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Landcare Research

Pen testing of the kill efficacy of the SA2 Kat trap when used for capturing possums

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Summary

Project and client

- Manaaki Whenua – Landcare Research, Lincoln, assessed the killing performance of the SA2 Kat trap for capturing possums, for Northland Regional Council, during September–October 2018.

Objective

- To test the killing efficacy of the SA2 Kat trap when capturing possums, following 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 15/12/01).
- The manufacturer provided six new SA2 Kat traps to test their killing performance on wild-caught possums. Possums were penned individually, and the trap was tested in a free-approach test.
- Once a possum 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 possums needed to be rendered irreversibly unconscious within 3 minutes.

Results

- Two possums were killed before a third remained conscious beyond the 3-minute threshold.
- Testing restarted, excluding the trap in which the possum survived. Ten of ten possums were killed successfully.

Conclusions

- The SA2 Kat trap passed the NAWAC trap-testing guideline when tested on possums.
- This style of trap can be used to target both cats (previously successfully tested) and possums, as both species are struck correctly when entering the trap. A different bait may be needed to selectively target each species.
- We conclude the trap is marginally effective for killing possums quickly, and a possible remedy would be to modify the shape of the striking bar so there is a greater probability that the carotid arteries are occluded as well as the trachea.

Recommendations

- If Northland Regional Council wish to use kill traps that have passed the NAWAC trap-testing guideline for targeting possums, they should support the use of the SA2 Kat trap.

- When promoting the use of the SA2 Kat trap by community groups and/or other agencies, the manufacturer should provide the same setting and baiting instructions as used for the NAWAC test.
- The trap manufacturer could consider modifying the shape of the striking bar so there is a greater probability that the carotid arteries are occluded as well as the trachea.

1 Introduction

Manaaki Whenua – Landcare Research, Lincoln, assessed the killing performance of the SA2 Kat trap for capturing possums, for Northland Regional Council, during September–October 2018.

2 Objective

- To test the killing efficacy of the SA2 Kat trap when capturing possums, following the National Animal Welfare Advisory Committee (NAWAC) trap-testing guideline.

3 Methods

The manufacturer provided six new SA2 Kat traps to test their killing performance on wild-caught possums. The trap design had previously been trialled on cats, and after some modifications it passed the NAWAC trap-testing guideline for cats (Morriss 2016, 2017).

Possums were acclimatised to captivity in outdoor pens for at least 1 week before being transferred to observation pens for the trap testing. Possums were penned individually, and the trap was tested in a free-approach test. In each observation pen a trap was set at the top of a leaning board c. 1 m above the ground (Figure 1). The trap was baited with flour lure (50:50 mix of flour and sugar flavoured with five spice) on the floor of the trap, and two small mounds of lure were placed on the leaning board to encourage possums to walk up the board towards the trap. The trap set was pre-fed for at least two nights with the trap left unset and baited as above, with the lure replenished daily. Once set, the base of the trap trigger was 90 mm in from the mouth of the trap.

Figure 1. SA2 Kat kill trap set at the top of a leaning board. Trap shown unset.

When a possum 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 guideline (2011), 10 of 10 possums needed to be rendered irreversibly unconscious within 3 minutes. Once irreversible unconsciousness was identified, a stethoscope was used to determine cessation of heartbeat.

All captures were videoed using a digital video system (GeoVision DVR) with infrared illumination. Testing was carried out during the first 3 hours of darkness. Video footage was reviewed using GeoVision EZView software.

This work was carried out with approval of the Landcare Research Animal Ethics Committee (AEC 15/12/01).

4 Results

The first two possums tested were rendered irreversibly unconscious within the 3-minute threshold, but the third possum, although securely held by the neck, still managed to breathe and was euthanised after 5 minutes (Table 1). This possum appeared to be positioned correctly, with the kill bar clamping posterior to the angle of the jaw, so it was unclear how the possum could continue breathing. It was concluded that the kill bar on the trap was not exerting enough pressure to occlude the possum's trachea, so this trap was removed from testing and testing restarted using the remaining five traps.

Ten of ten possums tested in the remaining five traps were rendered irreversibly unconscious within the 3-minute threshold (Table 1). Five of the ten possums became unconscious after 2 to 3 minutes. This probably indicates that either one or both carotid arteries were not fully occluded, and some blood flow continued to the brain. Although achieving irreversible unconsciousness took longer than observed with traps that cause significant trauma to the head or neck, this trap still achieved the requirements of the NAWAC guideline.

Table 1. Outcome of the test using the SA2 Kat kill trap for capturing possums

Date	Weight (kg)	Sex	Loss of palpebral reflex (min:s)	Heart stop (min:s)	Strike location	Notes
			Test 1			
12/09/2018	2.55	F	<2:04	3:40	Neck	Time to unconsciousness was probably shorter but difficult to access eye.
12/09/2018	3.04	F	<1:04	4:19	Neck	Time to unconsciousness was probably shorter but difficult to access eye.
15/09/2018	2.43	F	-	-	Neck	Still able to breathe (although restricted); looked to be well positioned with kill bar on neck and possum square on.
			Test 2			
15/09/2018	3.23	F	1:30	6:22	Neck	Trachea fully occluded.
15/09/2018	2.83	M	1:00	6:23	Neck	Trachea fully occluded.
19/09/2018	3.58	M	2:02	4:22	Neck	Trachea fully occluded.
19/09/2018	2.88	F	1:12	4:52	Neck	Trachea fully occluded.
19/09/2018	1.95	F	2:47	5:33	Neck	Trachea fully occluded.
19/09/2018	2.39	F	2:07	4:52	Neck	Trachea fully occluded.
3/10/2018	2.81	F	0:56	4:27	Neck	Trachea fully occluded.
3/10/2018	2.35	F	1:30	4:37	Neck	Trachea fully occluded.
3/10/2018	2.45	M	2:04	4:09	Neck	Trachea fully occluded.
8/10/2018	1.85	M	2:55	5:15	Neck	Trachea fully occluded.

5 Conclusions

The SA2 Kat kill trap passed the NAWAC trap-testing guideline when tested on possums. All possums were caught by the neck, which resulted in irreversible unconsciousness due to occlusion of the trachea and possibly total or partial occlusion of the carotid arteries. Because the trap requires an animal to push the trigger to fire the trap, this results in consistent kill bar strikes and increases the probability that captured animals are killed quickly.

Five of the ten possums used in the final test took more than 2 minutes to be rendered unconscious, which may indicate that their carotid arteries were not fully occluded and some blood flow continued to the brain. Nevertheless, because their trachea was fully occluded, irreversible unconsciousness was achieved. These times to unconsciousness are consistent with what has been achieved with other possum trap designs that kill the same way, such as the Sentinel (4 of 10 possums exceeded 2 minutes to irreversible unconsciousness; Warburton & Moffat 2007).

The uncertainty associated with why the third possum in the first test survived the 3-minute threshold and why other possums remained conscious for longer than 2 minutes suggests the trap is only marginally effective for killing possums quickly. A possible remedy would be to modify the shape of the striking bar so there is a greater probability that the carotid arteries are occluded, as well as the trachea.

The SA2 Kat trap could be used to target both cats and possums, as both species are struck across the neck when they trigger the trap and the trap has now passed the NAWAC guidelines for both species. A different bait might be needed to selectively target each species, but some bait types may be palatable to both. A possible bait could be cat biscuits embedded in thickly spread peanut butter on the trap floor.

The SA2 Kat trap has a bait spike behind the trigger inside the back of the trap to secure solid baits such as meat chunks (for cats) or apple (for possums). Baiting the trap this way was not tested, so it is unknown if possums would be struck correctly when interacting with the trap baited like this. Cats may be more inclined to use their paws to extract a solid bait and therefore have a higher probability of being incorrectly caught by the paw. Placing bait on the floor, as done for the testing of the trap in this trial, may be critical for consistent strike location, so we recommend this baiting method be used for both species.

6 Recommendations

- If Northland Regional Council wish to use kill traps for targeting possums that have passed the NAWAC trap-testing guideline, they should support the use of the SA2 Kat trap.
- When promoting the use of the SA2 Kat trap by community groups and/or other agencies, the manufacturer should provide setting and baiting instructions as per those used for the NAWAC test.
- The trap manufacturer could consider modifying the shape of the striking bar so there is a greater probability that the carotid arteries are occluded as well as the trachea.

7 Acknowledgements

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8 References

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