



Animal Liberation is an animal rights charity founded in 1976 by Christine Townend, based on the philosophies set out by Professor Peter Singer in his best-selling book, *Animal Liberation*.

Our goal

We believe all animals have the right to live free from human intervention. As societies throughout time have had to fight for the rights of slaves, women and other minority groups to challenge dominant social views, the animal rights movement is now the greatest social change movement around the world with the potential to vastly improve the lives of non-human animals. **Animal Liberation** intends to fight for all non-human animals until they are able to live lives of their choosing, free from intervention, and use and abuse by humans.

Our work

- We pursue our goal through education campaigns, public events and the utilisation of the media to get spread and get our message across. Our mission statement is: *to work toward the end of suffering of exploited and confined animals, through legislation, consumer advocacy, action and humane education.*
- We run a 1800 Cruelty Hotline for people in VIC and NSW country and rural areas to report neglect and cruelty to animals – over a period of eight years this service has assisted hundreds of thousands of animals.
- The development of campaign strategies designed to influence changes in law and consumer behaviour.
- Research, investigation and evidence gathering into areas such as the use of non-human animals for food, entertainment, science and fashion.

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Introduction

Animal Liberation appreciates the opportunity to provide the following comments on the NSW pest animal management review. For the purposes of this report, focus will be on four aspects that warrant deep and critical attention: the absence or inadequate provisions for monitoring and/or planning of control programs; the distinct lack of concerted effort to address viable alternatives to these programs; the review's call for a reduction of "red tape" constricting recreational hunting; and, finally, the deficiency of considerations pertaining to welfare issues in approved and/or developing control programs. To this end, focus will be upon cat management programs, potentially destructive data-mapping efforts, the proposed adoption of carp control methods, the welfare issues inherent in recreational hunting, and the lack of attention or effort to ascertain alternative control methods (notably sterilisation and non-lethal control methods). It is important to note, however, that this selective consideration and reliance on a comparatively narrow segment of analysis does not mean that the other un-encompassed aspects are not worthy of additional attention and analysis. Rather, it is the opinion of Animal Liberation that the implementation of *any* lethal control techniques is unacceptable. For this reason, consideration within this submission is divided into sections and subsections. Each section will address a distinct zone of analysis, with each corresponding subsection developing further these analyses. It must be noted that a number of factors will necessarily be included in each distinctive section (welfare, for example, is inherently tied to each and every analyses).

Overview

Numbers of animals killed annually in government and private control programs are notoriously difficult to approximate. It is, however, a number that is likely to run into the millions¹. Aside from the *Game and Feral Animal Control Act*, the managing of animals deemed 'feral' or 'pests' is administered through both State and Territory as well as Commonwealth law. The *Threatened Species Conservation Act 1995* (NSW) sanctions the development of 'threat abatement plans' to manage these issues². A survey of control programs developed and designed to control 'feral' animals recorded more than 2,500 distinct operations³. The survey concluded that "there was little reliable knowledge about the benefits" of these programs and "few control programs monitored changes in the pest species targeted for control and the native species of interest"⁴. There is, despite claims to the contrary, limited information on results of 'pest' animal control programs, primarily due to a lack of monitoring.

The draft Pest Animal Management Review 2016 (henceforth 'the Review') under consideration pays considerable attention to the role of cats and the perceived damage and threat posed to biodiversity and native species⁵. Importantly, the Review acknowledges that the recommendations provided "are not limited to legislative or regulatory frameworks alone". Instead, they seek to propound the view that people, citizens, "will be integral to program success". Accordingly, accountability comes to be considered a national responsibility.

¹ Thiriet, D., 2007, 'In the spotlight: the welfare of introduced wild animals in Australia,' *Environmental and Planning Law Journal*, vol. 24, pp. 417-426.

² Ellis, E., 2010, 'Australian regulatory framework,' *Hot Topics: Legal Issues in Plain Language*, vol. 74, pp. 7-14.

³ Thiriet, D., 2007, 'In the spotlight: the welfare of introduced wild animals in Australia,' *Environmental and Planning Law Journal*, vol. 24, pp. 417-426.

⁴ Reddix, B., and Forsyth, D. M., 2004, 'Final report for the Australian Government Department of the Environment and Heritage: Review of existing red fox, feral cat, feral rabbit, feral pig and feral goat control in Australia. II. Information gaps,' *Landcare Research/Arthur Rylah Institute for Environmental Research*.

⁵ The report claims, for instance, that cats threaten 36 mammal species across Australia.

A key and underpinning emphasis is on recasting several species as ‘pests,’ and subject to treatment that is deemed necessary to suppress the threat these species are considered to pose. Urgency is consistently considered to be necessary in treating and eradicating these risks and impacts; by advocating the legislative use of the *Biosecurity Act 2015* and introducing cats and deer into the scope of ‘pest management,’ the Review aims to prioritise select species whilst continuing other programs of control. Communities, the Review explains, “will be instrumental in getting better on-ground results”.

One way the Review suggests this to occur is through active encouragement of recreational hunting. As this report will show, hunting and the lack of responsibility and/or accountability this method involves, such methods are both inadequate and involve inherent threats to animal welfare. Through efforts to place the duty of ‘pest’ animal management on landholders and citizens, the Review claims it is essential to not only engage the Australian public, but to hold them accountable for the control of animals considered ‘invasive,’ ‘pests,’ and ‘feral’.

General discussion concerning the absence of alternatives and the impact current practices and methods present to issues concerning welfare

A 2004 study surveyed control programs centred upon six species of animals considered ‘invasive’ in Australia. The survey, the first of its kind in Australia, found over 2,500 separate control programs. The report concluded that “there was little reliable knowledge about the benefits of fox, feral cat, feral rabbit, feral pig, and feral goat control for EPBC Act listed threatened species”⁶. Further, “few control programs monitored changes in the pest species targeted for control and the native species of interest,” arguing that these programs “rarely included non-treatment areas or were randomly allocated”. Few of the programs evaluated either the species or the habitat prior to conducting their control programs. Whilst Federal, State and Local governments consign considerable resources to applying these control methods, the failure of these programs to meet “the basic experimental requirements” necessary to facilitating success, including replication and appropriate monitoring techniques, ultimately means that blame is *a priori* placed upon animals and makes it impossible “to separate an observed response in native species/habitat following pest control from climatic factors and/or a suite of potentially threatening processes”. As such, threats and risks posed by human actions and developments are consistently and ultimately deemed outside the scope of control methods. Habitat change, environmental degradation, the consequences of past human endeavours at control that utilised animals introduced for these reasons (and are now categorised as ‘pests’), means that responsibility is effectively detoured, with alternatives censured despite clear evidence that such alternatives are not only functionally appropriate, but alleviate a number of related issues. The 2004 audit of control programs concluded that few “met all of the requirements for reliable knowledge”. For example, a 1996 study noted “no [...] experiments have been completed to determine the effects of cats on native fauna”. This has not been addressed, despite the fact that it is apparent that “many factors other than feral cats can affect population size,” including the consequences and threats posed to humans and our impacts upon the environment.

As a result, this submission analysed the recommendations and overall content of the 2016 Review (with consideration of a number of related publications). It is the opinion of Animal Liberation that monitoring provisions, preliminary research, control technique feasibility and efficacy, and significant welfare and humaneness concerns render the Review inoperable. The following report will address each of these aspects and present a number of viable and operational alternatives.

⁶ Reddiex, B., and Forsyth, D. M., 2004, ‘Final report for the Australian Government Department of the Environment and Heritage: Review of existing red fox, feral cat, feral rabbit, feral pig and feral goat control in Australia. II. Information gaps,’ *Landcare Research/Arthur Rylah Institute for Environmental Research*

1 Cats

1.1 Overview of the recommendations provided within the Review

The Review calls on the NSW Government to declare cats a pest, and consequently be included in pest animal regulation provided within the *Biosecurity Act 2015*. The Review also calls for amendments to the NSW *Companion Animals Act 1998* to legislate compulsory desexing and registering of all cats by four months of age (the Review notes that NSW is the only state which does not consider it an offence for a cat to be “at large in contravention of confinement order[s]” and does not legally require desexing), with an added provision requiring local governments to institute “cat confinement areas”. It is also noted that the Australian Government Threatened Species Commissioner is currently pursuing public support for “24-hour containment requirements for domestic cats”. Additionally, the Review suggests a partnership with the RSPCA (and “other relevant organisations”) wherein a “targeted education campaign” to raise community awareness of the risks posed by stray or feral cats. As this report will show, the latter recommendations are necessary inclusions, yet the broad emphasis and proposed methodologies ultimately detract, rather than reinforce, these principles. In fact, community awareness raising campaigns are often at the fore of one of the most widely used, and practical, humane control methods applicable to controlling free-roaming cat populations; trap-neuter-release programs.

1.2 A brief introduction to TNR

A growing number of academic and field studies indicate that TNR programs are not only the most humane option available when conducting cat population control, they are effective when compared to lethal methods⁷. TNR programs have developed across Australia and worldwide, with universities acting as grounds to develop TNR program effectiveness and provide other communities with resources and support networks. The first of these is thought to be the formation of the Stanford Cat Network at Stanford University (California) in the late 1980’s⁸. Prior to practicing TNR methods, approximately 500 cats were present on university grounds. The program lasted 15 years and resulted in a steep population decline, leaving 85 cats after the program. Since that time, the cats have been adopted. As the Palo Alto Humane Society express, lethal methods need not be utilised as “feral colonies are successfully managed throughout the United States, in Canada, the Virgin Islands (under the guidance of the Tufts University Veterinary School), South Africa, Denmark, other parts of Europe and Africa, and Britain”⁹. Frequently these initiatives are run in collaboration with veterinary institutes and community groups (a factor that will be further discussed below). A 1998 study of a trap-test-vaccinate-alter-return-monitor (TTVARM) program at a Texas university effectively showcases the benefits, and increased efficacy of, humane control methods: kitten levels dropped the year following initial study, tame cat proportions increased, facilitated adoption, and eliminated complaints concerning the colony¹⁰.

Whilst several studies have indicated that TNR efforts are ineffective at reducing cat numbers, a number of related issues require additional analysis: an evaluation of a range of cat control methods and programs indicated that a primary reason TNR may be deemed ineffective is due to illegal dumping of cats which consequently negate positive developments and population effects¹¹. The abandoned cats would, for example, be attracted to the food allocated to the cats returned to the

⁷ Levy, J. K., Gale, D. W., and Gale, L. A., 2003, ‘Evaluation of the effect of a long-term trap-neuter-return and adoption program on a free-roaming cat population,’ *Journal of the American Veterinary Medical Association*, vol. 222, no. 1; Zaunbrecher, K. K., and Smith, R., 1993, ‘Neutering of feral cats as an alternative to eradication programs,’ *Journal of the American Veterinary Medical Association*, vol. 203, no. 3, pp. 449-452; Holton, L., and Manzoor, P., 1993, ‘Managing and controlling feral cat populations,’ *Veterinary Forum*, pp. 100-101.

⁸ Slater, M. R., and Shain, S., 2005, ‘Feral cats: an overview,’ in D J Salem and A N Rowan (eds.), *The State of the Animals III*, Washington DC, Humane Society Press.

⁹ Palo Alto Humane Society, 1995, *Non-Lethal and Non-Punitive Control of Feral Cat Populations at a Glance*. Available at: http://www.paloaltohumane.org/programs/pdfs/Feral_Cat_Populations.pdf

¹⁰ Hughes, K. L., and Slater, M. R., 2002, ‘Implementation of a feral cat management program on a university campus,’ *Journal of Applied Animal Welfare Science*, vol. 5, no. 1, pp. 15-28.

¹¹ Schmidt, P. M., Swannack, T. M., Lopez, R. R., and Slater, M. R., 2009, ‘Evaluation of euthanasia and trap-neuter-return (TNR) programs in managing free-roaming cat populations,’ *Wildlife Research*, vol. 36, pp. 117-125.

colony post-TNR and multiply the number of cats in any given colony, thus destabilising the efficacy of the program¹².

TNR programs have developed across Australia and worldwide, with universities acting as grounds to develop TNR program effectiveness and provide other communities with resources and support networks. A growing number of international communities, councils, and state governments are implementing TNR principles to humanely manage cat population levels in urban areas. The city of Berkeley in California, for example, openly supports TNR on the grounds that so-called ‘feral’ cats are the wild offspring of domestic cats abandoned and allowed to breed uncontrollably. The city not only recognises the true origins of stray animals, but also argues that TNR programs “enhance public safety” and “humanely controls feral cat populations”¹³. Similarly, Connecticut also advocates TNR and announced a \$175,000 grant for a TNR program in 2014¹⁴. After a surge in cat culls initiated by the Agri-Food and Veterinary Authority (AVA) following the SARS outbreak in Singapore, the Society for the Prevention of Cruelty to Animals (SPCA) and other welfare groups lobbied for the introduction of TNR programs to remedy the adoption of lethal methods. The AVA reversed the decision, implemented the Stray Cat Rehabilitation Scheme and sterilised cats through the Cat Welfare Society¹⁵.

1.3 TNR in Australia: resistance, efficacy, and potential

Cats were introduced into Australia as companion animals of 18th century European settlers, who then released them into the wild to control rabbits and rodents, who themselves were introduced to Australia by early settlers and subsequently released¹⁶. It is worth noting that these species are themselves subject to extensive and lethal control methods, including poisoned baiting, warren fumigation, and exposure to lethal viruses, including myxomatosis and RHDV (rabbit haemorrhagic disease)¹⁷. The use of poisons, particularly 1080 and pindone, have since been considered to be inhumane¹⁸, resulting in a slow and painful death and has been linked to the deaths of other exotic or native animals (so-called ‘by-kills’¹⁹) that subsequently eat the carcasses of poisoned mammals²⁰ (for further discussion of this key area of concern see sections 3 and 4).

The growth in cat population numbers is enabled by “the high natural reproductive capacity of cats: a female cat is likely to reproduce for all her adult life, and can produce up to three litters per year with an average of four kittens per litter”. Whilst this may be so, it does not account for the high mortality rates seen in stray colonies, which can be as high as 75%, with this percentage reaching close to 100% when females produce more than 2 litters in a year²¹. Kittens also die in the early neonatal period (between 6 to 8 weeks of age) at the rate of 12.8% to as high as 48%, with the same high percentage dying before reaching 100 days old. According to a 2012 Invasive Species Council

¹² Schmidt, P. M., Swannack, T. M., Lopez, R. R., and Slater, M. R., 2009, ‘Evaluation of euthanasia and trap-neuter-return (TNR) programs in managing free-roaming cat populations,’ *Wildlife Research*, vol. 36, pp. 117-125

¹³ City of Berkeley, n.d., ‘Feral cats’. Available at: http://www.ci.berkeley.ca.us/City_Manager/Animal_Shelter/Feral_Cats.aspx

¹⁴ Penney, J., 2014, ‘\$175K state grant will help control Quiet Corner feral cat population,’ *the Bulletin*. Available at: <http://www.norwichbulletin.com/article/20141026/NEWS/141029610/10284/NEWS>

¹⁵ Slater, M. R., 2007, ‘The welfare of feral cats,’ in I Rochlitz (ed.), *The Welfare of Cats*, Springer, the Netherlands.

¹⁶ Australian Government Department of Sustainability, Environment, Water, Population and Communities (ABARES), 2011, ‘The feral cat (*felis catus*)’. Available at: <https://www.environment.gov.au/system/files/resources/34ae02f7-9571-4223-beb0-13547688b07b/files/cat.pdf>

¹⁷ NSW Government Department of Primary Industries, n.d., ‘Rabbit control’. Available at:

<http://www.dpi.nsw.gov.au/content/agriculture/pests-weeds/vertebrate-pests/pest-animals-in-nsw/rabbit-control>.

¹⁸ “The RSPCA believes that the available evidence indicates that, in general, the effect of 1080 on animals is not humane and is opposed to its continued use for the control of populations of introduced or native species”. In Jones, B. (ed.), 2003, *Proceedings of the 2003 RSPCA Australia Scientific Seminar at the Telstra Theatre, Australian War Memorial Canberra, February 2003*. Available at: <https://www.rspca.org.au/sites/default/files/website/The-facts/Science/Scientific-Seminar/2003/SciSem2003-Proceedings.pdf>.

¹⁹ New Zealand Parliamentary Commissioner for the Environment, 2011, ‘Evaluating the use of 1080: predators, poisons and silent forests’. Available at: <http://www.pce.parliament.nz/media/1294/evaluating-the-use-of-1080.pdf>.

²⁰ Notman, P., 1989, ‘A review of invertebrate poisoning by compound 1080,’ *New Zealand Entomologist*, vol. 12, pp. 67-71.

²¹ Nutter, F. B., Levine, J. F., and Stoskopf, M. K., 2004, ‘Reproductive capacity of free-roaming domestic cats and kitten survival rate,’ *Journal of American Veterinary Medicine*, vol. 225, no. 9, pp. 1399-1402.

report, as many as 60% of a population needs to be killed in order to have any meaningful effect²². This, coupled with the 75% of kittens who do not survive their first 6 months, begs further investigation into the actual percentages, population densities and the efficacy of currently operational methods of “feral” cat control in NSW.

The RSPCA considers that “where humans make use of animals or interfere with their habitat, they should bestow a level of care befitting human dignity as rational, intelligent, compassionate beings, and a level of care merited by the nature of the animal as a sentient creature capable of responding to human care and attention. Such care should be marked by sympathy, consideration, compassion and tenderness towards animals”²³. Despite this, the Australian Government and State authorities routinely ignore or pillory principles and potential programs in favour of lethal control methods.

TNR programs work to minimise free-roaming cat populations and colonies through a series of techniques, including trapping, veterinary sterilisation, and release back into the area they were initially located. The US-based not-for-profit advocacy group Alley Cat Allies maintains that TNR is “the only effective method of stabilising outdoor cat colonies”. This method works precisely because when all cats in a colony are sterilised, their reproductive rates drop and eventually reach a complete halt²⁴.

Legally, the status of TNR is mired in confusion²⁵. The releasing of neutered or desexed cats back into their colonies may be considered an offence related to abandonment or “unlawful liberation”²⁶. In 2014 Greens member Alex Greenwich introduced to the Legislative Assembly as a Private Member’s Bill the *Animal Welfare (Population Control Programs) Bill 2014*. The Bill maintains that TNR is effective in decreasing population levels and consequently is beneficial to the ecosystem (echoing the professed rationale behind many control programs). The second reading maintains that even if this were not the case (i.e., if TNR did not effectively limit population size) it does not *increase*, and as such there is no harm in applying TNR principles that are proven to be far more humane than other options²⁷.

Whilst it has been known for some time that the overpopulation of companion animals results in millions of death every year²⁸, it is often not acknowledged that this too costs money²⁹. Of 33,736 cats admitted to RSPCA shelters in Queensland between 2006 and 2008, the most commonly documented reason was that they were “stray” (54%). So-called “owner-surrender[ed]” cats fell slightly lower at 44%. The outcome for each of these admissions was most often euthanasia (65%), with adoption peaking at 30%. Crucially, the odds of euthanasia dropped for cats and kittens that were desexed prior to arrival, and of the strays admitted only 8% had been sterilised (whether this was through one of the many currently operational cat colony care groups is unknown). Although the majority of cats kept as companions are desexed (approximately 90%), only 34% of cats surrendered to RSPCA shelters were, suggesting that there are vital differences between owners who surrender their companions compared to those who do not. Of the companion cats that were desexed, there are indications that up to 20% reproduce prior to sterilisation, producing up to 2 kittens before this. American studies have found that despite sterilisation of companion cats, 16%

²² Invasive Species Council. 2012, ‘Recreational hunting NSW: claims v facts’. Available at:

http://invasives.org.au/files/2014/02/fs_rechunt_NSWvfacts.pdf

²³ RSPCA Australia, 2009, ‘RSPCA Australia animals charter,’ cited in Ellis, E., 2010, ‘The influence of history,’ *Hot Topics: Legal Issues in Plain Language*, vol. 74. Available at: http://www.legalanswers.sl.nsw.gov.au/hot_topics/pdf/animal_law_74.pdf.

²⁴ Alley Cat Allies, 2015, ‘Trap-neuter-return effectively stabilises and reduces feral cat populations,’ Bethesda, Maryland. Available at: <http://www.alleycat.org/document.doc?id=702>

²⁵ Gotsis, T., 2014, ‘Feral cats: do trap-neuter-return programs work?’ *NSW Parliamentary Research Service*.

²⁶ Unlawful liberation is listed as an offence in both NSW and SA. Halstead, B., 1994, ‘Wildlife legislation in Australia: trafficking provisions,’ *Australian Institute of Criminology*, Canberra, ACT.

²⁷ <https://www.parliament.nsw.gov.au/bills/DBAssets/bills/SecondReadSpeechLA/2821/2R%20Animal%20Welfare.pdf>

²⁸ 15,491 (31.5%) of all cats received by RSPCA shelters are euthanased, almost double the number of dogs euthanased despite the similar numbers of animals received (45,954 dogs and 49,166 cats). RSPCA Australia, 2014, ‘RSPCA Australia national statistics 2013-2014’.

Available at: http://www.rspca.org.au/sites/default/files/website/The-facts/Statistics/RSPCA_Australia-Annual_Statistics_2013-2014.pdf

²⁹ Frank, J. M., and Carlisle-Frank, P. L., 2007, ‘Analysis of programs to reduce overpopulation of companion animals: do adoption and low-cost spay-neuter programs merely cause substitution of sources?’ *Ecological Economics*, vol. 62, pp. 740-746.

had reproduced prior to desexing³⁰. Other studies have found that the number of sterilised cats that reproduced prior to sterilisation is as high as 24.7%³¹. Of 103,643 cats studied in several free-roaming (stray) colonies across the United States, only 2.3% had been sterilised³². The pioneering study of Italy's TNR programs found that up to 21% of each colony studied was made up of cats abandoned by owners³³. For this reason, it has been suggested that programs that increase sterilisation of companion cats, combined with effective public information and awareness campaigns³⁴, may assist in decreasing the population numbers of free-roaming cat colonies and subsequently increase the efficacy of TNR programs³⁵.

All things being equal (age, sex, neutering/spaying, feral/stray status), the stray cats admitted to RSCPA QLD shelters were found to be more likely to be adopted than those surrendered³⁶. If people are, as the draft Pest Animal Management Review (March 2016) maintains, "a cornerstone of successful pest management," surely this implies a level of collective responsibility and accountability. As the reports discussed above conclude, new strategies are necessary to reduce the numbers of cats admitted (whether through surrender or their stray status) and subsequently euthanased. As "many cats admitted as strays were rehomable," providing that they were desexed, this clearly implies that for death-rates to substantially fall a system of sterilisation applied specifically to strays would alleviate the levels of euthanasia whilst simultaneously minimising the number of cats in free-roaming colonies. University of Florida researchers, who found that over the course of a two-year study, shelter intakes of cats dropped by 66% in TNR "target" zones, have effectively proved this particular hypothesis. This compared favourably to a 12% decline in other non-target zones, and was accompanied by a 95% reduction in euthanasia rates in the target zone compared to 30% in non-target zones³⁷. This, in essence, is the goal of TNR.

1.4 TNR on university campuses

As is the case in many of the co-existing features of cat control programs, the success or failure of TNR hinges on the actions and attitudes of the community. As there is increasing support for the humane treatment and control of so-called 'pest' animals, a number of agencies, organisations and governments have openly supported this method³⁸.

TNR has a strong support base in the United States and by governmental accounts is a growing technique used to ensure humane treatment within Australia³⁹. Historically, attempts and trials of TNR techniques have been conducted on university campuses with increasing levels of success⁴⁰. A

³⁰ Marsh, P., 2010, *Replacing Myth with Math: Using Evidence-Based Programs to Eradicate Shelter Overpopulation*, Town and Country Reprographics, Inc., New Hampshire.

³¹ Manning, M. M., and Rowan, A. N., 1992, 'Companion animal demographics and sterilization status: results from a survey in four Massachusetts towns,' *Anthrozoos*, vol. 5, no. 3, pp. 192-201.

³² Wallace, J. L., and Levy, J. K., 2006, 'Population characteristics of feral cats admitted to seven trap-neuter-return programs in the United States,' *Journal of Feline Medicine and Surgery*, vol. 8, pp. 279-284.

³³ Natoli, E., Maralitano, L., Cariola, G., Faini, A., Bonanni, R., Cafazzo, S., and Fantini, C., 2006, 'Management of feral domestic cats in the urban environment of Rome (Italy),' *Preventative Veterinary Medicine*, vol. 77, no. 3-4, pp. 180-185.

³⁴ Natoli, E., Maralitano, L., Cariola, G., Faini, A., Bonanni, R., Cafazzo, S., and Fantini, C., 2006, 'Management of feral domestic cats in the urban environment of Rome (Italy),' *Preventative Veterinary Medicine*, vol. 77, no. 3-4, pp. 180-185.

³⁵ Marsh, P., 2010, *Replacing Myth with Math: Using Evidence-Based Programs to Eradicate Shelter Overpopulation*, Town and Country Reprographics, Inc., New Hampshire.

³⁶ Alberthsen, C., Rand, J. S., Bennett, P. C., Paterson, M., Lawrie, M., and Morton, J. M., 2013, 'Cat admissions to RSPCA shelters in Queensland, Australia: description of cats and risk factors for euthanasia after entry,' *Australian Veterinary Journal*, vol. 91, no.1-2, pp. 35-42.

³⁷ Levy, J. K., Isaza, N. M., and Scott, K. C., 2014, 'Effect of high-impact targeted trap-neuter-return and adoption of community cats on cat intake to a shelter,' *The Veterinary Journal*, vol. 201, pp. 269-274.

³⁸ Toronto has bylaws that enable authorisation of TNR programs that include sterilisation clinics and membership in the Toronto Feral Cat Coalition. Toronto also provides free sterilisation for stray cats on the proviso that a workshop is attended (or the owner has a low income) and the colony is registered with Animal Services. In 2013, Toronto's major inaugurated a "Feral Cat Awareness Day". This is a pattern seen across the world, with many state governments in the US offering TNR initiatives and discounted or free veterinary assistance. The Humane Society of the United States (HSUS) supports TNR.

³⁹ Gotsis, T., 2014, 'Feral cats: do trap-neuter-return programs work?' *NSW Parliamentary Research Service*.

⁴⁰ Jones, A. L., and Downs, C. T., 2011, 'Managing feral cats on a university's campuses: how many are there and is sterilization having an effect?' *Journal of Applied Animal Welfare Science*, vol. 14, pp. 304-320.

1991 TNR program conducted on the University of Central Florida campus, for example, led to the adoption of close to half of the cats living on university grounds over an 11-year period⁴¹. A particularly notable example concerns the University of KwaZulu-Natal's Howard College in South Africa. The area is considered an "urban conservancy" (habitat is varied between urban zones and "conservation-sensitive natural bush habitat"). Despite this, and in spite of the Australian Government and State agencies promoting lethal control as the only efficacious method, the researchers of this study explicitly recommended the establishment of "a suitable and ongoing sterilisation programme [...] run in conjunction with a feral cat feeding programme" to manage population numbers. Further, the study concludes that eradication programs, particularly in urban areas, can result in a "vacuum effect," wherein new "migrant" (abandoned) cats fill the niche that eradication produces and effectively "encourage[s] subsequent reinvasion of the area"⁴². This is particularly relevant to the Australian context, as free-roaming cats are prefigured to be major threats to native wildlife⁴³. The validity of the subsequent containment and/or lethal eradication measures, ranging from trapping to poisoning, are in this instance severely weakened. As free-roaming cats are considered to be one of six select species causing "the greatest economic, social and environment impacts," the possibility that their removal or eradication could cause such a vacuum requires considerable attention (if, that is, the true intent of the proposed control programs is to protect native species and/or biodiversity⁴⁴). As is standard across all discussions regarding animal control programs and techniques, economics is considered to be a yardstick upon which all other elements may be measured. The South African example, however, belies this: whilst sterilisation (and TNR techniques) may require financial input and support, this can prove to be less costly in the long-term and also in terms of negative native wildlife impacts. If, as we have seen, free-roaming cats are generally unsterilized (without the support of government funding or the presence of a community cat care group), their introduction or migration into such an environment would prove more detrimental than the costs of humanely minimising their reproduction. The South African case exemplifies the dangers in foolhardily adopting an insufficiently analysed technique to the detriment of a sound, humane, and effective program proven functional and valid over both time and place.

1.5 Case study: UNSW Kensington Campus and Inner City Strays

An indicative case that ought to be considered in the Australian context is the UNSW Kensington campus TNR campaign, which, in the phraseology of the draft Pest Animal Management Review in question, "set[s] a precedent for NSW to build on". The campus had a history of free-living cat colonies. Before it was a university, it was a racecourse with racing stables and the cats were kept to control rodent population levels (routinely, such populations are not adequately fed to keep the cats undernourished and thus more liable to predation). Until attempts were made using TNR, the population was largely uncontrolled. In 2000, the Campus Cat Coalition (CCC) was formed and applied TNR principles, in combination with a rostered cat-feeding program. This attempt failed, however, primarily due to internal opposition within the university and a lack of funding and support. Prior to this (2007-08), a number of kittens were found dead in the university environs, with many others suffering severe flea infestations. As a control method, trapping and eradication was pursued on the grounds that the colony presented an OHS risk to staff and students on campus. In June of 2008, the CCC approached the university OHS committee to present the case for a humane approach to the perceived problem.

The CCC advocated a TNR program to be supplemented by ongoing medical care and the implementation of a registry system with microchipping to be carried out on a trial basis for one year

⁴¹ Levy, J. K., Gale, D. W., and Gale, L. A., 2003, 'Evaluation of the effect of a long-term trap-neuter-return and adoption program on a free-roaming cat population,' *Journal of the American Veterinary Medical Association*, vol. 222, pp. 42-46.

⁴² Tennent, J., Downs, C. T., and Bodasing, M., 2009, 'Management recommendations for feral cat (*Felis catus*) populations within an urban conservancy in KwaZulu-Natal, South Africa,' *South African Journal of Wildlife Research*, vol. 39, no. 2, pp. 137-142.

⁴³ The Review maintains, for example, that "cats alone threaten[...] 36 mammal species nationally" and endorses their inclusion within the "pest" animal category based upon this.

⁴⁴ This conclusion is tenuous. For more information, see Section 3 (alternatives to lethal control methods).

(with defined goals and targets culminating in a 12-month review). The implementation of the registry coupled with microchipping enabled certainty of the number of cats in the university colony (monitoring). This “experiment” in TNR resulted in a reduction of cat numbers (77 > 30), with 93% of all cats desexed and 100% of female cats successfully desexed. The accompanying system of volunteer feeding programs and rostering grew as the project developed with select retailers providing donated cat food to be used by student feeders (collaboration). An effective community education program aided the success of the project, utilising a campus website and publishing of articles in university publications and website pages, as well as holding a forum aimed at attracting volunteers. A Cat Working Group was initiated on campus that works in cooperation with university staff to facilitate positive interactions and mitigate potential problems. Since this was initiated, complaints regarding the cats on campus fell to zero. Through these methods, and the accompanying development of social networks and veterinary support, Campus Cats NSW has become a registered business, endorsed by the Australian Charities and Not-for-profits Commission (ACNC) as a charity with tax deductibility.

More recently, the Sydney-based not-for-profit association and charity Inner City Strays has received a grant funded by the City of Sydney under its Responsible Pet Ownership scheme to initiate a humane program to decrease the number of stray cats within inner-city Sydney⁴⁵. This is the first initiative of its kind in NSW, and through a four-month initial trial, 40 stray kittens were caught, desexed, vaccinated, treated for worms, fleas, and common illnesses (all subsidised by the City of Sydney) and finally adopted. This state-sponsored campaign, according to an official City of Sydney document, has the effect of reducing the number of cats by 320 in a single year, and 1,200 within two years “without any animals being culled”⁴⁶. Ultimately, the success of the pilot program led the City to supplement and extend the program, in line with the no-kill policy explicitly adopted. Critically, this campaign was introduced as a direct response to the State Government’s plan to cull approximately two million stray cats by 2020. To this end, veterinary hospitals and local organisations, including Inner City Strays, have supported the initiative through a rescue and re-homing strategy. Additionally, the City of Sydney, in collaboration with Inner City Strays, Community Cat Carers, and the Cat Protection Society, operate education workshops aimed at promoting humane and effective management of stray cat populations. Through this scheme, attendees are entitled to reduced rate desexing as part of the City’s feral cat management project (a collaboration between Alexandria Veterinary Hospital, Community Cat Carers, Inner City Strays, and the Cat Protection Society and funded by the NSW Office of Local Government)⁴⁷.

These initiatives, supported by state funding, are currently working under humane principles to achieve goals that do not require resorting to lethal control measures such as those advocated by the Review. Tellingly, the Review fails to mention any of these campaigns, and instead focuses upon techniques that are inherently inhumane and cause undue and unnecessary suffering and inevitably result in entirely avoidable deaths. For the Review to propose the utilisation of wholly gratuitous lethal forms of control measures despite the fact that current and ongoing campaigns⁴⁸ disprove its requirements and efficacy patently invalidates its recommendations.

1.6 The use of poisons as a method to control free-roaming cats

The Review claims that poison baits are “generally the cheapest and most effective broad scale technique for control of feral predators,” including free-roaming cats. Further, the Review maintains that the Australian Government has heavily subsidised “the research and development of a humane and target specific bait [Curiosity] suitably for the control of feral cats”. The Review also calls for

⁴⁵ City of Sydney, 2016, ‘City’s purrfect solution to stray cat problem,’ media release, April 14. Available at: <http://www.sydneymedia.com.au/citys-purrfect-solution-to-stray-cat-problem/>

⁴⁶ Ibid.

⁴⁷ City of Sydney, n.d., ‘Feral cat management project’. Available at: <http://www.cityofsydney.nsw.gov.au/live/animals/living-with-pets-in-the-city/adopt-a-pet>

⁴⁸ For the purposes of this submission, focus is upon a select portion of a much wider array of community initiatives working to utilise humane principles in efforts to reduce stray cat colony population levels.

further research predicated on exploiting “the cleaning habits of cats” in order to deliver lethal toxins (this is presumably a call to instigate a trapping/poisoning technique, although this is not explicitly discussed within the Review). Additionally, the Commonwealth Threat Abatement Plan for Predation by Feral Cats (2008) does not refer to TNR. Instead, its “very high priority” is to develop “an effective toxic bait for feral cats, one that is designed to be eaten by cats but not by other animals”. This is entirely unnecessary and ineffective. This form of lethal control is set to rely on Curiosity, a poison bait containing paraminopropiophenone (PAPP) “developed with investment from the Commonwealth, Victorian and Western Australian Government”⁴⁹ and championed as a marketable saviour for native Australian animals⁵⁰. It is, the Review notes, expected to be registered for use in Australia by 2016 and is considered to be “more humane” than 1080. The Curiosity bait, however, is simply the Eradicat bait with a Hard Shell Delivery Vehicle (HSDV) and injected with 1080 poison⁵¹. HSDV is a hard coating applied to toxins that enable insertion into baits⁵². PAPP, when absorbed into the bloodstream after ingestion, causes methaemoglobinaemia. This decreases the body’s ability to function, primarily resulting in a lack of oxygen to the cardiac muscle and brain. Whilst this causes unconsciousness prior to death, the poison can take up to 125 minutes to cause death. This has led researchers to conclude that it is “humane in comparison to available toxins”⁵³. Whether a smaller degree of suffering, or a higher degree of comparative humaneness, is where we are willing to cede what is still a prolonged death steeped in suffering, should be the subject of further analysis and detailed study. If, as this segment acknowledges, the use of poison is generally known to cause severe suffering and can thus be characterised as patently inhumane, the dearth of responsible research into alternatives is grossly negligent.

The Review acknowledges that “total mainland eradication” may be the “ideal goal,” it is currently not achievable with “current resources and techniques”. It appears, then, that alternatives ought to be addressed and that such alternatives should be not only taken seriously, but also actively assessed to ascertain which method is most suited to achieve control program goals whilst simultaneously meeting essential welfare criteria. Action 1.7 of the feral cat Threat Abatement Plan considers “humane killing methods,” including shooting and lethal injection, and notes that where these methods are unavailable or considered either too expensive or inhumane, new techniques are required. To this end, the Plan advocates the use of monitoring techniques (more discussion on the implementation of the Pestsmart Feralscan technology will be provided below), yet shies away from advocating non-lethal methods.

Curiosity (PAPP) has been field tested in South Australia’s Flinders Ranges National Park. Twenty cats were trapped, monitored with a tracking collar, and released. Two cats died after ingesting the bait, yet two ingested the bait and survived⁵⁴. The study found that mice constituted the staple of the cats diet, and claims that Curiosity baits decreased the population by 50%. Further, the report admits that cats typically prefer live prey, and their instinct may essentially decrease the baits efficacy (“the abundance of live prey at this study site may have contributed to the apparent low levels of bait uptake by feral cats”). Further, the report attempted to validate the efficacy of the poison bait by analysing the population levels of bird species. Whilst a nominal decrease was apparent, this, the report acknowledges, is likely to be due to the “highly mobile” nature of the bird in question (*Aquila*

⁴⁹ Gotsis, T., 2014, ‘Feral cats: do trap-neuter-return programs work?’ *NSW Parliamentary Research Service*.

⁵⁰ Arup, T., and Phillips, N., 2014, ‘‘Curiosity’’: the cat-killing bait to protect native species,’ *the Sydney Morning Herald*, July 2. Available at: <http://www.smh.com.au/environment/animals/curiosity-the-catkilling-bait-to-protect-native-species-20140701-zssij.html>

⁵¹ Johnston, M., Algar, D., O’Donoghue, M., and Morris, J., 2011, ‘Field efficacy of the Curiosity feral cat bait on three Australian islands,’ in C R Veitch, M N Clout, and D R Towns (eds.), *Island Invasives: Eradication and Management*, IUCN, Switzerland; Western Australian Department of Environment and Conservation, 2011, ‘Field trial to compare baiting efficacy of Eradicat and Curiosity baits’. Available at: <https://www.environment.gov.au/biodiversity/invasive-species/publications/field-trial-compare-baiting-efficacy-eradicat-and-curiosity-baits>; Australian Government Department of the Environment, 2015, ‘Threat abatement plan for predation by feral cats’. Available at: <http://www.environment.gov.au/biodiversity/threatened/publications/tap/predation-feral-cats>

⁵² Quinn, J., Johnston, M., Algar, D., and O’Donoghue, M., 2010, ‘Curiosity bait,’ in C Lane, A Bengsen, and E Murphy (eds.), *Proceedings of the National Feral Cat Management Workshop, 30th November 2010*, Invasive Animals Cooperative Research Centre, NSW.

⁵³ Murphy, E. C., Shapiro, L., Hix, S., MacMorran, D., and Eason, C. T., 2011, ‘Control and eradication of feral cats: field trials of a new toxin,’ in C R Veitch, M N Clout, and D R Towns (eds.), *Island Invasives: Eradication and Management*, IUCN, Switzerland.

⁵⁴ Johnston, M., Gigliotti, F., O’Donoghue, M., Holdsworth, M., Robinson, S., Herrod, A., and Eklom, K., 2012, ‘Field assessment of the Curiosity bait for management of feral cats in the semi-arid zone (Flinders Ranges National Park),’ *Arthur Rylah Institute for Environmental Research*, technical report series no. 234.

audax – wedge-tailed eagle). Alarming, from a welfare and humane standpoint, “pen trials” were also conducted. This involved captive feral animals (i.e. trapped wild animals) being administered the poison so researchers could ascertain its efficacy. This research was approved and granted a permit by the Australian Government’s Pesticides and Veterinary Medicines Authority, yet begs the question why ongoing studies specifically aiming to improve the feasibility and efficacy of lethal control methods are consistently elected over humane, non-lethal techniques. A possible explanation is that until effective and actionable alternatives are considered the currently employed techniques, regardless of their quality and efficacy, will continue to be applied. This sentiment was encapsulated in an RSPCA assessment of current animal control methods, with a stakeholder explaining, “the retention of effective vertebrate pest management techniques [...] [is needed] until more humane alternatives are developed”⁵⁵. The Review, in part, acknowledges this (concerning the control of species targeted on organic farms, where the farmer may not wish to subject their system to chemicals, “they can adopt an alternative approach such as trapping” – again, no mention is made of TNR techniques). Thus, the Review concedes that alternatives are available, and explicitly includes in its recommendation concerning cat management the need for “continued research into the scale, efficiency, cost-effectiveness, sustainability, and risk of cat control methods” (Recommendation 17). Yet this is as far as the Review is willing to go. Again, this is grossly negligent.

Furthermore, the Review includes a section expressly relating to the improvement of the “knowledge base” regarding research capacities (Recommendation 26). This latter recommendation calls upon the NSW Government to “commit long-term funding” for animal control research, including those targeting cats (Recommendation 26, iv(d)). Ultimately, however, the report concludes that poison baiting is most efficacious when distributed at a time when “alternative food sources” (that is, food that is part of the animals preferred or natural diet) are in decline. How this scenario can be achieved, however, is not mentioned (brief mention of environmental or habitat alteration is discussed, however this is not addressed in sufficient detail to enable an evaluative comment). Nor is the possible ramifications stemming from the loss of predation by cats on the mouse population addressed. It is hard, if not impossible, to reconcile the values espoused by the community with the methods currently utilised or under consideration by the NSW Government in attempts to control cat numbers.

1.7 Ethics and the demand for humane treatment

The draft Pest Animal Management Review (March 2016) maintains that solutions to the burden of so-called “pest” animals requires “shared responsibility, investment, action, and accountability”. This is true. The report draws on the passing of the *Biosecurity Bill 2015*, citing it as an opportunity to facilitate consistent regulations to manage wild animal populations and their impacts.

Effectiveness is listed as a primary concern in any discussion of management programs, spanning across species and techniques. Also of primary importance, according to a NSW Government 2014 research report, are the ethical factors therein. The report quotes Ellis, citing the fact that “they [feral cats, and all other so-called “pest” species] are sentient creatures,” and argues that the “application of different standards to the control of ‘feral’ animals or ‘pests’ is inconsistent with a moral obligation based on the capacity to suffer”⁵⁶. This is the essence of the concern regarding the lack of welfare considerations intrinsic in Australia’s wild animal control programs (for more on this, see Sections 3 and 4).

One of the methods the draft Review endorses is data-mapping. The Threat Abatement Plan for Predation by Feral Cats (2015) also endorses “monitoring technologies” that aggregate data

⁵⁵ Humane Vertebrate Pest Control Working Group, 2004, *A National Approach Towards Humane Vertebrate Pest Control*, discussion paper arising from the proceedings of an RSPCA Australia/AWC/VPC joint workshop, August 4-5, Melbourne. RSPCA Australia, Canberra.

⁵⁵ Sharp, T., 2012, ‘Standard Operating Procedure, PIG002: Aerial shooting of feral pigs,’ Invasive Animals CRC. Available at: http://www.pestsmart.org.au/wp-content/uploads/2012/12/PIG002_aerial-shooting_web.pdf

⁵⁶ Gotsis, T., 2014, ‘Feral cats: do trap-neuter-return programs work?’ *NSW Parliamentary Research Service*.

compiled by and available to the public⁵⁷. This, it appears, is the “shared responsibility” alluded to in the Review.

Data-mapping and technology geared towards compiling reserves of actionable information raise a number of concerns regarding not only the efficacy of such methodology, but also issues of welfare and accountability. The Pestsmart Feralscan website and smartphone app are advertised as a way to “map sightings of pest animals and record problems they are causing in your local area”⁵⁸.

Developed by the Invasive Animals CRC, with funding from the Australian Government, the technology bills itself as a “citizen surveillance” initiative using a “citizen science approach”⁵⁹ that “empower[s] the community⁶⁰,” and endeavours to “protect Australia’s threatened wildlife”⁶¹. The technology is divided into species subsections⁶². The public is encouraged to report sightings, with information listing the date, the species seen, and the number of animals witnessed. Immediately, this raises a number of questions. Preliminary investigations conducted by Animal Liberation have uncovered instances of documented killing linked to this technology. A social media page visited by citizens across the country actively encourages the use of FeralScan essentially as a hunting platform, with photographs and descriptions of the methods employed, the results, and advice for others. Local landholders, in collaboration with Tuckombil Landcare (NSW) and the North Coast Local Land Services (LLS), formed a wild dog lethal baiting program, beginning in April of 2015. By December the group had poisoned 70 wild dogs, openly confessing that they use Feral Scan⁶³ (whether similar groups are utilising the technology for the control of cats is currently unknown). For the recommendations of the draft Review to meet its own criteria for success, accountability must be ensured. This guiding principle has emphatically not been met. Through the website or app, any member of the community can essentially “mark” any animal seen which falls under the subcategories of “targeted” species (this raises issues of non-target animals within a target species being “mapped” as available and suitable for control).

As president and founder of Alley Cat Allies, an American based organisation that advocates TNR, Becky Robinson has argued, the app essentially allows you, “if you don’t have the stomach for killing cats, you can let others kill them for you”⁶⁴.

1.8 Issues relating to data-mapping technology: Pestsmart’s Feralscan

It is unclear whether this encouragement and facilitation of documenting locations of stray cats to be euphemistically “managed” (read: killed) constitutes incitement under the Commonwealth Criminal Code 1995 (s11.4). The NSW Law Reform Commission’s report on complicity recommended that the offence of incitement be extended to cover “acts of assistance as well as of encouragement”⁶⁵. Whilst there are no commonly held definitions of what constitutes an *act of incitement*, the provision concerning publication (through media and websites) “addressed to the world at large” can be considered incitement and engender a conviction “if it is distributed in such a way as to be likely to come into the hands of those capable of committing the incited offense (although not addressed to anyone in particular)”. As the website and app are both openly available

⁵⁷ Australian Government Department of the Environment, 2015, ‘Threat abatement plan for predation by feral cats’. Available at: <http://www.environment.gov.au/biodiversity/threatened/publications/tap/predation-feral-cats>

⁵⁸ <http://www.pestsmart.org.au/feralscan/>

⁵⁹ Noxious Weeds Advisory Committee, 2012, ‘Key meeting outcomes: meeting 55 held on 27 November 2012’. Available at: https://www.nswfarmers.org.au/_data/assets/pdf_file/0013/30514/FS-NWAC-55-Key-Meeting-Outcomes.pdf

⁶⁰ Mitchell-Whittington, A., 2016, ‘New online tool in cane toad control,’ *Brisbane Times*, February 9. Available at:

<http://www.brisbanetimes.com.au/queensland/new-online-tool-in-cane-toad-control-20160209-gmprbk.html>

⁶¹ <http://www.feralscan.org.au/feralcatscan/default.aspx>

⁶² As of May 2016, species included are rabbits, dogs, cats, foxes, pigs, mynas, mice, camels, goats, toads, fish, and starlings.

⁶³ ‘A howling success: Tuckombil gets wild dogs under control,’ 2015, *Landcare in Focus*. <http://www.landcareonline.com.au/wp-content/uploads/2016/01/Landcare-in-Focus-pp1-6.pdf>

⁶⁴ Robinson, B., 2015, ‘The cat and the app: how technology down under is killing cats,’ *the Huffington Post*. Available at: http://www.huffingtonpost.com/becky-robinson/the-cat-and-the-app-how-t_b_8785438.html

⁶⁵ Encouragement, according to the NSW Law Reform Commission report, include “command, request, propose, advise, induce, persuade, authorise, urge, and threaten or pressure another to commit an offense”. NSW Government, 2010, ‘Report 129: complicity,’ New South Wales Law Reform Commission. Available at: http://www.lawreform.justice.nsw.gov.au/Documents/r129_final_v02.pdf

to all members of the public, this criterion is plainly met. Further, under the *Prevention of Cruelty to Animals Act* (POCTA), a person “shall not commit an act of cruelty, authorise such an act or fail to take reasonable care to prevent an act of cruelty, fail to take steps to alleviate pain where cruelty is being inflicted and, where necessary, provide veterinary treatment”⁶⁶. Acts that are prohibited under POCTA include abandonment, poisoning, baiting, and trap-shooting⁶⁷. POCTA intends to ensure that people “treat the animal in a humane manner” and “ensure the welfare of the animal”⁶⁸. Cruelty, as codified under POCTA, refers to an act in which the animal is “unreasonably, unnecessarily or unjustifiably: (a) beaten, kicked, killed, wounded pinioned, mutilated, maimed, abused, tormented, tortured, terrified, or infuriated” or “(d) inflicted with pain”. Each of these criteria is met through the possible incitement provision under the Criminal Code and associated sections of POCTA. The Act provides for criminal prosecution and sets penalties, including fines and imprisonment (poisoning an animal carries a maximum fine of \$22,500 and up to 2 years imprisonment)⁶⁹.

Cats are included under Schedule 3 (Part 2) of the *Game and Feral Animal Control Act 2002* as game animals “living in the wild”. Under this Act, the term “hunt” is defined as actively searching, pursuing, trailing, stalking, or driving out an animal “in order to capture or kill”. A license is required to hunt game animals on private lands, yet is not required if “a person is hunting an animal listed in Part 2 of Schedule 3 on private land”. Whilst the RSPCA and its investigators are furnished with powers to search, enter property, and examine or seize animals under POCTA, it is difficult to ascertain how this regulatory mechanism functions when considering the broad and anonymous nature of the Pestsmart Feralscan technology. The evident disconnect between current legislation and the recommendations and advice provided by both Governments and governmental agencies requires further investigation, with transparency of findings and a clear and cogent mechanism enabling the enforcement of these provisions unswayed by either institutional or individual desires to launch campaigns centred upon animal management.

1.9 Case Study: Israel and Italian Law No. 281 (1991)

For over 50 years, stray cats were destroyed in Israel with no discernible or notable difference in population numbers⁷⁰. Pressure from the Israeli Cat Welfare Society and welfare organisations pushed for the application of TNR to effectively ensure humane treatment. Since 1997, the Israeli Supreme Court has mandated that “the mass killing of dogs and cats [is] not permitted” and that each case, or complaint, must be individually evaluated. Additionally, the Court announced that non-lethal methods, including TNR, should be utilised. To this end, Israeli municipalities and the Ministry of Agriculture and Rural Development annually invest millions into TNR campaigns conducted with the assistance of community members⁷¹.

Similarly, Italian law implemented a no-kill policy for free-roaming (stray) cats in 1991 with TNR functioning as the primary control method utilised⁷², making it the first of its kind in the world. In Italy, TNR programs are considered “the most practical, effective and humane way for controlling

⁶⁶ The Law Society of New South Wales, 2010, *Animal Law Guide: New South Wales*. Available at: <https://www.lawsociety.com.au/cs/groups/public/documents/internetyounglawyers/420246.pdf>

⁶⁷ Ibid.

⁶⁸ Prevention of Cruelty to Animals Act 1979. Available at: <http://www.legislation.nsw.gov.au/inforce/af92116f-7d2d-60a9-f731-9dacdd705d05/1979-200.pdf>

⁶⁹ The Law Society of New South Wales, 2010, *Animal Law Guide: New South Wales*. Available at: <https://www.lawsociety.com.au/cs/groups/public/documents/internetyounglawyers/420246.pdf>

⁷⁰ Slater, M. R., 2007, ‘The welfare of feral cats,’ in I Rochlitz (ed.), *The Welfare of Cats*, Springer, the Netherlands.

⁷¹ Gunther, I., Raz, T., Zor, Y. E., Bachowski, Y., and Klement, E., 2016, ‘Feeders of free-roaming cats: personal characteristics, feeding practices, and data on cat health and welfare in an urban setting of Israel,’ *Frontiers in Veterinary Science*, vol. 3, no. 21.

⁷² Under National Law No. 281 (1991) cats are considered to have “the right to live free [and be] protected and cannot be moved from their colony,” must be “surgically neutered [by the cooperating veterinary service] and [be] reintroduced in their colony”. Under the law, carers become institutionalised figures who are granted “the official assignment of the management of a cat colony if the local VPS [Veterinary Public Services] and the office for the animal welfare agree” (Natoli, E., Maragliano, L., Cariola, G., Faini, A., Bonanni, R., Cafazzo, S., and Fantini, C., 2006, ‘Management of feral domestic cats in the urban environment of Rome (Italy),’ *Preventive Veterinary Medicine*, vol. 77, pp. 180-185).

free-roaming cats”⁷³. This unique instance enabled the first critical assessment of a “nationally mandated TNR campaign”⁷⁴. Whilst most studies evaluating the efficacy of TNR, a decade-long 2006 survey analysed 103 distinct colonies and concluded that the campaign saw a decrease in cat numbers, before noting that “cat immigration” (primarily abandonment) raised population levels by up to 21%. Yet again, it is primarily due to community non-cooperation or lack of community support or education that see a relative decline in the efficacy of TNR campaigns. As the true effects of TNR campaigns may not be seen until 2 years after initiation⁷⁵, the actions of community members can be considered counterproductive and harmful to the public and institutional response to TNR efforts. The control and effective management of companion cat reproduction is cited as “crucial” to achieving control of free-roaming cat population levels⁷⁶. None of these can be considered indictments of TNR principles or effectiveness.

TNR programs, in and of themselves, can be effective when applied in conjunction with community education/information campaigns to alleviate the risk of undoing the achievements facilitated through TNR. The public, as the original Italian assessment paper maintains, must be made away of the need for better management of companion animal fertility and ought to be “matched with an effective educational campaign directed to citizens to reduce the high risk of owned-cat abandonment”. The Australian RSPCA, whilst not openly endorsing TNR and claiming that it is rather “difficult to recommend,” notes that for it to be successful it would need to be “well managed” and have “sufficient resources to continue over time”⁷⁷. This, however, is true of all currently operational control programs and techniques. The primary cause of TNR programs failing to achieve results appears to be lack of commitment by government and governmental agencies, limited funding and resources, and a distinct lack of structural support⁷⁸. Simply claiming that a method is ineffectual *without resources and management* is to say that the problem will not solve itself. The illegal dumping of unwanted cats and stray cats being attracted to food provided to neutered colony cats are known to “offset reductions in cat numbers caused by death and adoption,” a defining feature of many TNR programs⁷⁹. The Italian study concluded, “Subsidised neutering for owned pet cats might be less expensive [than lethal methods] in the long run”⁸⁰.

1.10 Conclusion

The Threat Abatement Plan for Predation by Feral Cats (2015) [henceforth ‘the Plan’] considers shooting as expensive, labour intensive and time consuming, yet includes no mention of humaneness (for further discussion on humaneness and welfare concerns see section 3 and section 4). Curiosity, meanwhile, is endorsed as having a “greater level of humaneness,” and expressly designed for use in environments where non-target species are located (for more information on the possible issues related to this see section 3.1.1). The Plan also consider other potential techniques, including the use of an encapsulated toxin to be implanted either directly into, or on collars, of threatened species, and proposes a concept of “exploiting” so-called “major landscape modifiers” (Action 1.4).

⁷³ Natoli, E., Maragliano, L., Cariola, G., Faini, A., Bonanni, R., Cafazzo, S., and Fantini, C., 2006, ‘Management of feral domestic cats in the urban environment of Rome (Italy),’ *Preventive Veterinary Medicine*, vol. 77, pp. 180-185

⁷⁴ Natoli, E., Maragliano, L., Cariola, G., Faini, A., Bonanni, R., Cafazzo, S., and Fantini, C., 2006, ‘Management of feral domestic cats in the urban environment of Rome (Italy),’ *Preventive Veterinary Medicine*, vol. 77, pp. 180-185; Schmidt, P. M., Swannack, T. M., Lopez, R. R., and Slater, M. R., 2009, ‘Evaluation of euthanasia and trap-neuter-return (TNR) programs in managing free-roaming cat populations,’ *Wildlife Research*, vol. 36, pp. 117-125.

⁷⁵ Natoli, E., Maragliano, L., Cariola, G., Faini, A., Bonanni, R., Cafazzo, S., and Fantini, C., 2006, ‘Management of feral domestic cats in the urban environment of Rome (Italy),’ *Preventive Veterinary Medicine*, vol. 77, pp. 180-185

⁷⁶ Ibid.

⁷⁷ RSPCA Australia, 2014, ‘What is trap-neuter-return and is it an appropriate strategy for the management of unowned cats’. Available at: http://kb.rspca.org.au/What-is-trap-neuter-return-and-is-it-an-appropriate-strategy-for-the-management-of-unowned-cats_462.html.

⁷⁸ Slater, M. R., 2007, ‘The welfare of feral cats,’ in I Rochlitz (ed.), *The Welfare of Cats*, Springer, the Netherlands.

⁷⁹ Winter, L., 2004, ‘Trap-neuter-release programs: the reality and the impacts,’ *Journal of Veterinary Medicine America*, vol. 225, no. 9, pp. 1369-1376.

⁸⁰ Natoli, E., Maragliano, L., Cariola, G., Faini, A., Bonanni, R., Cafazzo, S., and Fantini, C., 2006, ‘Management of feral domestic cats in the urban environment of Rome (Italy),’ *Preventive Veterinary Medicine*, vol. 77, pp. 180-185

These “modifiers,” the Plan suggests, can be “used or manipulated to exert additional control pressure on feral cats”.

As cats are not considered “pests” in all state and territory legislation the Plan seeks legislative amendments to “minimise any administrative burdens on land managers undertaking feral cat control programs”. Ultimately, the draft Review under consideration effectively negates the possibility of utilising TNR techniques on the spurious rationale that lethal methods prove more valuable and cost-effective. Recall, however, the South African university case. Classifying TNR and other “non-lethal means” as “impractical,” the draft Review considers poison baits to be the “cheapest and most effective broad scale technique for control of feral predators” and advocates the development of new techniques that “exploit the cleaning habits of cats to deliver toxins” (a suggestion that is also advised by the Plan). It is the opinion of Animal Liberation that the current control campaigns targeting “feral” cats is not only ineffectual compared to other techniques, it is liable to be less cost-effective and include far less negative welfare implications. This is a view upheld by a growing range of independent and empirical studies into the efficacy of TNR techniques and programs, outlined here with examples and statistical evidence. For the Review to be acceptable to the wider community, these alternatives must be approached with the same vigour and enthusiasm that the current techniques are granted.

2 Carp

2.1 Overview of the recommendations provided within the Review

The Review acknowledges that carp were introduced into Australia in the 1860s, yet did not present a threat until the 1970s when flooding adversely affected the Murray-Darling Basin and “saw their numbers explode”. As a result of this, carp (along with rabbits, pigs, foxes, dogs, goats and select species of birds), are thought to represent an annual cost of \$170 million. Carp alone are considered to present a cost of approximately \$9 million a year in NSW alone. This, it should be noted, is based on a single study estimate (McLeod 2016). The Review recommends that the NSW Government consider carp “a significant pest animal and prioritise their removal from freshwater environments” as they are considered “the most significant pest in NSW freshwater ecosystems,” making up over 80 per cent of fish biomass in the Murray-Darling. The eradication of carp is presented in the Review as a “once-in-a-generation opportunity” that could reduce population levels by between 90-95 per cent (the two figures appear interchangeable in the Review document).

The Review recommends the wholesale use of cyprinid herpesvirus (CyHV-3) to control the population levels of carp in Australian waterways, notably the Murray-Darling Basin, where their presence is cited as affecting the recreational fishing industry. The latter is considered a social impact, in that the reduction of recreational fishing amenities is positioned as a primary reason for releasing a relatively unproven and inadequately researched toxic eradication policy and method. Through reference to supposedly “effective” control programs of wild rabbits by myxoma and RHD, which themselves have been thoroughly criticised⁸¹, the Review essentially calls for the indiscriminate eradication of an entire species.

2.2 A brief epidemiological history of koi herpesvirus (KHV)

Beginning in the late 1990s, koi herpesvirus disease (KHVD), also known as gill necrosis virus (CNGV)⁸², has caused mass mortality to common carp and koi carp (*Cyprinus carpio*) in Europe, Israel, and the United States⁸³. It has been suggested that the virus had been present in wild common carp from 1996 in the United Kingdom, and since initial reports it has been identified across Europe, Asia, and Africa⁸⁴. The first reference to KHV and its potential to cause mass carp mortality was presented in 1999 at the 9th International Conference of European Association of Fish Pathologists (EAFP)⁸⁵ and was first isolated and identified a year later⁸⁶. The virus has been proven to spread through faeces and emission of viral particles in water via horizontal transmission (among individuals of the same generation)⁸⁷, with the skin acting as “the portal of entry [...] and the site of early replication”, which further acts as a site of transfer between fish. It is also thought that

⁸¹ “Myxomatosis and RHD do not control rabbits in Australia to a sufficient extent” (Williams, C. K., Davey, C. C., Moore, R. J., Hinds, L. A., Silvers, L. E., Kerr, P. J., French, N., Hood, G. M., Pech, R. P., and Krebs, C. J., 2007, ‘Population responses to sterility imposed on female European rabbits,’ *Journal of Applied Ecology*, vol. 44, no. 2, pp. 291-301).

⁸² Shapira, Y., Magen, Y., Zak, T., Kotler, M., Hulata, G., and Levavi-Sivan, B., 2005, ‘Differential resistance to koi herpes virus (KHV)/carp interstitial nephritis and gill necrosis virus (CNGV) among common carp (*Cyprinus carpio* L.) strains and crossbreds,’ *Aquaculture*, vol. 245, pp. 1-11.

⁸³ Bergmann, S. M., Schutze, H., Fischer, U., Fichtner, D., Riechardt, M., Meyer, K., Schrudde, D., and Kempter, J., 2009, ‘Detection of koi herpes virus (KHV) genome in apparently healthy fish,’ *Bulletin of European Association of Fish Pathologists*, vol. 29, no. 5, pp. 145-152.

⁸⁴ Michel, B., Fournier, G., Lieffrig, F., Costes, B., and Vandersplasschen, A., 2010, ‘Cyprinid herpesvirus 3,’ *Emerging Infectious Diseases*, vol. 16, no. 12, pp. 1835-1843.

⁸⁵ Pokorova, D., Vesely, T., Piackova, V., Reschova, S., and Hulova, J., 2005, ‘Current knowledge on koi herpesvirus (KHV): a review,’ *Veterinary Medicine Czechoslovakia*, vol. 4, pp. 139-147.

⁸⁶ Shapira, Y., Magen, Y., Zak, T., Kotler, M., Hulata, G., and Levavi-Sivan, B., 2005, ‘Differential resistance to koi herpes virus (KHV)/carp interstitial nephritis and gill necrosis virus (CNGV) among common carp (*Cyprinus carpio* L.) strains and crossbreds,’ *Aquaculture*, vol. 245, pp. 1-11.

⁸⁷ Macera, C. A., Shaffer, R. A., Shaffer, P. M., 2013, *Introduction to Epidemiology: Distribution and Determinants of Disease*, Delmar, New York.

transmission occurs when uninfected fish come into contact with the lesions this creates⁸⁸ and research has shown that entry of CyHV-3 is dramatically magnified when the mucus lining of affected lesions are disturbed (either through contact with other fish or other means)⁸⁹.

When infected, initial signs become apparent at 2 to 3 days. Infected fish present as lethargic or fatigued, have diminished appetites, suffer internal haemorrhages⁹⁰, and “lie at the bottom of the tank with the dorsal fin folded”⁹¹. The skin acts as a visible marker of infection, with clinical signs passing through a series of stages; the most apparent of these affect the gills, which regularly become necrotic and emit mucus, ultimately suffocating the fish. Aside from physical symptoms, neurological markers, such as disorientation and diminished equilibrium, also become apparent in the final stages⁹². Studies have shown that the infection affects the gill, skin, kidney, liver, spleen, gastrointestinal system, and brain, with the effects on the gills the first to become apparent.

2.3 The host-specificity of KHV

Prior to a 2009 study, it was believed that koi herpesvirus disease (KHVD) only affects *C. carpio* fish species. As a result, it has been considered common knowledge that KHVD is capable of transferring specifically to these species and none other. This view is endorsed by the Review, which claims that the virus is “specific to common carp”. However, CyHV-3 infection is capable of affecting a “broad host range”⁹³.

Since 2003 a number of “unexplainable cases of KHVD [...] without any epidemiological connection to KHV” have been documented. Consequently these outbreaks of “apparently healthy carp,” with KHV vaccination, were considered to be potential carriers capable of spreading KHV. There is “no published report or successful experiment showing the re-activation and re-isolation of herpesvirus from any latent or persistently infected aquatic animal”⁹⁴. The virus is believed to have “an undetectable latent phase” that can be complicated through “the unregulated sale of live apparently healthy” fish⁹⁵ and environmental fluctuations (for more on this see section 2.4).

In attempting to ascertain whether the virus exclusively infects *Cyprinus carpio* species, researchers have conducted a series of comparative experiments with common carp and strains or crossbreeds of both domesticated and wild species. One of the crossbred species proved highly resistant, with survival rates of over 60%, whilst other crossbreeds were shown to have greater resistance in wild environments compared to those in laboratory settings⁹⁶.

⁸⁸ Michel, B., Fournier, G., Loeffrig, F., Costes, B., and Vandersplasschen, A., 2010, ‘Cyprinid herpesvirus 3,’ *Emerging Infectious Diseases*, vol. 16, no. 12, pp. 1835-1843.

⁸⁹ Raj, V. S., Fournier, G., Rakus, K., Ronsmans, M., Ouyang, P., Michel, B., Delforges, C., Costes, B., Farnir, F., Leroy, B., Wattiez, R., Melard, C., Mast, J., Loeffrig, F., and Vanderplasschen, A., 2011, ‘Skin mucus of *Cyprinus carpio* inhibits cyprinid herpesvirus 3 binding to epidermal cells,’ *Veterinary Research*, vol. 42, no. 92, pp. 1-9.

⁹⁰ Shapira, Y., Magen, Y., Zak, T., Kotler, M., Hulata, G., and Levavi-Sivan, B., 2005, ‘Differential resistance to koi herpes virus (KHV)/carp interstitial nephritis and gill necrosis virus (CNGV) among common carp (*Cyprinus carpio* L.) strains and crossbreeds,’ *Aquaculture*, vol. 245, pp. 1-11.

⁹¹ Michel, B., Fournier, G., Loeffrig, F., Costes, B., and Vandersplasschen, A., 2010, ‘Cyprinid herpesvirus 3,’ *Emerging Infectious Diseases*, vol. 16, no. 12, pp. 1835-1843.

⁹² Michel, B., Fournier, G., Loeffrig, F., Costes, B., and Vandersplasschen, A., 2010, ‘Cyprinid herpesvirus 3,’ *Emerging Infectious Diseases*, vol. 16, no. 12, pp. 1835-1843.

⁹³ Bergmann, S. M., Kempter, J., Riechardt, M., and Fichtner, D., n.d., ‘Investigation on the host specificity of koi herpesvirus (KHV) infection,’ *Federal Research Institute for Animal Health*.

⁹⁴ Bergmann, S. M., Schutze, H., Fischer, U., Fichtner, D., Riechardt, M., Meyer, K., Schrudde, D., and Kempter, J., 2009, ‘Detection of koi herpes virus (KHV) genome in apparently healthy fish,’ *Bulletin of European Association of Fish Pathologists*, vol. 29, no. 5, pp. 145-152.

⁹⁵ El-Matbouli, M., and Soliman, H., 2011, ‘Transmission of *Cyprinid herpesvirus-3* (CyHV-3) from goldfish to naive common carp by cohabitation,’ *Research in Veterinary Science*, vol. 90, pp. 536-539.

⁹⁶ Shapira, Y., Magen, Y., Zak, T., Kotler, M., Hulata, G., and Levavi-Sivan, B., 2005, ‘Differential resistance to koi herpes virus (KHV)/carp interstitial nephritis and gill necrosis virus (CNGV) among common carp (*Cyprinus carpio* L.) strains and crossbreeds,’ *Aquaculture*, vol. 245, pp. 1-11.

A study of several unexplainable outbreaks of the virus led another research team to conclude that “more disease influencing factors exist” than have currently been accounted for⁹⁷. That is, the true extent of the host range of KHV is currently unknown. This study conducted an experiment to establish whether apparently healthy fish (koi or non-*Cyprinus carpio* species) can be infected when kept in cohabitation with infected carp. Ultimately, they found that these previously healthy fish could become infected and the infected species “were able to transfer KHV to naïve carp,” with the alarming conclusion that “some ornamental fish species could act as reservoirs of KHV infection”. Through studying several clinically healthy goldfish varieties for KHV infection using PCR (polymerase chain reaction) methods, none of the studied fish showed infection utilising this technique. However, utilisation of a nested PCR methodology indicated that these “apparently healthy” fish were in fact “KHV DNA positive”. This means that the virus can be, and has been shown to be, transferrable to non-*Cyprinus carpio* species, and can be latent in several species commonly sold at pet shops or wholesalers⁹⁸. The report noted that the majority of researchers “deny the presence of KHV in other fish species than *C. carpio*,” despite the fact that through the use of more discerning methods and techniques this has in fact been proven incorrect. Nested PCR is primarily used to achieve “high-level sensitivity”⁹⁹ allowing researchers to effectively differentiate specific DNA for comparative study. In fact, it has been shown that studies indicating that *C. carpio* are singularly vulnerable to KHV relate to “test sensitivity,” as other techniques do not routinely or commonly indicate infection. Fish species other than carp are vulnerable and at risk of KHV infection, leaving open the opportunity for the wholesale use of a previously absent toxin in Australian waterways to present far greater damage to both the ecosystem and economy.

By studying goldfish and a number of other non-*Cyprinus carpio* fish species that are considered to be immune from KHV infection and utilising traditional diagnostic measures (PCR), researchers have found that with a more sensitive diagnostic mechanism (nested PCR and *in-situ* hybridisation) they could, and do, show KHV infection. Ultimately, KHV has been shown to be infectious to non-*Cyprinus carpio* species, belying the Reviews assurance that this is not the case.

2.4 Water temperature and the stability of the Murray-Darling

Water temperature is a significant factor relating to CyHV-3¹⁰⁰ and disease susceptibility¹⁰¹. Temperature can act as a restrictor of viral cell replication, effectively “locking in” the virus without there being any visible indicators of this. The virus is known to affect fish only when water temperature is between 18°C and 28°C. Optimal conditions for replication is between 15°C and 25°C, whereas propagation of the virus is “turned off” at 30°C.

According to the Murray-Darling Basin Authority (MDBA), cold-water pollution (CWP), or the artificial lowering of water temperature caused by the release of water from dams back into the

⁹⁷ Bergmann, S. M., Schutze, H., Fischer, U., Fichtner, D., Riechardt, M., Meyer, K., Schrudde, D., and Kempter, J., 2009, ‘Detection of koi herpes virus (KHV) genome in apparently healthy fish,’ *Bulletin of European Association of Fish Pathologists*, vol. 29, no. 5, pp. 145-152.

⁹⁸ Bergmann, S. M., Schutze, H., Fischer, U., Fichtner, D., Riechardt, M., Meyer, K., Schrudde, D., and Kempter, J., 2009, ‘Detection of koi herpes virus (KHV) genome in apparently healthy fish,’ *Bulletin of European Association of Fish Pathologists*, vol. 29, no. 5, pp. 145-152.

⁹⁹ Singleton, P., 2000, *DNA Methods in Clinical Microbiology*, Springer-Science+Business Media, Berlin; McPherson, M., J., and Møller, S. G., 2006, *PCR*, 2nd edition, Taylor & Francis, New York.

¹⁰⁰ Pokorova, D., Vesely, T., Piackova, V., Reschova, S., and Hulova, J., 2005, ‘Current knowledge on koi herpesvirus (KHV): a review,’ *Veterinary Medicine Czechoslovakia*, vol. 4, pp. 139-147; Rakus, K., Ouyang, P., Boutier, M., Ronsmans, M., Reschner, A., Vancsok, C., Jazowiecka-Rakus, J., and Vandersplassen, A., 2013, ‘Cyprinid herpesvirus 3: an interesting virus for applied and fundamental research,’ *Veterinary Research*, vol. 44, no. 85, pp. 1-16.

¹⁰¹ Ryan, T., and Preece, R., n.d., ‘Potential for thermal shock in the Murray-Darling Basin: a scoping study for the Murray-Darling Basin Commission,’ *Arthur Rylah Institute for Environmental Research*. Available at: http://www.mdba.gov.au/sites/default/files/archived/mdbc-SW-reports/468_execsum_thermal_Shock.pdf

river channel further downstream¹⁰², is “widespread throughout the MDB [Murray-Darling Basin]”¹⁰³. A 2009 report published by the MDBA cites 20 instances in which “some form of CWP” has been registered¹⁰⁴. Similarly, a NSW Department of Infrastructure, Planning and Natural Resources (DIPNR) cold-water pollution assessment found that from a shortlist of close to 100 dams, 9 within the Murray-Darling were causing “relatively large and pervasive cold-water pollution”. This results in a marked decrease in water temperatures, with some bodies falling “more than 10°C lower than natural”¹⁰⁵. The potential for damage to aquatic organisms and general ecosystem health caused by CWP has been known for over 45 years¹⁰⁶. Yet the Review has neglected to include these figures or the implications that they raise, and has failed to provide adequate estimates regarding the efficacy and consequences of diminished water temperature in direct connection to the planned release of CyHV-3. A far greater and broader analysis of this potentiality is required prior to the approval and adoption of CyHV-3.

2.5 The evidence of latent KHV infection and virus transmission

Vitality, even in the absence of identifiable markers of transmission, infected fish can remain latently infected for up to 30 days. Ultimately this means that CyHV-3 can remain intact in infected bodies asymptotically “for long periods [...] when the temperature prevents virus replication” and “bursts of new infection[s] [can] occur after exposure to permissive temperatures”¹⁰⁷. Whether the carcasses of infected fish remain latently infected, and thus pose a secondary risk to other environments and/or species, has not been addressed by the Review, nor contemplated in terms of biosecurity risks.

CyHV-3 is known to replicate in goldfish, and under temperature fluctuations or environmental stressors, goldfish infected with CyHV-3 are capable of transmitting the virus. Further, goldfish “can act as a true carrier, as the virus can replicate in their tissues”. Despite this, infected goldfish exhibit “no abnormal clinical signs,” possibly because goldfish are not “the natural host of the virus” and are capable of acting as enablers, allowing the virus to multiply, replicate, and transmit at “undetectable levels”¹⁰⁸.

In studying the rates and symptomology of infected goldfish and their role as carriers of KHV, researchers found that carp kept in co-habitation with these infected fish died “without any clinical signs of infection with CyHV-3”. Despite not exhibiting visible signs of infection, analysis found that the CyHV-3 genome was present in the gills, kidneys, and spleens of the deceased fish as well as a number of live carp cohabitating with known infected goldfish¹⁰⁹. Further analysis revealed that the carp that died had been infected with the CyHV-3 virus “excreted from the infected goldfish”. In discussing why this occurred, researchers posited that environmental stressors, including unforeseen or unavoidable temperature alterations, “encouraged the virus to replicate and disseminate”.

¹⁰² NSW Office of Water, 2011, ‘NSW cold water pollution strategy: guidelines for managing cold water releases from high priority dams,’ NSW Office of Water, Sydney.

¹⁰³ Boys, C. A., Miles, N., and Rayner, T., 2009, *Murray-Darling Basin Authority Native Fish Strategy: Scoping options for the ecological assessment of cold water pollution downstream of Keepit Dam, Namoi River*, Murray-Darling Basin Authority, Canberra.

¹⁰⁴ Boys, C. A., Miles, N., and Rayner, T., 2009, *Murray-Darling Basin Authority Native Fish Strategy: Scoping options for the ecological assessment of cold water pollution downstream of Keepit Dam, Namoi River*, Murray-Darling Basin Authority, Canberra.

¹⁰⁵ Preece, R., 2004, ‘Cold water pollution below dams in New South Wales: a desktop assessment,’ Water Management Division, Department of Infrastructure, Planning and Natural Resources, Sydney.

¹⁰⁶ Lugg, A., and Copeland, C., 2014, ‘Review of cold water pollution in the Murray-Darling Basin and the impacts on fish communities,’ *Ecological Management and Restoration*, vol. 15, no. 1, pp. 71-79.

¹⁰⁷ Michel, B., Fournier, G., Lieffrig, F., Costes, B., and Vandersplasschen, A., 2010, ‘Cyprinid herpesvirus 3,’ *Emerging Infectious Diseases*, vol. 16, no. 12, pp. 1835-1843.

¹⁰⁸ El-Matbouli, M., and Soliman, H., 2011, ‘Transmission of *Cyprinid herpesvirus-3* (CyHV-3) from goldfish to naive common carp by cohabitation,’ *Research in Veterinary Science*, vol. 90, pp. 536-539.

¹⁰⁹ Ibid.

A second study produced to ascertain the host specificity of KHV led with the fact that channel catfish herpesvirus (CCV) is capable of infecting more than one species. Through analysing different organs of species previously considered incapable of developing or transmitting KHV, the study found that, despite previously showing no “clinical sign[s] of KHVD,” the virus was detected in “most of the experimentally or naturally-infected fish¹¹⁰”. This study also utilised the aforementioned nested PCR methodology, and noted that instances of KHV infection were not found using the “conventional” PCR method. This has been noted by other studies, who, to date, have not found the cause of the differential outcomes from each method¹¹¹

A key factor inherent to the proposed plan to infect carp in Australian waterways with KHV is the inevitable, and immeasurable, mass of dead fish that will result. With an estimated mortality rate of between 90-95%, and considering the Review’s estimation that carp account for up to 80% of biomass, the colossal amount of fish that will die and subsequently pollute waterways is staggering. By way of managing this proposed inevitability, the Review calls on the Local Land Services (LLS) and NSW Department of Primary Industries (DPI) to form a collaborative partnership to not only plan the release of the virus, but also engage with the community to “participate in carp clean-up issues”. As has been shown through the unacknowledged academic and scientific evidence of the potential CyHV-3 presents in facilitating infection in species other than those targeted (carp), the deluge of dead biomass that will result has not been adequately addressed and warrants further study and attention. Despite the fact that \$30 billion has reportedly been allocated to the clean-up after treatment, the issues related to host-specificity, or the lack thereof, are unattended to in the Review, which claims that “the implementation of this virus as a control method is essential”. The release of the virus is presented as a cure to the invasive nature of carp, with the virus acting as an aide to achieving healthy waterways and fish communities. The Review acknowledges that limitations currently exist, yet presents the case for CyHV-3 as a quick and safe remedy. In admitting that “several significant issues need to be adequately resourced and addressed prior to the virus’ release,” most apparently, for the Review, the clean-up post-release, the Review nonetheless presents the case for release as requiring a “fast-track[ed]” response. By alluding to the “success and lessons learnt from [previous] biological control research projects,” notably myxomatosis used against rabbits, the Review maintains that the virus should be released as a priority. However, the virus not only has the potential and known ability to transmit between species, of which more may be susceptible, it can also remain latent, posing a threat to un-targeted areas and species. This has profound effects on both the local ecosystem, including the waterways and species it is intended to safeguard, as well as broader communities that are subject to unforeseen threats that are not adequately addressed in the Review.

2.6 A distinct lack of alternative considerations: a review of the efficacy of daughterless carp technology and development of Judas fish

In 2014, the Australian Fisheries Research and Development Corporation (FRDC) reported that this gene technology (the technique involves altering the genes of fish to ensure the survival or fertility of male offspring) was trialled successfully and its adoption in control programs “could control and even exterminate invasive fish such as carp¹¹²”. As the report citing this success explains, methods of carp control have primarily involved either commercial harvesting or poisoning. Yet, whilst these techniques may diminish carp numbers and poisoning can “occasionally eradicate them from

¹¹⁰ Bergmann, S. M., Kempter, J., and Fichtner, D., 2009, ‘How host specific is infection with koi herpesvirus (KHV) for real?’ *The Israeli Journal of Aquaculture*, vol. 61, no. 3, pp. 270-290.

¹¹¹ El-Matbouli, M., and Soliman, H., 2011, ‘Transmission of *Cyprinid herpesvirus-3* (CyHV-3) from goldfish to naive common carp by cohabitation,’ *Research in Veterinary Science*, vol. 90, pp. 536-539.

¹¹² Thresher, R., 2014, ‘Male dominance to end species,’ *FISH*, vol. 22, no. 3. Available at: <http://frdc.com.au/stories/Pages/24-Male-dominance.aspx>

isolated areas¹¹³,” alternative methods are available, including daughterless technologies and the implementation of barriers, monitoring procedures (such as the ‘Judas carp’ approach, wherein radio transmitters are inserted into individuals for monitoring and location analyses), use of pheromone “baits” to entice and trap, as well as select and localised implementation of poisons to kill unborn embryos¹¹⁴.

According to the South Australian Research and Development Institute (SARDI), the solution to developing “a cost-effective carp control strategy is knowledge of the movement patterns and habitat preferences of carp” which can then be exploited to target and maintain control levels¹¹⁵. The Review fundamentally fails to consider alternatives to the proposed biological control of carp in Australian waterways. Despite the fact that independent studies and/or specific research is lacking in this area, the Review pressures for the release regardless. It is not until it is noted that an alternative method is available that we can adequately differentiate and discriminate.

Daughterless carp, or ‘Daughterless Carp Gene Technology’ (DCGT), is a biotechnological method applicable to control techniques of carp that has been known to government and agencies for over 10 years¹¹⁶ and is included in a series of projects under the CSIRO’s umbrella concept of ‘Sterile Ferals’¹¹⁷. The technique is included in the Murray-Darling Basin Commission’s 50-year Native Fish Strategy, with the CSIRO citing it is a “novel method of invasive species control [which] warrant[s] further development”¹¹⁸. It has been proven effective in managing the reproduction of zebra fish, a species closely related to carp, and the Invasive Animals CRC reported in 2013 that daughterless carp technologies not only have the potential to eradicate the female population, it curtails egg production by up to 90%¹¹⁹. Essentially it functions as a control method as well as a sterilisation procedure, thereby adding a multi-tiered element to an otherwise neglected alternative.

Since at least 2013, the Murray-Darling Basin Authority (MDBA), in collaboration with the Invasive Animals CRC and the CSIRO, has been actively developing insights into this method. It is known to “radically reduce [...] carp numbers within a few generations” and has been described by the above agencies as an alternative enabling a “potentially more powerful means [compared to other techniques] of controlling carp”¹²⁰. The technique essentially “biases offspring sex ratios towards males,” with the result of a manipulated population leading to “massively distorted sex ratios, reproductive failure and extinction”¹²¹. If this is the goal of the carp control program, and it’s aims are achievable via non-toxic means without the potential to cause a range of detrimental side effects, the adoption of a daughterless carp campaign appears to be worthy of supplemental attention. The Review, however, alludes to the possibility on a single occasion without discussing the merits this technique has over wholesale infection with CyHV-3.

2.7 Alternative technique case study: Judas carp in Tasmania

A sterilisation program has been employed in Tasmania to control carp numbers through the aforementioned ‘Judas carp’ technique. Carp were first discovered in Lake Sorell in 1995, leading the Inland Fisheries Service (IFS) to instigate a control program aimed at eradication. In October 2015 it

¹¹³ There is no evidence that the currently proposed program will be effective, whilst there are documented cases and a rich body of literature pointing to the merits of the daughterless carp technique.

¹¹⁴ Thresher, R., 2014, ‘Male dominance to end species,’ *FISH*, vol. 22, no. 3. Available at: <http://frdc.com.au/stories/Pages/24-Male-dominance.aspx>

¹¹⁵ Thwaites, L., Fredberg, J., and Ryan, S., 2015, ‘Glenelg River ‘Judas’ Carp Tracking: Program 2015,’ an Interim Report to the Glenelg Hopkins Catchment Management Authority, South Australian Research and Development Institute (Aquatic Sciences), Adelaide.

¹¹⁶ Gilligan, D., and Rayner, T., 2007, ‘The distribution, spread, ecological impact and potential control of carp in the upper Murray River,’ NSW Department of Primary Industries – Fisheries Report Series: 14. Available at:

<https://www.environment.gov.au/system/files/resources/b8589b8e-52dc-4391-bd18-3046ea775aef/files/upper-murray-carp-report.pdf>

¹¹⁷ Lapidge, K., 2003, ‘Background,’ in *Proceedings of the National Carp Control Workshop, 5-6 March 2003*, CSIRO, Canberra. Available at: <http://www.pestsmart.org.au/wp-content/uploads/2010/03/CarpProc.pdf>

¹¹⁸ Ibid.

¹¹⁹ Invasive Animals CRC, the Murray-Darling Basin Authority, and the CSIRO, 2013, ‘Daughterless carp’. Available at:

http://www.pestsmart.org.au/wp-content/uploads/2013/03/CPFS2_daughterless.pdf

¹²⁰ Invasive Animals CRC, the Murray-Darling Basin Authority, and the CSIRO, 2013, ‘Daughterless carp’. Available at:

http://www.pestsmart.org.au/wp-content/uploads/2013/03/CPFS2_daughterless.pdf

¹²¹ Thresher, R., Van de Kamp, J., Campbell, G., Canning, M., Grewe, P., and Barney, M., 2012, ‘Daughterless technology: a recipe for eradicating carp in Australia,’ *Management of Carp in Australia*, Melbourne, Victoria, 19-21 June.

was announced that a further \$1.37m would be provided to continue this method¹²². The project hinges upon sterilisation, with the aim of reliably sterilising carp whilst maintaining “behavioural integrity” to then be utilised as “Judas fish” (they are deployed to “assimilate and integrate seamlessly into the wild populations”)¹²³. According to the FRDC report compiled in collaboration with the University of Tasmania, the Inland Fisheries Service (IFS) and the Tasmanian Government, this method was chosen largely due to the fact that “several ecological and economic concerns and logistical limitations [...] precluded the use of drastic control approaches such as raining or mass application of chemicals/poisons”¹²⁴. This has effectively produced an “eradication of the species” in this region and government reports have declared the river system “carp-free”¹²⁵. The Invasive Animals CRC also reported that this Tasmanian program “enabled [...] near complete carp eradication”¹²⁶.

The FRDC maintain that a key component to the success of the program was the use of the Judas technique, first implemented in 1997. Not only did the technique enable the fulfilment of the programs objectives, it enabled a broader understanding of carp behaviour, which in turn facilitated a valuable monitoring system. As the SARDI report explains, use of chemicals in waterways has inherent risks that need to be considered: the use of chemicals necessitates large amounts of chemicals and may require a number of releases, the water system will generally require isolation and residual chemicals require treatment to alleviate the risk of unintended environmental consequences, and may require specialist training and/or permission. These requirements were considered to be unviable by the researchers and would be considered inappropriate under Victorian regulation¹²⁷.

Whilst it is acknowledged that this procedure requires intensive planning and time, and inherently involves a level of suffering due to the requirement of essentially corralling and fishing, it has proven successful at effectively managing carp numbers without recourse to potentially damaging poisons or viruses with unreliably documented host-specificity. This method, along with daughterless carp technologies, is worthy of the Review’s attention and deliberation.

¹²² Hunt, G., Hutchinson, E., and Rockliff, J., 2015, ‘Joint media release: \$1.37m boost for carp eradication in Tasmania,’ 28 October. Available at: <http://www.environment.gov.au/minister/hunt/2015/pubs/mr20151028a.pdf>

¹²³ Patil, J. G., Purser, J., and Nicholson, A., 2014, ‘Development and deployment of sterile ‘Judas fish’ to assist carp eradication in Lake Sorell, Tasmania: surgical and chemical sterilization,’ Fisheries and Development Corporation. New Norfolk, Tasmania.

¹²⁴ Ibid.

¹²⁵ Hunt, G., Hutchinson, E., and Rockliff, J., 2015, ‘Joint media release: \$1.37m boost for carp eradication in Tasmania,’ 28 October. Available at: <http://www.environment.gov.au/minister/hunt/2015/pubs/mr20151028a.pdf>

¹²⁶ Wisniewski, C., n.d., ‘Demonstration site: Lakes Sorell and Crescent, Tasmania,’ Inland Fisheries Service Tasmania. Available at: <http://www.invasiveanimals.com/research/phase1/goals/goal-4/4f16/>

¹²⁷ Patil, J. G., Purser, J., and Nicholson, A., 2014, ‘Development and deployment of sterile ‘Judas fish’ to assist carp eradication in Lake Sorell, Tasmania: surgical and chemical sterilization,’ Fisheries and Development Corporation. New Norfolk, Tasmania.

3 Alternatives to lethal control methods

3.1 Poisoning

As previously discussed the control methods under review include a reliance on poison baits. This reliance is couched in economic and efficacy terms (“poison baits are generally the cheapest and most effective broad scale technique for control of feral predators”). Whilst allowing for several shortcomings associated with this technique, the Review claims that research allows for a higher degree of certainty in adopting lethal control measures. Specifically, the Review states that investment in research conducted to ascertain a poison that is both humane and target specific has been ongoing in relation to the control of free-roaming cats (the Review expects this “improved” lethal bait to be approved within the year – see section 1 for more information). In rationalising this ever-greater concentration of both funding and research geared solely toward lethal control, the Review states that “until more effective baits *or methods* are available” poison baiting remains a necessary technique. Note the terse and incomplete allusion to *methods*. The continued use of poisoning is rationalised precisely because *more effective methods* are considered to be currently unavailable. However, as section 1 (‘cats’) attempts to illustrate, this is far from the case. The Review openly concedes that wholesale eradication of mainland species may be impossible, and endeavours to utilise lethal control in efforts to “suppress” population levels. This, however, is possible and proven to be achievable through alternative methods (see section 1 for discussion on the merits and value of non-lethal techniques in cat control programs and below for analysis on non-lethal sterilisation techniques). It appears, however, that an institutional reliance on lethal methods is entrenched within both the governmental agencies endorsing their use, and the community’s that purport to benefit from them.

Ultimately, poisoning is vindicated as posing as a limited yet appropriate technique to protect other species not deemed to be ‘pests,’ or acts as a safeguard against incursions that result in financially and/or socially negative consequences. A sound and thorough analysis of the nature, efficacy, and consequences of poisoning is an urgent requirement that is not forthcoming from either the Review or other agencies tasked with its implementation. Until such a time, it is difficult to reconcile the stated goals of poisoning campaigns with their efficacy and humaneness, especially in comparison to the alternative non-lethal techniques discussed within this submission.

3.1.1 Secondary poisoning of native Australian animals: 1080 poison

1080 (sodium monofluoroacetate) is commonly used as a vertebrate pesticide in NSW as a method to control wild animal populations. It is currently used in campaigns targeting dogs, foxes, pigs, and rabbits. Under the *Local Land Services Act 2013* the Local Land Services (LLS) regulates pest animal management on both private and agricultural land and is the exclusive distributor and training body of 1080 (as well as Pindone, an anticoagulant that causes fatal haemorrhaging, most commonly applied to rabbits in a series of baiting programs¹²⁸). Its use is currently regulated by a Pesticide Control Order (PCO), which authorises its use for specific species and places conditions on how and where it may be used¹²⁹. Research conducted within Australia has concluded that 1080 is inhumane, with a 2007 study concluding, “There is an urgent need for research into improving the humaneness of vertebrate control methods in Australia,” including the use of 1080¹³⁰

The use of 1080 is included within standard operating procedures (SOPs), along with guides concerning its implementation and known impacts upon animal welfare for both target and non-target species. This last point is of particular relevance, as 1080 is known to be ingested and cause deaths in a range of non-target species, including native Australian mammals. The Western

¹²⁸ Sharp, T., and Saunders, G., 2004, ‘RAB004: Ground baiting of rabbits with pindone,’ NSW Department of Primary Industries. Available at: <http://www.pestsmart.org.au/wp-content/uploads/2010/07/rab004-ground-baiting-rabbits-pindone.pdf>

¹²⁹ NSW Environment Protection Authority, 2015, ‘1080 bait user guidance fact sheet’. Available at: <http://www.epa.nsw.gov.au/pesticides/1080pcofactsheet.htm#>

¹³⁰ Sherly, M., 2007, ‘Is sodium fluoroacetate (1080) a humane poison?’ *Animal Welfare*, vol. 16, pp. 449-458.

Australian Government have even published a compilation of research papers that assess the risk of 1080 baits on non-target native species¹³¹. A 2002 report to Environment Australia and the NSW National Parks and Wildlife Service on the impact of 1080 fox poisoning campaigns on tiger quoll populations revealed that the “actual impact” of the poison on quoll populations is unknown, yet states that the “assumed risk” effectively led to restrictions on its use. This is critical. For there to be enough concern to warrant a restriction on what has been a mainstay in the animal control arsenal necessarily leads to the conclusion that this measure was considered vital. One of the reasons for this is that 1080 is “not species specific” and consequently introduces a potential threat and risk to non-target species¹³². This conclusion was also adopted in a 2000 report available on the Australian Government’s Department of Agriculture and Water Resources website on quolls in the Otway Ranges of Victoria¹³³. Similarly, a report compiled for the Victorian Department of Sustainability and Environment explains that 1080 baiting is conducted “extensively” in regions known to be home to Spotted-tail Quoll populations despite the species known sensitivity to the poison¹³⁴. The World Wildlife Fund (WWF) has also indicated that female and young quolls are “especially susceptible” to 1080 poison¹³⁵. It has also been suggested that quolls, among a number of other endangered or vulnerable native Australian species, are capable of consuming hard shelled delivery vehicle (HSDV) encapsulated baits, often thought to reduce the incidence or uptake of poisons by non-target species¹³⁶. Numerous other reports adopt similar conclusions and cite 1080 as a potential contributing cause of quoll population declines¹³⁷. Whilst there are considerable concerns regarding the use of poisons in wild animal control programs, this is often countered by claims that discontinuing their use may result in diminished efficacy of current management techniques¹³⁸. However, as this submission has attempted to belabour, the distinct lack of institutional willingness to consider non-lethal and progressively humane approaches has led to a reliance on the status quo (regardless of inferior efficacy and strong indications of a range of welfare concerns).

Poison baiting is criticised within the 2014 ABARES report due to diminished efficacy as dogs have learnt not to ingest poisoned baits and that there have been documented “off-target deaths” of domestic or working dogs. The baits are also known by landholders to kill native animals, including sand goannas¹³⁹, despite the fact that the Invasive Animals CRC explicitly claims this is unlikely¹⁴⁰. It is also possible that “secondary poisoning” will occur through the ingestion of bait by non-target species, and maggots in meat baits “can accumulate enough toxin to kill a vertebrate”. It is also known that pigs poisoned with 1080 vomit the toxin, subsequently passing on the poison as a second-hand or recycled toxin.

¹³¹ [http://www.parliament.wa.gov.au/publications/tables/papers.nsf/displaypaper/3912644c9a73ca72e8844c9048257e0c000976c4/\\$file/t-p-2644.pdf](http://www.parliament.wa.gov.au/publications/tables/papers.nsf/displaypaper/3912644c9a73ca72e8844c9048257e0c000976c4/$file/t-p-2644.pdf)

¹³² Körtner, G., and Gresser, S., 2002, ‘Impact of fox baiting on tiger quoll populations,’ final report to Environment Australia and the New South Wales National Parks and Wildlife Service. Available at: <https://www.environment.gov.au/system/files/resources/321120e5-e421-4740-af6d-3fd285584828/files/final-report.pdf>

¹³³ Belcher, C., 2000, ‘The range, status and distribution of the spot-tailed Quoll (*Dasyurus maculatus*) in the Otway Ranges’. Available at: http://www.agriculture.gov.au/SiteCollectionDocuments/rfa/regions/vic-west/forest-management/spot-tailed-quoll/vic_west_raa_quoll.pdf

¹³⁴ Long, K., and Nelson, J., 2008, ‘National Recovery Plan for the Spotted-tailed Quoll (*Dasyurus maculatus*),’ Victorian Government Department of Sustainability and Environment, Melbourne.

¹³⁵ World Wildlife Fund (WWF), n.d., ‘Species fact sheet: spotted-tailed quolls’. Available at: http://awsassets.wwf.org.au/downloads/sp003_fs_spotted_tailed_quoll_27feb08.pdf

¹³⁶ Buckmaster, T., Dickman, C. R., and Johnston, M. J., 2014, ‘Assessing risks to non-target species during poison baiting programs for feral cats,’ *PLOS One*, vol. 9, no. 9, pp. 1-7.

¹³⁷ Burnett, S., and Holmes, B., 2008, ‘The spotted-tailed quoll *Dasyurus maculatus* in Queensland’s Border Ranges area,’ report to the Northern Rivers Catchment Management Authority and the Queensland Parks and Wildlife Service. Available at: http://www.wildlife.org.au/projects/quolls/image/nrcma_quollreport.pdf; Glen, A. S., and Dickman, C. R., 2003, ‘Effects of bait-station design on the uptake of baits by non-target animals during control programmes for foxes and wild dogs,’ *Wildlife Research*, vol. 30, pp. 147-149; Andrew, D., 2005, ‘Ecology of the tiger quoll *Dasyurus maculatus maculatus* in coastal New South Wales,’ MSc thesis, School of Biological Sciences, University of Wollongong. Available at: <http://ro.uow.edu.au/cgi/viewcontent.cgi?article=1686&context=theses>

¹³⁸ Humane Vertebrate Pest Control Working Group, 2004, *A National Approach Towards Humane Vertebrate Pest Control*, Discussion paper arising from the proceedings of an RSPCA Australia/AWC/VPC joint workshop, August 4-5, Melbourne. RSPCA Australia, Canberra.

¹³⁹ Binks, N., Kancans, R., and Stenekes, N., 2015, *Wild Dog Management 2010 to 2014 – National Landholder Survey Results*, ABARES report to client prepared for Australian Wool Innovation Ltd., Canberra.

¹⁴⁰ Invasive Animals CRC, 2015, ‘Frequently asked questions: wild dogs and poison baiting’. Available at: http://www.pestsmart.org.au/wp-content/uploads/2015/04/WDFS8_dogs-poison-baiting.pdf

As a result, the NSW Government Office of Environment and Heritage has concluded that “secondary poisoning has been demonstrated to kill individual non-target animals,” but relies on the fact that the true extent of this is unknown and therefore declines to question the overall efficacy of poison baiting¹⁴¹. This, again, is an institutional reliance on the status quo. Despite this, there is evidence that the spotted-tail Quoll (*Dasyurus maculatus*), currently listed as an endangered native species under the Environmental Protection and Biodiversity Conservation (EPBC) Act¹⁴², is particularly affected by wild dog and fox poison baiting (this is listed as a cause of the distribution and population of this species across NSW by the Office of Environment and Heritage)¹⁴³. For these reasons 1080 poison was presented as a key threatening process under the *Threatened Species Conservation Act* and thus proposed to be listed under Schedule 3 of the Act. Ultimately, the NSW Scientific Committee rejected this proposal largely due to the conclusion that there was “no substantive evidence that [...] it [1080] adversely affects threatened species, populations or ecological communities” or that it could cause “species, populations, or ecological communities that are not threatened to become threatened”¹⁴⁴. It is increasingly crucial that a broad and inclusive re-evaluation of this agent be conducted, with a view to assessing its efficacy and humaneness. It is only through evidence-based dialogue and openness to innovative techniques that progress can be made. Progress that not only reduce suffering and welfare concerns, but also add to the overall moral status of any animal control campaigns and bolster community support for Government responses to perceived threats. Further, as this submission has endeavoured to explicitly show, the alternatives needn’t be conceived as inferior in terms of efficacy. Rather, as the evidence and reports included attempt to reiterate, there is a wealth and abundance of complimentary alternatives available that nullify the need to rely on lethal means.

3.1.2 Threats to agricultural production: the rhetoric and the reality

The Review emphatically links “pest” (read: introduced) animals to substantial agricultural losses, in terms of both income and productivity.

Deer are perceived to compete with native species and threaten agricultural production, with the Review claiming that their presence “damage[s] the environment by altering vegetation [and] soil and water systems,” ultimately causing substantial land degeneration. This, however, is an impact that is explicitly apparent in modern agricultural production¹⁴⁵, particularly intensive factory farming operations. It is a tragic irony that a species introduced for recreational hunting has been recast as environmentally damaging and demonised as a substantial threat to agricultural production, when the reality of modern intensive agriculture is itself a leading cause of many of these cited issues. Modern animal production is a known cause of many environmental problems, with Compassion in World Farming (CWF) explicitly stating that it has “a devastating environmental impact” and constitutes a major contributor to global warming, with livestock accounting for up to 10% of all greenhouse gas emissions and approximately 25% of all methane emissions¹⁴⁶. Based upon estimates, as definitive figures are non-existent, millions of introduced wild animals are killed each year “to allow other introduced animals [primarily exploited for agricultural production] the opportunity to graze unimpeded the fragile Australian soils, or to protect introduced crops”. These,

¹⁴¹ Hughes, L., 2008, ‘1080 poison baiting used for the control of vertebrate pest animals – rejection of key threatening process listing: final determination,’ NSW Government Office of Environment and Heritage.

<http://www.environment.nsw.gov.au/determinations/1080PoisonBaitingVertebratePestAnimalsRejectionKTP.htm>

¹⁴² Australian Government Department of the Environment, 2016, *Dasyurus maculatus maculatus (SE mainland population)* in Species Profile and Threats Database, Canberra. Available at: http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=75184#summary

¹⁴³ NSW Government Office of Environment and Heritage, 2014, ‘Spotted-tail quoll’. Available at: <http://www.environment.nsw.gov.au/animals/spottedtailedQuoll.htm>

¹⁴⁴ Hughes, L., 2008, ‘1080 poison baiting used for the control of vertebrate pest animals – rejection of key threatening process listing: final determination,’ NSW Government Office of Environment and Heritage.

¹⁴⁵ Halden, R. U., and Schwab, K. J., n.d., *Environmental Impact of Industrial Farm Animal Production*, A Report of the Pew Commission on Industrial Farm Animal Production. Available at: http://www.ncifap.org/images/212-4_envimpact_tc_final.pdf

¹⁴⁶ Gold, M., 2004, *The Global Benefits of Eating Less Meat*, Compassion in World Farming Trust, Hampshire, UK.

however, are “well-recognised causes of serious environmental damage”¹⁴⁷. Native species are also subject to lethal control rationalised as a mechanism to protect agricultural stock. Since settlement, dingoes have been subjected to extensive extermination campaigns implemented to defend agricultural animals, frequently utilising methods that inflict extensive pain and suffering.

Rabbits have also been condemned as threats to agricultural production, and have similarly been subjected to aggressive control measures. Control of rabbit populations is thought to have two specific aims: the prevention of agricultural production losses wherein improvement is considered to be a direct corollary commensurate to rabbit population reduction and the maintenance and safeguarding of native vegetation¹⁴⁸.

For the Review to be considered inclusive and authoritative, and thereby include thoughtful and rational solutions, these issues require consideration. To simply label an introduced species a ‘pest,’ and thereby legitimise lethal control techniques to remedy their impact, is negligent and dishonest. Intensive agriculture poses a far greater danger to the environment and is a factor that is consistently overlooked. Whilst it is true that a number of viable alternatives to lethal control take comparatively more time and resources, this minor limitation cannot be discredited as the vast majority of currently operational techniques neither guarantee success nor take into account the duration of implementation.

It is difficult to arrive at a conclusion that does not appear to position introduced species as the scapegoats for serious issues that require deliberative and thorough analysis. It is evident throughout the catalogue of documents, studies, and research conducted by, or at the behest of, government agencies that accountability is rerouted to animals whose initial appearance on Australian lands and waterways was either poorly managed or inappropriately conducted. This is to say; we must accept at least a modicum of responsibility and consequently re-evaluate the manner in which we endeavour to remedy negative ecological, social, or economic impacts.

¹⁴⁷ Thiriet, D., 2007, ‘In the spotlight: the welfare of introduced wild animals in Australia,’ *Environmental and Planning Law Journal*, vol. 24, pp. 417-426.

¹⁴⁸ Williams, C. K., Davey, C. C., Moore, R. J., Hinds, L. A., Silvers, L. E., Kerr, P. J., French, N., Hood, G. M., Pech, R. P., and Krebs, C. J., 2007, ‘Population responses to sterility imposed on female European rabbits,’ *Journal of Applied Ecology*, vol. 44, no. 2, pp. 291-301.

3.2 Sterilisation and immunocontraceptives

3.2.1 Overview: A brief history and analysis of the Review's recommendations

For the purposes of this submission, focus will be upon the Review's recommendations concerning deer and the litany of peer-reviewed evidence expounding the efficacy of implementing sterilisation or immunocontraceptive campaigns. It must be noted, however, that a number of related concerns and potential alternatives are applicable to a range of species targeted in the Review.

Deer were introduced into Australia as early as the 19th century by settlers and "hunt clubs" as readily available sources of recreational hunting fodder¹⁴⁹. Deer population levels may reach unwelcome densities due to a number of possible factors; this may include a relative cornucopia of food sources, a lack of predators or natural rivals, access to agricultural crops, or an artificial abundance of sustenance sources (suburban waste and gardens)¹⁵⁰. Yet the initial introduction of this species, and many others, is rarely considered in terms of either accountability or responsibility. That is, the underlying cause is often bypassed or routinely disregarded as the preliminary source of current population levels in favour of implementing wide scale lethal control measures.

Today, deer in Australia are considered to be in a precarious position on the so-called "invasion curve". This concept refers to the likelihood of eradication over time and in relation to cost-effectiveness. Along the curve there are thought to be four separate categories a species may fall under the rubric of at any given time, depending on the range and density of populations: these are, in order of development, prevention, eradication, containment, and long-term management¹⁵¹.

The Review maintains that legislative changes to the NSW *Game and Feral Animal Control Act 2002* should be made to "exclude all species of deer" and each should be added to regulations concerning "pest animals" mandated by the NSW *Biosecurity Act 2015* (Recommendation 16). When the latter Bill comes into effect, Part 10 of the NSW *Local Land Services Act 2013* will no longer apply, with provisions concerning wild animal control shifting to the *Biosecurity Act*. As a result, current control orders will be invalidated. Under the forthcoming framework, "pests" needn't be declared to authorise control methods and programs on their management, yet the Review argues that such a declaration "provides an unambiguous statement of intent". This is true. To explicitly pronounce a species as a "pest" amounts to an unequivocal declaration that such a species is to be subjected to a range of routinely lethal techniques aimed at their total or near-total eradication. As the Review further explains, "the declaration of a species as a pest by the state government is an effective mechanism for raising community awareness and shifting attitudes towards the management of that species". This presents a critical problem for both the realisation and adoption of humane control methods. The use of negative labelling, itself an intrinsically subjective procedure, acts to instil in the public a negative image of the species under consideration. It is evident that some people's definition of a "pest" species differs dramatically from others. Some may consider a species a "national icon," whilst others may consider them a resource or even "a victimised group"¹⁵². Furthermore, the use of such negative terminology does not accrue stable legislative significance¹⁵³ and is a factor recreational hunter's highlighted in the Review's consultation process, albeit from a significantly different angle ("Language was [...] seen as crucial: there is a difference between recreational hunting and hunting as a means of pest control and protecting the environment"). It is outside the scope of this submission to delve deeper into this highly problematic aspect of the

¹⁴⁹ Paronson, I., 1998, *The Australian Ark: A History of Domesticated Animals in Australia*, CSIRO Publishing, Collingwood, Victoria.

¹⁵⁰ Green, P., n.d., 'Can contraception control deer populations in the UK?'. Available at: <http://www.thedeerinitiative.co.uk/pdf/contraception-and-wild-deer-control.pdf>

¹⁵¹ Harvey, R. G., and Mazzotti, F. J., 2014, 'The invasion curve: a tool for understanding invasive species management in South Florida,' *The Institute of Food and Agricultural Sciences*. Available at: <https://edis.ifas.ufl.edu/pdffiles/UW/UW39200.pdf>

¹⁵² Thiriet, D., 2007, 'In the spotlight: the welfare of introduced wild animals in Australia,' *Environmental and Planning Law Journal*, vol. 24, pp. 417-426.

¹⁵³ Ibid.

“pest” animal control debate, yet it is crucial to consider the consequences fundamentally attached to such linguistic praxis¹⁵⁴.

Further, the Review declares that the NSW Government should “commit long-term funding to maintain pest animal research capacity to develop and evaluate *cost-effective and humane control techniques*,” including those related to deer control. Again, data-mapping is advocated for these purposes, with express intent to further the expansion of the Pestsmart FeralScan web portal and app to aid animal number collation. The Review acknowledges that financial impacts caused by deer are “less well researched” than other species, yet maintains that other States have gauged their impacts on agricultural production to be as high as \$20,000. As a result, and without adequate current investigatory groundwork, deer are judged as amassing a number of social impacts, including the mental health, quality of life, family succession planning, and cultural traditions, and that these impacts are “acutely felt” in select sectors and “appear to be increasing”. This conclusion is a direct reference to the negative impacts felt by agricultural farmers who consider deer to be an emerging threat to their production and profits. It is vital to recall, however, that the underlying historical cause of this economic impact cannot be legitimately levelled at the animals initially introduced by humans. That is, we are the cardinal cause and any subsequent efforts to re-establish an ecological balance must keep this in mind. To simply assign such a species with the label “pest,” ascribe to them, and them alone, the role of menace to monetary gain or agricultural livelihood, and subsequently attempt to correct historical errors through lethal and inhumane means is a dishonest rewriting of our collective accountability. If, as the Review claims, the “problem of pest animals is a shared one” and we collectively share responsibility, it is imprudent and impolitic to dismiss this shared history.

3.2.2 The efficacy of sterilisation and immunocontraceptives as a humane control method for wild mammal populations: zona pellucida vaccine (pZP)

Fertility control has been successfully applied to wild horses, deer and zoo populations for over two decades, beginning in 1996 with application to elephants in Kruger Park¹⁵⁵. It is considered to be a more humane¹⁵⁶, and often more effective, form of wild animal management as lethal methods, including shooting, are not precise, may result in prolonged suffering, and necessarily result in successive culling campaigns. Despite a wealth of authoritative knowledge and evidence on the efficacy of such methods, the Review categorically denies its applicability based on its cost and perceived risk. As the following segment will illustrate, however, this is not the case. The Review characterises the application of fertility control to be attractive, presumably on the basis that it is effective and presents a far higher degree of humaneness without the same level of animal welfare concerns lethal measures entail. However, this is as far as the Review is willing to go in its comments regarding its potential applicability.

The American based Science and Conservation Center (SCC), created in 1998, is an independent not-for-profit organisation that is “the world’s only dedicated facility for the development of wildlife contraceptives and methods of application”¹⁵⁷. In a report on wildlife fertility control, the SCC traces the history of wildlife population control methods, claiming that “humans have chosen to impose artificial human-induced mortality control on wild populations,” primarily through hunting, trapping and poisoning, and that these methods have become entrenched and widely accepted. This is analogous to current Australian control programs. However, a number of external influencers have

¹⁵⁴ Consider, for example, the discretionary use of the “pest” designation as applied to two common companion animals: dogs and cats. Labelling and subsequently implementing lethal measures against a select segment of a single species sends a manifestly contradictory set of beliefs and behaviours. Whilst it is common knowledge that animals are legally classified as property, this conflicting designation may result in “non-target” killings within a single, sanctioned for control, species.

¹⁵⁵ Kirkpatrick, J. F., 2011, ‘Fertility control: a new and successful paradigm for African elephant population management,’ *Veterinary Sciences Tomorrow*.

¹⁵⁶ Hardy, C. M., and Braid, A. L., 2007, ‘Vaccines for immunological control of fertility in animals,’ *Scientific and Technical Review of the Office International de Epizooties*, vol. 26, no. 2, pp. 461-470.

¹⁵⁷ Kirkpatrick, J. F., 2010, *Wildlife Fertility Control: Fact and Fancy*, Science and Conservation Center, Billings, Montana.

incrementally changed this situation. Expanding human urbanisation, varied legislative prohibitions and transforming public sentiments have threatened the legitimacy and validity of lethal control methods. This is a phenomenon seen in Australia, with the Invasive Animals CRC preparing a series of reports designed to assess public attitudes to wild animal control methods¹⁵⁸. Clearly, public attitudes to control methods are considered important to the agencies and institutional arms that plan and implement such policies. If, it would seem, there are operational alternatives that not only boast increased rates of efficacy and do not pose significant threats to welfare, why these alternatives are not adequately considered is unacceptable to a growing portion of the population. We are quickly approaching a point in which “safe, humane, and publicly acceptable wildlife management paradigms are beginning to replace lethal methods”. To arbitrarily dismiss such advancements is unacceptable.

For these reasons, contraception has been championed as a humane alternative¹⁵⁹. For a sterilisation method to be considered suitable, a number of characteristics have been presented as prerequisites: the vaccine must have an efficacy rate of 90%, it must be safe when applied to pregnant animals and must not have any detrimental effect upon either the foetus or neonate, it must be reversible, require no surgical invasion, have a minimal impact upon animal behaviour, have no short- or long-term consequences, it must be remotely applicable and not require direct handling of the targeted animal, and it must have prolonged efficacy over a period of years. It is reasoned that for contraceptive programs to deliver desired results, these requirements are obligatory¹⁶⁰.

One proven method which meets many, if not all, of these conditions, utilises the *porcine zona pellucida* vaccine (pZP), which effectively and safely functions as an immunocontraceptive, and thus effectively negates the use of lethal control measures¹⁶¹. It has been used as a contraceptive medium for the management of horses for a number of years, and was initially trialled specific to this species. PZP, like many other immunological vaccines, is composed of numerous formulations of proteins combined with adjuvants (pharmacological agents that alter the influence of other agents)¹⁶². The vaccine requires injection into the muscle of the animal, a requirement that can be met through the use of remote (dart) delivery. When immunised, the antibodies the vaccine produces enclose the oocyte and through steric hindrance (the immobilisation of chemical reactions) intercepts fertilisation¹⁶³. The vaccine is “at least 90% effective in preventing pregnancy in a variety of ungulates,” and is predominantly administered to females of the targeted species, including deer. Utilising fertility control methods to alleviate overpopulation problems have been advocated not only on the grounds of its proven efficacy, but also because it constitutes a considerably more humane solution¹⁶⁴. In reference to the previously discussed “invasion curve,” immunocontraceptive techniques have entered the management level and has been proven effective in over 85 different species at “the level of both the individual animal and the population”¹⁶⁵. That is, it has been proven effective at stabilising and controlling large numbers of free-roaming ungulates. This, then, is presented as a viable and valid alternative to lethal control methods.

¹⁵⁸ Fitzgerald, G., Fitzgerald, N., and Davidson, C., 2007, ‘Public attitudes towards invasive animals and their impacts: a summary and review of Australasian and selected international research,’ the Invasive Animals Cooperative Research Centre, University of Canberra, ACT; Fisher, N. I., Lee, A. J., and Cribb, J. H. J., 2012, ‘Will the community accept our science? Monitoring the community’s view about managing pest animals in Australia,’ the Invasive Animals Cooperative Research Centre, University of Canberra, ACT; Fitzgerald, G., 2009, ‘Public attitudes to current and proposed forms of pest animal control,’ Invasive Animals Cooperative Research Centre, University of Canberra, ACT.

¹⁵⁹ Liu, I. K. M., 2011, ‘A synopsis on contraception in wildlife and fera animals,’ *Revista Brasileira de Reprodução Animal*, vol. 35, no. 2, pp. 77-79.

¹⁶⁰ Ibid.

¹⁶¹ Kirkpatrick, J. F., Lyda, R. O., and Frank, K. M., 2011, ‘Contraceptive vaccines for wildlife: a review,’ *American Journal of Reproductive Immunology*, vol. 66, pp. 40-50.

¹⁶² Hardy, C. M., and Braid, A. L., 2007, ‘Vaccines for immunological control of fertility in animals,’ *Scientific and Technical Review of the Office International de Epizooties*, vol. 26, no. 2, pp. 461-470.

¹⁶³ Liu, I. K. M., 2011, ‘A synopsis on contraception in wildlife and fera animals,’ *Revista Brasileira de Reprodução Animal*, vol. 35, no. 2, pp. 77-79.

¹⁶⁴ Killian, G., Diehl, N. K., Miller, L., Rhyon, J., and Thain, D., 2006, ‘Long-term efficacy of three contraceptive approaches for population control of wild horses,’ *Proceedings of the 22nd Vertebrate Pest Conference*, R M Timm and J M O’Brien (eds.), pp. 67-71.

¹⁶⁵ Kirkpatrick, J. F., Lyda, R. O., and Frank, K. M., 2011, ‘Contraceptive vaccines for wildlife: a review,’ *American Journal of Reproductive Immunology*, vol. 66, pp. 40-50.

In programs administering immunocontraceptive vaccines to wild animal populations, concentration has been primarily afforded to wild horses, urban deer, bison, and African elephants¹⁶⁶. Its use for wildlife management has been proven since first trialed in 1988, and PZP in particular has proven to be effective and safe across a range of species with negligible negative consequences¹⁶⁷. Since initial development and trials, PZP has been supplemented to alleviate issues problematizing its applicability (for example, short immunisation periods and problems associated with remote administration). The early PZP vaccine required an initial primer shot followed by an annual booster. To aid in applicability and ensure prolonged efficacy, the vaccine has been merged with adjuvants (Freunds Modified and Freunds Incomplete) and can be applied remotely¹⁶⁸, meaning that it can be applied from a distance and requires no more effort than the currently applied lethal aerial shooting campaigns (One longitudinal study of the efficacy of PZP in deer compared two different modes of administering the vaccine, each with different adjuvants (one oil-based and the other alum, or aluminium salt, based)¹⁶⁹. Each method was compared on the basis of efficacy duration, with the oil-based emulsion adjuvant vaccine remaining active for the greatest length of time and can remain operative for up to 7 years after a single-shot immunisation).

3.2.3 PZP and immunocontraceptives as viable and actionable alternatives to current control programs

Whilst the technology was in its infancy two decades ago, it is now a proven mechanism to deliver humane and effective vaccines that invalidate the justification for lethal methods. Studies have consistently shown that these techniques are practical and functional now. Initially, questions regarding the economic feasibility, safety, and efficacy of treating free-roaming mammals with immunocontraceptives were not only reasonable but necessary lines of enquiry. Today, the question hinges on how to deliver such vaccines with less labour and less financial expenditure¹⁷⁰. That is, the technology is available, is proven to be effective, and entail no suffering; the single decisive factor preventing the application of immunocontraceptives to wild animals appears to be a lack of institutional commitment and determination to act in accordance with the criteria that animal control authorities place upon themselves (no doubt at the behest of public condemnation of inhumane treatment of animals).

The Review explicitly states “recreational hunting of deer will continue and even be expanded” (Section 6.2) despite the fact that Recommendation 26 (expand research capabilities) calls on the NSW Government to “commit long-term funding to maintain pest animal research capacity to develop and evaluate cost-effective and humane control techniques,” including those related to deer control programs. Further, the Review acknowledges “the available control techniques vary in efficiencies, cost-effectiveness, and humaneness,” before unequivocally stating that the most successful programs utilise several techniques, including aerial shooting. Fertility control of wild deer is considered “conditionally acceptable” in terms of humaneness, “not currently effective,” and expensive. The evidence presented within this report belies these conclusions.

¹⁶⁶ Ibid.

¹⁶⁷ Kirkpatrick, J. F., 2010, ‘Immunocontraceptive reproductive control utilising porcine zona pellucida (PZP) in federal wild horse populations.’ Available at: <http://www.einsten.net/pdf/110242569.pdf>; Kirkpatrick, J. F., Rowan, A., Lamberski, N., Wallace, R., Frank, K., and Lyda, R., 2009, ‘The practical side of immunocontraception: zona proteins and wildlife,’ *Journal of Reproductive Immunology*, vol. 83, pp. 151-157.

¹⁶⁸ Australian Brumby Alliance, 2012, ‘ABA info sheet: fertility control for wild horses’. Available at: <http://australianbrumbyalliance.org.au/wp-content/uploads/2012/09/ABA-Info-Sheet-Fertility-Control.pdf>

¹⁶⁹ Miller, L. A., Fagerstone, K. A., Wagner, D. C., and Killian, G. J., 2009, ‘Factors contributing to the success of a single-shot, multiyear PZP immunocontraceptive vaccine for white-tailed deer,’ *Human-Wildlife Conflicts*, vol. 3, no. 1, pp. 103-115.

¹⁷⁰ Kirkpatrick, J. F., Lyda, R. O., and Frank, K. M., 2011, ‘Contraceptive vaccines for wildlife: a review,’ *American Journal of Reproductive Immunology*, vol. 66, pp. 40-50.

3.2.4 Immunocontraceptives in the Australian context

It is important to consider whether any potential program will be effective and conducive to Australian conditions. The following passage will illustrate that not only is the implementation of nonlethal sterilisation campaigns a possibility; it is advantageous for a range of reasons. To illustrate this, a number of relevant Australian examples will be discussed.

A 2013 Parks Victoria¹⁷¹ report on wild horse management and control methods cites the PZP vaccine and notes its success in reducing the fertility of mares in American studies. However, the report erroneously states that it is “a short-term contraceptive” that requires reapplication “regularly”¹⁷². As we have seen, this is no longer the case. The vaccine can be effective on a long-term basis and requires no additional effort comparative to current techniques.

A report compiled on behalf of the NSW Office of Environment and Heritage formed to assess the humaneness of horse management methods in relation to the Kosciuszko National Park Wild Horse Management Plan discusses the use of PZP in controlling wild population numbers. The report, in marked contrast to the Parks Victoria review, acknowledges that the vaccine can be “administered using a dart (e.g. shot from a helicopter¹⁷³) or by hand injection to a confined animal (e.g. trapped and mustered and held in a yard)”¹⁷⁴. The study assessed the “overall welfare impact” of utilising the PZP vaccine in free-roaming horses and concluded that its overall impact was categorised as mild. In comparison to the welfare assessment of aerial shooting campaigns, which was split into two contrasting scenarios due to the potential instances in which “best practice alone does not result in the ideal outcome of immediate death,” and involves a “severe overall impact” with a correspondingly severe impact on markers of anxiety, fear, and pain as well as injury and functional impairment, the use of PZP vaccine immediately appears to outweigh this routinely chosen method. In assessing the “mode of death” this involves, the assessment concluded that “levels of suffering” were either severe or extreme when utilising aerial shooting. The report concludes that “debilitating long-term effects have not been observed in any species of wildlife treated with PZP,” and it has beneficial long-term effects related to animal welfare. This is an Australian document that explicitly endorses the potential use of PZP in campaigns aimed at stabilising wild ungulates. The Review does not include reference to this study.

Furthermore, Meat and Livestock Australia (MLA), the “marketing, research and development body of Australia’s red meat and livestock industry”¹⁷⁵, has also published reports citing PZP. The MLA report acknowledges that the use of PZP has been proven successful in enabling infertility in a number of species, including wild horses and cites single dose long-term success in deer, and may enable sterility “for targeted groups of females [...] given that this vaccine can be safely administered”. The report advocates further financial support for its development. The report concludes by explicitly stating “this [the development of the PZP vaccine] is a major logistic advantage for wildlife contraception”. This report is also absent from the Review’s consideration, perhaps due to the fact that it effectively contradicts the stated rationales precluding the use of fertility control methods, particularly PZP.

¹⁷¹ Parks Victoria is a statutory authority responsible for managing Victorian estates, created by the *Parks Victoria Act 1998*

¹⁷² Axford, J., and Brown, D., 2013, ‘Wild horse management and control methods,’ Parks Victoria Background Paper. Available at: http://parkweb.vic.gov.au/_data/assets/pdf_file/0011/574148/Background-Paper-3-Wild-horse-management-and-control-methods.pdf

¹⁷³ Specifically the SpayVac liquid formulation of the PZP vaccine.

¹⁷⁴ Independent Technical Reference Group (ITRG), 2015, ‘Assessing the humaneness of wild horse management methods: Kosciuszko National Park Wild Horse Management Plan; A report on the outcomes of a humaneness assessment panel assembled on behalf of the Independent Technical Reference Group (ITRG),’ State of NSW and the Office of Environment and Heritage. Available at: <http://www.environment.nsw.gov.au/resources/protectsnowies/knp-ssessing-humaneness-wild-horse-management-methods-2804.pdf>

¹⁷⁵ Meat and Livestock Australia (MLA), n.d., ‘About MLA’. Available at: <http://www.mla.com.au/About-MLA>

3.2.5 Conclusion

To be adequately inclusive of all viable options and alternatives, each possibility ought to be treated with the same consideration. That is, lethal measures must be considered in comparison to non-lethal humane alternatives and be granted the same level of deliberation. At present, a comparative analysis is fundamentally lacking, with preferential adoption of lethal methods prevailing over each of the valid and operational alternatives laid out in this report. At best, this amounts to an institutional lack of consideration, and at worst to a wilful omission of potential alternate control programs and principles. Neither of these verdicts is acceptable when the objective involves the wholesale killing of animals.

The Australian Government's report on assessing "the relative humaneness of pest animal control methods" provides a step-by-step method applicable when rating the acceptability or appropriateness of particular control methods¹⁷⁶. There should be a process of identifying alternatives to be contrasted against one another (including shooting, baiting, poisoning, and introduction of viruses or diseases), followed by an identification of the criteria relevant to each method (including efficacy, humaneness, viability, target specificity, and cost-effectiveness). These steps inform the application of a control method. Following the initial assessment, the Government report states that an identification of the "relative importance of each criterion" should be analysed, with each alternative being ranked against the others to reach a conclusion that adequately addresses each variable. In each of these steps, the contraception of free-roaming animals vastly overrides lethal methods.

¹⁷⁶ Sharp, T., and Saunders, G., 2011, 'A model for assessing the relative humaneness of pest animal control methods,' Australian Government Department of Agriculture, Fisheries and Forestry, Canberra, ACT.

4 Animal welfare

4.1 A brief explanation of what we mean when we talk about animal welfare

Whilst Animal Liberation considers any exploitative use of animals to be unacceptable and adopts a truly abolitionist stance in regards to any current or foreseeable use of animals which may result in harm, suffering, or pain, it is important to briefly define what we mean when we talk about animal welfare. Commonly defined as the health, happiness and condition of an individual or a regulatory policy devised to promote the fundamental physical, physiological or psychic wellbeing of an individual, welfare as applied to animals is often needlessly controversial. It is, at its core, an attempt to validate the intrinsic worth of nonhuman animals so that they are not treated as mere automatons or commodities available to be used in any manner humans wish. This is in direct opposition to early accounts that held the view that since nonhuman animals cannot reason, and thus did not possess a mind, and therefore did not have a mental life, they were little more than machines¹⁷⁷. Since this “monstrous thesis” was first proposed, most famously by Descartes¹⁷⁸, our collective understanding of animals has changed dramatically. Yet, this increased consideration has not translated into any appreciable reduction in either cruelty or disregard for animals. Indeed, some have claimed that the modern world exhibits greater examples of cruelty and abuse than any seen before in human history¹⁷⁹. It is undeniable, however, that despite our compunctions regarding welfare, animals continue to suffer immensely and for reasons that bear no relation to necessity.

According to the World Organisation for Animal Health (OIE), animal welfare refers to “how [positively or negatively] an animal is coping with the conditions in which it lives” and adopts as a guiding mechanism the universally recognised “Five Freedoms” developed in 1979 by the UK Farm Animal Welfare Council and since extrapolated to cover a broader range of species and contexts¹⁸⁰. The specified freedoms include: freedom from hunger and thirst; freedom from discomfort; freedom from pain, injury, or disease; freedom to express normal behaviour; and freedom from fear and distress¹⁸¹. Since the adoption of these basic freedoms they have been conceived of as a preliminary set of rights¹⁸², whilst others have argued that welfare is not translatable into rights-based language. It has also been recognised that animal welfare, understood as the verdict that while nonhuman animals have “an interest in not suffering,” this is routinely rescinded or outweighed by the rights or desires of humans¹⁸³. This development in our collective thinking about animals has been traced to the early twentieth century, when modern animal welfare legislation began to be introduced. Before this time, concern for animals, at least in law, was primarily a debate centred upon property status. This was, as one critic has argued, the “moral orthodoxy”; there was yet to be a “sustained challenge to the view that only unnecessary suffering should be avoided”¹⁸⁴. Today, however, it is increasingly evident that simply prohibiting *unnecessary suffering* is insufficient. An enforceable and strong regulatory approach is required if we are to effectively govern what we call “animal welfare”.

It is clear that the majority, if not all, of the animals discussed within this report will not have their five freedoms met. For the deer, cat, carp, or koi targeted by current control campaigns, little has changed since Descartes diagnosed them as merely complex machines. Whilst it is likely that the vast majority of people would agree with the phrase “animals have an interest in not suffering,” how this sentiment translates into action is unclear. For example, it is known that Australians “generally agree that animals are sentient and that people are obliged to avoid harming them,” and “relatively few Australians believe that current laws intended to protect the wellbeing of animals are

¹⁷⁷ Rollin, B. E., 2011, *Putting the Horse before Descartes*, Temple University Press, Philadelphia.

¹⁷⁸ Harrison, P., 1992, ‘Descartes on animals,’ *The Philosophical Quarterly*, vol. 42, no. 167, pp. 219-227.

¹⁷⁹ Francione, G. L., 2000, *Introduction to Animal Rights: Your Child or the Dog?* Temple University Press, Philadelphia.

¹⁸⁰ McCausland, C., 2014, ‘The five freedoms of animal welfare are rights,’ *Journal of Agricultural and Environmental Ethics*, vol. 27, pp. 649-662.

¹⁸¹ Webster, J., 2005, *Animal Welfare: Limping Towards Eden*, Blackwell Publishing, Oxford.

¹⁸² McCausland, C., 2014, ‘The five freedoms of animal welfare are rights,’ *Journal of Agricultural and Environmental Ethics*, vol. 27, pp. 649-662.

¹⁸³ Ibid.

¹⁸⁴ Garner, R., 2004, *Animals, Politics, and Morality*, 2nd edition, Manchester University Press, New York.

adequate”¹⁸⁵. It is unknown what the general public believes in regards to our treatment of “pest” species, yet if these conclusions are a gauge it is reasonable to presume that, given reliable and factual information, the vast majority would be unsupportive of many of the currently operational methods. How, it might be asked, is it possible to believe that animals are sentient and are capable of suffering, that we have an obligation to avoid causing them harm, and condone the use of lethal control techniques that are not only inhumane and ineffectual, but wholly unnecessary? The answer to this question is not forthcoming, and it is quite easy to understand why.

4.2 Overview and discussion of the recommendations provided within the Review

Despite the range of species and numbers of animals targeted in control programs each year and the methods and techniques applied, there is little reflection provided within relevant Codes of Practice (COP) and Standard Operating Procedures (SOPs) relating to welfare concerns. At first glance this would appear to contradict the stated aims of many of these documents. The general public is undoubtedly unaware or innocent to the fate affixed to a species designated “pest”. However, a number of reasons are associated with this, including poor community awareness of the suffering implicit in control campaigns, an absence of empathy for target species (particularly those that are widely considered ‘pests’), and a widespread belief that the welfare of target animals is merely a peripheral concern ultimately trumped by perceived environmental or economic issues¹⁸⁶. This is demonstrated by the publication of numerous government or government-funded reports exclusively relating to the “economic impacts” of “pest” animals, including a study extensively used within the Review¹⁸⁷ which evaluates a variety of detrimental impact variables posed by species currently considered “pests” in NSW. These variables include distribution and economic, environmental, and social impacts. Throughout the report, there is extensive discussion relating to these factors. There is a single reference to animal welfare (specifically regarding “wild horse management costs,” and as such hinges primarily on economic rather than welfare considerations). Within the Review, this study is held up as the definitive account of assessing the financial impacts of target species and is used to enumerate actual costs associated with these animals, instilling in the economic evaluation far more worth than any concern for the welfare of the animals trapped, shot, poisoned, or otherwise killed¹⁸⁸. At this point, it is worth reiterating that none of these techniques are *necessary*. There are viable and operational alternatives that render their continued use *unnecessary*. If we are to escape, or collectively advance, from the antiquated and obsolete notion that only *unnecessary suffering* ought to be abdicated, alternatives to lethal means that inherently require suffering to effectively function must be abolished. This, it must be stressed, is neither radical nor illusive. It is conservative insofar as the overwhelming majority of people believe suffering should be excised, and practical in that such alternatives are available, providing we are willing to adopt them.

The purpose of illuminating this focus is to introduce the dearth of concern for welfare, which, although the Review acknowledges is “a growing concern,” is ultimately disposed of by reference to Codes of Practice (which negotiate “relative humaneness”) and Standard Operating Procedures (which describe techniques and potential welfare issues arising from them). In response to these laudable, yet frequently inoperable claims, a brief critique of the codes and standards will endeavour to illustrate the rot inherent to the wild animal control programs and techniques currently employed throughout NSW.

¹⁸⁵ Humane Research Council, 2014, ‘Animal tracker Australia: baseline survey results’. Available at: <https://www.voiceless.org.au/content/animal-tracker-australia-0>

¹⁸⁶ Thiriet, D., 2007, ‘In the spotlight: the welfare of introduced wild animals in Australia,’ *Environmental and Planning Law Journal*, vol. 24, pp. 417-426.

¹⁸⁷ McLeod, R., 2004, *Counting the Cost: Impact of Invasive Animals in Australia*, Cooperative Research Centre for Pest Animal Control, Canberra.

¹⁸⁸ Table 2.2 of the Review lists the costs and losses believed to be caused by “pest” animals in NSW. “Production costs” vastly outweigh each of the two remaining variables (landholder management costs and government expenditure) totaling at \$109 million between 2013-14.

4.3 A brief discussion on the role of Codes of Practice (COPs) and Standard Operating Procedures (SOPs) in regulating animal welfare issues

A range of Codes of Practice (COPs) and Standard Operating Procedures (SOPs) has been devised as referrals to consult when planning or undertaking animal control programs at both the State and Commonwealth levels. These documents are thought to enable a standardisation procedure that allows control methods to be evaluated and administered in the most efficient and humane manner. SOPs discuss and catalogue control techniques, their implementation, and the welfare impacts that have on both target and non-target species, whilst COPs distribute general information regarding “best practice management, control strategies, species biology and impact” and include outlines of the humaneness, efficacy, cost-effectiveness and target specificity” of each technique¹⁸⁹. Whilst it is apparent that these were designed to assist in the planning and development of control mechanisms, and as such are inclusive of animal welfare requirements, both have significant shortcomings.

The codes and standards are insufficient. They do not include all species subject to control and issues regarding humaneness are inadequate¹⁹⁰. Many of the terms included in the Codes are phrased in an advisory rather than a mandatory tone (“should” instead of “must”) and thus, they embody minimal measures of welfare and are frequently devised to fulfil economic or expedient-based considerations. An example of this is found in the *Model Code of Practice for the Humane Control of Foxes*. This COP acknowledges that 1080 poisoning can result in “pain and suffering, sometimes for an extended period,” yet continues to prescribe its use on the grounds of it being relatively cost-effective¹⁹¹. This patently and immediately runs afoul of the provision presented above requiring the discontinuation of any practice that entails *unnecessary suffering*. Clearly, to suffer “for an extended period” presupposes unnecessary suffering.

Further, the Codes can be criticised as supplying obstacles to presenting prosecutions for cruelty. Although there may be clauses relating to animal protection and/or welfare within Codes, this may be trivial when the control technique is applied in compliance with the Codes. That is, if an act is endorsed within a Code that could otherwise be considered an act of cruelty, it provides the individual applying it absolution. This effectively enables an exemption to prosecutions of cruelty. For example, the *NSW Code of Practice for Licensed Game Hunters* includes reference to the *Game and Feral Animal Control Regulation 2004*, in which it is a mandatory obligation to “avoid suffering of animals”¹⁹² and hunted animals are not to be subjected to *unnecessary pain*, they must be hunted only if a *humane kill* is likely and the techniques used must be *reasonably accepted* to achieve these prerequisites¹⁹³. As this exhibits, the chosen terminology is not only vague and inexplicit, it allows for potential defences against the very acts it claims to prohibit, and reinforces the possibility of providing exoneration. How, it must be asked, is it possible to ascertain what exactly is “unnecessary pain” or what constitutes a “humane kill”? Presumably the two are closely related, yet it is not clear, perhaps intentionally so, what these vague terms mean or how they are to be assessed when applied to an injured, poisoned, or otherwise dying animal.

Additionally, the Game Council NSW statutory authority is tasked with providing effective management of introduced species of game animals and with promoting the responsible and systematic hunting of these species. The Council was established under the *Game and Feral Animal Control Act 2002* and has the responsibility for setting standards applicable throughout NSW. The Council has published a Hunter Education Handbook that acts as a guide to acquiring a restricted hunting licence (R-Licence) through sections concerning hunting techniques and their applicability to specific species. Again, there is a single reference to welfare within the Council’s “Game and Feral

¹⁸⁹ Sharp, T., and Saunders, G., 2011, *A Model for Assessing the Relative Humaneness of Pest Animal Control Methods*, 2nd edition, Australian Government Department of Agriculture, Fisheries and Forestry, Canberra.

¹⁹⁰ Thiriet, D., 2007, ‘In the spotlight: the welfare of introduced wild animals in Australia,’ *Environmental and Planning Law Journal*, vol. 24, pp. 417-426.

¹⁹¹ Sharp, T., and Saunders, G., *Model Code of Practice for the Humane Control of Foxes*, NSW Department of Primary Industries.

¹⁹² Thiriet, D., 2007, ‘In the spotlight: the welfare of introduced wild animals in Australia,’ *Environmental and Planning Law Journal*, vol. 24, pp. 417-426.

¹⁹³ *Game and Feral Animal Control Regulation 2004* (NSW), Schedule 2.

Species” portion of the Handbook. Instead, it focuses on the legalities of each technique as applied to each species. This is unsurprising given the functions and responsibilities of the Council, yet it does not explain why a governmentally sanctioned body tasked with providing management of game animals does not consider it a worthy factor for inclusion.

The Review notes that the Commission “supports the continued guidance of Codes of Practices and Standard Operating Procedures and their revision with advancements in technology and research”. This is appropriate. Yet this allows for a cyclical reliance on lethal techniques and/or methods that are considered to be economically viable and cost-effective without a comparable consideration for humaneness or welfare. The unenforceable nature of the codes and standards sanction the use ongoing use of a staggering repertoire of cruel methods, including the use of 1080 baiting (criticised by the RSPCA on the grounds that it is inhumane¹⁹⁴ and can pose secondary poisoning threats to non-target species¹⁹⁵) and aerial shooting (considered to be humane only when conducted by experienced and trained shooters, a proviso that is often not followed, and in any case, is unenforced¹⁹⁶).

A truly transparent and reliable governing body ought to strategically and forcefully address issues concerning animal welfare. Instead, we are provided with a set of inadequate and negligent documents that purport to consider humaneness and welfare, yet do little more than pay lip service to them.

4.4 Welfare concerns related to recreational hunting in NSW

The Review intends to position recreational hunting as an animal management tool (Section 7.4) and openly encourages it in this way. Recreational hunting is endorsed as a “valid and valued recreational pursuit,” before acknowledging that “shooting on its own is rarely an effective population control method” and in fact population control is “not the primary purpose of most recreational hunters”. In fact, hunters often actively maintain population levels, leaving juveniles and females, to allow for future hunting¹⁹⁷. Generally, according to the Invasive Species Council, “feral” animals are usually highly generative and have populations infused with so called “doomed surplus” (animals who die due to insufficient resources). This factor allows them to fill the gaps in numbers killed by hunters¹⁹⁸. Additionally, recreational hunters have been known to illegally release animals into the wild to be hunted in the future, an act that drastically undermines any purported control program. Additionally, hunters are known to favour killing large males (“trophies”), an act that in itself belies the oft cited justification that hunting acts as a conservation boon, as many species are polygamous and selecting to kill males allows those remaining to mate and propagate the population further.

Recreational hunters are codified in the Review as a special interest group, and plots to “actively engage recreational hunting groups in regional pest animal management” (Recommendation 22) whilst calling upon the NSW Government to “reduce red tape surrounding recreational hunting on private land” (Recommendation 23). This latter suggestion adds a further request that the Government “remove the requirement for hunters to be licensed to target non-indigenous species on private land” and intends to “promote the use of approved hunting organisation membership and programs to link hunters with landholders”. Presumably this is a reference to programs currently run by hunting organisations that attempt to encourage amicable relationships between landholders and recreational hunters. Whilst not being explicitly endorsed by the Review (there is no mention of

¹⁹⁴ RSPCA Australia, 2014, ‘What is the RSPCA’s view on using 1080 for pest animal control?’ Available at: http://kb.rspca.org.au/what-is-the-rspcas-view-on-using-1080-for-pest-animal-control_141.html

¹⁹⁵ Humane Vertebrate Pest Control Working Group, 2004, *A National Approach Towards Humane Vertebrate Pest Control*, discussion paper arising from the proceedings of an RSPCA Australia/AWC/VPC joint workshop, August 4-5, Melbourne. RSPCA Australia, Canberra.

¹⁹⁶ Sharp, T., 2012, ‘Standard Operating Procedure, PIG002: Aerial shooting of feral pigs,’ Invasive Animals CRC. Available at: http://www.pestsmart.org.au/wp-content/uploads/2012/12/PIG002_aerial-shooting_web.pdf

¹⁹⁷ Invasive Species Council. 2012, ‘Recreational hunting NSW: claims v facts’. Available at: http://invasives.org.au/files/2014/02/fs_rechunt_NSWfacts.pdf

¹⁹⁸ Ibid.

furthering or adopting such a strategy), the Sporting Shooters Association of Australia's (SSAA) Farmer Assist program is promoted as a social method to advocate the use of hunters as tools in control programs. Crucially, a defining feature of the Farmer Assist program is the effort to "provide more hunting opportunities for recreational hunters" through the fostering of such relationships. (This resembles the critique of the Feralscan portal and app admonishing the fact that an individual can effectively sign an animal's death sentence, yet allocate the final act to another. It appears, despite the efforts of the hunting lobby and the measures taken within the Review, that the vast majority of people are unwilling or unable to physically engage in the killing of sentient beings). As mentioned, this is not explicitly tabled as a method within the Review, yet it is given weight and ought to be adequately addressed (recall that the goals of control programs are "not the primary purpose of most recreational hunters" – they are, in fact, typically antithetical towards this).

According to the Review, recreational hunting is not only a valid option, but should be included in control techniques used in conjunction with other methods. This multi-faceted approach is thought to "maximise [recreational hunting's] effectiveness," especially if it is conducted in a planned sequence (i.e. if shooting is utilised in succession with other techniques), at the most appropriate time, is undertaken by "suitable operators" placed at the most appropriate locations to maximise the impact on selected target species, and is coordinated with other regions. As such, recreational hunting is positioned as a "complementary pest control tool" that is most, or singularly effective, when used in conjunction with other control techniques. The primary benefit recreational hunters are thought to augment control programs with are on-ground knowledge relating to the location, dispersal, and behaviour of targeted species. For these reasons, the Review endorses active engagement with recreational hunters.

The Review notes that during the Commission's regional tours the issue of recreational hunting was raised often. Importantly, these were primarily negative positions, including concerns regarding illegal hunting practices, trespassing of hunters onto private lands, and associated anti-social behaviours, all of which "contribute to a loss of trust between landholders and hunters". This is covered in discussion of the consultations with select stakeholders conducted to gauge responses and/or support for specific topics. For instance, the Review mentions instances of landholders "intentionally keeping pest animals on their property and providing accommodation for hunters," thus acting as "quasi game-parks"¹⁹⁹. This issue was also included when discussing the social impacts of recreational hunting (Section 2.3.2). Thus, the Review actively encourages a reduction in legal barriers to recreational hunting and a diminishing of regulatory or legislative safeguards against potentially dangerous hunting activities, whilst simultaneously conceding that significant issues are currently inadequately addressed. This schizophrenic approach requires transparent justification.

The Review explains that the RSCPA endorses shooting of free-roaming animals by professional marksmen on the grounds that it is considered more humane than poisoning. This in itself is insufficient grounds, as it has been adequately assessed that neither procedure is effective and involves significant welfare and humane-related issues. Similarly, both the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) and the Australasian Wildlife Management Society agree "shooting is ineffective in significantly reducing pest animal densities and impacts" that becomes less practical and effective over time.

Ultimately, hunting is an inadequate and often self-defeating technique as applied to control animals. Not only is it ineffective self-defeating, it is an immoral and indefensible act that has as its primary purpose the stalking and killing of a sentient being. No honourable or virtuous government

¹⁹⁹ The Review's response to this is to erect fences around such properties, and presumably, as is the methodology applied to other properties not undertaking personal management programs, authorised officers will enter to "undertake pest management". No mention is made of the fact that animals confined on such properties are effectively kept as captive fodder, or the fact that the Shooters Party tabled an amendment to the *Game and Feral Animal Control Bill* in 2009 seeking to enable the establishment of "private game reserves" in which animals would be released for the purposes of being hunted and killed for a fee¹⁹⁹, and "expand the list of game animals that may be hunted". This proposal again resurfaced in 2015, when the Shooters and Fishers Party issued a similar bill which would not only allow the establishment of "private hunting reserves," or "game parks," but would also amend POCTA¹⁹⁹.

or agency would actively promote or condone such behaviour, and for this reason, and the many others outlined above, the adoption of recreational hunters into the control program fold is an unacceptable addition to an otherwise faulty program.

4.5 The need for transparency and accountability

Despite token references to welfare scattered throughout the report (“animal welfare has become a growing concern in the pest animal control sector”), in establishing and recording the sentiments of special interest groups in the consultation portion of the report these groups were marginal. The section of the Review regarding “feral horse management program[s],” for example, states that “good relationships with land owners, animal welfare groups, horse and conservation advocates, and professionals (such as horse handlers and scientists) are *essential if a program is going to be successful*”. There were, however, a comparatively far larger segment of groups intimately tied to the exploitative use of animals included within the review process²⁰⁰.

The Sporting Shooters Association of Australia (SSAA) appears to have been heavily involved throughout the review process and within the consultation procedure of the Review. Other organisations present in this process that warrant additional analysis include Australian Wool Innovation (AWI). AWI, for example, has advertised and financially supported wild dog eradication campaigns, including the Kill More Dogs Initiative²⁰¹ (since renamed the Community Wild Dog Control Initiative²⁰²). This initiative is billed by AWI under the umbrella of “Sheep health, welfare, and productivity,” as wild dogs and foxes are considered to be leading causes of sheep mortality in commercial woolgrowing enterprises²⁰³. Landcare currently runs Wild Dog Control Groups, such as the Tuckombil Wild Dog Control Group²⁰⁴. The group is registered on the FeralScan website and uploads siting and images of wild dogs. The group is considered a success within the wild dog control community, with an article published in the Landcare magazine entitled ‘A Howling Success’. The article notes that the group actively uses the FeralScan technology, and had successfully poisoned 70 dogs between April and December of 2015²⁰⁵. Despite this glowing review of lethal control, the same issue of *Landcare in Focus* included an article outlining the merits of strategic fencing in managing wild dog predation and associated agricultural damage²⁰⁶.

There are a number of alternative methods to ensuring wild animals do not pose a threat to commercial business. The Leading Sheep program, for example, offers viable alternatives to lethal methods, including cluster fencing. South West NRM is currently assessing applications under a grants program with funding from the Australian Government and the Queensland Government (under the Queensland Feral Pest Initiative) promoting the adoption of cluster and exclusion fencing available to several Queensland shires²⁰⁷. This program meets several of the desired criteria

²⁰⁰ Included in the consultation process, along with the SSAA, were the Australian Pig Doggers and Hunters Association (pig dogging, the ignoble pastime of hunting wild pigs with dogs solely for entertainment or enjoyment, is effectively condoned by inclusion). Comparatively, the groups aligned with animal welfare included were, presumably, the Australian Veterinary Association (which, although claiming to advocate animal welfare ‘standards’ is not expressly opposed to hunting) and the RSPCA (which opposes the practice of recreational hunting based explicitly on the suffering and pain caused to animals through its act). As such, the single authority consulted in regards to recreational hunting that openly opposes the practice was the RSPCA; each of the previously mentioned bodies either openly encourage it or quietly accept it.

²⁰¹ Bolsenbroek, J., 2015, ‘AWI recruiting WA wild dog co-ordinator,’ *Farm Weekly*, 30 May. Available at: <http://www.farmweekly.com.au/news/agriculture/agribusiness/general-news/awi-recruiting-wa-wild-dog-coordinator/2733367.aspx?storypage=2>

²⁰² Australian Wool Innovation Limited, 2016, ‘Dogs, foxes, and pigs: Community Wild Dog Control Initiative – funding available’. Available at: <http://www.wool.com/on-farm-research-and-development/sheep-health-welfare-and-productivity/pest-animals/wild-dogs-foxes-and-pigs/>

²⁰³ Australian Wool Innovation Limited, 2016, ‘Pest animals’. Available at: <http://www.wool.com/pestanimals>

²⁰⁴ Northern Rivers Landcare, Inc., n.d., ‘Tuckombil Wild Dog Control Group’. Available at: <http://www.northernriverslandcare.org.au/wild-dog-control.html>

²⁰⁵ ‘A howling success: Tuckombil gets wild dogs under control,’ 2015, *Landcare in Focus*. <http://www.landcareonline.com.au/wp-content/uploads/2016/01/Landcare-in-Focus-pp1-6.pdf>

²⁰⁶ ‘Fences keep the dogs out at ‘Lower Lansdowne’,’ 2015, *Landcare in Focus*. <http://www.landcareonline.com.au/wp-content/uploads/2016/01/Landcare-in-Focus-pp1-6.pdf>

²⁰⁷ Southwest NRM, 2016, ‘Collaborative area management – phase 2’. Available at: <http://www.southwestnrm.org.au/sites/default/files/uploads/managed/SWNRM-CAM-Phase-2-FAQ.pdf>

discussed throughout the Review: it focuses upon prevention²⁰⁸ (“the most efficient approach”) and would incorporate “examples of current good practice, including [those] from other jurisdictions”.

For the Review to display the necessary clarity, transparency, and accountability, alternatives such as these (and each of the others provided above) need to be adequately addressed and thoroughly analysed and debated. Without such transparency and accountability, it would appear that the Review has simply anticipated the continued use of lethal means without sufficient or reasonable consideration for a myriad of operational and humane alternatives. Until these deficiencies are accounted for, it is impractical to reach any substantive conclusions. It is essential that these considerations be considered, as they meet or exceed many of the techniques recommended by the Review and additionally have negligible negative outcomes, entail a greater level of humaneness, and are peer and empirically proven to be efficacious.

²⁰⁸ Exclusion fencing is most commonly utilised in Victoria but is being increasingly employed as a viable alternative to baiting. According to an ABARES report the use of ground baiting fell from 81% to 69% between 2010 and 2014, whilst the use of exclusion fencing increased from 9% in 2010 to 29% in 2014.

5 Conclusion

Animal Liberation is committed to fighting for the rights of all species to live lives free of human (ab)use and exploitation. To this end, this submission compiled a catalogue of operational alternatives that are applicable for each of the designated species considered. As it is outside the scope of this submission to provide detailed analysis of each recommendation and associated control techniques provided within the Review, a select segment of the measures under consideration is documented, analysed, and submitted for further evaluation. It is the opinion of Animal Liberation that all lethal control measures be abandoned, not only on the grounds that the currently proposed measures demonstrably lack the required and necessary provisions safeguarding the welfare of targeted species and the high degree of humaneness the proposed alternatives offer, but additionally on the grounds that such alternatives are currently applicable and transplantable to Australian circumstances.

It is of primary importance that the ethics, values, and morals that are practiced within animal control programs be granted the weight and equal consideration they legitimately and rightfully deserve. Animal Liberation appreciates the opportunity to provide this submission, and trusts that the rationales and measures proposed within this report will be faithfully and candidly assessed.