Invasive Animals Cooperative Research Centre

milestone report

IACRC project code:	10.U.01.a
IACRC project title:	Introduced predator control and sustained fauna recovery in SW WA - is there a mesopredator release effect (cat/fox)? Sub-project 1 'Sustained introduced predator control in the Rangelands'.
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IACRC project manager:	Steve Lapidge
Milestone number:	10.U.1.1.09

Milestone

10.U.1.1.09 – Continue seasonal surveys of fox and cat populations prior to the next baiting program (Dec 2007- July 2008). Survey prey availability prior to baiting.

Abstract

The results for the first two years of the project have indicated that indices of introduced predator abundance can be significantly reduced for a number of months after the winter baiting. However, these indices, particularly foxes, gradually increase over the late summer and autumn during the main fox dispersal period. The control strategy implemented would be enhanced with the addition of an autumn fox baiting program which would maintain suppression of fox numbers until the subsequent winter integrated introduced predator baiting.

Recent development of an effective and reliable hair capture technique for DNA extraction will now enable collection of data that can be used to identify specific individuals at plots. This will provide valuable information for the development/refinement of more robust indices of relative abundance. The technique may also be able to provide estimates of population size and therefore allow validation of the utility of indices.

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Project objectives

The objective of this project is to develop operational-scale introduced predator control techniques for the semi-arid bioregions in the lower rangelands. The project is designed to be long-term, of landscape-scale, and with a science-based active adaptive management framework, to provide an integrated, effective and cost-efficient introduced predator control strategy in the semi-arid zone/rangelands ecosystems. The feral cat bait and baiting methodologies (i.e. timing of baiting, baiting intensity and frequency) will be employed to assess an integrated introduced predator (feral cat and fox) control strategy.

Hypothesis: - *Effective and sustained integrated, introduced predator control is achievable in the Rangelands using a feral cat baiting strategy.*

Success in achieving milestone

Predator surveys have been completed for the summer, autumn and winter (pre-baiting) monitoring periods. An additional survey was also conducted at the end of summer/early autumn to define the optimum timing for a fox baiting program (see Recommendations). Indices of relative abundance (Plot Occupancy and Plot Activity Index [PAIs]), derived from plot activity at sand plots, have been calculated for the summer and late summer/early autumn monitoring periods and are being collated and entered on the data base for the autumn survey period. Field work has recently been completed for the winter (pre-bait) survey. The baiting program is to commence on the 10th July and the post-bait survey to be conducted two weeks following its completion (Milestone 10.U.1.1.10).

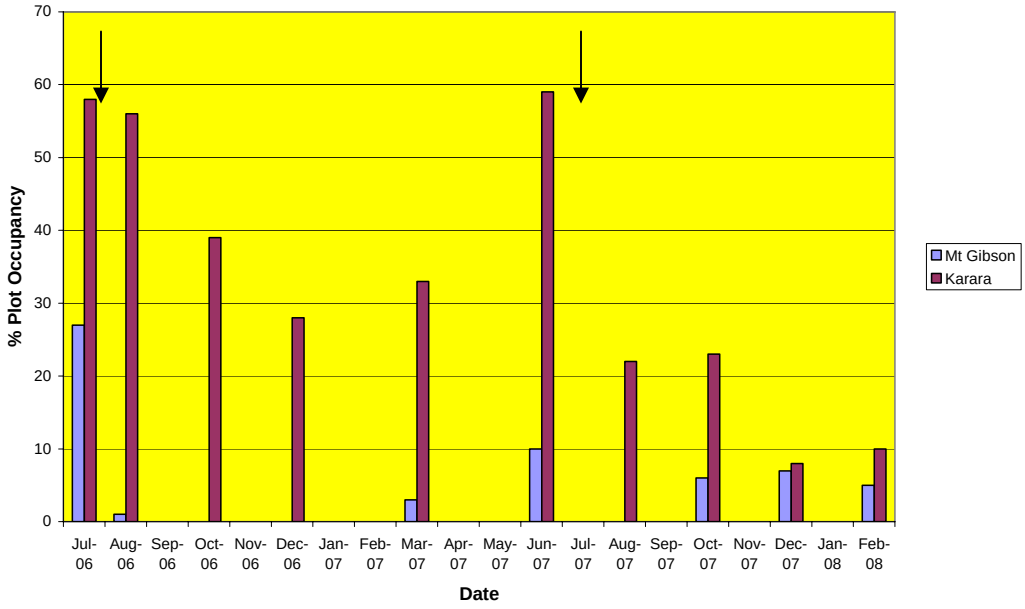
Results

Indices of relative abundance, over the study period up to the late summer/early autumn 2008 monitoring survey, are presented in Figures 1 to 4. The data presented are for the active sand plot stations only. The active stations have specific lures (FAP + Pongo + non-toxic cat baits) to entice animals to the plots and thereby maximize the number of plot incursions for each survey period.

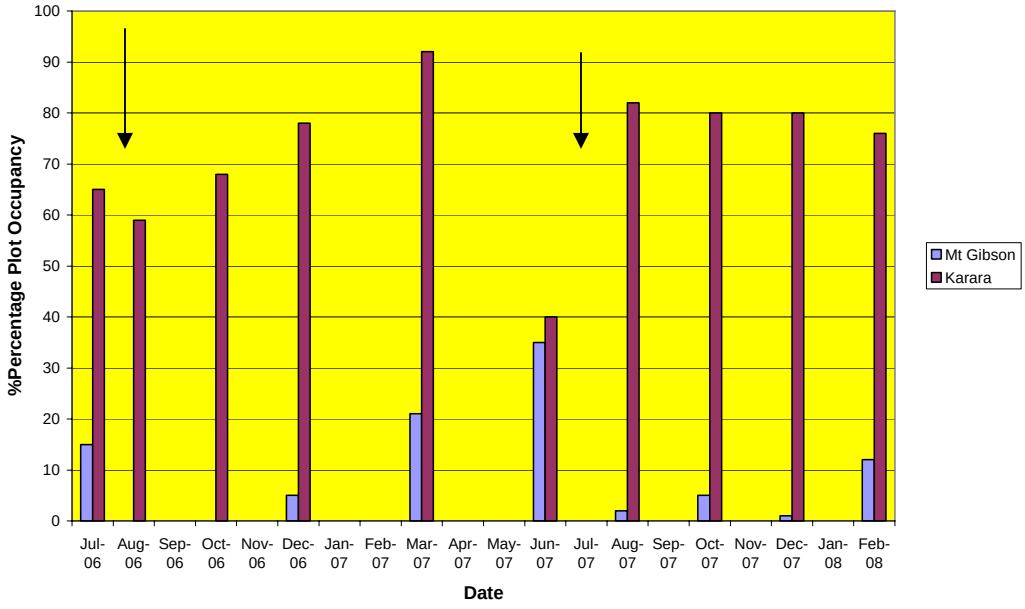
Prey resource monitoring is not continuing beyond the first two years as discussed in the previous report and outlined in 'Recommendations'. The results of these prey surveys and cat/fox diet analyses are currently being drafted as several publications and a series of Museum Records/Notes.

Figures 1 and 2. Plot occupancy (% plots visited) for each survey period for cats and foxes respectively. The blue bars are for plots in the baited site (Mt Gibson) and the violet bars are for plots in the non-baited site (Karara/Lochada). Arrows indicate time of baiting

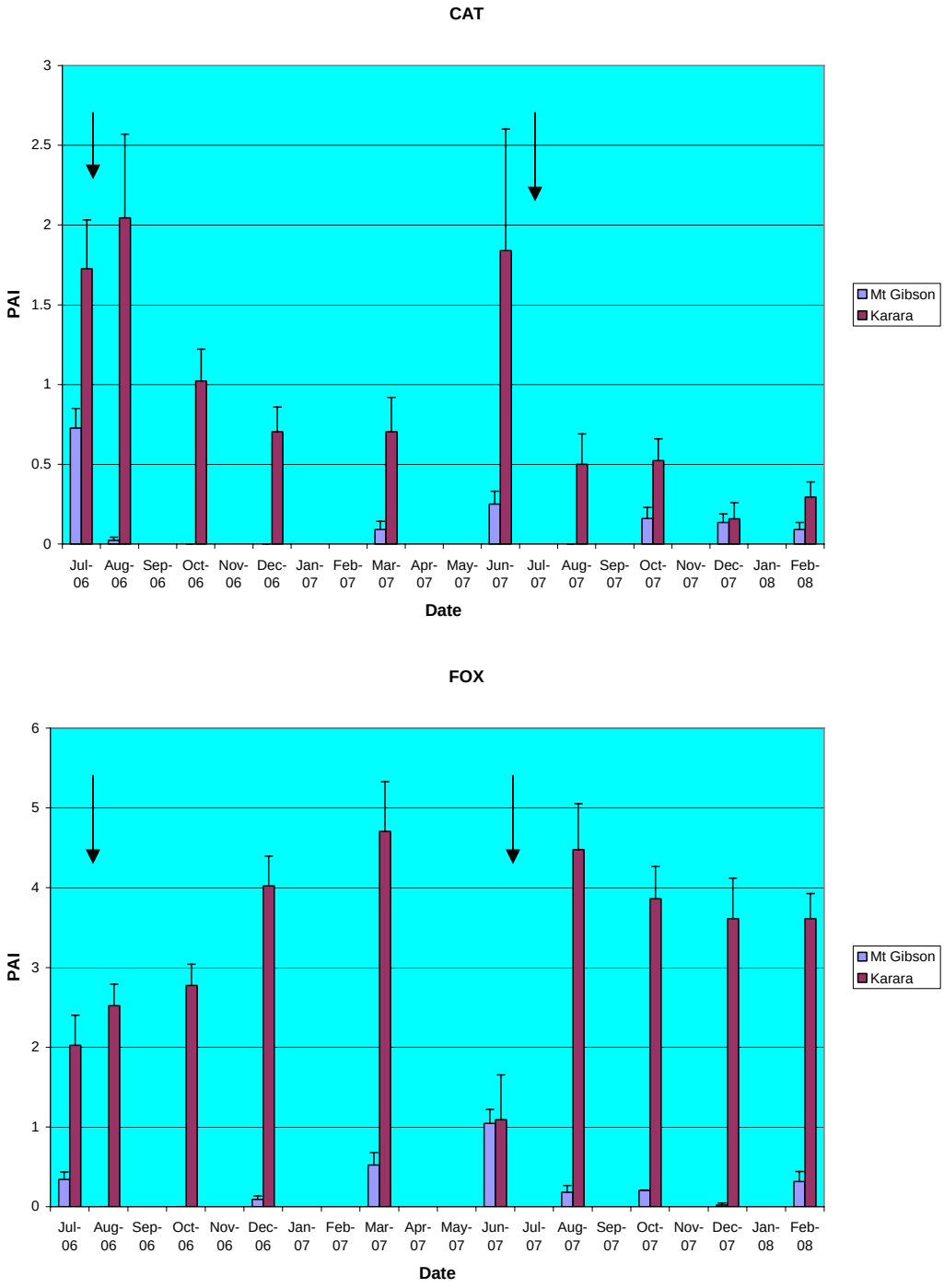
CAT



FOX



Figures 3 and 4. The PAI ± s.e. for each survey period for cats and foxes respectively. The blue bars are for plots in the baited site (Mt Gibson) and the violet bars are for plots in the non-baited site (Karara/Lochada). Arrows indicate time of baiting



Discussion

The results for the first two years of the project have indicated that indices of introduced predator abundance can be significantly reduced for a number of months after the winter baiting. However these indices, particularly foxes, gradually increase over the summer and autumn (fox dispersal period) to a level that may inhibit native fauna recovery. The indices of cat abundance one year post-baiting were less than half of the initial level, whereas fox abundance indices increased to a level higher than that recorded at the start of the project. Successes of the first baiting program were demonstrated again in the second year with complete removal of cats and almost complete removal of foxes following baiting. Indices of cat abundance have remained low in the baited site, while indices of fox abundance started to increase again during the period of juvenile dispersal.

The data suggest that cat abundance at Karara-Lochada has decreased while fox abundance has increased. To determine whether these changes in abundance over the survey periods are real or attributable to changes in activity or a combination of abundance/activity needs to be addressed. Recent development of an effective and reliable hair capture technique should enable this question to be answered. The hair capture technique will now enable collection of data that will be used to identify specific individuals at plots. This will provide valuable information for teasing out the abundance/activity issues that confound the indices of relative abundance and assist in the development of a more robust monitoring technique. For example, it will provide information on the independence of plots and transects. The technique may also be able to provide estimates of population size. Hair capture has been undertaken for the autumn/summer, autumn and winter survey periods and resulted in 100 plus samples being collected in each monitoring period. Results to date from the DNA laboratory indicate good DNA is being extracted from the hair and the samples are genotyping strongly (O. Berry pers comm.).

Overall progress of the project

The project is progressing on target. Under the active adaptive management framework, the control strategy implemented will potentially be enhanced with a fox baiting program in late summer/early autumn 2009. The addition of this baiting program will provide for reduction of fox numbers during the key dispersal period and suppress fox numbers until the subsequent aerial *Eradicat* baiting in July 2009. An additional monitoring period has been conducted this year and included for next year to define optimum timing for this fox baiting program.

Recommendations

Following discussions with the external reviewer panel for the ‘Mesopredator Project’, it is planned to conduct a baiting program at Karara-Lochada this winter, replicating that of Mount Gibson. The addition of another baited area, while removing the control site, will allow us to determine whether the baiting strategy trialed at Mount Gibson is also

effective at Karara-Lochada where introduced predator numbers are high. The baseline data gathered in the first two years of the project at Mount Gibson and Karara-Lochada will be used to assess future changes in predator abundance as the project heads towards completion in 18 months.

To address fox reinvasion in late summer/autumn, should the same results occur again this year and early 2009, it is proposed that an additional baiting, using fox baits, should be conducted in March-April. This program would occur in 2009 at both sites and potentially ongoing at Mt Gibson. In doing so, we aim to suppress fox numbers until the subsequent aerial *Eradicat* baiting in July 2009. Introduction of this program would also improve bait availability during the winter baiting.

The additional cat baiting programs at Karara-Lochada and potential autumn fox baiting programs were not budgeted for in the original submissions however; these programs are seen as critical to the successful conclusion of the project. Funds to conduct these baiting campaigns will be found internally and from potential savings within the current project. Discussions with the external reviewer panel for the 'Mesopredator Project' suggested that further monitoring of the prey resource was not warranted and funds for this research area would be better spent on the above baiting campaigns. Therefore, no further monitoring of the prey resource will be conducted at Karara-Lochada, but will continue at Mt Gibson funded by AWC.

Appendices

Recent publications are listed below: -

Algar, D. and Richards, J. (2008). Sustained integrated predator control in the Rangelands. (ABSTRACT). In: 14th Australasian Vertebrate Pests Conference: Darwin, Northern Territory, 10-12 June 2008.

Koch, K. (submitted). Impact of invasive species on endemic fauna in Western Australia. Honours thesis, Goethe-University Frankfurt, Germany.

Richards, J. and Algar, D. (2008) Controlling feral animals in the rangelands. *Landscope* **23(3),** 52-58.