# Appendix: Addressing the Terms of Reference in detail

## (a) The impact of cats on threatened native animals in metropolitan and regional settings.

While the impact of feral cats on Australian native wildlife populations in natural environments is well-documented, **there is no scientific evidence that domestic cats (cats that live in the vicinity of people), have any viability or conservation impacts at a population level on native wildlife**. In fact, Australian population studies have not found a measurable effect of domestic cats on native wildlife (Barratt 1998, Grayson 2007, Lilith 2010, Maclagan 2018). An ongoing issue is that feral cat impacts are often wrongly attributed to domestic cats, even though these are two distinct and geographically separate populations of cats with different behaviour and ecology. In addition, the estimates of pet and stray cat predation of wildlife are based on flawed theoretical calculations that assume all pet cats predate similarly, even if contained inside, and that stray cats being fed by people predate similarly to cats in rubbish dumps in small rural towns or in parks with bushland (Woinarski 2017, Coman 1972).

### Australian research findings

**Australian studies were unable to detect a measurable impact in urban areas of domestic cats on native mammals** (Maclagan 2018, Lilith 2010), or birds (Barratt 1998, Grayson 2007), but found that **vegetation quality, housing density, distance from bushland and size of bushland were significant factors** (summarised below). Other studies demonstrate the positive impact cat predation has by reducing the numbers of rats that predate bird nests (Matthews 1999).

Importantly, the **NSW Wildlife Rehabilitation Government Dashboard (2021) shows that in 2019-20, 402 threatened species were reportedly rescued as a result of loss of habitat, 290 as a result of collisions with motor vehicles, 127 as a result of dog attacks and 31 because of cat attacks.** Additionally, domestic cats that are obtaining food intentionally or unintentionally from humans predate significantly fewer animals than feral cats, which have to hunt to supply all their nutritional needs (Murphy 2019, Woinarski 2017).

The following section summarises the Australian studies investigating the association between cats in urban areas and wildlife populations. **Collectively, these findings from Australian research studies do not demonstrate a negative effect of cats on native wildlife population**, in contrast with the well-documented adverse effects of feral cats on native wildlife populations in undisturbed natural environments.

## Study 1: Do cat restrictions lead to increased species diversity or abundance of small and medium-sized mammals in remnant urban bushland? City of Armadale WA (Lilith 2010)

This Australian study analysed cat regulations enacted within differing suburbs, to test the hypotheses that the species diversity (measured by the Shannon-Weiner index) and abundance of small and medium-sized mammals should be higher in native bushland within or adjacent to subdivisions where cats are restricted, compared to similar areas where cats are not restricted. There were three different cat regulation regimes at the three different experimental sites, and these were compared and assessed for impact on native mammals:

- **no-cat zone** (strict prohibition of cat ownership)
- compulsory bells on cats and **night curfew of cats,**
- **no cat-related regulations**

These different cat regulations were in place for approximately 10 years prior to the study. The researchers also measured structural and floristic features of the vegetation at each site that might influence the species diversity and abundance of small and medium-sized mammals, either independently, or interactively with cat activity.

### Findings:

- **No significant differences in species diversity were found across the sites** and KTBA (known -to-be-alive) statistics for Brushtail Possums and Southern Brown Bandicoots, the two most abundant medium-sized mammals present, were similar across all sites.
- The smaller mardo (**Antechinus** flavipes), which the authors suggested could be regarded as the most susceptible to cat predation of all the native species trapped because of its size, was trapped **mostly at an unregulated cat site.**
- **Total mammals** trapped **at the unregulated cat sites exceeded those caught at the two sites with restrictions**, but these unregulated sites also had significantly denser vegetation.

**Conclusion**: The authors concluded that **pet cats did not negatively impact the species diversity or abundance of small and medium-sized mammals** at these sites and that vegetation characteristics are likely more important. In addition**, cat related by-laws, including prohibition of cat ownership, had no measurable benefits on wildlife**.

## Study 2: Species richness and community composition of passerine birds in suburban Perth: is predation by pet cats the most important factor? Perth WA (Grayson 2007)

This study was conducted across 57 sites in metropolitan Perth. The researchers investigated factors affecting passerine bird community composition. Bird data were collected at each site, and a questionnaire distributed to surrounding neighbours to determine cat and dog density.

**Findings**:

- **No link was found between cat or dog density and passerine bird species richness** (abundance and diversity).
- However, a **negative correlation was found between richness of bird species and both housing density and increasing distance from bushland** (and decreasing size of bushland).

**Conclusion**: These findings led the authors to conclude that habitat destruction and degradation were the critical factors affecting richness of bird species, rather than cats or dogs.

## Study 3: Do Pet Cats Deserve the Disproportionate Blame for Wildlife Predation Compared to Pet Dogs? NSW, Queensland and Victoria (Franklin 2021)

This Australian study analysed pet cat and dog predation and challenges longstanding assumptions and beliefs about the impacts of pet cats on native wildlife.

**Findings**:

- Not all pet cats were observed to catch prey which concurs with previous research. Of the pets observed to catch prey, the median numbers of native animals caught per dog or cat over 6 months were actually low (3 native animals per cat that predated).
- Only a very small minority of cats were prolific hunters countering common claims that all cats are efficient and prolific hunters that kill many animals. This finding also potentially invalidates often-used calculations estimating the number of native animals predated by pet cats.
- Most prey animals in the study were common native or introduced species suggesting that cats may not be having a significant negative effect on these populations.

**Conclusion**: The authors stated that, as others have concluded, **hunting by domestic dogs and cats appears to be of relatively minor conservation concern compared with issues such as habitat loss and urban development.** Therefore, efforts directed at habitat preservation are likely to be the most effective strategy to protect wildlife, as opposed to pet control regulations.

## Study 4: Don't judge habitat on its novelty: Assessing the value of novel habitats for an endangered mammal in a peri-urban landscape. Melbourne Victoria (Maclagan 2018)

Novel ecosystems are increasingly common across the world, particularly in areas heavily impacted by people such as urban and peri-urban landscapes. As a result, interest in their potential contribution to biodiversity conservation is increasing, including their ability to sustain populations of threatened species. Few studies have explored whether novel habitats can support viable populations over time and how they compare to less modified, remnant habitats.

This Australian study investigated the capacity for novel habitats to support an endangered mammal, the southern brown bandicoot (Isoodon obesulus obesulus: Peramelidae), in a highly

modified landscape near Melbourne. The study compared bandicoot abundance and body condition between five novel sites that were highly modified by human development, and two remnant sites that were bushland reserves, and examined whether novel sites support residency and key demographic processes necessary for bandicoot population persistence.

**Findings**:

- **Bandicoot abundance was higher at novel sites where cats were common, than at remnant sites (cats were uncommon), with the highest abundance at the novel site with the most urbanised surroundings**.
- Female body condition was similar between novel and remnant sites. The majority of bandicoots at novel sites were resident, and breeding activity, recruitment of first-year adults, and survival of mature adults were observed at all novel sites.
- It remains unclear how sufficient numbers of bandicoots at novel sites were avoiding predation by invasive red foxes, cats and other predators.
- The results demonstrate the potential significance of novel urbanised habitats for conserving threatened species within heavily modified landscapes. The quality of habitats should not be judged on their novelty alone. Broadening appreciation of the potential value of novel ecosystems could increase off-reserve species conservation opportunities - a key priority area in modern times.

**Conclusion:** The authors concluded the study showed novel urbanised habitats (where cats were common) can offer new conservation opportunities for species that have the adaptive capacity to exploit them. Traditional assumptions that human-modified habitats are automatically poorer in quality to remnant bushland habitats – such as the Human Threat Hypothesis - need careful re-examination. The capacity of habitat to support species of concern should be assessed without bias regarding its degree of novelty. As novel ecosystems become increasingly prevalent worldwide and off-reserve conservation becomes more important, conservation approaches should exploit novel conservation opportunities.

## Study 5: Domestic cat stomach content analysis study (Brisbane, Qld)

Analysis of the stomach contents of trapped urban stray cats (domestic cats) in the City of Brisbane revealed that the only prey species consumed were introduced black rats (BBC Invasive Times Newsletter).

**Conclusion:** Stray cats in urban areas are **not a significant cause of native wildlife predation** but predate introduced rodents.

## Study 6: Domestic cat stomach content analysis study (Southern Downs Shire, Qld)

Cats impounded by the Southern Downs Shire (Qld) found predominantly cat food, house mice and carrion (eastern grey kangaroos) and no species of conservation concern in cat stomach and colon samples (Leis 2021).

**Conclusion:** There was no evidence that stray cats **in a regional town** were predating native wildlife to provide their energy needs but were **predating introduced rodents**.

## Highly inaccurate estimates of domestic cat impacts on Australian native wildlife populations are driving domestic cat management

Highly publicised impacts of cats in highly disturbed environments (domestic cats) on birds (Woinarski 2017), mammals (Murphy 2019), reptiles (Woinarski 2018) and amphibians (Woinarski 2020) are based on extrapolating the findings from stomach and faecal samples and surveys of pet cat hunting behaviour. This has resulted in highly inaccurate conclusions regarding implied population effects of domestic cats in urban areas.

### *Flawed data collection and calculations*

For example, the effects of domestic cats are extrapolated from just 5 studies, 3 of which were from rubbish dumps in small rural towns, and the other two explicitly stated they only analysed stool samples that contained evidence of wildlife remains and excluded those that had evidence of cat food. The authors then calculated that all 0.7 million unowned cats living in highly modified environments domestic cats) predated similarly to those samples analysed. Clearly these results are in **no way representative of urban domestic cats**, the vast majority are fed intentionally by humans (Rand 2024b).

Similarly, the effects of pet cats were **extrapolated from 25 to 40-year-old studies of cats** that were observed to predate and the authors then **assumed that all 3.88 million pet cats predated similarly**. For example, the authors **estimated that every pet cat, regardless of whether it was contained inside or never seen to predate, killed 15.6 birds a year**. This has resulted in a gross overestimation of pet cat predation, given that many pet cats are confined solely inside, and not all cats predate, particularly older cats.

### *Other confounding factors*

In compounding these errors, the authors then imply this data translates to a population effect. For birds, for example, this is erroneous, because **birds killed by cats in urban areas are significantly less healthy than birds killed by cars or flying into windows** (Baker 2008, Møller & Erritzøe 2000), leading these authors to conclude that **cat predation in urban areas represents a compensatory rather than an additive form of mortality**. In other words, cat predation does not cause a secular change in the overall mortality of bird populations.

Therefore, the inherent biases, inaccuracies, and limitations of the study design of these highly quoted studies by Woinarski and Murphy mean that **there can be little to no confidence in the implied population effects.** In contrast, actual **Australian population studies have not found a measurable effect of domestic cats on urban wildlife.**

Furthermore, as concluded by Barratt (1998), estimates of predation by house cats, particularly extrapolated estimates, should be treated with caution. Predation estimates alone do not prove that prey populations are detrimentally affected, especially in highly disturbed and modified environments such as urban areas.

## False blame directed at domestic cats

False blame for wildlife impacts directed at domestic cats is harmful because it **contributes to the implementation of ineffective domestic cat management strategies** and can be used as a justification for lethal approaches to domestic cats. This **perpetuates the unnecessary and pointless killing of many healthy cats and kittens under the ineffective Trap, adopt or kill model**, which causes **devastating psychological damage to staff involved** and community cat carers (Bennett 2005, Whiting 2011, Scotney 2023). It does not reduce the overall number of wandering cats overtime as the population quickly replenishes to original levels due to the high cat reproductive rate, immigration of new cats into the area and increased survival of juveniles (Lazenby 2015, Miller 2014, Boone 2019, NSW Animal Seizures – Pound Data Reports).

**Australian shelter staff are often required to repeatedly kill large numbers of healthy cats and kittens, resulting in a significant human cost**. Many workers directly involved with the euthanasia of healthy animals **develop post-traumatic stress**, which is associated with depression, substance abuse, high blood pressure, burnout, sleeplessness and **increased risk of suicide** (Australian Veterinary Association 2022, Baran 2009, Reeve 2005, Rohlf 2005, Rollin 2011, Tiesman 2015, Whiting 2011).

Two quotes from shelter staff support research showing that killing healthy and treatable animals can result in severe mental health damage and increases the risk for suicide.

> *"The effect on mental health is a very real problem, and veterinarians were the most affected – it was terrible to see the impact on them" (senior shelter staff member)*
>
> *"I have seen so many people's lives damaged by having to kill a never-ending stream of kittens and cats" (senior shelter veterinarian)*

False blame can also promote the use of inhumane killing methods; be used as a **justification for cruelty towards cats**, increasing pain and suffering; and be used as an argument for mandatory cat containment which is not an effective strategy for reducing free-roaming cats or associated issues such as potential wildlife predation.

**Habitat loss is recognised as the main threat to Australian native wildlife populations** (Australia State of the Environment Report 2021). In contrast to domestic cats, population studies have found that habitat loss does have a measurable effect on Australian native wildlife populations. Habitat preservation and prevention of land clearing for human use such as urban development and agriculture is likely to be the most effective strategy to protect Australian native wildlife.

**Habitat preservation should be combined with Community Cat Programs**, i.e., high-intensity free desexing of owned and semi-owned stary cats targeted to areas of high cat intake or complaints. These programs significantly reduce the number of unwanted kittens born, free-roaming cats and associated issues such as nuisance or potential wildlife predation.

Additional **effective strategies include; Bed-time feeding – feeding pet cats their evening meal inside after securing them inside for the night, wildlife road safety measures, and targeted protection of threatened and endangered species. Examples include, erecting exclusion fencing around natural habitat, containment fencing in residential areas or around individual houses, providing free-desexing for pet cats and inside confinement at night for both dogs and cats**. This approach is especially important for nocturnal species at risk of predation by cats and dogs.

We strongly recommend that all areas, including in urban and peri-urban areas, that **a list of susceptible species is updated and published, *and* that detailed mapping occurs to document where these species are being found,** to facilitate targeted and microtargeted strategies for their protection that are based on a One Welfare approach. We recommend funding be provided to enable citizen science backed up with camera trap data be used to develop detailed maps across urban areas of Australia to guide strategic protection of species of conservation concern.

**Cat free zones are not supported as there is no evidence that this is effective in protecting native wildlife (Lilith 2010)**. We recommend alternative measures to mitigate cat predation risks. This ensures residents can continue benefiting from emotional support from cats without phasing out pet ownership**.**

The **highest priority voiced by residents for local government management of cats were to prevent kittens from being born (94% of respondents**) followed by stopping cats from preying on native animals (91%); reducing disease spread to pets (89%), wildlife (89%), and humans (87%); decreasing stray cat numbers (75%) (Rand 2024 c). **Desexing was preferred to euthanasia (65% vs 35% respondents).** Therefore, the community wants strategies to reduce kittens being born. **Only Community Cat Programs have been shown** to **decrease number of kittens being born** at the suburb or city level, not the traditional trap, adopt kill programs used for the last 30 or more years. Notably unpublished **camera trap data over 4 years** demonstrate a **reduction of free-roaming cats by more than 50% after implementation of a Community Cat Program** following years of traditional trap, adopt kill methods of cat management (Dutton-Regester 2024 unpublished).

***Recommendation A.1:*** **Reduce the number of free-roaming domestic cats** to reduce potential wildlife predation. by **implementation of Community Cat Programs** instead of ineffective and costly *Trap, adopt or kill* or mandated cat containment.

***Recommendation A.2:*** **Map locations of threatened and endangered wildlife** in urban and peri-urban areas using existing data sets (eg. Bird Life Australia, NSW Government Dashboard), combined with funding citizen science projects backed up by camera-trap data to facilitate targeted protection.

***Recommendation A.3:*** **Targeted protection of threatened and endangered wildlife** by, where appropriate, erecting exclusion fencing around natural habitat, containment fencing in residential areas or around individual houses, providing free-desexing for pet cats and promoting inside confinement at night for both dogs and cats (bed-time feeding of cats).

***Recommendation A.4:*** **Habitat preservation and rehabilitation should be a priority** and road safety measures implemented where there are species of conservation concern

***Recommendation A.5:*** **Cat management programs should be guided by robust scientific evidence** to support the conservation of threatened and endangered wildlife, ensuring that objectives and **key metrics are clearly defined and measurable to evaluate program effectiveness** and inform the selection of the most appropriate strategies.

## (b) The effectiveness of cat containment policies including potential barriers.

**The APWF is strongly opposed to mandated cat containment (night curfews and 24/7)** because it is ineffective in preventing free-roaming cats and therefore unsuccessful at protecting wildlife, and is a barrier to reducing free-roaming cats and associated issues.

Mandated 24/7 cat containment (also known as a 24-hour cat curfew) is generally proposed because of a **belief that it will reduce wandering cats and associated issues** such as nuisance complaints or potential wildlife predation, and protect cats from potential harm. While it seems logical and compelling that mandated 24/7 cat containment would reduce the number of wandering cats and associated issues, this assumption is not supported by the evidence.
The evidence in Australia and internationally clearly shows that **mandated 24/7 cat containment is not an effective strategy to reduce wandering cats or associated issues** such as nuisance complaints or potential wildlife predation.

**In Australia, mandated 24/7 cat containment is already proven to be a failure at reducing wandering cats in both the short, medium and long-term. This is supported by the following data:**

**RSPCA Australia** *Identifying Best Practice Domestic Cat Management in Australia* 2018 report acknowledges:

> *"Overall, local governments with cat containment regulations have not been able to demonstrate any measurable reduction in cat complaints or cats wandering at large following the introduction of the regulations".*

In the **City of Yarra Ranges** (Victoria), **in the 3rd year** after mandating 24/7 cat containment:

- Cat-related **complaints increased by 143%**
- Yarra Ranges Council acknowledged that the significant increase in cat complaints, was likely to be a result of the introduction of a 24-hour cat curfew in 2014.
- **Impoundments increased by 68%**
- Euthanasia increased by 18% (human population only increased by 2%) (Yarra Ranges 2021).