Te Korowai o Waiheke

TOWARDS PREDATOR FREE WAIHEKE

Stoat Eradication Plan Amendment –

Detect and Response Phase

May 2023

1. Context

A Mustelid Eradication Plan (MEP) for Waiheke Island was finalised in November 2019. This document is a supplement to the original MEP including the learnings to date and the detect and response plan that was implemented in April 2022. Between February 2020 and May 2023, no ferrets or weasels have been sighted or caught in the 1650 DOC 200 traps across the island. Te Korowai o Waiheke's Technical Advisory Group have agreed that stoats are the only mustelid on Waiheke Island. Therefore, going forward the plan will be referred to as the Stoat eradication plan. Amendments to this plan will be made annually after the denning/dispersal season.

2. Background

Trap network

The mustelid eradication program opened and set traps starting in February 2020. However, the traps were closed for two months due to the first COVID-19 lockdown. After traps were reopened in May 2020 they have been open continuously.

Initially, 1500 trap boxes were deployed at a density of 1 trap for every 6ha across the island (1800ha). A minimum of 200m is recommended so denning female stoats, which have the smallest home range, will be targeted. This target is reached for most of the island. There are a few small gaps across the island, where the distance between traps is 250m.

Traps with short offset baffles were outfitted with PVC extruders to prevent weka and cats from being caught in the traps across the island.

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Figure 1: Trap network across the Waiheke Island

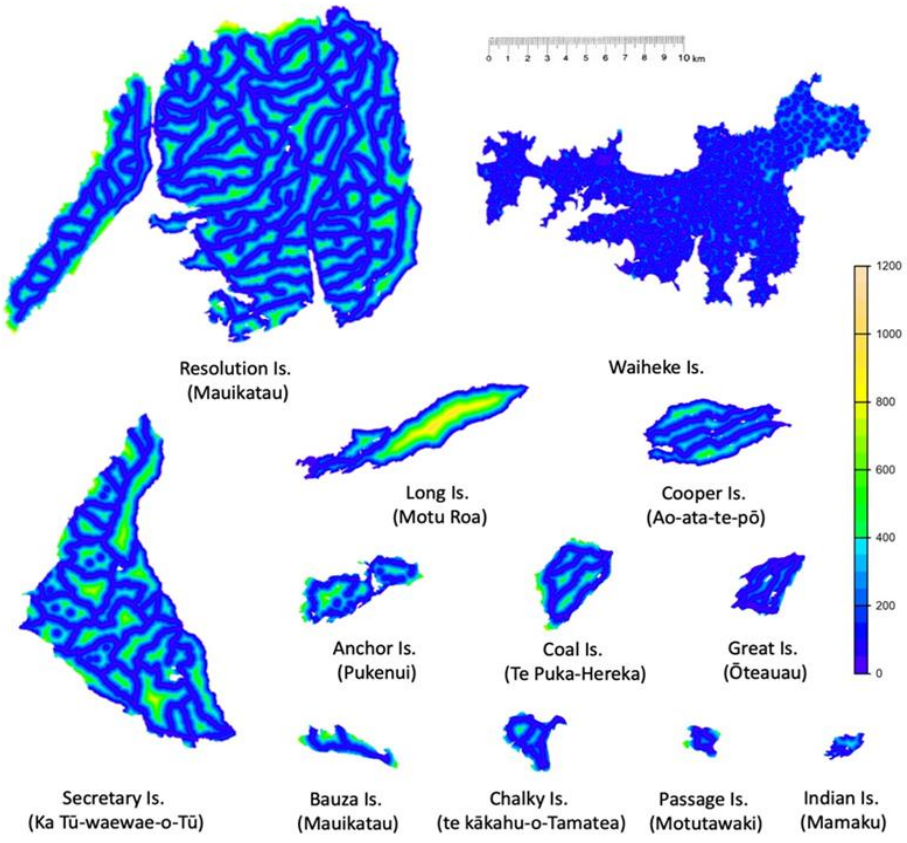

Figure 2: Distance in metres from next nearest trap. Image from Dr. Andrew Veale.

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Lures

Stoat traps were originally baited with fresh rabbit and real chicken eggs during spring, summer and autumn. In the winter of 2021 and a short period at the end of December 2021, Erayz and fresh chicken eggs were used as the lures, however Erayz did not perform well on Waiheke Island. We found that the erayz would become mouldy after 2 weeks and think this is because of the warmer and more humid climate of the region.

Trap check frequency

During the summer of 2021, traps were checked every 7 working days, in spring and autumn every 10 working days, and during the winter once per month. After stoat sightings, the stoat traps nearby were rebaited within 48 hours.

Program to date

Trap data

The project has caught 171 stoats to date. Traps near the coast and waterways have caught over 90% of the stoats since the project started. The project also caught 5,550 rats and 2,550 hedgehogs. All stoats are collected and sent to Dr. Andrew Veale for genetic analysis.

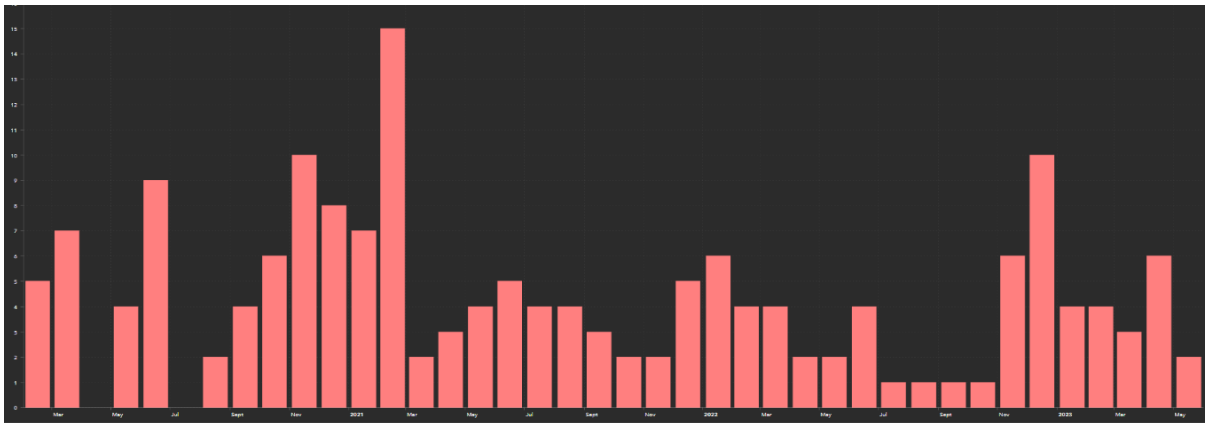

Figure 3. Stoat catch data by month

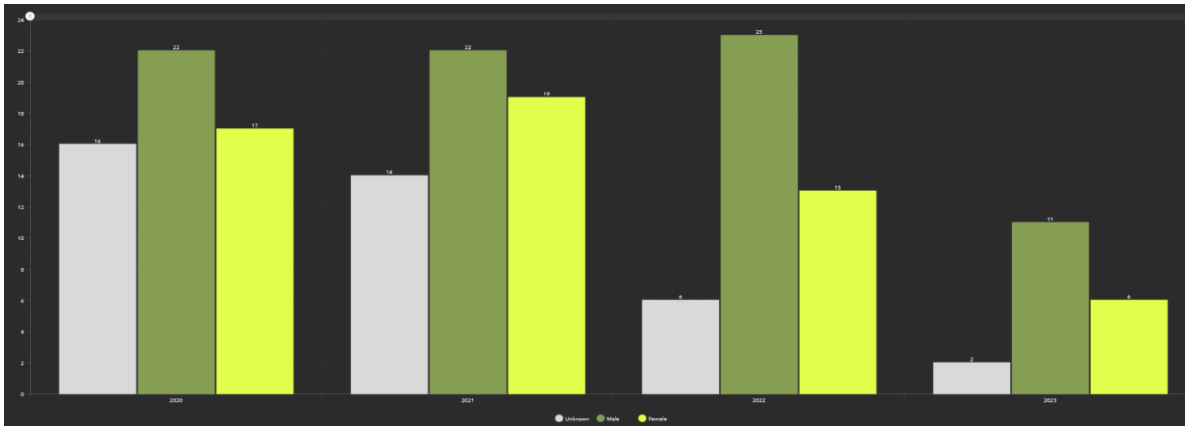

Figure 4. Stoat catch - sex by year

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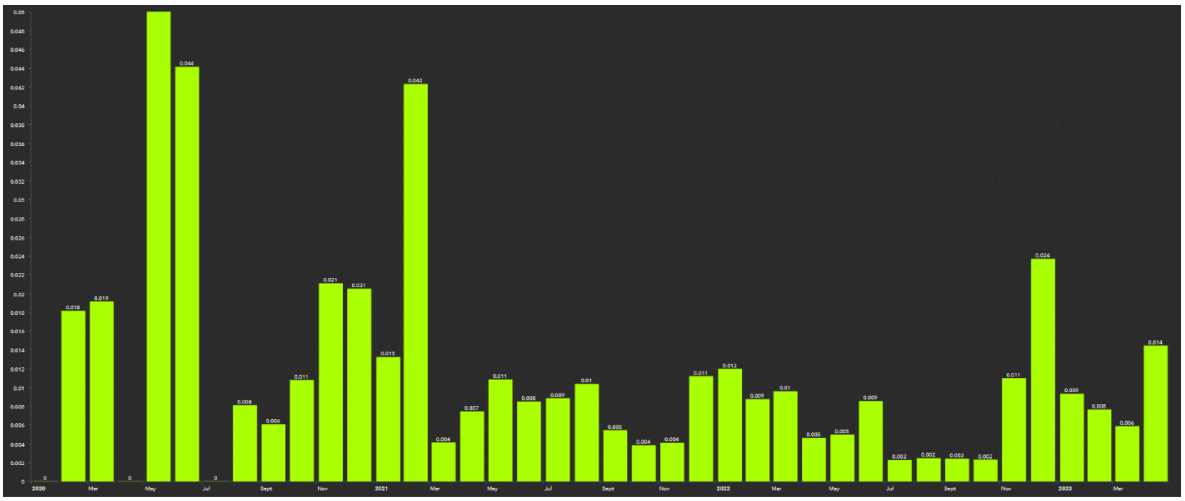

Figure 5. Stoat catches per 100 corrected trapping nights

Figure 6. Stoat catches Waiheke Island February 2020 – May 2023.

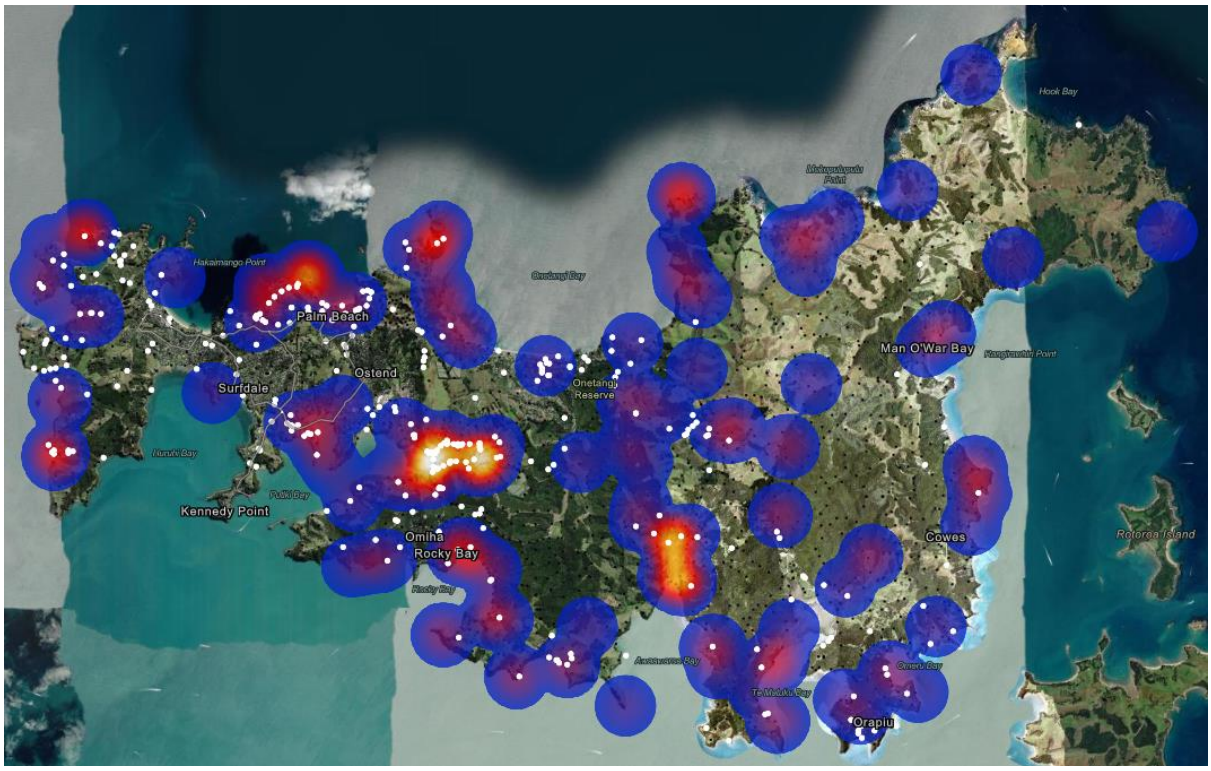

Figure 7. Stoat catch heat map Waiheke Island February 2020 – May 2023. Stoat sightings indicated by white dots.

Stoat genetic analysis

All stoats captured are frozen and sent off to Dr. Veale for genetic analysis. Waiheke Island stoats are genetically different from stoats from other parts of New Zealand, which allows TKoW to monitor if there are any incursions from the North Island. This genetic data also allows Dr. Veale to estimate the number of denning females during the spring.

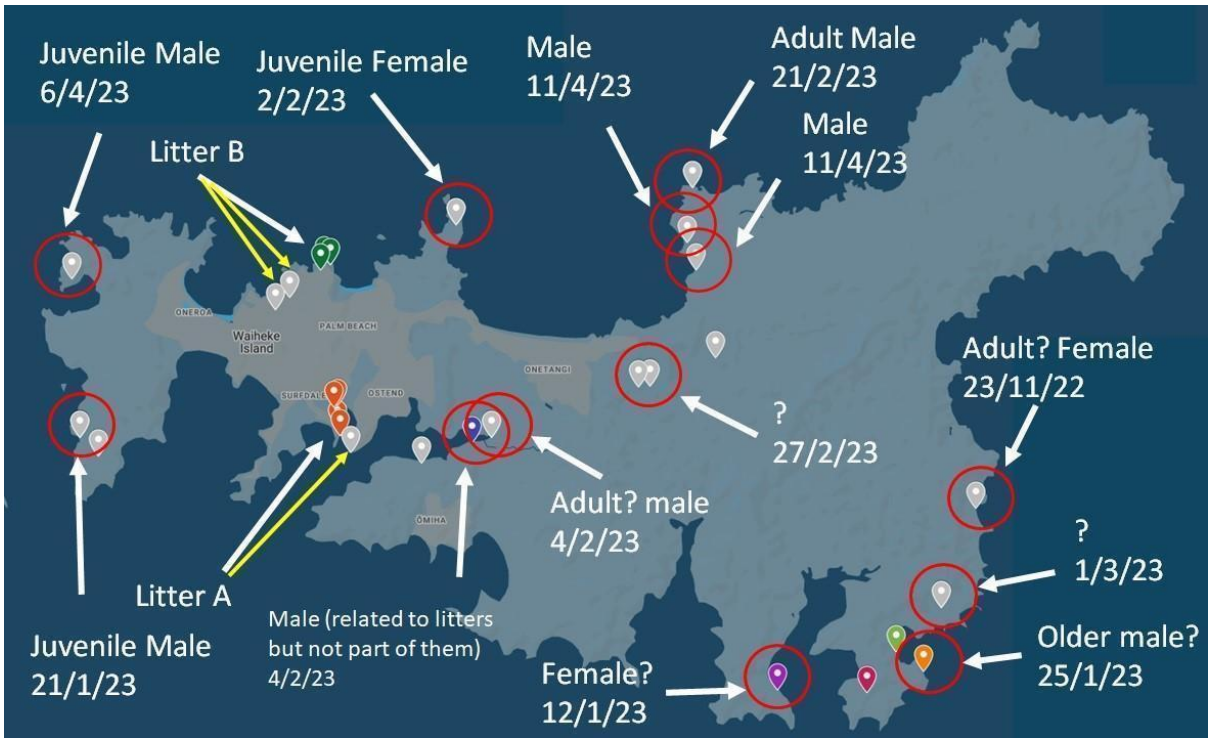

Figure 10: Genetic analysis of stoat captures Spring 2022 – Summer 2023 (most recent denning and dispersal season). Two litters were identified, with two other potential litters (juveniles caught on 21/1/23 and males caught on 11/4/23)

Trap audits

Internal audits are conducted on all traps within the network once each year in winter. The audit includes analysing trap box placement, smoothing edges, clearing vegetation, and weight tests on the actual DOC 200 trap. In addition to the annual audit in 2021, the field team started referring to "trap services" rather than "trap checks". so that every time a trap is rebaited it is serviced, with vegetation removed, and the overall trap condition is assessed.

Traps and trap density

Infilling traps in coastal and wetland areas. Analysing the data in 2021, we found that 90% of our stoat catches were within 100m of a waterway or coast. We looked at our trap network and looked for areas to add additional traps to increase the likelihood of stoats encountering stoat traps. There were an additional 100 traps added to the network. These additions increased the network to just over 1600 traps.

The PVC extruders were found to be a deterrent for stoats (catch rates were lower for traps with PVC extruders). One of the field technicians designed a mesh extruder that allows the stoat to enter the trap while walking on the ground.

Figure 13: Mesh extruder

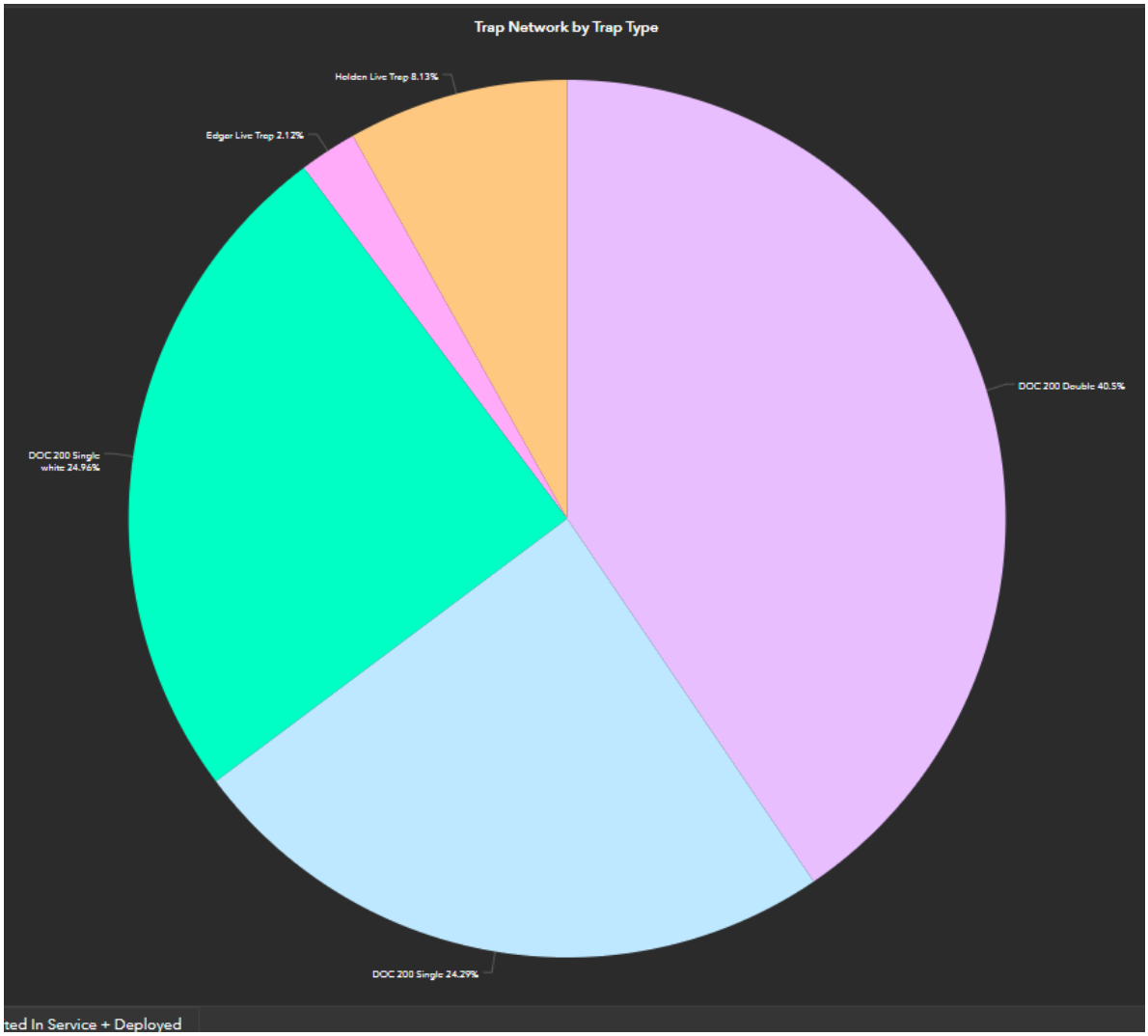

Figure 8: Trap network by trap type

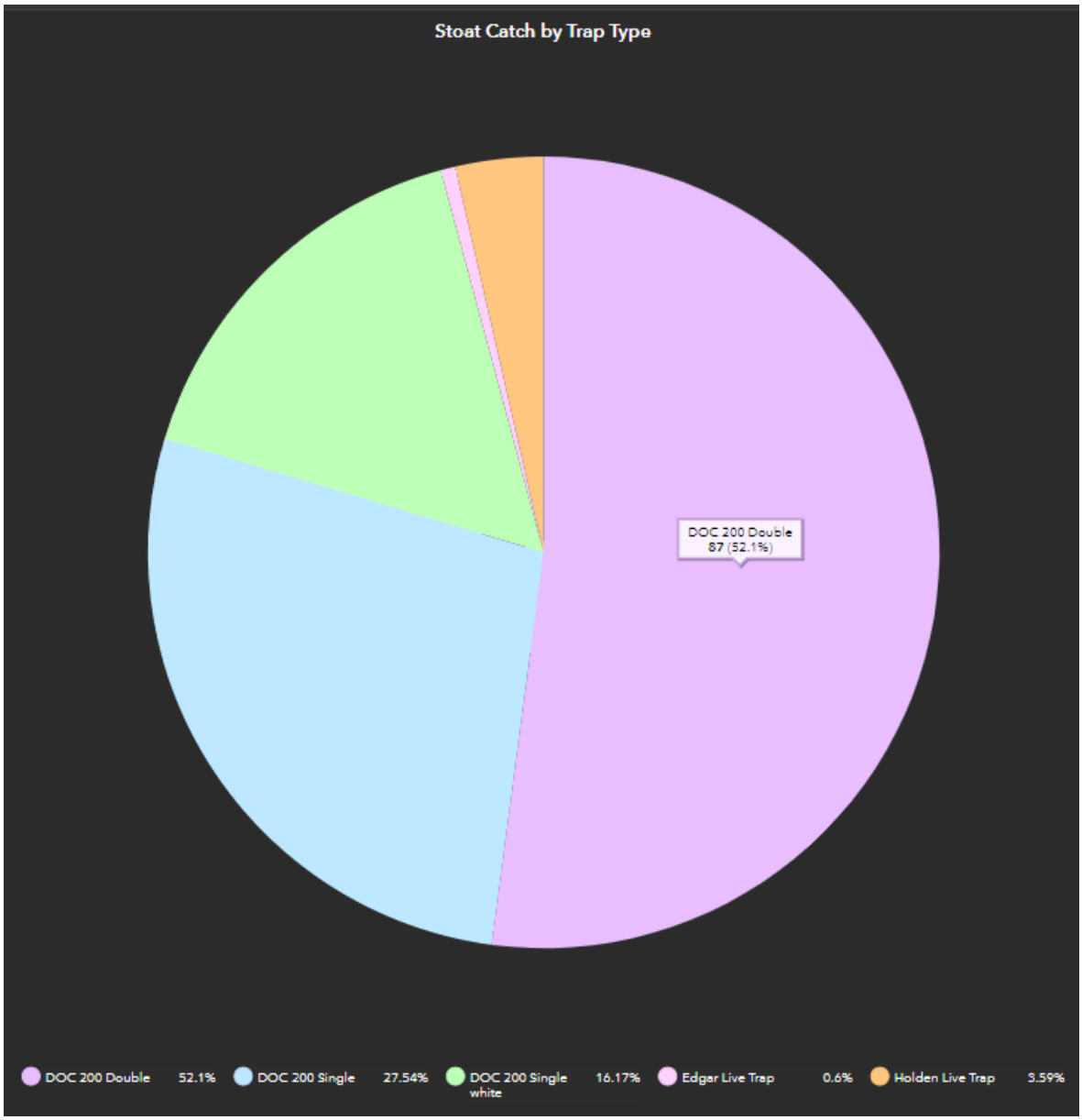

Figure 9: Stoat catch by trap type

Trap check frequency

We changed the winter trap check schedule to once every 3 weeks during the winter in 2021, so we can continue to use fresh rabbit instead of Erayz which we found was less attractive to stoats. We also continued to check traps between Christmas and New Year from 2021 to avoid using Erayz during the Christmas holiday.

Lures

Analysing the data showed that the Erayz was a less effective lure than fresh rabbit. Starting in June 2021 the winter trap checks were switched to once every three weeks. This allowed the rabbit to remain fresh and therefore was a more attractive lure for stoats.

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Both ferret bedding (50% of trap network September 2020) and egg mayo (placed in a cardboard container 33% of trap network January 2021) were placed inside traps. Both lures underperformed compared to their presence in the network. However, a different delivery method for the egg mayo (ZIP Motolure) still needs to be investigated.

Stoat bedding was deployed in 50% of the traps in the summer of 2021 – 2022. Traps were randomly selected across the network but during this time they equated to 67% of the stoat captures. During the winter of 2022, stoat bedding was also deployed into the traps that didn't initially receive the stoat bedding and equated to approximately the same percentage of catches. Stoat bedding was also deployed in all traps within 100m of the coast and waterways in the summer of 2022 – 2023.

Trail cameras

Trail cameras have been deployed five times since the start of the project. Trail cameras are deployed for two weeks, and a lure is secured to the ground in front of the trail camera. These detection devices were deployed once during the winter of 2020, and then each summer in 2020 - 2023. During the first three deployments, 180 cameras were deployed across the island. Twenty additional cameras were deployed in the summer of 2022 when a portion of MoW property changed hands and subsequently, TKoW were able to deploy cameras on this property. An additional ten cameras were deployed in the northern portion of the Ngati Paoa station for better coverage in 2023.

	Summer 2020	Winter 2020	Summer 2021	Summer 2022	Summer 2023
# of stoats detected on trail cameras	5	2	2	2	2

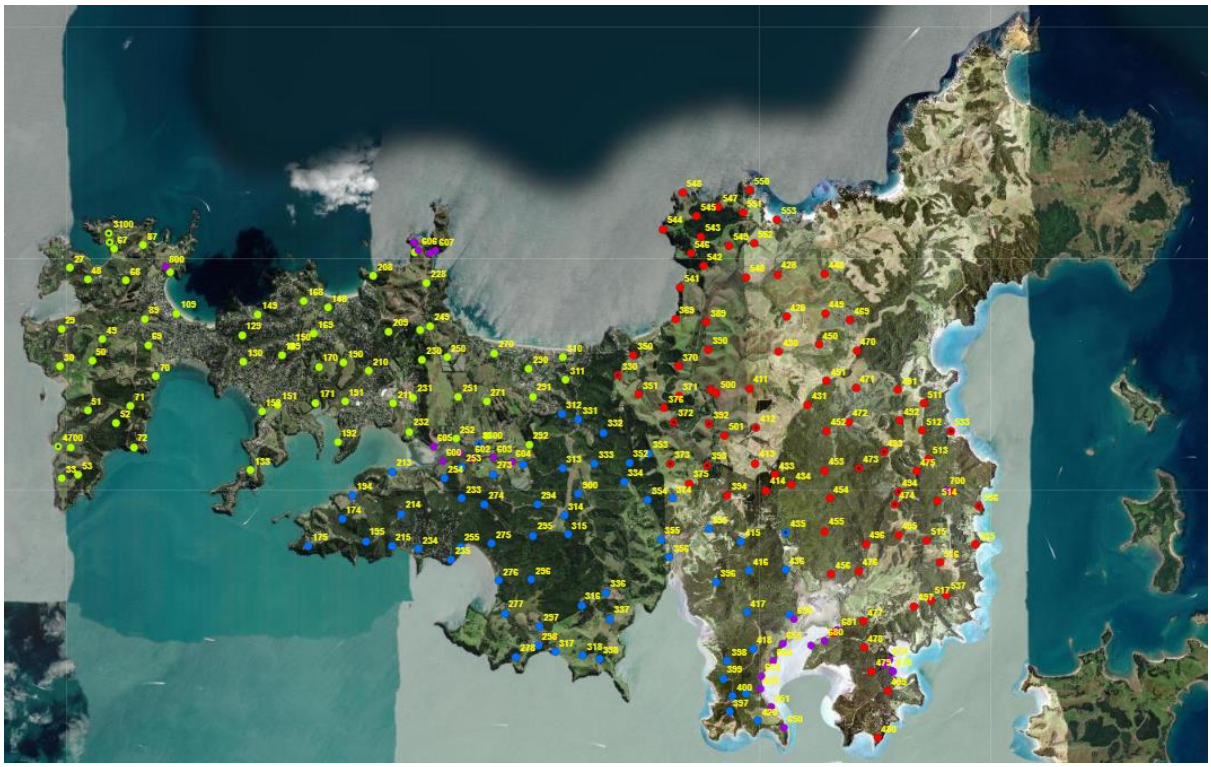

Figure 12: Trail camera locations. Twenty additional locations were added when access was gained to the Wairua property managed by Rarowhara. Purple data points were part of a trial using stoat bedding as a lure, and were not included in the standard camera monitoring.

The original camera setup included bait inside the white plastic egg cover used in the Trapinator stoat traps. This was secured to a piece of grey metal mesh and secured to the ground using a metal hoop. Erayz were used for the bait for the first three camera runs (summer 2020, winter 2020, and summer 2021). In the summer of 2022, we switched the lure to fresh rabbit and baited twice during the two weeks of monitoring. In the summer of 2023, we updated the lure based on Craig Gillies design. We wrapped Erayz around fresh rabbit and placed the lure inside a basket of green rabbit-proof fence material secured to the ground using a metal hoop.

Figure 14: The original camera setup included bait inside the white plastic egg cover used in the trapinator stoat traps.

Figure 15: Updated camera setup based on Craig Gillies design of erayz wrapped around fresh rabbit and green rabbit proof fence material secured to the ground using a metal hoop.

The method used to analyse the trail camera images was updated in 2022. During the summer 2020, winter 2020, and summer 2021 trail camera analysis was conducted by the field team scanning through images and categorizing images into what triggered the camera (i.e., stoat, rat, hedgehog,

vegetation, etc.). During the summer of 2022 and 2023, images were analysed by eVorta using their artificial intelligence software. eVorta is a web-based platform that is used to manage trail camera images, external users can upload and store their data via the website. The technology used an artificial intelligence-based machine learning algorithm to identify species of interest within an imagery dataset. The algorithm analyses the pixels, scanning for distinctive patterns in each image that relate to a species. It then identifies and tags the image with the species name and a certainty level, using a scale of 0-1 or low to high confidence. Users can also train the machine, working towards higher accuracy levels, by confirming or re-labelling tagged species in the images.

3. Detect and Response Phase

Trap types

Starting in April 2022 we also started deploying alternative traps (i.e., Edgar, Holden, cage traps) in response to public and trail camera stoat sightings. Initially, 1 Edgar trap and 12 Holden traps were used to deploy around stoat sightings. More recently 10 more Holden traps, 6 more Edgar traps, 4 large double entry cage traps, and 2 live capture rat traps were added to the response trap network. These traps are not permanently in the trap network and are only deployed for 2 – 4 weeks after a stoat sighting, indication by detection dog, or trail camera sighting. Modified Victors and more recently Goodnature A24s have also been deployed around stoat sightings.

Trap check frequency

After Dr. Andrew Veale's 2022 analysis and instances of family groups caught in proximity, we decided to change the denning and dispersal trapping schedule (October – February). All traps, excluding MoW traps, within 100m of the coast or waterbody were checked every 4 working days. The remaining traps were checked every 15 working days. If a trap caught a juvenile stoat or an adult female it was checked daily for the next 10 days.

Scent trails

TKoW trappers also started laying scent trails using dead stoats. Stoats caught in DOC 200s are taken to traps near the stoat catch and rubbed on the traps the same day. After collecting DNA samples, we will also take freshly caught stoats and create scent trails by dragging the dead stoat between traps and rubbing the stoat on traps.

Stoat detection dogs

Stoat detection dogs were used in three different locations on the island during the denning season in October 2022. Two scat detection dogs and two scent dogs went out to locations Dr. Veale identified related offspring were caught, but the female of the litter was not. These areas include the Rocky Bay area, east of Onetangi Bay, and Awaawaroa Bay. Some scent was found in the area east of Onetangi. Additional traps and trail cameras were deployed but there were no captures in this area. In the area north of Omiha on the Te Whau Peninsula scent and scat were detected. Additional live traps and trail cameras were deployed in this area. A stoat was seen on the trail camera footage, and additional live traps were deployed, and a sound lure with juvenile stoats was played in an Edgar trap. Additionally, a dead stoat was dragged through the area and on all the traps. After this, an adult male stoat was captured in an Edgar trap.

Stoat detection dogs were also used after stoat sightings near Kennedy Point, Palm Beach, Te Matuku Bay, and Park Point (SW corner of the island). At the Park Point location, the scent dog indicated on the wetland just south of the sighting, and additional Holden and Edgar traps were deployed. Two juvenile male stoats were caught within four nights after repositioning the traps.

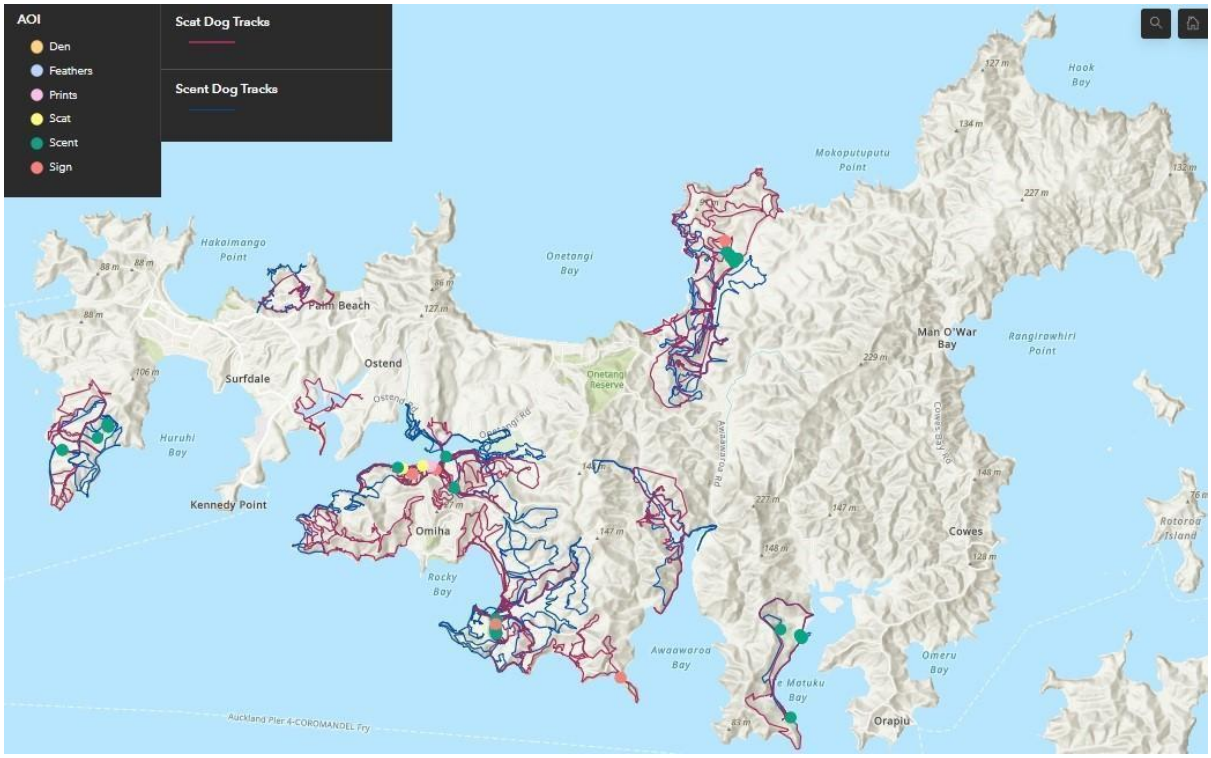

Figure 11: Stoat dog detection work across Waiheke Island October 2022 – February 2023

Report a stoat sighting campaign

TKoW initiated a comprehensive "Report a Stoat Sighting Campaign" during the denning and dispersal season, September 2022 through to February 2023. The objective for the campaign was to have people from the public report stoat sightings quickly. After a notified sighting a TKoW staff member will interview the person and judge the likelihood of the sighting being an actual a stoat and ranked 1 – 5. Based on the likelihood of the sighting being an actual stoat dictates the response to the sighting.

- Low likelihood, 1 or 2, a trail camera will be placed in the area.
- Moderate likelihood, 3, traps will be rebaited in the area.
- High likelihood of a stoat sighting, 4 or 5, alternative traps and trail cameras will be deployed in the area.

TKoW placed signs across the island at trailheads, portaloos, ferry terminals, grocery stores, and various other information points. Staff also reached out to different community groups, including

bus drivers, school groups, and Waiheke Rotary. Advertisements were placed on the Waiheke Island ferries, local paper, and festival brochures. During this campaign, 50% of the reported stoat sightings resulted in a stoat capture within 2 weeks of the sighting and 200m from the reported location. This response methodology is ongoing.

Figure 13: Report a stoat sighting campaign

Updates and future plans

PAPP has not been used as reports show that it is only lethal in 33% of instances where stoats consume the bait (anecdotal Dr Elaine Murphy). Current trials are being conducted with an updated formulation and this tool may be used in the future.

The project is constantly evolving and adapting to information we learn during the stoat eradication process. This is a unique opportunity to eliminate mustelids from an urban island (9300ha), which has never been done before. Plans to track down the last stoats are submitted regularly to the project's Technical Advisory Group for feedback, and adaptations are made as required.