

**Submission to the House of Representatives Standing Committee
on the Environment and Energy**

Inquiry into the Problem of Feral and Domestic Cats in Australia

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1. INTRODUCTION

The House of Representatives Standing Committee on the Environment and Energy Inquiry into the Problem of Feral and Domestic cats in Australia (Cat Inquiry) has broad terms of reference, ranging from the prevalence and impact of cats on native biodiversity, to the effectiveness of regulatory approaches and the importance of public education. In initiating the Cat Inquiry, the House Committee has said it will take into account other relevant inquiries and reviews, particularly the 2017 *Victorian Parliamentary Inquiry into the Control of Invasive Animals on Crown Land* (Victorian Inquiry).¹

In addition to the Victorian Inquiry, this submission also draws upon a range of policy documents, including:

- Environment Australia, Biodiversity Group, *Threat Abatement Plan for Predation by Feral Cats*, (1999);²

¹ Parliament of Victoria, Environment, Natural Resources and Regional Development Committee *Inquiry into the Control of Invasive Animals on Crown Land* (2017), available from https://www.parliament.vic.gov.au/images/stories/committees/enrc/Invasive_Animals_on_Crown_land/Final_Report/ENRRDC_58-04_Text_WEB.pdf.

² Environment Australia, Biodiversity Group, *Threat Abatement Plan for Predation by Feral Cats*, (1999), available from <file:///C:/Users/admin/AppData/Local/Temp/F2008B00668.pdf>.

- Australian Government, *Threatened Species Strategy*, Department of the Environment and Energy (2015);³
- Department of the Environment, *Threat Abatement Plan for Predation by Feral Cats*, Commonwealth of Australia, 2015;⁴
- The *ACT Pest Animal Management Strategy*, 2012-2022, Environment and Sustainable Development (2012);⁵
- Biosecurity Tasmania, *Tasmanian Cat Management Plan, 2017-2022*, Department of Primary Industries, Parks, Water and Environment (2017);⁶
- Department of Agriculture, Water and the Environment, *Invasive Plants and Animal Committee, Australian Pest Animal Strategy 2017-2027*, Commonwealth of Australia (2017).⁷

In this submission we focus principally on item “c” in the House Committee’s terms of reference for the Cat Inquiry, namely “the effectiveness of current legislative and regulatory approaches,” although there may be some overlap with other terms of reference.

We address in subsequent numbered sections of this submission three issues central to the Committee’s assessment of current law and policy and any changes it may wish to recommend:

1. What is a prudent and reasonable way to set management goals for domestic cats, feral cats and stray cats (as separate categories) in the light of the best available data about their numbers and their impacts?
2. What is the mix of techniques available for dealing responsibly and humanely with domestic cats, feral cats and stray cats (as separate categories) to manage their numbers and their impacts within the constraints of available resources and public opinion?
3. What legal and policy framework is needed to ensure that the relationship between management goals and techniques varies appropriately, depending on where problems occur and how serious they are, and so that “one size fits all” solutions are avoided?

³ Australian Government, *Threatened Species Strategy*, Department of the Environment and Energy (2015), available from <http://www.environment.gov.au/system/files/resources/51b0e2d4-50ae-49b5-8317-081c6afb3117/files/ts-strategy.pdf>.

⁴ Department of the Environment, *Threat Abatement Plan for Predation by Feral Cats*, Commonwealth of Australia, 2015, 6, available from <http://www.environment.gov.au/system/files/resources/78f3dea5-c278-4273-8923-fa0de27aacfb/files/tap-predation-feral-cats-2015.pdf>.

⁵ ACT Government, Environment and Sustainable Development, *ACT Pest Animal Management Strategy, 2012-2022*, Environment and Sustainable Development (2012), available from, https://www.environment.act.gov.au/_data/assets/pdf_file/0008/575117/PAMS_WEB.pdf.

⁶ Biosecurity Tasmania, *Tasmanian Cat Management Plan, 2017-2022*, Department of Primary Industries, Parks, Water and Environment (2017), available from <https://dpiwwe.tas.gov.au/Documents/TASMANIAN%20CAT%20MANAGEMENT%20PLAN%20FINAL.pdf>.

⁷ Department of Agriculture, Water and the Environment, *Invasive Plants and Animal Committee, Australian Pest Animal Strategy 2017-2027*, Commonwealth of Australia (2017), available from <https://www.agriculture.gov.au/sites/default/files/sitecollectiondocuments/pests-diseases-weeds/consultation/apas-final.pdf>.

While this submission focusses on feral and stray cats, it is important that stray cats are differentiated from domestic (owned cats). The significance of this distinction is elaborated in part 3.4 of this submission, which deals with Trap-Neuter-Return (TNR) as a means of regulating urban and peri-urban stray cats. Accordingly, the numbered submissions which follow, differentiate among categories of cats, so that submission Five, for example, which is made with respect to TNR is relevant to a regulatory regime aimed at urban and semi-urban cats and may be less suitable for a regulatory regime aimed at protecting native species in more open and remote parts of the country.

Throughout this submission we use the terms “feral cats” and “stray cats,” in the way these terms are defined by the *Threat Abatement Plan for Predation by Feral Cats 2015*: feral cats describes cats who live and reproduce in the wild (e.g. forests, woodlands, grasslands, deserts) and survive by hunting or scavenging. None of the needs of these cats are satisfied intentionally by humans.⁸ Feral cats can and should thus be differentiated from the stray cats found in and around cities, towns and rural properties. Strays may depend on some resources provided by humans but are not owned.⁹

2. DATA AND ITS RELATIONSHIP TO MANAGEMENT GOALS

One of the persistent even inevitable challenges of managing unwanted or pest animals is that decisions about them have to be made on the basis of incomplete data. Yet, reports and policy recommendations can be found that begin with remarkable certitude. Consider two examples:

Pest animals impose significant economic, social and environmental costs on NSW. They can affect agricultural productivity; access to export markets, public health and amenity; and the conservation of biodiversity.¹⁰

There is no doubt that invasive animals are a problem in Victoria. They impact on agriculture by preying on livestock, consuming pasture and damaging fences. They harm the environment by killing native species, damaging native vegetation and competing with native animals for food. They threaten people’s safety and amenity through car accidents and the fear of being attacked¹¹

⁸ Department of the Environment, *Threat Abatement Plan for Predation by Feral Cats*, Commonwealth of Australia, 2015, above 4, 6.

⁹ Department of the Environment, *Threat Abatement Plan for Predation by Feral Cats*, Commonwealth of Australia, 2015, above 4, 6.

¹⁰ New South Wales, Natural Resources Commission, *Supplementary Pest Control Trial*, Final Evaluation, 1, available from

<file:///C:/Users/admin/AppData/Local/Temp/Supplementary%20pest%20control%20-%20Final%20evaluation%20report%20-%20February%202017.pdf>.

¹¹ Parliament of Victoria, Environment, Natural Resources and Regional Development Committee *Inquiry into the Control of Invasive Animals on Crown Land* (2017), above 1, xiii.

While the impacts of invasive animals can be legally listed as threatening processes,¹² and the animals themselves can be legally declared to be pests¹³ and thus be made the subjects of a number of management plans and strategies,¹⁴ the fact that an animal can be legally declared to be a problem in one legal context does not warrant the conclusion by extrapolation that listed animals will be a problem everywhere they are found. By the same token, management methods and techniques found to be economical and effective for one species, or for a species in a particular situation, cannot be assumed to be economical and effective for all species or for a given species in different situational contexts.

In the particular case of feral cats, the significance of persistent and perhaps irreducible limitations in the best available data about the scope and extent of the threats they pose to native species is that management recommendations, whether they are presented simply as efforts to control but in some cases completely to eradicate feral cats, are almost always incorrectly targeted.¹⁵

A recent study on biodiversity decline in the Top End of Australia concluded, for example, that killing feral cats were not necessarily the best method to protect native species:

Our results suggest the best way to manage the impact of cats in this region may not be to simply kill cats, which is notoriously difficult across vast, remote landscapes. Instead, it may be more effective to manage habitat better, tipping the balance in favour of native mammals and away from their predators.¹⁶

In the same vein, the *ACT Pest Animal Management Strategy, 2012-2022* says that more research on feral cats is needed, particularly with respect to the probable effectiveness of eradication and control techniques. The strategy indicates that, apart from trapping and shooting at ecologically important sites, the feral cat's "[e]cological role as a predator/competitor [still] needs to be determined if a broad-acre control program is contemplated."¹⁷

¹² *Biodiversity Conservation Act 2016* (NSW), schedule 4.

¹³ Local Land Services (Wild Dogs) Pest Control Order 2015, under the Local Land Services Act 2013, NSW Government Gazette No 62 of 24 July 2015, 2234, Clause 7(a), available from https://www.dpi.nsw.gov.au/_data/assets/pdf_file/0020/602039/Wild-Dog-PCO.pdf.

¹⁴ Department of Sustainability, Environment, Water, Population and Communities, *National Feral Camel Action Plan: A National Strategy for the Management of Feral Camels in Australia*, (2010) available from <http://www.environment.gov.au/system/files/resources/2060c7a8-088f-415d-94c8-5d0d657614e8/files/feral-camel-action-plan.pdf>; Department of the Environment, *Threat Abatement Plan for Predation by Feral Cats*, Commonwealth of Australia, 2015, above 4, 6.

¹⁵ William Lynn, "Australia's War on Feral Cats: Shaky Science, Missing Ethics", October 7, 2015, the Conversation, <https://theconversation.com/australias-war-on-feral-cats-shaky-science-missing-ethics-47444>; William S Lynn, Arian Wallach and Francisco J Santiago-Avila, "Don't Blame Cats for Destroying Wildlife – Shaky Logic is Leading to Moral Panic", *The Conversation*, 30 July, 2020, available from, <https://theconversation.com/dont-blame-cats-for-destroying-wildlife-shaky-logic-is-leading-to-moral-panic-138710>; William S Lynn, Francisco J Santiago-Avila, John Hadidan, Arian Wallach and Joann Lindenmayer, "Misunderstandings of Science and Ethics in the Moral Panic Over Cats: Reply to Crespín et al. 2020", 2020 (Early View 05 May 2020) *Conservation Biology*, 1, <https://conbio-onlinelibrary-wiley-com.ezproxy.lib.uts.edu.au/doi/10.1111/cobi.13527>.

¹⁶ Alyson Stobo-Wilson, Brett Murphy, Graeme Gillespie, Jaana Dielenberg, and John Woinarski, "The Mystery of the Top End's Vanishing Wildlife, and the Unexpected Culprits", *The Conversation*, July 29, 2020, available from <https://theconversation.com/the-mystery-of-the-top-ends-vanishing-wildlife-and-the-unexpected-culprits-143268>.

¹⁷ ACT Government, Environment and Sustainable Development, *ACT Pest Animal Management Strategy, 2012-2022*, above 5, 70.

These qualifications signal underlying problems with recommendations for the broadscale, lethal control of feral cats, most especially where such recommendations are rolled out in the face of inadequate data about how expensive they are going to be and their likely effectiveness.

The sensitivity to incomplete data of regulatory regimes for species suspected of visiting unwanted and unacceptable impacts on valued, native species is certainly variable. Beginning in February 2014, for example, the New South Wales National Park and Wildlife Service trialled recreational hunting as a supplementary means of killing introduced (pest/non-native) animals in New South Wales (NSW) parks and reserves. The final report on this trial said that it was not possible to draw firm conclusions on the benefits of the killing, because it was a short term intervention and there was no associated or systematic ecological monitoring of the impacts attributed to the intervention.¹⁸ The report nevertheless gave approval for the trial to continue, recommending that monitoring systems be established, but without recommending how the costs of monitoring the impacts of the intervention could be budgeted, separately from the costs of the intervention itself. Given that the cost of the trial alone was significant, almost six million Australian dollars, it is difficult to understand how this this level of funding could have been committed: without any assessment of the benefit to native animals; without dedicated funding to monitor the effectiveness of the program for protecting native animals;¹⁹ and, importantly, to see how without dedicated funding for monitoring and assessment of environmental benefits, the report's tentative deductions could be sustainable.²⁰

The Victorian Inquiry specifically identifies challenges regulators face in making decisions on the basis of incomplete data.²¹ Finding 19 of the report says that:

Programs aimed at controlling invasive animals have not previously incorporated sufficient monitoring or evaluation mechanisms. Therefore, there is currently a lack of data about the relative costs and benefits of different control techniques in Victoria. The Committee cannot undertake a quantified cost-benefit analysis of different control techniques without accurate data. (P. 104).

Notwithstanding these problems with a lack of specific and reliable data about the cost and effectiveness of different management techniques, Recommendation 3 of the Victorian Inquiry advocates that the Government evaluate the effectiveness of existing control programs.²² A much better approach would have been to argue that governments, in Victoria and elsewhere, generate sufficient data on which to base workable decisions about whether existing programs work in protecting wildlife and what better alternatives there might be.

¹⁸ Natural Resources Commission, *Supplementary Pest Control Trial*, Final Evaluation, above 10, 1.

¹⁹ Natural Resources Commission, *Supplementary Pest Control Trial*, Final Evaluation, above 10, 6.

²⁰ Natural Resources Commission, *Supplementary Pest Control Trial*, Final Evaluation, above 10, 1.

²¹ Parliament of Victoria, Environment, Natural Resources and Regional Development Committee *Inquiry into the Control of Invasive Animals on Crown Land* (2017), above 1, 102-104.

²² Parliament of Victoria, Environment, Natural Resources and Regional Development Committee *Inquiry into the Control of Invasive Animals on Crown Land* (2017), above 1,104.

SUBMISSION ONE

That publicly declared goals for the management of feral cats and their environmental impacts be clearly evidence-based and data-driven. Adequate funding must be provided for research on the size and spatial distribution of feral cat populations, and on their environmental, economic and social impacts, and for monitoring and evaluating the long-term efficacy of a range of potential control programs, including non-lethal options, to protect threatened and endangered species.

3. CONTROL TECHNIQUES

3.1 Lethal Methods- General

Control techniques in Australia for “unwanted” and perhaps species listed as a “threatening process” invariably focus on lethal methods such as trapping, hunting and poisoning. At the Federal level, the *Threatened Species Strategy* (TSS) and the Threat Abatement Plan for Predation by Feral Cats, 2015 (2015 TAP) both assume that killing feral cats is the most effective management option.²³ Indeed, one of the aims of the TSS is that 2 million feral cats be killed by 2020.²⁴ The focus on killing is replicated in the Victorian inquiry, which criticizes the restrictions faced by authorities in eradicating cats, implying that regulators need more power to kill.²⁵ But how useful and productive is this focus on killing, rather than working towards outcomes which protect native biodiversity?

It needs to be acknowledged as a base assumption of public policy vis-à-vis the management of non-native species and the problems they create that culling is unlikely to eradicate feral cats on mainland Australia, a point plainly recognized a long time ago by the 1999 TAP and more recently confirmed by the 2015 TAP.²⁶ Moreover, culling will not succeed in reducing long-term population numbers, unless the number of cats killed “exceed[s] the replacement rate through breeding and immigration”.²⁷ Given uncertainties in gauging the dynamics of feral cat populations, this reduction dynamic cannot be guaranteed.²⁸

²³ Australian Government, *Threatened Species Strategy*, Department of the Environment and Energy (2015), above, 3, 11; Department of the Environment, *Threat Abatement Plan for Predation by Feral Cats*, Commonwealth of Australia, 2015, above 4, 8-9.

²⁴ Australian Government, *Threatened Species Strategy*, Department of the Environment and Energy (2015), above, 3, 11.

²⁵ Parliament of Victoria, Environment, Natural Resources and Regional Development Committee, *Inquiry into the Control of Invasive Animals on Crown Land* (2017), above 1, parag 8.7.

²⁶ Environment Australia, Biodiversity Group, *Threat Abatement Plan for Predation by Feral Cats*, (1999), above 2, 6, 19; Department of the Environment, *Threat Abatement Plan for Predation by Feral Cats*, Commonwealth of Australia, 2015, above 4, 9; Tim S Doherty, Chris R Dickman, Chris N Johnson, Sarah M Legge, Euan J Ritchie and John C Z Woinarski, “Impacts and Management of Feral Cats *Felis catus* in Australia”, (2017) 47 *Mammal Review*, 83, 84, 92.

²⁷ Helen Swarbrick and Jacquie Rand, “Application of a Protocol Based on Trap-Neuter-Return (TNR) to manage Unowned Urban Cats on an Australian University Campus”, (2018) 8 *Animals*, 1, 2
<https://doi.org/10.3390/ani8050077> .

²⁸ William Lynn, “Australia’s War on Feral Cats: Shaky Science, Missing Ethics”, above 15; Nicholas J Mooney and Christopher R Dickman, “Effects of Low-level Culling of Feral Cats in Open Populations: A Case Study from the Forests of Southern Tasmania”, (2015) 41 (5), *Wildlife Research*, 407, 407.

Culling rarely takes account to any meaningful extent of species' interactions, a point acknowledged in the *ACT Pest Animal Management Strategy, 2012-2022*.²⁹ Moreover, where regulators omit consideration of these interactions, they neglect the fact that feral cats are prey species for eagles, foxes and wild dogs.³⁰ Disregard for species' interactions also neglects the impact of cat eradication programs on populations of other introduced species, such as rabbits and rodents, which are prey species for feral cats.³¹ In plague seasons, for example, house mice comprise the entire diet of feral cats.³² But where there are insufficient mammals, feral cats turn their attention to small animals, reptiles and birds, so that threatened species such as the bilby and marsupial mole may be at risk.³³ It is questionable, however, whether the fact that feral cats threaten native species in some circumstances, indicates that the use of lethal measures should be the default regulatory strategy in all situations, let alone that killing is the most effective strategy to protect native species. Lethal measures should always require a high degree of justification and be underpinned by sound research, allowing them to be deployed where they will be most effective.³⁴ And it is imperative that the implementation of lethal measures is monitored, to justify their expense, to establish whether populations of feral cats are reduced in the long-term and above all to demonstrate how this leads to improved management outcomes for threatened and endangered species.

The use of lethal measures also raises serious ethical issues, clearly explained in the Model Code of Practice, which instructs that instead of “focussing on killing as many...[animals] as possible, ... management needs to be carefully planned and coordinated” and affect as few animals as possible.³⁵ Doherty and Ritchie conclude that principles of predator management should include five key principles

- (1) the aim should be to reduce predator damage to species and ecosystems, rather than merely reduce predator numbers per se;
- (2) it is necessary to demonstrate, rather than assume by association, predator damage to species and ecosystems;
- (3) a combination of

²⁹ ACT Government, Environment and Sustainable Development, *ACT Pest Animal Management Strategy, 2012-2022*, above 5, 70.

³⁰ Department of the Environment, *Threat Abatement Plan for Predation by Feral Cats*, Commonwealth of Australia, 2015, above 4, 15; Trudy Sharp and Glen Saunders, *Model Code of Practice for the Humane Control of Feral Cats* CATCOP– revised 03 September, 2012, 3, available from <https://www.pestsmart.org.au/wp-content/uploads/2012/09/catCOP2012.pdf>.

³¹ Elizabeth A Denny and Christopher R Dickman, *Review of Cat Ecology and Management Strategies in Australia*, Invasive Animals Cooperative Research Centre (2010), 2.

³² Chris Dickman, Overview of the Impacts of Feral Cats on Australian Native Fauna, The Director of National Parks and Wildlife Australian Nature Conservation Agency and Institute of Wildlife Research University of Sydney (1996), paras 3.4, 4.2, available from <https://www.pestsmart.org.au/wp-content/uploads/2010/03/impacts-feral-cats.pdf>.

³³ Rachel Partridge, “The Diets of Cats, Foxes and Dingoes, in Relation to Prey Availability, in the Tanami Desert, Northern Territory”, (2002) (29) *Wildlife Research*, 389, 392-5, 400; Mandy Patterson, “TRNP (trap-neuter-return): Is it a Solution for the Management of Feral Cats in Australia?”, in *Engaging with Animals: Interpretations of a Shared Experience*, Georgette Leah Burns and Mandy Paterson (eds), 169, 172, Sydney University Press (2014).

³⁴ David M Mellor and Kate E Littin, ‘Killing Pest Animals – Some Ethical Issues’ in Solutions for Achieving Human Vertebrate Pest Control, Proceedings of the 2003 Australia Scientific Seminar, Canberra (Bidda Jones, Ed) RSPCA (2003), 44, 44. Available from <http://www.rspca.org.au/sites/default/files/website/The-facts/Science/Scientific-Seminar/2003/SciSem2003-Proceedings.pdf>.

³⁵ Trudy Sharp and Glen Saunders, *Model Code of Practice for the Humane Control of Feral Cats* CATCOP– revised 03 September, 2012, above 30, 2.

management approaches can be used and should be considered; (4) the control of one species can affect others; and (5) management actions should be evidence-based.³⁶

SUBMISSION TWO

That regulators develop a suite of tools to deal with feral cats that are not based on lethal control as the “default position” and that any measures taken are tailored to the prevailing conditions (e.g., geographical location, ecosystem function, public support, etc.). If killing is adopted as a regulatory tool it must be linked to specific biodiversity outcomes and must be humane, following a humaneness framework.

The next two parts of this submission discuss particular methods of lethal control, shooting and poisoning.

3.2 Lethal Methods - shooting

The Victorian Inquiry, which covers a range of species, demonstrates a preference for hunting,³⁷ with a number of comments made to the inquiry about the suitability of this method for controlling cats.³⁸ Some noted the limited effectiveness of hunting. The Shooting Sports Council of Victoria argued that recreational hunting might be effective,³⁹ even though *Standard Operating Procedure, CAT001: Ground Shooting of Feral Cats* (SOP CAT) finds that while shooting is a prime means of controlling cats “it is labour intensive and not considered an effective broad-scale control method”.⁴⁰ The SOP CAT also clearly recognizes that the humaneness of shooting depends on variables it is difficult for regulators to control, including the skill and judgement a shooter exercises to ensure a clean kill, whether domestic cats are targeted, and whether, if a lactating female is killed, so are all her kittens.⁴¹

The use of hunting and expansion of hunting as a means of control need to be carefully monitored. In New South Wales, the *Game and Feral Animal Control Act 2002* (NSW) has authorised hunting since 2002 to control a range of species, including cats.⁴² The regime is managed by the Game Licensing Unit of the Department of Primary Industries. It replaced the Game Council of New South Wales, which was disbanded in 2013 because of governance failures “deeply embedded in politics.” A review showed that pressure was brought to bear on the NSW government by members

³⁶ Tim S Doherty and Euan G Ritchie, “Stop Jumping the Gun: A Call for Evidence-Based Invasive Predator Management”, (2017) 10 (1) *Conservation Letters*, 15, 19.

³⁷ Parliament of Victoria, Environment, Natural Resources and Regional Development Committee *Inquiry into the Control of Invasive Animals on Crown Land* (2017), above 1, Chapters 4, 6, 8, 9 and associated findings.

³⁸ Parliament of Victoria, Environment, Natural Resources and Regional Development Committee *Inquiry into the Control of Invasive Animals on Crown Land* (2017), above 1, para 8.7.

³⁹ Parliament of Victoria, Environment, Natural Resources and Regional Development Committee *Inquiry into the Control of Invasive Animals on Crown Land* (2017), above 1, para 8.7.

⁴⁰ Trudy Sharp *Standard Operating Procedure, CAT001: Ground Shooting of Feral Cats*, PestSmart, Centre for Invasive Species Solution, (2012) 1, available from https://www.pestsmart.org.au/wp-content/uploads/2018/02/171215-SOP_CAT001_web.pdf.

⁴¹ Trudy Sharp *Standard Operating Procedure, CAT001: Ground Shooting of Feral Cats*, PestSmart, Centre for Invasive Species Solution, (2012), above 40, 1-2.

⁴² *Game and Feral Animal Control Act 2002* (NSW), schedule 3.

of the Shooters and Fishers Party in the NSW Legislative Council.⁴³ The lesson, here, is clear enough. If hunting is formalised as a means of control, these mistakes should not be replicated.

The NSW study on recreational hunting as a form of supplementary pest control was unable to conclude that recreational hunting had led to long term ecological improvements. There was no adequate monitoring of its impacts.

SUBMISSION THREE

Regulators should not consider adopting hunting as a mainstream method for managing feral cats unless and until its reliability can be established. If it is sanctioned on a limited basis, it is important that it be regulated appropriately and that its ecological outcomes be carefully monitored. Hunting regulations are a state matter. But the federal government can, and should, provide appropriate guidelines to achieve uniform and best practice management across the Commonwealth.

3.3 Lethal Methods – poisoning

Poison has been used to kill feral cats, but not very successfully. Cats frequently avoid the poison, which can also destroy native species. Poison is also a problematic management choice, because feral cats are “often found in low densities and can have large home ranges.”⁴⁴ The poison most frequently used, sodium fluoroacetate (1080), causes “severe central nervous system disturbance, hyperexcitability, convulsions and ultimately respiratory failure”.⁴⁵ Its level of humaneness is, therefore, clearly questionable.

The *Australian Pest Animal Strategy 2017-2027* identifies a number of additional and serious problems with 1080, including the fact there is no antidote to the poison. This makes people in peri-urban areas reluctant to use it, in case their pets, working dogs and other domestic animals ingest the poison and are killed.⁴⁶ These drawbacks confirm that in urban and peri-urban areas alternative means of controlling unwanted animals are needed, most notably TNR, to which we turn next.

SUBMISSION FOUR

That toxic poisons should not be used to manage feral cats except as a last resort and even then, only if it can be shown that a toxin as it is typically used in the field, causes an immediate loss of consciousness. Before any limited use of a toxic poison is authorized, it must also be shown with

⁴³ Steven Dunn, Steve Corrigan and Russell Watkinson, *Governance Review of the Game Council of New South Wales*, for NSW Department of Primary Industries (2012), 3-5, available from <https://invasives.org.au/wp-content/uploads/2014/07/Game-Council-Governance-Review-S-Dunn-14-June-2013.pdf>.

⁴⁴ Trudy Sharp and Glen Saunders, *Model Code of Practice for the Humane Control of Feral Cats* CATCOP– revised 03 September, 2012, above 30, 6.

⁴⁵ Trudy Sharp and Glen Saunders, *Model Code of Practice for the Humane Control of Feral Cats* CATCOP– revised 03 September, 2012, above 30, 6.

⁴⁶ Department of Agriculture, Water and the Environment, *Invasive Plants and Animal Committee, Australian Pest Animal Strategy 2017-2027*, above 7, 28.

reasonable, legal certainty that the use of the toxin will enhance the protection of a particular threatened or endangered species.

3.4 Non-Lethal Methods - TNR

TNR offers regulators a management choice that is significantly different from and an improvement over practices that rely on wholesale killing. This stands in contrast to the official policy approach set out in the background statement to the 2015 TAP:

Capturing, sterilising and releasing (otherwise known as trap, neuter, release/return or TNR) programs are seen as an effective approach to managing colonies of stray cats in urban areas elsewhere in the world and are promoted in Australia. This approach should be considered unacceptable in Australia as there are no benefits to wildlife and it does not improve the welfare of the individual animals concerned.⁴⁷

This statement should in our view be withdrawn. It took no cognizance at the time it was made of reliable research demonstrating the effectiveness of TNR. And in the years since then additional research has shown that properly targeted TNR is an effective method, particularly in the urban places where most Australians live, for reducing populations of stray cats, and for reducing the number of cats and kittens entering, and ultimately dying in, local animal shelters. The most notable studies include:

- A TNR program in rural North Carolina (US) revealed a 36% average reduction in six sterilized colonies over the first two years; the population of three unsterilized colonies increased by 47% over the same period;⁴⁸
- A TNR program at the University of Central Florida led to a population reduction of 66% over the first six years tracking data was available, from 68 to 23 cats (Levy et al., 2003). Over the subsequent 17 years, the program further reduced the population of stray cats by 57%, from 23 to 10 cats;⁴⁹
- In Key Largo, Florida, ongoing TNR efforts led to a 55% reduction in community cat numbers over 14 years, from 455 to 206 cats;⁵⁰
- TNR reduced and, after 17 years, eliminated, an estimated 300 cats from the Newburyport, Massachusetts, waterfront;⁵¹
- Since at least 2005, a TNR program has been in place on the campus of the University of KwaZulu-Natal's Howard College (in Durban, South Africa), which

⁴⁷ Department of the Environment, *Threat Abatement Plan for Predation by Feral Cats*, Commonwealth of Australia, 2015, above 4, 6.

⁴⁸ M K Stoskopf and F B Nutter, "Analyzing Approaches to Feral Cat Management—One Size Does Not Fit All", (2004) 225 (9) *Journal of the American Veterinary Medical Association*, 1361, available from <http://www.ncbi.nlm.nih.gov/pubmed/15552309>.

⁴⁹ D D Spehar and P J Wolf, Back to School: An Updated Evaluation of the Effectiveness of a Long-Term Trap-Neuter-Return Program on a University's Free-Roaming Cat Population, (2019) 9(10) *Animals*, <https://doi.org/10.3390/ani9100768>.

⁵⁰ R W Kreisler, H N Cornell and J K Levy, "Decrease in Population and Increase in Welfare of Community Cats in a Twenty-Three Year Trap-Neuter-Return Program in Key Largo, FL: The ORCAT Program, (2019) 6 (7) *Frontiers in Veterinary Science*, <https://doi.org/10.3389/fvets.2019.00007>.

⁵¹ D D Spehar and P J Wolf, "An Examination of an Iconic Trap-Neuter-Return Program: The Newburyport, Massachusetts Case Study", (2017) 7(11) *Animals*, <https://doi.org/10.3390/ani7110081>.

is recognized as an “urban conservancy... interspersed with conservation-sensitive natural bush habitat and a nature reserve on the northern border”.⁵² Sterilization efforts led to a 38% reduction in the number of cats on campus (from 55 to 34) after four years.⁵³

- Surveys of colony caregivers have also demonstrated significant population reductions, such as a survey in urban areas of Australia, which found a reduction in colony size from a median of 11.5 cats to 6.5 cats over 2.2 years.⁵⁴
- A 30% reduction in cat numbers in two years, and 50% in 5 years for a TNR program at the University of New South Wales; numbers of cats managed decreased from 122 cats to 15 cats over 9 years, with most remaining cats over 10 years of age.⁵⁵

These studies show that if it is implemented with sufficient care and intensity (i.e., sterilizing enough cats in a given area), TNR can stabilize, reduce, and even eliminate stray cat populations at a local level. Computer modeling suggests more specifically that population reductions are achievable if at least 30% of the unsterilized portion of a given population is sterilized every six months.⁵⁶

In addition, TNR has reduced shelter intakes by as much as 32% on average (range: 1–45%) and sometimes by as much as 66%.⁵⁷

Importantly for Australian jurisdictions, a study of public perceptions of TNR programs conducted by Rand et al. in Brisbane found that, “After being informed about TNR programs for management of urban stray cats, most respondents (79%), chose TNR as their preferred management strategy, while a lesser proportion (18%) expressed a preference to continue the current Brisbane City

⁵² J Tennent and C T Downs, “Abundance and Home Ranges of Feral Cats in an Urban Conservancy where there is Supplemental Feeding: A Case Study from South Africa”, (2008) 43(2) *African Zoology*, 218, <https://doi.org/10.3377/1562-7020-43.2.218>.

⁵³ J Tennent and C T Downs, “Abundance and Home Ranges of Feral Cats in an Urban Conservancy where there is Supplemental Feeding: A Case Study from South Africa”, above, 52; A L Jones and C T Downs, “Managing Feral Cats on a University’s Campuses: How Many Are There and Is Sterilization Having an Effect?”, (2011) 14(4) *Journal of Applied Animal Welfare Science*, 304, <https://doi.org/10.1080/10888705.2011.600186>.

⁵⁴ K Tan, J Rand and J Morton, “Trap-Neuter-Return Activities in Urban Stray Cat Colonies in Australia” (2017) 7(6) *Animals*, <https://doi.org/10.3390/ani7060046>.

⁵⁵ H Swarbrick and J Rand, “Application of a Protocol Based on Trap-Neuter-Return (TNR) to Manage Unowned Urban Cats on an Australian University Campus”, above, 27.

⁵⁶ P S Miller, J D Boone, J R Briggs, D F Lawler, J K Levy, F B Nutter, M Slater, and S Zawistowski, “Simulating Free-Roaming Cat Population Management Options in Open Demographic Environments” (2014) 9(11) *PLoS ONE*, e113553 <https://doi.org/10.1371/journal.pone.0113553>.

⁵⁷ J K Levy, N M Isaza and K C Scott, “Effect of High-Impact Targeted Trap-Neuter-Return and Adoption of Community Cats on Cat Intake to a Shelter”, (2014) 201(3) *The Veterinary Journal*, 269–274. <https://doi.org/10.1016/j.tvjl.2014.05.001>; D D Spehar and P J Wolf, “The Impact of an Integrated Program of Return-to-Field and Targeted Trap-Neuter-Return on Feline Intake and Euthanasia at a Municipal Animal Shelter”, (2018) 8(4) *Animals*, <https://doi.org/10.3390/ani8040055>; D D Spehar and P J Wolf, “Integrated Return-to-Field and Targeted Trap-Neuter-Vaccinate-Return Programs Result in Reductions of Feline Intake and Euthanasia at Six Municipal Animal Shelters” (2019) 6(77) *Frontiers in Veterinary Science*, <https://doi.org/10.3389/fvets.2019.00077>.

Council lethal control program (catching and culling ~1,000 cats annually), and 3.4% of respondents chose to leave the cats alone.”⁵⁸

The full implications of TNR programs for the welfare of cats need further study. Because the cats involved in TNR programs are rarely tracked and regularly examined following their return, detailed information about their continuing health and welfare is relatively scarce. Some of the work conducted on college or university campuses has provided long-term data. And some studies of large-scale, shelter-based programs provide useful information regarding the general health of the cats involved. A study of a TNR program on the University of New South Wales campus (Sydney, Australia), for example, estimated the age of nine long-term resident cats (13% of the original cohort of 69) to be at least 10 years.⁵⁹ The average mortality rate observed is, the authors note, comparable to that of pet cats in England, who have an average lifespan of 14 years.⁶⁰

With regard to overall health, a study of a two-year TNR program (2,366 cats total) in Alachua County, Florida, reported that “euthanasia was performed for 11 (0.5%) debilitated cats,”⁶¹ while a similar study of six three-year, shelter-based TNR/RTF programs (involving a total of 72,970 cats) found that 0.5% (349 cats) were euthanized for serious health concerns. By comparison, 83% (60,613 cats) were returned to their trapping sites and 15% (10,698 cats) were adopted or transferred to rescue groups for adoption.⁶² And a survey of seven TNR organizations across the U.S. found that overall 0.4% (range: 0.03–0.7%) of the 103,643 cats for which records were available were euthanized “because of the presence of debilitating conditions, such as neoplasia, chronic inflammatory conditions, trauma, and infectious diseases” observed during routine examinations.⁶³

Researchers in Israel⁶⁴ have documented an overall prevalence among stray cats of 13.7% with “at least one external sign of illness (any external injury or disability, any skin lesion or emaciation),” noting that this is higher than the level reported in similar studies from the U.S. and U.K. But observations of cats in Auckland, New Zealand showed that 64% of both the “managed stray” (n = 210) and the “unmanaged stray” cats (n = 253) that were studied received an ideal Body Condition Score, compared to 76% of indoor-outdoor pet cats and 17% of “managed stray. Notably,

⁵⁸ J Rand, A Hayward and K Tan, “Cat Colony Caretakers’ Perceptions of Support and Opposition to TNR” (2019) 6 (57) *Frontiers in Veterinary Science*, <https://doi.org/10.3389/fvets.2019.00057>.

⁵⁹ H Swarbrick and J Rand, “Application of a Protocol Based on Trap-Neuter-Return (TNR) to Manage Unowned Urban Cats on an Australian University Campus” (2018) 8(5) *Animals*, <https://doi.org/10.3390/ani8050077>.

⁶⁰ D G O’Neill, D B Church, P D McGreevy, P C Thomson, and D C Brodbelt, “Longevity and Mortality of Cats Attending Primary Care Veterinary Practices in England”, (2015) 17(2) *Journal of Feline Medicine & Surgery*, 125, <https://doi.org/10.1177/1098612X14536176>; H Swarbrick and J Rand, “Application of a Protocol Based on Trap-Neuter-Return (TNR) to Manage Unowned Urban Cats on an Australian University Campus” (2018) 8(5) *Animals*, <https://doi.org/10.3390/ani8050077>.

⁶¹ J K Levy, N M Isaza and K C Scott, “Effect of High-Impact Targeted Trap-Neuter-Return and Adoption of Community Cats on Cat Intake to a Shelter”, above, 57.

⁶² D D Spehar and P J Wolf, Back to School: An Updated Evaluation of the Effectiveness of a Long-Term Trap-Neuter-Return Program on a University’s Free-Roaming Cat Population, above, 49.

⁶³ J L Wallace and J K Levy, “Population Characteristics of Feral Cats Admitted to Seven Trap-Neuter Programs in the United States” (2006) 8 *Journal of Feline Medicine & Surgery*, 279.

⁶⁴ I Gunther, T Raz and E Klement, “Association of Neutering with Health and Welfare of Urban Free-roaming Cat Population in Israel, During 2012-2014”, (2018) 157 *Preventive Veterinary Medicine*, 26, <https://doi.org/10.1016/j.prevetmed.2018.05.018>.

17% of “managed stray” and 13% of pet cats were overweight (excess body condition), and fewer “managed stray” cats were emaciated (0.5%), compared to pet cats (1.9%). Scores included coat condition, nose and eye discharge, ear crusting, and injuries, with the result that scores for stray cats were comparable to those for pet cats in all categories except coat condition.⁶⁵

In addition, among stray cats who have been sterilized, especially those in “managed colonies,” infection rates are frequently comparable to pet cats with outdoor access. One study of 100 “intensively managed” (i.e., vaccinated against the most common feline diseases and rabies, and treated for parasites) unowned and stray cats and 76 pet cats (47% of whom had outdoor access) in rural Randolph County, North Carolina, found “similar prevalences of infection with *Cryptosporidium*, *Giardia*, and *Toxocara cati*” between the two groups, while the unowned cats exhibited higher seroprevalences of *Bartonella henselae* (93% compared to 75%) and *Toxoplasma gondii* (63% compared to 34%), likely because of “greater exposure to vectors of these organisms.”⁶⁶ Rates of feline immunodeficiency virus (FIV) infection were comparable (5% and 4%, respectively), while the rate of feline leukemia virus (FeLV) was significantly higher (4%) in unowned cats compared to owned cats (1%).⁶⁷

Most but not all of the studies referred to in the preceding paragraphs were conducted at a limited scale, on educational campuses, for example, or as part of local community programs for managing animals and their welfare. These are clearly situations in which TNR can be useful. And it is, therefore, unfortunate that in a number of states in Australia, including New South Wales and Queensland, existing law and policy put the implementation of similar TNR programs on a precarious legal footing.

This limitation on the wider deployment of TNR in Australia stems in part from the operation of anti-cruelty regulations, which prohibit abandoning animals,⁶⁸ and partly from laws that classify both feral and stray cats as a biosecurity risk. By way of illustration, the *Biosecurity Act 2014* (QLD) creates seven categories of “restricted matter,” set out in schedule 2 of the act. The categories relate to noxious fish, pest and invasive animals, insects and weeds, and are supplemented by a series of obligations and offences, that vary according to the category.⁶⁹ Typical obligations prohibit the release or distribution of restricted matter, as well as prohibitions on moving or feeding them.⁷⁰ Species may be listed in more than one category, resulting in

⁶⁵ S Zito, J Walker, M C Gates and A Dale, “A Preliminary Description of Companion Cat, Managed Stray Cat, and Unmanaged Stray Cat Welfare in Auckland, New Zealand Using a 5-Component Assessment Scale” (2019) 6 (40) *Frontiers in Veterinary Science*, <https://doi.org/10.3389/fvets.2019.00040>.

⁶⁶ F B Nutter, J P Dubey, J F Levine, E B Breitschwerdt, R B Ford, and M K Stoskopf, “Seroprevalences of Antibodies against *Bartonella henselae* and *Toxoplasma gondii* and Fecal Shedding of *Cryptosporidium* spp, *Giardia* spp, and *Toxocara cati* in Feral and Pet Domestic Cats”, (2004) 225(9) *Journal of the American Veterinary Medical Association*, 1394, available from <http://www.ncbi.nlm.nih.gov/pubmed/15552314>; M K Stoskopf and F B Nutter, “Analyzing Approaches to Feral Cat Management—One Size Does Not Fit All”, above, 48.

⁶⁷ F B Nutter, J P Dubey, J F Levine, E B Breitschwerdt, R B Ford, and M K Stoskopf, “Seroprevalences of Antibodies against *Bartonella henselae* and *Toxoplasma gondii* and Fecal Shedding of *Cryptosporidium* spp, *Giardia* spp, and *Toxocara cati* in Feral and Pet Domestic Cats”, above, 66.

⁶⁸ *Prevention of Cruelty to Animals Act 1979* (NSW), s 11.

⁶⁹ *Biosecurity Act 2014* (QLD), ss 42-45.

⁷⁰ *Biosecurity Act 2014* (QLD), s 43 (1) prohibits the release or distribution of category 3 restricted matter, which in accordance with 43(3) includes giving it to another person or releasing it into the environment; s 44 obliges the

overlapping obligations and prohibitions. Feral cats, for example, are listed in three of the seven categories (categories 3, 4 and 6), leading to prohibitions on feeding them or giving them to another person, as well as their release into the environment. This legislation only differentiates, however, between two sorts of cats, domestic (owned) cats and other cats, which are treated as feral cats. And because it does not acknowledge stray cats as a separate legal and regulatory category the Queensland statute makes TNR difficult to justify and defend in a legal context as a legitimate management option.

In 2014, an independent member of the New South Wales Legislative Assembly for the Sydney electorate, introduced a private members bill, titled the Animal Welfare (Population Control Programs) Bill, 2014. The bill was intended to remove legal liability for groups and individuals undertaking TNR⁷¹ by introducing a licensing regime to be supported by sponsorship from nominated agencies.⁷² Although the Bill lapsed in February 2015, it is nevertheless an intriguing suggestion of law and policy reform, that could make TNR more widely operational in Australia, as part of broader community cat management programs in urban and peri-urban areas. Such local programs would focus on desexing cats in a target area with practical assistance from sponsoring agencies, such as the RSPCA and local councils, and could lead to the development of responsible, cat caring behaviours. By targeting urban and peri-urban stray cats, rather than also targeting feral cats, it seems to us that the bill struck exactly the right tone and would have been a good, first step towards making TNR more widespread and more effective in Australia.

SUBMISSION FIVE

That the Federal government support the assessment of TNR efforts by providing appropriate guidelines to achieve uniform and best practice management in trials of TNR across the Commonwealth, including guidance for the introduction of a licensing regime for TNR in those urban and semi-urban environments in Australia where there are significant numbers of stray cats, and exempting such trials from provisions of existing anti-cruelty, domestic animal management (containment) and biosecurity regulations, which hinder these trials.

4. STAKEHOLDER PERSPECTIVES

The *Tasmanian Cat Management Plan, 2017-2022* acknowledges that in “developing management responses for cats it is essential to acknowledge the diversity of views of the community.”⁷³ For

holders of category 7 restricted matter to kill or destroy it; s 45 (1) (a) prohibits moving a category 5 restricted matter, while s 45 (1) (c) prohibits feeding a category 6 restricted matter.

⁷¹ Animal Welfare (Population Control Programs) Bill 2014, text of bill available from <https://www.parliament.nsw.gov.au/bill/files/2821/First%20Print.pdf> ; explanatory notes available from <https://www.parliament.nsw.gov.au/bill/files/2821/XN%20Animal%20Welfare.pdf> ; second reading speech available from, <https://www.parliament.nsw.gov.au/bill/files/2821/2R%20Animal%20Welfare.pdf> .

⁷² Animal Welfare (Population Control Programs) Bill 2014, above 71.

⁷³ Biosecurity Tasmania, *Tasmanian Cat Management Plan, 2017-2022*, above 6, parag 3.3.

some people, as the old adage has it, “the only good cat is a dead one”.⁷⁴ Others are firmly of the view that cats have been unfairly targeted, in Australia and in other countries, as scapegoats for biodiversity losses.⁷⁵ And still others, perhaps with a more pragmatic outlook, think that while regulators need to protect native birds and animals from cat predation they ought not to rely on wholesale culling.⁷⁶

In this mix of views, Indigenous viewpoints have not been well-represented, although a number of recent studies show two things. One is that there is no single Indigenous view about how introduced species, including cats, ought to be understood and managed. And the other is that Indigenous views are generally different from settler views.

In the Western Desert region, for example, cats and rabbits are a well-documented food source⁷⁷ and groups such as the Jawoyn regard culling as wasteful.⁷⁸ Above all, Indigenous communities regard culling as a cavalier and an unwarranted form of management, describing it as ‘killing for nothing’.⁷⁹ These views persist, even where the species in question causes detrimental impacts to country.⁸⁰ Indigenous attitudes contrast sharply, therefore, with non-Indigenous management practices that legitimate culling as the primary means of dealing with unwanted animals. The divergence in approaches stems, it has been argued, from “the meeting of one culture that defined itself as absolutely different from animals with another that defined itself as indistinguishable from animals”.⁸¹

On another level, the attitudes of Aboriginal peoples to environmental protection start from markedly different philosophical foundations than those that underlie and undergird the management practices sustained by Western European philosophies about nature, and about relationships between people and nature. Aboriginal people think about environmental management as a shared and mutual process between a community and its country. So, they do not see themselves as managers who need to manipulate an external environment in order to

⁷⁴ D Trigger and J Mulcock, “Native vs Exotic: Cultural Discourses About Flora, Fauna And Belonging In Australia”, (2005) 84 *Sustainable Development and Planning, WIT Transactions on Ecology and the Environment*, 1301, 1307.

⁷⁵ Nicholas Smith, “The Howl and the Pussy: Feral Cats and Wild Dogs in the Australian Imagination”, (1999) 10 (3) *The Australian Journal of Anthropology*, 288, 301.

⁷⁶ D Trigger and J Mulcock, “Native vs Exotic: Cultural Discourses About Flora, Fauna And Belonging In Australia”, above 74, 1307; Helen Swarbrick and Jacquie Rand, “Application of a Protocol Based on Trap-Neuter-Return (TNR) to manage Unowned Urban Cats on an Australian University Campus”, above 27.

⁷⁷ D Trigger, ‘Indigeneity, “Ferality and What ‘Belongs’ in the Australian Bush: Aboriginal Responses to ‘Introduced’ Animals and Plants in a Settler-Descendant Society”(2008) 14 *Journal of the Royal Anthropological Institute*, 628, 632.

⁷⁸ Catherine J Robinson, Dermot Smythy and Peter J Whitehead, ‘Bush Tucker, Bush Pets, and Bush Threats: Cooperative Management of Feral Animals In Australia’s Kakadu National Park’, (2005) *Conservation Biology*, 1385, 1389.

⁷⁹ Catherine J Robinson, Dermot Smythy and Peter J Whitehead, ‘Bush Tucker, Bush Pets, and Bush Threats: Cooperative Management of Feral Animals In Australia’s Kakadu National Park’, above, 78, 1389.

⁸⁰ Petronella Vaarzon-Morel and Glen Edwards, ‘Incorporating Aboriginal people’s Perceptions of Introduced Animals in Resource Management: Insights from the Feral Camel Project’, (2012) 13 (1) *Ecological Restoration and Management*, 65, 68.

⁸¹ Adrian Franklin, *Animal Nation*, UNSW Press (2006), 48.

maintain and sustain their relationship to it.⁸² In their holistic view, healthy people and healthy environments are inseparable and management practices that fail to recognize and act on this holism are quite unlikely to succeed.

SUBMISSION SIX

That cat management strategies take divergent viewpoints into consideration, including Indigenous perspectives. If local committees and councils are formed in the future to manage feral and/or stray cats, there ought to be a requirement that a diversity of views (e.g., gender identity, race/ethnicity, socio-economic status, age, etc.) will be represented among the members.

5. MANAGEMENT GOALS AND CONTROL TECHNIQUES

As discussed above, the TSS deems the volume of cat killings as a *per se* effective performance indicator for feral cat management initiatives.⁸³ This emphasis on large scale killing is reinforced by a subsequent progress report that more specifically identifies the killing of a million cats within two years as an important environmental management milestone for Australia.⁸⁴ There are a number of problems with this approach to understanding how management goals and techniques might be inter-related.

First, there is insufficient evidence in the TSS itself to link killing very large numbers of feral cats to improved biodiversity outcomes for native species that are threatened or of concern. Secondly, the TSS does not address the question of whether killing is a cost-effective control method. And thirdly, the resort to large scale killing fails to account for the multitude of other factors that could explain how and why valued native species become threatened and/or endangered in Australia, and what to do about it.

With respect to the first point, the brute tendency to regard numbers of killings as a legitimate and acceptable performance indicator for efforts aimed at feral cat management is not limited to the TSS. It is replicated elsewhere, as in the report of the *Supplementary Pest Control Trial* conducted in New South Wales. The executive summary of the final report of that trial reads as follows:

This review demonstrates that the SPC trial has resulted in an improvement in integrated pest management at participating sites, and removal of 5,655 pest animals. The Commission cannot draw firm conclusions on the conservation benefits for threatened species and ecological communities, due to the limited scale of the trial and limitations of the ecological monitoring. However, the Commission considers that were it to continue,

⁸² Emile J Ens, Max Finlayson, Karissa Preuss, Sue Jackson and Sarah Holcombe, 'Australian Approaches for Managing 'Country' Using Indigenous and Non-Indigenous Knowledge', (2012) 13 (1) *Ecological Restoration and Management*, 100, 102.

⁸³ Australian Government, *Threatened Species Strategy*, Department of the Environment and Energy (2015), above, 3, 11.

⁸⁴ Australian Government, *Progress Report to the Minister for the Environment and Energy*, July 2016- December 2017, 19, available from <http://www.environment.gov.au/system/files/resources/12d8cf25-0169-46d6-8c72-dfe204ccf44c/files/threatened-species-strategy-progress-report.pdf>.

improvements in integrated pest management arising from the SPC program are likely to further support NPWS's protection of threatened species and ecological communities.⁸⁵

This inability to conclude that killing 5,655 animals had led to clear environmental benefits is serious, to say the least, given that the trial was conducted in national parks and reserves and that it cost almost six million dollars. It makes the decision to extend the trial incomprehensible.

Studies in Australia and overseas estimate that eradication campaigns can vary from \$1,200 per square mile to more than \$130,000 per square mile.⁸⁶ Governments in Australian jurisdictions have been willing to incur these sorts of costs, even in the face of substantial evidence that one of the biggest drivers of native species loss is habitat destruction.⁸⁷ Bushfires are also a significant factor. In South-Eastern Australia, for example, the 2019-2020 bushfire season is estimated to have resulted in the loss of 6 billion animals.⁸⁸ The reasonable inference is that instead of upholding a preference for eradication by killing, governments should also be attending to the rehabilitation of habitat and the prevention and mitigation of wildfires. In NSW, the threats to biodiversity listed pursuant to the *Biodiversity Conservation Act 2016* (NSW) include feral cats, but they also include Anthropogenic Climate Change, Clearing of Native Vegetation and High Frequency Fire.⁸⁹

The obvious question is whether dealing with these matters, and especially improving and restoring habitat, would be more cost-effective than culling. And it seems to us that policy makers ought to demand the answers to those questions. In any event, where biodiversity loss is attributed to a range of causative factors killing one species is unlikely to provide positive outcomes.

Extrapolating statistics from the 2015 TAP provides valuable insights into the multiple factors that are involved in biodiversity losses. Table A1 of the 2015 TAP, (at page 70) sets out a list of 84 mammal species that may be adversely affected by feral cats and the relative risk of feral cat predation on those species. Of the 84 species listed in that table, 30 are also classified as vulnerable under the *Environmental Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC), 27 are classified as endangered, 1 is classified as critically endangered and 26 are not classified as endangered or vulnerable under the EPBC. Table 1, below, sets out this classification in chart form.

⁸⁵ Natural Resources Commission, *Supplementary Pest Control Trial*, Final Evaluation, above 10, 1.

⁸⁶ Dave Algar, N Hamilton and C Pink, "Progress in Eradicating Cats (*Felis catus*) on Christmas Island to Conserve Biodiversity" (2014) 30 *Raffles Bulletin of Zoology, Supplement*, 45; C C Hanson, J E Bonham, K J Campbell, B S Keitt, A E Little and G Smith, "The Removal of Feral Cats from San Nicolas Island: Methodology" in 24th Vertebrate Pest Conference (R M Timm K A Fagerstone, Eds) 72, University of California, Davis (2010), available from <https://escholarship.org/uc/item/6z1433vq>; K J Campbell, G Harper, D Algar, C C Hanson, B S Keitt, and S Robinson, "Review of Feral Cat Eradications on Islands", in C R Veitch, M N Clout and D R Towns (Eds.), *Island invasives: Eradication and Management* (pp. 37–46). IUCN (2011).

⁸⁷ Brendana Wintle and Sarah Bekessy, "Let's Get this Straight, Habitat Loss is the Number-one Threat to Australia's Species", *The Conversation*, 17 October, 2017, available from <https://theconversation.com/lets-get-this-straight-habitat-loss-is-the-number-one-threat-to-australias-species-85674>.

⁸⁸ *Australia's 2019-2020 Bushfires: The Wildlife Toll*, (Interim Report), 2, WWF Australia (July 2020), available from, <file:///C:/Users/admin/AppData/Local/Temp/Animals%20Impacted%20Interim%20Report%2024072020%20final.pdf>.

⁸⁹ *Biodiversity Conservation Act 2016* (NSW), Schedule 4.

Table 1
Mammal Species Potentially Adversely Affected

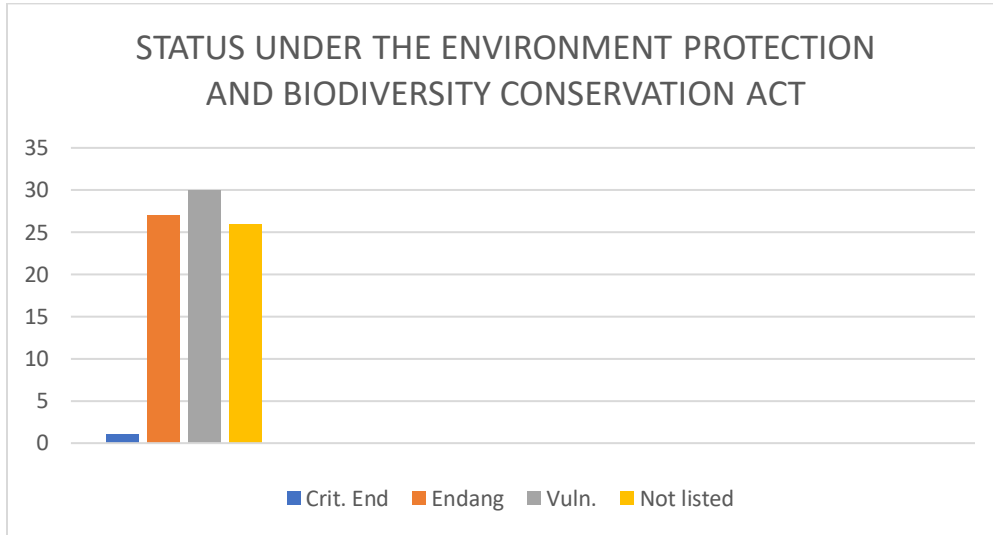


Table 2, below, sets out the number of threats vulnerable species face that are equal to or greater than the threats posed by feral cats. For one vulnerable species there was no information available but in every other case, there are multiple reasons why species are listed as vulnerable. For eight vulnerable species, there were four or more reasons equal to or greater than the threats posed by feral cats and for twelve vulnerable species there were six or eight reasons equal to or greater than the threats posed by feral cats.

Table 2
Vulnerable Species and Threats Equal to or Greater than Feral Cats

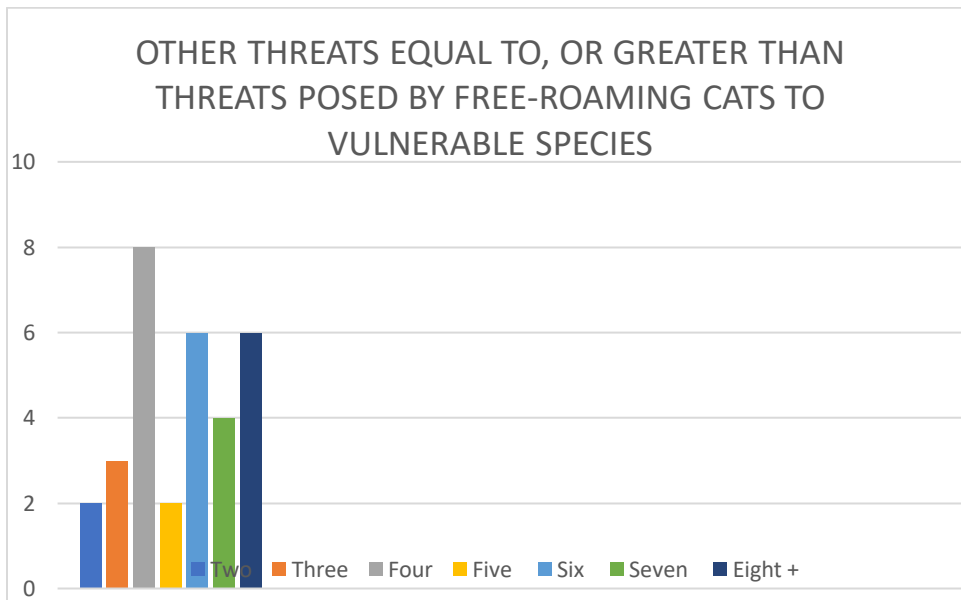


Table 3, below, repeats this analysis for endangered species. One endangered species faces four threats but none are equal to or greater than the risk posed by cats, so this has been omitted from the table. Otherwise, as with vulnerable species, endangered species face multiple threats to their survival, in one case nine other threats and in four cases, ten other threats.

Table 3
Endangered Species and Threats Equal to or Greater than Feral Cats

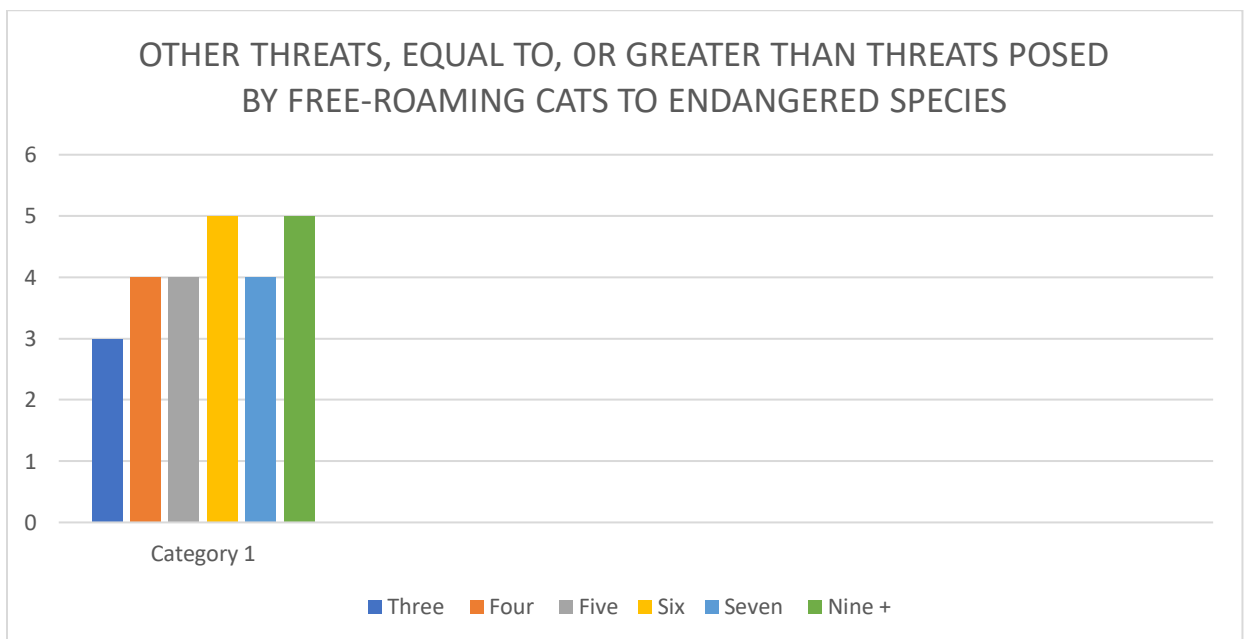


Table 4, below, compares the multiple threats. The risks posed by humans account for almost 60% of the total risks, while the impacts of other species account for 37.5% of total risks. The remainder of the risks comprised disturbance at roosting sites, loss of genetic diversity due to small population size, and predation by raptors.

Table 4
Comparison of Threats

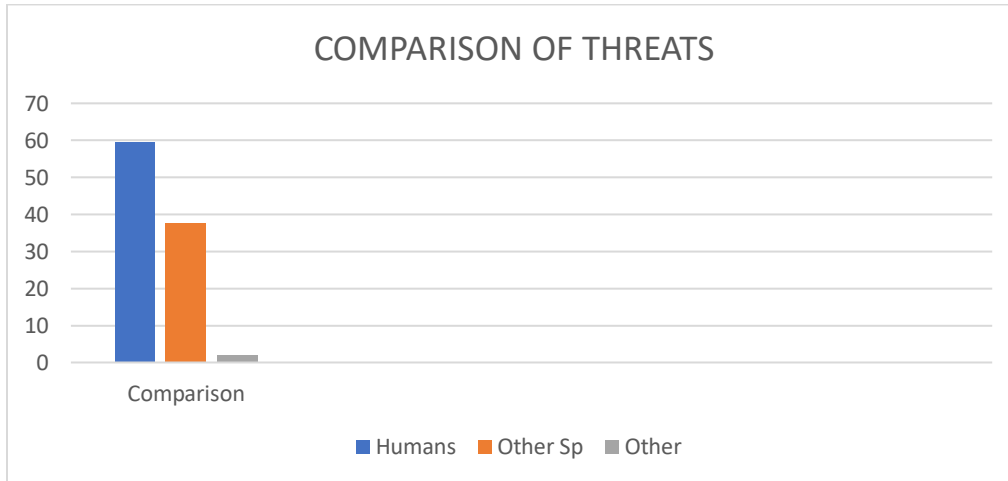
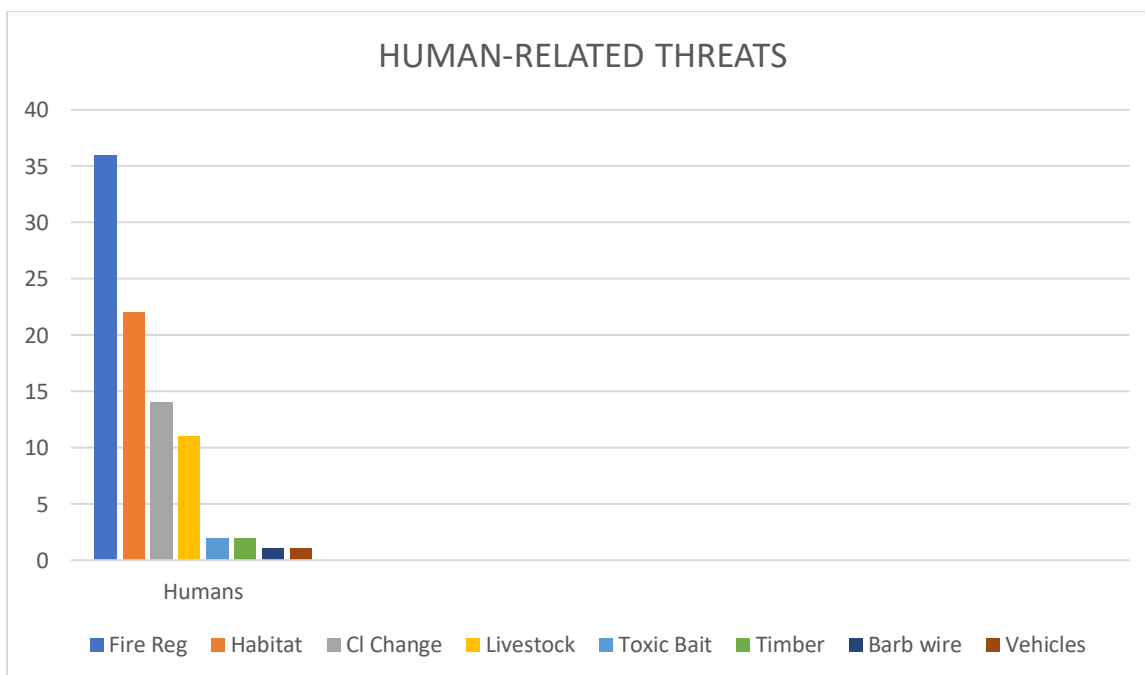


Table 5, below, details the threats posed by humans. These include inappropriate or altered fire regimes, vehicle mortality, habitat destruction, habitat alteration due to livestock production, and altered weather patterns.

Table 5
Human-Related Threats



Climate change and altered fire regimes are proving to be particularly destructive of species in Australia. As already mentioned, the recent 2019-2020 fire season in NSW has killed an estimated 6 billion animals. The World Wide Fund for Nature, commissioned a report which found that losses included 143 million mammals, 2.46 billion reptiles, 180 million birds, and 51 million frogs.⁹⁰ The severity of these fires also indicates that biodiversity conservation and climate change are intricately linked. The World Wide Fund for Nature put it this way:

In 2019 and 2020, we saw catastrophic burning throughout many regions of the world. Extreme bushfires are already becoming more frequent and the predictions are they will become even more severe due to climate change. WWF hopes this research will give other countries a window into the future of mega fires and their devastating impact on wildlife.⁹¹

Currently, regulation avoids engaging with biodiversity loss factors such as these, because labelling a species as invasive, a pest, or a biosecurity risk short circuits the process of analysis and decision making about how to deal with the losses. It is tantamount to a determination that an appropriate and useful assessment of the environmental impacts of listed species, and of how to deal with them, has already been made. This then justifies the lethal measures that invariably follow.

Yet interactions among species, humans and the environment are much more nuanced than this sort of simplistic regulation admits. It does little more than legalize the killing of whatever is unwanted, a policy that will be counter-productive in the long run.

Indeed, even if regulators were able to find the resources to kill two million or ten million cats, and sustain the killing policy over time, the threats caused by humans and their activities to valued native species would remain.

If the goal is to achieve environmental protection and specifically the conservation of Australia's native biodiversity, then complex issues concerning humanity's relationship to the environment need to be recognized and addressed. More specifically in the Australian case, it is not going to be possible to manage successfully the impacts of feral cats or any other single animal without addressing human-generated problems, including habitat degradation and destruction, climate change and altered fire regimes.

SUBMISSION SEVEN

That cat management take a holistic approach, explicitly incorporating awareness that threats to valued native species result from multiple factors, including human activities, and that the human activities which constitute threats need to be monitored and managed, and finally, that funding be prioritized to determine strategies which are most effective at protecting threatened and endangered wildlife, rather than programs that have numbers of cats killed as the primary outcome.

⁹⁰ *Australia's 2019-2020 Bushfires: The Wildlife Toll*, (Interim Report), WWF Australia (July 2020), above, 87, 2.

⁹¹ *Australia's 2019-2020 Bushfires: The Wildlife Toll*, (Interim Report), WWF Australia (July 2020), above, 87, 1.