

The Goodnature® A24 automatic rat & stoat Kill Trap Evaluation of Humaneness: 2011

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Purpose

This document reports on the evaluation undertaken to assess the welfare performance of the Goodnature® A24 automatic rat/stoat kill trap's ability to kill stoats (*Mustela erminea*) according to the National Animal Welfare Advisory Committee (NAWAC) Guideline 09: *Assessing the welfare performance of restraining and kill traps*¹.

Background

Stoats were a deliberate introduction to New Zealand as a biological control agent in the 1870-80's for the control of an earlier introduction of common European rabbits (*Oryctolagus cuniculus*) (King 1990). Stoats spread rapidly and were implicated in the extinction of bird species as early as 1910 (Brockie 2009). Stoats have had a major impact on New Zealand's biodiversity and continue to threaten fauna over much of New Zealand. The range reductions and threat status of endemic flightless bird species such as Kiwi (*Apteryx* sp) and Takahe (*Nortornis mantelli*) have been directly attributed to stoats and these species are now reliant on ongoing stoat control to avoid extinction.

The cost of controlling stoats is high and generally involves use of aurally applied toxins reliant on secondary poisoning via prey species (rodents) or costly ground based operations using single set kill traps. As tools such as toxins have become less socially acceptable and pressure on conservation related spending increases, the demand for other methods of control has increased.

The Goodnature® A24 automatic rat/stoat kill trap is designed to target stoats and all three species of rat with a reduction in the labour costs associated with the need to re-set the traditional single-set traps. This is the first example of a self-resetting trap for stoats that incorporates both a humane kill methodology with a practical field device.

To be considered humane as per the NAWAC standard, the trap was evaluated for its ability to render stoats irreversibly unconscious within three minutes. The trap operates by driving a captured bolt onto the brain case of the stoat instantly causing central nervous system suppression.

¹ <http://www.biosecurity.govt.nz/animal-welfare/nawac/policies/guideline09.htm>

Objective

The objective of the evaluation was to determine whether the captured bolt technology of the trap effectively targets and kills stoats within a naturally occurring weight range presenting to the trap in a “natural manner” as per the NAWAC Guideline 09: Assessing the welfare performance of restraining and kill traps.¹

Methods

The Goodnature® A24 automatic rat/stoat kill trap is designed to humanely kill rats and stoats of all independent age classes and to reset itself at least 24 times. The device tested used a captured bolt approximately 20mm in diameter with a series of crenulations around the striking edge. Striking force of the captured bolt (not tested) is stated as 35 Kg.

Stoats captured from the wild were tested after a short period of acclimatisation to captivity in a specially built facility at Landcare Research - Manaaki Whenua campus in Christchurch. One Goodnature® A24 automatic rat/stoat kill trap was then introduced to each animal in its enclosure. A Landcare Research - Manaaki Whenua technician (Grant Morris) and a Goodnature® representative (Craig Bond) monitored all stoat captures.

When the trap was triggered, the assessors rapidly approached the trap, and monitored the palpebral reflex of the animal and other vital signs, such as respiration and heart beat. The stoat's weight and sex were also recorded.

Palpebral reflex was assessed by lightly touching the cornea of both eyes of the unconscious stoat (Rowell et al. 1981). Respiration was determined by visual observation of expansion and contraction of the rib cage and heart stop determined by use of a stethoscope. All skulls were kept for further analysis, should they be required.

Results

All ten stoats trapped were rendered irreversibly unconscious within the acceptable humane time frame of three minutes with a mean time of 31.3 seconds (range 22 - 38 seconds). This time includes the lag between the trap triggering, and the ability of the assessor to travel to the trap and conduct the palpebral reflex test. In all cases eye reflex was absent on the first test conducted on the initial approach.

The weight of the tested stoats ranged from 196 - 405 grams which correlates to a naturally occurring weight range for wild stoats. The sex of the animals caught was weighted in favour of males with 6 male and 4 female stoats killed as shown in Table 1.

Table 1. Time to loss of palpebral reflex and heart stop in stoats captured in the Goodnature® A24 automatic rat/stoat kill trap (data from Landcare Research - Manaaki Whenua, Christchurch, New Zealand)

Date	Stoat no.	Weight g	Sex	Palpebral reflex	Heart stop	Strike location	Notes
1/03/2011	479	405	M	< 28s	3m 10s	dorsal strike on skull	No visible fractures in the dorsal surface of the skull when dissected
1/03/2011	497	287	M	< 34s	70m*	lateral strike on skull	*Remained unconscious throughout but continued to breathe. Considered 'brain dead' so euthanased at 70m. No visible fractures of skull when dissected.
1/03/2011	431	251	F	< 27s	2m 28s	dorsal strike on skull	Major skull fractures
2/03/2011	499	317	M	< 22s	3m 38s	dorsal strike on skull	Goodnature to examine skull
2/03/2011	505	238	F	< 35s	2m 48s	dorsal strike on skull	Goodnature to examine skull
2/03/2011	504	334	M	< 29s	2m 33s	dorsal strike on skull	Goodnature to examine skull
2/03/2011	500	292	M	< 37s	3m 3s	dorsal strike on skull	Goodnature to examine skull
3/03/2011	506	203	F	< 33s	2m 11s	dorsal strike on skull	Major skull fractures
3/03/2011	507	196	F	< 38s	2m 29s	dorsal strike on skull	Major skull fractures
4/03/2011	508	325	M	< 30s	2m 43s	dorsal strike on skull	Major skull fractures

Note: In all cases the animal presented with no palpebral reflex on first inspection. The times in table 1 are influenced by the time to access the animal after being struck by the trap.

Discussion

The Goodnature® A24 automatic rat/stoat kill trap meets the NAWAC guidelines for a humane kill trap. All animals were accessed and check for palpebrable reflex within 38 seconds and all animals were irreversibly unconscious on first inspection.

Many of the stoat's hearts continued to beat post capture for two to three minutes (2m 11s - 3m 38s). One stoat's heart beat continued for 70 minutes and was eventually euthenaised. At no stage did this animal regain consciousness and was deemed to be "brain dead."

Conclusion

This evaluation determined that the Goodnature® A24 automatic rat/stoat kill trap rendered stoats irreversibly unconscious quickly and effectively, meeting the NAWAC kill trap testing guidelines. The trap consecutively killed 10 stoats successfully ranging from 196- 405 grams body weight. In all cases palpebral reflex was absent on first approach to the struck animal at under 38 seconds.

References

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Rowell, H.C.; Ritcey, J.; Cox, F. (1981). Assessment of effectiveness of trapping methods in the production of a humane death. *In*: Chapman, J.A.; Pursley, D. ed. Proceedings of the Worldwide Furbearers Conference, Frosburg, Maryland, USA. Pp. 1647-1670.