



# Waikereru Sanctuary

## Pest Control & Species Summary

Jul 2023 - Jan 2024

Prepared for Waikereru Eco-sanctuary by Ecoworks NZ Ltd.



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## 1.0 Introduction

This report covers pest control work at Longbush Reserve and Waikereru Ecosanctuary undertaken by Ecoworks NZ Ltd. from 20<sup>th</sup> July 2023 to 20<sup>th</sup> January 2024.

Intensive vertebrate pest control has allowed the Waikereru – Longbush Eco-Sanctuary to develop into the most significant protected ecosystem within the lower Waiapu Ecological District. The Longbush Reserve (11 ha) was initially protected with stock fencing and pest control during 2002-2003. Since this time significant understorey seedling-shrub and sub-canopy forest tiers have re-established. Prior to 2002 this site was grazed by stock which had opened the understorey and allowed little to no successional vegetation to recover.

This site has been recognised by several of New Zealand's leading ecologists and botanists as a priority one recommended area for protection (J.R Leathwick *et al.* 1995). During the early 1990's the Protected Natural Areas Programme (PNAP) surveyed all remnant forest sites both on the Waimata River itself and throughout the greater Waiapu and Turanga Ecological Districts. Because of Waikereru's intact forest canopy and a full sequence of landscape units including alluvial terrace and podocarp-hardwood forest into kanuka forest slope, the site was given a priority 1 recommended area for protection rating and considered the rarest and most valuable site for biodiversity and forest species diversity on the Waimata River. Protecting a representative forest site such as Waikereru is vital and provides an 'island' of biodiversity resource, including species genetics and native forest seed material from which future restoration efforts within the catchment and lower Waiapu Ecological District will rely upon.

Since 2002, stock exclusion and intensive pest species protection using best practice methodology has allowed multiple regionally and nationally rare endemic species to survive and increase in density at Waikereru.

The full suite of introduced pests are targeted using best practice (DOC & Landcare Research). By working closely with organisations such as ZIP (Zero Invasive Predators), Trap.NZ, Predator Free 2050, Tier 2 and University Research personnel, we have incorporated the latest technology into this project and others throughout the region. This has included Auto Traps Ltd, Whakatane and working with their team to fine tune their product. The ZIP motor lure is currently being used at Waikereru and Whinray Reserves to pre-feed possums, rats and mustelids. We are using AI cameras alongside the Cacophony project platforms, training our cameras with Tier 2 to recognise and identify key pest species. Deploying toxins which are bird friendly at a smaller site such as this also brings benefits.

We are also working with engineers at Tier 2 to integrate robotics into future pest management programmes. Market ready systems which will deploy gel baits in future and are monitored remotely by laptop to target pest incursion sites identified by AI cameras. Both cameras and traps sending real time data via nodes to each other and the cloud making pest control a far more time effective programme.

Multiple species are being successfully protected at Waikereru, some of which are remnant populations within the Waimata Catchment. It is vital that we protect these species as we have already lost tens of species within this catchment within the last 120 years including kokako, kaka, kiwi and untold others.

The species under protection at Waikereru include:

### 1.1 Pekapeka – Long-tailed bat

This species was first recorded at Longbush-Waikereru in 2005 (Ecworks NZ), but would have been present for many thousands of years. The North Island pekapeka is classed as Threatened: ‘Nationally Critical’ (DOC & IUCN) and relies on old age mature native trees to provide historical cavity bearing breeding locations and high-quality pest control. Bats are seen on most nights during summer above Longbush forest. The ‘meadow’ paddock directly beside Longbush forest is a popular feed site where bats are regularly seen with thermal imaging equipment.

This is one of only four sites where long-tailed bat are protected within the Gisborne Region. Predators include cats (domestic and feral), ship rat, stoat, weasel and possum, therefore pest control is vital to protect this population of endemic bats found at Waikereru.



During 2023, artificial bat roosts (below) were sponsored by Ecworks NZ and installed at Waikereru. These will be monitored using hand-held bat detectors and thermal cameras over the next few years to measure the successful expansion of this bat population and its reproductive output. These roosts are based on a proven design used by Waikato Regional Council in Hamilton.

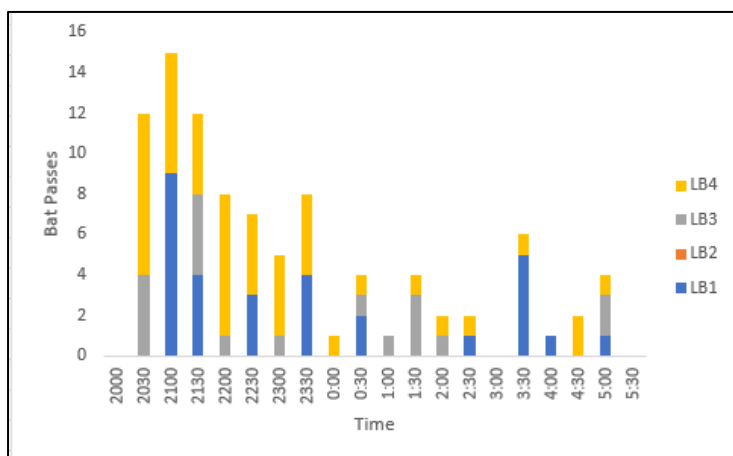


Fig 2: Accumulated hourly bat pass indices at four ABM sites at Waikereru between March 23<sup>rd</sup> and April 29<sup>th</sup> 2023. Data collected by Emma Naylor, Fig 3: – Artificial bat roost at Waikereru.



## 1.2 Rhytida Land Snail

During 2023 an amazing discovery occurred within Waikereru. *Rhytida greenwoodi* a carnivorous native land snail was discovered at Waikereru. This is the only site known on the East Coast of the North Island where this species is found today. Again our native snails are highly dependent on pest control. It appears a small remnant population has remained at Waikereru and during 21 years of pest control has been able to successfully breed. This species enjoys living within and under *Tradescantia fluminensis*, an introduced invasive ground cover weed. Therefore greater care is required at Waikereru now that this rare species is known to inhabit this valuable forest site.



## 1.3 Other regionally rare species found at Waikereru



Black orchid



Green Hooded Orchid (PCN Photo)



North Island Tomtit



Popokotea – whitehead (NZBOL – Photo)



Karearea



Woodworthia gecko

## 2.0 Pest Control Summary

Two hundred and thirteen traps and sixty-seven bait stations are spread over approximately 124 hectares at Waikereru. Traps are installed and baited according to industry best practice and serviced approximately every 30 days. Bait stations are monitored every 60 to 90 days or as required.

Trap results are shown below in a series of images generated from the Trap.NZ website. Records are generated in the field, at time of checking, using a smartphone app and then uploaded to the website at the end of the day's work.

Data includes kills from a selection of traditional mustelid and rat traps, as well as more modern automatic traps that can account for up to 90 kills between servicing. The automatic traps give an indication of possum or rat/mouse kills which are read off the device using an app (rat/mouse tally's generated by the traps are recorded as ship rats unless mouse carcasses are seen in/around the traps at time of data download).

These charts do not include kills from Goodnature A24 traps – during the timeframe of this report 81 gas cylinders for these traps were replaced (each cylinder being capable of 24 rat or mouse kills) which allows for up to 1944 additional rat or mouse kills (not allowing for leaks or malfunctions).

Table 1: Kill Tallies from 20/7/2023 to 20/1/2024

Month	Bird	Cat	Ferret	Hedgehog	Mouse	Possum	Rat	Stoat	Weasel	Total pests	None	Total checks	% Success
Jul 2023	0	1	0	0	0	0	0	0	0	1	47	48	2%
Aug 2023	0	0	0	0	8	3	58	1	2	72	117	189	38%
Sep 2023	0	0	1	0	1	6	86	0	0	94	35	129	73%
Oct 2023	0	0	1	1	1	3	48	2	2	58	107	165	35%
Nov 2023	1	1	0	1	1	1	9	1	0	15	103	118	13%
Dec 2023	0	0	0	0	10	3	39	2	3	57	91	148	39%
Jan 2024	0	0	0	0	0	3	22	0	0	25	113	138	18%
<b>Total</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>21</b>	<b>19</b>	<b>262</b>	<b>6</b>	<b>7</b>	<b>322</b>	<b>613</b>	<b>935</b>	<b>34%</b>

\*The 'bird' shown in the table above was a thrush

Two toxin types are used to control rodents. Ratabait pellets (Diphacinone) are deployed in bait stations to exclude birds across Waikereru. Cholecalciferol Striker baits are also deployed quarterly throughout Waikereru on tree stems. These baits are a bird friendly toxin. In the event that weka arrive at Waikereru there will be no impact on this species.

These baits target rats, mice and possums. Ecoworks NZ uses this toxin at 3 sites within Tairāwhiti and it has proven to be highly effective at protecting a wide range of species, including North Island robin, rifleman, bats, native frogs and invertebrates. These baits are enclosed within a wax and potato starch casing and are fully biodegradable.



Fig 12: Right - a typical striker for this series that still has the protective wax mostly intact and has had very minimal rodent or insect interaction.

Fig 13: Month by month chart of total kills

(Large spikes relate to accumulated auto trap kills)

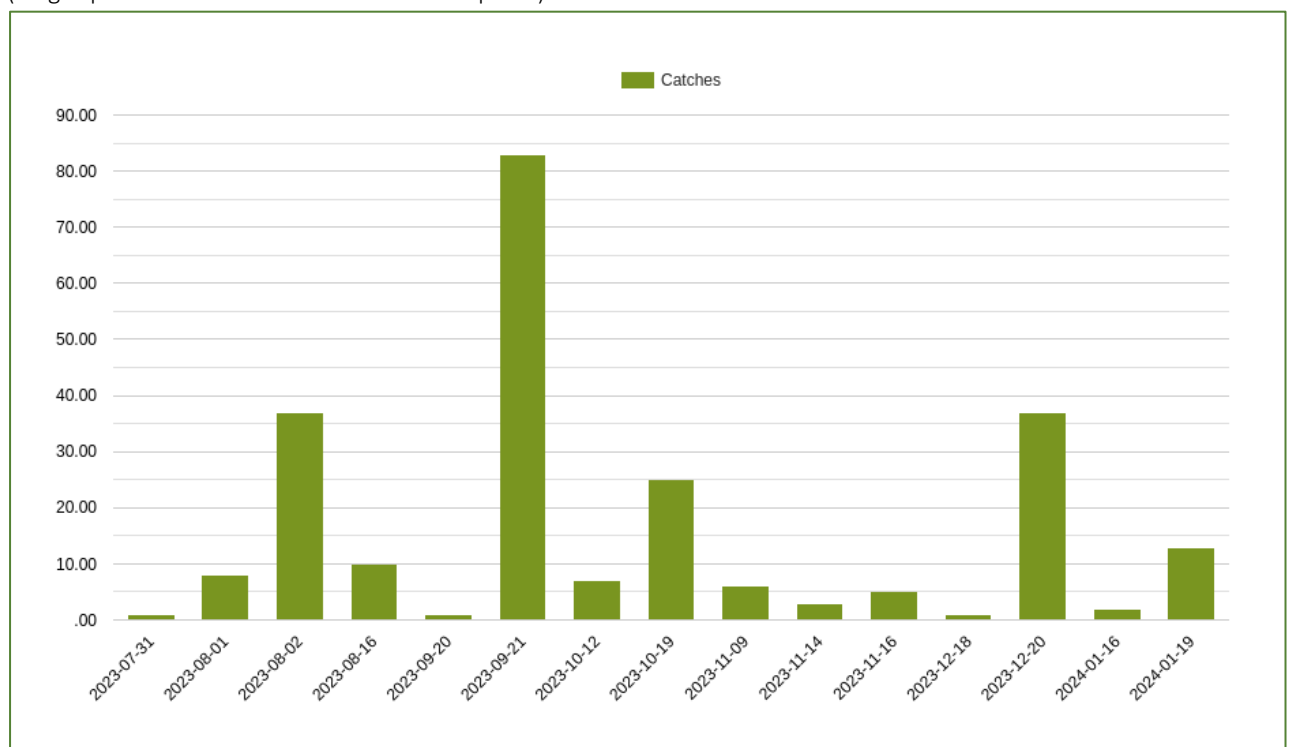




Fig 14: Monthly kills by species

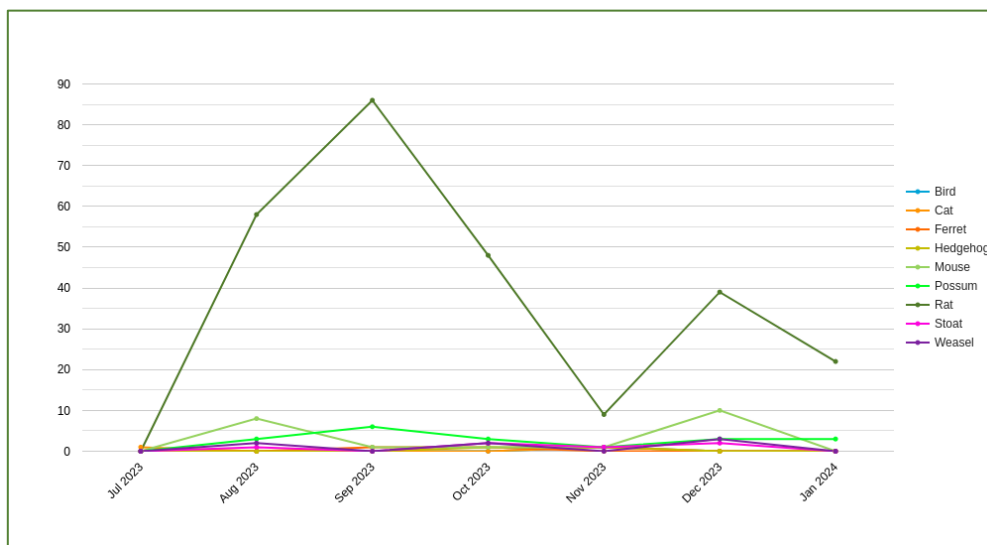


Fig 15: Total trap kills by location (Locations with zero kills not shown)

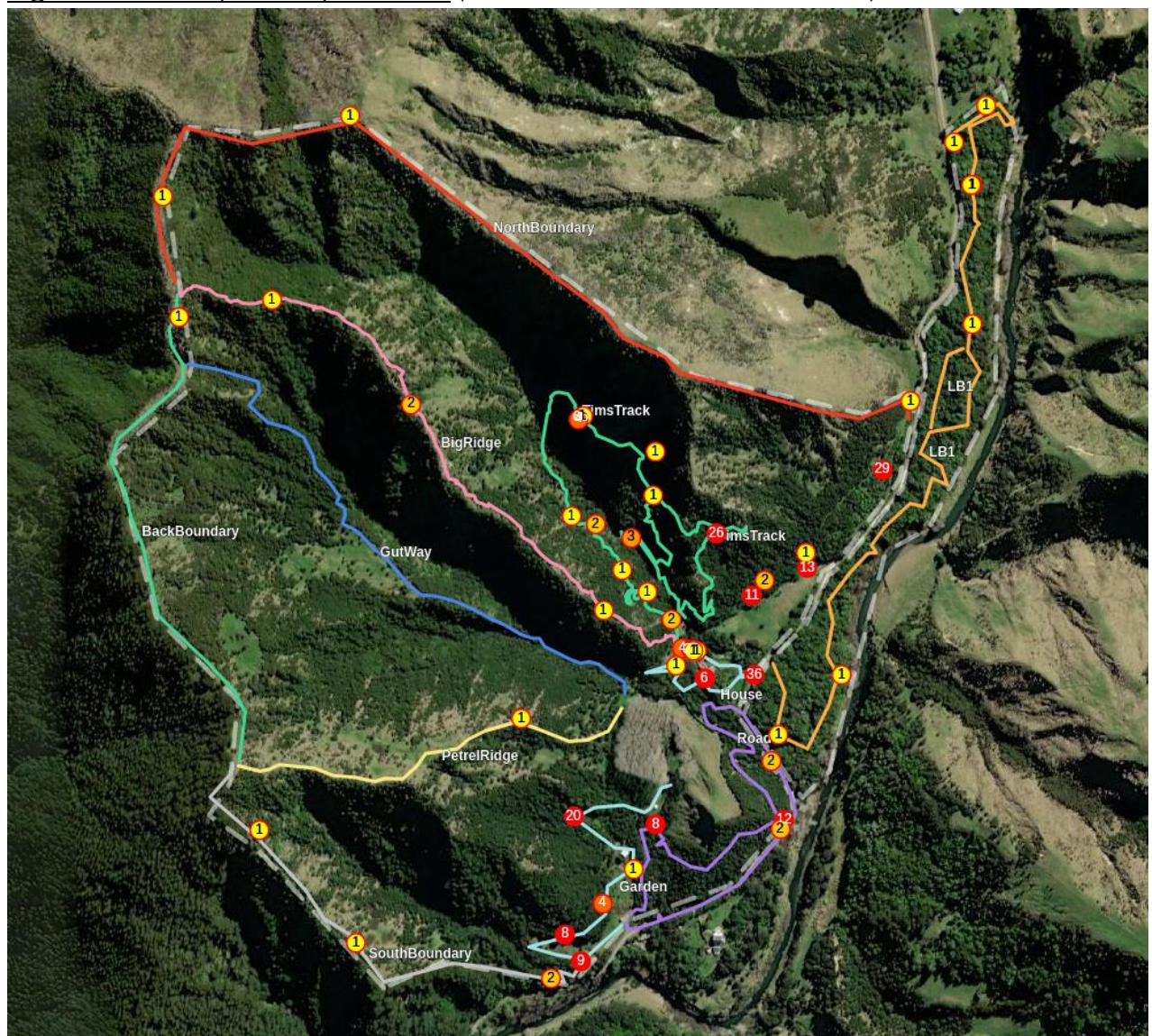




Fig 16: Trap kills as a heatmap.

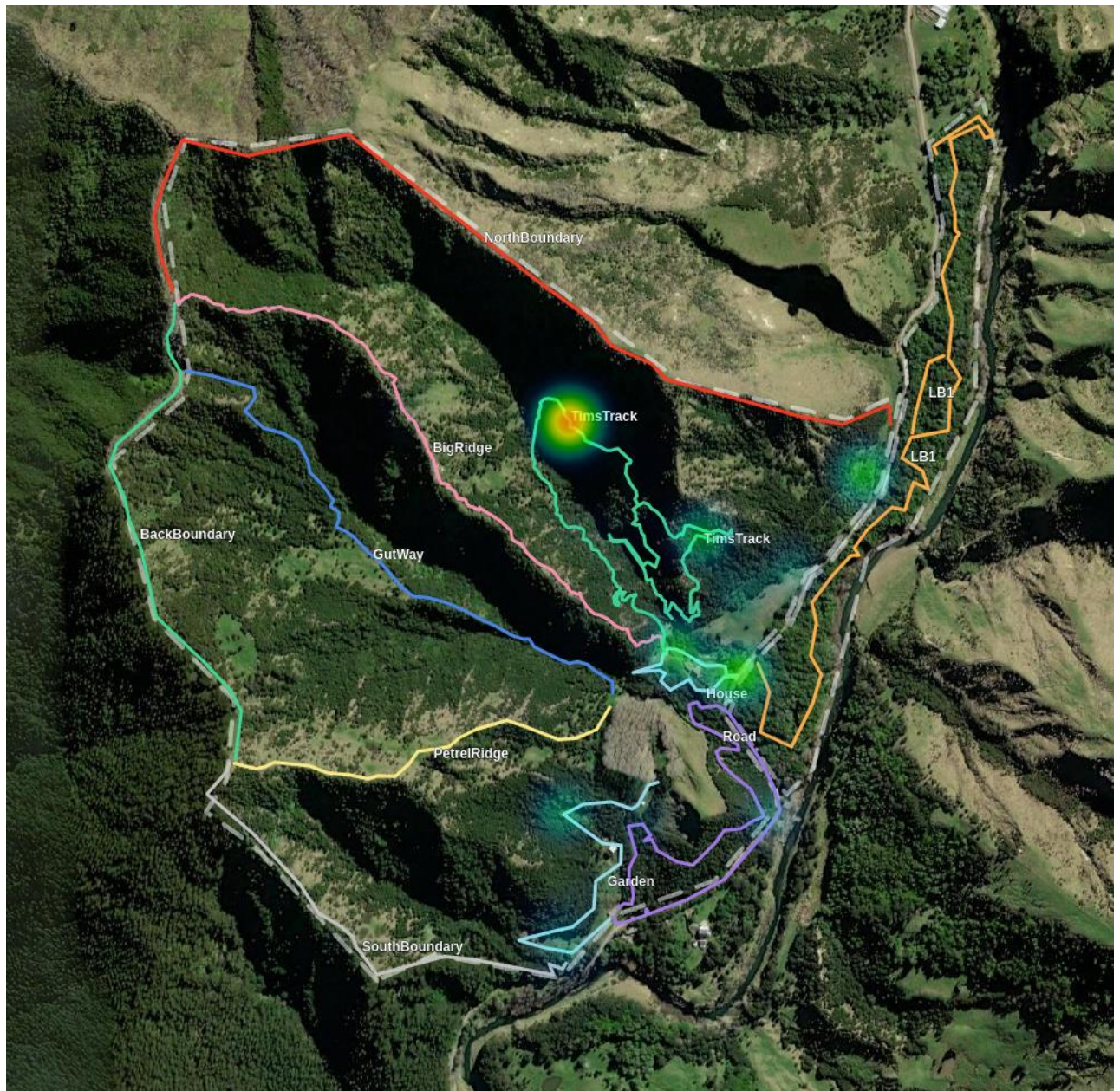




Fig 17: Waikereru heat map of trap kills without AT220's  
(To prevent data skew from high kill rates of AT220 auto traps)

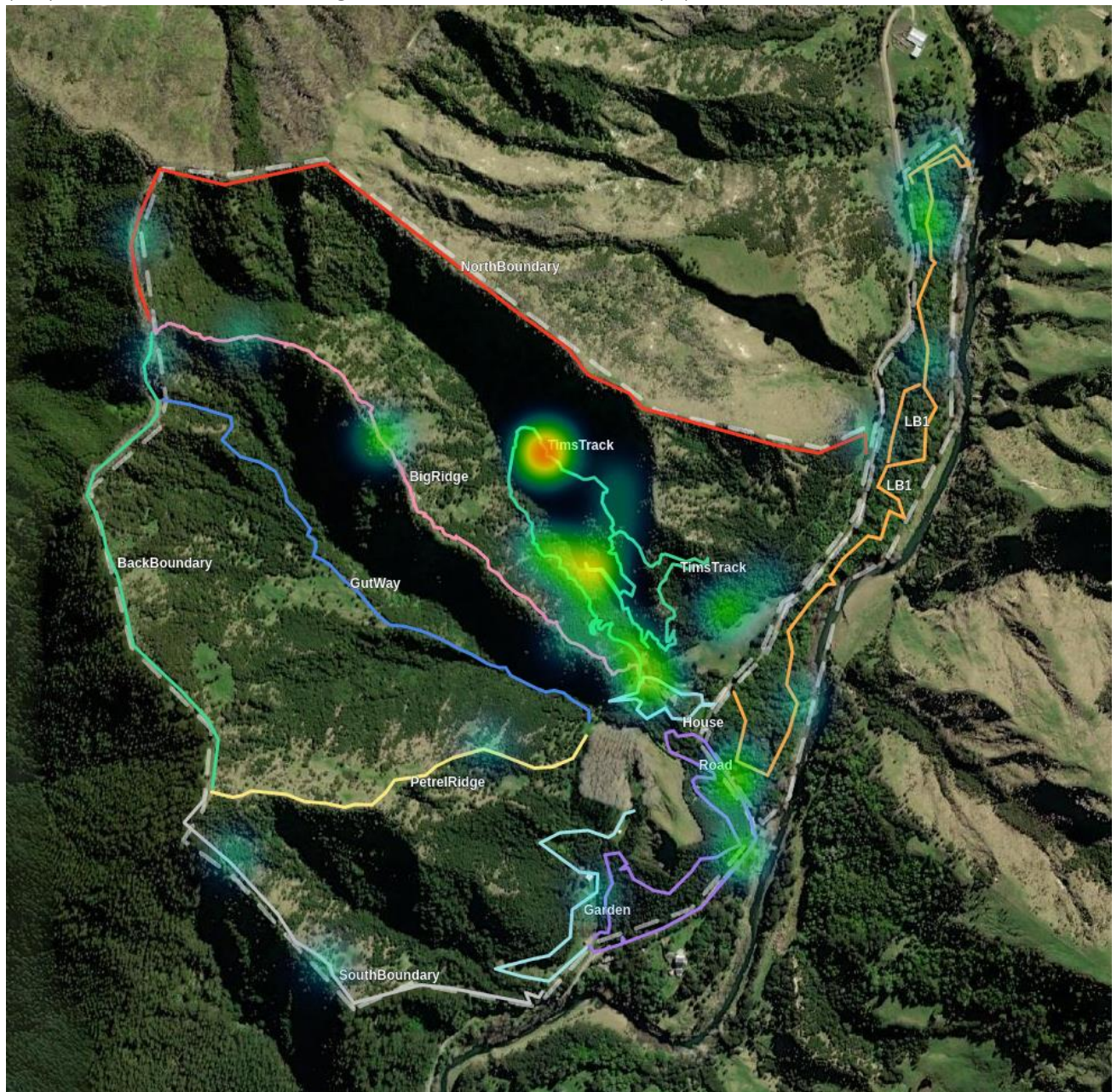
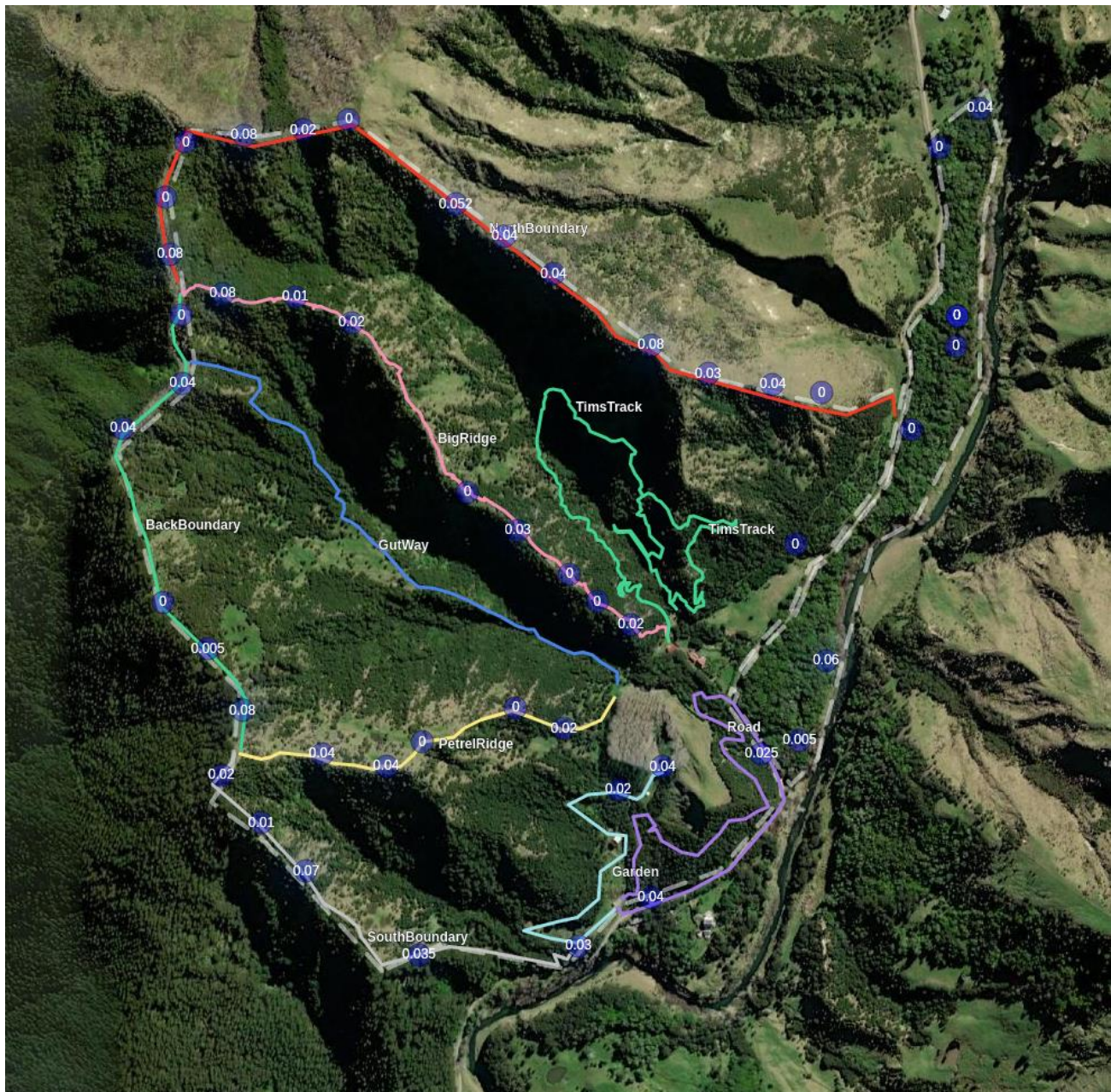




Fig 18: Map of Rat bait taken  
(Representing kilograms of "Double tap" bait)





### 3.0 Chew Card Indexing

Chew card pest monitoring is an ideal monitoring tool for this site as it allows us to detect multiple species at one time- mice, rats and possums. Following the 'Manaaki Whenua-Landcare' prescription for chew card indexing (Sweetapple) cards were deployed during January 2024 across the lower half of Waikereru Reserve. This was aimed at attaining a robust measure of rodent and possum densities immediately adjacent to the 'Seed Islands' project area and the riparian podocarp-hardwood forest. Monitoring this forest type is a good indicator of pest control success or failure as it holds a significantly higher density of rodents and possums than the upper slope regenerating kanuka forest due to the diversity, seasonality and abundance of fruit and seed material available to pest species.

Card locations were recorded on Trap.NZ app. Cards were deployed on Monday January 15<sup>th</sup> and collected on 19<sup>th</sup> January, 4 nights total. 32 cards were deployed at 100 metre spacing. Cards are 80mm x 160mm and folded in half and screwed to trees at possum browse height (right). Each card is filled with smooth peanut butter within the corflute tubing.



#### Results:

Total Chew Card Nights	128 nights
Total Possums	1 (0.78%)
Total Rats	0
Total Mice	0

Only 1 possum was recorded. It happened to be Waik105 (refer Trap.nz) which we had deployed a trail camera on, so we have video of this possum at this site (above).

This is a pleasing result. The rodent control operation is working well. We see this on multiple fronts. We are seeing an increase in North Island tomtit distribution and density across Waikereru. This species is highly susceptible to ship rat predation. Night observations using thermal monitoring equipment also indicates very low ship and Norway rat levels. Rats produce a lot of body heat and are easily detected within thermal scopes at night, and of course the chew card indexing indicates rats are at extremely low levels. This is very pleasing to know that highly vulnerable and threatened species such as invertebrates, native bats, *Rhytida* land snails and NI tomtit are all well protected.

Ship rats will cause significant damage to native forest and impact fruit and seed, invertebrates and larger species.

We believe a combination of Goodnature A24's, AT220's and Cholecalciferol striker baits are doing an excellent job at controlling the local rodent population and migration of individuals into Waikereru and therefore allowing Waikereru biodiversity to recover and expand.

Possums are also in low numbers, however due to the small size of Waikereru continued re-invasion occurs. The AT220's appears to do an excellent job removing possums. Since April 2023, 33 possums have been removed from Waikereru largely by AT220 traps.

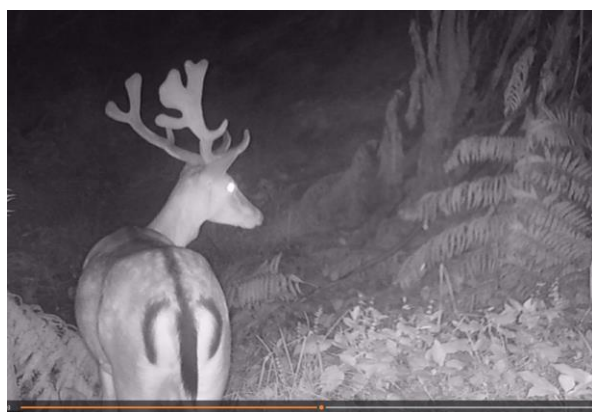
#### 4.0 Goats and Deer

Some major fence repairs were undertaken during mid 2023 after Cyclone Gabrielle the upper northern section of the perimeter fence (Bill Kings boundary) had slipped and repairs were made, fence restrained at several locations, new battens and gaps closed to ensure goats could not access.

A gap had also appeared along the southern pines boundary where deer were jumping in and out of Waikereru. The top wires were re-strained and stapled here with additional battens attached.

Waikereru Reserve is under extreme pressure from grazing pests outside the reserve. Pasture outside the fence is grazed down to the ground, therefore Waikereru Reserve is an extremely inviting proposition for goats and deer. The feral goat, red deer, fallow deer and stock pressure on the fence is very high and any weak point appears to be exploited rapidly. The deer fencing extensions added during 2020 is doing a great job. Like any fence a very small percentage of grazing pests still manage to enter the reserve. This appears to be the occasional goat or deer jumping and forcing itself between fence wires or deer jumping the Riverside Road low profile stock fence and gates.

Four separate culling missions have been undertaken since early 2023. Thirteen goats have been culled by Steve, Matt Huxtable and Quintin Scrivens using a mix of thermal equipment and indicator dogs.



**Figs 20-21: Fallow stag at Waikereru captured by IR trail camera and the top boundary fence showing heavy grazing outside the fence and dense grass sward within the fenced boundary.**

Large numbers of fallow deer are seen between Waikereru Reserve and Gisborne City. Donners Reserve and the true left of the Waimata River is grazed each night by fallow deer with up to 16 counted in one group during December 2023. Eight were counted at 5.00am recently grazing on mown grass beside housing and numbers appear to be expanding rapidly.

Ongoing intermittent hunting is carried out as budgets allow to maintain pressure on goats and deer at Waikereru alongside trail camera monitoring (above).

If you have any questions regarding this report, please contact Steve Sawyer on [Steve@ecoworks.co.nz](mailto:Steve@ecoworks.co.nz) or 027 209 6049.

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## Appendix 1.0-

Chew Card Lines January 15-19<sup>th</sup> 2024.

