FERAL PIG BAITING WITH FRUIT IN THE WET TROPICS

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ABSTRACT

Feral pigs (*Sus scrofa*) are a significant agricultural and environmental pest across Australia. The main method of feral pig control is poisoning with (1080) baits. Pigs are omnivores and have a diverse diet which includes carrion, insects, grains, bulbs, fruits, and plant material. Availability and familiarity play an important role in determining pig diet preferences, and diet varies according to location and season. The most common bait material to target feral pigs is either grain or meat but, in the wet tropics areas of north Queensland, meat and grain have limited uptake and are thus unsuitable. The bait materials of choice, due to both availability and pig preference, are local fruits. To date, there has been a relative paucity of data available on the efficacy and non-target impacts of the use of 1080 in fruit and vegetables as feral pig baits.

Over a four month period, bait visitation and uptake by various species for both poisoned and un-poisoned banana and mango baits, and changes in species indices on poisoned and un-poisoned sites, were monitored during routine feral pig baiting programs in representative areas.

Bait consumption by non-targets was minimal. More importantly, there were no significant differences in the abundance of overall non-target groups, whether based on taxonomic, dietary or IUCN classifications. Over the duration of the monitoring, baiting resulted in an 80% reduction in pigs detected. Our results demonstrate that pig baiting using fruit baits can be highly effective at managing feral pig populations with negligible risk to non-target species.

INTRODUCTION

Feral pigs (*Sus scrofa*) are a significant agricultural and environmental pest across Australia (Bengsen *et al.* 2014), with agricultural damage alone estimated to be greater than $100 million per annum (Choquenot *et al.* 1996). Efficient, broadscale control of feral pigs is heavily reliant on baiting with sodium fluoroacetate (1080). Feral pigs have a reasonably high tolerance of 1080 and, combined with their large body size, large doses of 1080 are required for a lethal dose. While baiting may be highly effective for reducing pig populations, the relatively high 1080 content in pig bait poses a potential poisoning risk to non-target animals (McIlroy 1983).

Feral pigs are attuned to eating the foods they are familiar with and that naturally occur in their territories. Consequently, landowners use the local and readily available foods pigs are attracted to as the bait substrate. This reduces (or eliminates) the time and cost of pre-feeding before poison bait is laid and facilitates more efficient and effective pig control programs.

There is a relative paucity of data on the efficacy of fruit and vegetable bait, as used to control feral pigs in the wet tropics, as well as data on quantifying non-target impacts.

This research investigated the efficacy and non-target impacts of using feral pig baits prepared from banana and mango.

METHODS

This project monitored field sites to quantify exposure to, and impacts from pig baiting operations via; 1) monitoring bait stations to determine the number and variety of species visiting and consuming bait, and 2) population-level counts of non-target species to detect any changes in abundance following baiting operations.

The study area was located in the Hinchinbrook Shire surrounding the town of Ingham in north Queensland. In order to ensure that the full range of potentially susceptible species was assessed, monitoring was undertaken over multiple seasons and habitats.

All baiting operations were conducted by an authorised Local Government officer, who prepared and deployed baits in accordance with the current Queensland Vertebrate Pesticide Manual.

Pre-feeding activities were undertaken to determine feral pig activity in the area and to estimate the amount of toxic bait would be required. Whole mangoes and bananas were used as bait material. Mangoes used were ripe, with an approximate edible mass (sans seed) of 250 grams. Bananas were ripened before use, and had a nominal mass of 250 grams (including skin). Individual baits were directly injected with 1 ml of 36 mg/ml solution through one or more injection sites.

1. Monitoring bait uptake

Bait material was monitored by cameras to determine the identity of species removing baits, and the proportion of baits removed/consumed by such species. Cameras and bait stations were the same for pre and post feeding stations.

2. Population counts

Non-target species were counted/indexed on treatment (1080 baited) and control (no baiting) sites throughout the 4 months of the study, to determine population-level changes. Two methods were used for this: counts along driven transect, and camera trapping on feeding stations.

RESULTS

<u>Baiting Efficacy</u>

Between January and April 2016 a total of 40 baiting events were monitored during pre-feeding with mango or banana, with 23 of these proceeding to the baiting and post-bait monitoring stage. A further 5 sites were monitored on control sites where no baiting was anticipated.

Baiting was generally very effective at reducing pig numbers at each location. There was an overall reduction of 80% (from 94 to 19 pigs) in maximum daily number of pigs detected between pre and post bait monitoring (Figure 1). Three of the events showed no change

in pig detections, while one showed an increase after baiting, possibly due to recolonisation or immigration of pigs from other areas.

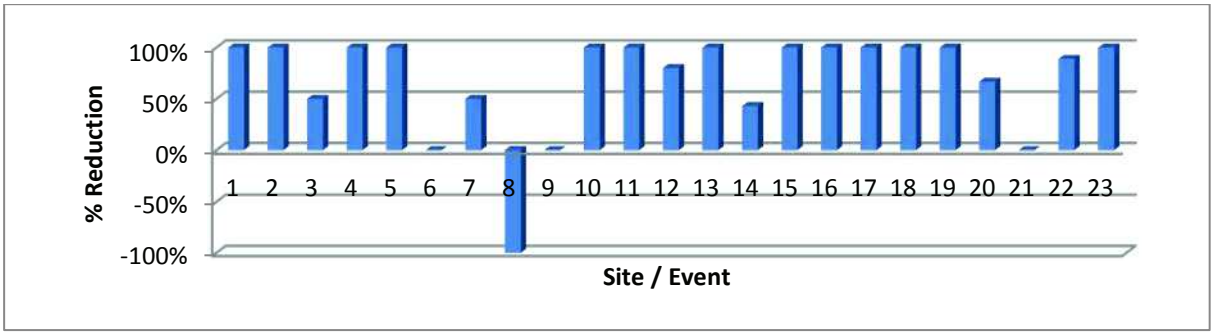

Figure 1: The percentage reduction in the maximum number of feral pigs recorded at bait stations (Site/Event).

Non-target Impact

Bird counts were conducted on three occasions (February, March and May) across approximately 60 kms of transects in baited and unbaited areas. The number of total birds per km of transect increased over time (Figure 2) on both the treated and untreated sites (P=0.05). The number of total birds observed per km of transect were significantly higher on the treatment sites for each of the three survey periods (P=0.05). However, there was no significant difference in mean bird counts between pre and post baiting surveys (P=0.05)

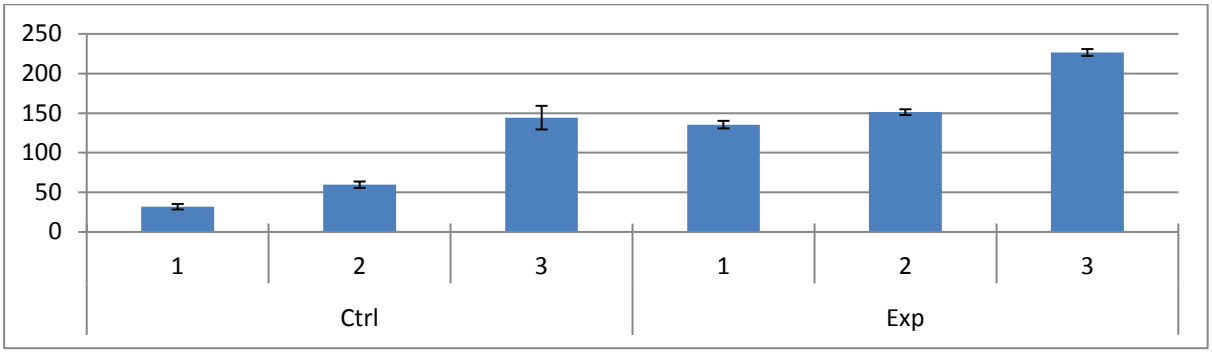

Figure 2: The mean number of birds km^{-1} (with 95% confidence intervals) on the unbaited control (Ctrl) and baited (Exp) sites, for each survey period (1-3).

Bird species were clustered into groups. There was no significant difference in mean counts of wet tropic endemics, or rare and/or endangered bird species (P=0.05) between treated and untreated areas. Similarly, there was also no significant difference in the mean number birds assessed as possibly at risk from direct bait consumption, or possibly being at risk from secondary poisoning, between treatment and non-treatment sites, nor between one survey period and the next (P=0.05).

DISCUSSION

Our data show that the use of mango and banana as a matrix for feral pig baiting is a safe and efficacious form of pig control. Despite over a decade of intensive use in the Hinchinbrook area the baiting method, as monitored in this study, is still achieving a reduction of ~80% in the pig population. In at least two of the monitored sites, multiple

successive baiting events were required as reinvasion occurred from pigs in surrounding habitat.

Avian non-target populations monitored as part of our study appear to be unaffected by baiting operations. Comparison of counts of bird species pre and post baiting, in baited and unbaited areas, do not provide any evidence of decline as a result of baiting. This is not surprising, given we recorded only limited non-target species activity at bait stations, and little direct consumption of bait material by non-target avian species. This suggests that, under the current use pattern the risk of direct consumption of bait material by avian species is negligible. There is also no evidence of any population-level effect of secondary poisoning through consumption of carcasses or vomitus, again supported through the lack of differences in the bird counts. The results of this study align with the anecdotal evidence reported by long-term bird watchers in the area, that there has been no noticeable change in bird species or numbers as a result of baiting (T. Ashton, personal communication, February 2016).

This study adds to the information currently available (e.g. Gentle et al. 2014; Di Bella et al. 2014) that support the continued use of 1080 baiting practices for feral pigs in Queensland.

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