Evaluation of the effectiveness of the Waddington backcracker trap for killing stoats

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ABSTRACT

The Animal Welfare Act 1999 enables traps that are considered unacceptably inhumane to be prohibited. This provision has resulted in an increased awareness of how well kill traps actually kill the intended target species. Trials of the killing effectiveness of stoat traps (both Fenn traps and Victor snapback traps) have shown that they do not kill stoats quickly or consistently. Because Fenn traps are used extensively by the Department of Conservation for trapping stoats in New Zealand it is desirable to find a humane alternative. Pen trials were conducted to determine the effectiveness of the Waddington backcracker trap for killing stoats. To pass the test for killing performance, the trap had to render 10 out of 10 stoats irreversibly unconscious within 3 min. Seven of eight stoats tested were rendered irreversibly unconscious within 3 min. However, the eighth stoat remained conscious beyond 3 min, resulting in the trap failing the test.

Keywords: Animal welfare, kill traps, stoats

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1. Introduction

The Department of Conservation (DOC) controls stoats (*Mustela ermina*) primarily by trapping them using Fenn traps. Tests conducted by Landcare Research have shown that Fenn traps do not kill stoats consistently or quickly (B. Warburton, unpubl. data.). Therefore, there is a possibility that these traps will be prohibited under the provisions of the Animal Welfare Act 1999.

In an attempt to identify a humane alternative to the Fenn trap, Philip Waddington in collaboration with DOC developed the Waddington backcracker trap in June 2002. Landcare Research was commissioned by DOC to determine the killing performance of this trap in August 2002.

The Waddington backcracker trap (Fig. 1) has four parallel strike bars, powered by two coil springs. When set, the strike bars are in an upright position and rotate through 90° when triggered to close downwards and strike the stoat across the dorsal surface. A treadle plate situated between the impact-point of the middle two strike-bars triggers the trap. The trap is set in a wooden tunnel.

2. Background

To protect some endangered species, DOC needs to control predators, such as stoats. The Fenn trap (both Mark IV and Mark VI models) has been used for trapping stoats in New Zealand since the 1970s (King 1994). Recent changes in animal welfare legislation include a provision for the prohibition of traps that are considered inhumane, and there is an increasing awareness of the need to know how well kill traps actually kill the intended target species. Acceptable traps must be able to consistently render target animals irreversibly unconscious within 3 min (NAWAC 2000). As part of an ongoing trap-testing programme, Landcare Research tested the killing performance of Fenn traps in 2001 and showed that they were ineffective with most captured stoats still conscious after 5 min (B. Warburton, unpubl. data). The Victor snapback trap was then tested but it could not consistently render stoats irreversibly unconscious within 3 min (Warburton et al. 2002). Consequently, DOC has continued to seek a humane, alternative trap.

The International Organisation for Standardisation (ISO) developed a draft standard for testing traps (Jotham & Phillips 1994; Warburton 1995) which has now been developed as the National Animal Welfare Advisory Committee (NAWAC) draft guidelines for testing traps. For kill traps to be acceptable, either 10 out of 10, or 13 out of 15, target animals must be rendered unconscious within 3 min of capture (NAWAC 2000).

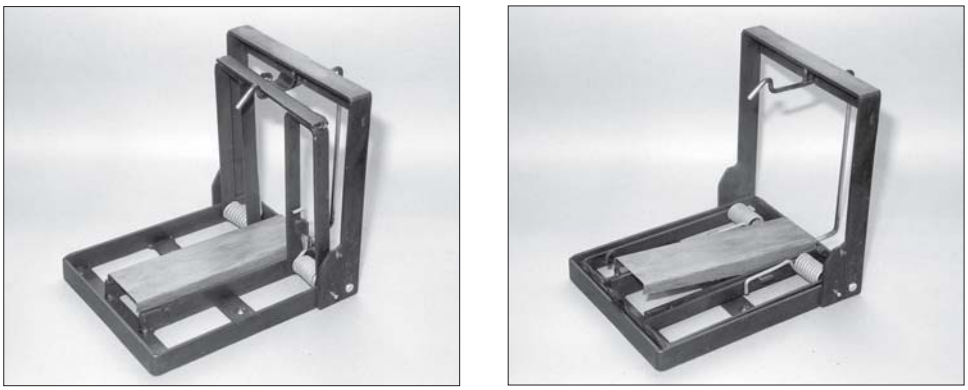

Figure 1. Waddington backcracker trap showing: set position with bars upright (left); and triggered position with bars down (right).

3. Objective

The objective of this study was to evaluate the welfare performance of the Waddington backcracker trap using pen trials to determine how well the trap captures and kills stoats.

4. Methods

This work was carried out with approval from the Landcare Research Animal Ethics Committee (AEC 03/01/02).

The Waddington backcracker trap test system consisted of the trap set in a single-open-ended tunnel with double mesh restrictors to align the animal over the trap and prevent access by non-target animals in the field. The back of the tunnel was fully covered with mesh to allow animals to see into the tunnel but not to access it from that end. Bait was placed behind the trap so that the animal had to walk over the trap plate (trigger) to reach it. A wide-angle, infrared video camera was positioned at the blind (fully mesh-covered) end so that the animal's approach into the tunnel and over the trap could be monitored and subsequently evaluated.

Ten, acclimatised, wild stoats were placed in outdoor observation pens for the trial. Each test animal was observed from inside an observation hut. Once an animal triggered the trap, the observer moved to the trap as quickly as possible to monitor the stoat's palpebral (blinking) reflex by blowing and/or touching the corner of the eye. This reflex stops when an animal is unconscious. The heartbeat was monitored using a stethoscope. The times to loss of palpebral reflex and cessation of heartbeat were recorded, as well as the strike locations of the trap's strike bars on the animal. Captures were monitored and recorded on video.

A sample size of 10 stoats was selected by DOC. All 10 of these animals had to be rendered unconscious within 3 min of capture for the trap to pass the test.

5. Results

The trap successfully rendered the first seven stoats unconscious within 3 min of capture (Table 1). The eighth test animal was still conscious after 5 min and was euthanased. The trial was stopped after the eighth animal. The eighth animal was the lightest of those tested (230 g). Six of the eight animals were struck on the head, resulting in skull fracture, and rapid loss of consciousness. All animals were struck by at least two of the trap's four strike bars (Table 1).

6. Conclusions

The Waddington backcracker trap failed to meet NAWAC (2000) draft guidelines for kill trap performance, even though most stoats caught were killed rapidly by a head strike. Although the trap has four strike bars to increase the chance of a strike being fatal, one animal received strikes on the neck and shoulders only, which were ineffective.

Stoats, like other mustelids, have strong neck muscles and to kill them with a strike in this location requires high-impact momentum and clamping forces (Warburton & Hall 1995). It is likely that more effective kills for this species can be obtained from head strikes. The challenge for any trap developer is to ensure that the trap can consistently strike an animal across the head. If the strike bars could be spaced and the trigger situated to ensure consistent head strikes, the Waddington backcracker trap would have a higher chance of passing the test. Alternatively, increasing the trap's clamping force could potentially improve killing performance in instances when the head is not struck and the animal is captured by the neck, shoulder, or chest.

TABLE 1. STRIKE DETAILS AND TIMES (MIN:S) TO LOSS OF PALPEBRAL REFLEX AND CESSATION OF HEARTBEAT FOR STOATS CAPTURED IN THE WADDINGTON BACKCRACKER TRAP.

WEIGHT (G)	SEX	STRIKE1	STRIKE 2	STRIKE 3	STRIKE 4	PALPEBRAL REFLEX	HEART STOP	NOTES
252	Male	Head	Neck	Shoulders	_	< 0:35	4:40	Fractured skull
281	Male	Head	Neck	Chest	_	< 0:42	3:40	Fractured skull
265	Male	Head	Shoulders	Chest	_	< 0:29	2:47	Fractured skull
290	Male	Head	Neck	Shoulders	_	< 1:10	12:04	Fractured skull
339	Male	Chest	Chest	Hindquarters	Hindquarters	1:04	2:48	_
340	Male	Head	Shoulders	Chest	_	< 0:50	2:50	Fractured skull
238	Female	Head	Shoulders	_	_	< 0:32	2:00	Fractured skull
230	Female	Neck	Shoulders	_	_	> 5:00	_	Euthanased

7. Acknowledgements

We thank Julie Turner for supplying and maintaining the stoats, and Morgan Coleman for commenting on drafts of this report.

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