Cats and wildlife in the urban environment - a review

Barbara Fougere

ABSTRACT

Wildlife conservation has recently become a motivation for the introduction of cat controls in the urban and peri-urban environment. However there is little research to quantify the impact of domestic cats on wildlife within the context of other negative effects such as habitat destruction, motor traffic and other domestic pets. The cost effectiveness of cat controls versus habitat rehabilitation in increasing native wildlife in urban areas and the cost benefits of pet ownership to people living in urban areas needs to be considered. This presentation examines the debate through a review of relevant literature concerning domestic cats, predation and wildlife.

HOUSEHOLD CATS AND WILDLIFE

The cat is a very popular companion animal and it is estimated that one third of all Australian households have at least one cat[1]. Studies show that the majority of urban cat owners are responsible owners. Australians have one of the highest cat desexing rates in the world (over 91% of cats are desexed)[2]. Cats make ideal pets for urban living. They are compact, easy to care for and ideal for lifestyles that require their pet to be alone for long periods of time. Cats also offer companionship and health benefits, which contribute to saving the Australian health budget $2.2 billion dollars annually[3], yet current figures show that cat ownership in Australia is declining[4] from 3.2 million owned cats in 1989 to 2.57 in 1999.

The decline in the owned cat population[5] may in part be due to the perception that cats are a threat to wildlife. In market research it is the second major reason for not owning cats after "dislike of cats" (PCIAS). This strong perception may be due to the frequent lack of distinction between owned cats, stray and feral cats[6] in the popular media. Images of cats with prey in their mouths are also very powerful. But does this lumping together of feral, stray and household cats and violent images realistically portray the hunting behaviour of the pet cat?

Is the well-adored household moggie a real threat to urban and semiurban wildlife? Or has the moggie simply become the symbolic scapegoat for wildlife threatened by the much greater force of urbanisation?

ACTUAL PREDATION BY HOUSEHOLD CATS

Do cats kill wildlife? What do they catch? How many do they catch? When do they catch?

Some cats are predators, but not all. Several surveys report that between 36%-56% of owned cats have been observed to hunt[7] meaning some 64% to 44% of cats are not observed to hunt. Reark (1994) found domestic cats catch on average 4.76 prey per year of which 3.19 are vermin and introduced species (67%). Barratt (1998) found that cats collected 10.2 prey (1.94 native animals) per cat per year with 70% of cats observed to take less than 10 prey per year, but 6% of cats caught more than 50 per year, thus bringing the overall average up. Barratt (1997) found that 74% of household cat prey was introduced species (rats, mice, mynah birds and others).

Cats have a preference for small mammals, then birds, other vertebrates and then invertebrates (such as insects) especially those with body weights less than 100grams[8]. The fox is also a threat and it has been asserted that all native mammals that fall in the weight range of 120-5000g are at risk from extinction when the fox is present[9]. Barratt[10] found that cats appear to hunt mammals that are most abundant. So that whatever is in good supply will be preyed upon (including mice and juvenile rats). He also demonstrated that cat movement from residential environments to surrounding habitat is significantly higher at night than daytime, lending weight to the practice of keeping cats indoors from dusk until dawn.

Contrary to popular myth of the cat lurking in the tree, cats hunt mainly on the ground and animals that live high in the foliage and are able to pass easily from tree to tree without coming to ground are relatively safe from predation[11]. This is a particularly good reason to encourage the planting of native flora especially trees in urban areas. Other research on domestic cats in Australia has focused on the wide diversity and quantity of prey species caught by cats, but not on the actual impact of predation on native and introduced species[12].

SIGNIFICANCE OF PREDATION BY CATS

So the perception that the average household cat in an urban area is a great threat to wildlife is probably as yet unsubstantiated. What do we know about the impact of domestic cats on wildlife? Does it really matter? Is predation actually threatening biodiversity?

Lowe (1999) in his book 'Feral Future' points out that because urban cats may be observed to kill birds, they are often condemned as major killers, second only to their feral cousins. However "ecologically there is nothing wrong with this - predation is a fact of life". Lowe discusses the fact that pet cats are the urban equivalent of other bird predators like falcons and owls and that hunting only becomes a worry if death rate of birds exceeds their birth rate. He also refers to some studies that show that leafy suburbs actually support more birds than intact forests, despite all the cats. And importantly, if any species is threatening birds in suburbia it is the pied currawong, a vicious native that raids nests and devours chicks and eggs.

Nattrass (1992) argues that the common assertion that major extinctions of wildlife will result from a lack of cat control of urban cats is unsupportable because there is essentially a lack of convincing information to support this view. As well (and irrespective of their accuracy) cat predation estimates alone as reported in several studies do not necessarily reflect relative impacts on different prey types. Nor do high predation rates prove those prey populations are detrimentally affected. This is especially relevant for highly disturbed and modified environments such as suburbs. Indeed Nattrass (1992) suggests that cats and dogs can in fact continue to harvest a surplus of individuals of a wide variety of relatively common wildlife species. And provided that sufficient areas of preferred habitat remain relatively intact, cats and dogs may pose no long-term threat to species survival.

Likewise some surveys seem to be contradictory to the perceived threat of cat predation. For example one study[13] found that in Melbourne wildlife shelters the Common Ring-tailed Possum was the most frequently recorded native animal injured by cats. Yet this species is one of the most common native mammals in Melbourne. Another study[14] showed that the most popular native prey species of domestic cats in Canberra did not appear to be affected by apparently high rates of predation, with ten years of bird count records showing recent increases in the abundance of this favoured prey species.

However in a small number of studies there is evidence that domestic and stray cats have minor or major impacts on native wildlife through predation and transmission of disease (e.g toxoplasmosis) usually on local populations rather than regional populations. In one case of the Eastern Barred Bandicoot in Hamilton Victoria, the population plummeted from 1750 animals in 1982-83 to 150-300 in 1989. This population reduction was caused by several factors including gross habitat modification, grazing and predation. Domestic and stray cats were thought to have a major impact under these conditions where ground cover for bandicoots is scarce[15]. However it is important to note that these bandicoots are "doing well in Tasmania, an island that is cat infested but fox free" (Lowe 1999).

But where feral cats exist, including peri-urban environments there is no doubt that they have a negative impact on native species. This is especially true for island ecosystems, where in specific cases feral cats have caused extinction[16]. And while the idea of eliminating cats in sensitive areas seems logical, it is important to note recent work that emphasises eradication of super-predators (such as feral cats) is not always the best solution to protect prey when there are introduced meso-predators, such as rats present[17]. In some ecosystems, after super-predators like feral cats are eradicated, there is a potentially greater threat for wildlife due to a burst in population and predation by the meso-predators. This can lead to extinction of the previously shared prey. This has particular relevance to domestic cats in urban areas where banning cats may have a paradoxical effect if meso-predators exist (such as rats) or perhaps little effect if other predators like foxes are present.

ARE THERE ANY BENEFITS TO PREDATION?

Could predation by cats possibly be beneficial? Atkinson (1985) suggests that cats may have a beneficial effect on wildlife by stabilising numbers of rabbits (which have substantial effects on ecosystems) and exotic rodents such as rats (sometimes a more serious predator of wildlife). In one study mammalian remains were found in 75% of cat scats in parks in Melbourne, of which rabbit was found in 56% of cat scats[18]. House mice (35%), Black rats (33%) and Common Ringtailed Possums (41%) were the most prevalent mammals found in cat scats in another survey in an urban park in Melbourne[19].

Barratt (1998) also observes the predation by cats on introduced species of birds being more common than on native species. Introduced Starlings displace several native birds[20], Blackbirds are aggressive competitors with native birds[21], and Common Mynahs compete with parrots for nesting sites[22].

These introduced species are increasing despite predation by cats. The effect of predation by cats on competition between introduced and native species, particularly birds, and the influence of house cats on the invasion of new suburban environments by native wildlife (relative to habitat effects) is worthy of further study[23].

PREDATION FROM A WELFARE PERSPECTIVE

Wildlife welfare is also an important issue and is reason enough to reduce potential predation by cats and dogs. It is however interesting to note that in one survey that examined the causes of mortality and injury to fauna submitted to wildlife shelters in Melbourne and rural centres, the highest recorded cause of injury was motor vehicles then human interference and thirdly cats[24]. Similarly, in a study of the population biology of long-nosed bandicoots at Sydney Harbour National Park, the main causes of death were identified as road trauma (approx) 58% and then predation by cats and foxes (approx) 37%[25].

In another recent survey by WIRES (1997), 87% of surveyed road kill identified were native species and the author estimated that some 12 million native animals are killed each year on roads. A reported study on eastern quolls and Tasmanian devils in the Cradle Mountain area of Tasmania that spanned the period before and after a road was sealed, found that the populations of both animals were decimated as the traffic speed increased. The effect was such that the population of eastern quolls had become extinct while the Tasmanian devil population had reduced to about 20 animals from the original 39[26].

Dickman (1996) estimates that some 2.2 million native animals are taken by domestic cats each year in Australia[27]. Based on the current population estimate of 2.593 domestic cats in Australia, with 56% hunting between 1.94 and 3.4 native animals per year[28], 2.82 million to 4.94 million native animals are caught each year. On the basis of extrapolations alone and the WIRES survey, it could be argued that motor vehicles are a more serious threat to wildlife and wildlife welfare than domestic cats.

HABITAT DESTRUCTION AND WILDLIFE

Cat predation is only one of a host of environmental hazards to native wildlife, the foremost being destruction of habitat, followed in no particular order by cars, foxes, rabbits, rats, hoofed animals, changes to water ways, introduced birds, pollution and others[29]. Natrass (1998) states that habitat destruction due to urbanisation, industrialisation and the keeping of horses is often final with the species becoming locally extinct. It is habitat destruction, which is the greatest threat to wildlife[30].

Jackson (1999) confirms Nattrass's views and also comments that the practice of banning cats in new subdivisions to protect wildlife is not based on sound evidence. In fact, Australia has denuded more than 55 million hectares of land and is currently clearing 309 000 hectares of wildlife habitat a year. Jackson points out that an extensive literature search demonstrates that this habitat destruction is the single most important threat to native wildlife in Australia. It is estimated that more than half Australia's bird species could be extinct within a century because of the loss of this habitat from land clearing and grazing. While much of the clearing is due to rural activities, new subdivisions in sensitive urban fringe areas are a contributor to this process. She concludes that it is not the cats that should be banned but the new developments.

Barratt (1998) says it is not surprising that wildlife populations in established suburban areas do not appear to be threatened by predation from house cats. He says species that breed in suburban environments have either persisted through the disturbances associated with the establishment of the suburb including the introduction of cats, or have invaded the suburban environment as habitat quality and diversity have increased with suburb age, irrespective of predation by cats. However he does suggest that the impact of domestic cats is likely to be most significant in undisturbed habitats such as those adjacent to new residential developments.

CONCLUSION

It is therefore useful to put the issue of domestic cats and wildlife into perspective and to be wary of singling household cats out as responsible for declining wildlife in urban areas. Cat owners should not feel or be made to feel guilty about owning cats. While preservation of wildlife in urban areas and the welfare of wildlife are both important and desirable community goals, it is also necessary to acknowledge the importance pet owners place on their animals and the recognised benefits of companionship and health that pets offer to those in the community.

Local authorities and planners (with one third of their constituents owning cats) in consultation with the urban animal experts may benefit from researching the impact of urban development on native fauna before implementing cat controls, especially in the case of new developments.

Despite habitat destruction being the clear determinant of wildlife survival, there is enough evidence available to indicate a reduction in the number of free ranging cats (especially stray cats) in urban areas would lead to a desirable increase in biodiversity in Australian cities[31] as would retention of suitable habitat. Likewise more research is needed to determine the cost effectiveness of cat control versus habitat rehabilitation (planting of trees and native shrubs to encourage native wildlife) in increasing native wildlife in urban areas.

The facts are that the majority of domestic and stray cats live in highly modified environments- suburbs, so their impact on native wildlife is difficult to distinguish from the impact of introduced species and habitat change. In sensitive areas controls on cats need to be part of a holistic approach to wildlife management with education (as opposed to legislation) being an important part of the community's contribution to environmental improvement. Such education would also encompass reducing pollution, protecting undisturbed habitats, planting flora that attracts and support native species, driving carefully and keeping cats indoors at night. This way the community can enjoy the benefits of responsible pet ownership and contribute positively to native wildlife.

Footnotes

[1] Reark 1994

[2] PCIAS 1999

[3] Heady etal. 1999

[4] Baldock 1999.

[5] The household cat population has declined from 3.2 million cats in 1989 to 2.57 in 1999, a drop of 20% despite a rising human population and dog population.

[6] Feral cats are defined as those that have none of their needs provided by humans, and their population size fluctuates largely independently of humans. By definition, feral cats do not live around centres of human habitation. Stray cats or unowned cats have many of their needs indirectly supplied by humans (shelter and food). The population of stray cats is partly controlled by human provision of these resources (e.g. rubbish tip sites). Stray cats are not necessarily domestic cats that have strayed (which are used to living in a home and likely to find themselves another one), but are probably born in the 'wild', are unsocialised and then live in and around human habitations. They can interbreed with domestic cats. Domestic cats or 'pet' cats live entirely with humans. Their ecology is different from stray and feral cats and is completely dependent on humans who provide food, water, shelter and a social structure, and affect mortality by controlling disease. Even opportunities to breed are largely controlled by humans, as around 90% of owned cats in Australia are desexed (Cat Management Strategy- 'Cat Kit' South Australia).

[7] Robertson 1998, Perry 1998, Reark 1994

[8] Dickman 1996

[9] cited in May, Norton 1996

[10] Barratt1995, 1997, 1998

[11] Barratt 1995, 1997, 1998

[12] Nattrass 1992, Paton 1990, 1991, Brunner etal.1991.

[13] Dowling etal (1994)

[14] Barratt (1998)

[15] cited in Dickman 1996

[16] Fitzgerald (1988)

[17] Courchamp etal 1999

[18] Wallis etal.1996

[19] Brunner etal 1991

[20] Taylor and Canberra Ornithologists Group 1992

[21] National Capital Development Commission 1984

[22] National Capital Development Commission 1984

[23] Barratt 1998

[24] Dowling 1994

[25] Scott etal 1999. The estimate of 59% for road kill may be an overestimate due to ease of finding road deaths, and the predation by cats and foxes may be an underestimate due to difficulty of locating carcasses unless radio collared.

[26] Cited in ëCaring roads cut carnageí in The Sunday Tasmanian 2 August 1998.

[27] based on the finding of Reark (1994)

[28] Barratt 1998

[29] Nattrass 1993

[30] Examples of habitat changes are: loss of nesting sites ó old and dead trees, in old growth forests and urban areas being removed for saw log supply, wood-chipping, pastoral land clearing, or housing and urban development; filling of creeks, ponds, swamps and wetlands; paving of gardens; weeds growing in bushland (pushing out the native plants which are food & shelter); introduction of feral and domestic animals into areas of habitat; removal of bush-rock which provides shelter for animals, especially reptiles; breakup of territory - by houses, roads, crops, barriers; installation of electrical wires; creation of land fills for rubbish (WIRES)

[31] Tidemann 1994

REFERENCES

Atkinson. 1995. Cited in Tidemann, CR. Yorkston, HD. Russack, AJ. The diet of cats, Felis catus, on Christmas Island, *Indian Ocean Wildlife Research*, 1994, 21, 279-86.

Baldock, C. 1999. Australia's Declining Household Cat Population - Forecasts, Impacts and Reasons - A Report of an Analysis. AUSTVET 30/4/99.

Barratt, DG. 1998. Predation by house cats, Felis catus (L.) in Canberra, Australia II Factors affecting the amount of prey caught and estimates of the impact on wildlife. *Wildlife Research* 1998 we, 475-487.

Barratt, DG. 1997. Predation by house cats Felis catus in Canberra Australia. Prey Composition and preference *Wildlife. Research* 24, 263-277.

Barratt, DG. 1995. Movement patterns and prey habits of house cats Felis catus in Canberra, Australia M App Sc Thesis University of Canberra.

Brunner, H. Moro, D. Wallis, R. Andrasek, A. 1991. Comparison of the diets of foxes, dogs and cats in an urban park. *Victorian Naturalist* Vol 108. No.2.

Courchamp, F., Langlais, M and Sugihara, G 1999 Cats protecting Birds: modelling the mesopredator release effect, *Journal of Animal Ecology* 1999, 68: 282-292.

Dowling etal. 1994. Cited in Dickman, C. 1996. Overview of the impacts of feral cats on Australian fauna. Prepared for the Invasive Species Program, *Australian Nature Conservation Agency* (University of Sydney: Sydney).

Dickman, C. 1996. Overview of the impacts of feral cats on Australian fauna. Prepared for the Invasive Species Program, *Australian Nature Conservation Agency* (University of Sydney: Sydney).

Fitzgerald. 1988. Cited in Tidemann, CR. Yorkston, HD. Russack, AJ. The diet of cats, Felis catus, on Christmas Island, *Indian Ocean Wildlife Research*, 1994, 21, 279-86.

Heady, B. Krause, P. 1999. Health benefits and potential budget savings due to pets: Australia and Germany survey results. *Australian Social Monitor* Vol 2, No 2, May 1999-10-27.

Jackson, H. 1999. Urban Planning Consultant specialising in Animal Management. Position statement on Cat Management. Unpublished. H Jackson Pty Ltd, 288 Brunswick St Fitzroy 3065.

Lowe, T. Feral Future -The untold story of Australia's Exotic Invaders, *Viking Penguin Books* Australia 1999.

May, S and Norton, TW. Influence of fragmentation and disturbance on the potential impact of feral predators on native fauna in Australian forest ecosystems. *Wildlife Research* 1996. 23:4, 387-400.

Nattrass, R. 1992. Wildlife Conservation in the Urban Environment: are Pets a threat? Urban Animal Management *Proceedings of the First National Conference on Urban Animal Management in Australia, Brisbane*.

Nattrass, R. (1993) A model for cat control. In Paxton (ed) *Urban Animal Management Proceedings of the Second National Conference on Urban Animal Management Conference in Australia* 1993

Norris, PA. Shinew, KJ. Chick, G. Beck, AM. 1999 Retirement, life satisfaction, and leisure services the pet connection. *Journal of Park & Recreation Administration* 1999 17:2, 65-83

Paton, D. 1990, 1991. The impact of cats on native wildlife ñ *proceedings of a workshop 8-9 May 1991*, Canberra, Australia.

PIAS 1999 Pet Care Information and Advisory Service Melbourne, *AC Neilson Survey for 1998*

Perry, G. Cats-perceptions and misconceptions: two recent studies about cats and how people see them. *Urban Animal Management Proceedings* 1999.

REARK Research. 1994. The Metropolitan Domestic Cat. Millwood J Heaton T.

Robertson, ID. 1998 Survey of predation by domestic cats AVJ 76 (8): 551-4 August.

Scott, LK. Hume, ID. Dickman, CR. 1999 Ecology and population biology of long-nosed bandicoots (Perameles nasuta) at North Head, *Sydney Harbour National Park Wildlife Research* 1999. 26:6, 805-821.

Shillingford, B. 2000 Urban Fox Control gene-emergency@bigpond.com.au personal comment August 2000.

Taylor. 1979. Cited in Barratt, D. 1994. Using theory and scientific experience to assess the impact of house based domestic cats. Felis catus on prey populations and prey community structure. *Urban Animal Management. Proceedings of the Third National Conference on Urban Animal Management in Australia.*

Tidemann, C. 1994. Do cats impact on Wildlife? *Urban Animal Management Proceedings of the Third National Conference on Urban Animal Management in Australia.*

Wallis, R. Brunner, H. Seeback, J. 1996. *The Victorian Naturalist* Vol 113, (6) 300-305 Diet of Red Foxes & Cats: Their impact on fauna living in parks in Melbourne.

WIRES. 1997. Road Kills of Animals on some NSW roads. Report on data collected by WIRES Volunteers in 1997.

ABOUT THE AUTHOR

Barbara Fougere
Level 1, 346 Darling St
Balmain NSW 2041
Ph: 02 9555 4249

Barbara is a veterinarian in Sydney who practices part time and has interests in the human-companion animal bond and animal welfare. She is the director of Veterinary Communications Australia offering communication and training services to the veterinary and pet industry. During her career she has worked in wildlife practice, travelled, studied, worked for a veterinary pharmaceutical company and pet food company. Most recently she conducted this literature review with the support of Pet Care and Advisory Service to inform the veterinary profession of the cats and wildlife debate.

UAM 2000 Index Page