

## The Goodnature™ Self-resetting Possum Kill Trap Evaluation of Humaneness: 2010

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### **Purpose**

This document reports on the field evaluation undertaken to assess the welfare performance of the Goodnature™ self-resetting possum trap according to the National Animal Welfare Advisory Committee (NAWAC) Guideline 09: *Assessing the welfare performance of restraining and kill traps*<sup>1</sup>.

### **Background**

The Brushtail Possum (*Trichosurus vulpecula*) was introduced into New Zealand to establish a fur industry. It has rapidly spread, invading all three main islands of the New Zealand archipelago as well as many smaller offshore islands. As a vector for bovine tuberculosis the animal is an economic pest, but it is also an environmental threat, attacking native plants and animals. The cost of controlling possums amounts to tens of millions of dollars each year, and as tools such as toxins become less socially acceptable, the demand for other methods of control has increased.

The Goodnature™ self-resetting possum kill trap is designed to target the possum, 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 possums 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 possums irreversibly unconscious within three minutes. The trap operates by driving a captured bolt into the brain case of the possum with the objective of causing spontaneous central nervous system suppression.

### **Objective**

The objective of the evaluation was to determine whether the captured bolt technology of the trap effectively targets and kills possums within a naturally occurring weight range in a 'wild' environment, as per the NAWAC Guideline 09: *Assessing the welfare performance of restraining and kill traps*.

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

## **Methods**

The Goodnature™ multi-kill possum trap is designed to kill possums of all independent age classes and to reset itself up to 12 times. The devices tested in the environment were the same prototype as previously tested, but one vented the gas through the killing bolt into the skull, reducing the striking force required. This use of the exhaust gas increased the kill efficiency by contusing the brain tissue while reducing the amount of force required to kill the animal. This, in turn, extends the longevity of trap components.

Possums living within the Rimutaka Forest Park were attracted to baited sites over a period of days. Two Goodnature™ self-resetting possum traps were then introduced to these baited sites.

To enable a rapid response to possum and trap activity, a camp was set up 20-50m away from the trap. Possum approaches to the trap were monitored by audio proximity alarm and infrared closed circuit television (CCTV). When a possum triggered the audio alarm the animal was observed via CCTV until it entered the trap. The infrared CCTV was used to record each possum trap encounter and provide the exact time of the trap being triggered.

Once triggered, assessors rapidly approached the trap, and monitored and documented the palpebral reflex of the animal and other vital signs, including respiration, heart rate, and the time to heart stoppage. The possum's weight and sex were also recorded.

Palpebral reflex was assessed by lightly touching the cornea of both eyes of the unconscious possum (Rowell et al. 1981). Heart rate was monitored at intervals using an infant grade stethoscope and respiration by expansion and contraction of the rib cage. Other movements or emissions from the animal were also noted. All skulls were kept for further analysis, should they be required.

## **Results**

All ten possums trapped were rendered irreversibly unconscious within three minutes with a mean time of 67.6 seconds (the range was 21 - 156 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 possums ranged from 1.8 - 2.8 kg, and the sex of the animals was evenly distributed with 5 female and 5 male possums killed as shown in Table 1.

**Table 1.** Time to loss of palpebral reflex and heart beat in wild possums captured in the Goodnature™ self-resetting possum traps.

Weight (kg)	Sex	Strike location	Palpebral reflex (Min:Sec)	Heart stop (Min:Sec)	Comments
2.5	Male	Extreme left side on line between ears	1:36	7:36	Animal in spasm for 2 minutes. No respiration. Ejaculation.
2.25	Female	By left ear	2:36	5:29	Animal self propelled 1.8m with spasms from rear legs.
2.3	Female	Near centre between ears	0:40	4:00	No respiration. Heart rate very rapid.
2.5	Male	Near centre between ears	1:30	5:10	Head stuck in trap. Body limp on arrival (40 seconds).
1.8	Female	Near centre between ears	0:45	4:30	Head stuck in trap. Body limp on arrival (30 seconds).
2.5	Male	Near centre between ears	0:21	2:14	
2.2	Male	Near centre between ears	0:23	2:20	
2.3	Female	Near centre between ears	0:30	2:09	
1.8	Female	Near centre between ears	1:25	3:55	
2.8	Male	Near centre between ears	1:30	12:20	Shallow respiration @ 5 second intervals.

**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™ self re-setting possum kill trap easily meets the NAWAC guidelines for a humane kill trap. However, a limitation of this test was the time it took to access the animal once struck by the trap. This distorts the results in table 1 by increasing the documented time of loss of the palpebral reflex.

It seems almost certain that the ten possums tested lost consciousness immediately upon being struck by the trap, ensuring the humane nature of this device. In this test, however, there was an absence of any large possums within the sample. As some South Island populations have an average weight of 3.55 Kg (Clout & Gaze 1984), it would be prudent to reassure ourselves that these large possums present to the trap effectively, and are dispatched in the same efficient way as this tested sample.

## Conclusion

This field evaluation determined that the Goodnature™ self-resetting possum trap killed the possums quickly and effectively, meeting the NAWAC kill trap testing guidelines. In all cases palpebral reflex was absent on first approach to the struck animal. The trap consecutively killed 10 brush tailed possums successfully ranging from 1.8 to 2.8 kg body weight.

## References

M.N. Clout and P.D. Gaze. (1984). Ecology Division, DSIR, Nelson, New Zealand. *New Zealand Journal of Ecology* Vol. 7. Pp. 147-155.

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.*