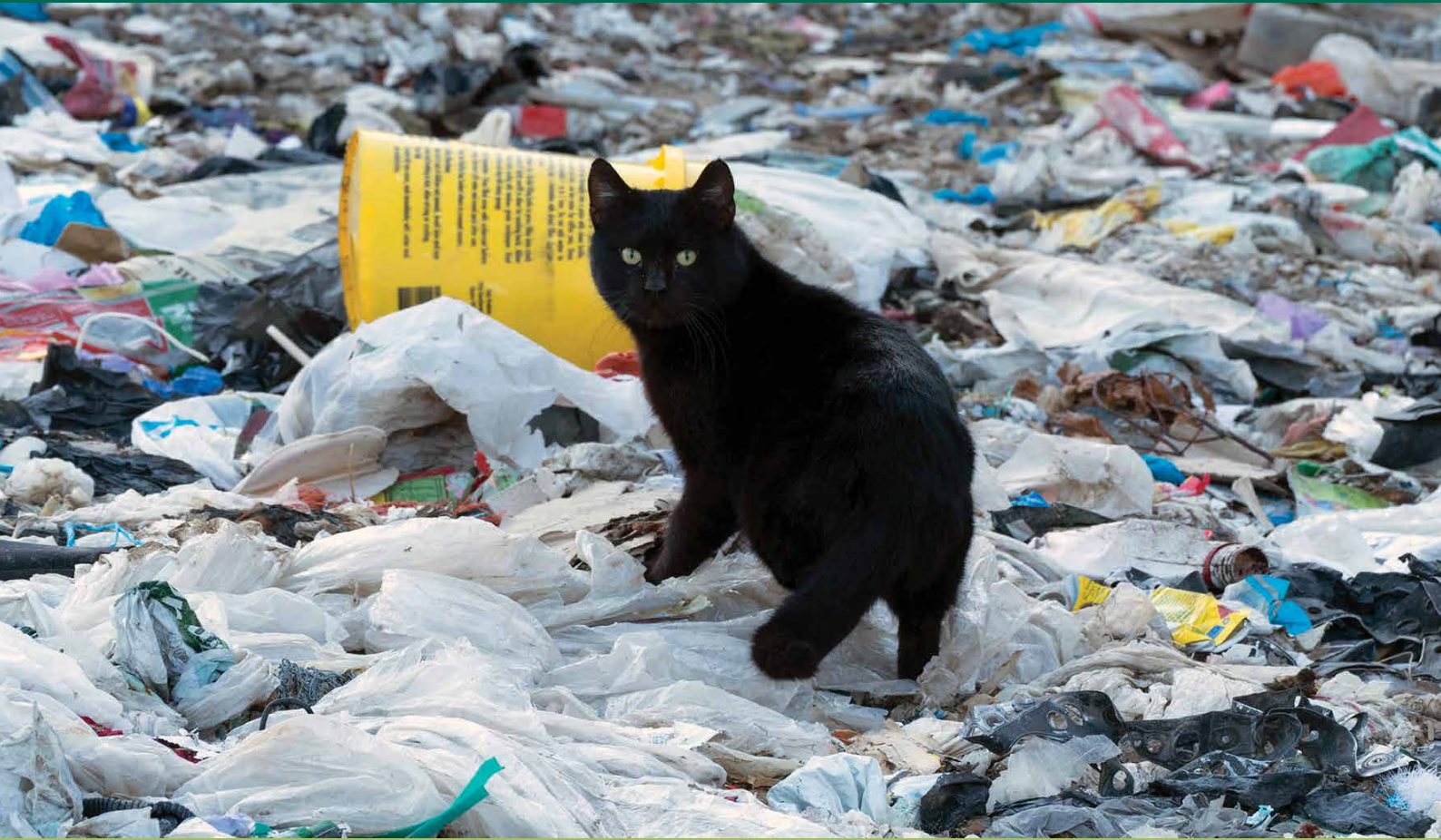




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National Environmental Science Programme



The management of cats by local governments of Australia

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Front cover image: Stray cat at a rubbish dump. Image: Alex Dudley

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Executive summary

Local governments have a central role in cat management in Australia, holding primary responsibility for managing the estimated 4.9 million pet and 0.7 million feral cats living in towns and cities. Cat management is a complex, significant and ongoing issue for local governments but, prior to this study, there has been no national assessment of how local governments manage cats and the specific challenges faced on the ground.

We invited local governments to participate in a national survey during 2020, that aimed to gather information on how they manage pet and feral cats, how their management activities and outcomes are monitored, and what resources and actions could support improved cat management practices around Australia. As well as examining differences between jurisdictions, and the connection between state/territory legislation and local government practices, we also examined whether the remoteness or socio-economic status of local government areas influenced cat management practices, as this might flag regional variation in the measures needed to support better cat management.

A total of 240 (44%) of 542 local governments participated in the survey. We also collected additional data on local government requirements for pet cat ownership by checking their websites for relevant information.

Pet cats

We found local governments use five key measures to manage pet cats: registration, identification (i.e., microchipping), desexing, limits on the number of cats per household, and restrictions on cat presence/movements. These measures are used to different degrees and in different combinations across local governments, creating a patchwork of approaches that is often ineffective, confusing to the public, and hampers efforts to ensure and monitor compliance.

Key results were:

- A key determinant of whether a cat management measure is used is whether state/territory legislation requires, or enables the setting of local regulations to enact them.
- Limits on the number of cats per household is required in over half (53%) of local governments.
- Registration is required in two-thirds of local governments, but we estimate that only a third of pet cats in these areas are registered.
- Desexing is required by around half of local governments, and such mandated desexing was associated with higher estimates of desexed cats in the pet cat population. However, the overall estimates for the proportion of pet cats that are desexed appeared low. The proportion of cats that are desexed was lower in remote and disadvantaged local government areas.
- Microchipping is required by the majority (98%) of local governments.
- Almost a third of the local governments mandate curfews, or containment, or prohibit cats from some areas. This was more common in cities than rural and remote areas, and is more common on islands with long-term plans to eradicate feral cats. Cat restrictions are also increasing in frequency.
- In some jurisdictions, cat containment is a consequence of requiring cats to be contained to the owners' property, or under the control of the owner (e.g., on a leash), in the same manner that is expected for dogs. Other jurisdictions do not legislate against 'roaming cats', making it harder for local governments to enact and police local cat containment bylaws.
- Around half of local governments operate their own pound, with these pounds each handling up to 2660 cats during the 2018-19 financial year (average 262,). There are no collated national data on the numbers of cats that pass through local government pounds and animal shelters run by non-government groups, but given the numbers of impounded cats reported by groups such as the RSPCA, the cumulative total is very large.
- Most local governments undertake some form of monitoring for compliance with their local requirements. However, most monitoring is *administrative*. Local governments also used *reactive* approaches, such as responding to complaints about excess cats on a property. *Proactive* monitoring of compliance, via doorknocks or patrols, was the least common approach.
- Incentives to encourage compliance with local requirements are moderately common: 29% of local governments that require registration offered incentives, such as reduced fees for short periods, or reduced fees for lower income earners, or for people adopting cats from shelters. Half of local governments that require desexing offer incentives, usually reduced registration costs or subsidised or free desexing.

Feral cats

The majority (87%) of local governments reported that stray/feral cats are a problem in their jurisdiction.

- Two-thirds of local governments have some feral cat management in place, typically trapping.
- Local governments reported removing an average of 153 feral cats in one year from their area.
- Trap-Neuter-Release programs occur at a low rate across local governments, mostly illegally or without local government support.
- Only half the local governments that manage feral cats undertake any monitoring, and mostly this focuses on keeping records of management activity. Very few local governments regularly survey the feral cat population to see if it is decreasing in response to management; and even less monitor the effect of management on wildlife.

Expenditure

Most local governments have a budget of less than \$20,000 annually for managing pet cats, and a separate budget of less than \$20,000 annually to manage feral cats. Overall, we estimate that local governments across Australia spend \$76 million annually on pet and feral cat management, excluding large budget island eradication programs.

Recommendations

Local governments emphasised that pet and feral cat management needs to be approached holistically, as the populations are connected, issues, challenges and solutions are often shared.

We recommend the density of feral and free-roaming pet cats in urban and peri-urban areas be reduced. This would reduce the impacts of pet and feral cats on urban and peri-urban wildlife, enhance welfare outcomes for cats, and reduce transmission rates of cat-borne pathogens that can affect people, livestock and wildlife. The survey shows that local governments overwhelmingly want to achieve this. Respondents identified their key challenges, and a package of solutions for those challenges:

1. Strong, enabling legislation to mandate responsible pet cat management set at the state/territory level, that is harmonised across jurisdictions. The legislative frameworks should include:
 - Mandatory registration of pet cats.
 - Mandatory identification of pet cats.
 - Mandatory desexing of pet cats, ideally by 4-5 months of age, with limited exceptions for licenced breeders.
 - Mandatory limits on the number of cats per household.
 - Mandatory requirement to keep cats contained to the owner's property, or under equivalent control to bring expectations about cat management in line with those for dogs.
 - Provisions to enable local governments to designate some residential areas as mandatory cat prohibition zones.
2. The legislative reform and its local implementation should be accompanied by community awareness and education programs.
3. Coordinated incentive programs could be introduced that encourage uptake of responsible pet cat ownership, this could include subsidies for desexing or cat containment materials after registration.
4. Enhanced monitoring, collating and reporting of activity information, including key data on registrations, desexing statistics, identification details, impoundments, and numbers of feral cats killed.
5. Enhanced monitoring of outcomes, especially the number of free-roaming cats and the consequences for local wildlife.

To help improve management of feral/stray cats, some additional recommendations include

- Amendments to pest/biosecurity legislation to recognise all unowned, feral cats as a pest species in all jurisdictions, in line with an agreement between all environment ministers from the Commonwealth, and all states and territories in 2015 (Meeting of Environment Ministers 2015).
- Education and clear messaging about not feeding stray cats; and that Trap-Neuter-Release is not effective or humane. Trap-Neuter-Release should be banned nationally.
- Reduce the feral cat carrying capacity around towns and cities by excluding cats (with fencing) from rubbish dumps and intensive farms.

Local governments of remote and very remote areas face some unique challenges; organisations such as Animal Management in Rural and Remote Indigenous Communities (AMRRIC) already have an important role in companion animal management. Support mechanisms for this organisation could be enhanced.

Section 1. Introduction

One of the most significant threats to Australian wildlife is predation by cats, which were introduced to the continent from 1788 (Kearney *et al.* 2019). Cats have had a major role in over 20 of Australia's 33 mammal extinctions since European settlement (Woinarski *et al.* 2019a; Woinarski *et al.* 2015). Feral cats now cover >99.9% of Australia's land area, with a population that fluctuates between 1.4 and 5.6 million, depending on weather conditions (Legge *et al.* 2017). There are an additional 0.7 million feral cats living in towns and cities (sometimes called strays) (Legge *et al.* 2017). The pet cat population in Australia is estimated to be 4.9 million (Animal Medicines Australia 2021), with about 27% of Australian households owning one or more pet cats.

Cats in Australia kill an estimated 1.7 billion native mammals, birds, reptiles and frogs every year, and they are causing ongoing declines in many wildlife populations (Threatened Species Recovery Hub 2020; Woinarski *et al.* 2019b). Although most of the predation toll is caused by feral cats, pet cats also have serious impacts on native wildlife, because they are living at high densities in urban areas, and their predation is concentrated in small areas (Legge *et al.* 2020b).

The management of environmental issues is complicated in Australia because of the three-tiered government system (national; state/territory; local government). The management of cats is particularly complex because cats are both cherished pets and feral pests (McLeod *et al.* 2019), with impacts on native wildlife and agricultural production (Legge *et al.* 2020a; Woinarski *et al.* 2019b). Cat management is therefore included in part in environmental, biosecurity and companion animal legislation, variously set across all three tiers of government. Furthermore, many components of these settings have been subject to recent change. The relevant policy and laws for any individual cat depends on the state or territory it is in, the local government area in which it lives, the tenure on which it roams, whether or not it is owned, and the purpose of management action considered (Woinarski *et al.* 2019b). However, there is a reasonably consistent division between the legislative, policy and management frameworks for feral versus pet cats.

Feral cats

In national legislation, predation by feral cats is listed as a key threatening process under the *Environment Protection and Biodiversity Conservation Act 1999*. A national Threat Abatement Plan helps to coordinate actions to reduce cat impacts. The relevant national policies relating to cats also include the Australian Pest Animal Strategy, which recognises the impacts of cats on agriculture as well as the environment, and the Threatened Species Strategy, which has had a strong focus on addressing the environmental threat from cats and supporting recovery in species that are highly vulnerable to cat predation. The Threatened Species Strategy has also helped to raise awareness and engage the broader community in conservation challenges caused by cats.

The Australian Government is obliged to manage feral cats on Commonwealth land, as set out in the Threat Abatement Plan, but elsewhere, feral cat management mostly falls to the States and Territories, governed by their own legislation (Woinarski *et al.* 2019b). A key determinant in how feral cats are managed by states and territories is whether they are listed as a pest species in environmental/biosecurity legislation, or not (Appendix 3). Some rural and remote local governments, including of some islands, also carry out some actions to manage feral cats in natural bushland, under the legislative framework of their state or territory. Local governments mostly carry out any management of feral cats in towns and cities ('strays'; see Box).



Feral cats in a letter-winged kite (*Elanus scriptus*) nest, Queensland. Image: Ivan Reynolds

Pet cats

Management of pet cats mostly falls to local governments, through companion animal legislation set at the state and territory level. Some local governments have established partnerships with, or contract out, aspects of pet and stray cat management to non-government organisations or animal rescue groups such as RSPCA-Australia, Animal Welfare League, or other organisations.

There are five key measures that local government areas (LGAs) use in pet cat management: capping the number of cats per household, registration, microchipping, desexing, and being able to restrict or control cat movements. The latter may take the form of being able to respond to 'nuisance cats' or straying cats, allowing for cat curfews or containment, or prohibition in designated areas (RSPCA-Australia 2018) (Table 1). These five measures are, to varying extents, set out in the relevant state/territory companion animal legislation, with local governments able to modify that overarching framework via setting local bylaws or regulations. Partly because of variation in legislation and policy across jurisdictions, and partly because the ability of local governments to make and enforce local laws to suit local circumstances may be constrained by state and territory legal frameworks (Legge *et al.* 2020b), local government management practices for cats are highly variable, ranging from 'do nothing' to implementing comprehensive bylaws requiring desexing, registration and 24/7 containment for pet cats.

Several previous studies have considered the role of LGAs in the management of cats (Table 2). Collectively, they indicate long-standing concerns about the shortcomings in existing regulation and management for cats in Australia, coupled with an increasing interest in strengthening cat management frameworks and regulations. However, none of this previous work quantified the frequencies of various cat management practices. There are no nationally coordinated databases for key parameters like microchipped cats, cat impoundments or registered breeders.

Thus, at a national scale, knowledge of the extent of local government action on cats, and the effectiveness of such actions, is poor. Furthermore, there has been little or no national assessment of what legislative and policy reforms, and what resources, would help LGAs do their jobs more effectively. This project aimed to address both knowledge gaps, via a survey of the practices and perspectives of local governments in the management of pet and feral cats in Australia. The aims of this project were to assess:

- current local government requirements and actions that relate to the management of cats;
- whether and how these activities, and their outcomes, are monitored, and how effective they are;
- whether there is information about pet or feral cat impacts or management options that would be useful for local governments, in the execution of their cat management programs.

To achieve these aims, we contacted 537 local governments, the ACT government, three external territories and one unincorporated area (French Island) to invite their participation in a national survey of cat management by local governments.

Table 1: Summary of legislation supporting key management actions for pet cats in each state/territory of Australia.

Jurisdiction	Does state/territory legislation enable local governments to set local bylaws/extent of enactment	Limit on number of pet cats per household	Desexing requirements	Microchipping requirements	Registration requirements	Provisions for 'nuisance' cats, or roaming cats	Provisions for cat curfews, containment, prohibition from areas or zones
Australian Capital Territory	Yes	Yes: 4	Yes: by three months of age	Yes	No	Yes	Yes: 17 cat containment suburbs in place.
New South Wales	No	No	No	Yes	Yes	Yes	Partial: Cats are prohibited in food preparation/ consumption areas and can be prohibited from designated wildlife protection areas.
Victoria	Yes	Partial: the state legislation does not set a limit on the number of pet cats, but stipulates that local governments should set the limits on number of pet cats per household. Limits may vary according to property size.	No	Yes	Yes	Yes	Partial: local governments must go through a process of developing and implementing the regulations.
Northern Territory	No territory-based legislation relating to pet cats. Some local governments have regulations in place (e.g, Darwin City Council sets a limit on the number of pet cats per household and has requirements for microchipping and registration, and containment laws, and Alice Springs Town Council sets a limit on the number of pet cats per household and compulsory registration).						
Tasmania	Yes	No From March 2022, a maximum of four cats over four months old can be kept on one property without a multiple cat permit.	Yes: cats over the age of 6 months must be desexed. From March 2022, all cats over the age of four months must be desexed, unless a vet certifies that it could adversely affect the health or welfare of the cat.	Yes	No	No	No
Queensland	Yes	No	No	Yes	No	No	No
South Australia	Yes	No	Yes: by 6 months of age, with limited exemptions.	Yes	No	Yes	Partial: local governments must go through a process of developing and implementing the regulations.
Western Australia	Yes	No	Yes: all cats over 6 months of age to be desexed.	Yes	Yes	Yes	No

Table 2: Summary of findings from studies of cat management by local government in Australia.

Study	Jurisdiction	Key findings
Grayson and Calver (2004)	National, with a focus on WA	Noted there are increasing numbers of local councils enacting cat control regulations, and some states have implemented state-wide regulations. Proposes that regulation of cat ownership is warranted, based on the precautionary principle.
McCarthy (2005)	National, focused on impacts of domestic cats in peri-urban reserves	Noted there is increased interest by local governments and the community in protecting environmentally sensitive areas from domestic cat impacts. Suggested cat confinement is the method of choice to prevent cat impacts in peri-urban reserves. Cat confinement strategies need to be part of an integrated approach to cat control, underpinned by community education about the cat welfare benefits of confinement, as well as the broader benefits to community.
Toukhsati (2012)	Victoria	Indicated that around 30% of councils in Victoria have mandated cat confinement legislation.
Eyles and Mulvaney (2014)	ACT	Recommended legislative and management reform in the ACT, including mandatory registration for pet cats, with fees that could fund the management capability of relevant authorities, declaration of all conservation reserves as cat-free areas, requirement for all new suburbs as declared cat containment areas, consolidation and strategic increase of cat containment in existing suburbs.
RSPCA-Australia (2018)	National	Noted there is a lack of adequate state-based legislation, and some local governments have established their own cat bylaws. The main focus of these bylaws has been to address the number of wandering cats causing a nuisance, by limiting the number of cats per household, compelling owners to confine their cats to their property, and requiring identification, registration and desexing. Highlighted that in NSW, councils are not able to implement bylaws that surpass requirements under state legislation, which poses significant challenges for cat management. Noted that on a national scale, there are significant inconsistencies among local government bylaws/regulations, even in adjacent local government areas.

Defining cats

Cats can be categorised in different ways, depending on the lifestyle, degree of containment, degree of socialisation and ownership of the cat. Cats can move between some of these categories in their lifetimes. While we recognise the nuances of cat classification, in this report, we use the following definitions:

Feral cats: cats that live in the wild and can survive without relying on people for food or contact.

Stray cats: feral cats living as fringe dwellers in towns and cities, profiting from the opportunities for shelter and food. These may include wayward pets, ex pets, semi-socialised or unsocialised feral cats. They may be fed by people, or not.

Pet cats: owned by people, and cared for in a responsible and consistent manner.

Terms commonly used in local government bylaws and regulations

Local governments can establish bylaws and regulations relating to cats, such as limiting the number of pet cats per household, requiring owners to confine pet cats within a property boundary (at night or 24/7), or requiring desexing, registration, microchipping. Terms like 'containment', 'confinement' and 'curfew' are not used consistently across local governments. In this report, we use the following definitions:

Nuisance cats: pet cats that disturb other residents (fighting, fouling) or adversely affect native wildlife. Some local governments focus on 'roaming' or 'wandering' cats instead of nuisance cats, although a cat doesn't need to be roaming to be a nuisance.

Roaming cat: a pet cat that is allowed to wander outside the owner's property.

Curfew: where cats must be contained or confined for part of the day, most commonly from dusk to dawn, usually within an owner's property boundary.

24-hour containment: complete containment of cats, indoors, in an outdoor cat enclosure, or in a yard with cat-proof fencing (or a combination of these) within an owner's property boundary, at all times. If the cat is away from the property, it must be in a cat transport box, or on a leash. Also called 24/7 or total confinement/containment/curfew.

Prohibition: where cats are prohibited from designated areas, such as suburbs adjacent to significant biodiversity values (e.g., seabird colonies). In NSW, local governments can prohibit cats from designated wildlife protection areas or food preparation areas. Also called cat-free zones, or cat ban areas. Note that we do not include general prohibition of pets from national parks, which applies around Australia, as part of this definition.

Section 2. Method

Designing and circulating the survey

The project team designed a comprehensive survey of cat management by local governments in Australia. We sought input from the Office of the Threatened Species Commissioner, representatives from state and territory governments on the national Feral Cat Taskforce, researchers and Animal Management in Rural and Remote Indigenous Communities (a non-government organisation) to develop and refine the survey questions. The survey comprised 56 questions in three sections, on pet cats, stray cats, and feral cats, and sought details of the current programs in place, whether the activities and their outcomes were monitored, and what information and resources were needed to improve local government cat management (Appendix 2). The survey was conducted under human ethics approval from the University of Queensland.

Since the legislative and policy settings vary among states and territories, the surveys were tailored for each jurisdiction. As well as the 537 local councils, we invited participation by three external territories which are administered by the Australian Government (Christmas Island, Cocos-Keeling, Norfolk Island); and parts of South Australia, Victoria, NSW and the Northern Territory which are not administered by incorporated bodies. We also contacted other relevant organisations to complete the survey for unincorporated areas in Australia (e.g., National Parks and Wildlife Service for the Unincorporated Far West region of NSW), but none of these responded.

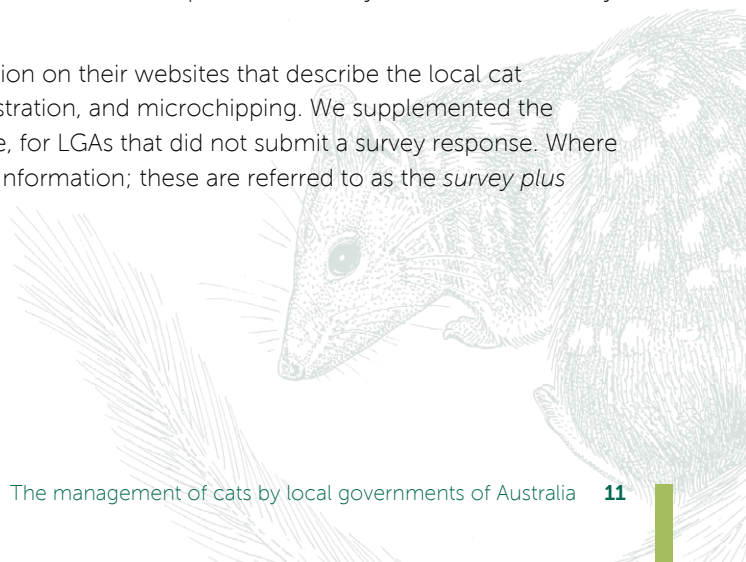
To maximise participation in the survey, we made initial contact to most local governments by phone, to introduce the project, and to identify the most appropriate staff member working in animal management operations, and who had a sound understanding of the management actions undertaken on cats in the local area. We also offered an incentive for participation in the survey – participants could enter into a draw to win a copy of 'Cats in Australia: Companion or Killer' and a \$200 camping store voucher.

Most local governments asked for any correspondence to be sent to a 'generic' council email address, as part of requirements to track incoming correspondence. For the island jurisdictions, surveys were completed by staff working in national parks (for Christmas Island, and Norfolk Island), or by a Landcare project officer (for French Island). This was due to local government staff being unable to complete the survey, or in the case of French Island, there being no local government in place.

Surveys were circulated in a staggered manner to each jurisdiction between December 2019 and May 2020. We provided the option of completing the survey online (via the Qualtrics survey platform), on a spreadsheet, or over the phone. The survey was designed to be in a user-friendly online format. We used the "display/branch logic" function in Qualtrics, to set conditions survey respondents must meet in order to see a question. For example, if they responded "yes" to the question about whether they undertake stray cat management, then they were asked to answer subsequent detailed questions about the management actions. We included a participant information sheet, and a contact phone number in case respondents preferred to complete the survey over the phone.

We circulated three reminders via email, combined with follow up phone calls, to try to maximise the response rates. The Australian Local Government Association, Australian Environmental Law Enforcement and Regulators Network and various Natural Resource Management organisations assisted in circulating the survey. Respondents had at least six weeks to respond. Most surveys were completed online. For two local governments, responsibility for cat management is split between different sections of councils (for example, pet cats managed by animal health workers, and feral cats managed by environmental or biosecurity staff); these local governments completed the survey by spreadsheet to allow different staff members to complete different sections. These partial responses were then combined to form a complete response for those local governments. Some local governments completed the survey more than once. Any duplicate responses (typically incomplete) were removed.

Finally, some local governments have comprehensive information on their websites that describe the local cat management requirements for desexing, household caps, registration, and microchipping. We supplemented the collated survey data with this information, when it was available, for LGAs that did not submit a survey response. Where relevant, we present results with and without this web-derived information; these are referred to as the *survey plus web-based data* and *survey data* respectively.



Potential drivers of variation among LGAs in cat management

For each LGA, we gathered information on three high-level factors that could affect their cat management activities:

- Jurisdiction: particularly if there was relevant legislation at the state/territory level to mandate a particular management approach. Note that we grouped the ACT, the three external territories, and French Island, into a category called "Other", to facilitate analysis.
- Remoteness: whether an LGA covers a city, inner or outer regional, remote or very remote area may affect the access to key services such as veterinarians or local pound facilities, and thus the way cats are managed. We used the Australian Statistical Geographic Standard (ASGS) remoteness structure described by the Australian Bureau of Statistics, which recognises five classes of remoteness based on measures of relative access to services (Australian Bureau of Statistics 2020) (Figure 1). The Australian Local Government Association estimates 55% of councils are regional, rural or remote councils (Australian Local Government Association 2021).
- Socioeconomic context of the LGA, as some cat management actions, such as desexing and registration, incur costs to pet owners. We used the Index of Relative Socio-Economic Disadvantage, a general socio-economic index developed by the Australian Bureau of Statistics (Australian Bureau of Statistics 2018). The index summarises a range of information about the economic and social conditions of people and households within an area (Australian Bureau of Statistics 2018). Generally, a low score indicates a relatively greater disadvantage, and a high score indicates a relative lack of disadvantage (Australian Bureau of Statistics 2018).

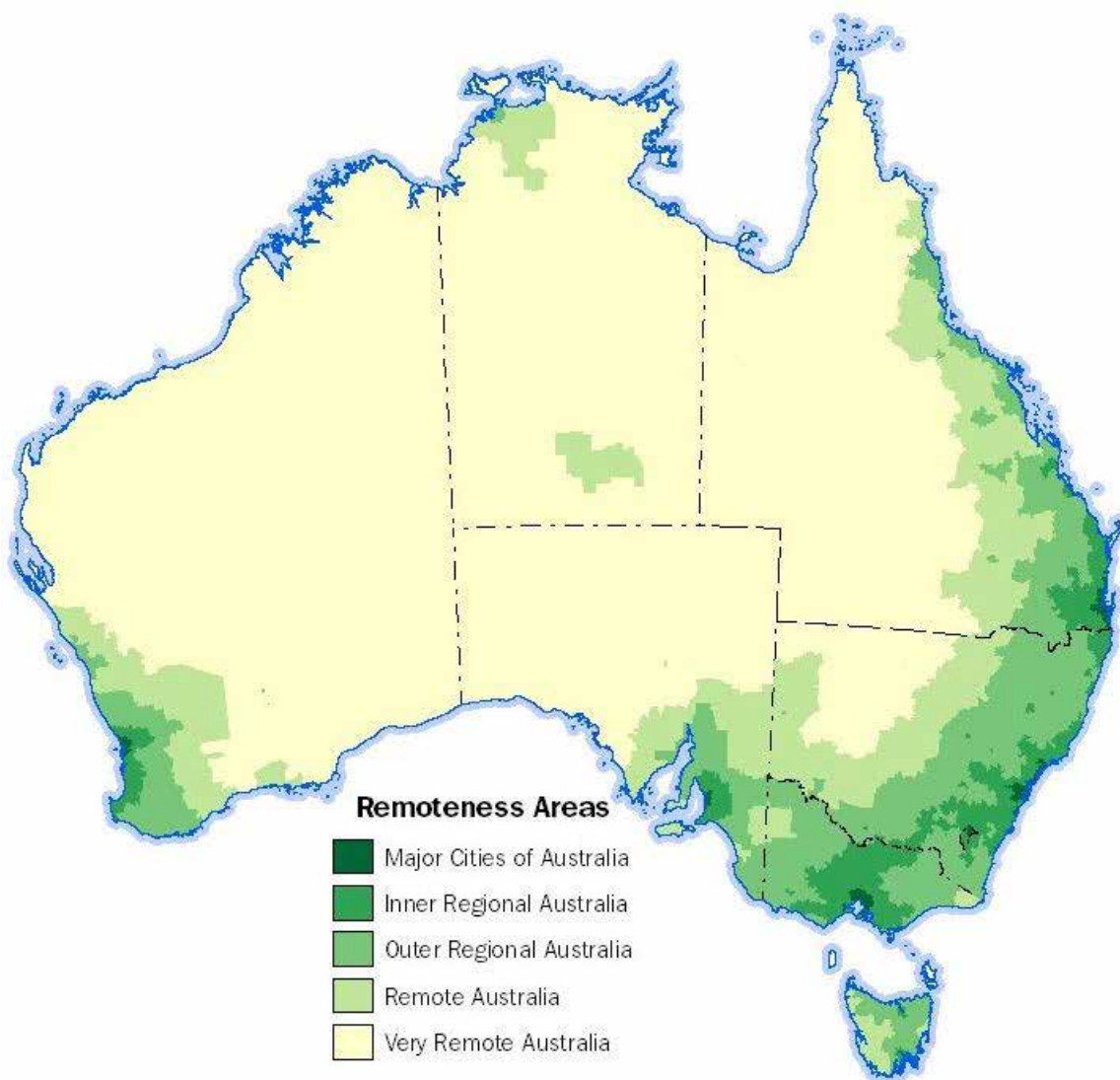


Figure 1: 2016 remoteness areas for Australia (Australian Bureau of Statistics 2020)

Pet cats – data collation

Local governments implement the state/territory legislation summarised in Table 2. The survey aimed to find out how actively the laws were implemented; whether local governments had their own bylaws/regulations to further strengthen cat management, to the extent possible under the jurisdictional law, and whether there were geographic or socio-economic factors that caused local governments to adopt particular pet cat management options.

Actions in place: We summarised the frequencies of the five key pet cat management measures (household caps, desexing, registration, microchipping, restrictions on movement), and examined the influence of jurisdiction, remoteness, and socioeconomic score for each measure.

Monitoring in place: We summarised the existence, type and frequency of monitoring for compliance with, or outcomes from, each of the five key pet cat management measures. This included summarised data on the incidence of LGA-operated pounds, and the numbers of cats that passed through those pounds in the FY 2018-19. Again, we considered the influence of jurisdiction, remoteness, and socioeconomic score on these data.

Encouraging compliance: We summarised the rate and range of incentive mechanisms in place to encourage pet owners to comply with cat management requirements.

Expenditure: We summarised the annual expenditure on pet cat management, and how that varied by jurisdiction, remoteness, socioeconomic score.

Feral and stray cats – data collation

Although the survey had separate sections for stray and feral cats, many respondents only completed one of these sections, commenting that they do not distinguish between stray and feral cats, in an operational sense. We therefore merged the information from the two sections into one set of data. From hereon, we refer to these cats as ‘feral cats’.

Actions in place: We summarised information on whether LGAs considered feral cats to be a problem, whether the LGA had management actions in place, what those actions were, and whether these varied by jurisdiction, remoteness, socioeconomic score. We included one question on whether Trap-Neuter-Release programs occurred in their LGA.

Monitoring in place: We summarised the existence, type and frequency of monitoring for outcomes of feral cat management.

Expenditure: We summarised the annual expenditure on feral cat management, and how that varied by jurisdiction, remoteness, socioeconomic score.

Analysis

To explore patterns in the survey responses, we used a generalised linear modelling approach in Genstat, fitting nominal logistic models where the response was of yes/no form, and using Wald statistics to test for significance of the fitted terms. The response variable in some analyses was continuous (e.g., number of cats impounded); in these cases, we fitted linear regression models and tested the significance of fitted terms with F statistics.

Note that the number of responses to individual questions varied as respondents were able to skip questions on the survey platform.

What works well, what are the challenges and needs

The survey allowed for free-form answers to questions about what is working well, what the main challenges for cat management are, and what information and resources would lead to improved cat management. We developed a typology to categorise the free-form answers (Appendix 4), then summarised the frequencies of responses across those categories. Although the survey asked these questions for pets and feral cats separately, we found that the answers often blurred across pets and feral cats, and we therefore present this information together, in one section.

When survey responses are quoted, they have been lightly edited to remove confidential details, clarify acronyms, and correct spelling errors.

We also provide case studies on aspects of cat management from each jurisdiction; these include actions that work well (e.g. Early Age Desexing, cat containment), highlight the value of regionally coordinated efforts or structures (e.g. Dog and Cat Management Board SA, TassieCat, and WA Feral Cat Working Group), highlight the challenges with cat management in remote areas (e.g. Gapuwiyak, NT) and the role of community groups in advocating for cat containment in LGAs (e.g. Aldgate Valley Landcare Group, Adelaide Hills SA) (see Appendix 1).

Section 3. Results

3.1 Survey response

We received survey responses from 240 LGAs about pet cats, and 237 LGAs about feral cats (Figure 2). For pets, this comprised 235 councils, three external territories (Norfolk Island, Christmas Island, Cocos-Keeling Islands), one unincorporated area (French Island), and the ACT. For feral cats, this comprised 233 councils, and the same external territories, French Island and the ACT. Respondents held a range of positions, typically in animal management, compliance or environmental management.

To this information, we added data on requirements for registration, microchipping, desexing, household caps from local governments that did not respond to the survey by searching content of their websites.

Table 3: Summary of survey response rates to the section on pet cats, and feral cats. All respondents who completed the section on feral cats also completed the section on pet cats. Very few survey responses were incomplete (1 in the pet cat section, 11 in the feral cat section).

Jurisdiction	Number of local governments/ authorities in jurisdiction	Number of responses received on pet cats	Number of responses received on feral cats
New South Wales	128	53 (41%)	53 (41%)
Victoria (Vic)	79	37 (47%)	36 (46%)
Northern Territory	18	8 (44%)	8 (44%)
Tasmania (Tas)	29	19 (66%)	19 (66%)
Queensland (Qld)	77	33 (43%)	33 (43%)
South Australia	69	41 (59%)	40 (58%)
Western Australia	137	44 (32%)	43 (31%)
Australian Capital Territory	1	1 (100%)	1 (100%)
External territories and unincorporated areas (Cocos Keeling, Christmas Island, Norfolk Island, French Island)	4	4 (100%)	4 (100%)
Total	542	240 (44%)	237 (44%)



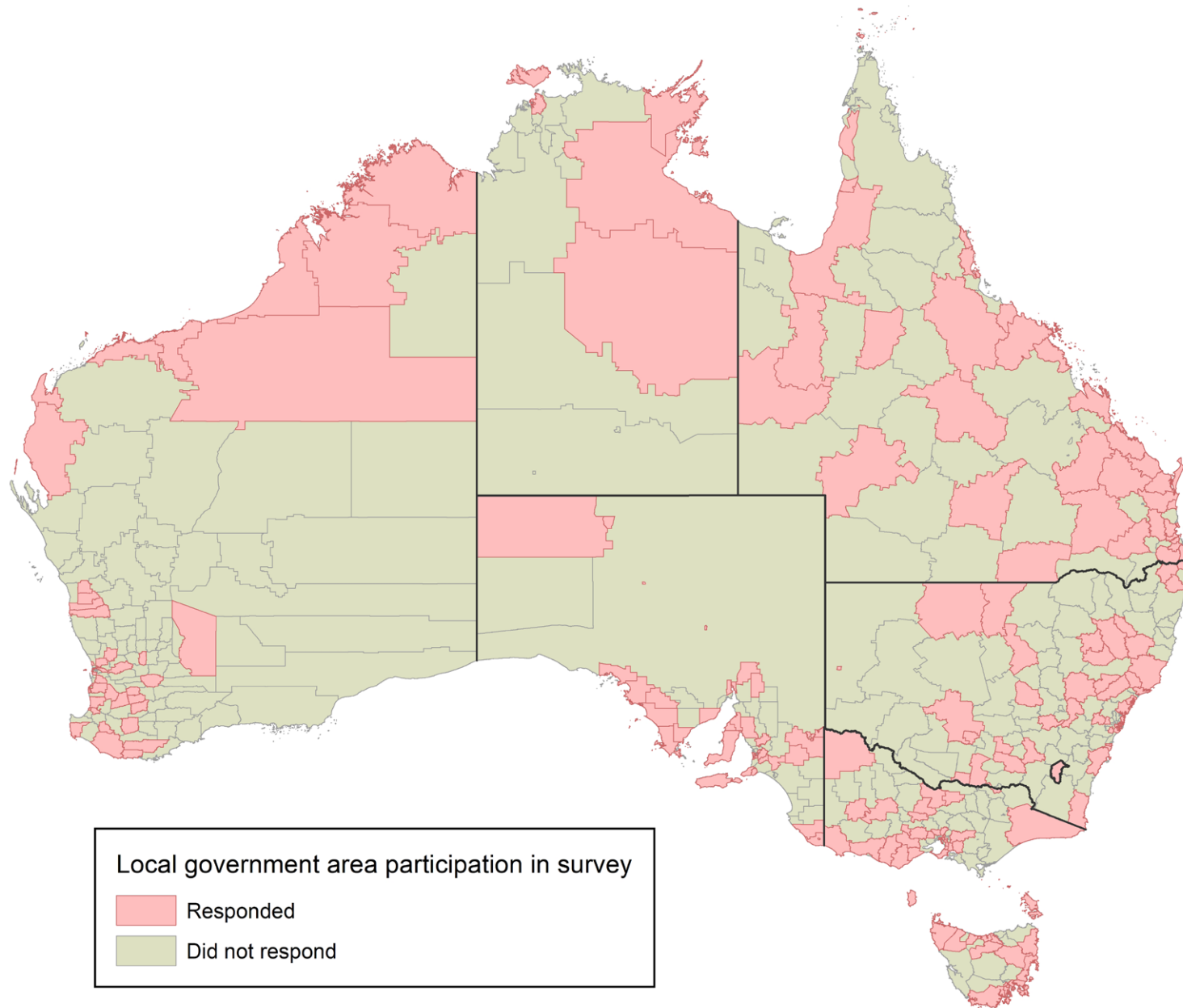


Figure 2: Local governments (in peach) across Australia that participated in the national survey. Areas not visible in the map extent are Christmas Island, Cocos-Keeling Islands, Norfolk Island and French Island.

3.2 Pet cats

3.2.1 Actions in place

Limits on pet cats per household

Based on the *survey plus web-based data*, 53% of 371 LGAs had set a limit on the number of cats per household. If the calculation is restricted to the *survey data* (n = 236), 58% of LGAs placed a cap on the number of cats per household, suggesting respondents were not a biased sample of all LGAs. Limit size ranged from 2 to 6; with a mode of 2 and an average of 2.4 for houses in residential areas; and a mode of 4 with an average of 3.9 for farmhouses.

The frequency with which local governments specified a limit on the number of pet cats per household varied among jurisdictions (Figure 3), from 0% in Tasmania to 100% in Victoria. In Victoria, the state legislation states that caps are to be set by the LGA. Thus, it appears that the setting of caps on the number of cats per household is facilitated when the state/territory legislation has a stronger position on this issue.

After excluding Victoria (where all LGAs set caps), there was still significant variation amongst jurisdictions in the likelihood that an LGA would set a cap, with NT and NSW LGAs being much less likely to do so than other jurisdictions (GLM, nominal logistic: $X^2_6 = 153$; $p < 0.001$) (Figure 3). The remoteness classification of the LGA did not influence whether the number of cats per household is capped ($X^2_4 = 5.32$; $p = 0.26$), nor did the socioeconomic score ($X^2_1 = 1.39$; $p = 0.24$).

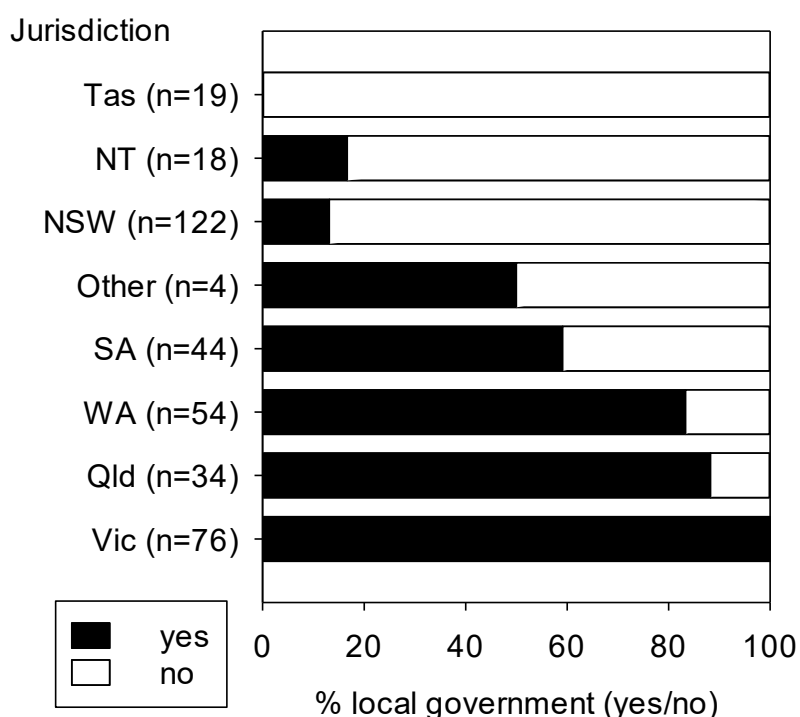


Figure 3: Percent of local governments in each jurisdiction that have bylaws or local regulations to limit the number of pet cats per household. The number of LGAs in each jurisdiction included in this analysis is shown in the axis labels.

Registration

Based on the *survey plus web-based data*, 68% of 542 LGAs require pet cats to be registered. Considering only the *survey data*, comprising 240 LGAs that responded to this question, 65% of LGAs required registration, suggesting respondents were not a biased sample of all LGAs.

All respondents from New South Wales, Victoria and Western Australia reported that they have mandatory cat registration requirements, consistent with their jurisdictional legislation (Figure 4). When registration was not a state/territory requirement, local governments mostly do not set local bylaws requiring registration (Figure 4).

Excluding NSW, Victoria and WA (where registration is mandated at the state level), neither the remoteness classification of the LGA (GLM, nominal logistic: $X^2_4 = 2.97$; $p = 0.56$), nor the socioeconomic score ($X^2_1 = 1.11$; $p = 0.29$) influenced whether LGAs required registration of cats.

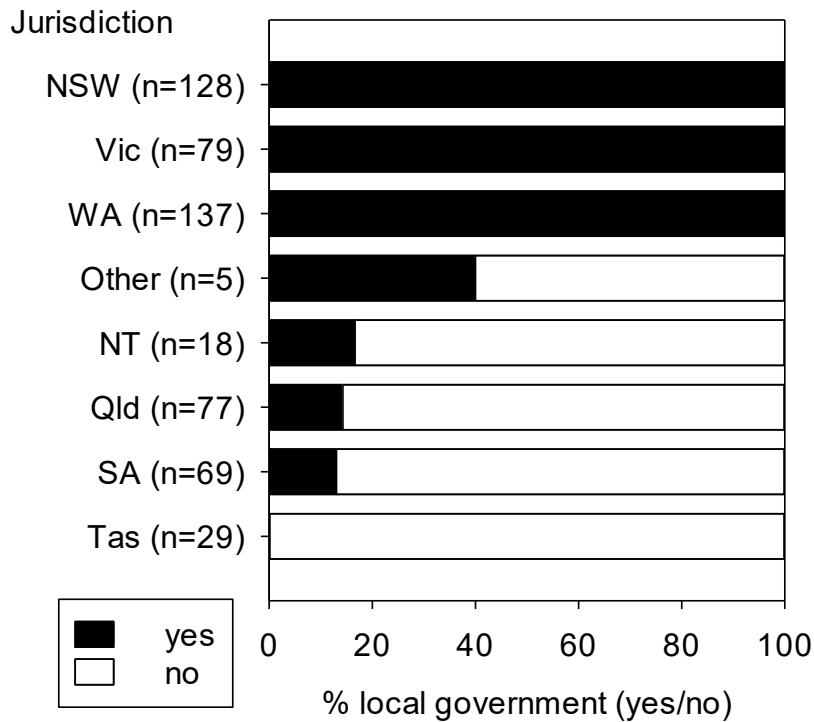


Figure 4: Percent of local governments, by jurisdiction, that reported having local bylaws or regulations about registration of pet cats. The number of LGAs in each jurisdiction included in this analysis is shown in the axis labels.

Microchipping

Based on the *survey plus web-based data*, 98% of 521 LGAs required pet cats to be microchipped. Using the *survey data*, comprising 240 LGAs that responded to this question in the survey, 96% required pet cats to be microchipped, suggesting the respondents were an unbiased sample of all LGAs. The NT is the only jurisdiction that does not require microchipping, and only one (Darwin City Council) out of 18 LGAs in the NT has local requirements for microchipping in place. Microchipping is encouraged but not required on French Island and on Norfolk Island, although new cats brought to Norfolk Island must be chipped to gain entry. We did not carry out analyses of variation in microchipping requirement, given it is almost universally required.

Desexing of pet cats

Based on the *survey plus web-based data*, 54% of 488 LGAs required desexing. When using the *survey data*, comprising the 239 respondents that answered this survey question, 51% of 239 LGAs mandate desexing, suggesting respondents were not a biased sample of all LGAs.

The frequency of local government bylaws requiring desexing varied markedly across jurisdictions, being highest in WA, SA and Tasmania where desexing is mandated in state/territory legislation, and lower in the other jurisdictions, where state/territory legislation does not include a requirement for desexing pet cats but local governments may set their own bylaws on the issue (Figure 5a). This suggests that mandating desexing at the state/territory level is needed to support wider use of this cat management option.

Of the jurisdictions where desexing requirements are set at the LGA level (Vic, ACT, NT, NSW, ACT, other), LGAs in Victoria and the 'other' jurisdictions are more likely to have desexing requirements (GLM, nominal logistic: $X^2_4 = 45.9$; $p < 0.001$). LGAs classed as 'city' and 'inner regional' are more likely to have desexing bylaws, as are 'very remote' local governments, with this latter pattern driven by islands with strong cat management ($X^2_4 = 13.7$; $p = 0.008$) (Figure 5b). Local governments with higher socioeconomic scores were marginally more likely to have compulsory desexing ($X^2_1 = 3.44$; $p = 0.06$) (Figure 5c).

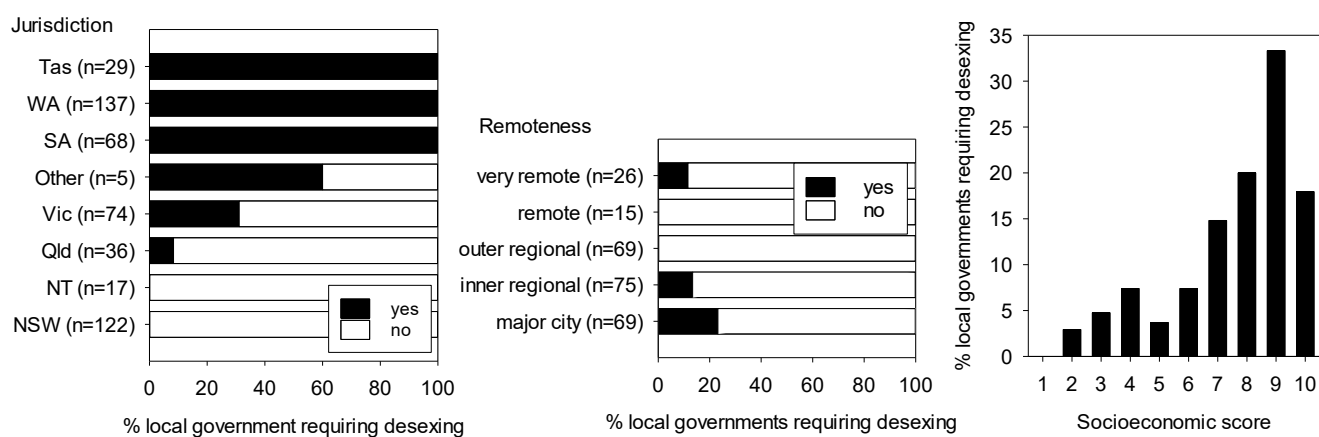


Figure 5: Desexing of pet cats. Percent of local governments that have local bylaws or regulations mandating desexing by (a) jurisdiction; (b) remoteness classification; and (c) socioeconomic score. The latter two graphs exclude local governments from Tasmania, WA and SA where desexing is mandatory. The number of LGAs in each jurisdiction included in this analysis is shown in the axis labels.

Restrictions on cat movements (curfews, containment and prohibition)

Based on the *survey data*, 63% of 240 LGAs reported that their LGA had some provisions for recognising either nuisance cats or roaming cats. Based on the *survey plus web-based data*, 31% of 250 local governments have either a cat curfew, 24-hour containment or prohibition zones (or a combination of these) in place. Curfews, 24-hour containment and prohibition were reported or known from 29, 33, and 23 LGAs respectively (with some LGAs having more than one type of restriction) (Table 4), but we note that overnight curfews are more likely to be used across entire government areas, whereas 24-hour containment and prohibition tend to be applied in more localised areas, such as next to areas with high conservation value.

Cat restrictions are most common in Victoria, being used in 75% of 49 Victorian LGAs (GLM, nominal logistic: $X^2_7 = 67.4$; $p < 0.001$; Figure 6). Overall, 45% of Victorian LGAs reported an overnight curfew, 24% reported 24-hour containment, and 12% prohibited cats from some areas. Some LGAs had more than one type of restriction in cat movement within their LGA. Tasmania had the lowest percentage of LGAs with some form of restriction on cat movement or presence, at 11% (Table 4). South Australian LGAs apply containment requirements mainly by exercising pre-existing 'nuisance' provisions, which require cats to be contained to their owners' property.

LGAs of cities and inner regional areas were more likely to have restriction on cat movement or presence than LGAs in rural and remote areas ($X^2_7 = 10.4$; $p < 0.03$) (Figure 6a). The LGA's socioeconomic score did not significantly influence whether it had cat restrictions in place ($X^2_1 = 0.22$; $p = 0.64$) (Figure 6b).

Table 4: The number of LGAs in each jurisdiction that have a form of restriction on cat movements or presence somewhere in their area. These data are based on the collated dataset of survey respondents plus additional information gathered from web searches.

Jurisdiction	Curfew	24-hour containment	Prohibition
Other (n=4)	0	2	1
Tas (n=19)	0	1	1
NSW (n=54)	1	1	7
WA (n=47)	0	1	4
SA (n=42)	5	6	0
NT (n=8)	0	1	3
Qld (n=34)	0	9	1
Vic (n=49)	23	12	6
Totals	29	33	23

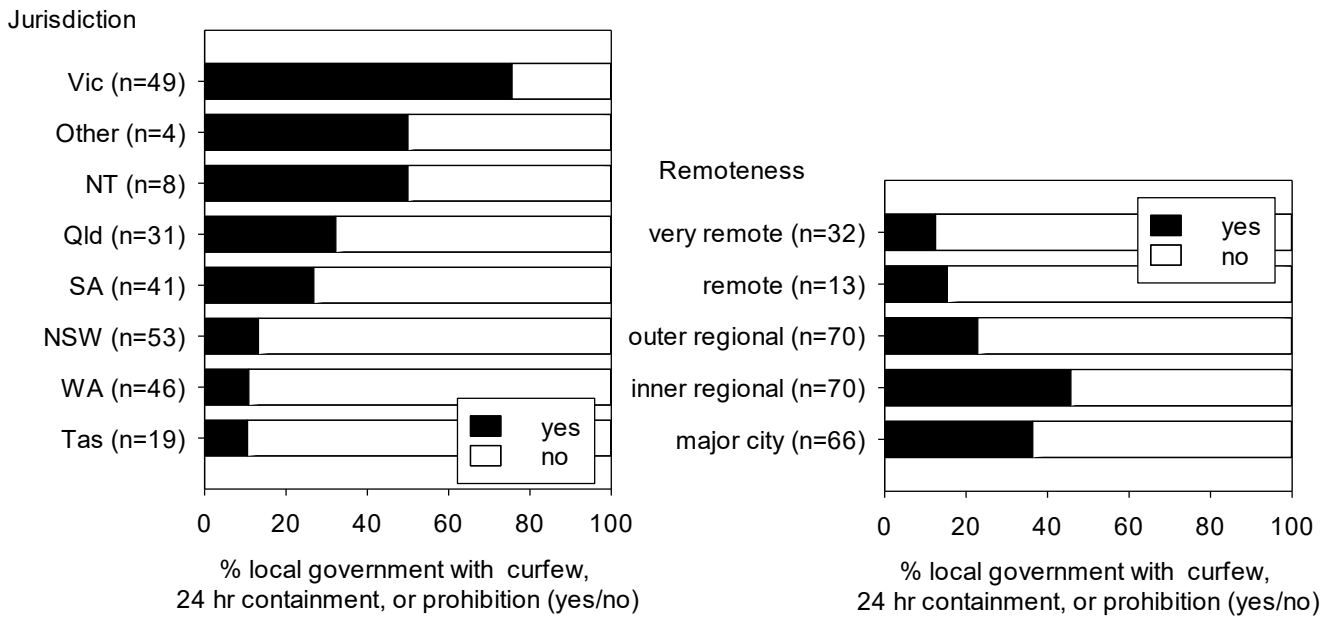
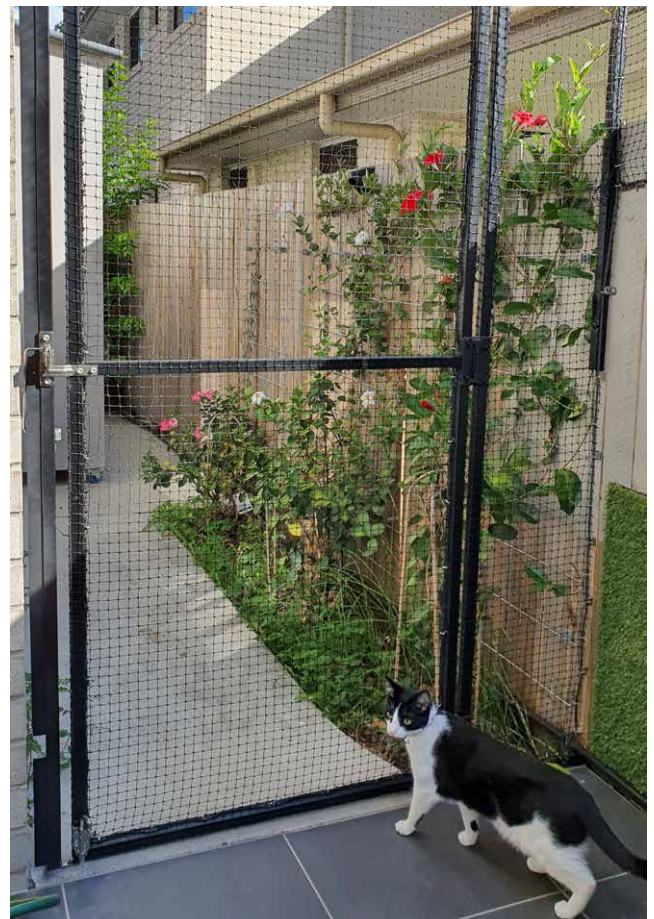
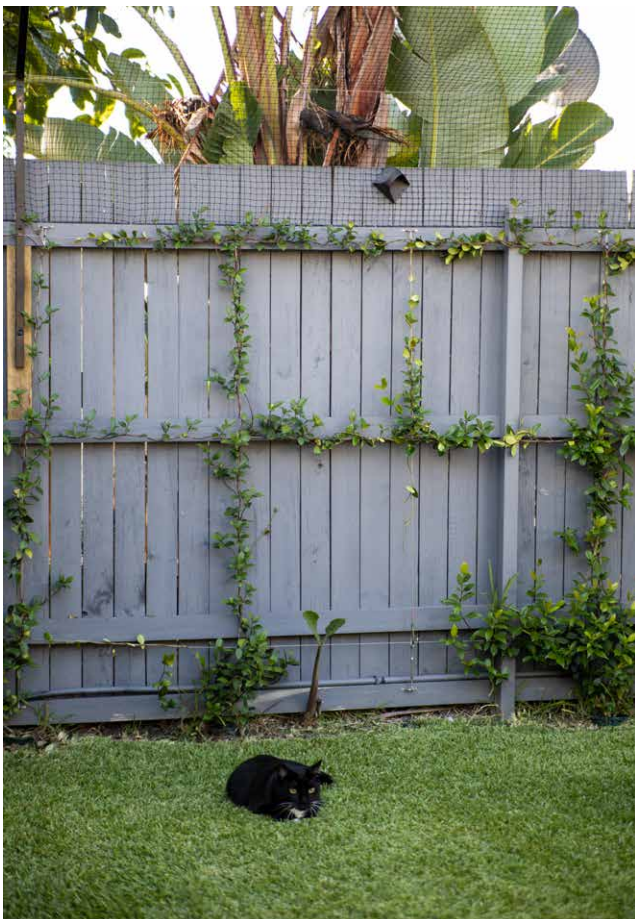


Figure 6: Cat curfews, 24-hour containment, and prohibition. (a) Percent of local governments in each jurisdiction with one or more restrictions on cat movement and presence in place; (b) Percent of local governments in each remoteness class that have some form of restriction on cat movement or presence in place. The number of LGAs in each jurisdiction included in this analysis is shown in the axis labels.

The application of cat curfews, containment and prohibition by LGAs is increasing. For example, night curfews have been subsequently (after the survey period) introduced in additional local government areas (including Knox, Victoria; Mount Barker, SA). Some populated islands have introduced, or are considering introducing, restrictions on cat movements or presence to support initiatives to reduce the impacts of cats on wildlife, including by aiming to make their island feral cat-free, or even cat-free, in the future. Examples include Rottneest Island (cats prohibited), Kangaroo Island and Bruny Island (24-hour containment), and Phillip Island (24-hour containment being considered).



Cat containment systems. Image credit: Jason Shortt

Pounds

Both pet cats and feral cats may be directed to pounds, but since they are an important element of pet cat management (by allowing wandering cats to be returned to owners), and not strictly necessary for feral cat management, we summarise the survey data on the incidence of pounds, and the number of cats that pass through pounds, here (Table 5).

Based on the *survey data*, comprising 129 respondents, 57% said their LGA operated a pound. An additional ten respondents said that this service was carried out by an external party, such as a charitable shelter. For example, the ACT Government pound does not hold cats; they have a contract for RSPCA-Canberra to hold and manage this on their behalf. Fewer SA LGAs operated a pound (31%; n=26) compared with NSW, NT, Qld, Victoria and WA (all 57% or more).

Of 55 LGA respondents that were able to supply data on the number of cats handled by their pound in a year, the mean was 262 (SE=61), and the total number was 14,423 cats. The distribution of numbers was skewed: the median number of cats through the pound each year was 120. The maximum handled by a single pound was 2660. If these figures are representative of all pounds, and we assume one pound (operated by the LGA or another organisation) per LGA, then that could sum to a total of 142,000 cats passing through pounds each year. In reality some LGAs have multiple pounds, so the real figure would be higher. For example, the RSPCA reports over 50,000 cats processed through its pounds each year, and there are many other organisations that operate shelters. Victoria and Queensland LGAs reported the highest overall numbers of impounded cats, and also the highest average per LGA ($F_4 = 4.10$; $p = 0.007$; cats impounded was first transformed by natural log; NT, Tasmania and Other excluded due to small sample sizes; Table 4). Neither remoteness ($F_4 = 1.43$; $p = 0.24$) nor socioeconomic score ($F_1 = 0.52$; $p = 0.47$) explained any of the variation in the number of cats impounded.

There was a positive relationship between the number of cats registered in an LGA and the number of cats that went through the pound in a year ($F_1 = 13.6$; $p = 0.001$; natural log transformation to normalise distribution before analysis). Thus, larger pet cat populations impose larger costs for local government.

Table 5: The numbers of cats impounded by jurisdiction for LGAs that responded.

Jurisdiction	Total cats impounded	Average cats impounded	Standard error	Sample size of LGAs that supplied data
NSW	1621	125	45	13
NT	484	484	.	1
Other	1	1	.	1
Qld	4838	484	258	10
SA	465	78	38	6
Tas	10	10	.	1
Vic	5379	538	151	10
WA	1625	125	52	13

3.2.2 Monitoring of cat management actions

We examined the rates of monitoring for each cat management action, in those LGAs where the action was required by law or regulation. Most LGAs reported monitoring of management actions. Compliance with registration was monitored more frequently than compliance with desexing, microchipping, and limits on the number of cats per household (Table 6). Monitoring rates varied among jurisdictions, being consistently higher in Victoria. Socioeconomic score did not predict the occurrence of monitoring, and remoteness predicted monitoring of microchipping only (see sections immediately below).

Table 6: The frequency of monitoring for each pet cat management action, for those LGAs where these actions are required by jurisdictional legislation or local government law/regulation.

Pet cat management action	Do LGAs monitor compliance?			Percent yes
	Yes	No	Total	
household limits	97	45	142	68%
registration	127	30	157	81%
microchipping	140	81	221	63%
desexing	57	30	87	66%

Limits on pet cats per household

Where household caps on the number of cats is imposed, monitoring for compliance varied among jurisdictions ($X^2_4 = 19.4$; $p = p > 0.001$), being highest in Victoria (90%) than in SA (71%), Queensland (59%), WA (41%) and NSW (33%). Socioeconomic score for the LGA did not significantly influence whether monitoring occurred ($X^2_1 = 0.13$; $p = 0.72$), nor did its remoteness classification ($X^2_4 = 4.54$; $p = 0.34$) (analysis excluded Other and NT because of small samples).

Monitoring methods mainly relied on *administrative* approaches, including random checks (particularly during renewal of registration), and by requiring permits for additional cats above the specified limits. *Reactive* methods, such as following up on complaints by LGA residents, were also moderately common, as were *proactive* methods, such as random doorknocks and checks (Table 7).

Table 7: Summary of the monitoring methods used by LGAs to check compliance with household caps, registration, microchipping and desexing requirements (*note: totals in Table 6 may not correspond to figures in Table 7 as some LGAs stated they undertook monitoring, but did not provide information on methods).

Monitoring methods	Number of LGAs using method			
	Limits on cats per household	Registration	Microchipping	Desexing
Administrative: Using existing systems (registration records/database), excess animal permits, permit checks and audits	44	39	72	32
Reactive: In response to reports/complaints from the public, or when a cat is impounded	24	23	65	16
Proactive: Patrols, census, doorknocking, house inspections	27	12		
Combination: administrative plus reactive, administrative plus proactive, or all three		34		1
Total*	95	108	137	49

Registration

Where registration is required, monitoring for compliance varied among jurisdictions ($X^2_4 = 14.2$; $p = 0.007$), being highest in Victoria (95%) than in WA (88%), Queensland (82%), SA (68%) and NSW (68%). Socioeconomic score for the LGA did not significantly influence whether monitoring occurred ($X^2_1 = 1.14$; $p = 0.29$), nor did its remoteness classification ($X^2_4 = 7.24$; $p = 0.12$) (analysis excluded Other and NT because of small samples).

Monitoring registration requirements was most commonly done with *administrative* methods, followed by *administrative plus reactive* methods. Some local governments (mostly in Victoria) reported having systematic companion animal inspection programs in place. Some LGAs reported using a range of methods to monitor and encourage compliance with registration requirements (including cross-checking with microchipping records, SMS reminders, door knocks). One Victorian LGA reported employing a standalone animal registration officer solely focused on increasing levels of companion animal registrations; one LGA in NSW reported undertaking an audit of the companion animal register (presumably by property inspections) and found over 9,000 unregistered animals.

Numbers of registered cats

A subset of 107 LGAs were able to provide data on the number of registered cats in their area. The average was 3224 cats (SE = 455). The distribution of registered cat numbers was skewed towards zero, with a median of 1473 and a maximum of 28,000. If the average number of registered cats is applied across all 542 LGAs in Australia, this suggests a pet cat population of 1.75 million, which is about one third of the most recent estimate for the total pet cat population in Australia (4.9 million, Animal Medicines Australia 2021). This suggests most cats are not registered, even when registration is a legal requirement.

Microchipping

Where microchipping is required, monitoring for compliance varied among jurisdictions ($X^2_4 = 24.4$; $p < 0.0001$), being highest in Victoria (94%) than in WA (83%), NSW (75%), SA (52%) and Qld (41%). Major cities (76%) and inner regional (70%) LGAs were more likely to monitor compliance of microchipping than outer regional (54%), remote (62%) and very remote LGAs (56%) ($X^2_4 = 9.88$; $p = 0.04$). Socioeconomic score for the LGA did not significantly influence whether monitoring occurred ($X^2_1 = 0.09$; $p = 0.76$) (analysis excluded Other and NT because of small samples).

Local governments monitored compliance with microchipping requirements mainly using *administrative* approaches, or *reactively* when cats were trapped/impounded (Table 7).

Desexing of pet cats

Where desexing was compulsory, monitoring for compliance with desexing requirements varied between jurisdictions ($X^2_1 = 9.99$; $p = 0.002$), being higher in WA (80%) than in SA (48%). The socioeconomic score for the LGA did not significantly influence whether monitoring occurred ($X^2_1 = 1.33$; $p = 0.25$), nor did its remoteness classification ($X^2_4 = 4.13$; $p = 0.39$) (analysis excluded Other and Queensland because of small samples).

Desexing of cats is monitored mainly by *administrative* methods. For example, in the ACT and Western Australia, proof of desexing (sterilisation certificates) is required in order to register pet cats. In South Australia, some local governments report using Dogs and Cats Online (DACO) to monitor compliance with desexing requirements, though the majority do not appear to use this function. Reactive methods, such as checking that cats are desexed when they are impounded, were also reasonably common (Table 7).

What influences the proportion of the pet cat population that is desexed?

Overall, 165 local governments reported a range in pet cat desexing rates, as estimated from registrations and impoundments:

- Very low (<25% of cats desexed) = 22%
- Low (25-50% of cats desexed) = 21%
- Moderate (51-75% of cats desexed) = 10%
- High (>75% of cats desexed) = 47%

We coalesced the four categories above into two (0-50% is very low-low; 51-100% is moderate-high) for analysis, as response rates for this question were lower, reflecting that many LGAs were unable to provide an answer.

Estimates of desexing rates varied among jurisdictions (GLM, binomial distribution: $X^2_7 = 44.7$; $p < 0.0001$), with LGAs in Victoria mostly reporting moderate to high rates of desexing, whilst LGAs in NSW and the NT mostly reported low and very low rates of desexing (Figure 7a). Estimated desexing rates were higher in LGAs with mandatory desexing

requirements ($X^2_2 = 16.3$; $p < 0.001$) (Figure 7b). Desexing rates did not vary across remoteness classifications ($X^2_4 = 3.03$; $p = 0.55$) but were lower in local government areas with lower socioeconomic scores ($X^2_2 = 4.96$; $p < 0.03$) (Figure 7c).

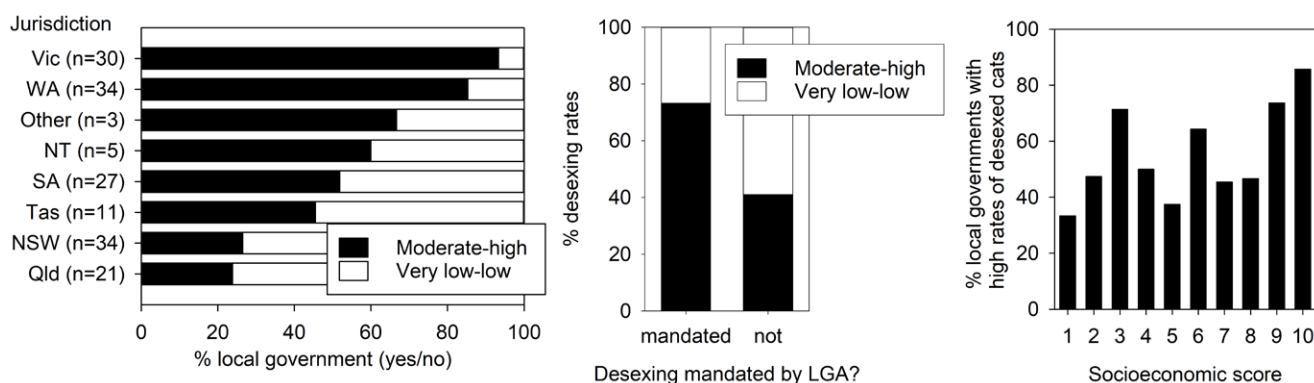


Figure 7: Desexing rates, where moderate-high means over 50% of pet cats are estimated as desexed, and very low-low means less than 50% cats are estimated as desexed. Estimated desexing rates vary by (a) jurisdiction; (b) are higher when the LGA has mandatory desexing requirements, and (c) are higher in LGAs with higher socioeconomic advantage. The number of LGAs in each jurisdiction included in this analysis is shown in the axis labels of Figure 7a.

Restrictions on cat movements (curfews, containment and prohibition)

107 LGAs reported that they monitored their regulations about nuisance or roaming cats, mostly by reactive tracking numbers of complaints, or numbers of cats seized. Only one of the 107 LGAs stated that they had information about the outcome of their activities on local wildlife. 54 LGAs did not monitor their regulations on nuisance cats.

Of 24 LGAs who responded to the question about monitoring cat curfews or containment, six said they monitored by tracking complaints; only one LGA measured outcomes by monitoring wildlife. Four LGAs with prohibition zones responded to the question about monitoring that action; only two monitored wildlife outcomes (e.g., with camera traps and sand pads) (Table 8).

One local government with a 'no cat suburb' reported that "we monitor this through customer complaints. We don't have any information regarding the outcome [for wildlife], but in the past 10 years we have received one complaint regarding a cat in the estate" (Victoria).

Table 8: Monitoring outcomes from cat curfews/containment. (*note: totals may not correspond to figures in Table 6 as some LGAs stated they undertook monitoring, but did not provide information on methods. ** Camera trap and sand pad trapping surveys are also used to detect cat incursions to French Island and Norfolk Island National Parks; we did not include the prohibition of animals from national parks in this report).

Monitoring methods	Number of LGAs using method		
	Nuisance or roaming cats	No. of LGAs using method to monitor compliance with curfews/containment	No. of LGAs using method to monitor compliance with prohibition
Reactive: In response to reports/complaints from the public	87	6	1
Proactive: Routine patrols by rangers	3	1	2
Proactive: Camera trap/sand pad/trapping surveys	2	1	1** (Tweed Shire Council)
Total*	92	8	6

Monitoring outcomes

The monitoring described for household caps, registration, microchipping and desexing focus on recording the amount of activity, and mostly using administrative or reactive methods rather than proactive methods. Monitoring the outcomes of pet cat management appears rare, although some respondents provided anecdotal evidence of outcomes. Across the entire sample of responses, only two LGAs reported that they used traps (camera traps, sandpads) to monitor the outcome of their activities on the presence of free-roaming pet cats in wildlife areas, and only one monitored the outcome of their activities on native wildlife with a survey program.

Tweed Shire Council in NSW is the only LGA we are aware of with systematic monitoring for the outcomes of their pet cat management measures (see Box).

Case Study: Love Cats, Love Wildlife, by Tweed Shire Council

Tweed Shire Council on the northern coast of NSW has been actively promoting responsible cat ownership, including through a three year "Love Cats Love Wildlife" program. Community events and comprehensive online and printed resources have aimed to encourage responsible cat ownership practices (particularly containment).

Tweed Shire Council adopted a Wildlife Protection Area Policy in 2017. A Wildlife Protection Area is public land that is reserved for the protection of native animals and their habitats. There are three bushland reserves (Koala Beach, Pottsville Environment Park and Pottsville Wetland) designated as wildlife protection areas in the Tweed Shire, and cats are prohibited from two suburbs adjacent to these wildlife protection areas. Tweed Shire Council also have night curfews in place for four suburbs and containment in one location.

The council staff run a 'cats on camera' monitoring program <https://www.tweed.nsw.gov.au/CatsOnCamera>, in which remote cameras are used to assess whether the cat prohibition zones and night curfews are working to exclude cats from adjacent bushland areas. Several individual pet cats have been identified. For example, one cat dubbed "Ginger" roams over an area of 417 ha.

The council has used camera trap arrays in bushland areas next to the suburbs with varying cat restrictions, to measure outcomes. This monitoring shows that cat prohibition is more effective than containment or curfews at reducing the presence of pet cats into bushland.

Tweed Shire Council has also tried to change pet cat owner behaviour by summarising the roaming behaviour of individual pet cats, what wildlife occurs in the same area, and the threats to the cats (crossing roads, foxes). Despite this education effort the roaming of pet cats in the region continues to be an ongoing challenge, in part because the NSW state legislation does not enable a strong response to roaming cats.



Figure 8: A composite of images from Tweed Shire Council's 'cats on camera' program. "Ginger", a pet cat (top right) has been detected roaming in the Pottsville wildlife protection area, where he encounters wildlife, as well as threats to his own safety. **Source:** Tweed Shire Council

3.2.3 Encouraging compliance: incentives

The survey included questions about whether the LGA offered incentives for registration and desexing. The responses showed that incentives for responsible pet ownership were moderately common: incentives for desexing (113 out of 217, or 52% LGAs) were more common than incentives for registration (42 out of 146, or 29% of LGAs) (Table 5). The most commonly reported registration incentive was reduced fees, for example for set periods, or for pensioners, or cats adopted from shelters. The most common incentive for desexing was reduced registration fees, followed by subsidised desexing programs (Table 9). Some LGAs offered incentives for both desexing and registration, for example by providing a subsidised desexing service, and a registration fee reduction for desexed cats.

In another part of the survey, we collected information on registration fees. Based on the information from survey respondents who provided costs for registration of both desexed and entire cats ($n = 100$), the average registration cost for desexed cats was \$45.78 (SE = 1.8), and for entire cats was \$156.20 (SE = 6.94). Considering the larger dataset (survey respondents, plus additional data sourced from web searches of council requirements) it appears that registration fee structures almost always incorporate financial incentives for desexing. Of 215 LGAs, 206 had lower fees for desexed cats (mean cost of registration for desexed cats was \$49.32 (SE = 1.00); for entire cats \$173.06 (SE = 3.95).

Table 9: Summary of the types of incentives for registration and desexing offered by local governments.

Incentives for registration <i>42 LGAs had at least one incentive, out of 149 that responded to this question (one LGA had two)</i>	Number of LGAs
Free or cheap registration (for periods, for pensioners, for low-income earners, for pound cats, or just in general)	25
Subsidies for desexing	7
Free products (cat bibs, bells, or free microchipping with registration)	5
No fines if registered cats found/impounded	5
Public awareness programs	1
Incentives for desexing <i>113 LGAs had at least one incentive, out of 217 that responded to this question (16 LGAs had two)</i>	Number of LGAs
Cheaper registration for desexed cats	80
Free or subsidised desexing	43
Free products (microchipping, cat food, cat collar)	5

Registration incentives varied significantly among jurisdictions, being most common in SA, and least common in the NT and Qld ($X^2_5 = 14.7$; $p = 0.01$). This effect persisted even when NSW, WA and Victoria (where registration is compulsory) were excluded. Registration incentives did not vary by remoteness ($X^2_4 = 4.32$; $p = 0.37$) nor socioeconomic score ($X^2_1 = 0.01$; $p = 0.98$).

Desexing incentives varied significantly among jurisdictions, being most common in SA and WA, and least common in the NT and Victoria ($X^2_5 = 51.0$; $p < 0.0001$). This effect persisted even when Tasmania, WA and SA (where desexing is compulsory) were excluded. Registration incentives did not vary by remoteness ($X^2_4 = 2.63$; $p = 0.62$) nor socioeconomic score ($X^2_1 = 1.41$; $p = 0.24$).

3.2.4 Expenditure on pet cat management

Of the 139 LGAs that responded to this question, the modal expenditure on pet cat management was less than \$20,000 per year (Table 10). Eighteen respondents indicated their local government spent nothing on pet cat management. Of the 13 LGAs that reported spending over \$200,000 per year, eight were from Victoria. Many survey respondents were unable to provide an estimate.

Table 10: Estimates for the annual expenditure on pet cat management across all LGAs,

Annual expenditure	Number of LGAs
0. Nothing	18
1. Up to \$20,000	65
2. \$21,000 to 50,000	25
3. \$51,000 to 100,000	8
4. \$100,000 to 150,000	4
5. \$150,000 to 200,000	6
6. Over \$200,000	13

If the expenditure categories are treated as a continuous variable, then averaged across jurisdictions, remoteness classifications, and socioeconomic scores, then Victorian LGAs spent much more on average, than LGAs in other jurisdictions (around \$150,000 annually, compared to the overall average of \$21,000 to \$50,000), and Tasmanian LGAs spent the least (less than \$20,000). LGAs of major cities spent more than other LGAs (\$50,000 to \$100,000); outer regional, remote and very remote LGAs spent the least (c. \$20,000). Finally, LGAs with least disadvantaged socioeconomic scores spend more than those with most disadvantaged socioeconomic scores.

We estimated the total expenditure on pet cat management by local governments around Australia. Using the midpoint of each value range, and giving an upper bound of \$600,000 for class 6, the total expenditure in 2018-19 across the 139 LGAs that provided budget information was \$8,875,000, and the average was \$64,000 per LGA. Using this figure and multiplying by the total number of LGAs in Australia (542), we extrapolate that approximate local government annual expenditure on pet cat management is around \$34.6 million.

3.3 Feral cats

Note that in this section, we consider responses to the survey sections on 'feral' and/or 'stray' cats together, and use the term 'feral' to refer to both.

3.3.1 Actions in place

Are feral cats a problem for local governments?

The majority (87% of 226 responses) of local governments around Australia considered stray/feral cats to be a problem (Table 11). Sample responses included:

"98% of cats impounded are feral or stray cats" (Queensland).

"Huge problem, large feral population over 50,000 km² municipality" (NSW)

"We have impounded 4,996 since June 2015 to June 2019 - this clearly demonstrates a very real cat management problem" (Victoria).

There was no indication that feral cats were more likely to be considered a problem depending on remoteness ($X^2_4 = 3.63$; $p = 0.46$), or jurisdiction ($X^2_7 = 5.40$; $p = 0.61$). However, LGAs with lower socioeconomic scores were more likely to report that feral cats were a problem ($X^2_1 = 6.38$; $p = 0.01$).

To explore whether desexed pet cats contribute to the perception of a large feral cat population, we examined whether LGAs with mandatory desexing requirements, or high desexing rates, were less likely to report a feral cat problem. There was no evidence of relationship between mandatory desexing of pet cats, nor desexing rates in pet cats, and the perception of a feral cat problem (GLM nominal logistic; mandatory desexing: $X^2_1 = 0.03$; $p = 0.86$; desexing rate $X^2_1 = 2.20$; $p = 0.14$ (Table 11).

Table 11: The numbers of LGAs that report feral cats as a problem, versus their estimate for whether the desexing rates in the pet cat population are above or below 50%; and versus whether they require pet cats to be desexed or not.

	Pet desex rate < 50%	Pet desex rate > 50%	Desexing pets mandatory	Desexing pets not mandatory
Stray/feral cats considered a problem	59	76	98	98
Stray/feral cats NOT considered a problem	6	16	15	14

Extent of management of feral cats

Overall, 64% of 232 respondents reported that their LGA actively managed stray/feral cats. This included 13 respondents who stated their LGA did not have a feral cat problem, specifically because of the active management programs in place.

The existence of feral cat management varied significantly among jurisdictions, being more likely to occur in LGAs in Victoria and other jurisdictions (ACT, external and unincorporated territories) and least likely in Tasmania ($X^2_7 = 33.2$; $p < 0.001$) (Figure 9). Feral cat management did not depend on remoteness ($X^2_4 = 2.22$; $p = 0.70$) nor socioeconomic score ($X^2_1 = 0.65$; $p = 0.42$).

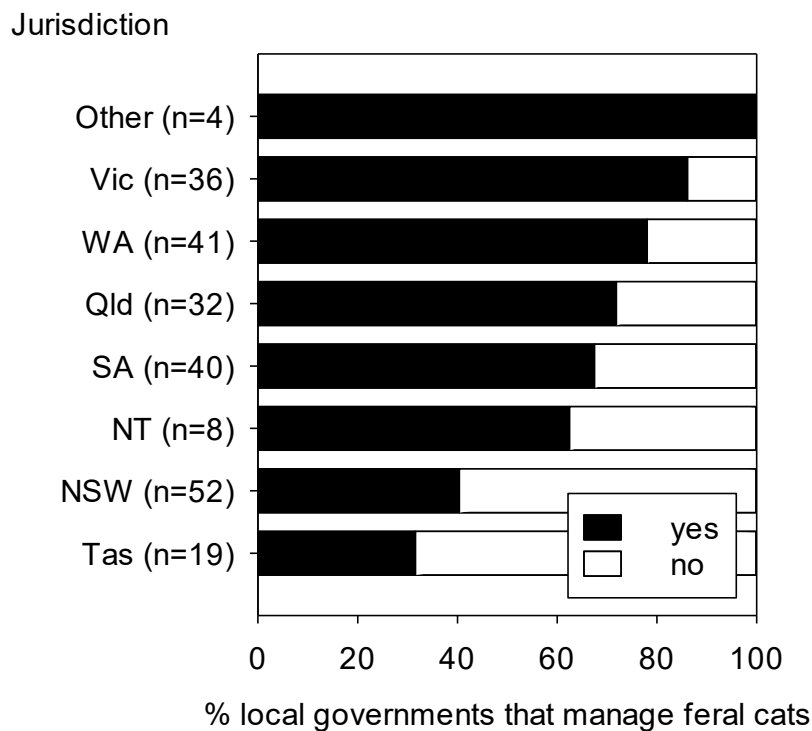


Figure 9: The percent of LGAs in each jurisdiction that have feral cat management programs in place. The number of LGAs in each jurisdiction included in this analysis is shown in the axis labels.

Trapping, shooting, poison

LGAs used trapping, shooting, and poison to control feral cats, but trapping was much more common. Trapping was carried out equally commonly by LGA staff (87%, out of 149 LGAs that manage feral cats), and by community members with traps loaned by the local government (91%, out of 149 LGAs that manage cats) (Table 12).

Poison baiting occurs only in Queensland, SA and Christmas Island; in Queensland these poison baiting programs are typically targeting foxes, or wild dogs, and feral cats are not the primary target species. Felixer grooming traps, which use sensors to target and spray cats with a measured dose of toxic 1080 gel (Thylation Group 2021) were reported as used in two areas of SA: APY Lands and Kangaroo Island. Shooting is used to manage stray cats by 23% of 104 LGAs that answered the question about shooting.

Table 12: Summary of the numbers of LGAs in each jurisdiction that reported using trapping, shooting and poison to control cats. Poison was delivered through baiting, or via the Felixer grooming trap.

	Trapping	Shooting	Poison
NSW	17	2	0
NT	4	0	0
Qld	22	5	11
SA	24	4	2 (both Felixer)
Tas	4	0	0
Victoria	31	1	0
WA	26	11	1
Other	3	1	1

Trap Neuter Release (TNR)

Considering only the responses that registered yes or no ($n = 206$), it appears TNR may be rare, occurring in 15 (7%) LGAs. TNR programs are mostly undertaken by members of the community without LGA support, and often in contravention of law. Of the 15 LGAs that reported that they were aware of TNR programs in their area, only two were supported by the local government. In the other cases, the respondents usually noted the activity was illegal. A respondent from one LGA reported that they were interested in a future trial of TNR.

3.3.2 Monitoring of feral cat management

Is there any monitoring?

Of the 148 LGAs that responded to say that they manage of feral cats, 49% carry out some form of monitoring attached to that management.

Monitoring of whether feral cat management actions are working was more common in major cities than in relatively more remote areas ($X^2_4 = 11.7$; $p = 0.02$). Monitoring was also more common in areas that were least disadvantaged in terms of their socioeconomic score ($X^2_1 = 5.1$; $p = 0.02$), but remoteness and socioeconomic score could not be entered simultaneously in the model due to some collinearity. There were no differences between jurisdictions ($X^2_5 = 4.62$; $p = 0.46$; NT and Other excluded due to small sample sizes).

What monitoring is undertaken?

Most monitoring of feral cat management focusses on recording activity-related measures, such as noting numbers of complaints, or pound admissions, rather than outcomes, with the rigour of these records varying from regular to ad hoc (Table 13). Fewer (45) LGAs undertake trapping and spotlight surveys, and of these, only 17 LGAs reported sampling feral cat numbers regularly (i.e., at least quarterly) with some sort of trapping or spotlighting survey (Table 13).

Table 13: Monitoring methods used by local governments to track feral cats, including the frequency with which they are used. Individual local governments may use more than one method.

Jurisdiction	Monitoring method (number of local governments using method, and frequency of use)							
	Spotlight surveys at night		Trapping (including camera trapping surveys*)		Keeping records of resident observations and complaints		Keeping records of pound admissions	
External territories			2	weekly (n=1) intermittently (n=1)	2	weekly (n= 1) intermittently (n=1)		
NSW	1	once a year	6	quarterly (n=1) once a year (n=2) intermittently (n=3)	17	Varied from daily to once a year	21	varied from daily to once a year
NT	1	intermittently	3	daily (n=1) weekly (n=1) quarterly (n=1)	2	daily (n=2) intermittently (n=1)	2	daily (n=1) monthly (n=1)
QLD	3	intermittently	6	monthly (n=1) twice a year (n=1) intermittently (n=4)	12	Varied from daily to once a year	13	varied from daily to once a year
SA	1	once a year	4	monthly (n=1) twice a year (n=1) intermittently (n=2)	16	Varied from daily to once a year	16	varied from daily to once a year
Tasmania			3*	once every two years (n=1) not specified (n=2)	1	intermittently		
VIC			6	daily (n=1) quarterly (n=1) once a year (n=2) intermittently (n=2)	23	Varied from daily to once a year	30	varied from daily to intermittently
WA	4	monthly (n=1), quarterly (n=2), intermittently (n=1)	6	daily (n=1) monthly (n=2) quarterly (n=1) intermittently (n=2)	20	Varied from daily to once a year	20	varied from daily to intermittently
Total	10		35		93		102	

Case study: feral cat management by Brisbane City Council

Brisbane City Council has dedicated resourcing for the management of feral (stray) cats in the Brisbane local government area.

Feral cats have been a regular and high-volume source of complaints to the council, and some people feed feral cats in Brisbane's business/commercial areas. Community members had expressed concerns about the impact of cats on native wildlife, including ground-nesting birds (bush stone-curlews), bandicoots and brush-tailed phascogales. In response to this, Brisbane City Council made a decision to transfer the management of feral cats to the pest animal section as feral cats are a biosecurity matter in Queensland legislation. Where captured, feral cats cannot be rehomed, and are euthanised.

There are targets set for trapping of feral cats in the Brisbane City Council local government area. At the same time, council staff discourage the feeding of feral cats by community members, and in some cases, apply enforcement actions against ongoing feeders of feral cats. Any cats with microchips or thought to be pet cats are directed to the animal rehoming centre. With dedicated efforts and daily trapping of feral cats, there has been a corresponding decrease in feral cat numbers over time.

Brisbane City Council appears to be one of the few local governments which utilises the state biosecurity legislation for the management of feral cats. Other local governments (including respondents to this survey) in Queensland noted an interest in adopting the approaches to feral cat management being applied by Brisbane City Council.

Monitoring outcomes

Monitoring the outcomes of feral cat management on the size of the feral cat population is rare. Some LGAs use capture success from regular trapping efforts to gauge whether the feral cat population is changing; if done rigorously, this is a useful approach. For example, Brisbane City Council has such a program in place (see Box).

Monitoring the outcomes of feral cat management for wildlife is very rare. Tweed Shire uses camera traps not only to monitor cat presence in bushland, but also to monitor the status of sensitive native species. LGAs of some islands, of APY Lands, and in Tasmania mentioned monitoring wildlife in their survey responses, but survey respondents did not provide any detail on these programs.

Anecdotal observations about management effectiveness

Across all LGAs, 44 respondents (26%) said they thought the feral cat population was decreasing in size, 58 (34%) believed it was increasing, and 68 (40%) believed the feral cat population was stable. NSW and Queensland had higher proportion of LGAs reporting an increasing feral cat population (44% of 39 NSW LGAs; 45% of 29 Qld LGAs); WA had the highest proportion of LGAs reporting a decreasing feral cat population (50% of 30 WA LGAs).

Reports of the change in feral cat populations did not appear to vary across the remoteness categories (Table 14: Contingency table analysis $\chi^2_2 = 1.48$; $p = 0.48$; remoteness classes grouped into two levels because of small samples for the remote and very remote classes).

Table 14: The numbers of LGAs reporting that feral cat populations were increasing, stable, or decreasing, in urban and rural/remote areas.

Feral cat population change	Major city and inner regional	Outer regional, remote, very remote
Decreasing	25	19
Stable	33	35
Increasing	26	32

Number of feral cats removed

Respondents from 53 LGAs reported a total of 8468 feral cats removed during 2018-19 (39% via trapping programs carried out by LGA staff; 39% via trapping carried out by community members; 4% via poison delivery, and 3% were shot). The numbers of cats removed by poison are likely underestimated, because of the difficulty estimating bait uptake and outcome. We also note that many LGAs that said they managed feral cats were unable to also provide estimates of the numbers of cats removed.

WA reported the highest number of feral cats removed overall, but Victorian LGAs removed more, on average, than LGAs in other jurisdictions (Table 15). Feral cats removed did not vary with remoteness nor socioeconomic score.

Section 3.2.1 summarised the survey data on the number of cats impounded (totalling 14,423 cats). Some of these cats will be feral rather than pets, but we lack information on the proportions. The proportions are likely to vary across jurisdictions. For example, feral cats are listed as a biosecurity matter under Queensland state legislation, and once trapped cannot be rehomed, but must be euthanised. They are therefore less likely to enter pounds.

Table 15: Feral cats removed per jurisdiction across respondent LGAs, and the average and SE per LGA in that jurisdiction. Note the sample sizes are relatively small, and the SE are large.

Jurisdiction	Total cats removed 2018-19	Average per LGA	SE	Sample of LGAs
NSW	626	78	40	8
NT	610	203	144	3
Other	179	90	61	2
Qld	1974	197	96	10
SA	710	89	24	8
Tas	24	24	.	1
Vic	2066	689	206	3
WA	2279	127	39	18

3.3.3 Expenditure on feral cat management

Of the 74 LGAs that responded to this question, the modal expenditure on feral cat management was less than \$20,000 per year (Table 16). Of the 10 LGAs that reported spending over \$200,000 per year, six were from Victoria. The expenditure on feral versus pet cat management by LGAs was correlated (Figure 10). However, it is possible that some LGAs were not able to separate out the costs of pet from feral cat management, and reported the same figures across the survey questions dedicated to pets and feral cats. Note that many survey respondents were unable to provide an estimate of the costs incurred to manage cats in their area.

Table 16: Estimates for the annual expenditure on feral cat management across all LGAs.

Annual expenditure	Number of LGAs
0. Nothing	2
1. Up to \$20,000	47
2. \$21,000 to 50,000	6
3. \$51,000 to 100,000	5
4. \$100,000 to 150,000	2
5. \$150,000 to 200,000	2
6. Over \$200,000	10

Victorian LGAs spend much more on feral cat management, on average, than LGAs in other jurisdictions, and Queensland and SA LGAs spent the least ($F_7 = 3.79$; $p < 0.001$); major cities tend to spend more than remote areas ($F_4 = 1.99$; $p = 0.099$). In contrast to pet cats, feral cat expenditure was not related to socioeconomic score ($F_1 = 2.01$; $p = 0.16$)

We used these figures to estimate the total expenditure on feral cat management by local governments around Australia. Using the midpoint of the value ranges, using an upper bound of \$600,000 for class 6, the total expenditure in 2018-19 across the 74 LGAs that provided information on budgets was \$5.66 million, and the average per LGA was \$76,400. Using this figure and multiplying by the total number of LGAs in Australia (542), we extrapolate that annual expenditure is around \$41.4 million on feral cat management by LGAs across Australia (noting that some LGAs may have reported the same figures for both pet and feral cats). These estimates do not include the very large budget island eradication programs.

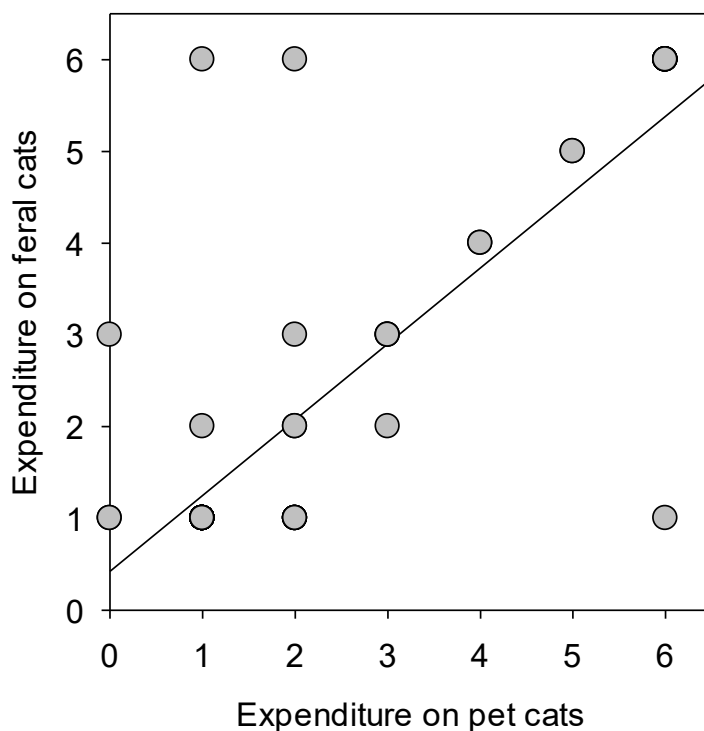


Figure 10: Annual expenditure on feral cat management by LGAs is related to their expenditure on pet cat management. Expenditure categories (0-6) are described in Table 16.

3.4 What would support better management of cats?

In law and policy, there is a clear delineation between pet and feral cats. In practice, there is no neat distinction between pet and feral, and individual cats transfer between these categories. As managers of the urban and peri-urban feral cat population, local governments have direct experience of this continuum, when they encounter pet cats and kittens that have been dumped or abandoned, non-desexed pet cats roaming at large and breeding, feral cats being fed and sustained at high density by members of the public, and also from dealing with the complex issues of backyard breeding and cat hoarding.

Survey responses on what works well for cat management, the key challenges, and what would support improved management, were often shared across the pet and feral cat sections. Thus, one of the strongest themes from the survey responses was the transfer between pet and feral cat populations, and how their management is closely linked. Here, we therefore summarise the responses about improving pet and feral cat management together.

The survey responses to these questions were grouped into typologies, as per Appendix 4. The typology aligns with a previous review of barriers to environmental management by local governments, summarised in Appendix 6.

3.4.1 What works well for pet and feral cat management?

Local governments identified several actions that work well, and are shared across the pet and feral cat management programs: **education and uptake of responsible pet ownership (RPO) practices, trapping programs, and desexing programs** (Figures 11a and b). The commonality of these actions across pet and feral cat management highlights the strong link between the two. For example, uncontrolled breeding by roaming, non-desexed pet cats adds to the urban feral cat population. Community support was recognised as an important factor for feral cat management: their involvement in cat trapping programs is considered integral to cat management practices, as are partnerships with welfare organisation who help rehome feral cats. Targeted management (e.g., the removal of cats from specific sites) was also noted positively. For pet cats, the legal, policy and resourcing enabling mechanisms were noted as important by many respondents.

Many respondents felt nothing is working well for pet cat or feral cat management.

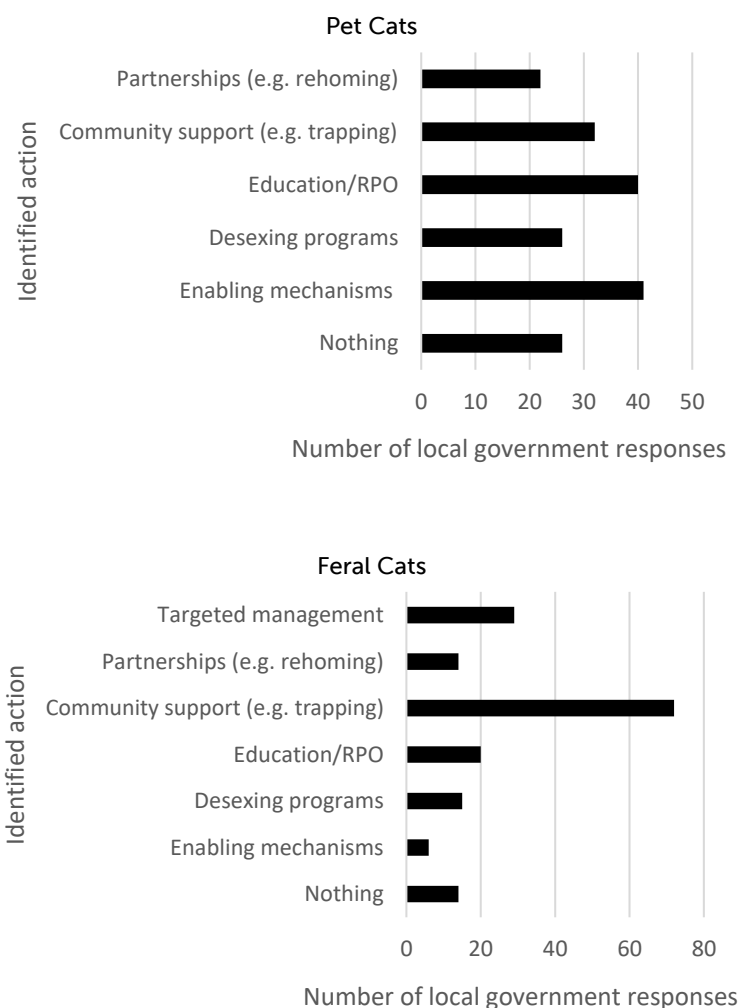


Figure 11: The frequency of identified actions which work well for the management of (a) pet cats (from a sample size of 187 responses), and (b) feral cats (from a sample of 156 responses).

Sample responses:

“Cat containment suburbs generally seem to be working, but we need to regulate and enforce it more. Education programs on containment suburbs. Signage in these areas. Increasing awareness of impacts of cats-lots of nature reserves” (ACT).

“People who do practice responsible cat care/ownership, particularly keeping cats in and at home. Others, who don’t like cats, keeping some pressure on. New state cat Management Plan and regional approach” (Tasmania).

“There is a large number of rehoming groups that solely rehome cats and kittens so we are able to rehome cats and kittens that our impounded if they are healthy and sociable” (Queensland).

3.4.2 Main challenges for pet and feral cat management

Local governments identified three key challenges which are shared across both pet and feral cat management programs. Respondents highlighted that **pet cat owner attitudes and practices** (e.g., societal norms on roaming cats, perceived notion that they play a role in introduced rodent control, 'not my cat' and 'it's just a cat' attitudes) posed the biggest challenge for pet cat management, and one of the biggest challenges for feral cat management.

LGAs identified the lack of **funding, resources and support** as a key challenge for both pet and feral cat management. In most jurisdictions, there are limited resources for companion animal management. Compliance and enforcement actions for cats are likely required outside of business hours which incurs additional costs. Feral cat management is expensive and time consuming. **Legislation** is a key problem in parts of Australia, most notably in NSW, with 37 respondents in this state listing weak legislation as the key challenge they face in managing pet cats. One issue of difference between pet and feral cats was that managing feral cats is **logistically difficult**.

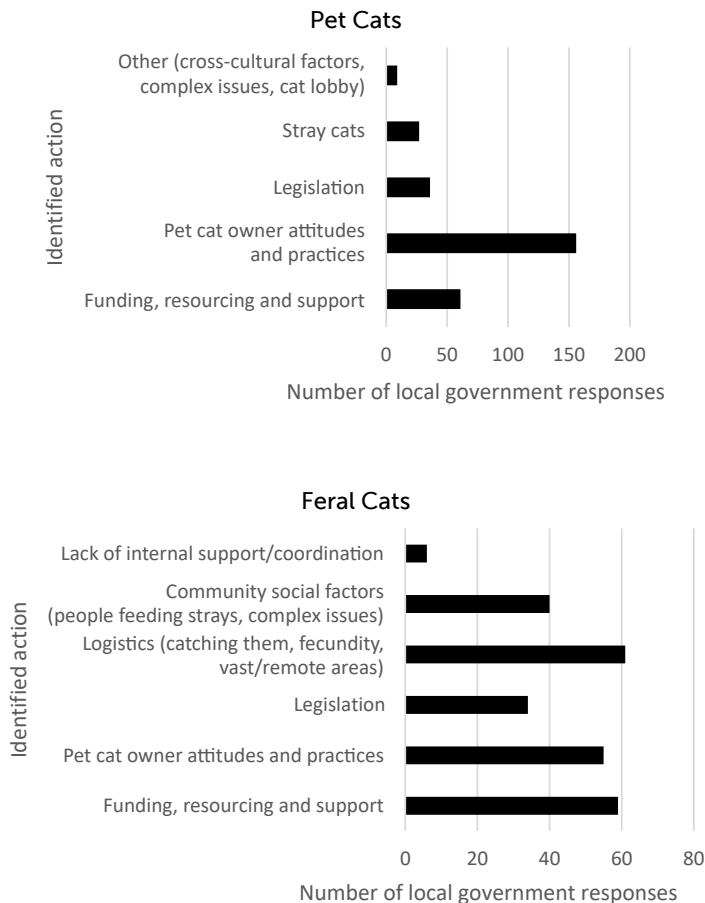


Figure 12: The main challenges identified by local governments for (a) pet cat management; and (b) feral cat management.

Sample responses:

"Cats being allowed to roam freely without restriction. Public opinion on the freedom that cats have. Traditionally being allowed out whenever including roaming at night. Cat owners are not treated the same as dog owners, whether for control or what these animals do. If a dog is found off its property, there is an immediate fine but no such fine for cat owners; if a dog attacks another animal there are severe penalties but if a cat does then there could be a 6-month nuisance order. This is not logical or fair and needs a solid overhaul. The Companion Animal reference group never meets and in the 20 odd years in having to deal with these situations there has been no change to the legislation to control cats" (NSW).

"Educating cat owners that desexed or not, cats still roam and still kill native fauna. Cats should be subject to the same control and registration as dogs" (NSW).

"Resourcing, legislation. No one wants to pay for management of stray/feral cats. There needs to be more resourcing and supported by legislative change, more and stronger provisions and resources for compliance and enforcement. Unless you have a permit to breed cats, all cats must be desexed. Larger fines (at least \$1,000) for not desexing" (NSW).

"They continue to be a problem and there are no apparent statutory instruments to force appropriate control. A general lack of understanding that cats are environmentally destructive predators when they are not confined and carry life-threatening diseases. The myth that cats are soft, furry cuddly creatures needs to be debunked and appropriately addressed" (NSW).

3.4.3 What reforms, information and resources would help improve pet and feral cat management?

Local governments were asked to identify what reforms, information or resources would help their jurisdiction manage pet and feral cats more effectively. The responses usually mapped closely to the issues they raised as key challenges, namely **education and uptake of responsible pet ownership practices, funding, resourcing and systems, and stronger legislation and compliance powers**.

Local government staff have a strong interest in information and resources on **responsible cat ownership** that would help get councillors engaged in the issue, as well as cat owners adopting the practices. The most commonly noted action that would support better pet cat management, was access to additional information on responsible pet ownership, including how to transition roaming to contained cats. Respondents noted that resources need to be available in languages other than English, for culturally and linguistically diverse communities.

Many councils are seeking additional targeted **funding, resourcing and support**, for staff, equipment and facilities to underpin improved management. Local governments typically have limited capacity to generate revenue (Appendix 6); the priority placed on cat management varies substantially between and within jurisdictions. A key theme which emerged was that many local governments have an interest in **stronger legislation and compliance powers**. Another action for pet cats was for a **community awareness campaign** on cat impacts (e.g., through national television advertising), to ensure that this messaging reaches everyone, not just segments of the community.

Sample responses:

"A consistent approach Australia wide. Education via media. Support to make this a priority within animal management. The legislation is so weak that it does not help" (NSW).

"Only a change in legislation will bring about meaningful change Cats are seen as furry friendly companions and the damage they do to native animals is brushed aside. I do not see anything happening in my lifetime and the resulting extreme damage to native animal populations will be the result" (NSW).

"Changes to legislation/regulation Recommended changes - all cats must be desexed unless owned by a registered breeder. All cats to be restricted to owners' property. Cats must be under effective control on a leash held in the hand of a competent person if off the owners' property or in any public place. Cats found off the owners' property not under effective control maybe impounded by any person and owners fined for failing to control or prevent escape. Additional funding to all councils to allow for specialist equipment to scan cats, trap cats and house cats at shelters" (NSW).

"Financial resources to be able to staff and fund the activity. To be able to engage and properly manage volunteer assistance. Financial ability to ground floor work the problem through policy development and management plans and then be able to fund the actions that come from that approach instead of the ad-hoc unfocused, "let's have a brochure, that'll fix it" attitude. This needs to be done at the state and local level" (NSW).

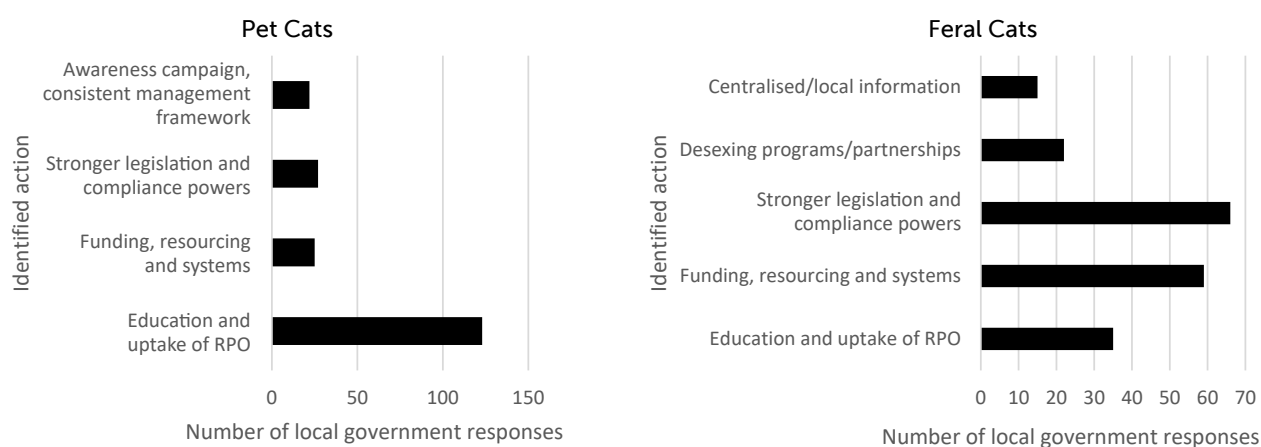


Figure 13: Information and actions identified by local governments to help manage (a) pet and (b) feral cats more effectively. RPO: Responsible pet ownership.



Feral cat at a rubbish dump, NSW. Image credit: Alex Dudley.

3.5 Limitations to the study

The extent to which surveys accurately represents the range of views on a given topic can be influenced by the response rate, and by biases in who responds. Potential effects on response rate and bias in our survey include:

Response rate:

- The survey took around 30 minutes to complete, which may have reduced the survey response rate. Some respondents started but did not complete the survey. The survey also comprised a large number of open-ended questions, to allow respondents to provide detailed answers, however this method may deter and frustrate some participants.
- Respondents may have perceived there was a level of repetition in the survey questions (Appendix 2), due to the repeated question structure for cats in in three categories (pets, strays, ferals); this may have caused them to disengage from the survey before completion.
- A similar survey with some overlap in content was circulated by the Australian Institute of Animal Management at the same time as this survey; this may have deterred some local governments from participating.
- The survey was rolled out to local governments during the bushfire crisis in Australia, followed by the COVID-19 pandemic. These events may have disrupted functions of local governments, and some local governments have information management systems which do not allow for data on companion animals to be readily accessed remotely.

Potential biases in data:

- Local councils that have introduced more comprehensive bylaws on cats, or those with an interest in doing so, may be more interested in the subject matter, so may have been more likely to have responded which may cause proactive cat management actions to appear more common than they really are.
- Survey respondents may be concerned about reprisal from parts of the community, particularly in relation to reporting of management actions for stray and feral cats, including for baiting, shooting and euthanasia rates. It is possible that actions involving euthanasia are under-reported or not reported.

In spite of these potential constraints, our approach of contacting LGA staff directly by phone, with follow-up calls where needed, may have helped obtain a relatively high response rate (44%), and also should have helped to cause responses to be more representative. Our summaries of the rates of pet cat management actions from survey responses were extremely similar to the same statistics we derived from internet research, suggesting representativeness in the surveys.

Section 4. Discussion

Our survey of cat management practices of LGAs provides a comprehensive audit of the types and extent of local government management actions in place for both pet cats, and feral (including stray) cats, across Australia, how compliance with these actions is monitored, whether the actions make a difference, and the cost of that management. Our survey also revealed the additional policy, legislative and information support that LGAs believe would help them better achieve their cat management goals. In this Discussion, we summarise actions underway for managing pet cats and feral cats, and the evidence for whether the actions deliver the intended outcomes. We then discuss the collated perspectives of LGAs on cat management: what they feel works well, what their challenges are, and what would help address those challenges. Based on the survey results, we recommend the priorities for policy, legislative reform and practice that will lead to better cat management.

Pet cat management

There are five key measures that LGAs can use to manage pet cats – registration, identification (microchipping), desexing, and restrictions on cat movements and presence, with these underpinned by public awareness and access to relevant information. Each of these measures potentially achieve different but related outcomes, and they are best implemented as an integrated package. Registration and identification are cornerstones for managing pet cats. Registration raises income that can subsidise the LGA's pet management administration and operations. It also provides data on the size of the pet cat population that can enable human and infrastructure forward planning. For example, our survey results showed that impoundment rates increase as the size of the registered cat population in the LGA increases, so LGAs could use registration records to project expenditure related to the operation of a pound. Registration also provides opportunities to incentivise other measures such as microchipping and desexing; our survey shows that most LGAs with registration requirements have a fee structure to encourage desexing, and sometimes microchipping. Identification via microchipping allows lost or stray animals to be returned to owners, which is an essential filter for impounded cats, to reduce the likelihood that much-loved pets are euthanised. Identification also allows LGAs to police requirements like curfews, as the owner can be found and fined.

Desexing and household limits on the number of cats are both key measures for reducing the potential nuisance value of cats to local residents, and also for reducing the leakage of pet cats into the stray/feral cat population. There is a national shortage of vets in Australia, particularly in rural areas, but also increasingly in urban practice (Australian Veterinary Association 2018); this has implications for desexing. Cat restrictions (curfews, containment, prohibition) can play a similar role, by also being an important mechanism for reducing nuisance and reducing transfer of pets to feral populations. In addition, cat restrictions can reduce the impacts of pet cats on peri-urban wildlife; cat curfews can limit predation on native animals that are active during curfew times (although the curfew may increase predation pressure on animals active when the cats are at large), and total containment and prohibition should eliminate predation impacts on wildlife completely. Containment and prohibition should also prevent the transmission (including to cat-owners) of diseases caused by cat-borne pathogens (Legge *et al.* 2020a)

The survey showed that the five key pet cat management measures are not generally used as an integrated package. Instead, they are used to different degrees and in different combinations across LGAs (to some extent patterned by jurisdiction), creating a patchwork of approaches to pet cat management that is confusing to the public, and hampers efforts to police and enforce local requirements. This diversity, and its hindrance for improved cat management, has been remarked upon before (RSPCA-Australia 2018; Woinarski *et al.* 2019b). Our analysis of the survey results helps to explain some of the drivers for the diversity, and therefore indicates what pathways could help improve pet cat management.

Overarching legislative framework

For all the pet cat management measures, the key factor influencing whether the LGA required the measure from pet cat owners or not, was jurisdiction, and specifically, whether that measure was set or enabled by state/territory legislation. For example, WA, Tasmanian, and SA legislations require that pet cats be desexed, and unsurprisingly, all the corresponding LGAs responded that this requirement was in place at a local level. Victorian legislation (*Domestic Animals Act 1994*) does not set a limit on the number of cats per household, but it enables this measure, by stipulating that LGAs set this limit, and this explains why all Victorian respondents said their LGA had a limit on the number of cats permitted in a household. Similarly, Victorian legislation (*Domestic Animals Act 1994*) and South Australian legislation (*Dog and Cat Management Act 1995*) enables LGAs to make bylaws requiring cats to be "securely confined" to the owner's premises for a specified duration (e.g. an overnight curfew, or 24/7), coupled with strong powers by council staff to police such bylaws by seizing and destroying cats at large (*Domestic Animals Act 1994*). The proportion of LGAs reporting some form of restriction on cats was correspondingly higher in Victoria and SA than in other states.

There are two known examples of local governments setting cat management bylaws in the absence of overarching territory legislation in the NT. Darwin City Council sets a limit on the number of pet cats per household, cats are required to be registered and microchipped, and containment laws are in place. Alice Springs Town Council sets a limit on the number of pet cats per household and cats are required to be registered and under effective control of their owners.

The importance of clear and strong legislation at the state/territory level was commented on by many respondents. The recurrent feedback was that when strong enabling legislative frameworks are in place, they help local pet cat management; when they are not in place, the absence presents a significant challenge; and addressing that challenge, in a consistent way across jurisdictions, was identified by many respondents as a key action that would support better management.

Access to services

Other potential drivers for variation in pet cat management measures required by LGAs are remoteness (which affects access to facilities) and socioeconomic context, as some measures incur costs to pet cat owners. In fact, our analysis shows that these factors are less consistently related to the cat management measures than jurisdiction, with interesting exceptions: remoteness was related to desexing requirements, with 'city' and 'inner regional' LGAs more likely to have desexing bylaws. Poor access to veterinary services in more remote LGAs may explain this pattern. However, desexing was also required relatively more often in 'very remote' LGAs, with this pattern driven by islands with strong cat management frameworks tied to long term biodiversity conservation visions. Some of these islands have brought vets into the community for short periods, offering free desexing programs. This model could be extended to other remote and rural LGAs, to drive uptake in pet cat desexing.

Remoteness also affected the use of cat restriction bylaws and regulations, with city LGAs more likely to impose cat curfews, containment, or prohibition requirements. It is possible that the higher risks of injury to the cat, for example by vehicle strike, and higher potential for wandering cats to be nuisances to residents, makes cat containment in more populous areas more broadly acceptable to the community. More work into the most resonant incentives for cat containment across remoteness categories would be useful.

Socioeconomic context was significantly associated only with desexing requirements, whereby the least disadvantaged LGAs were more likely to have compulsory desexing. Providing access to free desexing services in economically disadvantaged LGAs may be helpful.

Monitoring of, and compliance with, pet cat requirements

Compliance with pet cat management measures is difficult to gauge accurately, because most monitoring of compliance relies on administrative checks (e.g., to cross-check that a registered cat is also microchipped, or desexed), or reactive methods (e.g., following up on complaints about excessive cats on a property). Proactive monitoring approaches, such as systematic checks of residences, occur much more rarely. Nevertheless, some revealing inferences can be made.

Registration: Given an apparent marked disparity between the numbers of registered cats reported by LGAs, and the estimated overall pet cat population size from independent surveys (Animal Medicines Australia 2021), it appears that even when registration is required by the LGA, only about a third of pet cats are registered. Increasing the uptake of registration requirements could help generate more revenue (especially given the modal annual expenditure on pet cat management is less than \$20,000) and provide more opportunities to incentivise responsible pet ownership more broadly. It is recognised that cat registration costs need to be set carefully; to allow for the generation of revenue, while reflecting the lower level of tangible service provision by local governments for cats (compared to dogs, which have designated off-leash areas and parks).

Desexing: In LGAs where desexing is required, the estimated proportion of cats that are desexed is higher, suggesting that mandating desexing does result in a smaller proportion of cats able to breed freely. We did not find that mandated desexing or high desexing rates in cats was linked to reduced concern about the feral/stray cat population in that LGA. This assessment was based on anecdotal information, and should be treated cautiously, but it suggests that preventing supplementation into the feral cat population from freely breeding pet cats is not enough, by itself, to drive the feral cat population down. Also, the age at which pet cats are desexed may play a role; currently the ACT is the only jurisdiction which mandates Early Age Desexing (Appendix 1). In addition, the estimates for desexing provided by survey respondents suggest lower overall desexing rates (57% of respondents estimate that over half of the cats in their LGA were desexed) than other surveys have suggested (i.e., from 84 to over 94%) (Hall *et al.* 2016; Mazeau *et al.* 2021). The higher rates of desexing reported in these other surveys may reflect a bias in sample, with one being based on a voluntary online survey (Hall *et al.* 2016) and the other based on the VetCompass Australia database of cats presented to veterinary practices (Mazeau *et al.* 2021). Other studies focused on admissions to animal shelters have found lower rates of desexing (i.e., 36%)

amongst surrendered cats (Alberthsen *et al.* 2016). Potentially, a much high proportion of pet cats need to be desexed to stop transfer from pet to feral populations.

Cat restrictions: Although this cat management measure was used least frequently (31% of LGAs), the rate was still appreciable and becoming more common. Cat restrictions were most common in Victorian and SA LGAs, where containment to the owner's property is made possible by state legislation that explicitly provides for LGAs to make bylaws requiring curfews, containment and prohibition from designated areas. In some cases, local community groups may be important drivers of such change (e.g., Aldgate Valley Landcare Group, Appendix 1). The ACT has also embraced the use of cat restrictions, with 17 suburbs now requiring 24-hour containment of cats, and expansion of restrictions planned, enabled by a holistic policy approach (the ACT Cat Plan 2021-2031). In contrast, NSW state legislation allows for LGAs to designate wildlife protection areas from which cats are prohibited, but because it is not illegal for cats to roam freely in NSW, survey respondents noted that implementing cat curfew, containment and prohibition provisions is very challenging.

Survey respondents noted there are some mechanisms which can be useful in greater coordination of cat management efforts (e.g., Dog and Cat Management Board SA, TassieCat, WA Feral Cat Working Group), as well as requiring the development of LGA Domestic Animal Management Plans in Victoria (Appendix 1).

Feral cat management

The majority (87%) of respondent local governments reported that they consider feral cats (and/or stray) to be a management problem, in terms of their impacts on wildlife, human health and amenity and disease transmission to livestock. Some respondents described the scale of the issue as 'very small', but others stated feral cats were a substantial problem, with one local government reporting euthanasia rates of 25-100 cats every week. Overall, two-thirds of LGAs have programs in place to manage feral and stray cats, but the funding provided for these activities is usually low, with the modal expenditure below \$20,000 per year.

The most common management response for feral cats is trapping, with that task shared about equally between LGA staff and members of the public (using LGA traps). A sample of 53 LGAs provided data on the number of cats removed in a year, averaging 157 feral cats per LGA. In a survey of feral cat control carried out by RMIT (Kusmanoff *et al.* 2018), a sample of 70 LGAs reported killing an average of 91 cats in the same financial year (2018-19). It is possible that our survey overestimated the average number of cats killed per LGA, because some LGAs that said they managed ferals did not provide information on numbers killed, perhaps when the number was very small.

The survey suggests that TNR programs are rare, and mostly carried out by local residents or groups, mostly against the wishes of the LGA. The survey results may underestimate the frequency of cat feeding and TNR programs, as this activity is often carried out clandestinely. Despite the evidence that TNR programs are ineffective for reducing the population size of feral cats (Calver *et al.* 2020; Crawford *et al.* 2019), interest in the approach persists at low levels. In late 2019 the Australian Pet Welfare Foundation commenced a "Community Cat Program" in the local government area of Ipswich, Queensland, with plans to expand the program to other states of Australia. The "Community Cat Program" is essentially a Trap-Neuter-Release program for stray cats, expanded to include desexing of pet cats for low-income earners. Our survey did not capture the rollout of this program.

Some LGAs are involved in ambitious feral cat management programs. For example, some island LGAs, such as Kangaroo, Bruny, French and Christmas Islands, are part of initiatives to eradicate feral cats from their islands. In these cases, LGA activities are partly supported by funding via the Australian Government's Threatened Species Strategy.

Outcomes

The survey showed that local governments are largely focused on measuring activities through ad hoc administrative and reactive methods (crosschecking across databanks, tallying complaints), rather using proactive measures or independent verifications, such as systematic house checks to collect data on the number of cats per household, and whether they are registered, identified, and desexed. This makes it difficult to assess the compliance with local requirements for cat management, and to use that information to improve practice and outcomes. The positive link between pet cat population size and the numbers of cats directed to council pounds shows there is a substantial cost associated with managing cats for LGAs, so approaches to increasing registration, identification, desexing rates, and tighter restrictions on cats wandering at large, could all contribute to reducing the impoundment and euthanasia rates and thus costs for LGAs.

Very few LGAs had monitoring programs in place to measure the outcomes of management actions on the size of the free-roaming cat population (including pet cats wandering freely, and feral cats). Where these programs do exist, they are valuable for demonstrating progress towards reducing free-roaming cat population sizes (see Brisbane City Council case study). Some monitoring programs are tied to requirements to contain cats (via curfew or 24-hour containment) or to

exclude cats from certain suburbs. For example, camera trapping or sand pads are used in bushland area next to suburbs with cat restrictions in Tweed Shire Council. This monitoring shows that cat prohibition is more effective at reducing the frequency of pet cat incursions to bushland areas adjacent to suburbs, than containment or curfews. Although this represents only a single example, information like this is invaluable for guiding LGAs on what the most effective, and cost-efficient, cat restriction options are.

What works, what are the challenges, what do LGAs need (for both pets and strays)

A strong message from the survey was that local governments want to improve cat management practice and outcomes, and that pets and feral cats need to be managed holistically. Several factors that respondents identified as supporting, challenging, or needed, for better cat management were shared across pet and feral cats. In particular, consistent, clear and strong legislation for pet cat management at the state/territory level was a recurring theme, and respondents noted that harmonising the approaches to cat management across jurisdictions would be valuable.

Our survey results show that state legislation is a key driver of stronger cat management practices by local governments. Although local governments can introduce their own bylaws, this is a slow and expensive process, results in piecemeal and local scale change, and does nothing to address the inconsistencies in cat management requirements that create confusion among pet owners.

In 2020, a parliamentary inquiry into the problem of feral and domestic cats in Australia was held. Submissions from local governments to the parliamentary inquiry again highlighted the challenges with making bylaws at a local government level, including that they could be overridden or disallowed by the state government; may be challenged by community and lobby groups and involve a lengthy process and cost to establish and implement (Australian Local Government Association 2020). The final report, released in February 2021, called for a more effective and coordinated policy, management and research response on cats in Australia (House of Representatives Standing Committee on the Environment and Energy 2021); at the time of writing (October 2021), there has been no formal government response to the final report.

Responsible pet ownership was another recurring theme that supported LGA management of both pets and feral cats when present and challenged that management when absent. Cat owner attitudes and practices, societal norms on roaming cats, and the lower value placed on cats (compared to dogs) by many pet owners, were noted as the most significant challenges for improving management. Many survey respondents drew a comparison with the way dogs are managed compared to cats (subject to containment within a yard, and otherwise under effective control, such as on a leash). Rather than a community conversation about *restricting* cat movements, constructive progress could be made by flipping the issue on its head: if cat husbandry was expected to be the same as the husbandry of dogs and other domestic animals, cats would be required to be contained to an owner's property at all times or be under an owner's effective control. LGAs would not need to consider introducing bylaws or regulations to contain cats, and any cat found roaming at large could be picked up by LGA staff, and the owners fined.

Awareness and education programs, tailored for linguistically and culturally diverse communities, were identified as needed to encourage responsible pet cat ownership, which in turn is instrumental to more effective feral cat management. Increased funding, as well as increased access to information and awareness resources, was also commonly identified as a key need. Based on the expenditure information provided by survey respondents, we estimate that local governments spend \$34.6 million a year on pet cat management, and \$41.4 million a year on feral cat management, excluding the large budget island eradication programs. We note the combined total (\$76 million) is a fraction of what pet cat owners spend each year on the care of their pet cats (\$10.2 billion; Animal Medicines Australia 2021), and increasing resourcing to local governments to manage cats, via increased registration uptake, or support from their state/territory government, would be helpful.

The survey results highlighted specific challenges for cat management in remote areas, which often have limited infrastructure, limited access to veterinary services, and may have complex community settings (see Appendix 1). There are reports of increasing cat numbers in some remote areas; addressing this issue will require working sensitively and collaboratively with these communities (Kennedy *et al.* 2018), and creative ways of providing important services such as desexing clinics and information about responsible pet ownership.

In their submission to the House of Representatives Inquiry on the problem of cats, the Australian Local Government Association (ALGA) noted that local governments that introduce more comprehensive bylaws on pet cats, do so in response to community surveys that show a large proportion of the local community favours strong action to curb cat impacts on wildlife and nuisance behaviour. They noted that such councils are typically peri-urban, contain bushland areas, or have shared boundaries with conservation parks. The ALGA also noted that the introduction

and implementation of bylaws on cats creates the need for additional resourcing, such as staff, vehicles, microchip scanners, and holding facilities to house animals caught after business hours, before they are transported to an animal pound. Such bylaws require ongoing efforts for public awareness, handling of queries and complaints, and ensuring compliance through issuing and administering penalties (Australian Local Government Association 2020).

Our survey results are consistent with the findings of a contemporaneous survey by the Australian Institute of Animal Management (AIAM), which had 165 complete responses. The key findings of the AIAM survey (Australian Institute of Animal Management 2020; Thompson 2021) were:

- for pet cats, local governments would like to implement cat containment, mandatory desexing and community education programs;
- many local governments reported that stray cats are a significant concern;
- the majority of local governments have a reactive approach to pet and stray cat management; and
- that there is a need for improved data collection systems for pet and stray cats.

Recommendations

To reduce the impacts of pet and feral cats on urban and peri-urban wildlife, to enhance welfare outcomes for cats, and to reduce transmission rates of cat-borne pathogens that can affect people, livestock and wildlife, the density of feral and free-roaming pet cats in urban and peri-urban areas should be reduced. The survey shows that local governments overwhelmingly want to achieve this goal through improving cat management. Respondents identified their key challenges, and a package of solutions for those challenges:

1. Strong, enabling legislation for pet cat management set at the state/territory level, that is harmonised across jurisdictions. The legislative frameworks should include:

- Mandatory registration of pet cats. Amongst other benefits this will provide accurate data on pet cat populations; provide revenue that can be used for compliance monitoring, enforcement, education; and make it possible to offer incentives for other actions.
- Mandatory identification of pet cats (to facilitate other requirements, allow for compliance monitoring and provide the mechanism to contact owners of impounded cats).
- Mandatory desexing of pet cats, ideally by 4-5 months of age, with limited exceptions for licenced breeders (to reduce the incidence of unwanted cats, impoundment rates, and nuisance issues).
- Mandatory limits on the number of cats per household (to reduce cat hoarding, and nuisance issues for neighbours).
- Mandatory requirement to keep cats contained to the owner's property, or under equivalent control (e.g., on a leash, or in a cat box) when off-property. This would bring expectations about cat management in line with those for dogs, and would reduce the incidence of free-roaming cats.
- Provisions to enable local governments to designate some residential areas as mandatory cat prohibition zones (to reduce the risk of cat impacts in areas of high conservation value).

2. The legislative reform and its local implementation should be accompanied by community awareness and education programs, suited to linguistically and culturally diverse communities, that promote responsible pet ownership, and explain the conservation, welfare and disease impacts of free-roaming cats, and the benefits of enhanced management.

3. Coordinated incentive programs could also encourage uptake of responsible pet cat ownership. For example, registering a cat could open up access to subsidised desexing, or subsidised costs of cat containment/catio materials to make backyards secure.

4. Enhanced monitoring, and coordinated collating and reporting of activity information, including key data on registrations, desexing statistics, identification details, impoundments, and numbers of feral cats killed. This information should be rolled up to state/territory and national level.

5. Enhanced monitoring of outcomes, especially the number of free-roaming cats (i.e., both pet and feral), and also the consequences for local wildlife. This information is essential for guiding further local government investment.

To help improve management of feral/stray cats, some additional recommendations include:

- Amendments to pest/biosecurity legislation to recognise all unowned, feral cats as a pest species in all jurisdictions, in line with an agreement between all environment ministers from the Commonwealth, and all states and territories in 2015 (Meeting of Environment Ministers 2015).

- Education and clear messaging about not feeding stray cats; and that Trap-Neuter-Release (and its variants) is not an effective or humane method of managing stray cats. Trap-Neuter-Release should be banned nationally.
- Reduce the feral cat carrying capacity around towns and cities by excluding cats (with fencing) from rubbish dumps and intensive farm sites.

Local governments of remote and very remote areas face some unique challenges. In these situations, organisations such as Animal Management in Rural and Remote Indigenous Communities (AMRRIC) already have an important role in companion animal management (Appendix 1). Support mechanisms for this organisation could be further enhanced, for example by funding positions for vets and community animal health workers within remote area local governments.

Postscript update: pets and the COVID-19 pandemic

This survey was undertaken in late 2019-early 2020. Animal Medicines Australia provided a social research snapshot of pets and people in Australia in the COVID-19 pandemic (Animal Medicines Australia 2021). The report found there has a substantial increase in the pet cat population in Australia, from 3.8 million (in 2019) to 4.9 million (in August 2021) (Animal Medicines Australia 2019; Animal Medicines Australia 2021). The implications of this increase in pet cat ownership are unknown. There are some concerns that with easing of lockdowns and other restrictions, pet abandonment rates may increase (Ho *et al.* 2021). At the same time, there are ongoing challenges for the veterinary sector, with a high level of workplace attrition, high levels of financial and workplace stress and associated mental health implications being reported (Australian Veterinary Association 2019). While the Australian Veterinary Association has a range of workforce initiatives in place, it is a significant challenge to provide an effective veterinary workforce aligned with the needs of pets and their owners, and to ensure that vets have the right skills and are located so they can address local needs and be able to respond to emerging issues or disease outbreaks as needed (Australian Veterinary Association 2019).

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Ethics statement

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Appendix 1: Case studies

Our survey of local governments found examples of actions, initiatives and collaborations for cat management underway in each jurisdiction, by local governments or stakeholders with an interest in cat management. These include:

- requirements for Early Age Desexing and cat containment in the ACT;
- a targeted desexing program in a remote Indigenous community in the NT,
- a state-based organisation focused on companion animal management, the Dog and Cat Management Board in SA;
- a Landcare group advocating for cat containment, SA;
- Domestic Animal Management Plans in Victoria;
- a regional approach to pet cat management (TassieCat) in Tasmania,
- a collaborative approach to feral cat management in WA.

These case studies illustrate the diversity of cat management practices in Australia. They also highlight the many challenges of cat management for local governments, particularly those in remote areas, and those which do not have enabling legislative mechanisms in place, constraining what they can do.

ACT

Case study 1: Desexing age requirements for pet cats

The ACT is the only jurisdiction that requires Early Age Desexing of pet cats: all cats over three months old must be desexed, and there is a commitment to increase uptake of pre-pubescent desexing of cats prior to sale, transfer or return (ACT Government 2021). While this requirement has been in place since 2007, the implementation of it has been slow, with a relatively small proportion of veterinarians in the ACT making this recommendation to pet cat owners (Mazeau *et al.* 2021).

The age at which pet cats are desexed is important as many unplanned pregnancies occur when cats are between four and nine months of age, if they reach sexual maturity. The current scientific evidence strongly supports the desexing of pet cats before they reach puberty (also called Early Age Desexing) and is supported by organisations such as Australian Veterinary Association (Australian Veterinary Association 2017) and RSPCA-Australia (RSPCA Australia 2021).

There is considerable scope for local governments, animal welfare organisations and veterinarians to work together on communicating the importance of, and implementing, Early Age Desexing programs. Where local governments can set cat bylaws, setting requirements for Early Age Desexing would be an important consideration; it would also represent an important reform for companion animal legislation at the state/territory level as part of a suite of measures that can help reduce the likelihood of pet cats contributing to the feral cat population.

Case study 2: Cat containment

The ACT Government has recognised that cat containment is a key policy for reducing the impact of cats on the environment (ACT Government 2020). There are currently 17 cat containment areas in the ACT (ACT Government 2020) (Figure 14). A cat containment area can be declared in a suburb, or part of a suburb. Rangers are able to seize free-roaming cats in declared cat containment areas, and infringement notices of up to \$1,500 can be issued to the keeper or carer of a cat that is not complying with the cat containment requirements (ACT Government 2020).

However, a lack of compliance monitoring and enforcement may be undermining the strength of the laws. There have been reports of increases in the number of roaming cats collected from cat containment suburbs in Canberra (Brown 2017), and cat impoundment numbers have not reduced.

In early 2021, the ACT Labor and ACT Greens outlined a commitment to “conduct a cat-containment awareness campaign on the impact of cats in wildlife in Canberra and increase cat containment measures to move towards Territory wide cat containment” (ACT Labor and ACT Greens 2021). The ACT Cat Plan, released in May 2021, includes an action to “introduce city-wide cat containment requirements for new cats acquired after 1 July 2022, with grandfathering arrangements for all cats in non-containment suburbs owned before this date” (ACT Government 2021).

Containment bylaws can only be effective if compliance is monitored, if non-compliance is detected and penalised, if infrastructure, staffing and a process for impounding and handling wandering pet cats are all in place, and if

accompanied by ongoing education about the need for cat containment (Legge et al. 2020b). The ACT Cat Plan 2021-2031 recognises the importance of a comprehensive compliance and enforcement framework to support animal management and welfare laws, which comprises risk-based codes of practice and guidelines, community education programs and proportionate and escalating penalties for non-compliance (ACT Government 2021). The grandfathering arrangements in existing suburbs may make compliance monitoring more difficult.

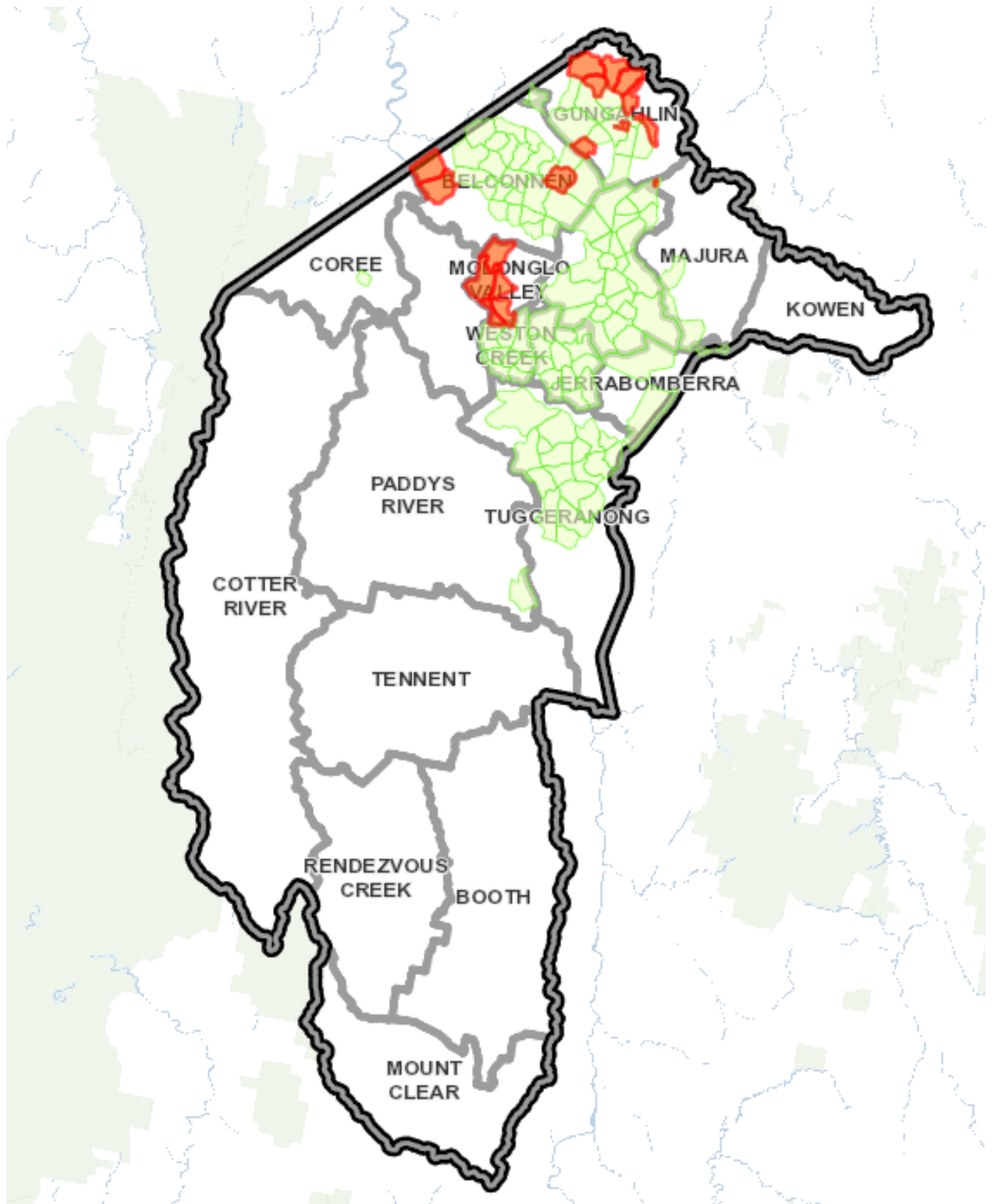


Figure 14: Map of the ACT, with cat containment areas in red, suburbs in green (current to June 2021).

NT

Case study 3: Gapuwiyak Cat Project-collaboration for pet cat management in an Indigenous community context

Gapuwiyak is an Indigenous community in north-eastern Arnhem Land, located about 500 km east of Darwin, and 120 km west of Nhulunbuy (East Arnhem Regional Council 2021). The population of Gapuwiyak and its surrounds is just over 900, mostly Yolngu, with people from 11 different Yolngu groups (East Arnhem Regional Council 2021). Gapuwiyak is one of many remote Indigenous Australian communities where pet cat populations are increasing (Cumming 2019).

Many remote communities in Australia have no or very limited access to veterinary services (AMRRIC 2022). Animal Management in Rural and Remote Indigenous Communities (AMRRIC) is a not-for-profit organisation that works with remote Aboriginal and Torres Strait Island communities and other stakeholders to deliver companion animal management and community education programs (AMRRIC 2022). The key veterinary services are desexing programs, anti-parasitic treatments, and treatments of injury and illness (AMRRIC 2022).

The community were concerned with the increasing cat populations in Gapuwiyak and surrounding homelands, leading to a collaborative project between AMRRIC, the East Arnhem Regional Council and an Indigenous ranger group, the Yirralka Rangers.

The project originally comprised three components:

1. An educational program about responsible cat ownership
2. Veterinary services focused on surgical desexing of pet cats in the community
3. Cat trapping and humane euthanasia at the community periphery and surrounding bushland.

The third component of the project was unable to be delivered due to staff constraints at the time.

To quantify the cat population size AMRRIC undertook door-to door companion animal censuses at the start and end of the project.

AMRRIC and the local government worked with the Yirralka Rangers to deliver an educational campaign at the local school, focused on the impacts of cats on native wildlife, promoting the importance of desexing cats and responsible cat ownership behaviours, specifically keeping cats indoors at night (Falls 2019). As part of the project, the team developed a locally tailored educational bilingual resource, which can be used by the Yirralka Rangers in the course of their work in the region.

The local government (East Arnhem Regional Council) provides veterinary services, with regionally based veterinarians and community-based animal health workers. This allows for the building of relationships with local communities and developing ways to work together on companion animal management issues in a cross-cultural context. In this project, Regional Council veterinary staff desexed 63 cats over eight days, bringing the proportion of desexed cats in the local area to 68% (Cumming 2019). AMRRIC recommends that within a community, at least 90% of the cat population should be desexed, in aiming for a stable population (AMRRIC 2022); there are logistical challenges that can make reaching this level difficult.

The work undertaken in Gapuwiyak provides a model that can be adapted in other remote Indigenous communities where there are growing cat populations. The partnership between local governments, Indigenous rangers, and AMRRIC has resulted in effective community engagement, and is likely to have reduced the flow of pet cats into stray/feral cat populations in remote areas. AMRRIC is reporting that remote community cat populations are growing, and that further work and investment into this issue is needed.



Cats in a remote community in the NT. Image credit: Ian Morris.

SA

Case study 4-the Dog and Cat Management Board, SA

The Government of South Australia has set up a Dog and Cat Management Board (DCMB), under the *Dog and Cat Management Act 1995 (Dog and Cat Management Board 2020a)*. It is the only statutory board focused on companion animals in Australia and works with key partner organisations and the SA Government to improve the management of companion animals in South Australia. The Dog and Cat Management Board maintain South Australia's Dogs and Cats Online (DACO) System, a database for microchip data, local council dog and cat registration records, breeder registration and other management information (Dog and Cat Management Board 2020a).

Until recently, the DCMB has focused largely on dog management issues. DCMB prepared a strategic plan for 2020-2025 (updated in 2021), which includes the following actions (Dog and Cat Management Board 2020b):

- Equal focus on cat management to the same level as dog management;
- Reducing the number of unwanted dogs and cats; and
- Support and encourage research on responsible ownership and effective dog and cat management.

The plan also identifies the following challenges:

- Meeting the needs of diverse stakeholders;
- Addressing cat management and building consensus around cat management approaches;
- Effectively engaging stakeholders and communicating key messages to target audiences; and
- Managing current and future activities within a limited budget.

DCMB have prepared a template of cat bylaws for South Australian Councils, but to date relatively few local governments in SA have adopted these. The content on the DCMB website has been updated to include more comprehensive information on cat ownership, covering the following topics:

- Owning a cat;
- Desexing;
- Keeping cats in;
- Legal responsibilities for cat owners;
- Lost and found;
- Microchipping;
- Nuisance cats;
- Registering cats;
- Renting with cats;
- Unowned and feral cats; and
- Wildlife impacts.

This centralised source of information is valuable for local governments and pet owners in the state, despite the absence of consistent state-wide legislation for cats.

Case study 5-Development of cat bylaws, Adelaide Hills Council

In some cases, community groups advocate for the introduction of local cat bylaws by local governments. The Aldgate Valley Landcare Group commenced a process of lobbying for bylaws on cat containment in the Adelaide Hills local government area in around 2010. The Aldgate Valley area supports a range of native animals that are threatened by roaming pet including native water rats (rakali), western pygmy possums and yellow-footed antechinus.

In 2017, the council undertook its second round of public consultation on its Animal Management Plan. The Aldgate Valley Landcare group provided a detailed submission, with the principal recommendation being, "that Adelaide Hills Council should introduce new bylaws which will require all pet cats to be identified and registered with the council, and to be confined at all times to their owner's premises" (Aldgate Valley Landcare Group 2017). The local government undertook four rounds of community consultation for this process.

Adelaide Hills Council are introducing a cat bylaw, which will take effect on 1 January 2022, which requires all domestic cats to be kept at home at all times (unless on a harness, leash or similar) (Adelaide Hills Council 2021).

The Aldgate Valley Landcare group estimate it took 12 years of effort to get the local council to approve bylaws on cat containment, comprising tens of thousands of hours of volunteer time (Aldgate Valley Landcare Group, pers. comm). This case study highlights the long and protracted process for individual local governments to introduce and implement change at a local level and highlights the value in having a higher-level framework (national or state legislation), to be implemented by local governments.

Tasmania

Case Study 6: TassieCat model-a regional approach to cat management

TassieCat was established in July 2018, through funding from the Tasmanian Government (Tasmanian Cat Management Project 2021). TassieCat is a state wide joint initiative to promote and facilitate responsible cat ownership in Tasmania, through partnerships with local government and key stakeholders (Tasmanian Cat Management Project 2021). TassieCat comprises a team of three regional cat management coordinators, one in each of the southern region, north-west and northern region of Tasmania. Each is at various stages of developing regional cat management strategies.

TassieCat has proved useful in harnessing regional stakeholders involved in pet cat management, and as a forum for developing regional approaches to pet cat management in Tasmania. The TassieCat website provides comprehensive resources on responsible cat ownership.

There are cat bylaws in place but only for Bruny Island, which includes compulsory desexing and microchipping of pet cats, keeping cats within an owner's property boundaries, a limit of two cats without a permit, and prohibiting the feeding of stray cats (Kingborough Council 2018). This bylaw was introduced to help protect threatened species including migratory birds, the little pygmy possum, long-nosed potoroo, southern brown bandicoot, Tasmanian bettong and eastern quoll. The Bruny Island cat bylaw took over five years to develop, which included community consultation, and subsidy programs for cat containment systems.

Victoria

Case Study 7: Domestic Animal Plans, Victoria

One of the requirements of the *Domestic Animals Act 1994* in Victoria is every local government must prepare a domestic animal management plan, outlining how it will manage dogs and cats within its municipal boundaries. Domestic Animal Management Plans are considered to be an important part of companion animal management in Victoria, for several reasons:

- Strategic planning- enables local governments to strategically plan for the domestic animal needs in their community;
- Collaboration-ensure community expectations are considered and addressed;
- Assurance-highlights the important role of local governments in companion animal management; and
- Continuous improvement-identifies and promotes improvement of services, by requiring annual evaluation.

A benefit of Domestic Animal Management Plans is they require information on impoundments, rehoming and euthanasia rates to be collected by individual local governments, which can be collated to determine what is occurring at the state level. Another benefit of this process is that the planning process identifies how the government will protect the environment and local wildlife from the negative impacts of dogs and cats and promotes responsible pet ownership practices.

Source: Domestic Animals Policy, Victoria (2021).

Case study 8: Initiatives promoting cat containment

Safe Cats, Safe Wildlife is a campaign managed by Zoos Victoria and RSPCA-Victoria, to share the message that cats kept at home are safe and happy cats (Zoos Victoria and RSPCA-Victoria 2021). Collaborators in the campaign include the Australian Veterinary Association, BirdLife Australia and Wildlife Victoria. The campaign has support from 33 local governments, 64 veterinary clinics, universities, organisations which promote cat containment systems and other stakeholders (Zoos Victoria and RSPCA-Victoria 2021). Information is shared via the web and comprises resources on responsible cat ownership and expert advice from veterinarians. The key lessons from the program are that:

- Engaging cat owners is best achieved with messaging that motivates them (e.g., cat safety); it is crucial not to demonise cats;
- Providing support and resources on cat containment for owners is important, as they often don't know where to start; and
- Working with a range of organisations helps reinforce the norm that cats should be kept at home.

A similar initiative, Keeping Cats Safe at Home, will commence in NSW in 2021 (Department of Planning Industry and Environment 2021). RSPCA-NSW, supported by the NSW Environmental Trust, have commenced the consultation phase of the project, in which they will work with ten local governments to provide education and advice for communities on keeping pet cats contained (Department of Planning Industry and Environment 2021).

The South West NRM group in WA has established a cat owner education program, Happy at Home, which includes information on why cats are best kept safe at home, and tips for pet owners on transitioning cats from outdoors to indoors, examples of cat containment options and enrichment for contained cats (South West Group 2021).

WA

Case study 9: Western Australia Feral Cat Working Group

In April 2020, the WA Feral Cat Working Group was established with the aim to drive a unified approach to the control of feral cats in Western Australia (The Western Australian Biodiversity Science Institute 2021). The group is in its early stages, and will make information on feral cat management available to all end users, enable the translation of research findings into effective on-ground outcomes, and help guide the implementation of feral cat research by The Western Australian Biodiversity Science Institute (The Western Australian Biodiversity Science Institute 2021). The group comprises skilled representatives from community, government, industry and research, currently involved in feral cat research in WA.

The establishment of such working groups could be a useful mechanism for information sharing, identifying opportunities for collaboration, and implementing strategic and targeted control efforts focused on biodiversity values. In terms of relevance to local governments, regional working groups on cat management may be a useful mechanism for information and resource sharing, and collaborative management efforts.

Appendix 2: Survey questions

1. Please list your local government area
2. Please list your role within local government.

Section 1: Pet cats

Pet cats: owned by people and cared for in a responsible and consistent manner.

3. Does your local government set a limit on the number of cats per household?
If yes-enter the number of cats.
4. If there is a limit on the number of pet cats per household, is this monitored?
If yes-please describe.

Registration

5. Are pet cats required to be registered in your local government area?
If yes:
6. What is the cost of registration per cat?
7. How many pet cats are registered in your local government area?
8. Does your local government monitor compliance with registration requirements for pet cats?
If yes, please describe.
9. Does your government offer incentives for registration of pet cats? If so, what are they?
10. Does revenue from registration fees go to the management of cats or other wildlife issues?

Microchipping

11. Are pet cats required to be microchipped (identified) in your local government area?
12. Does your local government monitor compliance with microchipping requirements? If so, how?

Desexing

13. Are pet cats required to be desexed in your local government area?
14. Does your local government monitor compliance with desexing requirements? If so, how?
15. Does your local government offer any incentives for desexing of pet cats
(e.g., offering reduced registration fees for desexed cats)?
16. What proportion of cats are desexed in your local government area
(if known, if not, please provide an estimate).

Nuisance/roaming cats

17. Does your local government have regulations to address nuisance cats?
18. How does your local government respond to complaints about nuisance cats?
19. Does your local government have regulations about roaming cats?

Cat containment, curfews and prohibition

20. Does your local government require cats to be contained or confined in some area? If yes, please describe the containment (e.g., night-time curfew, 24/7 containment) and in which suburbs/areas, and the reasons for containment (e.g., suburb is adjacent to area of high environmental value)
21. If cats are contained from some areas, how is this monitored? Do you have any information on the outcomes (e.g., increases in wildlife?)
22. Does your local government prohibit cats from any suburbs or areas? If so, why?
23. If cats are prohibited from some areas, how is this monitored? Do you have any information on the outcomes (e.g., increase in wildlife?)

Expenditure/other

24. How much does your local government spend on the management of pet cats (please provide estimate, including staffing and operational resources).
25. Any other regulations/information you'd like to share about pet cats?

Guidance for pet cat owners

26. Does your local government provide information/other incentives/support services to pet cat owners about responsible cat management? If yes, please describe what this information is, and how it is provided (e.g., website, with registration materials)

Information gaps - pet cats

27. Is your local government part of any broader initiatives/programs relating to pet cat management
If yes, please describe.
28. What is working well for the management of pet cats?
29. What are the main challenges for the management of pet cats?
30. What information/resources would help your jurisdiction in promoting responsible cat ownership (e.g., factsheets, FAQ, info on transition to indoor cats, resources in languages other than English, other)?

Section 2: Stray cat management

Stray cats: feral cats living as fringe dwellers in towns and cities, profiting from the opportunities for shelter and food. These many be wayward pets, ex pets, semi-socialised or unsocialised feral cats. They may be fed by people, or not.

31. Are stray cats a problem in your local government area?
32. Does your local government carry out management activities that aim to control stray cats?
If yes:
33. Does your local government humanely manage stray cats by:

	Yes	No	Don't know	If yes, please indicate the frequency of action	If yes, total number managed with the action in 2018-19	Comments
Trapping (by local government staff)						Please include what happens to trapped cats.
Trapping (by community residents, using local government cat traps)						Please include what happens to trapped cats.
Poison baiting						
Shooting						
Other (please describe)						

34. In some areas, individuals and community organisations undertake unofficial Trap-Neuter-Release (TNR) programs. Do you know if any such programs are underway in your jurisdiction? If yes, please provide any information you are comfortable to share.

Note: responses will only be used to obtain an indication of how many are known to be underway in Australia.

35. Does your local government operate a pound or shelter?

If yes:

36. How many cats are directed there per year?

37. How much does your local government spend on stray cat management? (please provide estimate, including for staffing and government resources).

38. Does your local government monitor whether these actions are working?

39. If yes, does your local government monitor stray cat management by:

	Yes	No	Don't know	Frequency of action	Total in 2018-19	Comments
Spotlight surveys at night						
Trapping surveys						Please include what happens to trapped cats.
Keeping records of resident observations/complaints						
Other						

40. Do you have any anecdotal observations about whether stray cat management is working or not (e.g., increase in native wildlife)?

41. Do you know if the issue of stray cats is improving, the same or deteriorating over the last 10 years in your local government area? Please provide details.

42. What is working well for the management of stray cats? Please provide details.

43. What are the main challenges for the management of stray cats? Please provide details.

44. What information or actions would help your local government manage stray cats more effectively?

Section 3: Feral cat management

Feral cats: cats that live in the wild and can survive without relying on people for food or having contact with people.

45. Does your local government consider feral cats a problem? If yes, please provide details.

46. Does your local government carry out management activities that aim to control feral cats?

If yes:

47. Does your local government humanely manage feral cats by:

	Yes	No	Don't know	If yes, please indicate the frequency of action	If yes, total number managed with the action in 2018-19	Comments
Trapping (by local government staff)						Please include what happens to trapped cats.
Trapping (by community residents, using local government cat traps)						Please include what happens to trapped cats.
Poison baiting						
Shooting						
Other (please describe)						

48. How much does your local government spend on feral cat management?
(please provide estimate, including for staffing and operational resources).

49. Does your local government monitor whether these actions are working?

If yes:

50. Does your local government monitor feral cat management by:

	Yes	No	Don't know	Frequency of action	Total in 2018-19	Comments
Spotlight surveys at night						
Trapping surveys						Please include what happens to trapped cats.
Keeping records of resident observations/ complaints						
Other						

51. Do you have any anecdotal observations about whether feral cat management is working or not?

52. Do you know if the issue of feral cats is improving, the same or deteriorating over the last 10 years in your local government area? Please provide details and summary of trends if available.

53. What is working well for the management of feral cats? Please provide details.

54. What are the main challenges for the management of feral cats? Please provide details.

55. What information or actions would help your local government manage feral cats more effectively? Please provide details.

56. Is there anything else you would like to tell us?

Appendix 3: Key legislation in each state/territory pertaining to cats

Jurisdiction	Key legislation on companion/pet cats	Key legislation relating to feral cats	Declared pest animal	Are there significant requirements for local governments to manage feral cats?
Commonwealth		EPBC Act (Cat TAP) Predation by Cats as a Key Threatening Process, and associated Threat Abatement Plan	Yes - KTP	Feral cats must be managed in accordance with TAP on Commonwealth lands
Australian Capital Territory	Domestic Animals Act 2000	Pest and Animals Act 2005	No	No
New South Wales	Companion Animals Act 1998	Local Land Services Act 2013 Biosecurity Act 2015 Biodiversity Conservation Act 2016 Game & Feral Animal Control Act 2002	No	No
Northern Territory		Territory Parks and Wildlife Conservation (NT) Act 2006	Yes	Unowned cats are 'subject to control'
Queensland	Animal Management (Cats and Dogs) Act 2008	Land Protection Act 2002 Biosecurity Act 2014	Yes	Yes. Each local government must have a biosecurity plan that covers invasive plants and animals. There is variation in these plans and how they are implemented
South Australia	Dog and Cat Management Act 1995	Natural Resources Management Act 2004	Yes	No. Feral cats are declared as a threat to natural resources, but management by local government varies
Tasmania	Cat Management Act 2009	Biosecurity Act 2019	No	No
Victoria	Domestic Animals Act 1994 Domestic (Feral and Nuisance Animals) Act	Catchment and Land Protections Act 1994 Flora and Fauna Guarantee Act 1988 Wildlife Act 1975 Prevention of Cruelty to Animals Act 1986	Yes, on public lands	No, the key responsibility for feral cat management lies with state government
Western Australia	Dog and Cat Management Act 1995 Cat Act 2011	Biosecurity and Agriculture Management Act 2007 Biodiversity Conservation Act 2016	Yes, unassigned control. There is no obligation on individuals or agencies to undertake management of feral cats	No

Appendix 4: Typology of open-ended survey responses

A large proportion of the survey comprised open-ended survey questions. We grouped and tallied actions under 5-6 categories in a response typology; in cases where survey responses included multiple actions, all actions were tallied. At times, there is some overlap in the typologies.

What works well for pet cat management?

Response typology	Specific actions included in survey responses
Nothing	N/A A subset of local governments responded that nothing is working well for pet cat management
Enabling mechanisms	Cat containment, state laws, local bylaws, dedicated resourcing
Desexing programs	Free or subsidised desexing programs, incentives for desexing
Education/responsible pet ownership (RPO)	Education, responsible cat owners
Community support (e.g., trapping)	Trapping programs (by community members and local governments)
Partnerships (e.g., rehoming)	Collaborations/partnerships

What are the main challenges for pet cat management?

Response typology	Specific actions included in survey responses
Pet cat owner attitudes and practices	The perceived right of cats to roam, cat is too well fed to prey on native wildlife, cats are important for the control of introduced rodents or keeping snakes away, socio-economic factors (people who do not desex their cats, which may be intentional, or cannot afford to desex cats)
Funding, resourcing and support	Compliance and enforcement, internal support for cat management, support from veterinarians, staff and equipment for catching cats
Legislation	Weak legislation (allowing cats to roam, desexing not mandatory)
Stray cats	Stray/unowned cats were listed in terms of people feeding them, but not being formal owners
Other	Cross-cultural factors, complex issues (cat hoarding, backyard breeding), the cat lobby

What information/actions would help support improved pet cat management?

Response typology	Specific actions included in survey responses
Information and uptake of responsible pet ownership practices	Fact sheets, FAQ, info on transition to indoor cats, information/resources for culturally and linguistically diverse communities, centralised source of "go to" information on cats and cat impacts
Funding and resourcing	Staff, facilities, desexing programs
Stronger legislation	Stronger compliance powers
Stronger overarching awareness campaign/management framework	National campaign on cat impacts (e.g., TV advertising)

What works well for feral cat management?

Response typology	Specific actions included in survey responses
Nothing	A subset of local governments responded that nothing is working well for stray cat management
Community support (e.g., trapping)	Community trapping programs
Desexing programs	Free or subsidised desexing programs, incentives for desexing
Partnerships (e.g., rehoming)	Adoption/rehoming programs with vet clinics
Education/responsible pet ownership (RPO)	Education, responsible cat owners
Targeted management	Cat management by private landholders
Enabling mechanisms	Compliance, ongoing management program, bylaws to set caps on number of pet cats per household/nuisance provisions, cat curfews (to reduce transfer of pet cat to feral cat population)

What are the main challenges for feral cat management?

Response typology	Specific actions included in survey responses
Pet cat owner attitudes and practices	Complacency, the perceived right of cats to roam, cat is too well fed to prey on native wildlife, cats are important for the control of introduced rodents or keeping snakes away, dumped/abandoned cats
Funding, resourcing and support	Limited resourcing, including for staffing/equipment, compliance and enforcement, lack of internal support for cat management, limited support from veterinarians, high cost of management
Logistics	Catching them, high fecundity, appropriate tools for managing cats, particularly in vast/remote areas
Legislation	Weak/inadequate legislation
Community social factors	"Cat lobby" groups/individuals opposed to feral cat management and euthanasia of feral cats
Lack of internal support/coordination	Not considered as a priority, economic impacts poorly known, lack of local data to inform management

What information/actions would help support improved feral cat management?

Typology of response	Specific actions included in survey responses
Information and uptake of responsible pet ownership practices	Fact sheets, FAQ, info on transition to indoor cats, information/resources for culturally and linguistically diverse communities, centralised source of "go to" information on cats and cat impacts
Centralised/local information	A centralised "go to" website on cats/cat impacts, including locally relevant information.
Desexing programs/partnerships	Mandatory desexing
Funding, resourcing and systems	Cheaper euthanasia, funding for a cat management officer, resources for management
Stronger legislation/coordination	State-wide or national management framework, stronger legislation with hefty fees for non-compliance, containment requirements

Appendix 5: Timeline of key events relating to cats in Australia

The concern about the impacts of cats in Australia can be traced back to early naturalists. There has been concerted research effort to collect evidence of these impacts (Legge *et al.* 2020c). The development of policy and legal settings for the management of cats have not yet kept pace with, or adapted in response to this evidence (Woinarski *et al.* 2019b).

Timeline of cat introduction and key events relating to cats in Australia (adapted from (Woinarski *et al.* 2019b))

Year	Key events relating to cats in Australia
1788	Cats are introduced into Australia by the First Fleet.
1800s-1900s	Large numbers of cats were transported to goldfields in south-eastern and western Australia and turned loose to control outbreaks of mice, rabbits and native rodents.
1890	Cats occupy 99% of Australia (based on a reconstruction of the historical spread of feral cats in Australia, undertaken in 2008).
Early 1900s	Archibald Campbell documents his observations of ongoing declines in a range of native birds, and the need to control feral cats in Australia.
1935	Biologist H.H Finlayson noted major changes in native wildlife populations based on his work in central Australia, with particular reference to the damage caused by rabbits, foxes and feral cats.
1989	Introduction of local government acts which have led to greater responsibility for local governments in community development, economic growth and natural resource management.
1991	First known local night curfew for cats bylaw established by the (then) Sherbrooke Council (now Shire of Yarra Ranges), Victoria.
1994	Catchment and Land Protections Act 1994 and Domestic (Feral and Nuisance) Animals Act 1994, and Domestic Animals Act 1994 come into effect in Victoria.
1995	The Dog and Cat Management Act 1995 is enacted in South Australia.
1996	The report 'Overview of the Impacts of feral cats on Australian native fauna' is prepared for the Australian Government.
1998	The Companion Animals Act 1998 is enacted in NSW.
1999	A national threat abatement plan for feral cats was established (under legislation preceding the EPBC Act). The Commonwealth Environment Protection and Biodiversity Conservation Act 1999 enacted.
2000	'Predation by feral cats' recognised as a key threatening process under the EPBC Act 1999 The Domestic Animals Act 2000 is enacted in the ACT.
2002	Land Protection Act 2002 enacted in Queensland.
2004	First suburbs (Bonner and Forde) declared as cat containment areas in the ACT Natural Resources Management Act 2004 enacted in South Australia.
2005	Review of the national threat abatement plan for feral cats. This review reported it was difficult to assess the extent of implementation and progress of the plan.
2006	Territory Parks and Wildlife Conservation Act (NT) 2006 comes into effect in the NT.
2007	Australian Pest Animal Strategies developed by Commonwealth state and territory agencies of the environment and of primary industry/agriculture.

2008	A second iteration of the national threat abatement plan for feral cats developed and approved. The Minister for the Environment at the time, Peter Garrett, banned the importation of 'savannah cats' to Australia, on the grounds of potential additional risk to Australian biodiversity. The Animal Management Act (Cats and Dogs) Act 2008 comes into effect in Queensland.
2009	The paper 'House cats as predators in the Australian environment', providing an overview of the predatory activities of pet cats, is published. Cat Management Act 2009 comes into effect in Tasmania.
2010	'Review of cat ecology and management strategies' report released.
2012	The ACT Pest Management Strategy 2012-2022 developed.
2013	The Cat Act 2011 enacted in Western Australia. The act allows for enforcement of responsible cat ownership and reducing unwanted pregnancies that can lead to kitten dumping.
2014	Review of the second national threat abatement plan for feral cats. This review also reported it was difficult to assess the extent of implementation and progress of the plan. The Biosecurity Act 2014 comes into effect in Queensland.
2015	National Threatened Species Strategy developed and approved. This strategy includes a primary focus on the management of feral cats in order to improve the outlook for threatened species, driven by a particular interest by the Minister for the Environment at the time, Greg Hunt. The strategy included targets to: <ul style="list-style-type: none"> - eradicate feral cats from 5 islands of biodiversity significance - establish 10 mainland cat-free exclosures - establish 'best practice' feral cat control across 20 million hectares, - cull 2 million cats; by 2020. The position of Threatened Species Commissioner was established as part of the Commonwealth's Environment Department. The first Commissioner championed the case for control of feral cats for threatened species conservation, and raised the profile of the issue. Establishment of the national Feral Cat Taskforce, to help coordinate research, monitoring and management to enhance public awareness, amongst states and territories of Australia. The third iteration of the national threat abatement plan for feral cats developed and approved. Commonwealth, State and Territory ministers endorsed a national declaration of feral cats as pests, after tackling feral cats was highlighted as an action area in the Threatened Species Strategy. A national feral cat mapping system, Feral CatScan is launched and rolled out. The system aims to record and centralise real-time information about feral cat activity and impacts on native species.
2016	The Biodiversity Conservation Act 2016 enacted in Western Australia. The Biodiversity Conservation Act 2016 is enacted in NSW, listing feral cats as a key threatening process.
2018	WA Government completed cat eradication program on Dirk Hartog Island, off the WA coast, the largest island in the world from which cats have been removed. Cats have been eradicated from 30 Australian islands since 1970.
2019	Feral cats declared a pest in Western Australia. 17 cat containment areas now established in the ACT. 'Cats in Australia-Companion and Killer' book released. Cat Management Amendment Bill 2019 introduced into the Tasmanian Parliament. The Australian Pet Welfare Foundation commenced its "Community Cat Program" (a variant of a Trap-Neuter-Release program) in Ipswich, Queensland, with plans to expand the program to South Australia, Victoria and New South Wales.
2020	The Cat Act 2011 of Western Australia currently under review. A major review on the impacts of pet cats on Australian wildlife is released. The Standing Committee on the Environment and Energy undertake an inquiry into the problem of feral and domestic cats in Australia. Amendments to the Cat Management Act 2009 (Tasmania) due to come into effect in late 2020.
2021	Parliamentary inquiry report "Tackling the feral cat pandemic: a plan to save Australian wildlife" released. The report calls for a "reset" of aspects of cat management policy, including night-time curfews for pet cats and expansion of Australia's existing network of reserves free from introduced predators.

Appendix 6: Summary of barriers to environmental management by local governments

There has been relatively limited work on the role of local governments in environmental management. A 2006 review found that local governments face constraints in environmental management, including a shortage of essential resources (money, time, expertise, statutory powers and political will), a lack of data and knowledge, poor consultation with stakeholders and a lack of coherent environmental powers at the local level (Pini *et al.* 2007). That review of local government engagement in environmental management in Australia summarises the key factors as follows:

Capacity: local governments may have limited capacity for natural resource management, due to factors such as agricultural restructuring, ageing of the population, drought (and other natural disasters) and the reduction of people involved in agriculture; it was common for local government staff to argue that it was impossible to prioritise natural resource management when they were facing more immediate concern (Pini *et al.* 2007). Local governments also highlighted the challenges associated with the additional responsibilities being devolved from other tiers of government to local government (Pini *et al.* 2007).

Commitment: local government commitment to having dedicated resourcing for environmental management is variable. Many local governments have environmental officers, but the degree to which environmental management is a priority and resourced is also variable. In some cases, officers may work across multiple local government areas. The 2007 review found that the extent to which the environment is viewed as a priority significantly determined the level of staffing and resourcing allocated to environmental management in local government areas (Pini *et al.* 2007). A key factor in the success of a local government sustainability initiatives is the “presence of passionate individuals with a long-term connection to the local area and commitment to environmental work” (Wild River 2005).

Coordination: the three-tiered system of government makes for a challenging natural resource management policy and legislative arena (Pini *et al.* 2007). The same review found that the lack of integration between different agencies and the inconsistent consultation between State and Federal government, as well as other stakeholders such as Natural Resource Management organisation, with local governments pose an ongoing challenge in environmental management (Pini *et al.* 2007).

Community: Community interest in environmental management is also highly variable between local government areas.

Summary of barriers to environmental management by local governments (adapted from (Pini *et al.* 2007)).

Theme	Barriers
Capacity	<ul style="list-style-type: none"> Lack of financial resources. Lack of expertise, skills and training. Limited readily available and accessible data on natural resource management for planning. Limited political and legislative power of local government in relation to natural resource management. Short political cycles make planning problematic. Increased devolution of responsibilities from State and Federal Governments to local government.
Commitment	<ul style="list-style-type: none"> Other priorities seen as more important (e.g. economic priorities, services). Lack of support from key staff. Lack of support from critical mass of councillors. Narrow definition of environmental management. Environmental officers not placed in key positions in organisational hierarchy.
Coordination	<ul style="list-style-type: none"> Poor coordination between the three tiers of government. Variable coordination and collaboration between regional and local spheres. Lack of understanding of the multiple roles of local government.
Community	<ul style="list-style-type: none"> Lack of interest in environmental management. Competing priorities. Limited resources for community engagement (time, money, expertise). Limited understanding of the need for and benefits of community engagement by council staff and elected members. Utilisation of a narrow range of strategies to engage the public. Increased work demands in rural people due to factors such as agricultural restructuring, drought.

Appendix 7: Useful resources/additional reading

Factsheets - The Threatened Species Recovery Hub

The impact of cats in Australia

<https://www.nespthreatenedspecies.edu.au/media/2j1j51na/112-the-impact-of-cats-in-australia-findings-factsheetweb.pdf>

The impact of pet cats on Australian wildlife

https://www.nespthreatenedspecies.edu.au/media/dehnttbf/7-4-the-impact-of-pet-cat-impacts_f.pdf

For whom the bell tolls: cats kill more than a million Australian birds every day

<https://www.nespthreatenedspecies.edu.au/publications-and-tools/for-whom-the-bell-tolls-cats-kill-more-than-a-million-australian-birds-every-day>

The hidden costs of cats in Australia: cat dependent diseases and human health

https://www.nespthreatenedspecies.edu.au/media/gatmsmla/7-4-cat-dependent-disease-findings-factsheet_v17.pdf

The toll of cat-dependent diseases on Australian agriculture

https://www.nespthreatenedspecies.edu.au/media/w4jdwslx/7-4-cats-and-agriculture-findings-factsheet_v13.pdf

Videos - The Threatened Species Recovery Hub

The impact of roaming pet cats on Australian wildlife

https://www.youtube.com/watch?v=ytZM3Tm_oQc&t=58s

Cat-borne diseases and their impacts on human health

<https://www.youtube.com/watch?v=P25VoNs-m1Q&t=2s>

Cat-borne diseases and their impacts on agriculture and livestock

<https://www.youtube.com/watch?v=Guoluq31y-A>

Caring for Country: Managing cats animation

<https://www.youtube.com/watch?v=TGyhPFRCDs8>

Posters

The impact of feral cats in Australia

<https://www.nespthreatenedspecies.edu.au/publications-and-tools/cat-impacts-in-australia>

The impact of urban cats in Australia

<https://www.nespthreatenedspecies.edu.au/publications-and-tools/cats-in-urban-australia>

Books

Read JL (2019) *Among the Pigeons: Why our cats belong indoors*. (Wakefield Press.)

Woinarski JCZ, Legge S, Dickman CR (2019) *Cats in Australia: Companion and Killer*. CSIRO Publishing.

<https://www.publish.csiro.au/book/7784/>

Cat containment information/resources

Safe Cat, Safe Wildlife

<https://www.safecat.org.au/>

Tassie Cat

<https://www.tassiecat.com/>

Cat owner education program: South West group

<http://www.southwestgroup.com.au/natural-resource-management/happyathome/>

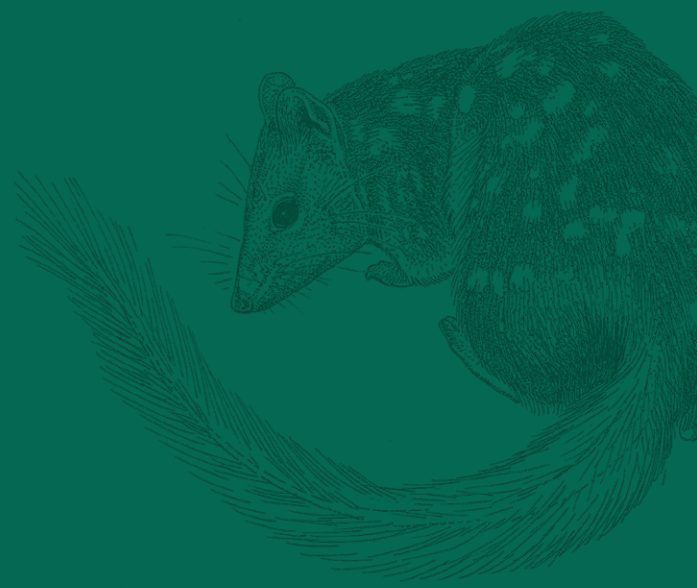
What do cats get up to when they roam?

<https://www.youtube.com/watch?v=g-5kL7MVSd4>



Further information:

<http://www.nespthreatenedspecies.edu.au>



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