PESTSMART

Proceedings of the National Feral Cat Management Workshop

30th November 2010

Edited by Chris Lane, Andrew Bengsen and Elaine Murphy

Invasive Animals CRC

An Australian Government Initiative

CRC AUSTRALIA

Proceedings of the National Feral Cat Management Workshop

Mantra Southbank, Melbourne, Australia

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Invasive Animals Cooperative Research Centre

Vertebrate Pest Research Unit,
Orange, New South Wales 2800

2013

An Invasive Animals CRC Project

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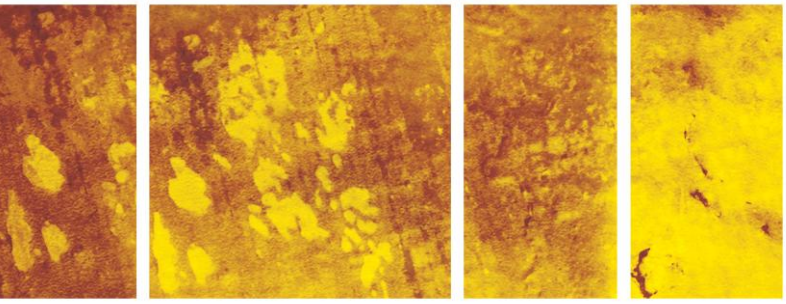

Summaries of discussions held at the National Feral Cat Management Workshop are included in these proceedings to provide addition information on issues raised by participants. These summaries have been edited for brevity, to avoid repetition or where comments were unclear. In some instances, attribution may be incorrect. The reader is advised that individual participants and their organisations have not endorsed the views expressed.

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Postal address: Innovation Building 22, University Drive South, Bruce ACT 2617.

Office Location: Innovation Building 22, University Drive South, Bruce ACT 2617.

Telephone: (02) 6201 2887

Facsimile: (02) 6201 2532

Email: contact@invasiveanimals.com

Internet: www.invasiveanimals.com, www.feral.org.au

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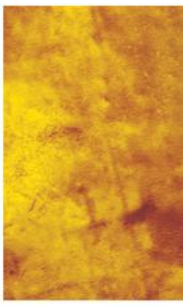

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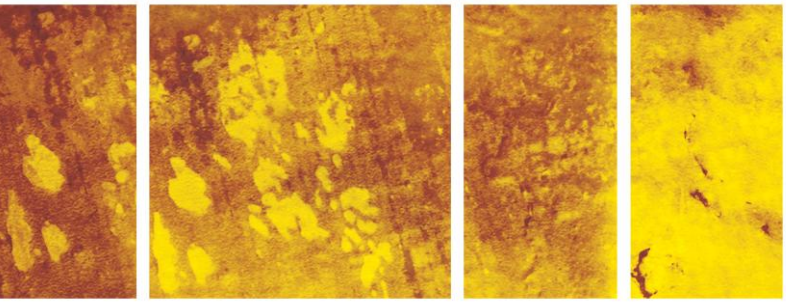
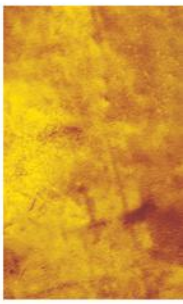




Executive summary

Domestic cats (*Felis catus*) were brought to Australia by the first European settlers from the late 18th century and feral populations quickly established. Feral cats are now common throughout most environments in Australia, including offshore islands. Predation by feral cats is thought to have contributed to the extinction of small to medium-sized ground-dwelling mammals and ground-nesting birds in Australia's arid zone, and to threaten the continued survival of native species that currently persist in low numbers. The eradication or long-term control of feral cats is therefore an essential part of restoring some native communities.

The Invasive Animals Cooperative Research Centre hosted a feral cat workshop in Melbourne on the 30th of November 2010. The objectives were to:

1. Build common understanding about current / recent research and issues in feral cat management.
2. Identify future needs for feral cat management research.
3. Identify areas where strengthened collaboration will be beneficial.

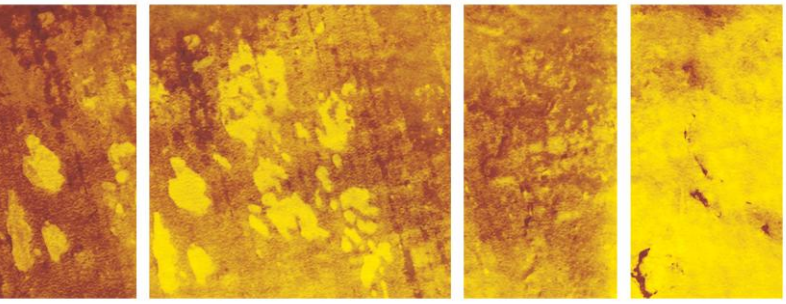
Twenty-four participants attended from all states except Queensland and the Northern Territory. Three of the participants were from New Zealand. The group were mainly involved in the development of new tools, so the workshop did not aim to cover all areas associated with feral cats (which would have required more time and a greater number of participants).

Key findings:

We are still largely working on cat control tools, and we can not progress or become more strategic until the tools are registered. Additional research is also required to protect non-target species from accidental harm resulting from cat control operations. Toxin dispensing devices such as the 'Cat Assasin' can provide a useful starting point in looking for behavioural points to exploit, and we need to expand on this strategy. We also need to consolidate data from camera trap surveys and tracking studies so that we can interrogate it for cat behaviour that can be exploited using existing tools, and so that we can start to design new tools. Bait developers and bait testers need to be better integrated to improve feedback and communication in the design process.

The need for, and benefits of, feral cat management interventions must be more effectively communicated to the broader community. A public consultation package is needed prior to new products being made available.

Better communication is needed between the Curiosity® consortium and the IA CRC during the pending PAPP registration process. There has been a tendency to compete over fixed funds when we should be collaborating. We should move on from the past and prepare for the five year IA CRC extension by prioritising efforts now and collaborating. It will be important to remain mindful of the past, and how cat research and development has reached its current point, but it is now time to push forward collectively.



Options for baits or other control tools that target multiple species were discussed, as well as whether it would be more beneficial to have several bait options available for each target species as opposed to a single bait available for several target species. For example, the Curiosity® cat bait targets foxes and cats, whereas existing fox baits do not target cats. We will have to be pragmatic about protecting AWI's investment, or the investments of DEWHA, ACTA, or any other parties that have invested in products. The intellectual property would need to be put around the table and all parties would need to be involved in discussions. The market in Australia is too small to support several players with shared IP. The IA CRC would need to be involved in any tender process for the manufacture of the Curiosity® cat bait.

We should be engaging with more local councils about education regarding domestic cat control. Some councils are actively involved with domestic cat management and education, but many are not. We need greater engagement with the broader community to build an understanding of the need for cat control.

It should be put to the Vertebrate Pests Committee (VPC) that feral cats be recognised as a pest animal of national significance. David Dall could put this to the VPC for consideration.

ACTION: agreement that the recognition of cats as a pest animal of national significance goes forward to the VPC, via the workshop paper.

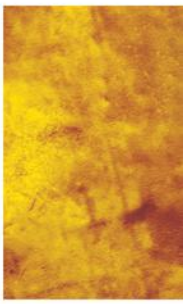
ACTION: That the National Feral Cat Workshop Proceedings and an information paper go forward to VPC.

Conclusions:

- Many collaborations were accelerated today; the challenge now is to capitalise on these. Annual meetings or an on-line forum for advice and sharing of data, published papers and the like would be very useful. An alternative would be to email project summaries annually, with a bi-annual meeting. It was agreed that face-to-face meetings are preferred, although they are more expensive.
- The commercialisation of PAPP baits for canids and the New Zealand registration experience should be assessed as case studies, to expedite the commercialisation processes for the cat baits and toxin tunnels.
- There is an immediate need to establish a practical arrangement for the delivery of cat control tools that will benefit the nation.
- There is a further need for a strategy or strategies that will facilitate the management of feral cat impacts across different Australian landscapes.

Opportunities for IA CRC re-bid:

- Build on registration of PAPP by developing targeted delivery systems such as image recognition and automated toxin delivery devices.
- Work together with the Curiosity® cat group in the re-bid.



Proceedings of the National Feral Cat Management Workshop, 30 November 2010

Workshop hosted by Invasive Animals Cooperative Research Centre.

Location: Mantra Southbank, Melbourne, Victoria.

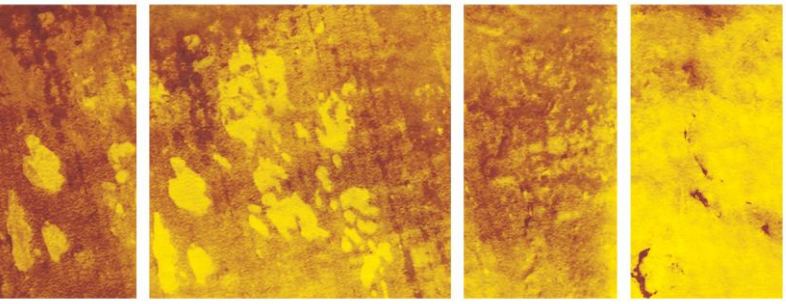
Workshop participants:

Alan Robley
Andrew Bengsen
Billie Lazenby
Charlie Eason
Chris Dickman
Chris Lane
Damian McRae
Dave Algar
David Dall
Duncan MacMorran
Elaine Murphy
Frank Gigliotti
Glen Saunders
Tony Buckmaster
John Read
Keith Morris
Luke Gadd
Pip Masters
Michael Johnston
Michael O'Donoghue
Sascha Rettke
Simon Humphrys
Steve Lapidge
Sue Robinson

Facilitator: Simon McGuiness

Workshop objectives

1. Build common understanding about current / recent research and issues in feral cat management.
2. Identify future needs for feral cat management research.
3. Identify areas where strengthened collaboration will be beneficial.



Agenda

9.00 am - Start

Welcome and Introductions: Elaine Murphy, Invasive Animals CRC

Workshop Process: Simon McGuinness, Facilitator, RM Consulting Group

9.30 - 9.50 am - Setting the Scene

Reducing the impact of feral cats: Chris Dickman

9.50 - 10.40 am - Improving cat control technologies (Part 1)

Short talks

- Toxins: Charlie Eason
- Baits: Dave Algar
- Hard shell delivery vehicle: Mike Johnston/Michael O'Donoghue
- IA CRC non-target data: Simon Humphrys
- Non target species –
    - Western Australia: Keith Morris
    - Scotia Sanctuary: Steve Lapidge
    - Kangaroo Island: Pip Masters

10.40 – 11.00 am - Morning Tea

11.00 – 11.30 am

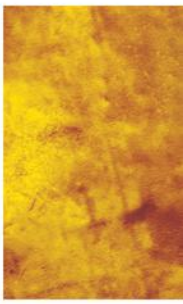
Facilitated Workshop Discussion

1. What could be our five-year goal?
2. What's needed to get there?
3. Are there opportunities for strengthened collaboration?

11.30 – 1.00 pm - Improving cat control technologies (Part 2)

Short talks

- Tunnels delivering toxins, Kangaroo Island: John Read
- Tunnels delivering toxins, New Zealand: Duncan MacMorran
- Landscape use by cats: Tony Buckmaster
- Mesopredator release: Keith Morris



Facilitated Workshop Discussion

1. What could be our five-year goal?
2. What's needed to get there?
3. Are there opportunities for strengthened collaboration?
4. Is our suite of control tools too limited?

1.00-1.45 pm – Lunch

1.45 – 3.00 pm - Implementing feral cat management programs

- Findings and insights from management programs: Luke Gadd/Sue Robinson
- Feral cat reductions at two sites in Tasmania: Billie Lazenby
- Registration issues: Simon Humphrys
- Cat control in NZ: Elaine Murphy

Facilitated Workshop Discussion

5. What could be our five-year goal?
6. What's needed to get there?
7. Are there opportunities for strengthened collaboration?

3.00 - 3.20 pm - Afternoon Tea

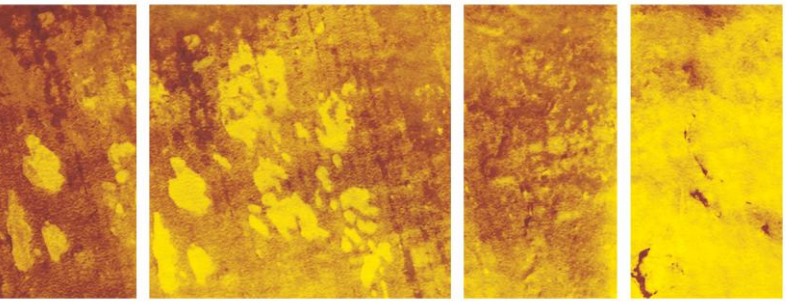
3.20 – 4.30 pm - Conclusions from the workshop

Map out a way forward to manage impacts of feral cats across the different landscapes of Australia

Facilitated Workshop Discussion

What are the short and long-term needs for each region of Australia, and for Australia as a whole?

4.30 pm - Close - Elaine Murphy



Workshop papers

Identification of sites of high conservation priority impacted by feral cats

Christopher R. Dickman[A], *Elizabeth Denny*[A] & *Tony Buckmaster*[A,B]

Report for Department Of Environment, Water, Heritage and the Arts
[A] University of Sydney
[B] Invasive Animals Cooperative Research Centre

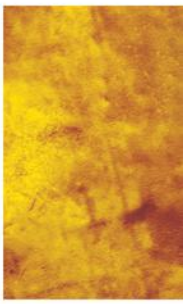
Feral cats (*Felis catus*) have been recorded throughout the Australian mainland and on many offshore islands. Predation by feral cats has been implicated, together with other factors, in the population declines of many species of native vertebrates. Some of these declines have resulted in the shifting of species' conservation status to a more endangered level, with several native species having become extinct. Predation by feral cats is classified as a key threatening process by the Australian Government under the *Environment Protection and Biodiversity Conservation Act* 1999.

The cryptic nature of the cat, its exploitation of both modified and unmodified habitats, its status as both a pest and a pet species, and the abundance of introduced prey species and supplemental food sources throughout its range, all contribute to the many acknowledged problems associated with the control or eradication of feral cats in Australia.

In the absence of a single, robust way to measure cat densities and the known difficulties associated with assessing cat impacts at the species level, indirect methods are required to prioritise sites for the implementation of cat control programs.

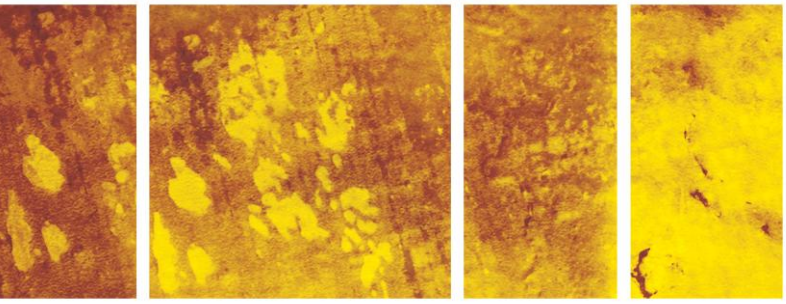
This report uses an interactive decision-making tree based on characteristics of prey species to provide a relative measure of probable cat impacts between sites on the Australian mainland and offshore islands. The decision-making tree provides a single score for geographical (IBRA) regions, specific mainland sites and offshore islands that may be used comparatively for the allocation of resources for cat control programs. Although the scores in this report are based only on those species listed in the Australian Government's *Threat Abatement Plan for Predation by Feral Cats* (2008), comparative scores can be calculated and allocated for sites that support any species at risk of predation by feral cats and classified as threatened, endangered, or vulnerable at the national, state or local level. Indeed, the decision-making tree also allows non-threatened species to be assessed for their risk of predation from cats, should the need arise to do so.

The interactive decision-making tree provided comparative scores for the potential impact of cats in each IBRA region of Australia. These scores varied from a high of 328 for the South Eastern Highlands IBRA region of eastern Australia, to a low of 24 for the Gawler IBRA region of South Australia and for three other IBRA regions located wholly or largely in Western Australia. However, there were also nine IBRA regions with no extant TAP-listed species; these consequently received no scores. The decision-making tree also provided comparative



scores for the impact of feral cats in specific sites throughout the mainland and on offshore islands. These scores, based on data provided by land managers or available in the literature, varied from highs of 117 for the Diamantina National Park in Queensland and 108 for the East Gippsland area in Victoria, to a low of 10 for Dirk Hartog Island off the Western Australian coast. Further scores were calculated for sites at which cat control is uncertain ('data deficient') and from which cats have been eradicated or never recorded to identify sites that could be potentially impacted by feral cats in future. These scores varied from a high of 201 for sub-Antarctic Macquarie Island to a low of 9 for Boondelbah Island off the coast of New South Wales.

We conclude that feral cat control on the Australian mainland is a long-term, multi-faceted, labour- and resource-intensive venture requiring site-specific control methods that provide systematic and regular downward pressure on feral cat populations. An effective program of management should also include concurrent control of populations of both stray and owned domestic cats. We conclude further that greater success in cat control programs will be achieved by targeting specific sites using site-specific control methods. Human activities such as urban and rural development, agriculture and habitat modification favour the establishment and maintenance of feral cats. We recommend that a 'nil tenure' approach to cat control, with management activities encompassing public- and privately-owned reserved land as well as adjacent urban, rural and semi-rural developments, is necessary to reduce the feral cat population on the Australian mainland and offshore islands. In the absence of a sustained and integrated approach of this kind, declines and losses of native species are likely to continue.

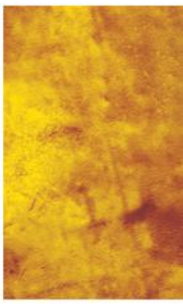


Unexpected? Feral cat reduction efforts at two sites in Tasmania

Billie Lazenby

University of Sydney
Supervisor: Professor Chris Dickman, University of Sydney; Associate supervisor: Nick Mooney

Feral cats are recognised as a major threat to Australia's biodiversity, however there have been few studies on the population and community level impacts of feral cats in Australia, especially on mainland sites. Anecdotal reports have indicated a marked increase in feral cat numbers in Tasmania, associated with a demonstrated decline in Tasmanian Devils as a result of devil facial tumour disease, which has led to even greater concern of the potential impact of feral cats in Tasmania. In light of this increase in concern, four spatially independent study sites were established in a replicated field removal experiment in similar vegetation types in southern Tasmania. Trappable feral cats were removed at two sites over a 12 month period using a range of box trap styles, and small mammal and carnivore numbers were monitored at all four sites before and after cat reduction efforts using remote cameras and Elliott small mammal traps. Despite a marked decline in capture-per-unit effort of feral cats in cage style traps at both attempted cat reduction sites, capture-mark-recapture estimates from infra-red cameras based on identification of individual feral cats (using coat colour, coat pattern, body shape and other distinguishing features) have indicated a substantial increase in feral cat numbers at the two attempted cat reduction sites. Fieldwork and analyses are ongoing as to the relationship (if any) between spatial and temporal changes in feral cat numbers and small mammal population estimates.



Feral cats in the tall forests of Far East Gippsland, Victoria

Tony Buckmaster

Invasive Animals Cooperative Research Centre and University of Sydney

Research was undertaken in the tall forests of far-east Gippsland, Victoria in the IACRC Southern Ark Demonstration site. Feral cats were captured and fitted with GPS / VHF collars or standard VHF collars.

Home Range

Males: 455 ± 126 ha (range 226 – 816)
Females: 105 ± 28 ha (range 53 – 166)

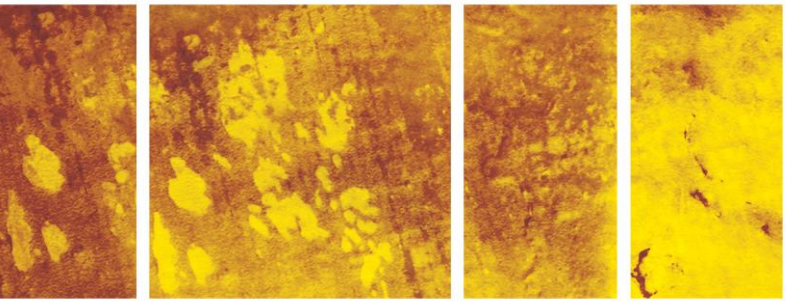
Compared with Australian and NZ studies of non-urban feral cats, home ranges are smaller than those in the arid and alpine zones but larger than those living in temperate farmland or open woodlands. This is probably due to differences in food availability.

GPS fix rate: (SirTrack collars) Highly variable with mean fix rate of 49%. Variations in fix rate probably due to collars rather than habitat. One cat with two separate collars had 71% on one collar and the next had 23% fix success.

GPS data showed large areas in the home ranges that were not utilised by cats. Small mammal trapping shows that the lack of use of these areas is not prey based as high density of prey items in the unused areas. Probably a predator avoidance strategy as have wild dogs / dingoes present in the area.

Cats are active throughout the day but move less during the late morning and afternoon and more during the evening and early night. Cats are utilising a Lévy walk style foraging pattern that maximises the prey encounter rates when prey are sparsely distributed through their environment. This may mean that using sparsely distributed control measures (traps / baits) may be more effective than using a uniform pattern.

Desktop analysis of all Australian vertebrates (except fish) to determine the probability of non target exposure to toxicant encapsulated in HSDV in the Curiosity® cat bait. Using a HSDV significantly decreases likelihood of exposure to toxicant (reduces number of species that will be exposed from 221 to 47).



Current feral cat work on Kangaroo Island

Pip Masters & Andrew Bengsen

Kangaroo Island Natural Resources Management Board

Feral cats pose a threat to endangered species on Kangaroo Island, and have substantial economic impacts on the Island's primary producers. Effective cat management requires a strategic approach, informed by the ecology and impacts of the cats, as well as community expectations.

We identified four key requirements necessary to support existing knowledge and enable the development of strategic feral cat management on the Island:

1. *Effective and target-specific control tools:*

We have been trialling prototype cat control tunnels produced by Connovation and Ecological Horizons. Results so far suggest that the prototype tunnels should be highly-target specific: feral cats are the only species which have entered tunnels. However, more work is required on lures and toxin-delivery mechanisms before either of the prototypes we have been trialling are capable of consistently achieving a lethal dose of toxin to the majority of cats that encounter them.

2. *Information on temporal and spatial variation in landscape use by feral cats:*

We have fitted 16 cats at two sites with GPS collars to describe home range characteristics, identify habitat preferences and activity patterns, and to assist in determining the optimal spatial distribution of control tools. Preliminary results suggest that cats on the Island prefer well-treed habitat to more open country, may focus most of their activity within one or more areas within their broad home range, and have relatively small home ranges (mean 100% MCP = 5.50 km^2 ± 3.03 SD, n = 4).

3. *Identification of biologically relevant management units:*

Genetic samples have been collected from over 140 feral cats across the Island, to describe the genetic structure of the cat population, and potentially to identify genetically-distinct populations indicative of low immigration from surrounding areas. In particular, we are keen to examine genetic transfer across the 1 km isthmus which separates the Dudley Peninsula from the rest of the Island, to determine whether this area may benefit from intensive cat control without being rapidly re-colonised.

4. *A reliable method for estimating cat abundance:*

We are currently trialling photographic capture-recapture methods to estimate feral cat abundance, using variation in pelage patterns to identify individuals. This method has been used effectively for other solitary felids, and a pilot study conducted earlier this year suggests it should be useful for feral cats on the Island. The ability of camera traps to detect cats known to be in the study area, and our ability to distinguish cats based on their pelage, will be evaluated using 10 GPS collared cats and six other marked cats at the site.

Curiosity® bait

Julie Quinn[A], Michael Johnston[B], Dave Algar[C], Michael O'Donoghue[D]

[A] Australian Government Department of Sustainability, Environment, Water, Population and Communities (represented by Damian McRae).
[B] Victorian Government Department of Sustainability and Environment
[C] Western Australian Government Department of Environment and Conservation
[D] Scientec Research Pty Ltd

Project

Predation by feral cats is listed as a key threatening process under the Commonwealth Government's *Environment Protection and Biodiversity Conservation Act 1999* and the associated Threat Abatement Plan lists the development of a toxin-bait for cats as a very high priority. The Australian, Victorian, and Western Australian governments have, since 1996, collaborated in the development of the Curiosity® bait for broad-scale control of feral cat populations. Scientec Research Pty Ltd has been contracted to the Australian Government to develop the chemistry requirements.

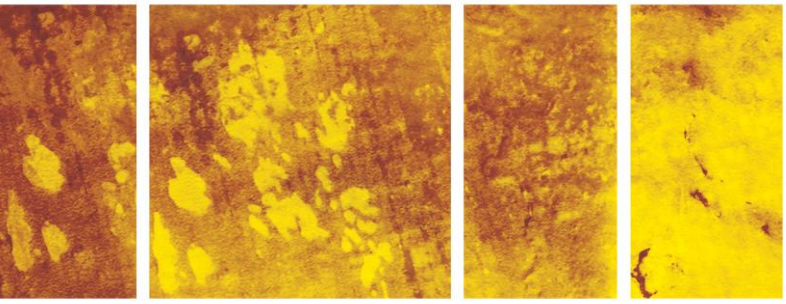
The Curiosity® bait project has brought together two pieces of technology. The first is the attractant matrix, the Eradicat® bait, developed and patented by the Western Australian Government. The second is the use of a 'hard shell delivery vehicle' (HSDV or pellet) to contain the PAPP HCL toxin, and which is implanted into the bait. The project is at the stage of collecting field efficacy data for an APVMA registration application.

Field Efficacy Trials

Field trials on temperate, semi-arid and tropical islands have been conducted. The success rates have ranged from ca. 33 to 87% reduction in feral cat numbers, with no detectable impact on populations of non-target species.

French Island, Victoria (April 2008): A temperate island trial wherein a 50 km^2 section of the French Island National Park was baited. Results indicated significant efficacy at low cat density. Six of nine radio-collared feral cats consumed bait(s) and subsequently died. N.B. One of the 'survivors' had moved to an area where baits were not applied prior to baiting. Although the activity plots within the trial site did not record sufficient visits before or after the baiting period to show a statistically significant result, activity differences between the baited area and a non-baited (control) area were definitive

Dirk Hartog Island, Western Australia (April 2009): Engineering issues prevented the use of PAPP-HSDV's at this semi-arid island site. As a result, Eradicat® baits containing 1080 and which were implanted with a HSDV containing the Rhodamine B (***"Rh B"***) were used. Rh B was used as a surrogate for PAPP to enable identification of animals that would have died from consuming one (or more) PAPP-HSDV bait(s). Results indicated that of the 15 radio-collared



cats, 12 died following consumption of baits that contained Rh B-HSDV pellets (three did not take the baits, with two accessing the then ready supply of turtle hatchlings at the time of baiting). Two additional dead cats were located that had consumed baits containing the marker dye. Feral cat activity at the monitor plots indicated a twelve-fold reduction following baiting. Monitoring of non-target species indicated that there was no negative impact on populations of resident raptors, the main potential non-target species on the island.

Christmas Island, Indian Ocean (October 2008 and September 2009): This tropical island trial (Christmas Island National Park) employed a modified bait presentation protocol (compared to that applied on the other island sites) to minimise bait monopolisation by robber crabs. A network of bait suspension devices was established throughout the park. Baits were hung out of reach of the crabs but accessible to the feral cats. The trial in October 2008 encountered issues with (i) bait palatability, arising from a manufacturing non-conformity, and (ii) the early arrival of significant rains. The trial was repeated in September 2009 with the corrected bait medium. The recorded reduction in feral cat activity post-baiting was 87%.

Tasman Island, Tasmania (May 2010): The Curiosity® bait was used as part of an eradication program conducted by the Tasmanian Government. While only four of the fifteen collared cats were confirmed to have died following consumption of the Curiosity® baits, definitive Rh B staining was observed in 89% of cats trapped subsequent to the baiting phase (n=28), indicating that (i) the baits were attractive, and (ii) the PAPP-HSDV's had been consumed. The less than anticipated efficacy from the baits has been attributed to an engineering issue, with HSDV failure causing premature rupture of the HSDV's and dispersion of PAPP HCL into the bait where binding to meat occurred making unavailable. The engineering failure has been resolved.

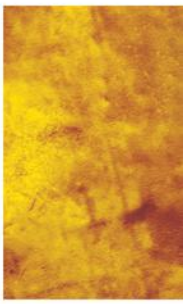
Future Trials

Three field efficacy trials are planned on mainland sites:

- Wilson's Promontory National Park, Victoria, a temperate site, will be baited during February/April, 2011.
- Cape Arid National Park, Western Australia, is a semi-arid site which will be baited between March and May, 2011. This trial will entail a comparison of the efficacy of the Curiosity® and Eradicat® baits.
- Finally, an arid site trial is planned for the Bush Heritage Australia property of Ethabuka (south-western Queensland), June/July, 2011. However, ongoing rain at this site may necessitate the trial being conducted at an alternative site in the Flinders Ranges National Park, South Australia.

Northern Australia

A tropical mainland site has not been proposed. Data available indicate that varanids are highly susceptible to PAPP. Baiting for cats in southern Australia is undertaken when varanids



are minimally active. However, such a 'baiting window' does not exist in northern Australia where varanids remain active all year. As an alternative, it is proposed that 1080 be used in the HSDV's instead of PAPP. Pen trials with encapsulated 1080 on cats to determine efficacy are currently underway, with a field trial planned for a northern Australia site to examine uptake of the Curiosity® bait/HSDV by both target and non-target species. Funding for this work is yet to be agreed.

Non-target species

The Curiosity® bait minimises exposure, and thus the hazard, to many non-target species if they should encounter a surface laid bait because of the encapsulation of the toxin. This is a result of most mammal species tending to process food in the mouth through chewing, with the result that they reliably reject the pellet during feeding. Testing has been conducted on a plethora of non-target species to ensure they either reliably reject the pellet or are not susceptible to the PAPP toxin.

However, it has been noted that certain bird species, such as raptors, will take baits when placed on a disturbed site, especially if they notice people placing the baits. Given these observations, it is anticipated that these birds will ***not*** consume baits that have been aerially dropped onto non-disturbed sites/bush. In respect of Magpies and ravens, while these will consume baits, the bait has been size configured to ensure they are required to peck at the bait rather than swallow them whole. Finally, while Emus will eat baits, it has been determined that they have a high tolerance to PAPP and, as such, should not be affected by any baiting program even following the consumption of multiple baits.

Additional data describing the susceptibility of several Australian fauna to PAPP have been purchased from the IA CRC.

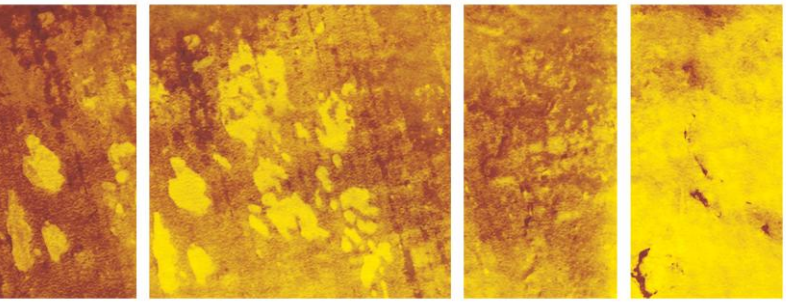
An important attribute of the PAPP(HSDV) is that there will be no risk of secondary poisoning from the toxin PAPP because it causes, once adsorbed into the blood, a non-reversible chemical reaction with haemoglobin results, and, while toxic to that particular animal, causes no risk to any predator or scavenger feeding on the carcass.

Registration of the Curiosity® bait

Extensive pen trials of the Curiosity® bait have been conducted. Together with the Island and Mainland field trial data, a submission for registration of the Curiosity® bait is anticipated for late 2011.

Commercialisation

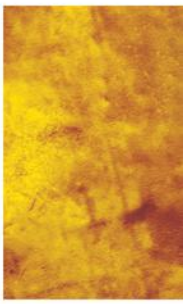
The Curiosity® bait will be offered to the private sector for commercialisation. There will be restrictions on use of the bait to 'conservation' areas' only (specific definition(s) to be determined) and agreement will be required to ensure ongoing supply for conservation purposes in Australia from the company commercialising the product.



The relevant intellectual property from the project will be offered as a bundled package to simplify the agreement with the commercialising company. The offer will be made via a tender process run by the Australian Government Department of Sustainability, Environment, Water, Population and Communities (formerly DEWHA).

Intellectual Property

The Commonwealth owns the intellectual property associated with the Curiosity® bait. The development of Curiosity® bait has entailed combining a number of developments which were progressed in conjunction with various parties. Most importantly, the preliminary concepts of the Curiosity® bait were developed jointly by the Commonwealth, Victoria and Western Australia while the HSDV and drug-core formulation were developed by Scientec for the Commonwealth. The intellectual property regime was simplified in mid-2008 when Victoria and Western Australia assigned all of their rights in the invention to the Commonwealth. At the same time, Scientec has provided the Commonwealth with a deed of assignment confirming that the Commonwealth owns the intellectual property in respect of use of the HSDV for (specific) Feral Animal applications. Western Australia own the intellectual property associated with the Eradicat® bait. Scientec retains ownership of the intellectual property associated with the ***"Method and Apparatus for Coating a Material"*** [Australian Patent No. 744606 (PCT/AU97/00872)], ie the technology and engineering behind the method of manufacture of the HSDV.



Eradicat® feral cat bait

Dave Algar

Western Australian Department of Environment and Conservation

DEC researchers have conducted an extensive series of trials in an endeavour to develop a bait medium that was palatable to feral cats and capable of carrying a toxin. The baits had to be relatively easily and cheaply manufactured and would stay intact when distributed from an aircraft over broadscale areas. These trials have led to the design and development of the feral cat bait known as 'Eradicat®'. The bait is injected with 4.5 mg of the toxin 1080.

Trials have been conducted to determine the optimum time of year to conduct baiting programs to maximise efficiency.

A number of broad-scale experimental and operational baiting programs have been conducted across various climatic/habitat types to examine the level of control achieved under different baiting densities to provide a cost efficient and effective baiting strategy.

Long-term, sustained control of feral cats at sites in arid and semi-arid zones has been demonstrated using the Eradicat® bait.

Trials are now being conducted in more mesic areas in the south-west where cat predation is believed to threaten several endangered species.

Assessment of bait uptake by a range of non-target species likely to be at risk has been conducted. Methods to reduce exposure to the toxin are also being investigated (eg toxin encapsulation).

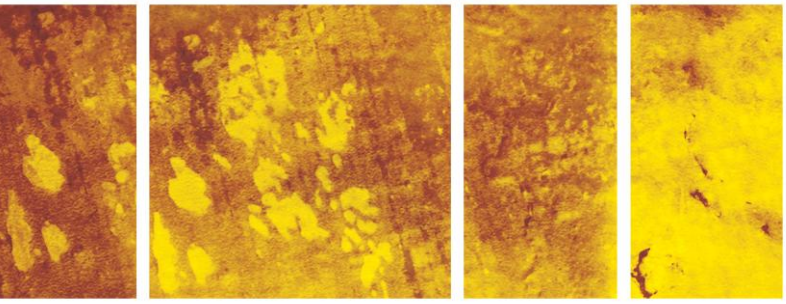
A "Bait Composition Licence Agreement" for manufacture of the bait medium overseas has been drafted and is with DEC's Director General for sign-off.

The Eradicat® bait registration package has been submitted to the APVMA.

Trapping techniques

A number of ground trapping techniques are used and an elevated platform system has been developed to minimise the likelihood of injury to non-target species where a potential risk is posed.

Collaborative research is underway to develop a toxicant delivery system on a trap so that trapped cats are killed immediately following capture which will alleviate the need for regular servicing, particularly in sites difficult to access.



Monitoring techniques

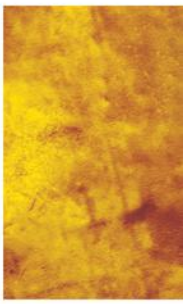
A hair snag device has been developed to collect hair from cats in the field. The hair collected is of sufficient quality/quantity to enable DNA extraction. This technique enables collection of data to identify specific individuals at plots, which can in turn provide estimates of population size.

A new scent lure is currently being developed that has potential to be used in monitoring and trapping programs. The lure may also be incorporated into the bait medium to further increase attractiveness.

Island eradications

Feral cats have been eradicated on Hermite Island (14 km^2) in the Montebellos and Faure Island (58 km^2) in Shark Bay. Following feral cat eradication, successful translocation of a number of native species to these islands has occurred. Feral cats have also been eradicated from Rottnest Island (17 km^2).

Cat eradication campaigns are proposed to commence in 2011 on Dirk Hartog Island (620 km^2), the largest island off the Western Australian coast, and also on Christmas Island (135 km^2).



Tasman Island cat eradication

Luke Gadd & Sue Robinson

Tasmanian Department of Primary Industries, Parks, Water and Environment

Production of eradication plan March 2009: Steering Committee established

Research work begins to inform the Plan, Jan 2009 – Dec 2009

- Remote cameras deployed for monitoring cat prey species activity and presence
- Bait attractiveness and uptake trials
- GPS tracking of cats

Preparation work, July 2009 – Dec 2009

- Track network established on island
- Additional cameras set on tracks and slope access points to monitor cat movements
- Detector dogs training begins
- Pre-eradication baseline seabird population monitoring undertaken

Permits and equipment acquired, planning finalised Nov 2009-Apr 2010

- APVMA permit
- Leg hold trap exemption
- Reserve Activity Assessment (including environment impact assessment)
- Plans finalised: Operational, Communications, OHS and Biosecurity Strategy

Preparations for trial of Curiosity® Cat Bait

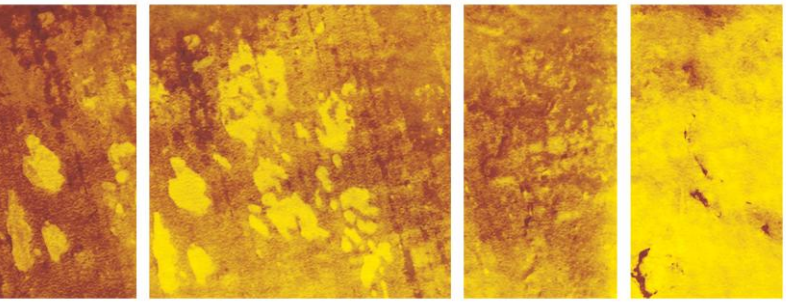
- AEC approval for trial
- VHF collaring of cats to monitor efficacy of bait drop

Eradication Work - Aerial bait drop with Curiosity® on 3 May 2010

- Five out of 15 collared cats poisoned from PAPP baiting (4 retrieved, plus 1 missing likely dead)
- 28 cats trapped between 6 - 15 May
- 19 cage, 8 leg hold, 1 by hand
- 10 of these had VHF collars

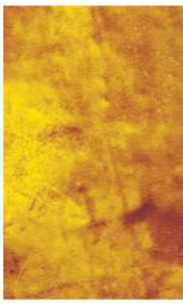
Monitoring and verification: 15 May 2010 to at least May 2011

- No confirmed cats since 15 May
- possible cat eye shine on 31 May
- 550 trap nights
- 73 hours of spotlighting
- 237 person hours of sign searching



- 146 dog hours of searching
- 3200 camera days
- Seabird and bush bird monitoring

Current situation – Extensive sign searching four to five days per month, no conclusive cat sign, fresh carcasses found outside seabird colonies may be raptor predation – vigilance and monitoring continues.



An update on feral cat research at Arid Recovery

Katherine Moseby

Arid Recovery and University of Adelaide

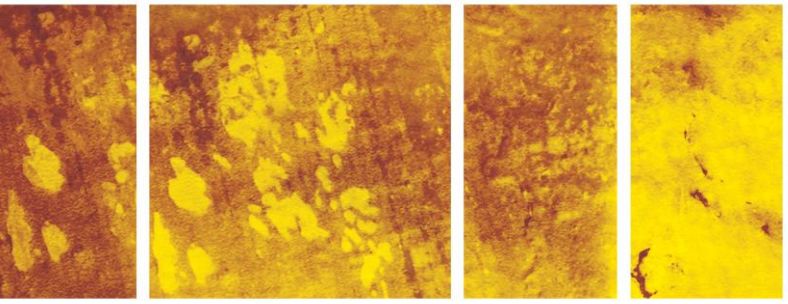
Aerial baiting trials

Results from five years of aerial baiting trials have been analysed and prepared for publication. Areas of between 650 and 1800 square km were baited. Results suggest that aerial baiting with Eradicat® baits was only successful for cats during one of eight baiting events over the five year period (2002 see graph below). This was during the period of lowest rabbit abundance (see fig 7). Baiting was very successful for foxes, with significant declines after each baiting event. Rabbit numbers significantly increased in the baited area over the five-year period in relation to control areas suggesting that ongoing baiting will lead to reduced effectiveness for cats as prey responds to the decline in fox numbers. During 2002, when cat abundance did decline after baiting, reinvasion occurred soon after baiting and within four months there was no difference in abundance of cats between baited and unbaited sites. There was a significant decline in fox abundance over the five-year baiting period but no significant decline in cats.

Table 1: Details of the baiting regime/strategy used each year for aerial baiting around the Arid Recovery Reserve between 2002 and 2006.

Year	Bait Type	Frequency	Density (per km^2)	Total baits	Area (ha)	Timing
2002	sausage*	annual	25	15000	65 000	June
2003	sausage	annual	25	45000	180 000	May
2004	dried meat	annual	5	9000	180 000	May
2005	sausage	quarterly	10	54000	180 000	May, Aug, Nov
2006	sausage	quarterly	10	36000	180 000	Feb, May

* preceded by hand baiting three weeks prior, using 1400 buried dried meat baits at an approximate density of two per km^2 to reduce non target uptake by foxes.



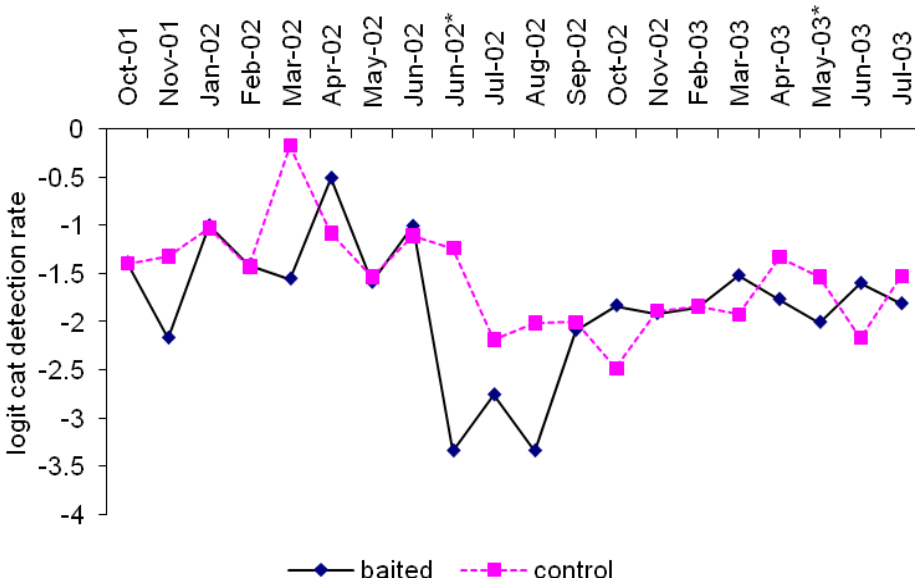


Figure 3: Logit predicted mean detection rate of cats on track transects in baited and control areas before and after baiting in 2002 and 2003. * = first transect after baiting event

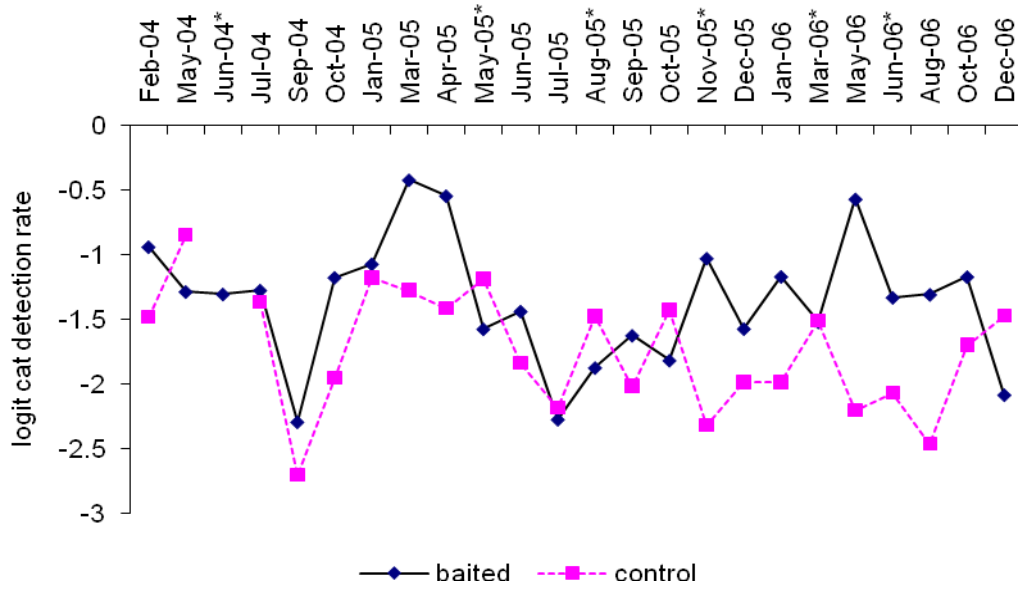


Figure 4: Logit predicted mean detection rate of cats on track transects in baited and control areas before and after baiting in 2004 and 2005/6 * = first transect after a baiting event

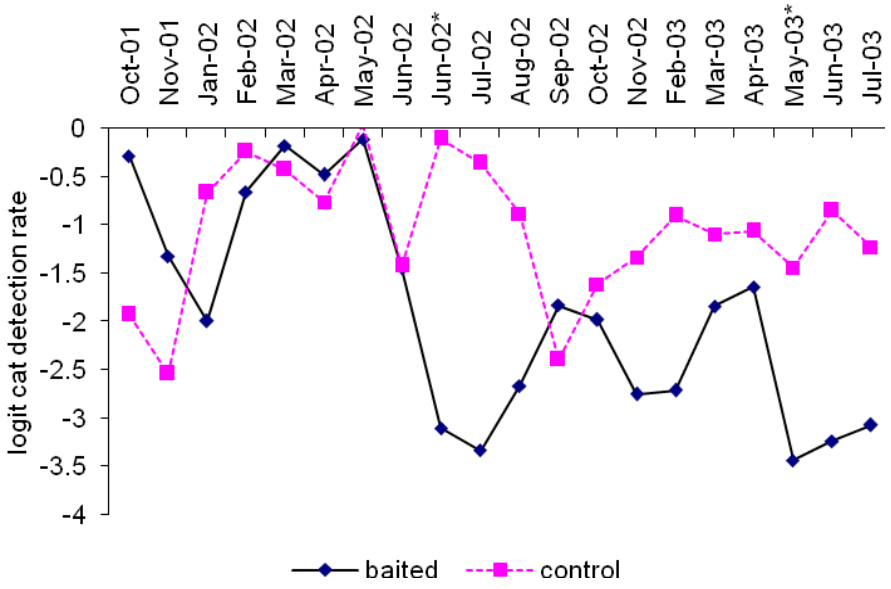
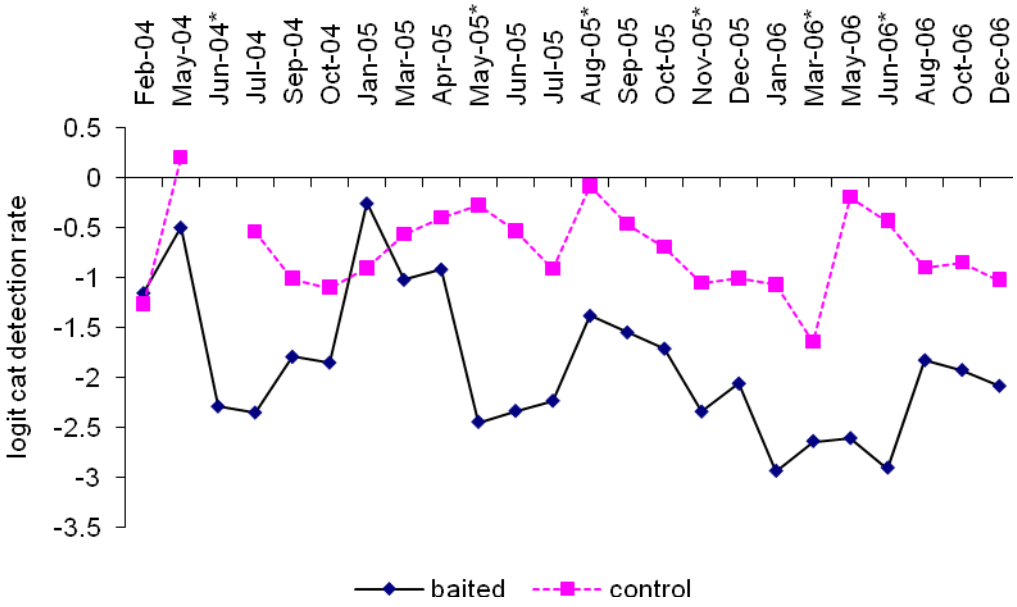


Figure 5: Logit predicted mean detection rate of foxes on track transects in baited and control areas before and after baiting in 2002 and 2003. * = first transect after a baiting event



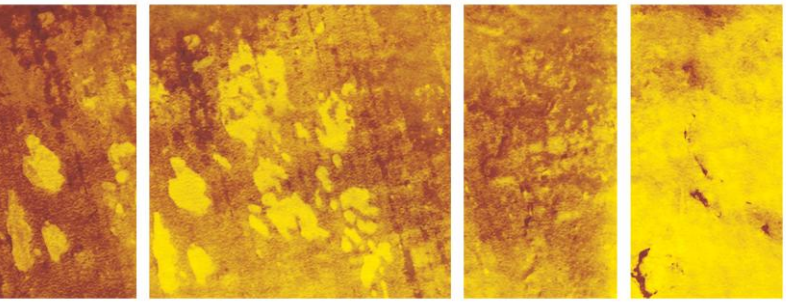


Figure 6: Logit predicted mean detection rate of foxes on track transects in baited and control areas before and after baiting in 2004 and 2005/6. * = first transect after a baiting event

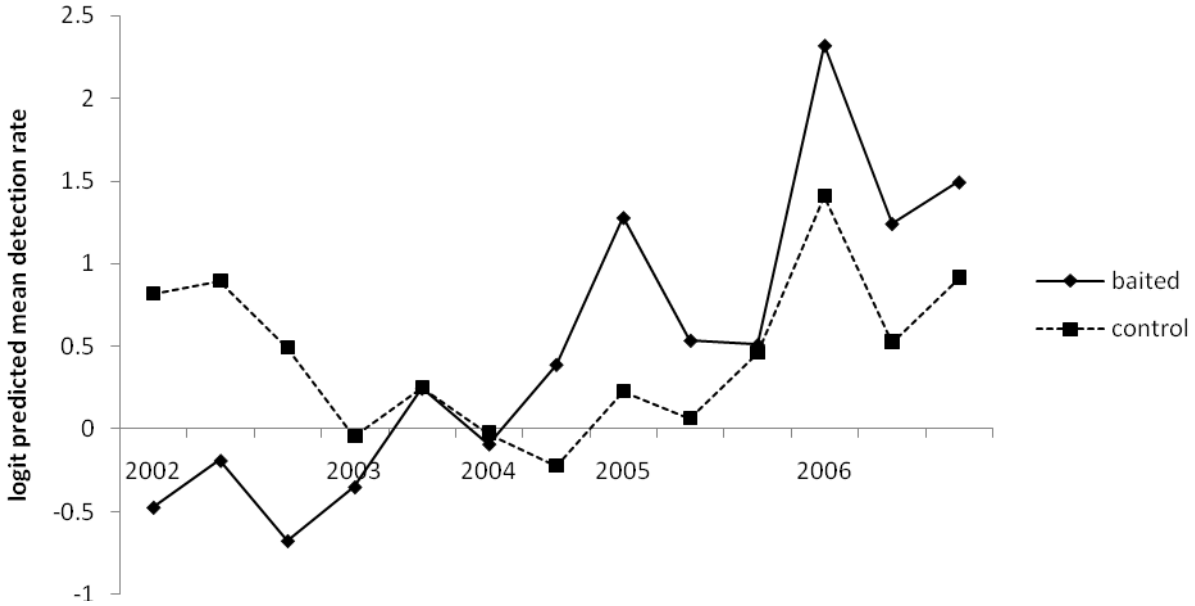
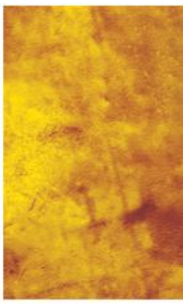


Figure 7: Logit predicted mean detection rate for rabbits at baited and control sites over the five-year study period. Monitoring sessions (months) have been blocked into monitoring periods to show overall trends.

Uptake trials by target and non-target species were also conducted. Bait detection rates and bait uptake rates were both poor with cats failing to find many of the baits and even when locating a bait, most cats failed to ingest it (less than 14% in some instances). High non-target uptake was recorded with corvids the main non-target species (tup to 90%). Trials were conducted in winter so uptake by goannas is likely to be significant in summer. Burrowing bettongs ingested a small proportion of baits but most non-target mammal species only ingested less than 10% of the sausage (however in some species such as *Pseudomys bolami* this is still enough for a lethal dose). The presence of audio or olfactory lures failed to improve bait ingestion rates by cats or foxes. Habitat trials found that bait uptake by cats was higher in dune habitat under vegetation compared with out in the open. On average more than half of the baits were taken by target and non-target animals within 10 days of baiting.



Conclusion

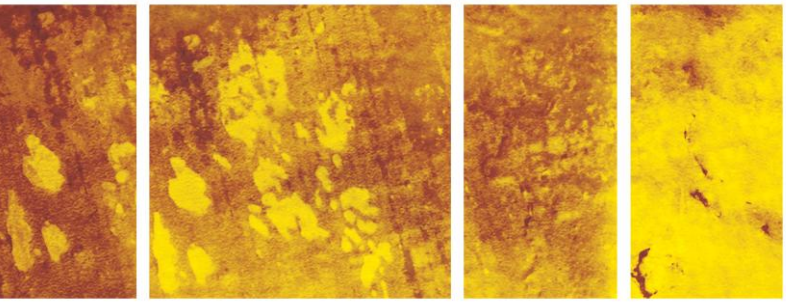
In areas where rabbits or alternative prey are present it is unlikely that Eradicat® baits will be successful. This suggests that in areas with high cat abundance (i.e. areas where control is arguably most needed) it is unlikely that baiting will be a long-term effective method of cat control. Cats have poor bait detection and bait ingestion rates compared with foxes and other species and so high non-target uptake is common. Future control should concentrate on improving bait ingestion rates by either involuntary consumption of poison or by developing a highly-palatable bait that will trigger ingestion regardless of hunger.

Wild West trials

Based on the failure of aerial baiting to control cats at a landscape scale, Arid Recovery attempted to control cats in a smaller area (Wild West zone-150 sq km) using a combination of methods. Methods included 20 permanent leghold trap stations, bimonthly Eradicat® poison baiting, monthly shooting and bimonthly opportunistic trapping. Track monitoring showed that foxes became extremely rare in the Wild West area and cat abundance was slightly lower but similar to control areas. This study ran for over two years during which time a release of 20 bilbies and 99 burrowing bettongs was attempted. Adult bilbies remained present in the area for over 19 months but young bilbies were continually being killed by cats. Drought conditions and low levels of predation eventually led to extinction. Burrowing Bettongs were extinct in the area after six months probably from a combination of movement outside the Wild West area and predation by cats, foxes and dingoes. This study indicates that at a cat density of 20% (20% of track transect segments contain cat spoor) reintroductions were unsuccessful. The aim for future Arid Recovery programs is to reduce cat abundance to less than 20% and then re-attempt reintroductions. Interestingly, low cat presence in one of the Arid Recovery exclosures has not led to a decline in Bettong abundance suggesting that there is a threshold of cat abundance below which threatened species can survive. Unless information is obtained on the level of cat abundance at which reintroductions can be successful then cat control methods cannot be effectively evaluated.

Acknowledgements

The following people assisted with these trials: Katherine Moseby, John Read, Brydie Hill, Nicki Munro, Jenny Stott, Bree Galbraith, Adam Bester, Clint Taylor, Helen Crips, Melissa Farelly, Travis Gotch, Kev Mooney, Frank Bernhardt, Hugh McGregor, Justine Smith, Amber Cameron, Laura Cunningham, Cara Reece, Chris McGoldrick, Pete Paisley, Marie and Leo McCormack, Bobby Hunter.



Assessment of risks to non-target species from an encapsulated toxin in a bait proposed for control of feral cats

Paul J. de Tores[A,B], Duncan R. Sutherland[A,B], Judy R. Clarke[A], Robert F. Hill[B], Sean W. Garretson[A,B], Lenny Bloomfield[A,B], Lauren Strümpher[A,B], Alistair S. Glen[A,B] & Jennyffer Cruz[B,C]

[A] Western Australian Government Department of Environment and Conservation
[B] Invasive Animals Cooperative Research Centre
[C] University of Queensland

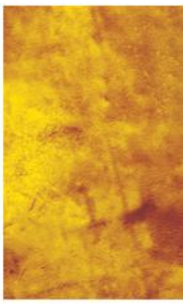
Context: The CURIOSITY® bait is the name coined for a variation of the existing sausage style cat bait, ERADICAT®. The latter is currently used under experimental permit in Western Australia for research associated with cat control. The CURIOSITY® bait has been proposed to reduce the risk to non-target species by encapsulating a toxin in a pellet. The CURIOSITY® bait differs from ERADICAT® by providing a pH buffered (less acidic) medium. We trialled a prototype pellet proposed for encapsulation of 1080 and/or alternative toxins with delivery proposed through the CURIOSITY® bait.

Aim: Our aims were to determine if the pellet was consumed by non-target native species from south-west Western Australia.

Methods: Trials involved use of a non-toxic biomarker, Rhodamine B, encapsulated within the pellet and inserted into the CURIOSITY® bait. Uptake of the encapsulated biomarker was assessed in captive trials for the target species, the feral cat (*Felis catus*) and two non-target species of varanid lizard, Rosenberg's goanna (*Varanus rosenbergi*) and Gould's goanna (*V. gouldii*) and the non-target mammal species chuditch (*Dasyurus geoffroii*) and southern brown bandicoot (*Isoodon obesulus*). Uptake of the encapsulated biomarker was also assessed in field trials for a range of native species.

***Key results*:** Captive trials demonstrated captive feral cats will consume the CURIOSITY® bait and pellet. However, results from captive and field trials indicated several non-target species also consumed the bait and pellet. We also found the pellet itself was not sufficiently robust for use in a bait. As with previously reported studies, we found Rhodamine B to be an effective biomarker for use in cats. We also developed a technique whereby Rhodamine B can be used as a biomarker in reptiles. However, its use as a biomarker in other species was confounded by what appeared to be background, or pre-existing levels of fluorescence, or banding, in their whiskers.

***Conclusion*:** The prototype pellet is unsuitable in its current form for use with the CURIOSITY® bait. We caution the CURIOSITY® bait has non-target issues in south-west Western Australia and any proposed variations to this bait, or the ERADICAT® bait, need to be rigorously assessed for their potential risk to non-target species and assessed for the level of uptake by cats, irrespective of their suitability/unsuitability as a medium for delivery of an encapsulated toxin. We believe the threat to biodiversity conservation values from unmitigated feral cat predation of native fauna poses a significant and real threat and we recommend urgent investment of resources to address the issue of cat predation in a coordinated and collaborative manner within Australia and New Zealand.



Cat bait trials on Kangaroo Island

Pip Masters

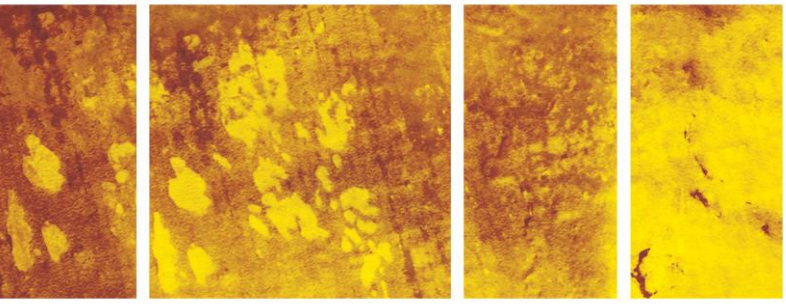
Kangaroo Island Natural Resources Management Board

The uptake of non toxic Curiosity® feral cat baits were trialled on Kangaroo Island, South Australia. The design was based on that developed for Scotia Sanctuary, New South Wales, where trials were undertaken during the same period of time.

Data was collected along fixed transects located on three sites, each of which was sampled three times between October 2008 and April 2009. The study investigated the fate of ground deployed baits, with bait uptake species identified by the identification of sand tracks and to a minor extent, remote cameras.

Feral cats took around 11% of baits; the majority were taken by ravens, goannas and possums the rest were taken by tammar wallabys and western grey kangaroos. Cat tracks were identified on 243 of the 1,640 baited plots, and baits were taken by cats from 66 of these plots, or 27% of encountered baits.

This study suggests that the Curiosity® cat bait is not suitable for controlling cats on Kangaroo Island in its current form because of the high non-target uptake and low uptake by cats.



Feral cat bait uptake trials: Scotia Sanctuary

Elizabeth Denny

University of Sydney

The Curiosity® feral cat bait was trialled at the Scotia Wildlife Sanctuary (Australian Wildlife Conservancy) in far western New South Wales. Uptake trials were conducted along fixed transects for the three spring months (September, October, November) 2008. The study investigated the fate of baits deployed above ground, with bait uptake species identified by sand tracking, remote photography and spooling of baits. Habitat assessment, spotlighting, small mammal trapping and scat searches were incorporated into the study to investigate the relative abundance of mammalian predators (dogs, foxes and cats), the relative abundance of native and feral prey species and the habitat preference of feral cats.

Each month of the study 540 baits were deployed, with a total of 1620 for the whole study, and a total of 914 baits (56.42%) were taken. Most baits were taken by corvids (64.88%), with foxes and large lizards (sand goannas, inland bearded dragons and shingleback lizards) accounting for 15.1% and 5.7% respectively. Feral cats accounted for less than 1% of the bait uptake.

The Curiosity® feral cat bait uptake trials at Scotia Wildlife Sanctuary were not successful in establishing the attractiveness of the baits to feral cats. Cat visitation to sand plots and bait uptake by cats was low, cat tracks were recorded infrequently on sand plots, no cats were seen along driven spotlight transects, no cats were captured by remote photography, and systematic scat searches along the transects produced few cat scats. The results indicated generally low cat activity/density on the Sanctuary and thus low bait uptake by feral cats

Cat Assassin – a novel, target-specific and low-effort cat control device

John Read

University of Adelaide and Ecological Horizons

Trappability and bait uptake by feral cats is low when live prey are abundant, therefore an optimal toxin delivery mechanism is not dependent upon a feeding response.

Grooming trials have indicated that cats, but not dogs or wallabies, fastidiously and dexterously groom grease/gel applied to their upper neck.

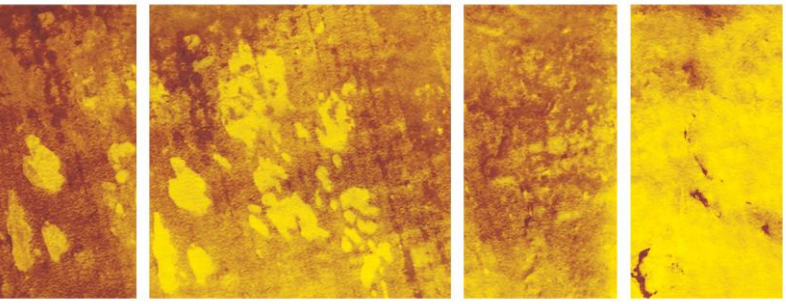
Containment of a toxin-containing gel dispenser within a pipe excludes large non-target species.

Mounting an infrared trigger 250 mm above ground level and spraying gel from above excludes small non-targets (reptiles, rodents etc.).

If contaminated cats behave like domestics, they will flee from the device once dosed to groom (and die!) at distance, leaving the cat assassin available to spray up to 100 cats without re-filling.

The ultimate objective is to demonstrate target specificity and efficacy of an automatically-reloading PAPP-dispensing mechanism to poison feral cats.

Field trials with non-toxic media are being undertaken at Arid Recovery (Roxby Downs) and Kangaroo Island to test optimal lures, placement, target specificity and component reliability.



Control and eradication of feral cats: field trials of a new toxin

Murphy, E.C.[A,B], *Shapiro, L.*[C], *Hix, S.*, *MacMorran, D*[C]. & *Eason, C.T.*[C,D]

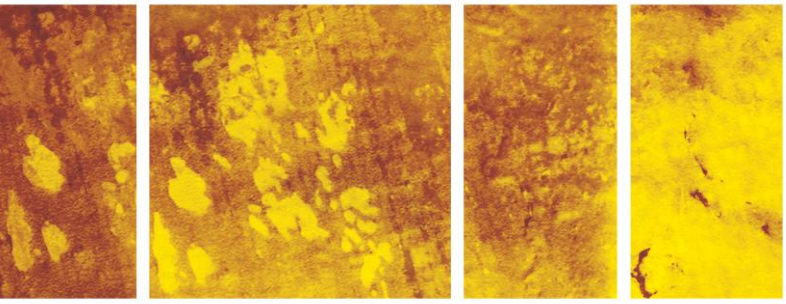
[A] New Zealand Department of Conservation
[B] Invasive Animals Cooperative Research Centre
[C] Connovation Ltd.
[D] Lincoln University

Abstract: Feral cats (*Felis catus*) have caused the decline and extinction of threatened species on islands worldwide. The eradication or long-term control of cats is therefore an essential part of restoring native communities on these islands. In most situations, a combination of lethal techniques is required to remove feral cats, including trapping, hunting and poisoning. Para-aminopropiophenone (PAPP) is being developed as a new, humane poison for feral cats. Mammalian carnivore species appear more susceptible to PAPP than birds, so it potentially has higher target selectivity than other available toxins. A proprietary formulation of PAPP (PredaSTOP®) developed by Connovation N.Z. Ltd. has been shown to kill cats humanely when delivered in a meat bait in pen trials. Two field trials of the formulation were undertaken with radio-collared cats. Toxic baiting was carried out by placing meat baits containing 80 mg PAPP in bait stations. 5/8 radio-collared cats in the South Island study and 13/16 radio-collared cats in the North Island study were poisoned. In the latter study, an additional three cats without collars that were monitored using infra-red cameras were also poisoned. Our results indicate that PAPP is an effective toxin for cats in the field, with potential application for their eradication or control on islands.

In: Veitch, C. R.; Clout, M. N. and Towns, D. R. (eds) 2011. Island invasives: Eradication and management. IUCN, (International Union for Conservation of Nature), Gland, Switzerland.

Reported oral LD_{50} values for PAPP

Species	LD_{50} (mg/kg)	Reference
Domestic cat (*Felis catus*)	5.6	Savarie et al. 1983
Coyote (*Canis latrans*)	5.6	Savarie et al. 1983
Dog (*Canis familiaris*)	7.5	Coleman et al. 1960
Stoat (*Mustela erminea*)	9.3	Fisher et al. 2005
Bobcat (*Lynx rufus*)	10	Savarie et al. 1983
Kit fox (*Vulpes velox*)	14.1	Savarie et al. 1983
Ferret (*Mustela furo*)	15.5	Fisher & O'Connor 2007
Red fox (*Vulpes vulpes*)	< 25.2	Marks et al. 2004
Dama wallaby (*Macropus eugenii*)	89	Fisher et al. 2008
Badger (*Taxidea taxus*)	c. 100	Savarie et al. 1983
Raccoon (*Procyon lotor*)	142	Savarie et al. 1983
Rat (*Rattus norvegicus*, albino)	177	Savarie et al. 1983
Mouse (*Mus musculus*, albino)	223	Savarie et al. 1983
Striped skunk (*Mephitus mephitus*)	> 400	Savarie et al. 1983
Brushtail possum (*Trichosurus vulpecula*)	≥ 500	Fisher et al. 2008
Guinea pig (*Cavellio porcinus*)	1020	Scawin et al. 1984
Mallard duck (*Anas platyrhynchos* Pekin breed)	32	Eason et al. 2010
Mallard duck (*Anas platyrhynchos* Pekin breed)	38	Fisher et al. 2008
Red-winged blackbird (*Agelaius phoenicus*)	133	Savarie et al. 1983
Blackbird (*Turdus merula*)	174	Eason et al. 2010
Black-billed magpie (*Pica pica*)	178	Savarie et al. 1983
Common crow (*Corvus brachyrhynchos*)	≥ 178	Savarie et al. 1983
Coturnix quail (*Coturnix coturnix*)	> 316	Savarie et al. 1983
Starling (*Sturnus vulgaris*)	> 316	Savarie et al. 1983
Weka (*Gallirallus australis*)	568	Eason et al. 2010
Australian magpie (*Gymnorhina tibicen*)	1388	Eason et al. 2010



Feral cats and the Australian Pest Animal Strategy

David Dall

National Coordinator, Australian Pest Animal Strategy
LPO Box 5055, University of Canberra, Bruce, ACT 2617

The Australian Pest Animal Strategy ('APAS'; www.apas.net.au) is a national framework plan developed by the Vertebrate Pests Committee (VPC) and agreed by all Australian governments.

It sets out how those governments will work with each other, and with business, industry and the community to manage the issues and problems associated with vertebrate pests across the biosecurity continuum in Australia. A key function of the APAS is to provide a mechanism for coordinating adoption of consistent national approaches to management of pest animals and their impacts.

In cooperation with the Australian Weeds Committee, the VPC is currently finalising a 'National Categorisation System for Invasive Species', which will be forwarded to the National Biosecurity Committee for endorsement.

Consistent with the APAS, one of the categories established under this system is expected to be 'Established Invasive Species of National Significance'. This category will identify pest species that have actual or potentially 'nationally significant impacts' across one or more states or territories, which cannot feasibly be eradicated, and for which national coordination of effort is needed to reduce/minimise their impacts.

Feral cats appear to satisfy the criteria required for Ministerial endorsement of a pest species as a member of this category.

Identification of feral cats as an Established Pest Animal of National Significance (EPANS) would assist to maintain a focus on investment of resources required for development and delivery of strategies and technologies to reduce their impact on the national environment.

NZ Department of Conservation Best Practice: Feral Cats - Kill Trapping

New Zealand Department of Conservation unpublished, 2010

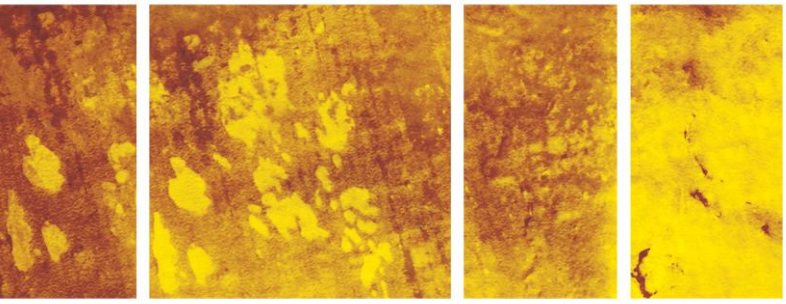
Technique

Trap station layout

- Meaningful population control in areas where cats are abundant (see below) requires an extensive trap layout: set traps 100-200 metres apart along linear landscape features (fence lines, forest edges, waterways, roads and tracks), in isolated patches of cover and other preferred microhabitat, and in areas with high prey abundance.
- There should be at least one trap station within a cat's home range. They have large (0.46-20.83 km^2), often over-lapping, home ranges [1]. Densities of feral cats, where measured, range from 0.19 cats/km to 118 cats/km^2. The highest densities are in areas with the most prey eg seabird islands, farmland and/or high rabbit population areas.
- Look for fresh sign when locating additional traps or consider moving those traps which are not catching animals
- Individual cats follow particular routes and the areas they hunt can sometimes be very specific, taking the trap to the cat often works.
- In areas of dense vegetation, consider cutting tracks if none exist.
- Tracks are often utilised by cats in this type of habitat.
- Supplementary trapping around farm buildings, offal pits and rubbish dumps may help reduce the cat population and slow reinvasion.
- The large home range of cats means these animals may be the same ones entering conservation areas.
- A good track infrastructure is important, and each trap station numbered for ease of relocation and data collection.
- Reduces the risk of missing a trap during checking and allows capture data to be related to each trap site.

Timing of operations

- Timing is critical and depends on the species being protected, and the biology of cats and their prey at the site.
    - eg To protect species such as brown teal, weka, dotterel, kiwi, and wrybill it is necessary to control cats year round.
    - eg To protect yellow eyed penguins, cat control should occur before (1 month+) and during the penguins September – March breeding season.



- Cats may become more easily trapped during times of seasonal food shortage.

Effective use of kill traps

- Trap checking regimes need to consider:
    - Trap occupancy rate (of both target and non-target species)
    - Field life of the bait used.
    - Timing of inspection regimes vary from weekly (or more frequently) during high cat numbers; to monthly in winters with low cat numbers and when bait is not rotting. Localised site protection inspections may need to take place on a more frequent basis (i.e. daily).

Equipment

Trap type

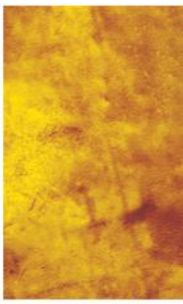
- Key elements are: catch effectively, kill humanely, easy to use and maintain, light weight, portable and cost effective. The following are recommended:
    - The Steve Allan (SA) Conibear raised trap and cubby systems
    - The Set-n-Forget raised trap system;
    - The Belisle Super X220 trap in a 'chimney' trap cover or cubby;
    - The raised Timm's trap;
    - The Twizel kill trap system.
- These are the only traps and trap systems that have passed the National Animal Welfare Advisory Committee (NAWAC) guidelines for use as a cat kill trap.

Note: the sets described will exclude ground birds such as weka, rail and kiwi.

Maintenance of traps

New Traps

- Steve Allan (SA) Conibear traps frames are made from stainless steel, however, the springs are made of carbon steel and must be lubricated (eg with fish oil).
- Springs are prone to rusting, especially in coastal environments.
- Timm's traps do not require additional treatment.
- Belisle Super X220 and Set-n-Forget traps should be treated to prevent traps rusting excessively. Coating should not repel cats or attract non-targets, and should be user friendly. Examples of protective coatings are:
    - Dipping the traps in melted preserving wax,
    - Nothing (in dry conditions),
- Traps should **not** be electroplated.



Electroplating quality is highly variable. Done poorly, rust becomes worse than no treatment, occurring under the plating where follow up with other protection is difficult.

Traps in use

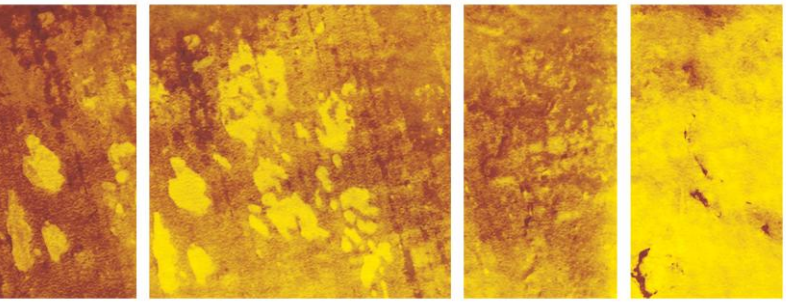
- Traps should be regularly cleaned with wire brush.
- This removes mould, fur and bits of dead animals and allows for identifying what species has escaped in the case of an empty sprung trap.
- Un-sprung traps must be set off when bait is changed or at monthly intervals. In coastal environments, traps should be sprung at least fortnightly.
- Un-sprung trigger mechanisms can rust, resulting in slow set-off times which risk missed or poor captures.
- A formalised maintenance regime is important. Traps should be regularly maintained, including checking for weakened springs and oiling the spring and trigger mechanism. The trigger should not be allowed to become stiff.

Bait and lures

- The SA Conibear system is designed for use with 'sloppy' baits such as minced meat or 'sloppy' cat food.
- This ensures the cat triggers the trap with its head.
- The Timm's trap, Set-n-Forget trap and Belisle Super X220 are designed to take solid meat bait or solid baits (i.e. Connovations bait).
- Where possible, baits should consist of local food sources used by cats.
- Cats are flexible and opportunist in their diet. The most effective baits may differ with location and with the natural diet of cats in that location.
- Effective baits include: Meat - fresh and salted rabbit, hare, and possum and fish (fresh/frozen/salted).
- Baits should be changed regularly (timing will depend on environmental conditions) and disposed of away from the trap.
- Rotting bait close to the trap station may deter cats.

Skills required

- Program managers and project managers need a good working knowledge of cat ecology and the prey ecology in order to manage control operations effectively.



- Trappers should have a good working knowledge of cat behaviour. Specific on job training in the use of traps is essential.
- Training in the use of the SA Conibear system is required, contact staff listed in the information section.
- A consistently high standard of setting traps is essential – trappers must be dedicated to the work.
- Cats which escape from poorly set traps are often particularly hard to catch again.
- If working in bush, trappers need bush navigational skills involving compass and map reading.

Standards

Animal Welfare Act 1999

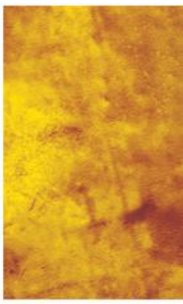
Under the Animal Welfare Act 1999, NAWAC developed draft guidelines for testing kill traps. The SA Conibear system [2], Belisle Super X220 system [3] Timm's trap [4], and Set-n-Forget trap [5] have passed the guidelines. It is recommended that only traps that have passed the NAWAC guidelines are used, because other traps that have not passed may eventually be prohibited or restricted [6]. Note: the SA Conibear trap and Belisle Super X220 must be used it the same way as when they were tested against the NAWAC guidelines.

Sustaining control over the long term

- It is essential that conservation outcomes are monitored in order to judge effectiveness of the control program.
- Currently there is no effective result monitoring technique for feral cat control operations. Control operations are useless unless outcomes are achieved.
- Cat abundance is strongly correlated with food availability.
- Techniques such as shooting, dogging and cage trapping can supplement trapping strategies.
- Good data collection helps operations to be more effective and efficient over the long term. What is recorded depends on what the project wants to know.
- Dogs trained to target cats under DOC's national predator dog program can be useful to check for the presence of cats and whether areas that require additional traps.

Limitations

- Non-target interference via removing bait (eg rodents, wasps, possums) or closing traps (getting caught or setting off) can affect ability to catch cats.



- In areas close to human settlement household pets are at risk. Cage traps are an alternative where people have concerns about domestic pets, farm animals and children.
- Careful placement of traps in high public usage areas is important.
- Cats are highly valued by many people. Non-targets eg Harrier hawks can be caught in traps

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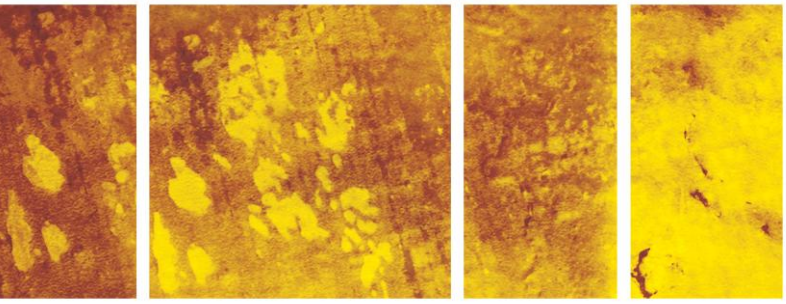


Monitoring indicates rapid and severe decline of native small mammals in Kakadu National Park, northern Australia

J. C. Z. Woinarski [A B E], M. Armstrong [A], K. Brennan [A], A. Fisher [A], A. D. Griffiths [A], B. Hill [A], D. J. Milne [A], C. Palmer [A], S. Ward [A], M. Watson [A C], S. Winderlich [D], S. Young [A]

[A] Department of Natural Resources, Environment, The Arts and Sport, PO Box 496, Palmerston, NT 0831, Australia.
[B] School for Environmental Research, Charles Darwin University, Casuarina, NT 0909, Australia.
[C] Present address: PO Box 601, Jabiru, NT 0886, Australia.
[D] Kakadu National Park, PO Box 71, Jabiru, NT 0886, Australia.
[E] Corresponding author. Email: john.woinarski@nt.gov.au

Abstract

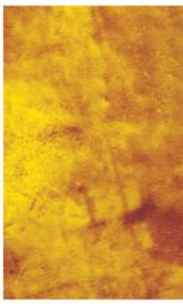
Context: Australia has a lamentable history of mammal extinctions. Until recently, the mammal fauna of northern Australia was presumed to have been spared such loss, and to be relatively intact and stable. However, several recent studies have suggested that this mammal fauna may be undergoing some decline, so a targeted monitoring program was established in northern Australia's largest and best-resourced conservation reserve.

Aims: The present study aims to detect change in the native small-mammal fauna of Kakadu National Park, in the monsoonal tropics of northern Australia, over the period of 1996–2009, through an extensive monitoring program, and to consider factors that may have contributed to any observed change.

Methods: The small-mammal fauna was sampled in a consistent manner across a set of plots established to represent the environmental variation and fire regimes of Kakadu. Fifteen plots were sampled three times, 121 plots sampled twice and 39 plots once. Resampling was typically at five-yearly intervals. Analysis used regression (of abundance against date), and Wilcoxon matched-pairs tests to assess change. For resampled plots, change in abundance of mammals was related to fire frequency in the between-sampling period.

Key results: A total of 25 small mammal species was recorded. Plot-level species richness and total abundance decreased significantly, by 54% and 71%, respectively, over the course of the study. The abundance of 10 species declined significantly, whereas no species increased in abundance significantly. The number of 'empty' plots increased from 13% in 1996 to 55% in 2009. For 136 plots sampled in 2001–04 and again in 2007–09, species richness declined by 65% and the total number of individuals declined by 75%. Across plots, the extent of decline increased with increasing frequency of fire. The most marked declines were for northern quoll, *Dasyurus hallucatus*, fawn antechinus, *Antechinus bellus*, northern brown bandicoot, *Isoodon macrourus*, common brushtail possum, *Trichosurus vulpecula*, and pale field-rat, *Rattus tunneyi*.

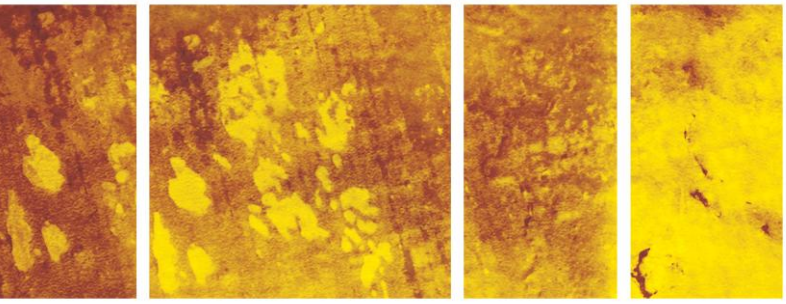
Conclusions: The native mammal fauna of Kakadu National Park is in rapid and severe decline. The cause(s) of this decline are not entirely clear, and may vary among species. The most



plausible causes are too frequent fire, predation by feral cats and invasion by cane toads (affecting particularly one native mammal species).

Implications: The present study has demonstrated a major decline in a key conservation reserve, suggesting that the mammal fauna of northern Australia may now be undergoing a decline comparable to the losses previously occurring elsewhere in Australia. These results suggest that there is a major and urgent conservation imperative to more precisely identify, and more effectively manage, the threats to this mammal fauna.

Woinarski, J.C.Z., Armstrong, M., Brennan, K., Fisher, A., Griffiths, A.D., Hill, B., Milne, D.J., Palmer, C., Ward, S., Watson, M., Winderlich, S., and Young, S. (2010) Monitoring indicates rapid and severe decline of native small mammals in Kakadu National Park, northern Australia. *Wildlife Research* **37**, 116–126.



Review of Cat Ecology and Management Strategies in Australia

Elizabeth Denny and Chris R. Dickman

University of Sydney and Invasive Animals Cooperative Research Centre

Felis catus, the domestic cat, occurs throughout the Australian mainland as well as on more than 40 islands off the Australian coast. Cats exploit diverse habitats, including deserts, forests, woodlands, grasslands, towns and cities, and occur from sea level to altitudes above 2000 m. The classification of cats as domestic, stray or feral reflects the varied ecology of cats and their dichotomous status in Australia — as both a valued pet species and an introduced feral predator.

Impacts

Feral cats are carnivorous hunters that depredate animals up to 2 kg, but more often take prey under 200 g. The feral cat is linked to the early continental extinctions of up to seven species of mammals. They are also linked to island and regional extinctions of native mammals and birds and have caused the failure of reintroduction attempts aimed at re-establishing threatened species. Today, 35 vulnerable and endangered bird species, 36 mammal species, seven reptile species and three amphibian species are thought to be adversely affected by feral cats. Other species are potentially affected by infectious diseases transmitted by cats. The true environmental and economic impact of feral cats has not been calculated.

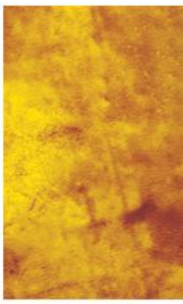
Legislation

In most Australian states and territories, legislation has been introduced to restrict the reproductive and predation potential of owned domestic cats. Many local government areas have introduced cat-specific legislation, with restrictions including the banning of cats as pets in some communities, compulsory neutering, individual identification, and containment of pet cats.

Predation by feral cats was listed as a Key Threatening Process under the Federal *Endangered Species Protection Act 1992* (now incorporated in the *Environment Protection and Biodiversity Conservation Act 1999*). *A Threat Abatement Plan for Predation by Feral Cats* was produced in 1999 and amended in 2008 to promote the recovery of vulnerable and endangered native species and threatened ecological communities.

Estimating abundance

The three most common techniques for estimating cat abundance in Australia are spotlighting, counting tracks, and bait uptake estimates. The accuracy of spotlighting is dependent upon the density of vegetative cover and cat behaviour; the accuracy of track counts depends upon where track pads are set and the competence of the operative in recognising tracks; and most bait uptake studies provide data on cat activity rather than relative abundance or densities.



All three techniques are best suited to open, dry habitats with low vegetative cover. In wetter, more closed and productive habitats with high vegetative cover, techniques such as remote photography and the analysis of DNA extracted from scats or hairs provide alternatives for estimating abundance or density. Such estimates are a necessary prerequisite for the implementation of control or eradication programs to avoid over- or under-commitment of labour, time and money, and are also necessary to measure the efficacy of management programs.

Techniques for control or eradication

A nationally coordinated program of feral cat control across Australia is not feasible, as it is with other introduced species, and control efforts are best targeted at protecting threatened species or habitats. All successful cat eradication programs in Australia have been conducted on islands or within areas bounded by predator-proof fencing, and most have required the use of more than one control method. Successful techniques for the control or eradication of cats on islands have proved largely impractical on the mainland. Hunting, trapping and shooting are time and labour intensive and not economically viable over large areas. Trap-neuter-return is unsuccessful in open populations and not practical over large areas. The introduction of disease (eg panleucopaenia) is restricted by the probable impact on owned domestic cats and the low transmission rate amongst widely dispersed feral cats. Toxins presently registered for cat baiting may have unacceptable environmental impacts on many habitats.

Research into more felid-specific toxins, cat attracting baits and lures and cat-specific toxin delivery systems may lead to the adoption of poisoning as the most widely used technique for the control or eradication of feral cats.

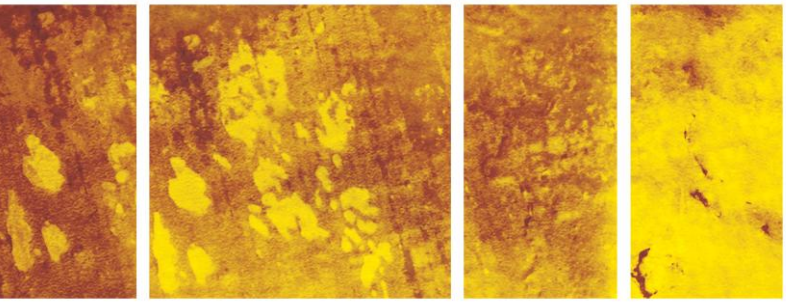
Management at the regional and local level

Management of feral cats requires reliable data on the density or relative abundance of cats in targeted areas, and analysis of the cost effectiveness and efficacy of the various control measures that may be implemented. At the regional and local level, eradication of cat colonies and the management of resource-rich artificial habitats to discourage colonisation by cats should be an adjunct to any feral cat control program. Implementation of companion animal legislation that requires firmer controls on the owned, domestic cat population is also an important consideration for the longer-term reduction of the feral cat population in Australia.

Factors limiting effective management

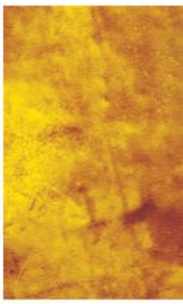
Although adequate legislation is in place in some jurisdictions, the problems associated with cat control programs in Australia include: the time, cost and social impacts associated with enforcing companion animal legislation; the acceptance in some states of cats as pest control agents; variable cat densities between habitats; relatively low bait acceptance by feral cats; a lack of programs aimed specifically at stray cat colonies exploiting highly modified habitats; little data on the impact of cat removal on populations of introduced rodents and rabbits; and few accurate estimates of the density or relative abundance of feral cats.

Research is needed to define the most successful methods for gaining public acceptance of the importance of maintaining effective companion animal legislation; estimating densities of



cats in various habitats; the cost effectiveness of control techniques including broadscale baiting; assessing the impact of the removal of colony-forming cats in resource-rich artificial habitats on the broader feral cat population; and assessing the impact of cat removal on both native and introduced small mammal populations and the further indirect effects of removal on other components of the biota.

http://www.feral.org.au/review-of-cat-ecology-and-management-strategies-in-australia/



Facilitated discussion notes

The output of the facilitated discussion is summarised in the following notes, which should be considered as a preliminary guide for future directions.

Specific points noted here do not necessarily represent the views of all workshop participants.

Facilitated Workshop Discussion 1

1. *What could be our five-year goal/what does success look like?*
2. *What's needed to get there?*
3. *Are there opportunities for strengthened collaboration?*
4. *Is our suite of control tools too limited?*

Group 1 report

Tools – ideally have all tools available – 1080, Eradicat, PAPP (curiosity), HSDV, toxin delivery tunnel

Markets will have sorted themselves out in five years based on efficacy plus non-target outcomes. Market in Australia will be large for baits at least. Prioritisation process needs to be used to pick best regional targets and mostly involve government lands (in the early stages and not precluding other lands in the future). International markets will accelerate progress in Australia.

Needs – greater variety of baits for all environments/seasons. Landscape application (aerial). Reduced application rates (due to more targeted application). Baits that take out cats and foxes. Greater safety for non-targets, eg Dingoes.

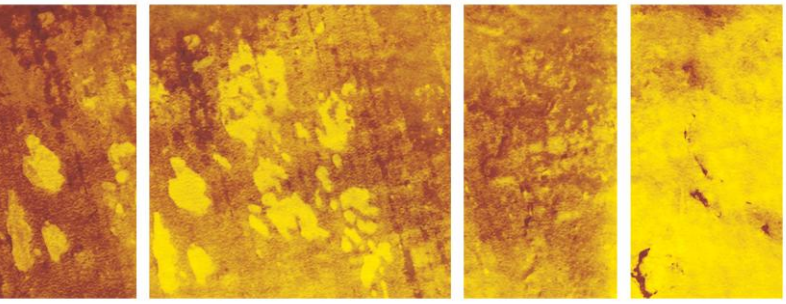
Better collaboration is needed.

Group 2 report

Tools available – Curiosity and Eradicat registered, Tunnel/Smart deliveries available. Attractants available.

Extension – recipe book of what works and when, a decision tree.

Collaboration – DSE/Tas Parks working together, that all trials involve collaboration, legislation is reviewed allowing for consistency across the States in management and potentially making it a requirement to control feral cats in certain situations. Revisit decision tree with personal anecdotes – allow the general community or cat management groups across Australia to see some success and failed stories, providing new groups on how best to manage cats in certain situations – a data bank of stories – web based.



Group 3 report

Success - Demonstrated ability of success of three control techniques, at scale and available (cost effective, registered, manufactured, scalability, supply security, quality assured, consistency). The ability to control/manage cats across different environments and different seasons (geographical/temporal). Education of managers, users, government/bureaucracy on best practice. Use will be dynamic according to situation (encourage recommendation approach). More understanding on the ecology of cats, habitats, refuga, timing (prey population) needed. Collaboration also needed.

Group 4 report

What defines success?

Registration and commercialization of a product.

An understanding of where the different products will work most effectively, where they are limited and why.

Native animals showing a recovery in response to the use of products.

Needed

Steps required getting to success mapped out.

Significantly reducing impacts of cats mirrored in longer-term come back of biodiversity.

Bench marks are required for the target species impacts and other biodiversity assests before we apply management techniques.

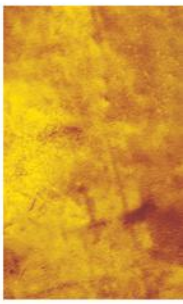
Cats needed to be listed as a pest animal state legislation – policy leadership.

Determine cost-effectiveness of techniques – breakdown into unit costs.

Longer-term horizons on biodiversity impact – so that we can implement management at the most appropriate time (an immediate effect of intervention is not the priority).

Collaboration

Assess the commercialization of PAPP baits for canids to inform how the commercialization of the cat baits and tunnels can be approached, so that pitfalls are avoided and the process accelerated.



Facilitated Workshop Discussion 2

Improving cat technologies – is our suite of control tools too limited?

Group 1 report

We need an accepted mix of monitoring methods for control programs – eg. Kangaroo Island using sand pads, is that the right way to go?

PAPP registered in NZ before Australia – are there things we can learn to accelerate registration in Australia?

Are there longer term strategies? For example indirect control by changing habitat – habitat manipulation – eradicating rabbits, fire regimes.

Timing – IA CRC rebid – two years to get PAPP registered. It is a good opportunity to roll out what we can do with the cat post by 2012. There is a risk that we'll have tools available, but then no funds available to promote and put them out there. Registration is just the beginning and we neede to sell it that way - but what happens if PAPP isn't registered in the life of the IA CRC?

APAS – national mechanisms to accelerate cat action eg APAS TAP.

Cat legislation in Tasmania overhauled. All cats microchipped and then it will be the same as dog ownership, keep on own property – tighter cat controls. This happens in Victoria now, but up to shires to enforce – does it happen?

There are not enough funds available to do the work – a lot of today is about collaboration – is enough of that happening, and if it's not, would extra funds be a solution. There is only a small bucket of money available - it's contested, so is diluted - strengthening collaboration may/will help use it more effectively. It's not too late now to work together. Can IA CRC help others out there and take this into five-year rebid? The IA CRC is a good body to attract funding, funding that may not come to fruition for others if they are not at the table to bring the players together.

Group 2 report

Monitoring recovery of native species after cat control, if we have tools, let's focus it.

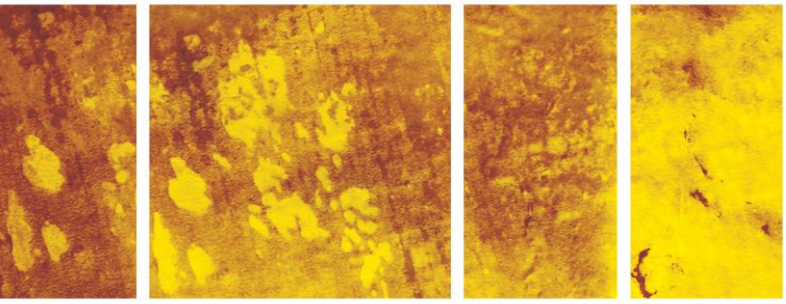
We need to create confidence in products with ongoing field trials. We need those trials to go well to further promote and create trust between IA CRC and States.

Once available, tools are made available for high priority areas.

Development of a monitoring toolbox for cats.

Integrated pest control.

No silver bullet approach – need a mix.



Pest Smart tool kit – collection of current info on all tools accessible by all.

Group 3 report

Targeting Achilles heel of cats – use of habitat, use of prey.

Synthesis of non-target data to date – needs publishing – large scope for information sharing.

PAPP trials with more reptiles needed, to better assess risk.

Worried about IA CRC ending – succession planning – needed for coordination – what happens when not around anymore.

Ability to have PAPP antidote will be a key driver in uptake by land managers.

Don't get too caught up in domestic cat education – it won't help reduce the feral population out there.

Biocontrol – keep a watching brief – may be a longer term option. Trying to get something registered will be difficult because of the domestic cat issue.

Group 4 report

Determine cost effectiveness of tools – cost per unit of effort - for bait, aerial, tunnels etc.

Longer timeframe to enable better measurement.

Development of toxin tunnels as a strategy is a good starting point. Baiting not necessarily targeting their weaknesses – so with toxin tunnels, look at other behavioural aspects of cats to find Achilles heel.

Consolidate cat radio-tracking, GPS and camera data - with increased understanding, create new tools.

Community understanding, responsible ownership.

Better ways of communicating the need to control cats and the benefits – greater package of information to provide to community on the delivery of tools.

Cat laws tightened on Kangaroo Island – cats should be chipped, registered and neutered.

Group discussion

Mapping out a way forward to manage impacts of feral cats across the different landscapes of Australia - what are the short- and long-term needs for each region of Australia, and for Australia as a whole?

We need to map out a way forward to manage impacts of feral cats across the different landscapes of Australia. Also, work out a sensible arrangement for the delivery of a tool (PAPP) that is best for Australia.

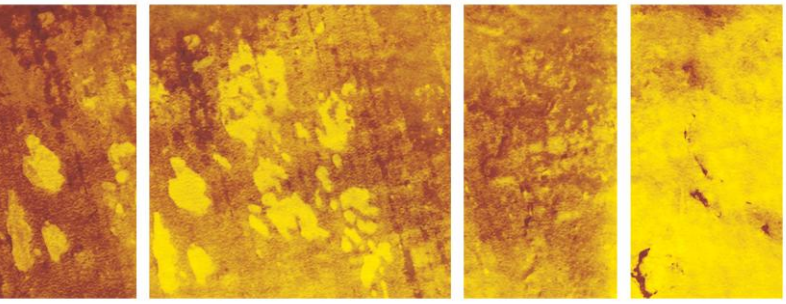
We should be engaging with more Councils about education re. domestic cat control. Some Councils currently do, but many Councils don't. We need to build understanding of the need for cat control amongst the community via engaging with the community. The Tasmanian community currently supports cat control. There was an absence of discussions today regarding the movement of domestic cats over to feral populations. In Tasmania the regulation of domestic cats is via the sale of kittens, which can only occur through limited avenues.

There was discussion on the issue of rural rubbish dumps and how domestic cats accessing dumps can become feral cats. There was a recommendation to encourage the regular burning of rubbish. Fencing was also discussed but vehicle access limits the effectiveness of enclosing dumps. Could rubbish dumps be used as feral cat lures and traps? There is strong community support for feral cat management, often there is a lack of government support, and hence cat management doesn't progress. Kangaroo Island has good cat management practices (desexing, microchipping of any cat entering KI). Christmas Island has total desexing of all cats on the island policy. Having said all that, cat control is 'more a numbers game'. Education is good, but it only takes one solitary cat to do a lot of damage (especially if it targets a particular prey species).

At this workshop there were no discussions regarding biological control as an option. There is a need to keep pushing the boundaries. Registration of biological control options would be difficult given the interaction between pet/domestic and feral cats. But in the future (20 to 50 years time) biological control could become possible as society/technology progresses. We can't imagine what options will be available then. There is genetic research on other pest species being undertaken. Agreement from some that the solution may not be here now, but who knows what the future holds?

We still seem to be 'stuck' in 'tools'. It's argued that we can't progress until the 'tools' are available. 'Tools' are our specialty, deal with that and leave the 'community support' aspect to the (support) specialists. Research is being done that will iteratively produce a bait that is effective for feral cats but additional work needs to occur to protect non-targets. Toxin tunnels are the start of a process where we are starting to look for behavioural points to exploit. Need to expand on this strategy. We need to consolidate camera and collar data so that we can interrogate it for cat behaviour that can be exploited with our current tools and start to design new tools.

Bait developers and bait testers need to be better integrated (communicate better). We need better ways of communicating the need and/or benefits of an intervention – greater package of public consultation prior to products being made available. There needs to be better communication between the Curiosity consortium and the IA CRC during the registration process. The IA CRC needs to provide support for additional uses of PAPP – toxin tunnels,



concentrates of PAPP etc. We have a tendency to fight over the set bucket of money when we should be collaborating.

Could funding have been more effectively used?

Funding could have been more effectively used, if the money was used to 'glue us together'. We should forget the past and get set up for the five year extension by prioritising efforts now and collaborating. The IA CRC is powerful in attracting funding and has a better chance than the smaller players. Smaller players are 'knocked out' as a result. We cannot forget the past as it is important in how cat projects got to this point. But let's now work on how to go from here collaboratively.

What are the things we can do now to pull all of the projects through to registration packages? Unfortunately money that the IA CRC has is all tied up in projects. Could we approach commercialisation with several target pests in mind? For example, baits that target multiple pests, like a fox and cat bait in one product, as opposed to pest specific baits that only tackle cats or foxes. Could we run this alongside the original fox bait package? Have to be pragmatic about protecting AWI's investment, or DEWHA or ACTA, whoever has invested in the product. The Intelectual Property (IP) would need to be put around the table and have all players together to hold these discussions. The market in Australia is too small to support several players with shared IP.

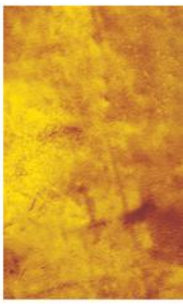
Discussion returned to multiple target bait options and whether it would be more beneficial to have several bait options available for each target species versus single bait available for several target species. Synthesis of non-target data is needed to better assess risk.

Could the Vertebrate Pests Committee (VPC) recognise cats as a pest animal of national significance? Could this be put to the VPC for consideration? Maybe the review of the current Threat Abatement Plans provides an opportunity when they are up for revision in 2013?

ACTION: agreement that the recognition of cats as a pest animal of national significance goes forward to the VPC, via the workshop paper.

ACTION: That the National Feral Cat Workshop Proceedings and an information paper go forward to VPC.

The Australian Pest Animal Strategy (APAS) national framework plan may also provide an opportunity. The interpretation of feral cats needs to be defined. What can we do to move on? Suggestion is to get the APVMA moving.



What would success look like?

1. A suite of tools suited to different landscapes and contexts

- Proven effective in reducing cat populations or impacts. Likely end-users should be involved in field trials to encourage future adoption.
- Products registered
- Commercially available; a secure supply of quality-assured products
- Affordable and cost-effective
- Non-target impacts are within acceptable limits
- Practical and useable

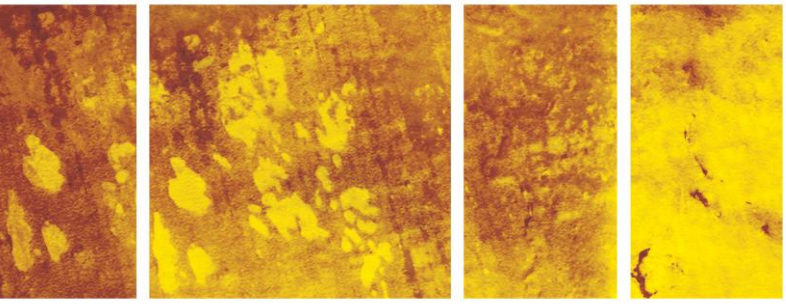
2. Control programs that are effective

- Land and resource managers with the capability to develop and conduct effective programs
- An understanding of the where, when and how of feral cat impacts, and an ability to implement the right type of management program at the right place at the right time
- Inclusion of species interactions and positive and negative responses to cat population reductions
- An ability to monitor the outputs and outcomes of management, such as cat activity and the response of native fauna

3. Political and community support

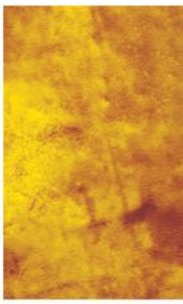
- National and State government support
- National mechanisms to accelerate action on feral cats (eg Australian Pest Animal Strategy, Threat Abatement Plans)
- Animal welfare organisations
- Community ownership
- Tighter controls on domestic cats

It was also noted that a succession plan was needed to progress further work in the event of the IA CRC no longer being able to do so. For example, who would be responsible for continuing product registrations if the IA CRC after the IA CRC closes?



Conclusions from the workshop

- Many collaborations were accelerated today; the challenge now is to capitalise on these. Annual meetings or an on-line forum for advice and sharing of data, published papers and the like would be very useful. An alternative would be to email project summaries annually, with a bi-annual meeting. It was agreed that face-to-face meetings are preferred, although they are more expensive.
- The commercialisation of PAPP baits for canids and the New Zealand registration experience should be assessed as case studies, to expedite the commercialisation processes for the cat baits and toxin tunnels.
- There is an immediate need to establish a practical arrangement for the delivery of cat control tools that will benefit the nation.
- There is a further need for a strategy or strategies that will facilitate the management of feral cat impacts across different Australian landscapes.



Closing discussion notes

**Contributions not listed were generally omitted because speakers could not be heard or identified.*

PIP MASTERS: Perhaps we should be engaging with more local councils about education regarding domestic cat control. Some Councils are currently active in this area, but many are not.

SIMON HUMPHRYS: An understanding of the need for cat control must be built through community engagement.

BILLIE LAZENBY, SUE ROBINSON OR LUKE GADD: There is strong community support for cat control in Tasmania, probably because of education and awareness.

STEVEN LAPIDGE: Given the absence of a 'silver bullet', what is the right mix of old and new contol tools?

SUE ROBINSON: The movement of domestic cats over to feral populations has not been heavily discussed today. In Tasmania, domestic cats are regulated through the sale of kittens, which can only occur through limited avenues, thereby accounting for all pet cats.

CHRIS DICKMAN: There is an issue with domestic cats accessing rural rubbish dumps and joining the feral population. It may be possible to manage these populations by recommending or encouraging the regular burning of rubbish. Fencing could also be possible, although it would often be difficult because of the need for vehicles to access dump facilities.

SIMON HUMPHRYS: Perhaps dumps could be used to lure feral cats for trapping.

PIP MASTERS: There is often a lack of government support for trapping in areas where there is strong community support, which prevents potential progress in managing cat impacts. Kangaroo Island Council has good cat management practises, which require the desexing and microchipping of any cat that enters the Island.

MICHAEL JOHNSTON: Domestic cats are heavily regulated on Christmas Island, where all cats are required to be desexed.

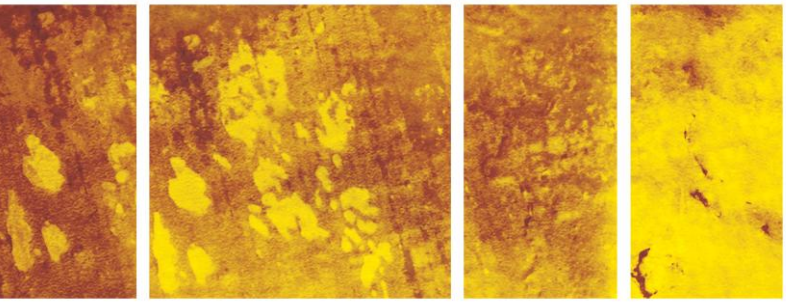
ELAINE MURPHY: Education is good, but it only takes one cat to inflict a lot of damage on a vulnerable resource, especially if that cat specialises on a particular type of prey.

JOHN READ: There has been no major discussion today of biological control options for feral cats. We need to keep pushing the boudaries of what might be possible.

STEVEN LAPIDGE: Registration of biological control options would effectively be impossible.

ELAINE MURPHY: In the future, perhaps 20 or 50 years, biological control could become possible as society and technology both progress. We can't currently imagine all of the options that might be possible then.

STEVEN LAPIDGE: A suitable virus is not available.



ELAINE MURPHY: There is genetic work being conducted in the background.

JOHN READ: A biological solution might not be apparent now, but it could be in the future.

SIMON MCGUINESS: We still appear to be stuck in a tools paradigm.

STEVEN LAPIDGE: It is not possible to progress beyond this stage until useful tools are developed and registered for use.

SUE ROBINSON: Tools are our specialty, and we should leave the community support aspect of feral cat management to the experts in that field.

UNKNOWN: Argued that there is insufficient funding available for the development and adoption of tools.

FRANK GIGLIOTTI: We have a tendency to compete over a fixed amount of money available for this sort of work when we should be collaborating.

STEVEN LAPIDGE: Commonwealth Government funding tends to be allocated to a few specific research organisations.

SIMON MCGUINESS: Could the available funding be used more effectively?

SIMON HUMPHRYS: Funding could be more effective if it were used to 'glue us together'.

STEVEN LAPIDGE: We should move on from the past and set the foundations for the IA CRC's five year extension bid by prioritising efforts now and collaborating more effectively.

FRANK GIGLIOTTI: The IA CRC is a powerful body for attracting funding, and has a better chance than smaller organisations. Consequently, smaller organisations and other interested parties are 'knocked out'.

DAVID DALL: We should not forget the past, as it is important in how the current suite of feral cat research projects have arrived at this point. However, it is important to move from here with greater collaboration.

DAMIAN MCRAE: Noted the importance of registration packages.

DAMIAN MCRAE or SIMON HUMPHRYS: What can we do to pull current projects through to registration?

STEVEN LAPIDGE: Money currently held by the IA CRC is commited existing projects.

ELAINE MURPHY: We should approach commercialisation with several target species in mind. For example, products that target multiple pests, such as a combined fox and cat bait, as opposed to existing products that target only foxes or cats. Could we run something like this alongside the existing fox bait package?

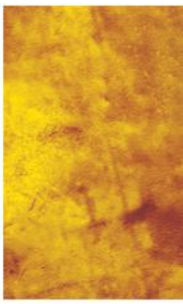
SIMON HUMPHRYS: We would have to be pragmatic about protecting existing investment from organisations such as AWI, DEWHA or ACTA. The intellectual property would need to be laid on the table and all parties would have to be involved in discssusions.

STEVEN LAPIDGE: The public tender process may affect the range of possible options anyway.

DAVID DALL: The Australian market is too small to support several parties with shared intellectual property.

SIMON HUMPHRYS: The government may be unlikely to encourage this.

ELAINE MURPHY & SIMON HUMPHRYS: General discussion about the relative merits of a multi-species bait option versus species-specific baits.



STEVEN LAPIDGE: The IA CRC would need to be involved in any tender for manufacture of a cat bait.

MICHAEL JOHNSTON, to DAVID DALL: Could feral cats be recognised as a Pest Animal of National Significance by the Vertebrate Pest Committee (VPC)?

DAVID DALL: This could be put to the VPC for consideration.

DAMIAN MCRAE: Current Threat Abatement Plans are due for revision in 2013; might this be an opportunity for listing of feral cats as a Pest Animal of National Significance?

GLEN SAUNDERS: The VPC is the only body capable of listing cats.

DAVID DALL: agrees with above.

GROUP: Agreement that the recognition of feral cats as a Pest Animal of National Signficance should be put to the VPC

SIMON MCGUINESS, to DAVID DALL: What would be the process for such an action?

DAVID DALL: Discusses the Australian Pest Animal Strategy (APAS), refering to his workshop paper.

MICHAEL JOHNSTON: The interpretation of 'feral cat' needs to be defined.

ELAINE MURPHY: What can be done now to move on?

DAVE ALGAR: Suggests that the Australian Pesticides and Veterinary Medicines Authority (APVMA) needs to 'get moving'.

STEVEN LAPIDGE: There may be potential for IA CRC support for John Read's 'Cat Assassin' project.

KEITH MORRIS: Suggests animal meetings of feral cat research groups.

GROUP: General discussion about the logistics of this suggestion, especially relating to funding as the IA CRC budget could not be expected to cover the cost of future meetings.

JOHN READ: An alternative could be to email project summaries annually, with a bi-annual meeting.

SIMON HUMPHRYS: An online forum would be a useful tool for collaboration.

UNKNOWN: Perhaps 'feral.org' could provide a channel for communication.

GROUP: Broad agreement that face to face meetings were highly desirable.

ELAINE MURPHY: Mentioned that the last cat workshop was held at the 14th AVPC in June 2008, so it had been timely to hold another one. Participants were thanked for contributing and the workshop was closed.

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