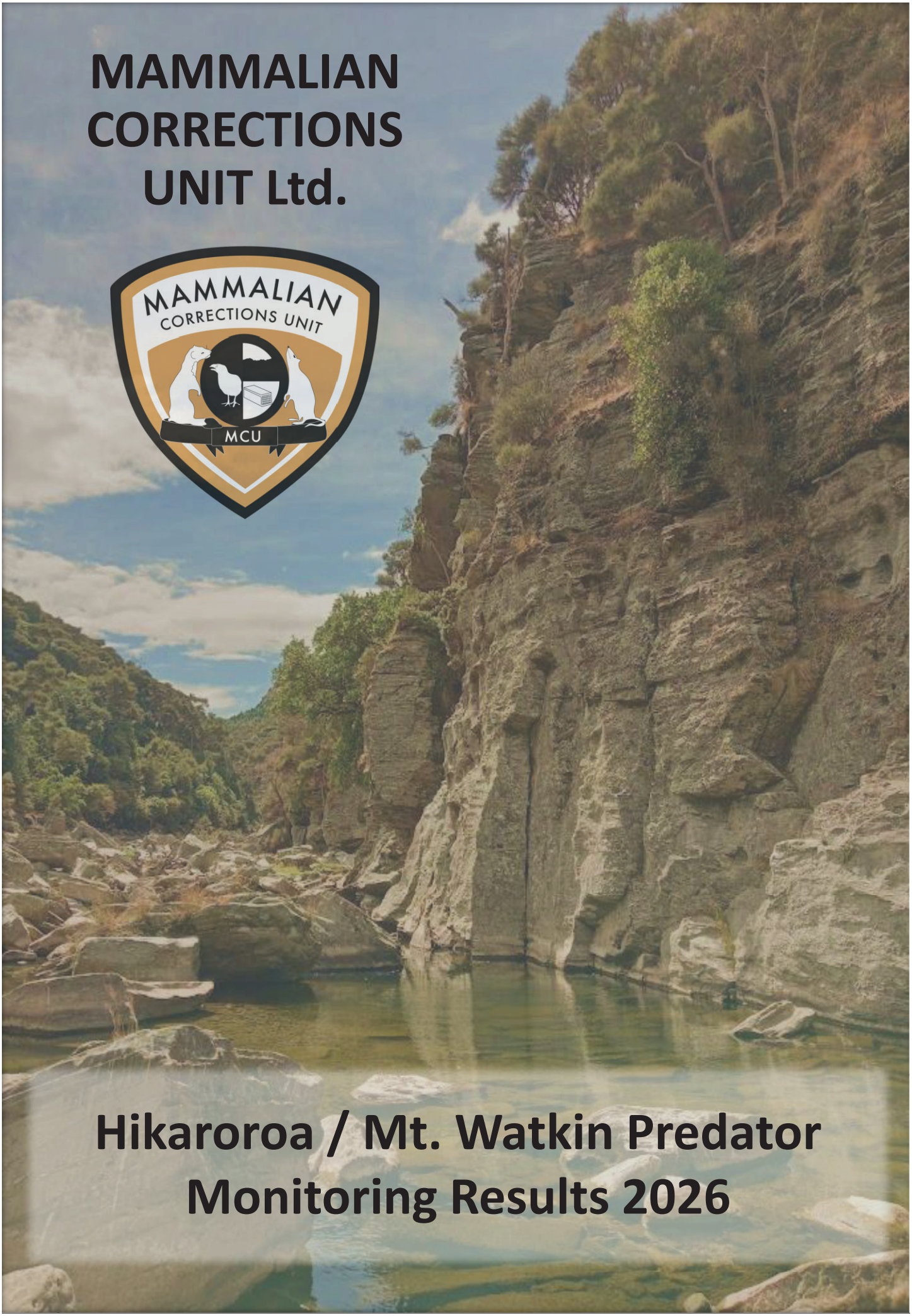
MAMMALIAN CORRECTIONS UNIT Ltd.



Hikaroroa / Mt. Watkin Predator Monitoring Results 2026

Produced on behalf of the Dunedin City Council
&
the Hikaroroa / Mt. Watkin Conservation Group
by
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A Note on Reporting Scope and Management Structure

The Hikaroroa landscape comprises both the 660 ha Dunedin City Council (DCC) Hikaroroa / Mt. Watkin Scenic Reserve and a network of surrounding privately owned properties managed collaboratively through the Hikaroroa / Mt. Watkin Conservation Group (HMWCG). Although these are separate management entities with different funding arrangements and operational responsibilities, together they form an interconnected ecological landscape. Native species, introduced pests, and ecological processes move freely across property boundaries, making landscape-scale management practical and essential for both parties.

Mammalian Corrections Unit Ltd. (MCU) provides contracted pest management, monitoring, and reporting services for both organisations. Monitoring and reporting undertaken within the DCC Scenic Reserve is funded through DCC's operational pest management programme, while monitoring and reporting on HMWCG-managed private land is funded through the Department of Conservation Community Fund Project Coordinator role. Although these monitoring programmes are funded separately, they have been presented together in this report in good faith to provide a more holistic understanding of ecological conditions across the wider Hikaroroa landscape that give useful insight to both management parties.

Results from DCC and HMWCG monitoring are presented separately to acknowledge differences in management history, survey timing, and land tenure. However, synthesising these datasets provides valuable context for adaptive management and supports coordinated decision-making between project partners working towards the shared goal of protecting and restoring the ecological values of Hikaroroa / Mt. Watkin.

Executive Summary

The Hikaroroa / Mt. Watkin Scenic Reserve predator monitoring programme was established in 2021 to understand pest presence, evaluate the effectiveness of future pest management operations and provide an evidence base for adaptive management. Monitoring was expanded beyond the Dunedin City Council Scenic Reserve to include significant habitat on surrounding private land managed by the Hikaroroa / Mt. Watkin Conservation Group following the group's successful DOC Community Fund 2024 application. Together, these monitoring networks now provide a landscape-scale understanding of predator populations and reinvasion pressures across the wider catchment.

Monitoring results indicate that predator control operations have generally been successful in reducing populations of several key pest species. Possum suppression has been particularly effective, with Wax Tag Indices declining substantially following installation of the AT220 automatic trap network. Current monitoring suggests possum abundance remains low across both reserve and private land, with suppression levels potentially exceeding original modelling expectations.

Feral cat detections have also shown a declining trend since monitoring began, although cats remain the most detectable predator species within the project area.

Mustelid monitoring indicates that stoats, ferrets, and weasels occur at relatively low densities. Monitoring suggests stoat abundance may fluctuate in response to rodent population peaks, highlighting the importance of understanding interactions between pest species.

Rodent populations remain comparatively low relative to many New Zealand forest systems, although seasonal and annual fluctuations continue to occur. The absence of landscape-scale rodent control remains a significant gap in the current management programme and may limit future biodiversity outcomes and species recovery opportunities.

Monitoring data collected over the past five years have provided a valuable and robust baseline for understanding pest population dynamics and assessing management effectiveness. As the programme matures, however, it is recommended that monitoring effort be streamlined to improve cost efficiency while retaining sufficient information for adaptive management and accountability reporting.

A revised annual monitoring programme based around a 7-day survey period is recommended. This approach would reduce monitoring effort by approximately 87.5% compared to the original monitoring regime, while retaining the independent monitoring required to assess long-term trends and management outcomes.

Independent monitoring should remain a core component of the programme, as operational trap catches alone become increasingly difficult to interpret over time due to changes in trap performance, pest behaviour, and control methodologies.

Overall, the monitoring programme indicates that current pest management is achieving meaningful reductions in several target species and provides a strong informational foundation for future management planning.

Introduction & Purpose

Dunedin City Council has invested in a structured predator monitoring programme to measure the effectiveness of predator control operations and guide management decisions at Hikaroroa / Mt. Watkin Scenic Reserve since 2021.

The private land HMWCG monitoring network provides understanding of pest pressures and dynamics in non-legally protected significant habitat and directly supplements the DCC's reserve monitoring program by allowing greater understanding of reinvasion pressures.

Monitoring is an important component of adaptive conservation management, providing objective information on pest animal relative abundance and the outcomes of management interventions.

This report provides a summary of predator monitoring undertaken within the Hikaroroa / Mt. Watkin Conservation Project area, spanning both DCC and private land. It outlines the monitoring framework, presents key results collected to date, and provides preliminary interpretation of the findings to support management and budget planning discussions.

Monitoring Framework and Rationale

Monitoring is a core component of adaptive pest management, providing information on predator abundance, control effectiveness, and long-term trends. The Hikaroroa monitoring programme uses four standardised methods to measure changes in predator populations over time, helping guide management decisions, prioritise resources, evaluate and justify the outcomes of predator control investments, and provide accountability for public funding.

General Information

Multiple methodologies have been employed to monitor the pest species on the Hikaroroa / Mt Watkin landscape. Each methodology is designed to target a specific group of predators, with results able to be assessed over time. **Table 1** highlights the four methodologies currently used. Transects have been semi-randomly selected, ensuring a representative mix of habitat types and elevations (**Table.2)** to ensure monitoring is representative of the entire site. **Map 1** provides visual representation of the monitoring locations employed.

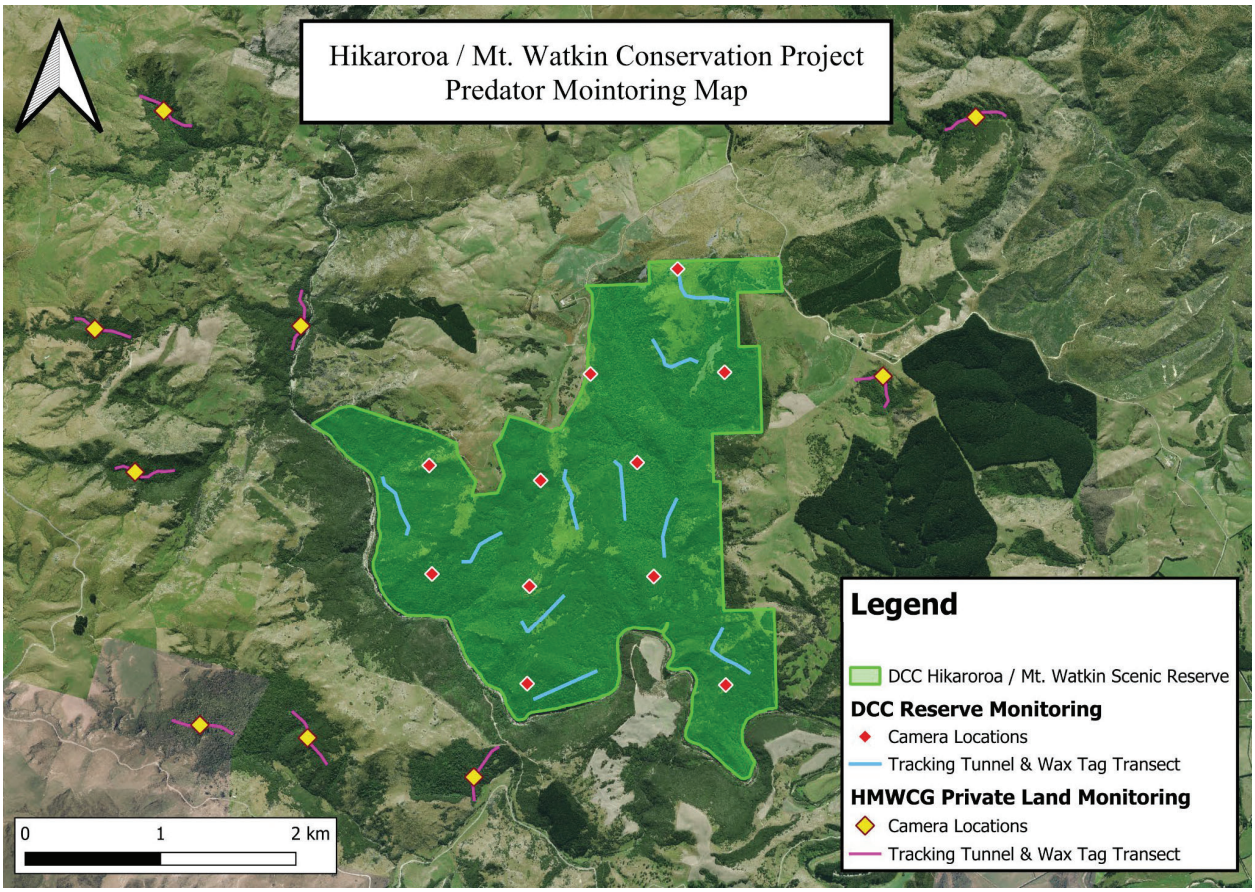
Table.1 Overview of methodologies, frequency, and target species of monitoring protocol.

Methodology	Species Monitored	DCC program	HMWCG program	Current Frequency
Tracking Tunnel 1-Night Rodent Survey	Rats and Mice	10 transects	9 transects	Annual*
Tracking Tunnel 21-Night Mustelid Survey	Mustelids -- Ferrets, Stoats, Weasels	10 transects	9 transects	Annual*
21-Night Fresh Meat Camera Survey	Feral Cats, Mustelids	11 camera sites	9 camera sites	Annual*
7-Night Wax Tag Survey	Possums	10 transects	9 transects	Annual

*Note: Survey frequency has changed from seasonal to annual to save budget after the baseline monitoring period was completed (3-years). See recommendations section for further discussion on proposed changes to ongoing monitoring protocol.

Table.2 Elevations of monitoring sites / transects.

Camera	Elevation(m)	TT/WT Line	Elevation(m)
MW01	320	MW01	200
MW02	230	MW02	300
MW03	310	MW03	340
MW04	330	MW04	240
MW05	170	MW05	120
MW06	140	MW06	180
MW07	140	MW07	100
MW08	200	MW08	250
MW09	370	MW09	320
MW10	320	MW10	500
MW11	500		



Map.1 Depicts the monitoring locations of camera sites, tracking tunnel transects, and wax tag transects at Hikaroroa / Mt. Watkin Scenic Reserve and the surrounding Hikaroroa / Mt. Watkin Conservation Group managed private land. Together they form the Hikaroroa / Mt. Watkin Conservation Project Predator Monitoring network comprising 19 TT/WT transects and 20 camera sites.

Methods

Camera Methodology

Remote cameras are deployed throughout the Hikaroroa / Mt. Watkin Conservation Project area to monitor the presence and relative activity of feral cats, mustelids, and other observed species. Cameras are located on an approximately 800 m grid across the reserve, providing broad spatial coverage based on current known parameters with regard to cat and mustelid home range.

On the surrounding HMWCG private land, camera monitoring sites have been colocated with the center of tracking tunnel lines to create labour efficiency. The number of monitoring transects / camera sites was based on habitat fragment size ratio to create comparable monitoring effort to that within the reserve, despite covering a larger more spatially separated area.

Camera locations are selected to maximise detection probability by targeting areas with evidence of animal movement, such as game trails, ridgelines, fence lines, and natural travel corridors. Each camera is baited using rabbit meat secured within a wire mesh cage to attract predators while preventing bait removal.

Cameras are configured to capture a burst of three photographs per trigger event, followed by a five-minute delay before re-triggering to reduce repeated detections of the same individual. Surveys are conducted for approximately 21 consecutive nights alongside the 21-night mustelid survey.

Table.3 Camera setting used on browning dark-ops game cameras for camera surveys.

Options (ignore if not listed below)	Setting
Date/time	Check correct
Mode	Trail
Capture delay	5 minutes
Pic Size	Ultra
MultiShot	*STD-3 shot*
Cap start/end	1200am-1200am
Smart IR	*On*
Night EXP	Pwr save
Temp unit	C
Info strip	On
Motion detect	Normal
Name	Station ID

Tracking Tunnel Methodology

Tracking tunnel monitoring is used to assess relative rodent and mustelid activity across the Hikaroroa area. Permanent monitoring lines have been established across a range of habitat types and elevations representative of the reserve and significant habitat fragments on surrounding private land.

Each tracking tunnel line consists of ten tunnels spaced at 50 m intervals.

Rodent surveys are conducted over a single fine night using Black Trakka ink cards baited with smooth peanut butter (Bay Road brand) at both ends of the tunnel. The 21 night (+- 3 days) mustelid surveys use an ink card and a small piece of salted rabbit meat inside a wire cage attached at the centre of each tunnel. All tracking tunnel cards are held in by a bulldog clip to reduce interference (possums often pull the cards out).

Tracking cards are subsequently collected and analysed to identify footprints and calculate a Tracking Index (TI), expressed as the percentage of tunnels visited by each target species.

Wax Tag Methodology

Wax tag monitoring is used to assess relative possum activity. Wax tag lines are co-located with tracking tunnel transects to maximise operational efficiency and reduce monitoring costs.

Each wax tag transect consists of ten wax tags installed at 20 m intervals. Wax tags are installed with glowtags and blazed with unscented blaze. Sites are left active for seven consecutive nights before being collected and assessed for possum bite marks. Results are expressed as a Wax Tag Index (WTI), calculated as the percentage of tags bitten during the survey period.

Analysis

Camera Data Analysis

Camera data was analysed and entered into a spreadsheet. The index for each species detected was then calculated for each camera by determining the number of triggers per target species per 1000 hours (CH1000). The mean detections for each species was calculated along with the mean CH1000 for each species.

Additionally, as a rough indication of species distribution across the field site, we calculated the proportion of cameras triggered by each species. The distribution index is available in the raw data tables, but due to lack of correlation were not presented in this report.

Tracking Tunnel Data Analysis

Tracking data was analysed and entered into a spreadsheet based on presence/absence of prints per species. The indices for each species detected were then calculated per line by dividing the number of tracked cards for each species with the number of tunnels per line, represented as a percentage.

The mean, standard deviation and standard error were then calculated across all lines. These are available in the raw data tables for future statistical analysis and have not been included in current graphs.

Wax Tag Data Analysis

Chew data was analysed and entered into a spreadsheet based on presence/absence of possum chews per station. Possum indices were then calculated per line by dividing the number of chewed stations by the number of stations per line, represented as a percentage.

The mean, standard deviation and standard error were then calculated across all lines. These are available in the raw data tables for future statistical analysis and have not been included in current graphs.

Results: Relative Abundance Trends Over Time

Camera Survey Results – Comparative Graphs

Visual results are presented here. Supporting data tables are available in the Appendix, **Table A-1** and **A-2. Figure 1** displays the relative abundance of the six predators controlled across the DCC Reserve and conservation group private lands.

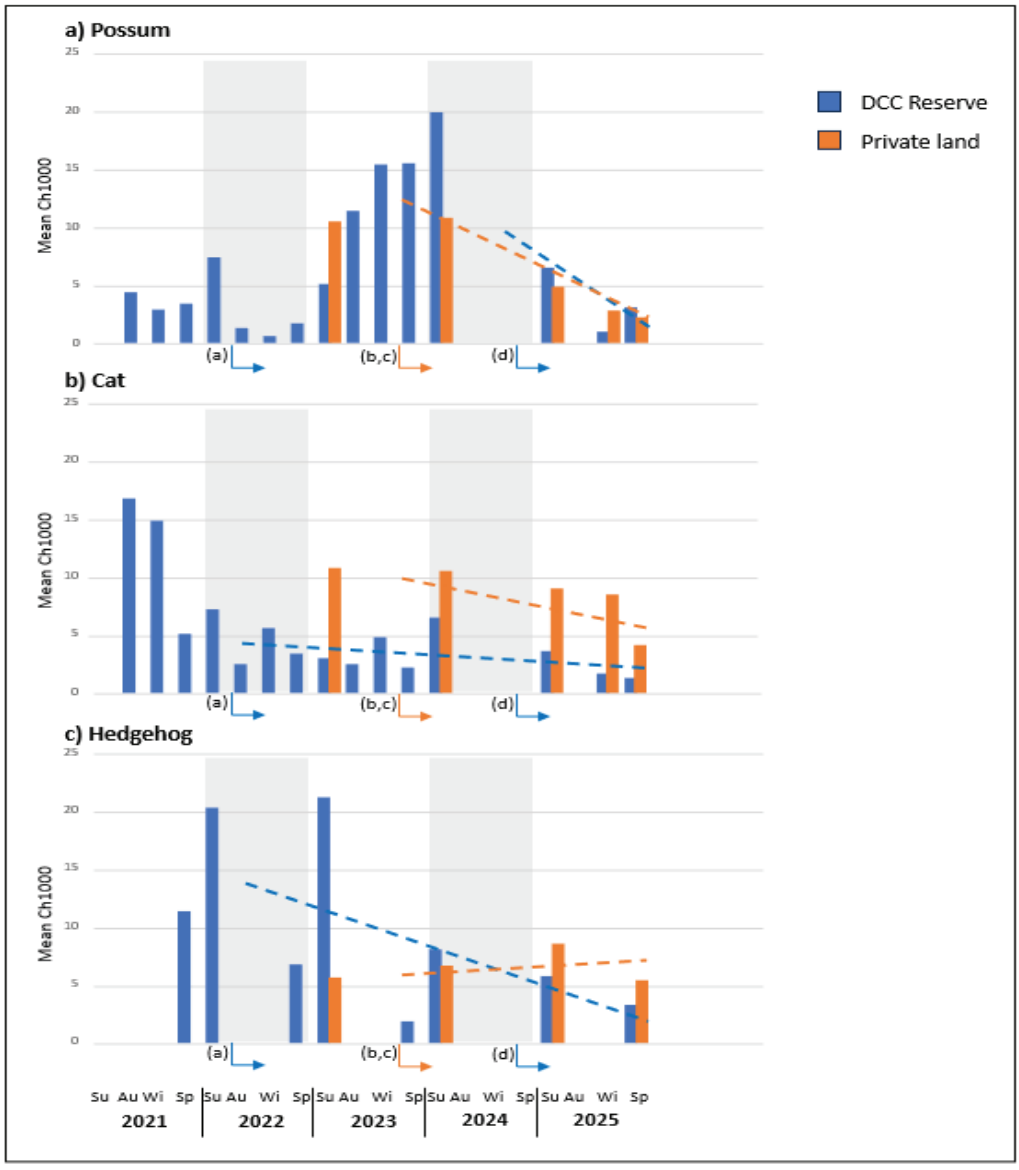


Figure 1. Camera Monitoring. Relative abundance (based on mean CH1000 from cameras) of vertebrate pests on the reserve and private land from Autumn 2021 through spring 2025. Trends in species abundance are shown for both areas from the commencement of trapping for each species (While cats are not targeted specifically by either AT220s or DOC200 traps, they do get caught in both traps.) Hedgehogs are common bycatch in DOC200s.

(a) Arrow indicates the commencement of DOC200 trapping on the DCC Reserve;
(b) Arrow indicates the commencement of AT220 trapping on private land;
(c) Arrow Indicates the commencement of DOC200 trapping on private land;
(d) Arrow indicates the commencement of AT220 trapping on the DCC Reserve)

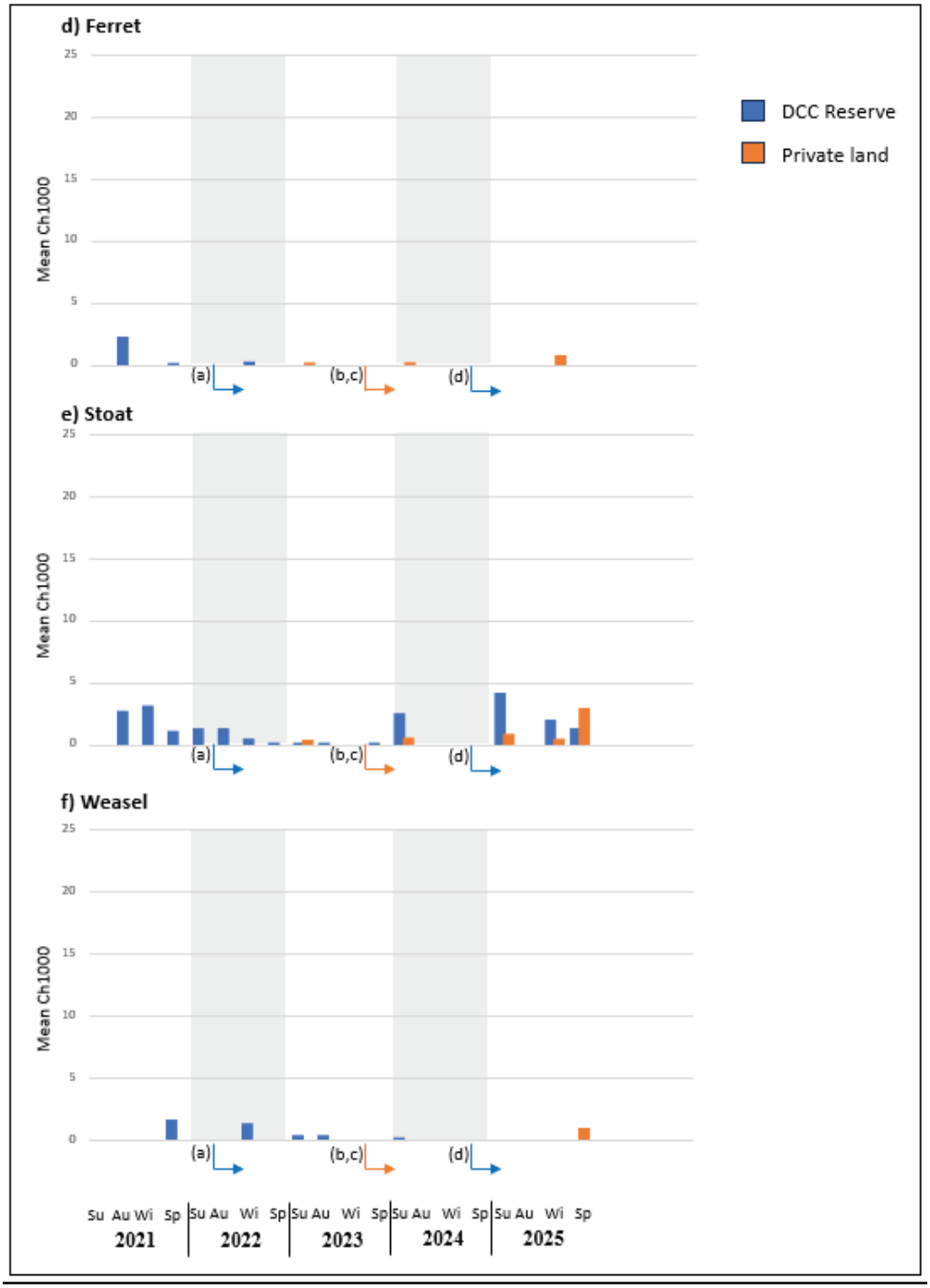


Figure 1, continued. Camera Monitoring. Relative abundance (based on mean CH1000 from cameras) of vertebrate pests on the reserve and private land from Autumn 2021 through spring 2025. Trends in species abundance are shown for both areas from the commencement of trapping for each species. Hedgehogs are not specifically targeted but can be trapped in DOC200s. Trendlines are not included for Ferrets or Weasels as the abundance is too low to visualize a trend.

(a) Indicates the commencement of DOC200 trapping on the DCC Reserve;
(b) indicates the commencement of DOC200 trapping on private land;
(c) Indicates the commencement of AT220 trapping on private land;
(d) indicates the commencement of AT220 trapping on the DCC Reserve;

Tracking Tunnel Surveys: Comparative Graphs

Visual results are presented here. Supporting data tables are available in the Appendix, **Table A-3** and **A-4.**. **Figure 2** displays relative abundance of rats and mice across the Reserve and conservation group private lands during the 1-night surveys. **Figure 3** displays relative abundance of 4 pest species during the 21-night surveys.

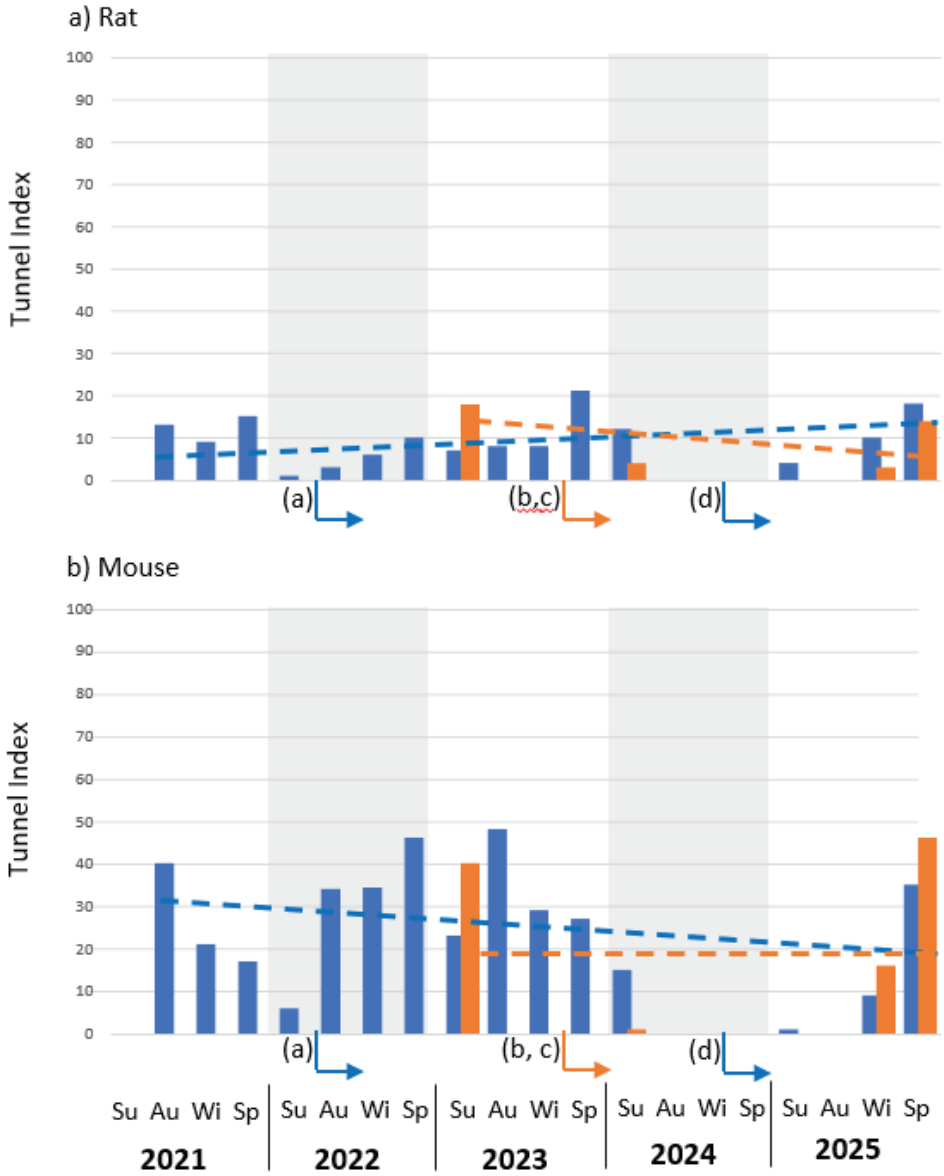


Figure 2. 1-Night Tracking Tunnels. Relative abundance of rats and mice based on Tunnel Index across all lines in the reserve and private land from Autumn 2021 through Spring 2025.Trends in species abundance are shown from the commencement of DOC200 trapping in each area.

(a) Indicates the commencement of DOC200 trapping on the DCC Reserve;
(b) indicates the commencement of AT220 trapping on private land;
(c) Indicates the commencement of DOC200 trapping on private land;
(d) indicates the commencement of AT220 trapping on the DCC Reserve;

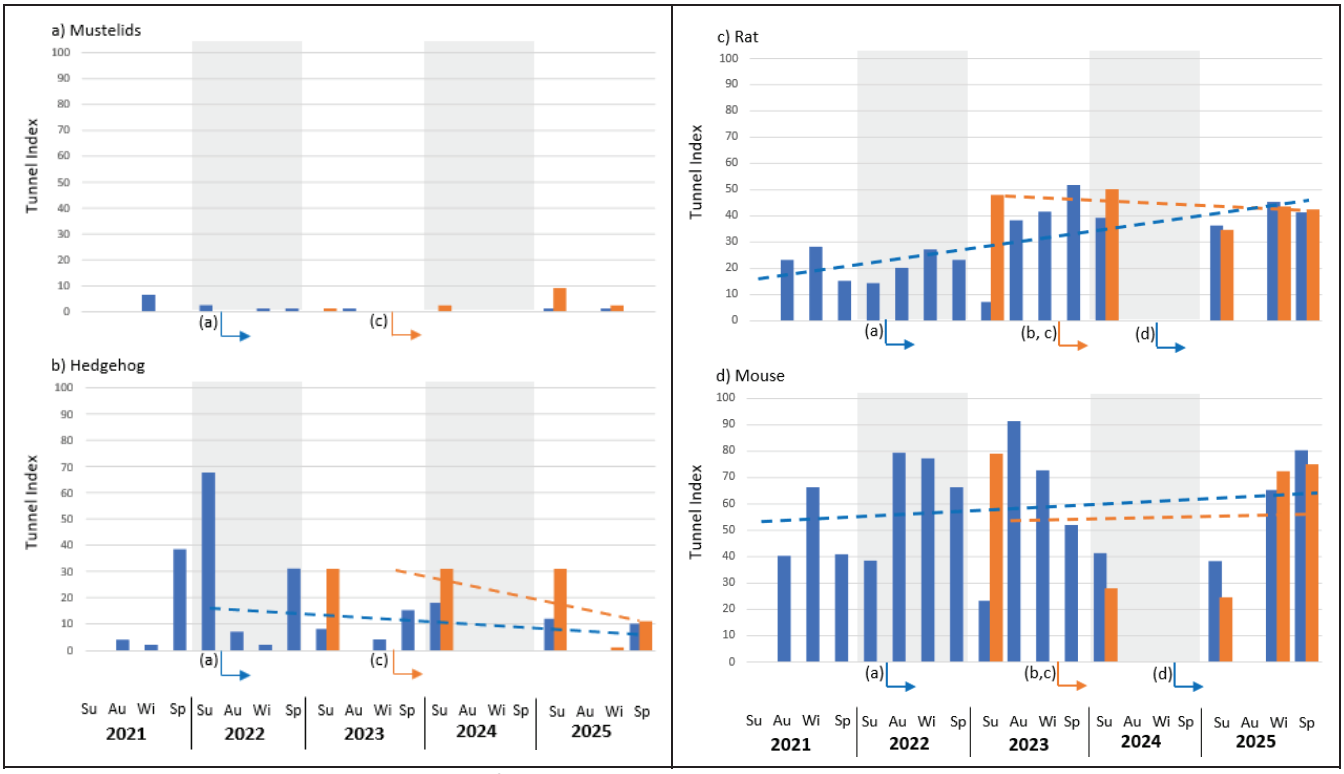


Figure 2. 21-Night Tracking Tunnels. Relative abundance of mustelids, hedgehogs, rats and mice based on Tunnel Index across all lines in the reserve and private land from Autumn 2021 through Spring 2025. Trends in species abundance are shown from the commencement of DOC200 trapping in each area.

(a) Indicates the commencement of DOC200 trapping on the DCC Reserve;
(b) indicates the commencement of AT220 trapping on private land; *(not indicated on this graph set)*
(c) Indicates the commencement of DOC200 trapping on private land;
(d) indicates the commencement of AT220 trapping on the DCC Reserve; *(not indicated on this graph set)*

Wax Tag Surveys: Comparative Graph

Visual results are presented here. A supporting data table is available in the Appendix, **Table A-5**. **Figure 4** displays relative abundance of possums across the Reserve and conservation group private lands, based on the indices derived from possum chews across all 7-night waxtag surveys.

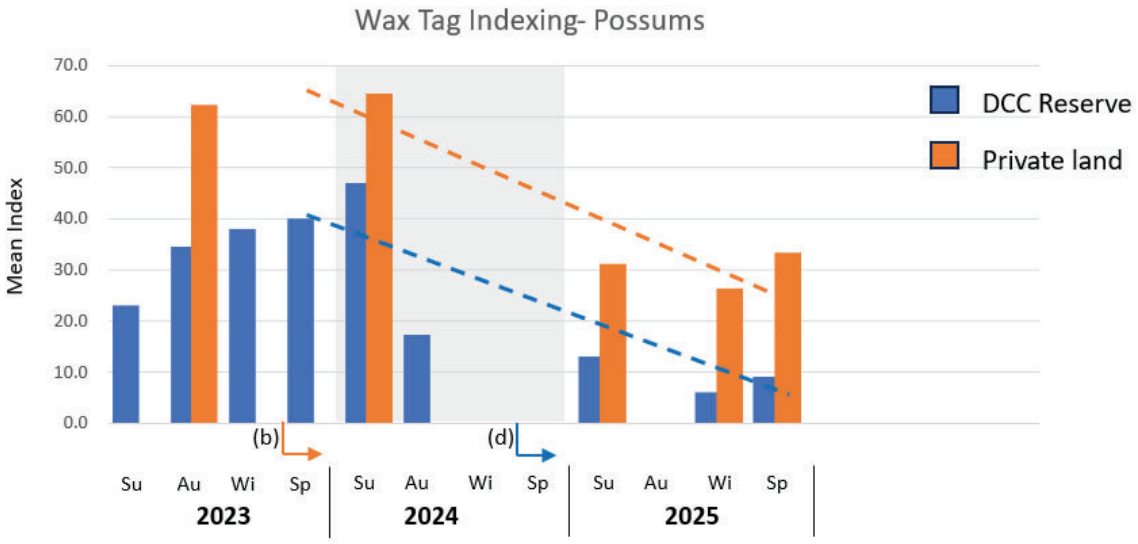


Figure 4. Wax Tag Monitoring. Relative abundance of possums (measuring Mean Index (MI) across all lines) the reserve and private land from Spring 2023 through spring 2025. Trends in species abundance are shown for both areas from the commencement of trapping on private land.

(a) Indicates the commencement of DOC200 trapping on the DCC Reserve; *(not indicated on this graph)*
(b) indicates the commencement of AT220 trapping on private land;
(c) Indicates the commencement of DOC200 trapping on private land; *(not indicated on this graph)*
(d) indicates the commencement of AT220 trapping on the DCC Reserve;

Discussion: Interpretation and Recomendations

Interpretation for each Species	Management Recommendation
Possums	
Changes in possum detectability have mapped relatively closely with control effort. OSPRI operations reduced detectability; however, detectability was starting to increase towards the end of OSPRI control in 2023. The highest Wax Tag Index (WTI) monitoring result (47% WTI DCC, 64% WTI HMWCG) occurred as the AT220 trap network was beginning to be installed in early 2024. Detectability has remained low since autotrap installation, averaging 11.3%WTI DCC / 30.2% WTI HMWCG with a negative trend. The possum suppression achieved (>50% detectability reduction) by the AT220 network has surpassed the modelling by BSI (Manaaki Whenua - Landcare Research) that was done for the Predator Free Dunedin's AT220 expansion network that modelled that the 500m grid would keep possum numbers from rebounding from 2%RTCI to 5%RTCI (2%WTI Ospri is approximately equivalent to a 17%WTI DCC and a 47%WTI HMWCG).	The AT220 automatic kill-trap network has been performing very well at keeping possum numbers low. The AT220 trapping and WTI monitoring program should continue. Reinvasion pressure will be increasing rapidly as possum numbers recover outside the project area, so a Feratox knockdown is likely to be necessary at some point. Trapping data from past service, Nov 2025, clearly shows an increase in trap catch on private land (highest reinvasion pressure) compared to the core area of the reserve that remained with a very low trap catch. This suggests that the private land AT220 network is functioning as an adequate reinvasion buffer. This would be confirmed if core area WTI remains low in this next annual survey. We recommend a feratox knockdown response be initiated when WTI HMWCG reaches 50-60% and certainly if WTI DCC surpasses 25%. Ideally knockdown is timed to maintain low detectability in the core area of the reserve. Residual Trap Catch Index (RTCI leghold monitoring) could be considered over WTI monitoring as it can perform more accurately at low densities, however this will increase labour costs.
Mustelids	
Mustelid densities in the project area are too low to be accurately tracked using a standard 21-night salted meat mustelid survey. Camera monitoring has had better success, with stoats having slightly higher detectability in the landscape compared to weasels and ferrets. Stoat densities have shown spikes the year	The 21-night survey method should be discontinued, and replaced with a 7-night fresh meat and peanut butter survey that runs concurrently with the 7-night possum surveys in order to save labour for both contractors and volunteer labour burden. Mustelid trapping should continue to suppress predation impacts. For gold standard mustelid

following rodent spikes, which suggests successful breeding due to increased food availability.	control, HMWCG should continue their trapline expansion to extend to the 2 home range mark (mustelid control out to a 1600m buffer around the reserve). Rodent control during peak years could also be an effective way to prevent subsequent spikes in mustelid numbers. Encapsulated PAPP sausage bait station knockdowns are recommended once EPA approval for this method has been finalized recognizing that a multi-method approach is needed for long term suppression. Keeping mustelids below the 5 detections per 1000 camera hours across the project area is the recommended initial suppression target to maintain at this phase of the project. This number could increase as cats are further suppressed.
Feral Cats Feral cat detectability has had a negative trend in both the reserve and surrounding private land since initial monitoring rounds, with a stronger trend in the core management area of the reserve. Baseline year 1 baseline monitoring showed an average of ~11 cat detection per 1000 camera hours in the reserve. Year 2 onwards has shown consistently less than or around ~4 detections per 1000 camera hours. This continued negative trend is likely a result of kitten catch in the DOC200/250 network and by-catch in the AT220 network.	Kill trapping and live trapping trials are underway. Future feral cat management should be based on the outcomes of this season's trapping outcomes and monitoring results. As a starting management objective MCU recommends attempting to maintain feral cat detectability below 5 detections per 1000 camera hours for several years to see if biodiversity recovery is detectable.

Feral cats remain the most detectable predator species in the project area on camera surveys.	
Rodents Overall, the dry forest system of Hikaroroa has low rodent tracking rates relative to other forest systems. Rodent tracking indices show seasonal and annual fluctuations, likely linked to masting years of tussock and podocarps, and to drought years. Rodent detectability on the surrounding private land is relatively consistent with reserve tracking rates despite increased proximity to exotic grassland.	1-Night Tracking tunnel rodent surveys are tracking at 0-21% (avg.9%). Monitoring sensitivity would likely need to be increased to have more informative post operational metrics if rodent control is undertaken at Hikaroroa in the future, though variation from the 1-night methodology would make data less comparable to other sites. No landscape scale rodent control is undertaken at Hikaroroa presently other than trap by-catch, which is unlikely to have a population level effect. There would be conservation value in incorporating rodent control at Hikaroroa in future as it could prevent seasonal/annual spikes that increase predation pressure on lizard, bird, and invertebrate communities as well as seed destruction in rare habitat types. Rodent control would likely establish Hikaroroa as a viable site for species reintroductions.
Hedgehogs No targeted hedgehog relative abundance monitoring is undertaken at Hikaroroa, although tracking tunnel surveys and camera surveys do incidentally detect them. This incidental survey data does suggest a negative trend for hedgehog abundance, though it is too soon to say whether this is mostly	The trap network at Hikaroroa was previously considered too lean relative to hedgehog home range size, to achieve meaningful hedgehog suppression. However, Hikaroroa does utilize special DOC200 trap entrances that increase hedgehog trapability. There is limited best practice established for hedgehog control, though they do represent a

seasonal variation (hedgehog activity is highly variable as many hibernate) or an actual population trend.	serious conservation threat to invertebrate and lizard values of the reserve and are now known to actively disrupt and predate Kārerea / Eastern Falcon nests.

Future Monitoring Recommendations

Though seasonal monitoring is considered Department of Conservation best practice, it is extremely labour intensive and costly. Now that several years of baseline data have been collected, Mammalian Corrections Unit Ltd. recommends that the DCC and the HMWCG reduce predator monitoring to annual 7-night surveys for all predator monitoring methods.

Table.4 Recommended variations for future long term monitoring protocol.

Methodology	Species Monitored	DCC program	HMWCG program	Current Frequency
Tracking Tunnel 7-Night Fresh Meat and Peanutbutter Survey	Rodents, hedgehogs, mustelids	10 transects	9 transects	Annual (Nov)
7-Night Fresh Meat Camera Survey	Feral Cats, Mustelids	11 camera sites	9 camera sites	Annual (Nov)
7-Night Wax Tag Survey	Possums	10 transects	9 transects	Annual (Nov)

We believe a more sensitive rodent survey will be beneficial for informing any future rodent management as current trends from 1-night surveys nearly bottom out the graph. A 1-night rodent survey could be run alongside the new method for the first few years to calculate an index translation which would avoid making previous data incomparable. By incorporating fresh meat alongside peanut butter in a 7-night rodent survey will still allow for some hedgehog and mustelid detection while avoiding having to run a separate survey (7-night fresh meat surveys are used by the Department of Conservation as a valid mustelid monitoring tool).

Waxtag surveys would remain unchanged. Camera surveys would be collected at the end of the 7 days – historical camera footage can be truncated to a 7-night analysis to create a continuous dataset moving forward.

This reformed program would take labour costs from 32 field days for both DCC & HMWCG (combined 64 field days) for standard seasonal monitoring, or 8 (16 combined) for standard annual monitoring, down to 4 field days (8 combined) for DCC/HMWCG if switched to annual 7-day modified surveys.

As a final note, MCU recommends independent pest monitoring should remain a component of the Hikaroroa / Mt. Watkin pest management programme, even as project priorities shift and funding constraints require management effort to be prioritised. While operational trap catches provide a useful indication of pest activity, changes in trap performance, control methods, and pest behaviour can make it difficult to determine whether changes in catch rates reflect true population changes or simply changes in management effectiveness. Independent monitoring therefore provides an important quality assurance measure and a consistent basis for adaptive management decisions.

The modified 7-day monitoring protocol is recommended as an appropriate balance between operational efficiency and independent evidence based management. Compared with the original 64-day monitoring regime, this approach reduces monitoring effort by approximately 87.5% while still providing sufficient information for accountability reporting, long-term trend assessment, and evidence-based management when compared with the robust baseline data collected over the past 4 years. This allows resources to be redirected towards pest control operations while maintaining the independent monitoring needed to evaluate programme success.

Acknowledgements

We thank the Mammalian Corrections Unit field team for data collection across the reserve, Dunedin City Council staff for their support and oversight of the programme, and the Hikaroroa / Mt. Watkin Conservation Group landowners for their ongoing commitment to conservation and site access. We also acknowledge the valuable technical review and advice provided by Rising Cloud Conservation Ltd. and Graham Hickling from the BioEconomy Science Institute - Maiangi Taiao (formerly Manaaki Whenua - Landcare Research).

Appendix

1. Camera Monitoring Tables
2. Tracking Tunnel Tables
3. Wax Tag Table

Camera Monitoring

Table. A-1 Tables portraying the number of detections (**a**) and mean CH1000 (**b**) for the eight target predator species at Hikaroroa/Mt. Watkin DCC Reserve on each camera survey to date. Note that mice and rats were not graphed since the spacing of the cameras does not allow for accurate reporting of these rodents due to their small home ranges.

(a) HMW DCC ReserveTotal Detections

Quarter	Possum	Rat	Mouse	Weasel	Stoat	Ferret	Cat	H Hog
Jan-Mar 2021								
April-June 2021	23	4	2	0	14	12	88	7
July-Sept 2021	17	4	11	0	18	0	86	8
Oct-Dec 2021	18	15	10	9	6	1	27	60
Jan-Mar 2022	39	16	8	0	7	0	38	107
April-June 2022	7	9	98	0	7	0	13	3
July-Sept 2022	4	55	63	9	3	2	35	3
Oct-Dec 2022	9	54	56	0	1	0	18	36
Jan-Mar 2023	27	56	10	2	1	0	16	110
April-June 2023	64	221	434	2	1	0	14	4
July-Sept 2023	78	286	255	0	0	0	25	6
Oct-Dec 2023	85	299	70	0	1	0	12	10
Jan-Mar 2024	109	183	118	1	14	0	36	45
April-June 2024								
July-Sept 2024								
Oct-Dec 2024								
Jan-Mar 2025	36	114	80	0	24	0	19	31
April-June 2025								
July-Sept 2025	5	299	23	0	10	0	9	0
Oct-Dec 2025	18	183	88	0	7	0	7	18

(b) HMW DCC Reserve Mean CH1000

Quarter	Possum	Rat	Mouse	Weasel	Stoat	Ferret	Cat	H Hog
Jan-Mar 2021								
April-June 2021	4.4	0.8	0.4	0.0	2.7	2.3	16.7	1.3
July-Sept 2021	2.9	0.7	1.9	0.0	3.1	0.0	14.8	1.4
Oct-Dec 2021	3.4	2.8	1.9	1.7	1.1	0.2	5.1	11.4
Jan-Mar 2022	7.4	3.0	1.5	0.0	1.3	0.0	7.2	20.3
April-June 2022	1.3	1.7	18.6	0.0	1.3	0.0	2.5	0.6
July-Sept 2022	0.6	9.0	10.3	1.4	0.5	0.3	5.6	0.5
Oct-Dec 2022	1.7	10.3	10.7	0.0	0.2	0.0	3.4	6.8
Jan-Mar 2023	5.1	10.5	1.9	0.4	0.2	0.0	3.0	21.2
April-June 2023	11.4	38.2	77.2	0.4	0.2	0.0	2.5	0.7
July-Sept 2023	15.4	58.2	50.7	0.0	0.0	0.0	4.8	1.2
Oct-Dec 2023	15.5	55.5	12.4	0.0	0.2	0.0	2.2	1.9
Jan-Mar 2024	19.9	33.8	21.3	0.2	2.5	0.0	6.5	8.1
April-June 2024								
July-Sept 2024								
Oct-Dec 2024								
Jan-Mar 2025	6.5	18.2	13.8	0.0	4.1	0.0	3.6	5.8
April-June 2025								
July-Sept 2025	1.0	59.8	4.5	0.0	2.0	0.0	1.7	0.0
Oct-Dec 2025	3.1	33.2	16.4	0.0	1.3	0.0	1.3	3.3

Table. A-2 Tables portraying the number of detections (**a**) and mean CH1000 (**b**) for the eight target predator species at Hikaroroa/Mt. Watkin Conservation Group private lands on each camera survey to date. Note that mice and rats were not graphed since the spacing of the cameras does not allow for accurate reporting of these rodents due to their small home ranges.

(a) HMWCG Private Land Total Detections

Quarter	Possum	Rat	Mouse	Weasel	Stoat	Ferret	Cat	H Hog
Jan-Mar 2021								
April-June 2021								
July-Sept 2021								
Oct-Dec 2021								
Jan-Mar 2022								
April-June 2022								
July-Sept 2022								
Oct-Dec 2022								
Jan-Mar 2023	50	21	13	0	2	1	51	27
April-June 2023								
July-Sept 2023								
Oct-Dec 2023								
Jan-Mar 2024	43	16	0	0	2	1	42	28
April-June 2024								
July-Sept 2024								
Oct-Dec 2024								
Jan-Mar 2025	22	23	5	0	4	0	40	39
April-June 2025								
July-Sept 2025	12	61	33	0	2	3	35	0
Oct-Dec 2025	11	105	44	5	14	0	20	26

(b) HMWCG Private Land Mean CH1000

Quarter	Possum	Rat	Mouse	Weasel	Stoat	Ferret	Cat	H Hog
Jan-Mar 2021								
April-June 2021								
July-Sept 2021								
Oct-Dec 2021								
Jan-Mar 2022								
April-June 2022								
July-Sept 2022								
Oct-Dec 2022								
Jan-Mar 2023	10.5	4.4	2.7	0.0	0.4	0.2	10.7	5.7
April-June 2023								
July-Sept 2023								
Oct-Dec 2023								
Jan-Mar 2024	10.8	3.9	0.0	0.0	0.6	0.2	10.5	6.7
April-June 2024								
July-Sept 2024								
Oct-Dec 2024								
Jan-Mar 2025	4.9	5.5	1.1	0.0	0.9	0.0	9.0	8.6
April-June 2025								
July-Sept 2025	2.8	15.0	8.2	0.0	0.5	0.8	8.5	0.0
Oct-Dec 2025	2.2	22.4	8.9	1.0	2.9	0.0	4.1	5.4

Tracking Tunnels

Table A-3 1-Night Tracking Tunnels. Tables portraying the indices values for 3 pest species detected across all 1-night peanut butter surveys at Hikaroroa / Mt. Watkin Scenic Reserve and the HMWCG Private Land.

	DCC Reserve			Private Land		
	Rat	Mouse	Hhog	Rat	Mouse	Hhog
Autumn 2021	13.0	40.0	4.0			
Winter 2021	9.0	21.0	0.0			
Spring 2021	15.0	17.0	5.3			
Summer 2022	1.0	6.0	16.0			
Autumn 2022	3.0	34.0	0.0			
Winter 2022	6.0	34.3	1.0			
Spring 2022	10.0	46.0	4.0			
Summer 2023	7.0	23.0	8.0	18.0	40.0	1.0
Autumn 2023	8.0	48.0	1.0			
Winter 2023	8.0	29.0	0.0			
Spring 2023	21.0	27.0	2.0			
Summer 2024	12.0	15.0	0.0	4.0	1.0	1.0
Autumn 2024						
Winter 2024						
Spring 2024						
Summer 2025	4.0	1.0	0.0	0.0	0.0	2.0
Autumn 2025						
Winter 2025	10.0	9.0	0.0	3.0	16.0	0.0
Spring 2025	18.0	35.0	2.0	14.0	46.0	1.0
Mean Tracking	9.67	26.26	3.17	7.8	20.6	1

Table.A-4. 21 Night Tracking Tunnels. Tables portraying the indices values for 4 pest species detected across all 21-night salted meat surveys at Hikaroroa / Mt. Watkin Scenic Reserve and the HMWCG Private Land.

	DCC Reserve				Private Land			
	Mustelid	**Rat**	**Mouse**	**Hhog**	**Mustelid**	**Rat**	**Mouse**	**Hhog**
Autumn 2021	0.0	23.0	40.0	4.0				
Winter 2021	6.0	28.0	66.0	2.0				
Spring 2021	0.0	15.0	40.7	38.3				
Summer 2022	2.2	14.2	38.2	67.4				
Autumn 2022	0.0	20.0	79.0	7.0				
Winter 2022	1.0	27.0	77.0	2.0				
Spring 2022	1.0	23.0	66.0	31.0				
Summer 2023	0.0	7.0	23.0	8.0	1.1	47.8	78.9	31.1
Autumn 2023	1.0	38.0	91.0	0.0				
Winter 2023	0.0	41.3	72.4	4.1				
Spring 2023	0.0	51.4	51.8	15.2				
Summer 2024	0.0	39.0	41.0	18.0	2.2	50.0	27.8	31.1
Autumn 2024								
Winter 2024								
Spring 2024								
Summer 2025	1.0	36.0	38.0	12.0	8.9	34.4	24.4	31.1
Autumn 2025								
Winter 2025	1.0	45.0	65.0	0.0	2.2	43.3	72.2	1.1
Spring 2025	0.0	41.0	80.0	10.0	0.0	42.2	74.9	11.1
Mean Tracking	0.9	29.9	57.9	14.6	2.9	43.6	55.6	21.1

Wax Tag Monitoring for Possums

Table A-5. Table portraying the indices values derived from possum chews across all 7-night waxtag surveys at Hikaroroa / Mt. Watkin Scenic Reserve and the HMW Conservation Group Private Land..

	DCC Reserve				HMWCG Private Land			
	# Lines	Total WTs available	# Tracks	Mean Index Across Lines	# Lines	Total WTs available	# Tracks	Mean Index Across Lines
Summer 2023	10	96	23	23.0				
Autumn 2023	10	97	34	34.5	9	90	56	62.2
Winter 2023	10	100	38	38.0				
Spring 2023	10	100	40	40.0				
Summer 2024	10	100	47	47.0	9	90	58	64.4
Autumn 2024	10	99	17	17.3				
Winter 2024	10							
Spring 2024	10							
Summer 2025	10	100	13	13.0	9	90	28	31.1
Autumn 2025	10							
Winter 2025	10	100	6	6.0	9	87	23	26.3
Spring 2025	10	99	9	9.0	9	90	30	33.3
Mean Tracking				25.3				43.5