Draft updated threat abatement plan for predation by feral cats

Submission of the
Australian Veterinary Association Ltd

December 2023

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The Australian Veterinary Association (AVA)

The Australian Veterinary Association (AVA) is the only national association representing veterinarians in Australia. Founded in 1921, the AVA today represents members working in all areas of animal science, health and welfare – including conservation and wildlife. Veterinary roles extend far beyond caring for the health and welfare of our pets and production animals. Veterinarians are the pathologists, field officers and inspectors that secure the safety of our food, ensure market access for our exports, and help to safeguard the human population from zoonotic diseases.

The Australian Veterinary Association is grateful for the opportunity to make a submission on the revised Feral Cat Threat Abatement Plan.

Preamble

The Feral Cat Threat Abatement Plan (TAP) is an important document to assist with the protection of our threatened and vulnerable native species. It provides guidance to different stakeholders to help achieve consistency, efficiency, effectiveness, humaneness and best practice across jurisdictions and landscapes. Previous versions of the TAP have focused on managing feral cats (those cats living in the wild, completely independent of humans) whereas this revised version has integrated other cat categories which may create confusion and inconsistency. Where necessary cats need to be managed humanely and effectively to reduce negative impacts. However, it may be more appropriate for this TAP to specifically focus on feral cats with the management of domestic cats (owned, unowned and semi-owned) who have some interaction and dependence on humans, to be explored in detail with key stakeholders regarding being covered in a separate document.

Cats are intelligent, sentient animals who play a significant role in Australian society. Cats form bonds with people and provide companionship and enjoyment. For many people, relationships with animals are positive and important by contributing to health and wellbeing. However, it is recognised that management of domestic cats to promote cat and human welfare and to reduce native species predation, poses many challenges and must be carefully considered.

It is hoped that the AVA submission will provide useful insights into improving approaches to manage both feral and domestic cats.

Discussion

1. Cat Definitions

The AVA does not support the narrow definition of feral and pet cats used in the revised TAP under 3.1 as this is not consistent with our Policy Management of cats in Australia (ava.com.au) and RSPCA's Identifying Best Practice Domestic Cat Management in Australia. The definition should reflect the different human-animal relationships associated with different categories of cats. This is reflected below as:

- Domestic - cats with some dependence on people (direct or indirect) living in the vicinity of where people live or frequent, including around farm buildings, and are subcategorised as owned, semi-owned and unowned.

    - Owned - These are cats who live in a domestic household, are usually named, have a form of identification and depend on humans for their food.
    - Semi-owned – These cats are variably dependent on humans for food and shelter and are more abundant in areas where food resources are available.
    - Unowned – These cats are indirectly dependent on humans and receive food from people unintentionally, such as via food waste bins. They are more abundant in areas where food resources are available. These cats are of varying sociability and are sometimes called stray cats.
- Feral – These cats live independently of humans, tend to be solitary and their territory can be large and variable, depending on resources.

However, it is noted that individual jurisdictions may have varying legislative definitions, and the AVA Code of Professional Conduct requires veterinarians to ensure they understand and comply with relevant legislation.

It is also recognised that although these populations overlap to varying extents, they each require a different management strategy. There is very little evidence that supports restricting the definition to only pet and feral cat as the existing scientific literature indicates that domestic cat management including unowned and semi-owned cats requires an evidence based strategic collaborative approach. Labelling these populations as 'feral' will subject them to being declared as a pest in relevant jurisdictions, which would encourage and condone killing as the only management method, as these cats could not legally be rehomed. This would create confusion and significant concern amongst the community, thereby risking social license for all cat management activities. The importance of developing a solid, universal definition about what a feral cat is, as opposed to a stray cat has been highlighted by Deak et al (2019). Dubois et al (2017) also acknowledges the risks of labelling species as pests in a generic sense rather than focusing on developing strategic, location specific action plans.

Recommendation 1: The Feral Cat TAP includes a more holistic definition of cats which is based on how and where they live and aligns with the following.

- **Domestic (Cats who obtain food and/or support from humans intentionally or unintentionally and live around humans in urban and peri-urban areas and infrastructures near humans in non-urban areas (e.g. farms, mining sites). Three subcategories of domestic cats are recognised:**
    - **Owned**
    - **Semi-owned**
    - **Unowned**
- **Feral (Cats who have no relationship with or dependence on humans, and live and reproduce in the wild)**

It is also recommended that the Feral Cat TAP be confined to actions specifically focused on feral cats who do not live in proximity with, are dependent on and are not formally owned, or cared for, by people. This would remove reference to 'human-associated' feral cats or 'urban' feral cats or even pet cats in the Feral Cat TAP. Domestic cat (owned, unowned and semi-owned) management should be covered in a separate document, and this should be referred to in the TAP. An option may be to consider work already undertaken relating to domestic cat management where different populations of domestic cats are identified. The report published by the RSPCA Identifying Best Practice Domestic Cat Management in Australia is a useful reference document.

Recommendation 2: That the Feral Cat TAP does not cover domestic cat (owned, unowned and semi-owned) management and only focuses on feral cats as being those living in the wild and are completely independent of humans.

Recommendation 3: That the management of domestic cats (owned, unowned and semi-owned) be covered in a separate action plan document.

2. Key Stakeholder Consultation

In the TAP, Guiding Principle 1 states stakeholders with interests in cat management and welfare should be respectfully engaged.

Given that restricting definitions to only feral or pet cats is a significant change from the 2015 TAP, the AVA feels that appropriate consultation should have occurred with key stakeholders prior to the release of the revised TAP. In addition to the AVA, other key stakeholders include major animal welfare organisations (e.g., RSPCA, Animal Welfare League, NSW Cat Protection Society etc), local governments, animal management organisations (e.g., Australian Institute of Animal Management and Animal Management in Remote and Regional Indigenous Communities) and social scientists, relevant researchers etc. Effective stakeholder consultation was also identified by Deak et al (2019) as an important factor in achieving successful management programs.

Recommendation 4: Appropriate consultation with key stakeholders be undertaken regarding the narrow definitions of cats in the revised TAP before the TAP is finalised.

3. Feral Cat Management

Invasive species, ecosystem modification and agriculture in Australia are noted as the key threats impacting on many threatened species (Kearney et al, 2019). Worldwide, cats, dogs and rodents are the most damaging invasive mammalian predators. In Australia, introduced species including rabbits, cats and foxes, affect 267 of Australia's 1257 threatened species as listed in the *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)*. Feral cats are known to threaten 123 of these listed species. Feral cats are likely to have been a major cause in 57% of Australia's 47 extinctions of reptiles, birds and mammals since European settlement, and that trend continues unabated (Woolley et al, 2019). An important consideration is to ensure the continued import prohibition of new domestic cat hybrids (Action 1.5).

Considerable ongoing work is being undertaken to help combat these significant negative impacts including refining lethal methods as well as assessing novel non-lethal options such as improving fire management (Doherty, 2017) and supporting native species to be more resilient to cat predation protection and enhancement of habitat structural complexity at both the local and landscape scale (Stobo-Wilson et al 2020) and training to improve anti-predator responses as part of re-introduction programs (Moseby et al, 2012; West et al, 2018).

Recommendation 5: The AVA encourages research on non-lethal methods to mitigate predation impacts by feral cats.

3.1 Welfare considerations

It is essential that management programs are developed and implemented to minimise negative animal welfare outcomes for feral cats as well as non-target species whilst still achieving conservation and biodiversity objectives. Irrespective of the category assigned to a cat, consideration must be given to their sentience and ability to suffer. Public trust and social license are critical for the ongoing support for management activities (Deak et al 2019).

Bounties

The TAP mentions bounty systems (Action 2.10) in relation to cat hunting in designated areas. The AVA is aware that bounties currently exist in some areas for foxes and that in the recent past, there has been at least one regional council in Queensland who introduced a feral cat bounty. Bounties have been shown to lead to inhumane outcomes for targeted species and in relation to implementing a feral cat bounty, domestic cats may also be targeted, particularly given the proposed re-categorisation of stray cats as "human-associated feral cats". Furthermore, reviews of bounties have shown them to be counter-productive to more efficient, longer-term options and usually result in no appreciable reduction in the number of pest animals (Wilson, 2008; Proulx & Rodtka, 2015). A 1998 review by Hassall and Associates confirmed that bounties had limited value for controlling wide-spread pest species, provided poor return on investment and were often counterproductive.

The Pestsmart website on fox control states that "reviews of past bounty schemes from Australia and around the world show that they are an ineffective form of pest animal control and do not deliver long-term solutions to a widespread pest animal problem."

Recommendation 6: That the TAP does not suggest the use of bounties because bounties have been shown to be ineffective.

CoPs & SOPs

The AVA acknowledges and supports Action 2.11 in the TAP which promotes access and review of Codes of Practice (CoPs) and Standard Operating Procedures (SOPs), that this be coordinated across jurisdictions, and assessed using the humaneness index.

Education

Under Action 2.15, it mentions school education programs. There are concerns regarding the effect on children in association with the language and descriptions of the impacts of cats on native species as well as management programs focusing heavily on lethal control methods. Killing any species on a massive scale may cause distress to young people and so requires careful consideration. Furthermore, it is essential that education programs include other causes of loss of biodiversity e.g. land clearing, climate change etc.

Action 2.16 focuses on changing views regarding perceptions or acceptability of different control methods. Rather than taking the approach that views need to be changed, perhaps a more effective strategy is to also consider how management programs may need to be changed to address concerns.

Lethal control methods

Lethal control methods must be justified, humane, and targeted to specific cat populations posing a risk to threatened wildlife, while minimising the risk to non-target species.

Toxic baits – 1080 and PAPP

The continued reliance on 1080 for lethal feral cat control raises concerns in terms of relative humaneness as well as social acceptability. The basis for the development of a more humane toxin, paraminopropriophenone (PAPP), was to provide a more humane alternative to using 1080. Johnston et al (2020) reported that Curiosity® baits cause mild suffering for a relatively short duration in feral cats. After field assessments over several years across different jurisdictions and landscapes demonstrating efficacy, Curiosity® (contains PAPP in a hard-shell delivery vehicle) was registered in 2020. It is understood that the uptake of PAPP has been limited, particularly in Western Australia, where the Eradicat® 1080 bait is used widely, mainly due to the 'tolerance' of native species to 1080 associated with native plants containing sodium monofluoroacetate.

PAPP, which is considered to be more humane than 1080, may be toxic to larger species of lizards, although modelling behaviour and activity may assist in identifying low risk periods to deploy baits (Jessop et al 2013). Despite Heiniger et al (2018) showing that quolls and bandicoots in the Northern Territory consumed the meat bait but not the HSDV, and therefore did not ingest any toxin, caution is advisable regarding use of Curiosity baits in areas where quolls are known to inhabit.

It is understood that trials will commence to assess the use of PAPP in the Felixer grooming traps – this is strongly supported and should be included under Action 4.3.

Recommendation 7: That the TAP advocate for limiting the use of 1080 toxin and utilising PAPP in all situations where it is safe to do so.

Recommendation 8: To complete evaluation of using PAPP as an alternative to 1080 in Felixer grooming traps.

Trapping

Cage trapping is a commonly used method with more calls to use leghold traps. Although trapping any wild animal will cause negative mental impacts such as fear, stress and anxiety, there has been limited research on behavioural responses of animals caught by leghold traps. Swelling of the limb at the site of restriction caused by the jaws of the trap have been noted in studies (Marks, 2008; McGregor et al 2016) but there appears to be no reports regarding the nature and degree of mental suffering associated with these traps. It is acknowledged that with the use of new technology providing alerts that a trap has been triggered which will allow an inspection to be done quickly (especially where intensive trapping is done and so traps could be checked within a few hours of being triggered), thus potentially reducing negative animal welfare impacts (Meek et al, 2021). However, these tools may not be broadly available in the near future and so it is important that comprehensive animal welfare assessments are done on leghold traps.

Recommendation 9: Evaluations are done to determine the nature and magnitude of and opportunities to mitigate negative welfare impacts, including mental impacts of leghold traps on feral cats and non-target species.

Shooting

Action 4.4 encourages collaboration to evaluate ground shooting undertaken by sports shooters. Undertaking a trial is important before this approach is deemed effective and humane. It is essential that a robust competency assessment is developed to ensure that any shooters participating in the trial have the necessary skills to kill cats in compliance with the SOP CAT 001 Ground shooting feral cats. Independent field audits of shooting operations undertaken as part of the trial should also be conducted to assess animal welfare outcomes.

Recommendation 10: Recreational shooters involved in trials or formal feral cat control be assessed for shooting competency and compliance with SOP CAT 001 Ground shooting feral cats and that field audits are conducted to assess animal welfare outcomes of shooting operations.

4. Domestic Cat Management

4.1 National Domestic Cat Working Group

The AVA commends the Office of the Threatened Species Commissioner (OTSC) for establishing the national Domestic Cat Working Group. This is a vital initiative and requires ongoing support to help maintain discussions regarding domestic cat management especially as this requires different key stakeholders to those working on feral cat issues. A useful role of the working group could be to develop a national domestic cat action plan which incorporates best practice and evidence-based information to help achieve strategic, humane and effective domestic cat management. The AVA Policy Management of cats in Australia (ava.com.au), and RSPCA's Identifying Best Practice Domestic Cat Management in Australia are useful resources for this work.

Recommendation 11: That funding be made available to support the continuation of the National Domestic Cat Working Group and that the AVA remains a member of this group.

Recommendation 12: That consideration be given to the National Domestic Cat Management Working Group developing a national domestic cat management action plan. It is essential that the Feral Cat TAP and a national domestic cat management action plan align with each other.

4.2 Predation

It is recognised that domestic cats may pose a risk to vulnerable native species in some locations. However, it is essential that there isn't an overreliance on predation estimates. Legge et al (2020) provides some useful insights of the estimation of the predation toll of pet cats. However, the authors acknowledge many limitations of this work including:

"Although the Australian studies differ in methods, duration and sample size, and have not sampled exhaustively across Australian urban, peri-urban and rural environments, collectively, they represent a substantial research effort and include sampling from many locations."

"Detrimental impacts to wildlife populations from pet cat predation have also been reported from Australia, but the evidence is patchier."

"The examples of wildlife population declines as a result of pet cat predation are highly suggestive, although these studies are few (especially so from Australia)."

Despite these limitations, the paper also highlights the importance of obtaining data from specific locations and cites. Several studies have helped to shape local action plans to mitigate negative predation impacts on wildlife, although the confidence in the relative contributions of pet versus feral cats was questioned.

These studies highlight the importance for funding to conduct field studies to quantify the impact of predation by free-roaming domestic cats on wildlife populations rather than estimates of predation, which may have no association with actual wildlife populations. This could be included in a national domestic cat action plan. Ideally rather than focusing on national estimates, it is useful to obtain more definitive data which can be utilised in a more strategic approach. For example, in areas of high conservation value. This type of data can also be used to underpin any decisions relating to declaring cat-free zones. Citizen science backed up with camera trap data could be used to develop detailed maps across urban areas of Australia to guide strategic protection of species of conservation concern.

Recommendation 13: Allocate funding to undertake comprehensive field studies to quantify impact on wildlife populations of owned, semi-owned and unowned domestic cats in specific locations. This could be included in a national domestic cat management action plan.

4.3 Impacts of cats on human health - disease

Diseases which can be spread from cats to humans are not common in Australia. The overall public health risk from cats is small, especially if good personal and pet health and hygiene are practiced (Chomel, 2014). Toxoplasmosis, a protozoal infection in cats, can occur in people mainly through the ingestion of poorly cooked meat (which contains infected cysts) or through ingesting toxoplasma spores from fruit/vegetables or material which is contaminated with cat faeces. Although many people may come in contact with or ingest infected material, disease is rare. However, risks are heightened for young/old, pregnant women or individuals with low immunity but extra precautions can be taken to help avoid infection. There is a lack of epidemiological data which describes the cause, nature and prevalence of toxoplasmosis in people in Australia and there is no evidence that owning a cat increases the likelihood of becoming infected (AVA 2023). At best, selective and/or simplified information may lead to the misinterpretation that having direct contact with cats poses a high risk of disease, and at worst it could be argued this disease is being weaponised to create public fear.

Recommendation 14: That a comprehensive study is undertaken to quantify the source, nature and prevalence of toxoplasmosis in humans in Australia.

4.4 Management options

NOTE: Although reference to specific clauses in the TAP may be made below, these comments should be incorporated into a National Domestic Cat Action Plan, rather than remain in the Feral Cat TAP.

Effective humane management relies upon good collaboration and communication between key stakeholders, good strategic planning with clear, justifiable achievable goals and ongoing monitoring of achieving objectives. Cat management plans offer a useful framework to achieve these goals. Animal management plans are a mandatory requirement under state legislation in Victoria and South Australia, although it is understood that the focus to date has been on dog management by councils. However, several councils have implemented holistic management plans which include strategies to address cat overpopulation and high euthanasia rates, e.g. Casey Council, Yarra Ranges.

Management programs must be evidence based and be supported by sufficient funding. Ideally, research should be conducted to add to contemporary scientific knowledge. Strategic planning must consider the cohort of cats (i.e., owned, semi-owned or unowned), the nature and extent of negative impacts attributed to free roaming cats and identification of locations which offer the greatest gains (this may include socio-economic factors, availability of food sources, degree of risk to native species and level of support from the community etc).

Recommendation 15: State Governments and Local Councils are encouraged and supported to implement domestic cat management plans which include appropriate legal requirements and community support/education programs.

Recommendation 16: Research should be conducted where cat management plans and/or bylaws are implemented to evaluate effectiveness of approaches and to assist with adaptive management.

The use by councils of trap and kill programs as the main approach to manage unowned and semi-owned cats is not desirable. The main factor influencing success is the ongoing requirement to cull a substantial proportion of the cat population to exceed reproduction levels, which is difficult and resource intensive to sustain. A study by (Lazenby 2014) found that low level culling actually resulted in an increase in cat numbers. Other studies which provide estimates of the proportion of cats to be removed vary from 50-82% of cats (Andersen et al. 2004; Nutter 2005; McCarthy et al. 2013). Furthermore, high intensity trap and kill programs are not consistent with community expectations (Kennedy et al 2020; Halls and Bessant, 2023; McDonald et al 2023).

There are also important considerations relating to significant negative mental health impacts of people involved in mass killing programs including shelter staff, animal management officers and cat care givers (Reeve, 2005; Rohlf and Bennett, 2005; Rogelburg 2007; Baran et al, 2009; Scotney et al, 2015; Scotney 2023). It is acknowledged that euthanasia of individual cats on health and behavioural grounds may need to be undertaken.

Recommendation 17: Management programs to manage free-roaming owned, unowned and semi-owned cats should be aligned with a One Welfare philosophy aimed at balancing and optimising the wellbeing of animals, humans and the environment.

The AVA is cautious regarding councils establishing cat-free suburbs (refer to Action 9.2 in the TAP). It is essential that due process is adhered to, and that any declaration is evidence-based and justified in terms of demonstrating that an area is of high biodiversity value through valid environmental studies and ongoing monitoring. Research has shown cat-free suburbs have no benefit in protecting wildlife (Lilith 2010) and that habitat quality is more important (Lilith 2010; Grayson 2007). It also denies residents and their families the benefit from the emotional bond with a cat, while not restricting ownership of dogs, which are consistently shown to attack substantially more wildlife of conservation concern than cats (NSW Government Dashboard (2021). An alternative is to assist cat owners with low-cost or free containment systems and require residential developers in new housing areas adjacent to wildlife species of conservation concern to provide cat-proof fencing for properties or erect effective barrier fencing around these areas.

Recommendation 18: Local governments are encouraged to implement other strategies than restricting cat ownership in critical areas to achieve 'cat-freeness'. Cat-free zones may have application with new developments, but this needs to be evaluated.

4.4.1 Owned cats

In terms of owned cats, the AVA acknowledges the key focus areas as being desexing, identification and containment. Desexing cats is an important way of reducing the number of unwanted cats, improving the health of individual animals, and reducing the potential for problems associated with cats in communities. Routine prepubertal desexing of cats (by four months of age) avoids unintended/unwanted litters. There is no evidence which demonstrates that mandatory desexing programs are effective in significantly reducing overpopulation and other problems associated with cats in the community. This is on the basis that a high proportion of owned cats are desexed, and because it fails to recognise that it is not lack of motivation or lack of knowledge, but cost that is the barrier. The strongest predictor of whether a cat in a household is desexed is family income (Chu 2009). However, one study in the ACT, where cats must be desexed by three months of age, indicated that lack of enforcement and veterinary and broader community awareness may have contributed to the legislation being ineffective (Orr & Jones, 2018). Of note, the three states with the highest per capital cat intake into shelters and pounds have mandated desexing (Chua 2023), and another study of 191,000 cats entering RSPCA shelters around Australia (Alberthsen 2016) also documented no benefit of mandated desexing. Individual identification is essential to reunite owners with lost/escaped cats. Most cats entering rescue shelters are not identified or claimed by their owner. Free microchipping offered by councils has helped to encourage owners to identify their cats.

Cat containment retains cats on their owners' properties and helps to protect local wildlife from predation, reduces risks to the community and agriculture from zoonotic disease and reduces complaints to local government about nuisance from cats. Keeping cats contained decreases their risk of injury and certain diseases so they can live safe, healthy and longer lives. Contained cats require an appropriate environment with enrichment that meets the cats' physical and mental needs, allows expression of natural behaviours, promotes good health and welfare and minimises stress. This

should include controlled outdoor access where possible. Significant further research is required to optimise the health and welfare of contained cats.

Although the TAP does not specifically recommend mandatory containment, there is increasing expectation of councils to introduce 24/7 containment bylaws. To date, no studies have been conducted or reported on the effectiveness of mandatory containment. However. several studies have shown that effective management of domestic cats requires knowledge and understanding of human behaviour and identification of barriers to containing owned cats (McLeod et al, 2015; McLeod et al, 2017; McLeod et al, 2019; Rand et al, 2023; Ma, 2023).

Recommendation 19: The Domestic Cat Management Action Plan to include a plan and budget for an information campaign that educates cat owners on the benefits of requiring cats to be contained, and how to optimise a cat's environment (including behavioural interactions) to meet their needs whilst being contained.

4.4.2 Semi-owned cats

The intentional provision of food, medical treatment and shelter by humans for a cat that is not considered to be owned by the individual is defined as "semi-ownership" (Toukhsati et al, 2007). A survey of residents in rural and non-rural Victoria found that 22% of respondents engaged in activities consistent with cat semi-ownership behaviours and that strong feelings towards these cats were evident (Toukhsati et al 2007). A further study using an online questionnaire to examine interactions and caretaking behaviours concluded that encouraging semi-owners to have the cats they care for sterilised may assist in reducing the number of unwanted kittens and could be a valuable alternative to trying to prevent semi-ownership entirely (Zito et al 2016). Attachment is a vital consideration in relation to exploring management strategies for semi-owned cats. Neal & Wolf (2023) found that the strength of the bond by carers of semi-owned cats was similar to carers of owned cats. Two recent Australian studies revealed similar findings relating to the strong relationship of carers to free roaming cats. These studies recommended a care-centred approach based on One Welfare principles to support cat care givers to desex and where possible, adopt these cats (Scotney et al 2023; Crawford et al 2023). A further study by Ma et al (2023) identified semi-owners of unowned 'stray' cats as a valuable potential target audience for human behaviour change interventions which requires a nuanced approach to achieve positive outcomes for people and animals.

Progress is being made by some state governments to integrate a more care-centred approach for domestic cat management. For example, the ACT Cat Plan Implementation Plan (2021) includes working with animal care and rescue organisations to manage semi-owned and unowned cats in public places, through trap, de-sex and adopt activities.

Recommendation 20: Management of semi-owned and unowned cats must be given higher priority by local government. Effective strategies must be implemented by targeting areas of high numbers of free-roaming cats/cat-related complaints and/or high cat admissions and impoundments to shelters and council. Legislation to allow councils to humanely manage semi-owned and unowned populations must be prioritised.

Recommendation 21: Further research is encouraged to evaluate the costs and benefits of community support programs to encourage desexing and adoption of semi-owned cats.

4.4.3 Unowned cats

These cats live around where people live or frequent and obtain food inadvertently from humans, for example from a food bin or rubbish dump.

Recommendation 22: Management options need to be investigated that align with a One Welfare philosophy and protect the environment while avoiding increasing the number of healthy and treatable cats and kittens killed by veterinary staff in shelters, pounds and veterinary clinics with council contracts.

Trap, neuter and return (TNR) has been proposed as an alternative to lethal cat control and involves trapping, desexing and then returning semi-owned or unowned cats to their original location. Caretakers typically provide food and shelter and monitor the cats. When foster or permanent homes are available, young kittens and friendly adults are removed and placed for adoption. Significant scientific discussion continues regarding the place of TNR programs in the management of cats (Crawford et al 2019; Wolf et al 2019) such that these programs cannot be supported as a generalised or key strategy in the management of cats.

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