



FY23 Goodnature A18 Automatic Multi-Kill Trap for Mongoose - Kaiwainui Project

Final Report

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Small Indian mongooses (*Herpestes auropunctatus*) are an invasive species in Hawaii and a serious predator of threatened and endangered native birds. Currently, land managers are limited in their ability to control mongoose because the tools available. Mongoose control efforts on the islands of Hawaii, Maui, Molokai, and Oahu would be greatly improved with an effective multi-kill trap, as would

interdiction and rapid response efforts on Kauai and Lanai where mongoose are presumed to be absent. The protection and recovery of endangered species at Kaiwainui is under the purview of Department of Land and Natural Resources (DLNR), therefore further developing tools/best practise to manage invasive predators adheres to the agency's objectives.

Abstract

Goodnature supplies automatic traps for worldwide conservation projects targeting stoats, rats, mice, american mink and eastern grey squirrels. These traps are called the Goodnature A24 Automatic Trap for Rats and Stoats (A24), and although they are effective for controlling rodents and stoats to protect native species, an A24 does not have enough power to humanely kill some large male mongoose. Therefore, Goodnature have developed an additional trap which targets small Indian mongooses, the Goodnature A18 Automatic Multi-Kill Trap for Mongoose (A18 for Mongoose). This trap is twice as powerful as the A24 and has a modified shroud and trigger system specifically designed for mongoose.

DLNR funded Goodnature to develop an A18 trapping network and system for Mongoose jointly at Kaiwainui, Oahu. The objective of this project was to evaluate the effectiveness of the Goodnature A18 network for Mongoose and to suppress and control reinvastion of a population of mongoose at Kaiwainui, with the aim of delivering a fully functioning trapping best practise system at the end of the project.

This project was run from 20 March 2023 to 01 April 2023 on the island of Oahu, Hawaii at the 300ha Kaiwainui Marsh at Kailua.

Correct this at the end - During the efficacy trial, 14 mongooses were observed killed under Goodnature A18 for Mongoose traps. Others may have been killed and subsequently scavenged by predators before observation. During the efficacy trial the mongoose tracking rate in the trial area was reduced from 58 % to 8 %. The results indicate that the A18 for Mongoose is effectively functioning and able to reduce a mongoose population.

Introduction

Goodnature based the design of this project, after discussion and site visits with DLNR staff and on current mongoose control protocols on Oahu, taking into account local mongoose control knowledge, terrain vegetation and the statutory land boundaries^{[1][2]}.

The Goodnature A18 Mongoose uses the same proven technology as the Goodnature A24. However, the A18 Mongoose has a more powerful strike mechanism and a trigger and shroud assembly designed specifically for mongoose. As a consequence, the A18 Mongoose is twice as powerful as the Goodnature A24.



Figure 1: Entrance to the Kawainui Marsh Wildlife Sanctuary

Methods



Figure 2: Trap deployment map. The photograph shows the 350 ha Kawainui Marsh - State Wildlife Sanctuary. Red markers show the locations of traps (1 - 44) Black squares show monitoring sites (1 - 12).

Monitoring

Tracking tunnels were placed within the core of the Kawainui Marsh approximately 100m apart. Tracking cards were placed within the tracking tunnels, and baited with sardines in the centre of the tracking card. Monitoring with tracking tunnels began two days prior to setting the traps. The tracking cards were replaced daily if they were tracked. The presence of mongoose was monitored and recorded for two days before the traps were activated and at the end of this 11 day project.



Figure 3: The photograph shows site 1 of the tracking network with the trap and tracking tunnel.

Trapping

Traps were attached to trees at a height of 250 mm. Traps were baited with sardines on the first two days then the sardines were removed and replaced with “cat kibble soaked in fish oil. All trap sites were GPSed and marked with a pink plastic triangle nailed to the tree and marked with it’s individual site number.

All mongooses that were found killed were aged and sexed, then removed from the trap site.

All traps and tracking tunnels were left at their sites for DLNR to manage into the future.



Figure 4: The photograph shows a dead mongoose under a Goodnature A18 at Kawainui marsh.

Results

Monitoring and trapping results for the project are shown in Table 1 & 2.. Photographs of all tracking cards can be found in the Appendix. The tracking data indicates a sharp decline in mongoose tracking rate from the date of activation of the traps to the end of the trial.

Table 1: Trapping and monitoring programme - day by day and results.

Date	Tracking tunnels	Traps
20 March	Scoped out, planned tracking tunnel sites	Scoped out and planned trap sites
21 March	Placed tracking tunnels	Marked trap sites and established tree mounts for A18s
22 March	Pulled tracking cards 5/12 or 41% tracked. Placed new tracking cards	Marked rest of sites
23 March	Pulled tracking cards 7/12 or 58% tracked	Placed and set all A18's
24 March		Checked all traps - 6 mongoose
25 March		
28 March		Checked all traps - 4 mongoose (including a double kill)
29 March		
30 March		
31 March		Checked all traps - 2 mongoose
01 April	Pulled tracking cards 1/12 or 8% tracked	



Figure 5: The photograph shows the multi-kill at site 21 on 13 November 2023.

Table 2: Detailed capture data for all captures at all sites

Date	Trap number / Age / Sex
24 March	22 adult male 23 adult male 41 adult female 43 adult male 32 adult male 34 juvenile female
28 March	37 adult male 15 adult (too rotten for sex to be determined) 21 2 x adult male
15 November	25 adult (too rotten) 26 adult female

Conclusions

The removal of 12 mongooses during this trial, and the reduction of the mongoose tracking rate in the trial area from 58% to 8 % in just 7 days further proves that the Goodnature A18 Mongoose trap suppresses the mongoose population in the project area.

At site 21 we observed a kill of two mongooses, highlighting the usefulness of the self-resetting ability of the traps even when daily checks are performed. It also confirms that a mongoose will interact with an A18 Mongoose trap in the presence of a dead conspecific. For some species, rats for example, the presence of dead conspecifics increases the attractiveness of the A24 traps. It will be interesting to see if the same is true for mongoose and the A18 Mongoose trap in the future.

Future development

The next stage of this project is to continue with trap servicing at monthly intervals with the “cat kibble/fish oil” static lure. And continue to monitor using the existing tracking tunnel network.

Goodnature A18 Mongoose showed excellent performance in Hawaii from the perspective of suppressing mongoose. As a supplement to this functionality it may be valuable to develop a long-life lure specific for mongoose that will last for extended periods in the field. Goodnature will continue to discuss with local conservation teams and Goodnature may set a lure development time frame if it is necessary.

Acknowledgements

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References

- [1] Great Island A24 Stoat Elimination Project Update 01. DOCCM-3184333. Internal Report
- [2] Stoat invasion, eradication and re-invasion of Island in Fiordland. Graeme Elliott, Murray Willans, Hannah Edmonds and David Crouchley (2010 - NZ Journal of Ecology)
- [3] Mongoose control project in Okinawa Island, Japan (H28マングース報告書_A24_170324)
- [4] Goodnature A18 Automatic Multi-kill trap for Mongoose Efficacy Trial, Hiroshi Tokunaga & Darren Peters (Feb 2018)

Appendices:

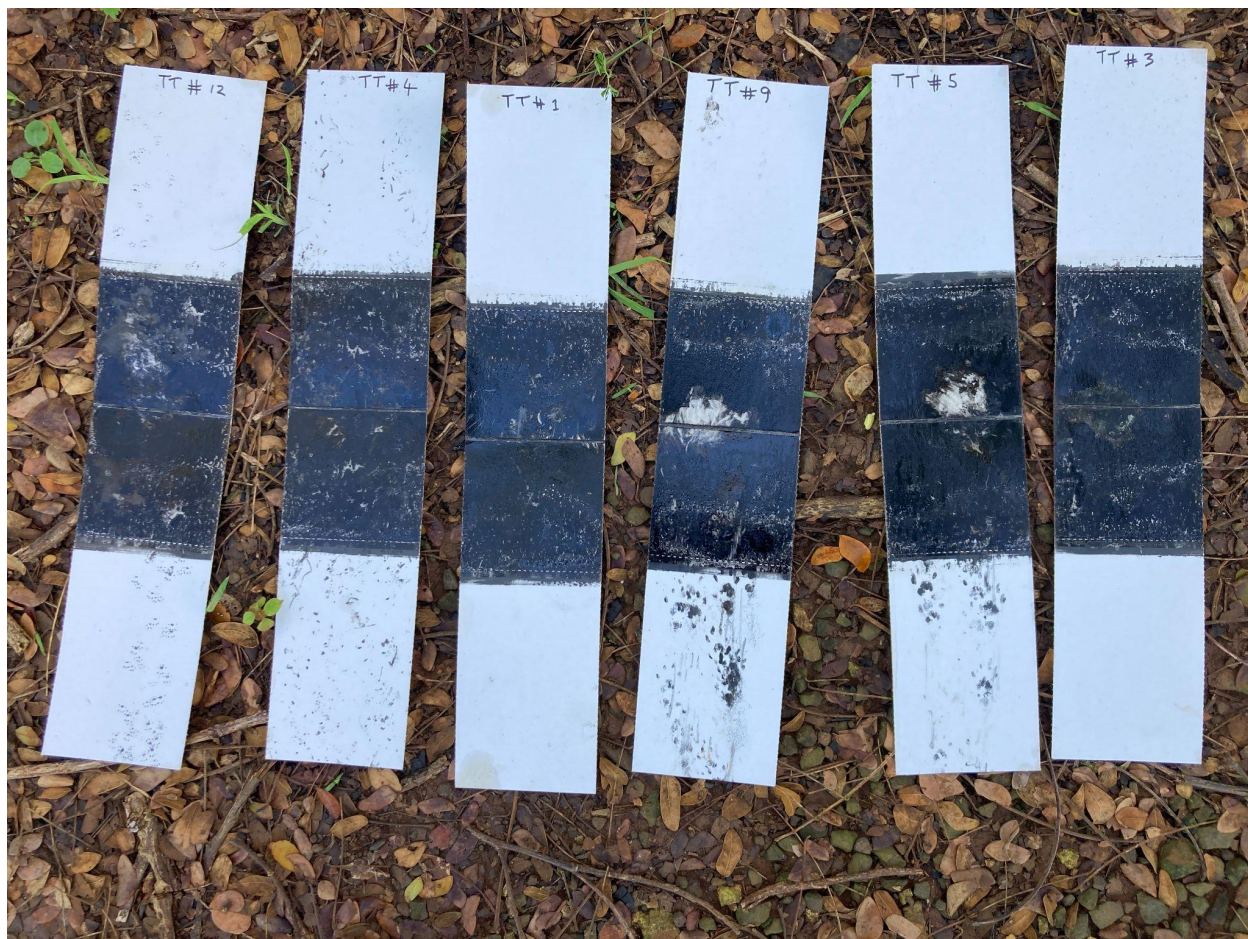


Figure 6: The photograph shows a sample of the pre-monitoring cards. Cards 9 and 5 show the presence of Mongoose.

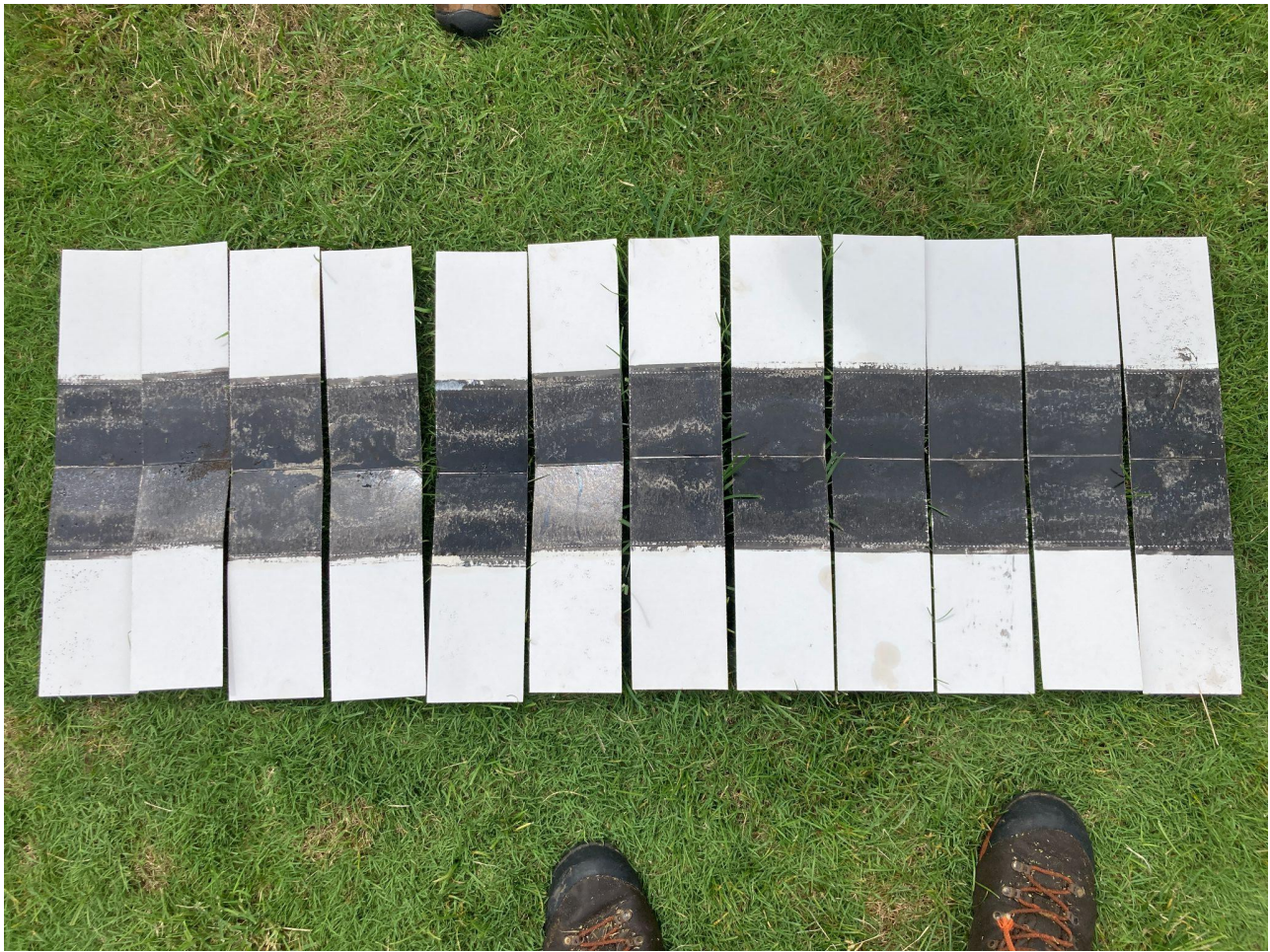


Figure 7: The photograph shows the post monitoring result. 1 of 12 cards showed the presence of Mongoose. Resulting in an 8% monitor.



Figure 8: The photograph shows the use of cat kibble and fish oil as a lure in a Goodnature A18 Lure basket. Cap removed for visibility.



Figure 9: Another angle of the use of cat kibble and fish oil as a lure in a Goodnature A18 Lure basket. Cap removed for visibility.