A review of trap-neuter-return (TNR) for the management of unowned cats

Introduction

The management of unowned, stray or feral cats is an extremely complex and emotive issue. Trap-neuter-return (TNR) is one method promoted, primarily in the United States, as a humane alternative to euthanasia for managing and reducing populations of unowned cats. TNR relies on desexing (neutering) a large proportion of a specific cat population to prevent further breeding. A range of arguments are mounted by pro- and anti-cat lobby groups for and against TNR programs. Science is used by most to support their position, and although some good research has been conducted, everyone would agree more is needed. This report looks at TNR from various perspectives in an attempt to understand how useful such programs would be within the Australian context.

Unowned cats – are they feral or stray?

Before considering TNR itself it is necessary to discuss what we mean by an unowned, stray or feral cat. Some overseas researchers simply classify feral cats as those that are not socialised and therefore not able to be re-homed (Bradshaw et al. 1999; Slater, 2002, 2005). This is a purely behavioural definition and, while useful when considering rehoming options for cats, is not helpful in the current discussion. Australian researchers Coman and Jones (1982) split cats into two broad groups, urban and rural, but then described separate types in each group: fully domesticated pets, wandering house pets, semi-domesticated farm cats, and feral cats. Apart from farm cats, all types were present in urban and rural settings. They noted, however, that accurately defining cat types is difficult as cats may switch from one category to another. Moodie (1995) argued for a division into domestic, feral or stray classifying feral as those cats completely independent of humans; strays as those relying to some extent on humans and domestic cats as living with humans and having their needs intentionally met by humans. Stray cats often live in the urban fringes including such places as dumps or other discrete sites. However, there is strong evidence that cats move freely between these urban sites to more distant sites completely relying on predation (Denny, 2005).

For the purpose of this paper, we have used the definitions put forward by Moodie (1995) to describe domestic, stray and feral cats. However, the term 'unowned' cat is used to describe the target of TNR programs. This covers all unconfined (stray and feral) cats that are not under the direct care of humans irrespective of their socialisation status or source (Levy & Crawford, 2004).

Cats enter the unowned population from many sources including domestic cats that have been abandoned, lost or strayed from their owners, cats deliberately introduced to control vermin and through breeding within the population (Robertson, 2008). Cats have the capacity to reproduce from a young age and often. For example, cats can be sexually active from 5 to 6 months of age, and can produce 1-6 kittens, 1.4 times a year (Nutter et al, 2004). In some instances cats may move in and out of this population as their ownership status changes.

Irrespective of where unowned cats come from, how they got there, how friendly they are, and whether they interact with humans or are dependent to some extent on humans for food or shelter, they are roaming free within a particular area. Their impact on the environment in terms of predation and disease spread, their public nuisance and concerns for their welfare, remain issues (Denny & Dickman 2010). Therefore, all such cats should be considered together but some management strategies may not apply to all such cats. The most appropriate management strategy depends on location and local population of native species.

Control of unowned cats

Currently there are a number of management approaches to unowned cats:

- Do nothing
- Kill on site (by trapping or poisoning)
- Trap, remove and euthanase
- Trap, remove, neuter and re-home if possible, and euthanase remainder
- Trap, neuter and return

This paper focuses only on the last option.

According to the Australian Government's National Consultative Committee on Animal Welfare (NCCAW, 2008), any control program should: protect the welfare of cats, reduce impact on wildlife, reduce public nuisance, recognise the value of cats to our community and educate the community.

RSPCA Australia policy states that any program for the control of cats must adopt a holistic, strategic and humane approach and aim to: recognise the value of cats as companion animals and improve the overall welfare of cats; reduce the impact of hunting by cats; reduce the incidence of public nuisance caused by uncontrolled cats; incorporate measures to cover the whole cat population and thus address all sources of the problem (Policy A8.4, RSPCA Australia 2010). RSPCA Australia also endorses several principles for humane pest control including the need for a clear evaluation of the need for a control program, a built-in assessment of the effectiveness of the program, the need to use the most humane method of control available and that the method must be performed effectively over the long term to reduce adverse impacts (Policy E2.9, RSPCA Australia 2010).

Trap-neuter-return

Trap-neuter-return (or release) is one approach to the management of unowned cats which is gaining popularity in many countries, particularly the US (Denny & Dickman, 2010). It focuses on the management of cats in defined populations or 'colonies', where a colony is defined as a group of cats living in the same location and sharing a common food source. It involves capturing cats, sterilising and returning them to the place where they were found (occasionally they are released elsewhere.) Longcore et al. (2009) claim that 71-94% of a colony must be desexed and no new cats join the colony for the population to decline. Other treatments may be performed at the same time such as vaccination, de-worming and flea treatment, and they may be permanently identified by having an ear tip removed. The colonies are then 'managed' to some extent: usually the management includes some level of regular feeding and caring by volunteers. As part of ongoing management, the caretakers will trap and sterilise any new members as they join the colony.

Most TNR programs are carried out in urban or peri-urban areas. Since the recruitment of cats to the colony includes abandoned and stray animals, public education programs and more responsible pet ownership are alternative options to TNR.

The aim of TNR programs is to produce a stable, healthy cat colony with natural attrition expected to eventually reduce the numbers. This has been shown to occur in urban areas when accompanied by an adoption program (Levy, Gale & Gale, 2003), but it requires long-term consistent management. As cats move from one area to another, and people abandon new animals, new recruits join the colony and numbers fluctuate. In fact, once it is known that a TNR program is operating in an area some people abandon their cats nearby knowing they will be neutered and cared for (Slater, 2002).

A 10-year study of TNR programs in Rome, Italy found that although there was a general decrease in the number of colony cats, immigration of cats to the colonies through abandonment and straying was 21% (Natoli et al., 2006). Also, a study of TNR programs in two counties in the USA did not report a consistent reduction in colony growth or the proportion of female cats that were pregnant (Foley et al., 2005).

If reduced numbers of unowned cats is the only aim, TNR seems to be no more effective than euthanasia alone in closed populations and less effective in open populations (Denny & Dickman,

2010). The cost of running a TNR program is also greater than other control methods and one could argue that it may not be the best use of limited resources.

Some have argued that managed colonies can lead to a form of animal hoarding (Lepczyk et al., 2010); others report cats in managed colonies being described as pets (Centonze et al., 2002). However, many cats in colonies continue to have far from ideal welfare status (Jessup, 2004). Jessup (2004) describes TNR as trap-neuter-re-abandon.

TNR is an important element in the 'no kill' animal shelter movement (Winograd, 2007). It is argued that since most unowned cats are not socialised adequately, if they enter shelters they are killed as they are not suitable candidates for adoption. Therefore, if such cats enter shelters it becomes impossible for the shelter to become truly 'no-kill'.

Ethical considerations

TNR raises a number of fundamental ethical questions which revolve around society's responsibility towards unowned cats. Do cats hold a special position with respect to humans and does that mean they are, and should be, treated differently from other free-living introduced animals? Most other introduced species are considered pests, and programs such as TNR are not generally considered for them. Feral dogs, camels, pigs, goats, foxes and rabbits are routinely killed due to their pest status (Lepczyk et al., 2010).

RSPCA shelters take in around 65,000 cats every year: on average, 40% of these are euthanased. A third of euthanased cats are put down for behavioural reasons, ie they were not socialised or behaviourally suited to a home situation. Feral cats represent a large number of these kittens and cats. Do these animals deserve the right to live? Also, what about the wildlife they kill – do they deserve the right to live?

TNR has its own ethical issues such as the question of interfering with a free living animal and then returning it, altered, to its home range (Jessup, 2004). The neutering may change its success and even its welfare in the wild. Neutered animals are thought to be lower down the feline hierarchy than entire animals and may lose out to fertile others.

Finally, is it ethically defensible to introduce TNR programs with the purpose of reducing euthanasia rates in animal shelters?

Conservation considerations

People who argue for and against TNR agree that cats have negative impacts on wildlife populations; they just disagree on extent. There is much debate on this issue and science can throw up conflicting results.

Grayson and Calver (2004) argue that the precautionary principle should be adopted when considering the issue of the effect of cats on wildlife populations. The precautionary principle states that when there are threats of serious consequence, lack of full scientific knowledge should not prevent measures being taken to prevent these threats. That is, there is a need for action despite uncertainty. In this situation this means that TNR cannot be used because there is a risk to wildlife.

Feral cats represent a threat to over 110 species in Australia, more than any other exotic animal or plant (Coutts-Smith et al, 2007). This threat is usually through predation but can include disease spread and competition (Denny & Dickman, 2010). This threat is recognised by the Commonwealth Government under its *Environment Protection and Biodiversity Conservation Act 1999* and by some state legislation, for example, the Victorian *Flora and Fauna Guarantee Act 1988*. Cats can predate on small to medium sized mammals, birds, reptiles, amphibians and insects. Cats are on the list of the 100 worst invasive species globally (Lowe et al, 2000 in Longcore et al., 2009).

Cats are an exotic species so do not fill any existing niche (Longcore et al., 2009). Also, there seems to be a ready supply of cats to populate colonies and this results in cats often being at densities 10-100 times higher than other similar sized predators (Liberg et al, 2000). If the TNR program is accompanied by ongoing feeding and care (which it normally is) the home range of the colony tends to reduce which will alter, but not eliminate, the predation effect.

However, a study in suburban bushland in Sydney found that the presence of cats decreased the richness of bird species but reduced the predation in above the ground bird nests (Dickman, 2007).

That is, the cats were killing another pest species, the rat, which normally steals the eggs. Similarly, in a study in suburban Perth, cat density was not correlated with bird species richness, rather distance to nearby bushland, housing density and size of nearby bushland were (Grayson et al., 2007). Both these studies were in suburban settings so may not relate to more extensive bushland.

An issue worth mentioning is the role of cats in killing other pest species such as mice and rats. The two examples mentioned in Sydney and Perth show that cats have a role in reducing these species which themselves predate on birds. Some studies on islands have shown that if the cat numbers are reduced (by whatever means), the rat and rabbit populations skyrocket (Robertson, 2008). In other words, controlling cats alone is not the answer for positive conservation outcomes; all species with a negative environmental impact need to be managed in an integrated way.

Animal welfare considerations

Animal welfare considerations must take into account the welfare of unowned cats but also the welfare of the species upon which they prey. Feral cats are known to kill and maim native animals (Coutts-Smith et al, 2007). If we feel it is incumbent upon us to consider the welfare of individual cats then the same is true for each native animal (Lepczyk et al., 2010). Conservationists tend to consider population effects of feral cats; will the cats have any negative effect on the species? (Longcore et al., 2009). Bird lovers, in contrast, may be more concerned about the death of each individual bird even if it is a common species. The birds and animals attacked by cats suffer negative welfare outcomes.

There is evidence that at the level of the individual, cats benefit from TNR in terms of their health; body score index improves and their life expectancy increases (Robertson, 2008). They are often vaccinated at the time of capture so have immunity to common feline diseases. Also, fighting between desexed males will be less and therefore too the possible injuries and abscesses that follow fighting. However, as stated above, other studies have found little improvement in welfare (Jessup, 2004).

Some argue that these benefits should be a consideration when thinking about a TNR program. They argue that unowned cats suffer high mortality rates, high rates of disease, parasite burdens and a poor quality of life. However, others argue that if the cats are considered wild these types of welfare outcomes are a normal part of such an existence. We do not interfere in other wild animal populations. For example, it is unlawful to feed the dingoes on Fraser Island (*Nature Conservation Regulation 1994* and *Recreation Areas Management By-laws 1991).*

There is also evidence that although the process of capture, surgery and transportation of the cats can be distressing and have some welfare implications, overall the process can be successfully managed to minimise these effects (Looney et al, 2008). A reasonable number of trapped cats will be pregnant, depending on season when trapping is carried out, but most of these can still be successfully neutered (Scott et al., 2002).

Legal considerations

Each state in Australia has its own laws with respect to animal welfare and feral or pest animal management that have implications for the status and treatment of unowned cats (see Denny & Dickman 2010 for further detail). These laws vary in their provisions, but in some jurisdictions they may act to prevent the application of TNR programs where it is unlawful to abandon an animal or release a feral or pest animal.

The term abandonment is not always clearly defined in animal welfare or domestic animal management legislation. The legal interpretation is commonly that abandonment includes intent to permanently abandon an animal by dumping it somewhere or by moving house and not returning. This leaves a grey area regarding animals that are trapped, neutered and released into the care of a community caregiver who feeds and monitors the animals.

In Victoria it is an offence to abandon a cat (or dog) under section 33 of the *Domestic Animal Act 1994*. It is also an offence under Section 9.1h of *Prevention Of Cruelty To Animals Act 1986*. However it is not clear whether animals released under a TNR program where they are continually managed constitutes abandonment.

In Queensland, it is unlawful to release a feral animal back into the wild (*Land Protection (Pest and Stock Route Management) Act, 2002)*. Therefore, TNR would not be lawful in Queensland under current legislation. Queensland's *Animal Care and Protection Act, 2001* could be interpreted to allow a managed TNR program to occur. However, the *Land Protection Act, 2001*, takes precedence over the *Animal Care and Protection Ac, 2001*.

Would TNR programs work in Australia?

This is a difficult question to answer. First, the aim of the program would need to be clear so that the outcomes could be assessed. Various interest groups with their different perspectives have divergent aims and therefore will judge success differently.

Another important issue is how well studies conducted overseas, particularly in the US, apply to the Australian context. The native animal populations in the two countries differ markedly. Apart from the dingo, Australia has no large, free-ranging predators as does the US. Therefore, cats are rarely predated on. Also, most of our native species are small and vulnerable to predation by cats, and some are classified by the Government as threatened or at risk. Cats are capable of taking some Australian species to the point of extinction. Already Australia has lost more native species than any other country, mostly due to human interference and loss of habitat.

Most of the research into TNR has been conducted in the US. At best, the results suggest that if the aim is to reduce the number of cats in a particular location then a well-managed TNR program which includes the rehoming of kittens and euthanasia of old and sick cats can be as effective as culling alone. However, TNR is more costly. Both of these methods require on-going monitoring and can never be viewed as a one-off solution. Denny and Dickman (2010, p.36) claim that researchers agree that TNR is 'unlikely to be effective in widely dispersed, open cat populations, as occurs throughout much of the Australian mainland'.

If wildlife protection is the main concern, then TNR may not be the answer. Cats, even in a managed TNR program that are being fed regularly, hunt and kill wildlife even if the home-range is reduced. Feral cat populations in remote Australia would not be suitable candidates for TNR due to the distances involved, lack of resources to conduct TNR and to ensure long-term management, and the adverse impacts of maintaining a cat population in areas of ecological importance.

If welfare is the driving force, then again TNR is not necessarily the solution. There is evidence that cats have better welfare if part of a managed program, but other studies suggest otherwise.

Many researchers argue that future solutions actually lie in solving the problem before it starts. This is through responsible cat ownership, enforcement of cat registration and confinement, neutering of cats, and general education about the value of cat ownership and what responsible ownership means. The money invested in TNR programs would be better spent on education and community awareness and cat desexing programs.

There is also some evidence that when TNR programs are introduced a general community feeling develops that the problem is solved. It appears to remove the responsibility of individual members of the public to look after their cats because someone else will.

Conclusions

The management of unowned cats, and whether TNR is the best solution, are both extremely complex issues. Feral and stray cats exist in Australia because of actions taken by humans. They suffer ill health, starvation and poor welfare, they predate on wildlife and in turn cause suffering to their prey. In areas of ecological importance, they have a significant adverse impact on some threatened or sensitive species. Yet it is accepted that it is impossible to eradicate feral or stray cats from mainland Australia, which means that control must be considered as an ongoing activity (NCCAW 2008).

There is no simple or 'one size fits all' solution. There may be some well defined and contained areas where an unowned cat population is having a limited influence on wildlife where a TNR program could be a good option. Such a program would need to be well managed and have sufficient resources to continue over time. It would need to include desexing of adults, re-homing of kittens and adults that are socialised to humans, and euthanasia of older or sick animals. However, as a long term strategy, in most of Australia, it is difficult to recommend (Denny &

Dickman, 2010). Also, the strategy may contravene existing animal welfare or pest/feral animal management legislation in some jurisdictions.

Since resources for cat control are limited, resources in and around towns and cities would be better spent on education, increased community awareness about responsible cat ownership, targeted desexing programs particularly for low-income earners, and better laws and regulations. These strategies should reduce the number of owned animals and their offspring entering the unowned cat population.

For remote Australia where feral cats are completely unsocialised and therefore not candidates for rehoming, the most cost-effective and humane option is likely to be targeted and ongoing lethal control in priority areas where adverse environmental impacts are highest.

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