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Effectiveness of feral cat control using para-aminopropiophenone (PAPP) on Toronui Station, Hawke's Bay

Effectiveness of feral cat control using para-aminopropiophenone (PAPP) on Toronui Station, Hawke's Bay

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Contents

Summary

Project and Client

- In September 2016, Hawke's Bay Regional Council (HBRC) conducted control of feral cats (*Felis catus*) on Toronui Station, northern Hawke's Bay, using baits containing the toxin para-aminopropiophenone (PAPP). HBRC staff monitored cat populations before and after the control operation using camera traps. Landcare Research was contracted to assess the effectiveness of the cat control operation using camera trap data provided by HBRC. This report addresses Milestone 1.4 of the Te Matau a Maui Contract between Landcare Research and HBRC: "Estimate effectiveness of cat population reduction on Toronui Station (PAPP trial) using camera trap data collected and collated by HBRC. Report describing the results of feral cat control by Feb 28, 2017."

Objectives

- To estimate the percentage reduction in the feral cat population on Toronui Station following PAPP baiting conducted in September 2016.
- To compare the spatial distribution of feral cats on Toronui before and after the PAPP baiting operation.

Methods

- Toronui Station is a 1600-ha pastoral property in northern Hawke's Bay. Previous monitoring by Landcare Research has shown that feral cats are common on the property.
- In September 2016, HBRC established 48 bait stations on Toronui. Bait stations were spaced about 500 m apart in an approximate grid formation.
- After pre-feeding with non-toxic rabbit meat baits for 14 days, three toxic baits were placed in each bait station.
- Each toxic bait consisted of a 15-g ball of minced rabbit or beef with 200 mg of PredaSTOP® paste, containing 80 mg of PAPP, in the centre.
- Baits were left in place for 5 days, after which any remaining baits were removed.
- The relative abundance of feral cats was monitored using camera traps for three weeks before the PAPP operation, and again for three weeks immediately after baiting finished.
- 40 camera traps were deployed about 500 m apart in a grid formation. Cameras were mounted on a tree or wooden post, facing south, with the base of the camera 10 cm above the ground. A plastic vial containing a scent lure (ferret body odour) was pegged to the ground 1.5 m in front of the camera. Cameras were set to take three photographs each time they were triggered, with no delay between successive triggers.

- Photographs of cats captured on the same camera < 30 minutes apart were assumed to represent a single encounter, unless they clearly showed different individuals (e.g. based on coat pattern). Photographs captured > 30 minutes apart were assumed to represent independent encounters.

Results

- In the 3 weeks before the baiting operation, cats were detected on 42 occasions at 22 cameras. This corresponds to a camera trap rate (CTR) of 5%.
- During the PAPP operation, baits were removed from 17 of the 48 stations. It was therefore assumed that 17 cats had been killed.
- In the 3 weeks following completion of baiting, cats were detected on 22 occasions at 14 cameras (CTR = 2.5%). The relative abundance of cats is therefore estimated to have been reduced by 50%.
- The rate ratio of CTR before and after control was 2.0. The 95% confidence interval for the rate ratio (1.2 – 3.4) did not overlap zero, indicating that the difference was statistically significant.
- Most detections of cats in the post-control period were near the edges of the study area, suggesting that these may have been animals moving in from the surrounding area.

Conclusions

- A single application of PAPP baits reduced the relative abundance of feral cats by about 50%.

Recommendations

- Although a single application reduced the relative abundance of cats significantly, it is likely that a second application would have contributed to a greater reduction. It is recommended that future PAPP operations comprise two bait applications a few days apart.
- Additional PAPP baiting on Toronui is recommended to further reduce cat numbers. This will likely deliver greater, and longer lasting, benefits for native biodiversity and agriculture.

1 Introduction

Feral cats (*Felis catus*) have negative impacts on native biodiversity and agriculture in New Zealand through predation of native wildlife and spread of disease to livestock (Gillies & Fitzgerald 2005). Since 2010, Hawke's Bay Regional Council (HBRC) have been developing and refining techniques for wide-scale predator control. Through the Poutiri Ao ō Tāne and Cape to City programmes, trapping methods have been developed to reduce predator abundance across rural and semi-urban landscapes. However, effective, wide-scale control of feral cats by trapping is challenging. Current best practice (live trapping with cage and leg-hold traps) is expensive and time-consuming. Additional, more affordable control tools are required to compliment trapping efforts for feral cats.

Para-aminopropiophenone (PAPP) is a toxin that has recently been registered to control feral cats in New Zealand (EPA 2011). Mammalian carnivores are more sensitive to PAPP than birds, potentially making PAPP more target-specific than other available toxins (Savarie et al. 1983; Murphy et al. 2011). A proprietary formulation of PAPP (PredaSTOP® paste) developed by Connovation NZ Ltd. has been shown to kill cats humanely when delivered in a meat bait in pen trials (Eason et al. 2010). PAPP has also been demonstrated as an effective toxin for cats in the field (Murphy et al. 2011).

PAPP has the potential to be an effective and affordable tool for reducing feral cat densities in large-scale predator control. It may be useful both for initial 'knock-down' control of cat populations, and as a maintenance 'spot control' tool if cat densities were to increase within the maintenance area. PAPP could also prove to be an effective tool for helping prevent spikes in predator numbers in areas with increasing rabbit densities.

2 Background

In September 2016, the Biosecurity team at HBRC conducted a trail of PAPP to test its effectiveness as an initial control tool for feral cats. Here we report on the effectiveness of the control operation.

3 Objectives

- To estimate the percentage reduction in the feral cat population on Toronui Station following PAPP baiting conducted in September 2016.
- To compare the spatial distribution of feral cats on Toronui before and after the PAPP baiting operation.

4 Methods

Toronui Station is a 1600-ha pastoral property in northern Hawke's Bay. Previous monitoring by Landcare Research has shown that feral cats commonly occur on the property (Glen et al. submitted).

In September 2016, HBRC established 48 chimney tunnel style bait stations on Toronui. These are wooden tunnels with mesh on both ends and an opening at the top (Fig. 1). This design reduces non-target risk by restricting access by dogs and birds while still allowing cats easy access to the baits.

Figure 1 A chimney tunnel style bait station containing PAPP baits for feral cat control. (Photo by Rod Dickson).

Bait stations were spaced about 500 m apart in an approximate grid formation (Fig. 2). However, exact placement of bait stations was flexible in order to target likely habitat for feral cats, e.g. bush-pasture margins, waterways, tracks, fence lines, and isolated patches of cover. At the time of establishing the bait stations, 4–6 non-toxic 'pre-feed' baits (rabbit meatballs) were placed in each bait station. Free-feed baits were replenished after 7 days, and left in place for a further 7 days before being replaced with toxic baits.

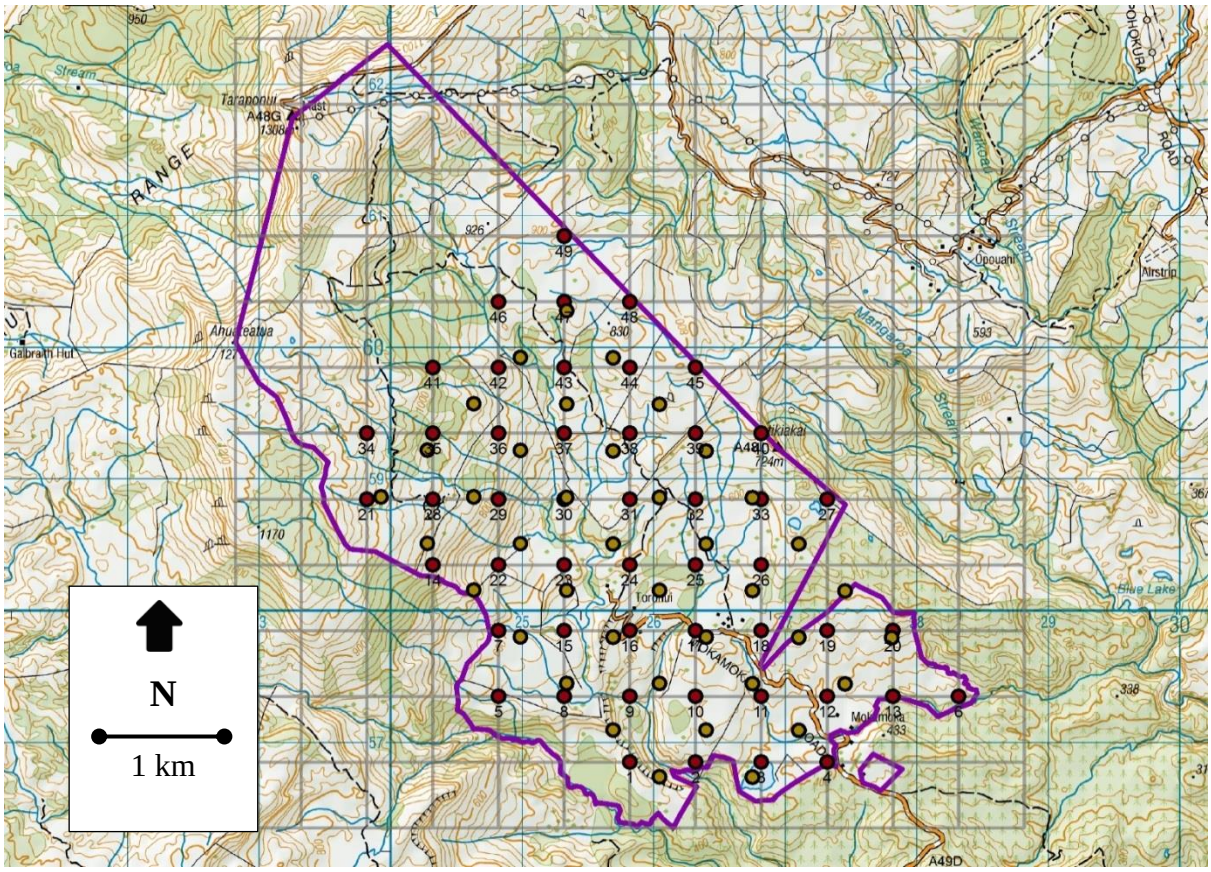

Figure 2 Map of Toronui Station, northern Hawke's Bay showing the locations of bait stations (red points) and camera traps (yellow points).

Toxic baits consisted of approximately 15 g of minced rabbit or beef rolled into a ball. In the centre was 200 mg of PredaSTOP® paste (Connovation Ltd, Manukau) containing 80 mg of PAPP. Baits were dyed green to reduce their attractiveness to non-target species (birds). Each bait station contained three PAPP baits. Toxic baits were left in place for 5 days, after which any remaining baits were removed.

The relative abundance of feral cats was monitored using camera traps for 3 weeks before the PAPP operation, and again for three weeks immediately after baiting finished. Forty camera traps (Browning Spec Ops Model BTC-3XR, Prometheus Group, Birmingham, Alabama) were deployed about 500 m apart in a grid formation (Fig. 2). Cameras were mounted on a tree or wooden post, facing south, with the base of the camera 10 cm above the ground. A plastic vial containing a scent lure (ferret body odour; Garvey et al. 2017) was pegged to the ground 1.5 m in front of the camera. Cameras were set to take three photographs each time they were triggered, with no delay between successive triggers.

Following the methods of Garvey et al. (2017), photographs of cats captured on the same camera < 30 minutes apart were assumed to represent a single encounter, unless they clearly showed different individuals (e.g. based on coat pattern). Photographs captured > 30 minutes apart were assumed to represent independent encounters.

We estimated the relative abundance of cats before and after the control operation using the camera trap rate (CTR), which is calculated as the number of independent photographs per 100 camera trap days (Rovero & Marshall 2009). We tested for a significant difference in CTR before and after the control operation by calculating the rate ratio and its associated 95% confidence interval (CI) (Kirkwood & Sterne 1988). If the 95% CI does not overlap zero, a significant difference is inferred.

5 Results

In the three weeks before the baiting operation, cats were detected on 42 occasions at 22 cameras (Fig. 2a). This corresponds to a CTR of 5%. During the PAPP operation, baits were removed from 17 of the 48 stations. It was therefore assumed that 17 cats had been killed. In the three weeks following completion of baiting, cats were detected on 21 occasions at 14 cameras (Fig. 2b) (CTR = 2.5%). The relative abundance of cats is therefore estimated to have been reduced by 50%. The rate ratio between the CTR estimates before and after baiting was 2.0 (95% CI 1.2 – 3.4). The 95% confidence interval for the rate ratio did not overlap zero, indicating that the difference was statistically significant. Most detections of cats in the post-control period were near the edges of the study area (Fig. 2b), suggesting that these may have been animals moving in from the surrounding area.

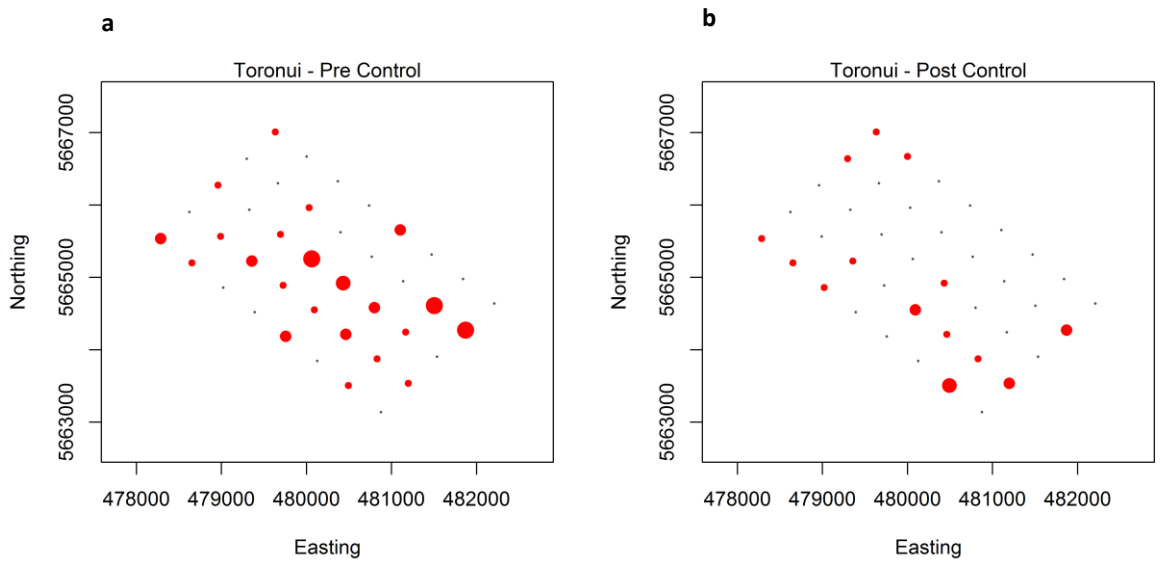

Figure 3 Feral cats detected by camera traps on Toronui Station (a) before and (b) after cat control using PAPP baits. Black dots indicate the locations of camera traps. Red circles indicate locations where one or more cats were detected; the size of each circle indicates the number of independent cat encounters recorded by that camera.

6 Conclusions

A single application of PAPP baits reduced the relative abundance of feral cats on Toronui Station by about 50%. The spatial distribution of cats on the station was also reduced, with fewer camera traps detecting cats after control and in a smaller portion of the station.

7 Recommendations

For logistical reasons, a second planned application of PAPP did not occur during the trial on Toronui. Although a single application reduced the relative abundance of cats significantly, it is likely that a second application would have resulted in a greater reduction. It is recommended that future PAPP operations comprise two bait applications a few days apart.

Additional PAPP baiting on Toronui is recommended to further reduce cat numbers. This will likely deliver greater, and longer lasting, benefits for native biodiversity and agriculture.

8 Acknowledgements

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