FERAL PESTS PROGRAM

PROJECT 11

METHODS OF BROADSCALE CONTROL OF FERAL CATS, AND FOX CONTROL AT A NUMBAT RE-INTRODUCTION SITE. YEAR 2

Progress Report, June 1994

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SUMMARY

Pen trials to determine the relative preferences of captive semi-feral cats for five manufactured fox and cat bait materials and the effectiveness of two taste-enhancing additives have been completed. The results indicate that the bait known as "Pussoff" and dried kangaroo meat baits were the most preferred bait types in the trial. However, the effect of the additive "Digest" was dramatic, and increased the acceptability of "Pussoff" and kangaroo meat significantly. Again, there was no difference in acceptability between these two bait types plus additives.

Field trials were then run in which a three-way choice was presented, between the two preferred bait types with "Digest" and "Foxoff" bait with no additive. Trials were run at a semi-arid coastal site, an arid inland site and a semi-arid inland site. Cat numbers at the first two sites were very low, but high numbers were found at the third site. Results from all sites again showed that the effect of "Digest" was greater than any difference in preference for the bait type. Serum samples were collected from fifty cats.

Fox control was carried out in May 1994 over the 40 000 ha numbat re-introduction area at Karroun Hill Nature Reserve, by aerial baiting at 7.5 baits per km^2. The progress of radio-collared numbats at Karroun Hill has been monitored. Survival of young born on the reserve has been significantly greater than that of animals translocated from Dryandra Forest. Predation of numbats has continued under the regime of fox control, but there is a relatively higher rate of predation by cats versus foxes or birds than was recorded prior to fox control.

INTRODUCTION

This project has two major components. Research into methods of broadscale control of feral cats (Scope items 1-4 and 8-9), being carried out by Dr. Algar, has made several major advances since field studies have commenced. The nature of these developments, and aspects of cat behaviour elucidated through these studies, require changes in the methodology from that proposed in the Scope items for the project. This report outlines the advances made and the progress on the Scope items, and indicates where changes to the methodology might be required. The second component of the project, fox control at the Numbat re-introduction site at Karroun Hill, being carried out by Dr Friend, is running according to the original proposal.

PROGRESS ON SCOPE ITEMS

1. Carry out bait acceptability tests on commercially available fox and cat bait types in pen trials.

These pen trials have been completed. A report, presented as an Appendix to our final report on Year 1 of the project, was forwarded to ANCA Feral Pests Program on 28 February 1994. The results of the trials indicated a distinct ranking of preference for the various bait mediums offered. This occurred despite the fact that several of the mediums were constituted from essentially the same substances. A significant preference was shown by the cats for the size-reduced standard roo meat bait and the prototype fishmeal bait "Pussoff", while there was no significant preference for the Incitec extruded roo meat bait. The least preferred baits were meat-substitute bait "Foxoff" and the pelletized fishmeal bait supplied by the New Zealand Department of Conservation. These results suggest that cats display some sensitivity, not only to the taste of a bait, but also to its physical form. This has been highlighted in nutritional literature where it is suggested that cats are much more sensitive to the physical form and taste of their food than are dogs and many other mammals.

Of the two additives thought likely to most improve the taste of the bait mediums and tested in pen trials, Digest was significantly more preferred than L-alanine. Consumption of the bait mediums "standard" and Pussoff with the additive Digest was significantly greater than the controls. It would appear, even at this early stage of research, that the use of Digest is critical to the success of feral cat baiting campaigns.

The pen trials were designed to provide information on bait options that could be successful in controlling feral cat populations. Several bait types were to be selected from the range of responses achieved from the pen trials to test on feral cats in the field. We selected the two most preferred bait types, "roo meat" with Digest and Pussoff with Digest, and Foxoff as the least preferred, control bait. Fortuitously, this combination of bait types covers the range of bait medium substances available.

2. Carry out bait acceptability tests on commercially available fox and cat baits in field trials at coastal semi-arid zone, inland semi-arid zone and inland arid zone sites.

Acceptability to feral cats of the three bait types listed above is now being examined in the field. We have been successful in developing a technique which allows discrimination of bait preferences, in a cafeteria trial, on feral cat populations. Description of this technique is currently being prepared as a manuscript for publication. The technique involves the use of cyanide encased in the bait. When a cat consumes one of the three baits offered it is killed immediately and individual bait preference can be assessed.

Field work has now been completed at three sites; Peron Station (coastal semi-arid zone), Wanjarri (inland arid zone) and on the Nullarbor (inland semi-arid zone). The results are presented in Table 1.

Table 1. Feral cat bait preference trials. Cat numbers consuming the various bait types offered.

Site	Bait Type		
	Roo meat + Digest	Pussoff + Digest	Foxoff
Peron	0	3	0
Wanjarri	2	2	0
Nullabor	11	13	0

Results from the first two sites were disappointing because of the low cat abundance at both sites. Preliminary surveys at both sites suggested that feral cats were present but in low numbers and this was confirmed during the bait preference trials. Presence of cat tracks resulted in kills but track numbers were very low.

Initially we met with little success on the Nullabor, despite high cat numbers, until two crucial factors became apparent.

'Curiosity killed the cat' Bait stations were initially placed at 200m intervals along tracks. It soon become evident that cats were not utilising the tracks and therefore not finding the baits offered. A cat's sense of smell is poor in comparison to canids and their primary hunting skills rely on sight and sound. Thus, to attract cats to the bait stations we used a variety of visual and acoustic attractants. 'Curiosity killed the cat' - cats were attracted to the bait stations and baits were taken.

Tendency to 'cat-nap' Bait uptake was further enhanced by leaving baits in place during the day, rather than retrieving all baits at dawn. The cats did not display nocturnal behaviour but rather 'cat-napped' and were active throughout the day. It is also of importance to note that baits were taken despite the high availability of live prey.

Results of the initial trials highlight certain aspects that will improve the success of baiting to control feral cats. It would appear that bait uptake in tests was significantly influenced by the use of the flavour enhancer "Digest", rather than the bait medium itself. There was no significant difference in the consumption of the roo meat

compared with the Pussoff bait mediums during field trials. Bait preference trials are to be conducted at three further sites to confirm the results to date and to have a sufficient data base for publication. Field work is due for completion at the end of July this year.

Results to date also suggest that there is considerable potential for the use of visual and acoustic attractants in feral cat control techniques. Research has now commenced into the effectiveness of items that attract cats to bait stations by visual and acoustic cues, and thus enhance bait uptake and bait efficiency. Such attractants have considerable potential to enhance the effectiveness of the cyanide baiting technique and its usefulness as a measure of feral cat density (as discussed in our FPP application for 1995, entitled "Refinement of baiting strategies to control feral cats, and development of a survey technique to measure feral cat abundance"). This work will be conducted in conjunction with the additional bait preference trials.

3. Conduct two trials of baiting effectiveness on radio-collared groups of feral cats at suitable field sites. These trials will test the effectiveness of dried meat baits used in Western Australia for fox control versus the most acceptable bait type from pen and field trials.

An alternative methodology for these trials is currently being assessed. Given the promising results using visual and acoustic lures, it may be preferable to present unpoisoned baits containing a biomarker during bait trials, then assess bait uptake by collecting all the cats in the area by the use of cyanide baits, dogs, shooting and trapping. This method has the advantage over the radio-collaring method that the presentation of labelled baits to cats is the first disruption of their usual environment. If the cats have been trapped first for radio-collaring, it might increase their wariness toward new objects, or trapping may in fact bias the selection of experimental animals.

4. Run a similar trial of the selected bait type, i.e. establish a radio-collared group of feral cats and then measure the percentage kill using the selected bait type at the fauna reconstruction site at Karroun Hill Nature Reserve.

The methodology proposed for this trial may also need to be reassessed.

5. Reduce fox numbers by aerial baiting with 1080 in an area of Karroun Hill Nature Reserve in which numbats are being re-introduced. The area, of approximately 40 000 ha, will be baited twice during 1994.

Aerial baiting was carried out over the 40 000 ha area at Karroun Hill Nature Reserve on 3 May 1994. The second baiting is proposed for late September 1994.

6. Monitor the effectiveness of the fox control at Karroun Hill NR using cyanide transects.

Assessment of the effectiveness of the April aerial baiting at Karroun Hill will be carried out in June 1994 by use of cyanide transects.

7. Monitor the numbat colony at Karroun Hill and determine sources of mortality (allocated to raptor, fox, cat, or other) in 1994 for comparison with previous years.

As of late December 1993, 13 numbats were alive and fitted with functioning radio-collars. We made monitoring trips to Karroun Hill in January and February 1994, and radio-tracking flights over the area in February and April 1994. Figure 1 shows the number of live numbats fitted with radio-collars at the beginning of each month so far.

By the beginning of May 1994, the number of live numbats fitted with functioning radio-collars had fallen to six. The high transmitter failure rate (75%) experienced in 1993 has apparently been remedied by a change in supplier, and only three of the seven losses could have been due to signal failure. The other four losses were due to predation. In at least three of these cases, the position of the remains, the nature of tooth marks on the collar and other evidence implicated a feral cat as the predator. As in previous years, the origin of the numbats has a significant effect on their survival at Karroun Hill. Three numbats of four translocated from Dryandra in December 1993 died through predation before February 1994, but only one of six young born at Karroun Hill and radio-collared in October 1993 had suffered the same fate by February 1994.

Fox control by aerial baiting with dried meat baits containing 4.5 mg of 1080 was carried out at a rate of 7.5 baits per km^2 over the 40 000 ha release area at Karroun Hill in October 1993 and May 1994. Prior to that, aerial baiting was carried out in November 1990, March 1991, October 1991, and March 1992. By use of the cyanide transect method, this baiting regime has been shown to be effective, as no foxes have been found on transects run after baiting. In all years, numbats have been released, and the survival of those animals and their young has been monitored. In the final report, the mortality rates under aerial baiting will be compared with those measured when no fox control was being carried out. At this stage, it appears that predation of numbats by feral cats is more frequent when baiting is being carried out. The implication of this is that cats may be favoured by fox control at Karroun Hill, as has been found in studies in more arid regions.

8. Collect and store sera samples from one hundred to two hundred feral cats within Western Australia, in accordance with agreed protocols.

Serum samples from fifty feral cats were collected during the study on the Nullarbor in March-April 1994.

9. Liaise frequently with scientists and organisations involved in related cat research, especially those scientists and organisations receiving funding from the Feral Pests Program of the Australian Nature Conservation Agency.

This liaison was assisted by attendance by both Dr Friend and Dr Algar at the Feral Cat Threat Abatement Plan workshop in Canberra in late March 1994.

Live radio-collared numbats

in Karroun Hill Nature Reserve in 1994