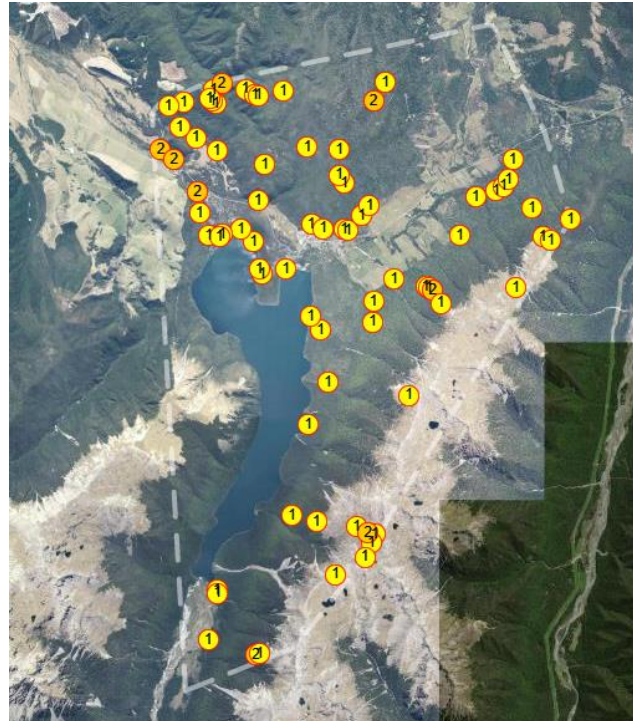


Figure 2. Location of mustelid catches (stoats, weasels, ferrets) in the Rotoiti Nature Recovery Project from 1 July 2021 to 30 June 2022. Number in circle indicates the number of mustelids caught at each location.

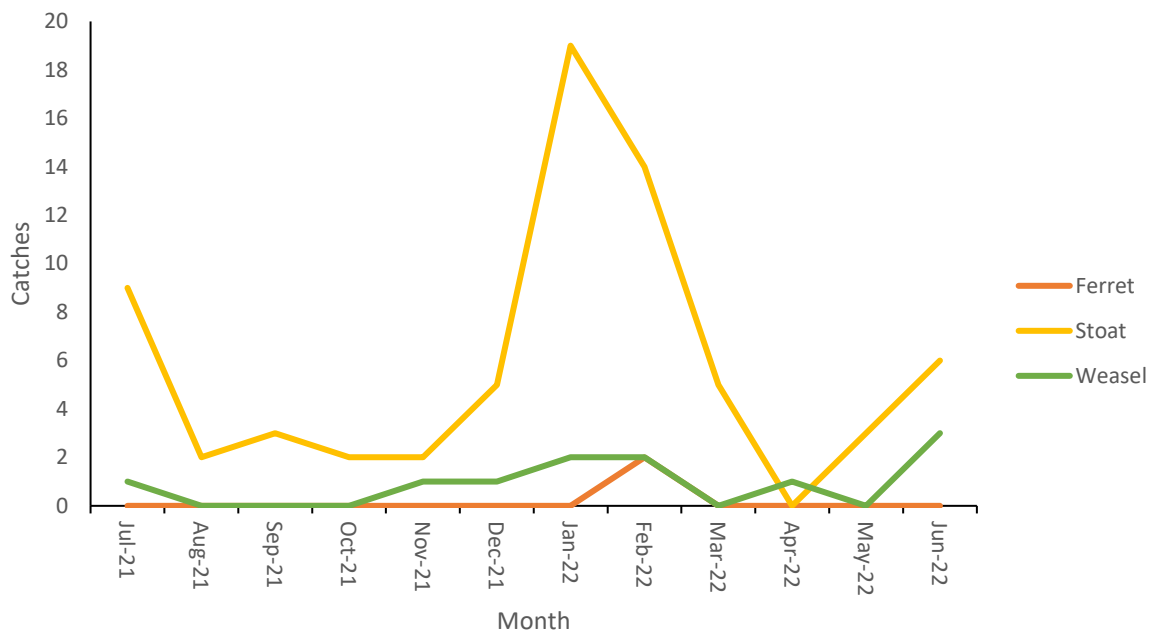


Figure 3. Mustelid catches (stoats, weasels, ferrets) in the Rotoiti Nature Recovery Project from 1 July 2021 to 30 June 2022 by month.

CONTROL POSSUMS

A total of 173 possums were caught in the RNRP in 2021/22, among which 142 were captured in Big Bush and 31 were captured in the core area (Table 2, Error! Reference source not found.4). This is similar to the previous season, when 101 possums were caught (85 in Big Bush and 16 in the core area). Possum catches in the RNRP peak in February and the tend to level off in the cooler winter months (Figure 4. Possum catches in the Rotoiti Nature Recovery Project from 1 July 2021 to 30 June 2022. Number in circles indicates the number of possums caught in each location.5).

Table 2. Possum (*Trichosurus vulpecula*) captures in the Big Bush and Core blocks of the Rotoiti Nature Recovery Project from 1 July 2021 to 30 June 2022.

| LINE (BIG BUSH) | POSSUM CATCHES | LINE (CORE) | POSSUM CATCHES |
|---------------------|----------------|-----------------|----------------|
| Dome Ridge | 38 | Snail Boundary | 2 |
| Boundary | 13 | St Arnaud Track | 3 |
| Black Sheep Gully | 11 | Grunt Boundary | 12 |
| Little Dog | 49 | Middle of Road | 3 |
| Old Dump Site | 7 | Clearwater | 1 |
| Black Valley Stream | 14 | Hubcap | 10 |
| Duckpond | 10 | | |
| Total | 142 | Total | 31 |

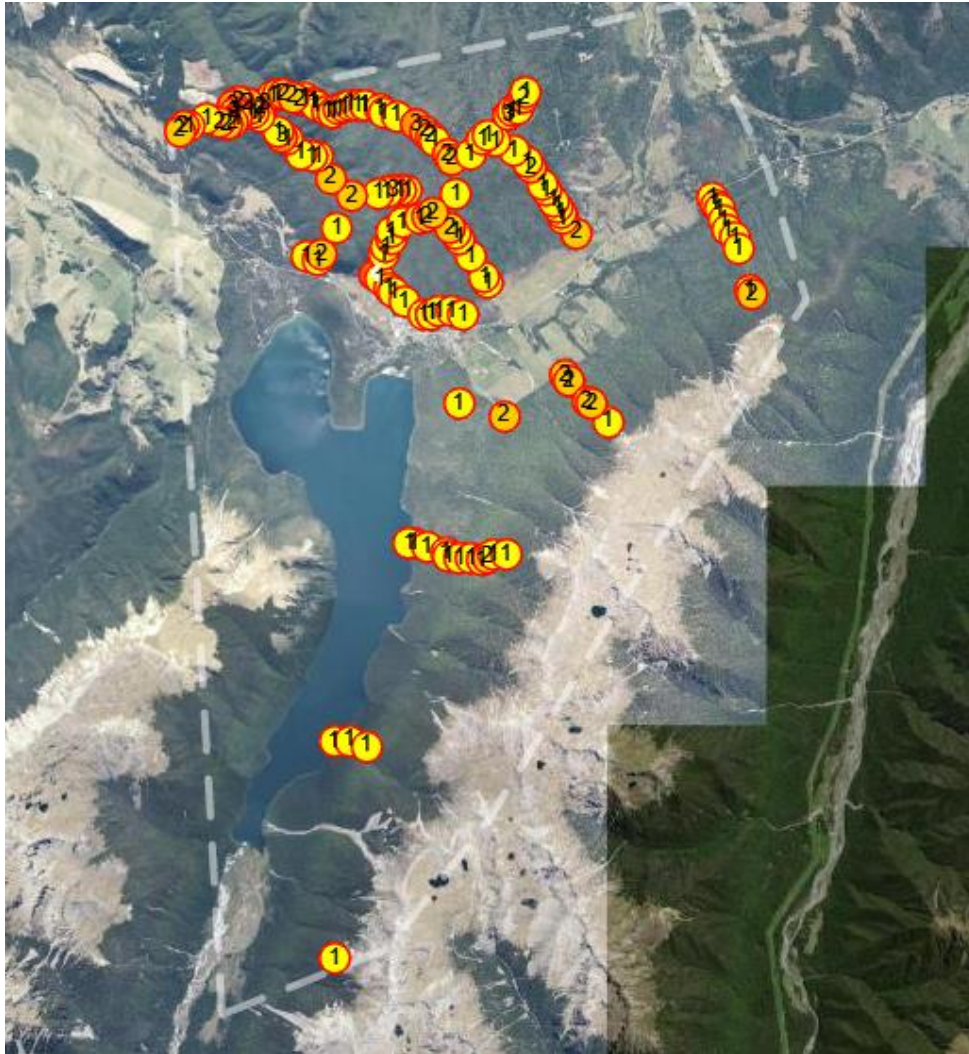


Figure 4. Possum catches in the Rotoiti Nature Recovery Project from 1 July 2021 to 30 June 2022. Number in circles indicates the number of possums caught in each location.

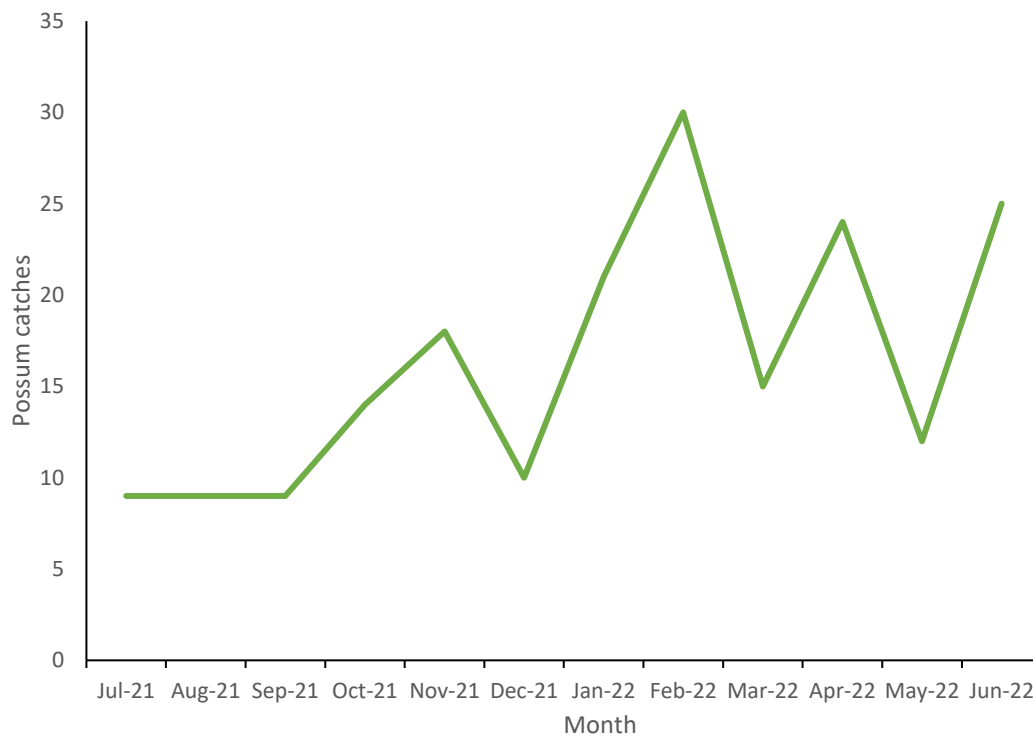


Figure 5. Possum catches in the Rotoiti Nature Recovery Project from 1 July 2021 to 30 June 2022 by month.

FRIENDS OF ROTOITI

For most Friends of Rotoiti trap lines the rats are the most caught species except for the Rainbow where hedgehogs were the most caught species on the line and the ski field road where possums were the most caught species. (Figure 6, Table 3). The most possums were caught on the Ski Field Road, when we consider that this line is only open for the summer months. The Rainbow Road and Whiskey lines caught the most stoats.

Table 3. Total catches on each of the Friends of Rotoiti mustelid/possum lines in 2021/22. Tophouse line does not have sentinel/possum traps.

| Line | Bird | Cat | Ferret | Hedgehog | Mouse | Possum | Rabbit | Rat | Stoat | Total |
|--------------------------|------|-----|--------|----------|-------|--------|--------|-----|-------|-------|
| Honeydew (DOC150) | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 30 | 0 | 31 |
| Mt Robert Road | 0 | 0 | 0 | 1 | 0 | 7 | 0 | 20 | 3 | 31 |
| Speargrass | 0 | 0 | 0 | 0 | 0 | 33 | 0 | 51 | 4 | 88 |
| Tophouse | 0 | 1 | 3 | 7 | 1 | 0 | 8 | 15 | 3 | 38 |
| Whiskey | 0 | 0 | 0 | 1 | 0 | 18 | 0 | 69 | 9 | 98 |
| Rainbow Road | 2 | 15 | 6 | 73 | 1 | 22 | 16 | 30 | 14 | 179 |
| Ski field Road | 0 | 0 | 0 | 3 | 0 | 26 | 0 | 3 | 3 | 35 |

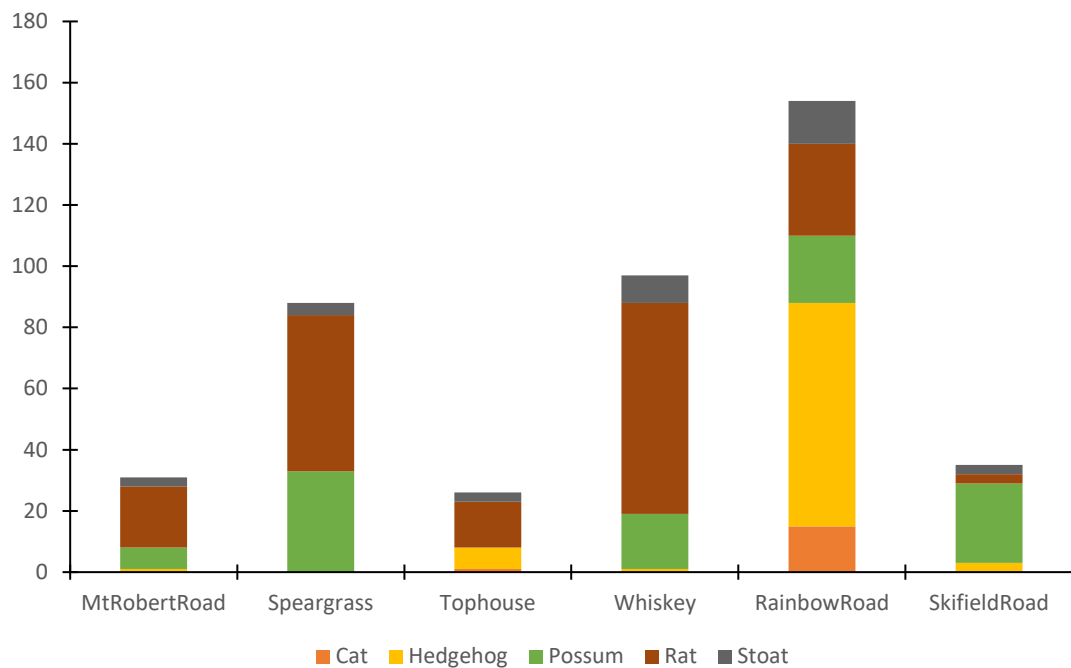


Figure 6. Proportion of species caught on on Friends of Rotoiti trap lines in 2021/22.

Table 4 summaries the total catches from the St Arnaud Village rat traps network run by the Friends of Rotoiti. These traps are checked fortnightly and are Victor traps baited with peanut butter.

Table 4. Total catches from the Friends of Rotoiti Village rat trapping lines in 2021/22.

| Line | Hedgehog | Mouse | Rat | Total |
|---------------------------|----------|-------|-----|-------|
| Black Hill | 0 | 43 | 5 | 48 |
| Water Tank | 0 | 16 | 0 | 16 |
| View Road | 0 | 12 | 1 | 13 |
| Black Hill Contour | 0 | 12 | 2 | 14 |
| Ward Street | 0 | 9 | 1 | 10 |
| Black Valley | 0 | 75 | 15 | 91 |
| Holland Street | 0 | 25 | 3 | 28 |
| Robert Street | 0 | 14 | 8 | 22 |
| Moraine Walk | 1 | 39 | 0 | 40 |
| PCLLine | 4 | 15 | 16 | 35 |
| Peninsular | 2 | 89 | 23 | 116 |
| Lodge Road | 0 | 31 | 3 | 35 |
| Village Link | 0 | 51 | 10 | 61 |
| Loop | 0 | 15 | 26 | 41 |

MONITORING

Mustelid tracking rates in the RNRP trapping area were $3\% \pm 2\%$ (mean \pm SEM) in November 2021 and undetectable (0%) in February 2022. At the Rotoroa non-

treatment site where no trapping is undertaken, tracking was $27\% \pm 15\%$ in November 2021 and $31\% \pm 13\%$ in February 2022.

In this financial year the Friends of Rotoiti did three rodent tracking tunnel monitoring lines once, which consisted of 10 tracking tunnels spaced at 100m. The tracking was $7\% \pm 3\%$ in May 2022.

Discussion

The RNRP mustelid trap network successfully maintained tracking indices below the 5% target, whereas mustelid tracking indices were well above 5% at Rotoroa, where no mustelid control was carried out. This network is supported by the Friends of Rotoiti trap lines which help to reduce reinvasion in the mainland island.

No possum waxtag monitoring was carried out in 2021/22. But as in previous years, the trap lines in Big Bush caught the highest number of possums, with the Dome Ridge trap line on the northern boundary having the highest catch rate. The highest catch rates in the core area were on the Hubcap and Clearwater lines at the northern and southern boundaries. This difference in catch rates is due to the core area having a long history of possum control, whereas areas north of the Big Bush control block do not have any possum control, resulting in reinvasion from these areas.

The trial of checking RNRP traps every second month during the winter saved us a significant amount of staff time each month. To ensure there was not a detrimental effect on predator control here, the trap captures were monitored closely. At the end of each month the saturation rate of each line needed to be assessed to ensure we are remaining below the threshold of 40%. It was very important that all trap data was entered in a timely manner (the day or day after the trap checks) so that decisions could be made for the trap checks in the following month. Only the SAT/CED lines were checked every month, the rest of the traps were well below the 40% saturation rate.

The state of the erayz bait was noted and this ranged from very mouldy to completely fine. The next step would be to look at longer life baits and how these can be dispensed in our trap boxes to ensure that the traps and bait was attractive for the full two months.

Going forward the trapping regime and bait types used should be continued to be monitored and reassessed to ensure we are all trapping in the most efficient way possible.

The Friends of Rotoiti have been awarded funding from the Rātā Foundation to install a trap line in the Travers and Sabine Valley's (Griffin 2021). The main aim of this trap line is to protect these rivers and allow whio to re-establish. In the 2021/22

financial year FOR member began construction of the traps and started deploying them in the Travers Valley. The trap catches from the first couple of checks have not been recorded in this report as this is still in the initial stage. From 2022/23 financial year these trap lines will be able to be reported on.

References

Griffin M. 2021. Proposal to the Rata foundation for the Friends of Rotoiti trap line in the Travers and Sabine Valleys. DOC- 6416985.

Waite J, Griffin M, Joice N, Poutu N, Brown K. 2021. Efficacy of run-through versus best practice double set DOC200 trap boxes for stoat (*Mustela erminea*) control. New Zealand Department of Conservation. DOC-6658029.