

# Managing feral cats to protect northern quolls in the Pilbara

by Russell Palmer, Lesley Gibson, Michael Craig and Georgina Pitt, Department of Biodiversity, Conservation and Attractions, [russell.palmer@dbca.wa.gov.au](mailto:russell.palmer@dbca.wa.gov.au)

## Background

Feral cats (*Felis catus*) are a major threat to biodiversity in Australia and have been directly implicated in the decline and extinction of many species, particularly native mammals. While control of feral cats is considered a major conservation priority, managing their populations at the landscape-scale is challenging.

Aerial baiting with the *Eradicat*<sup>®</sup> feral cat bait, a manufactured sausage-style bait containing the toxin '1080' (sodium fluoroacetate), has been shown to be effective in reducing cat populations on islands and mainland areas in the arid zone.

Use of *Eradicat*<sup>®</sup> in Western Australia is currently restricted in some northern parts of the state as the risk of this bait to several native carnivores is not clear. This includes most of the Pilbara, as this region is the last remaining mainland stronghold of the endangered northern quoll (*Dasyurus hallucatus*). Although this medium-sized (300-700g) carnivorous marsupial is known to have moderate tolerance to 1080, their risk to *Eradicat*<sup>®</sup> baits in the wild is less well known.

In 2015, a trial was undertaken in the Pilbara whereby the survival of radio-collared quolls following a small-scale cat baiting operation was monitored. None of the collared quolls exposed to the baits were poisoned, but feral cats killed 20% of the 41 quolls collared for this study over a period of four months. This study confirmed that *Eradicat*<sup>®</sup> is a low poison risk to quolls but predation by feral cats is a major concern.

It was not known if landscape-scale feral cat baiting in the Pilbara would be effective in the naturally fragmented rocky landscapes inhabited by northern quolls, and, if so, whether this species would respond to cat control. To find out, we used 120 camera traps spaced across two adjacent cattle stations (~300,000 ha) to monitor feral cats and quolls before and after winter baiting over four years (2016-2019). Yarraloola station was aerially baited with *Eradicat*<sup>®</sup> (baited) and the adjacent Red Hill remained unbaited as a reference site. GPS radio-collars fitted to 15 feral cats were used to estimate the mortality rates following baiting operations in 2018 and 2019.

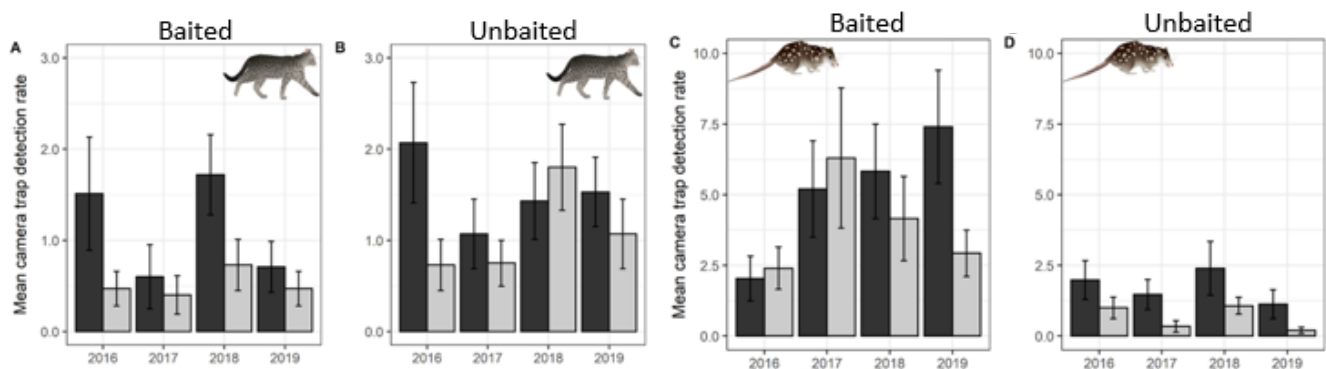


Figure 1: Mean detection rate of cats and northern quolls per 100 camera trap nights prior to (■) and after (□) the winter baiting program from 2016 to 2019 on Yarraloola (baited) and Red Hill (unbaited).

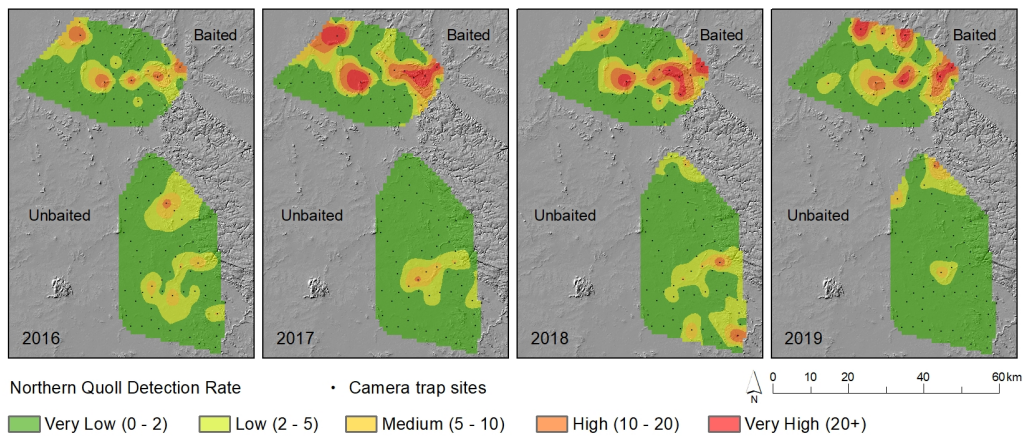


Figure 2: Response by northern quolls (measured by their detections on camera traps) to cat baiting on Yarraloola (top) from 2016 to 2019. The Red Hill reference site is at the bottom of the image.

## Findings

- Over the study, camera traps recorded 230 independent cat detection events (baited: 87; unbaited: 143) and 633 independent northern quoll detection events (baited: 527; unbaited: 136).
- There was no significant effect of baiting on cat detections with the change in cat detections from pre- to post-baiting being similar at the treatment and reference sites (Figure 1). However, mortality rates of collared feral cats ranged from 18-33% after baiting, indicating that the program was reducing cat numbers.
- The detection rate of cats on camera traps at the landscape-scale was low, hampering our ability to detect change. Shifts in the behavioural responses of cats to camera traps and across seasons over the four year study may have also confounded the results.
- There was a positive effect of cat baiting for northern quolls. Their detections at the unbaited site significantly decreased in all four years whereas quoll detections either increased or decreased to a lesser degree at the baited site (Figure 1). Quolls also expanded their range in response to baiting (Figure 2).
- The decline in northern quoll detections at the unbaited site is likely to be explained by the cumulative effect of predation by cats, decreased mating activity in the second half of August and the onset of male die-off in northern quoll populations.

## Management implications

While our study indicated that landscape-scale baiting using Eradicat® does not remove all cats from the target area, there was evidence of a direct knockdown of cats, and a positive response of northern quoll populations to baiting. It is likely that the rugged rocky habitat preferred by northern quolls in the Pilbara buffered them to some extent from cat predation. Hence, the reduction in a relatively small proportion of cats in our study was sufficient to demonstrate a benefit to northern quolls.

A more strategic adaptive management approach that accounts for the unpredictable behaviour of feral cats is likely to be needed to enhance effectiveness of control programs. For example, a combination of aerial and targeted ground-baiting by hand may be more cost effective than uniform aerial baiting across the entire focus area. Complementing baiting with leg-hold trapping may also help to remove individuals that avoid taking baits. Camera trap detection rates of cats in low density populations may potentially be improved by deploying cameras in clusters, and locally positioning each within preferred cat habitat. A cost-saving option may also be to avoid baiting altogether after high-rainfall periods as prey abundance will be high and feral cats are less likely to take baits.

### Further information

Palmer R, Anderson H, Richards B, Craig MD and Gibson, L (2021). Does aerial baiting for controlling feral cats in a heterogeneous landscape confer benefits to a threatened native meso-predator? *PLoS ONE* **16**: e0251304

Cowan M, Moro D, Anderson H, Angus J, Garretson S, Morris K (2020). [Aerial baiting for feral cats is unlikely to affect survivorship of northern quolls in the Pilbara region of Western Australia](#). *Wildlife Research* **47**, 589-598.