



Manaaki Whenua  
Landcare Research

# **Pen testing the kill efficacy of the BT250 trap when used for capturing ferrets**

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# Pen testing the kill efficacy of the BT250 trap when used for capturing ferrets

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# Summary

## Project and client

- Manaaki Whenua – Landcare Research, Lincoln, was contracted by National Springs & Wire Products NZ Ltd to assess the killing performance of the BT250 kill trap against ferrets. The work was carried out during July 2021.

## Objective

- To test the killing performance of the BT250 against ferrets, using the National Animal Welfare Advisory Committee (NAWAC) trap-testing guideline.

## Methods

- This work was carried out with the approval of the Landcare Research Animal Ethics Committee (AEC 18/12/02).
- The manufacturer provided BT250 kill traps to test their killing performance on wild-caught and captive-bred ferrets.
- Ferrets were penned individually and trialled in a free-approach test. Once the ferret was struck by the trap, the time to loss of palpebral (blinking) reflex was measured to determine whether the trap rendered the captured animal irreversibly unconscious within 3 minutes. For the trap to pass the NAWAC trap-testing guidelines, 10 of 10 ferrets needed to be rendered irreversibly unconscious within 3 minutes.
- Ferrets that were trapped but remained conscious for longer than 3 minutes were euthanised and then necropsied to determine the kill-bar strike location.

## Results

- Of the first two ferrets tested, one was killed successfully and the other was not. This ferret regained consciousness and pulled out of the trap after 7 minutes 7 seconds. Testing was stopped and the traps returned to the manufacturer for modification. Spring strength was increased, and the traps were resubmitted for testing.
- The modified trap successfully killed 10 out of 10 ferrets. All 10 ferrets were assessed as being rendered irreversibly unconscious in under 30 seconds, so the trap qualifies as a Class A trap for welfare performance.

## Conclusion

- The final modified version of the BT250 kill trap met the NAWAC trap-testing test criteria when tested on ferrets, and it qualifies as a Class A trap.

## Recommendations

- The BT250 kill trap can be promoted as having met the NAWAC trap-testing criteria for ferrets. Traps can now be labelled as passing the NAWAC guideline (Class A)<sup>1</sup>.
- The BT250 kill trap is difficult to manually set because of its powerful springs, so it is recommended that traps be bolted rather than screwed into trap boxes to eliminate the risk of screws pulling out during trap setting. The use of a setting tool is also recommended.

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<sup>1</sup> We can confirm that the BT250 traps provided to Manaaki Whenua – Landcare Research, when assessed under test conditions, met the NAWAC trap-testing criteria to a Class A classification standard. Please note that as the NAWAC guidelines are not legally binding and there is no approval scheme, NAWAC traps may not be marketed as NAWAC approved/certified. The content of this report, and confirmation by Manaaki Whenua – Landcare Research that a trap has met the NAWAC trap-testing criteria may not be used in any way that could suggest that Manaaki Whenua – Landcare Research, or any Ministry or other government entity are endorsing a particular trap.

## **1 Introduction**

Manaaki Whenua – Landcare Research, Lincoln, was contracted by National Springs & Wire Products NZ Ltd to assess the killing performance of the BT250 kill trap against ferrets. The work was carried out during July 2021.

## **2 Objective**

- To test the killing performance of the BT250 when capturing ferrets, using the National Animal Welfare Advisory Committee (NAWAC) trap-testing guideline.<sup>2</sup>

## **3 Methods**

The client provided BT250 kill traps to test their killing performance on ferrets. Wild-caught ferrets were acclimated to captivity in outdoor cages for at least 4 months before being transferred to an observation pen for the trap testing. Two captive-bred ferrets older than 18 months were also used.

Ferrets were penned individually and trialed in a free-approach test during the day. In the observation pen a trap was screwed into and set in a single-entrance, double-mesh baffle tunnel (manufactured by Haines Pallets, Lower Hutt). The trap was baited with chicken mince in the bait holder provided, and a small amount was placed inside the entrance to encourage entry by ferrets (Figure 1).

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<sup>2</sup> National Animal Welfare Advisory Committee (NAWAC) 2019. Guideline 09: Assessing the welfare performance of restraining and kill traps 2019. <https://www.mpi.govt.nz/dmsdocument/8521-nawac-guideline-09-assessing-the-welfare-performance-of-restraining-and-kill-traps> (accessed 3 August 2021).



**Figure 1. Unset BT250 kill trap in a Haines Pallets single-entrance tunnel. The lid has been unscrewed and opened to view the trap from above. The trap was firmly screwed to the tunnel base.**

When a ferret was struck by the trap, the time to loss of palpebral (blinking) reflex was measured to determine whether the trap had rendered the captured animal irreversibly unconscious within 3 minutes. For the trap to pass the NAWAC trap-testing guideline (2019), 10 of 10 ferrets needed to be rendered irreversibly unconscious within 3 minutes. If a trap renders all captured animals irreversibly unconscious within 3 minutes, but with some or all greater than 30 seconds, then the trap qualifies as a Class B trap for welfare performance. If all 10 animals are rendered irreversibly unconscious in under 30 seconds, then the trap qualifies as a Class A trap. Once irreversible unconsciousness was identified, a stethoscope was used to determine time to cessation of heartbeat.

During the pen tests, the BT250 was modified once after failing to kill a ferret in the required time frame. The different tests and trap and tunnel specifications used in each test are listed in chronological order, as follows.

## Test 1

The trap was firmly screwed into the tunnel floor and baited with a ball of chicken mince placed in the bait holder beyond the hinge of the trap, with an additional small piece inside the entrance to encourage entry to the trap tunnel by ferrets (Figure 1). The set-off weight of the trap treadle was adjusted to 100 g, which is below the maximum tolerance of 120 g suggested in the Predator Free 2050 *Practical Guide to Trapping*.<sup>3</sup>

## Test 2

The spring strength of the trap was increased to increase the impact momentum of the kill bars. To achieve this, the diameter of the spring wire was increased from 5.0 mm to 5.3 mm, which increased impact momentum by 27% (Mike Baird, National Springs & Wire Products NZ Ltd, pers. comm., July 2021). Because of the extra force required to set the trap it was bolted into the trap tunnel (Figure 2) and a setting tool was used to set the trap.<sup>4</sup>



**Figure 2.** For test 2 the modified trap was bolted into the tunnel base (left) with a washer and nut assembly, securing the bolts on the underside (right). A setting tool was used to set the trap.

Any test animal that escaped and survived (one only) was euthanised with an intra-cardiac (0.5 mL/kg bodyweight) injection of pentobarbitone, and then necropsied to identify whether the trap had caused any injury. This work was carried out with the approval of the Landcare Research Animal Ethics Committee (AEC 18/12/02).

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<sup>3</sup> <https://www.doc.govt.nz/globalassets/documents/conservation/threats-and-impacts/pf2050/pf2050-trapping-guide.pdf> (accessed 3 August 2021).

<sup>4</sup> <https://www.connovation.co.nz/products/doc-trap-setting-tool> (accessed 3 August 2021).

## **4 Results**

Of the first two ferrets tested, one was killed successfully and the other was not. This animal regained consciousness and pulled out of the trap after 7 minutes 7 seconds (Table 1). It was then euthanised. Both ferrets were necropsied, and both had visible skull fractures. Testing was stopped and the trap was returned to the manufacturer for modification, as described in the methods.

Using the modified trap, 10 of 10 ferrets were killed successfully. All of these ferrets were assessed as rendered irreversibly unconscious in under 30 seconds, so the trap qualifies as a Class A trap for welfare performance (Table 1).

**Table 1. Outcome of tests using the BT250 kill trap for capturing ferrets**

Date	Weight (kg)	Sex	Time to loss of palpebral reflex	Time to heart stop	Strike location	Notes
<b>Test 1</b>						
1/07/2021	0.85	M	<29 s	-	First 4 bars across head/neck/shoulders.	Initially unconsciousness but revived; struggling after 5 minutes and pulled out of trap 7 m 7 s; euthanised; necropsy showed skull fractured.
1/07/2021	0.98	M	<30 s	10 m 23 s	First 4 bars across head/neck.	No consciousness detected, but reflexive gasping prolonged time to loss of heartbeat; skull fractured.
<b>Test 2</b>						
26/07/2021	1.01	M	<25 s	3 m 24 s	4th bar across head; bars 1–3 across shoulder to neck.	Reflexive movement until 2 m 40 s; skull fractured.
26/07/2021	1.00	M	<25 s	2 m 14 s	3rd bar across head; 2nd bar back of skull; 1st bar across neck.	Skull fractured.
26/07/2021	0.71	F	<21 s	9 m 47 s	4th bar across head; bars 1–3 across shoulder to neck.	No consciousness detected, but reflexive gasping prolonged time to loss of heartbeat; skull fractured.
26/07/2021	0.80	F	<17 s	2 m 12 s	4th bar across head; bars 1–3 across shoulder to neck.	Skull fractured.
26/07/2021	0.75	F	<22 s	3 m 59 s	1st bar across rear of skull; 2nd bar across muzzle.	Skull fractured.
26/07/2021	0.77	F	<21 s	4 m 11 s	2nd & 3rd bars across head; 1st bar across neck.	Skull fractured.
26/07/2021	0.83	M	<18 s	2 m 33 s	3rd bar across head; 2nd bar back of skull; 1st bar across neck.	Skull fractured.
26/07/2021	0.98	M	<20 s	7 m 7 s	2nd & 3rd bars across head; 1st bar across neck.	No consciousness detected, but reflexive gasping prolonged time to loss of heartbeat; skull fractured.
26/07/2021	0.98	M	<19 s	3 m 11 s	3rd bar across head; 2nd bar back of skull; 1st bar across neck.	Skull fractured.
26/07/2021	0.89	M	<22 s	2 m 40 s	3rd bar across head; 2nd bar back of skull; 1st bar across neck.	Skull fractured.

## **5 Conclusions**

The BT250 kill trap met the NAWAC trap-testing criteria as a Class A trap when tested on ferrets. An increase in impact momentum was needed before the trap consistently killed all tested ferrets.

The final version of the BT250 trap has very high impact momentum, so it is expected that all possible non-target captures (e.g. possums, feral cats, stoats, rats, hedgehogs) will also have a high probability of being killed quickly.

## **6 Recommendations**

- The BT250 kill trap can be promoted as having passed the NAWAC guideline for ferrets. Traps can now be labelled as passing the NAWAC guideline (Class A).
- The BT250 kill trap is difficult to manually set because of its powerful springs. Therefore, it is recommended that traps be bolted into trap boxes rather than screwed to eliminate the risk of screws pulling out during trap setting. The use of a setting tool is also recommended.

## **7 Acknowledgements**

Thanks to Mike Baird from National Springs and Wire Products NZ Ltd for providing traps and funding the pen testing. Thanks also to Animal Facility staff for animal husbandry, Bruce Warburton and Chris Jones for review, Ray Prebble for editing, and Kate Boardman for final formatting of this report.