Submission on:

Inquiry into the problem of feral and domestic cats in Australia

Centre for Ecosystem Science, UNSW, Sydney

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1. Executive Summary

The Centre for Ecosystem Science and the Wild Deserts project welcomes the opportunity to provide advice to this important inquiry. We provide seven recommendations which we believe would increase the effectiveness of management of feral and domestic cats and reduce their damage, reflecting the current state of scientific knowledge.

Our team of scientists from Wild Deserts have been heavily involved in clearly documenting the impact of feral cats on native wildlife over the last 25 years, as evidenced by our research (Short et al. 2019, McGregor et al. 2020, Moseby et al. 2020a). Our research suggests feral cats are the most significant barrier to successful reintroductions of threatened species in the arid zone with numerous reintroduction projects failing due to predation by feral cats (Moseby et al. 2011b, Moseby et al. 2015, Moseby et al. 2019, Short et al. 2019). Feral cats also kill in situ populations of threatened species such as rodents, dasyurids, birds and reptiles (Woinarski et al. 2018). We have found that even species up to several kilograms in body weight such as rock wallabies are killed by feral cats (Read et al. 2019a).

Our research has shown that individual cats can have disproportionate impacts on threatened species populations and can cause high mortality rates of threatened species. These cats are usually large, male and in good body condition ie expert hunters (Moseby et al.2015).

Domestic cats are also widespread and have disproportionate impacts on all biodiversity compared to native predators due to their much higher densities (Legge et al. 2020), These impacts of domestic cats are more severe than many owners appreciate because only a fraction of kills are seen by owners and prey that escape cat predation have among the highest mortality rates of injured wildlife.

2. Recommendations

Recommendation 1: There should be an adoption of more harmonised legislation and regulation which takes a risk-based approach in relation to trialling and improving new control methods. Once approved in one state, there should be approval in all states.

Recommendation 2: There should be legislation and regulation, with compliance, ensuring that pet cats are registered, desexed (unless registered breeders) and microchipped, and contained indoors or on the owner's property at all times.

Recommendation 3: Tighter regulation and enforcement of laws preventing deliberate feeding of stray cats and inadvertent supplementation through unfenced dumps (council, industry, mining camps etc) are required to reduce high densities of cats contributing to predation and disease impacts.

Recommendation 4: There should be a national framework for the control, investment in new approaches and survey of domestic and feral cat populations, which can report on measures to improve outcomes in reducing biodiversity impacts of cats.

Recommendation 5: There should be increased investment in developing new cat control technologies with a focus on methods that will enable future co-existence between native wildlife and feral cats. Field trials of new technologies should have improved approval processes to facilitate faster trials and quicker uptake of new technologies.

Recommendation 6: Import controls should prohibit the import of any other large cat species, or variant large domestic cats or their hybrids, unless as exhibits for approved zoos or equivalents.

Recommendation 7: Domestic cats have significant impacts on native wildlife, particularly where urban or farm areas are near wildlife habitats. There should be improved education about the impacts of these domestic cats on wildlife and what the public can do to control the impacts of their pet cats.

3. Centre for Ecosystem Science, UNSW Sydney

The Centre for Ecosystem Science (CES), UNSW Sydney, supports instruments of government and communities, including strategies, policies and management actions that improve effectiveness of biodiversity conservation, founded on a strong evidence base. Researchers in CES have established track records in the research and management of Australia's biodiversity, both within and outside protected areas. This includes investigations of the effects of introduced species, including feral cats, on biodiversity, including threatened species. In particular, researchers focus on the three main realms of biodiversity (freshwater, terrestrial, marine) in the natural world (https://www.ecosystem.unsw.edu.au/) and welcome the opportunity to provide a submission on this inquiry on behalf of the Centre for Ecosystem Science, UNSW Sydney.

4. Wild Deserts Project

Our Wild Deserts' project is in Sturt National Park in northwestern NSW (35,000 ha). It is a partnership between CES, Ecological Horizons and NSW National Parks and Wildlife Service. We have considerable and growing experience in the management of biodiversity affected by feral cats. The Wild Deserts project area is bounded on the northern and western sides by the dingo fence, which aims to exclude dingoes *Canis familiaris* from NSW, to protect domestic livestock. For restoration of the area, we aim to eradicate and control introduced animals, manage native herbivores, remove artificial waters and reintroduce seven regionally-extinct mammals. The Wild Deserts Project aims to reintroduce seven locally extinct mammal species: burrowing bettong (*Bettongia leseuer*), greater bilby (*Macrotis lagotis*), western barred bandicoot (*Perameles bougainville*), golden bandicoot (*Isoodon auratus*), greater stick-nest rat (*Leporillus conditor*), crest-tailed mulgara (*Dasycercus cristicauda*) and western quoll (*Dasyurus geoffroii*). This has required construction of two 2000-ha feral-species-proof exclosures (Pedler et al. 2018, Kingsford et al. in press). A major focus is the control of feral cats which significantly impact biodiversity, including threatened species (Kingsford et al. in press). We have also established a 10 400-ha 'Wild Training Zone', where we control feral cats at low densities to allow biodiversity to survive and increase. This requires introduction of novel methods of

controlling and measuring impacts of feral cats. Wild Deserts has a vision: 'To understand, restore andpromote desert ecosystems through ecosystem manipulations, reintroductions and collaborative partnerships' (Pedler et al. 2018). Wild Deserts occupies the traditional land of the Wongkumara and Maljangapa Aboriginal people, developed for grazing sheep and cattle in the early 19th Century, before becoming a national park in 1972. Our Wild Deserts Research and Management team includes: Professor Richard Kingsford, Dr Reece Pedler, Dr Rebecca West, Professor David Keith, Dr Keith Leggett, Professor Mike Letnic, Dr Katherine Moseby, Dr John Read and Sharon Ryall.

5. Introduction

Our approach to this submission represents the team's collective research experience in active management and control of feral cats, including our current management of the Wild Deserts' project is in Sturt National Park. We address each of the eight terms of reference providing recommendations where relevant.

6. Terms of reference

a. The prevalence of feral and domestic cats in Australia;

In the arid zone, where our research is focussed, feral cats are found throughout, in every habitat type (Legge et al. 2017). They survive without free water or human contact and live as a wild species feeding on native wildlife, in all ecosystems, from sandy deserts to gibber plains and freshwater ecosystems. They occupy home ranges which vary with different factors (Bengsen et al. 2016).

b. The impact of feral and domestic cats including on native wildlife and habitats;

Our team of scientists from Wild Deserts have been heavily involved in clearly documenting the impact of feral cats on native wildlife over the last 25 years, as evidenced by our research (Short et al. 2019, McGregor et al. 2020, Moseby et al. 2020a). Our research suggests feral cats are the most significant barrier to successful reintroductions of threatened species in the arid zone with numerous reintroduction projects failing due to predation by feral cats (Read and Bowen 2001, Moseby et al. 2011b, Moseby et al. 2015, Moseby et al. 2019, Short et al. 2019). Feral cats also kill in situ populations of threatened species such as rodents, dasyurids, birds and reptiles (Woinarski et al. 2018). We have found that even species up to several kilograms in body weight such as rock wallabies are killed by feral cats (Read et al. 2019a).

Our research has shown that individual cats can have disproportionate impacts on threatened species populations and can cause high mortality rates of threatened species. These cats are usually large, male and in good body condition ie expert hunters (Moseby et al. 2015).

Domestic cats are also widespread and have disproportionate impacts on biodiversity compared to native predators due to their much higher densities (Legge et al. 2020). These impacts of domestic cats are more severe than many owners appreciate because only a fraction of kills are seen by owners and prey that escape cat predation have among the highest mortality rates of injured wildlife.

Recommendation 1: There should be an adoption of more harmonised legislation and regulation which takes a risk based approach in relation to trialling and improving new control methods. Once approved in one state, there should be approval in all states.

Recommendation 2: There should be legislation and regulation, with compliance, ensuring that pet cats are registered, desexed (unless registered breeders) and microchipped, and contained indoors or on the owner's property at all times.

c. The effectiveness of current legislative and regulatory approaches

There are two key areas for improvement in current legislative and regulatory approaches: control of feral cats and domestic cats. There are a range of methods used to control cats, including trapping, shooting and poisoning by baits or grooming traps. These are variously effective depending on resourcing, cat hunger, prey populations and habitat. We need legislation to allow the control of feral cats in all states and territories and an easier pathway for trialling new technologies for cat control. Recent experience with attempting to undergo field trials to test novel poison delivery systems for cats suggests that this is a significant barrier to finding new methods of control. Funding opportunities for developing novel methods and field trialling them are also very limited despite the fact that cats are more difficult to control than foxes. There is a need to more quickly adopt novel and effective techniques. Currently there is a state by state approach to regulation. This is an area where there could be considerable harmonisation in approaches whereby one state could adopt legislative and regulatory approaches from another jurisdiction once there has been sufficient review of the potential impacts on non-target fauna. Most importantly, there needs to be more of risk management as opposed to a no risk approach, which is currently predominant, given the impacts of feral cats on biodiversity. This approach should include assessing the relative risk to wildlife of **not** conducting feral cat control, rather than solely concentrating on potential risks of feral cat control.

For domestic cats, there are obvious and well understood options which could be legislated and regulated. They would not affect the enjoyment that people get from having cats and would indeed improve the welfare, health and longevity of pet cats. All pet cats should be kept indoors or confined to the owner's property and be registered, microchipped and spayed or castrated.

Aggregations of stray and feral cats around food sources (including dumps and illegal feeding stations) create local sinks of predation pressure and supplement feral cat populations. Greater enforcement of laws prohibiting outdoor stray cat feeding and requiring dumps to be fenced will greatly assist reducing the impacts of stray and feral cats.

Recommendation 3: Tighter regulation and enforcement of laws preventing deliberate feeding of stray cats and inadvertent supplementation through unfenced dumps (council, industry, mining camps etc) are required to reduce high densities of cats contributing to predation and disease impacts.

d. *The effectiveness of Commonwealth action and cooperation with states and territories on this issue, including progress made under the Threat Abatement Plan, national framework and national declaration relating to feral and domestic cats in Australia;*

There is a need for improved consistency among the States and the Commonwealth in relation to action and cooperation, which is currently improving. In particular, there needs to be active reporting of new and novel effective methods of control which can be rapidly implemented (see comment on regulation and legislation). There also needs to be improved reporting at state and Commonwealth levels on the impacts of feral cats on native wildlife and a coordinated program of investment in cat control and survey.

Recommendation 4: There should be a national framework for the control, investment in new approaches and survey of domestic and feral cat populations which can report on measures to improve outcomes in reducing biodiversity impacts of cats.

e. *The efficacy (in terms of reducing the impact of cats), cost effectiveness and use of current and emerging methods and tools for controlling feral cats, including baiting, the establishment of feral cat-free areas using conservation fencing, gene drive technology;*

UNSW/Wild Deserts recognise the challenge and importance of managing feral cats to enable reintroductions of threatened wildlife. We are proposing to conduct pioneering field trials of several promising new techniques (Felixer Grooming Traps and Population Protection Implants) to reduce cat impacts on reintroduce threatened species. In particular, we focus on monitoring the efficacy of key methods of control.

i. *Poison Baiting*

Research conducted by us and others suggests that poison bait uptake by cats is generally low or highly variable (Moseby et al. 2011a, Moseby et al. 2011b). When alternative prey are present, including house mice or rabbits, the efficacy of baiting is significantly reduced as cats prefer live prey over scavenging. This has been a major hurdle for effective control of cats in areas where alternative prey are present (Moseby and Hill 2011, Moseby et al. 2019). Poison baiting can also have non-target impacts and we have been developing different methods to reduce non target impacts and increase bait uptake by cats.

ii. *Felixer Grooming Traps*

One of our team, Dr John Read, is responsible for the invention and development of the Felixer Grooming Trap. The Federal Government have supported R&D and commercialisation of Felixers, considered to be a very high priority for action in the Threat Abatement Plan for Predation by Feral Cats. Optimised Felixers have since proven to be highly targeted and efficient at controlling feral cats with particular value in areas where baiting is not permitted or for cats that are reluctant to take baits or enter traps (Read et al. 2019b, Moseby et al. 2020b). Felixers have also proven useful in eradicating cats from fenced reserves and for minimising cat incursions and reducing cat predation outside fenced reserves (where cats congregate to prey on emigrating wildlife). Greater attention to deploying Felixers around reserves and along feral cat reinvasion pathways and native wildlife corridors

should assist threatened wildlife to colonise areas outside reserves. Other fences and barriers (e.g. along highways or around rubbish dumps) are also prime locations for Felixers to be deployed to reduce feral cat and fox predation without exposing wildlife or pets.

iii. *Population Protecting Implants*

Another feral cat management tool under development is the Population Protection Implant, a microchip sized poison dose that is inserted safely in prey animals (Toxic Trojans) that will kill a cat that eats them (Read et al. 2016). This is designed to prevent the catastrophic predation that threatens many isolated or reintroduced populations when a small number of cats learn to kill and then target rare species (Moseby et al. 2015). More support for these new technologies that specifically target those feral cats causing most serious problems would be welcomed.

iv. *Reducing introduced prey abundance*

Our research has shown that when the density of rabbits and house mice (introduced prey) can be significantly reduced, the results of cat baiting is significantly increased. This suggests that ripping rabbit warrens or conducting mouse or rabbit control is essential to improved cat control in areas where these species co-habit.

v. *In situ predator training*

We have demonstrated that feral cats are the leading cause of reintroduction failure in arid Australia and that successful reintroductions are almost always conducted onto islands or fenced reserves where cats are excluded. However, this only exacerbates prey naivety where native species haven't co-evolved with cats and lack appropriate anti-predator traits. We have been trialling a new method of exposing native prey to low densities of cats over long time periods to try and accelerate natural selection and stimulate learning (Moseby et al. 2015). Our results suggest that native species can co-exist with cats at low density (Moseby et al. 2019) and over time they can improve their physical and behaviour anti-predator traits (Atkins et al. 2016, West et al. 2018, Ross et al. 2019). These results suggest that in order to re-establish threatened mammals back into the wild, we need to facilitate low level exposure to cats over long time periods. Thus control methods are needed that will lower cat density to very low levels to give native species time to adapt and evolve.

Recommendation 5: There should be increased investment in developing new cat control technologies with a focus on methods that will enable future co-existence between native wildlife and feral cats. Field trials of new technologies should have improved approval processes to facilitate faster trials and quicker uptake of new technologies.

f. The efficacy of import controls for high risk domestic cat varieties to prevent the impacts of feral and domestic cats, including on native wildlife and habitats;

Introducing new high risk cat varieties has to be avoided. Banning the Savannah Cat, which was a large cat, which could easily have become feral was very prudent. Our research suggests that cat body size is the most important predictor of predation impact on threatened mammalian prey >500g (Moseby et al. 2015, Moseby et al. 2020a). This means that

introducing cats that are larger or better hunters than existing cats in Australia will lead to catastrophic outcomes for wildlife. In addition, any other cat hybrids should not be permitted to be imported into Australia unless they possess traits making them more suitable for indoor living (e.g. docile).

Recommendation 6: Import controls should prohibit the import of any other large cat species, or variant large domestic cats or their hybrids, unless as exhibits for approved zoos or equivalents.

g. Public awareness and education in relation to the feral and domestic cat problem; and

Public awareness, given the many cats people have as pets, is critically important in terms of the public understanding the need to control their pets and limit the impact of cats of wildlife. There is also a misconception that feral cats are simply pet cats that have gone wild. This is not the case with most feral cat populations in regional Australia living independent from human contact and breeding and maintaining their own populations.

Improved public awareness and education should include more public information on the impacts of cats and how the public can play an important role in limiting this devastating impact. These issues are canvassed broadly in two popular publications (Dickman et al. 2019, Read 2019), including by one of our team. These have continued to shift public opinion towards the urgency for control of feral and stray cats for environmental and health reasons. The public are increasingly asking or demanding that policy makers introduce tighter control of feral and free-ranging domestic cats.

Although the wildlife predation risks of feral cats are now well understood, greater awareness of the role of outdoor cats in spreading diseases to humans and livestock are not well recognised. A soon to be published study (Legge et al. in press) estimates the annual costs of these cat-borne diseases to the human health budget in Australia to be in excess of $6B a year.

One concerning trend that would benefit from more awareness is the misplaced support from some community members for Trap Neuter Release (TNR), as a tool to reduce numbers of stray cats. Numerous studies have shown that TNR is ineffective and sometime counterproductive, including leading to greater risks to animal welfare, conservation and public health. Federal, State and Local Governments should follow the lead of the Brisbane City Council in prosecuting individuals who repeatedly (after warnings) feed uncontained cats because it is the supplementary feeding that enables cat numbers to increase to high densities.

Recommendation 7: Domestic cats have significant impacts on native wildlife, particularly where urban or farm areas are near wildlife habitats. There should be improved education about the impacts of these domestic cats on wildlife and what the public can do to control the impacts of their pet cats.

h. The interaction between domestic cat ownership and the feral cat problem, and best practice approaches to the keeping of domestic cats in this regard.

Many feral cats, particularly around urban communities, can be domestic cats which have either bred and been discarded or live as ferals in urban and farm communities. There is a strong relationship between cat ownership and management and the feral cat problem because of this interaction.

Free ranging domestic cats cause many of the same health, societal, environmental and animal welfare issues as feral cats, hence management of free ranging pet cats is important irrespective of their leakage to feral populations. Cat care advocates, breeders, vets, public health officials, ecologists and conservationists are united in advocating for pet cats to be contained to properties, ideally in inside/outside cat runs. New legislative options requiring pet cats to be desexed, registered and contained are increasingly be adopted by councils, usually driven by strong public support. Cat laws are now mirroring dog management laws and ideally should be matched by similar registration costs and fines for transgressions.

However, councils are now realising that enforcement of registration and containment bylaws is important but very challenging, because unlike dogs wandering cats are typically not able to be caught and identified. A solution being investigated by several councils in South Australia, with the support of the Dog and Cat Management Board, is the use of specially coded registration tags, matching a cat's microchip number, and coordinated by the DACO pet registration system. Wandering registered cats can be detected and photographed remotely, providing councils with evidence for awareness or compliance enforcement for their owners.

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