

Native Mammals as Pets

Attitudes and Opinions of Ku-ring-gai Residents

For Peter Clarke, Ku-ring-gai Council, by Sarah Turp



2009

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Executive Summary

Australia has one of the highest levels of pet ownership in the world however there is strict legislation regulating ownership of particular species. While a number of states have revised legislation to allow the keeping of native species New South Wales remains mostly conservative, only allowing two native species to be kept on a private level. At present it is mostly unknown whether the “blanket ban” on private ownership of native mammals is actually of any benefit. Many species have become endangered by loss of habitat and lack of awareness by local residents causes conflict. It is argued that by introducing native mammals into the pet industry conservation, education and a sense of culture within communities can be encouraged. This project is an investigation into the attitudes and awareness of Ku-ring-gai residents towards native mammals and their possible introduction into the pet industry. Primary research was conducted through self completion surveys, where 300 surveys were sent to residents selected at random through the Ku-ring-gai Council database of postal addresses.

The results of the surveys showed that there was no significant difference in responses between the different sexes of residents. Variations in responses occurred from the oldest of the four age groups (66+) when compared to the three younger age groups (18-30, 31-50, 51-65) when asked to describe what qualities they looked for in a pet and what they were willing to pay for a pet. It became evident that there was a lack of knowledge amongst the community when it came to native mammals with 48% admitting they have a limited awareness of native species. Responses regarding whether native mammals should be included in the pet industry were generally similar across all age groups with 75% of all respondents siding against the proposal. It was determined that the residents of Ku-ring-gai council are unprepared to accept native mammals as pets at the present time. This may be improved through education regarding conservation and the benefits of owning native species as an alternative to current pets.

Introduction

Pets play an important role in every stage of human development. For children pets provide lessons on responsibility, care, communication, confidence, friendship and mortality. For adults pets become companions for those living alone, a sense of purpose to the elderly (EPFIF 2008).

Pet ownership is an ever expanding enterprise. Millions of pets are kept worldwide, and new species are being introduced and becoming more popular each year. However not all species are suitable as companions for humans and due diligence should be taken when deciding to introduce a new species into the pet industry (Auty 1996). Australia's pet ownership is amongst the highest in the world. Approximately 70% of households across Australia currently own a pet, 53% of which own at least one dog or cat, and approximately 88% have owned a pet at some stage (Headey 2006, Vic parliament 2002).

In New South Wales all native mammal species, except for the dingo, are protected. As such dingoes are the only native mammal that can be owned privately as a pet without having to acquire a licence from National Parks and Wildlife Service (NPWS) (DECC 2008). Only two other native mammals can be kept as pets in NSW and a licence from NPWS is needed to keep them. These are the spinifex hopping-mouse, *Notomys alexis*, and the plains rat, *Pseudomys australis* (Croft 2000).

It has recently become legal to keep a select group of native mammals in Victoria and other states through a tiered licensing system, similar to the one used for reptiles in NSW, however there has been little research conducted into the success of keeping native marsupials. It is still relatively difficult to obtain most marsupial species (Marsupial Society of Australia Forum 2009). Residents of NSW are mostly unaware of Australia's native fauna (Hopwood 1996) introducing native species into the pet industry may assist in broadening awareness and increase sentimental value of these animals. This could then aid the conservation of many

species. There has been a great deal of debate amongst wildlife carers and conservationists in regards to the ethical, practical and conservation considerations. Despite this being an ongoing deliberation there has been little input from the wider community and as such it is mostly unknown whether natives would be accepted into the pet industry.

Ku-ring-gai council is interested in providing an alternative to the introduced species that are currently kept as pets in the area (dogs, cats, rabbits etc). Native mammals are a natural substitute that are argued to cause less impact on the surrounding environment, increase education and awareness, and may also aid conservation efforts. This project is a study into the attitudes of Ku-ring-gai residents towards keeping Australian native mammals as pets. It was also an objective to determine awareness of wildlife in general and trends and attitudes of pet keeping in a wider context. It was hypothesised that there would be a difference in opinions between different age groups and sexes amongst the population. The aim was to determine whether the general population is open to the concept of native mammals as pets and to determine some criteria that native species would need to meet to be accepted by the community and the pet industry.

Literature review

Pet keeping around the world.

While dogs and cats are indisputably the most popular of pets there is much more variety to be found. Many people lack the time or space to adequately care for these species and as such choosing smaller animals as pets is becoming increasingly popular. Animals such as rabbits, guinea pigs, rats, mice, ferrets, birds, reptiles and fish that can be kept in small enclosures inside or in the ever shrinking backyards of modern suburbia (EPFIF 2008). Pet ownership is often seen as a status symbol. New species introduced to the industry are quickly taken up by the public as a novel and trendy distraction, often with little thought to the husbandry requirements of the animal. The recently developed craze of “pocket pets” in America is widely aimed at owning sugar gliders, *Petaurus breviceps*, and the idea is that the animals are small enough to carry with you wherever you go (Pet Industry News 2007). There is little research done into the effects this sort of treatment has on the animals. Popular culture does not only encompass novel ideas such as “pocket pets”, larger more impressive pets are also common in America and the UK. Large mammal species such as primates and big cats and exotic birds and reptiles are popular amongst the wealthy (Grier 2006).

It is estimated that noncompliance with the UK’s Dangerous Wild Animals Act 1976 licences is between 85 and 95%. For example there are approximately 655 legally held primates in the country, therefore the actual number of primates kept as pets in the UK could be anywhere up to 62 ,000 animals. There are approximately 15,000 legally kept primates in America; with the level of noncompliance estimated to be similar to those in the UK (Soulsbury *et al* 2009).

Schuppli and Fraser (2000) developed a tiered system to determine the suitability of a species as a pet. Using this system it can be concluded that primates are a category E animal:

“Species that are unsuitable as companion animals because of undue risk to one or more of: the animal, the owner, the community or the environment”.

Pets also pose a financial burden through feeding, housing and vet costs some animals can incur bills into the thousands of dollars (PFMA 2008), added to this are the time requirements of many animals; most dog species should be exercised at least once a day (Headey 2006). And finally when the pet dies, there is often psychological trauma, as the owner experience the loss of a close companion (Mayon-White 2005).

Pets in Australia

Wildlife on the Black Market

The illegal trade of wildlife and their products is a long established business that is worth an estimated US \$20 billion annually (Alacs & Georges 2008). This is a wide spread and sophisticated network of criminals operating across most of the worlds continents. Due to its highly unique native fauna Australia is a key focal point of smuggling operations. The illegal smuggling of wildlife poses many threats to Australian biota. Many animals die in transit, over exploitation of wild populations can lead to extinction (Soulsbury *et al* 2009), animals brought into the country are a bio-security risk as they may escape captivity and establish pests populations, and as they do not go through customs they may also bring disease, parasites and seeds into Australia which has the potential to have a devastating impact on native fauna and agriculture industries (Australian Customs 2009).

Australia is one of the 172 signatories of the Convention on International Trade of Endangered Species of Wild Fauna and Flora (CITES) which, developed in 1963, aims to conserve wildlife by monitoring trade in plants and animals to ensure it does not threaten the survival of a species (Australian Customs 2009). Australia regulates its wildlife trade under Part 13A of the Commonwealth Environmental Protection and Biodiversity Conservation Act

1999 (EPBC Act) under which the harshest penalties for black market wildlife trade are given to offender. Fines of up to \$110,000 for an individual or \$550,000 for a corporation and up to 10 years imprisonment apply in Australia (Australian Customs 2009). The USA and UK have a maximum jail sentence of 1 year and 7 year respectively. Despite the harsh punishment trade in wildlife and their products is increasing in Australia. During 2004 and 2005 over 3900 seizures were made, this almost doubled in 2006-2007 to 7533 seizures (Alacs & Georges 2008). These were not only made on items native to Australia; international wildlife products appear to be readily available to the Australian public, for example there are 197 listings for elephant ivory on eBay Australia (Alacs & Georges 2008).

The graph below shows the percentages of wildlife illegally traded in Australia between 1994 and 2007. As can be seen the majority of trade is in reptiles and birds (69%).

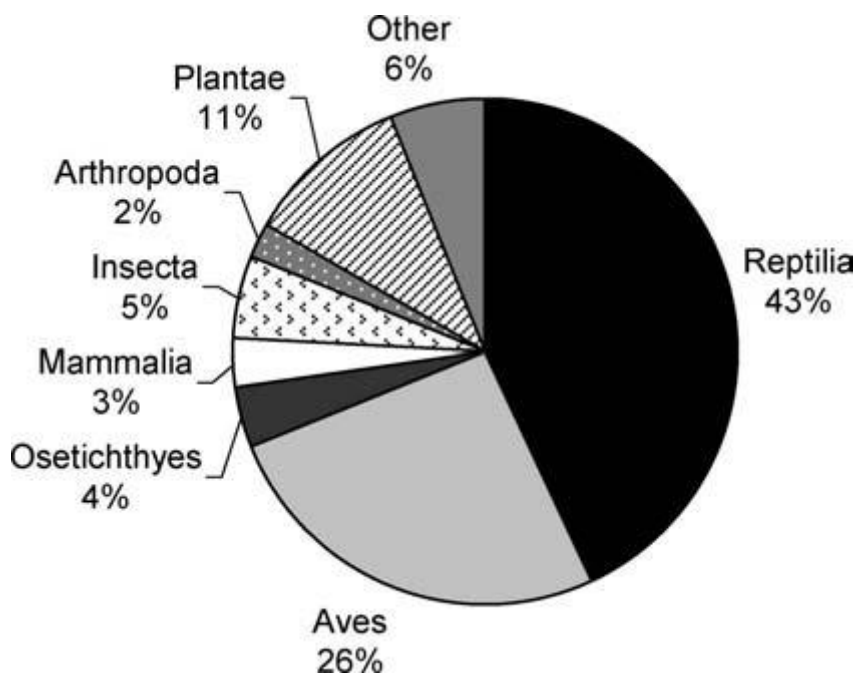


Figure 1 Types of wildlife traded in Australia from 1994 to 2007 from the Australian Customs Wildlife Prosecutions Database (Alacs & Georges 2008).

The Blanket Ban on Australian Mammals in NSW

It is illegal to take any animal from the wild and substantial fines apply if you are found to be in the possession of a protected species (Hopwood 1996).

Spinifex hopping-mice and plains rats are the only species permitted as pets as there are no conservation or welfare concerns associated with these species, they are quite prolific breeders in captivity and while most do not like to be handled as you would a domestic mouse or rat they are fairly easy to keep in medium sized aquariums (DAFFA 2008).

Reptile Keeping in NSW

There are a number of reptile species that can be kept in NSW under a two tiered licensing system distributed by NPWS. The licences require that all reptiles are registered, allowing NPWS to monitor which animals are being bred and where they are being kept. Class one licences allow the keeping of smaller dragons and lizards, i.e. eastern water dragons, eastern bearded dragons, bluetongue lizard, and small non-venomous snakes such as the children's and carpet pythons. Anyone over the age of 10 years can apply for a class 1 licence. A class two licence allows the keeping of larger and more dangerous reptiles that are harder to keep. The applicant must be 18 years or older and have held a class one licence for at least two years. Woma pythons, lace monitors and frilled lizards can be kept under a class two licence (DECC (2008)). Little research can be found on the success of this new industry however it is expanding and a commercial breeders licence is being developed to allow increasing demands for reptile pets to be met (DECC (2008)).

Expanding the pet industry in Australia

Small Mammals in Australia an Overview

Australia has a highly unique selection of native biota, most species cannot be found anywhere else in the world. As such Australia is internationally recognised as one of the

worlds 25 biodiversity hotspots (Alacs & Georges 2008). Australia's fauna is not as impressive as that of other continents such as Africa and South America, with more than 100 mammal species weighing less than 100 grams and a high proportion of the rest of the species having a comparatively small stature (Soulsbury *et al* 2009). Most of the Australian public have a very limited knowledge about their native fauna. This can be contributed to the fact that the vast majority of the population reside in large cities and towns where the animals have been pushed to the outskirts by habitat destruction and domesticated pets such dogs and. In addition a large proportion of native mammals are nocturnal and arboreal making them distinctively hard to locate (Hopwood 1996).

A large percentage of Australian wildlife is now endangered, approximately half of the worlds endangered mammals are Australian (Wamsley 1996). The rate at which species are becoming threatened, endangered and extinct is increasing drastically, with more species being placed on threatened lists in the last 20 years than the previous 200 years (Wamsley 1996).

Issues associated with the husbandry of Australian Mammals

There is a great deal of animal welfare concerns involved in keeping native wildlife as pets. And this is the main argument against keeping them. The National Consultative Committee on Animal Welfare (NCCA)W) and the National Parks and Wildlife Service (NPWS) state that there is a lack of information available to the public on how to care for native species and as a result the animal is likely to be kept in unsuitable conditions. There is also a greater financial obligation that is required with the initial setup and upkeep of native mammals (DAFFA 2008, DECC 2008). Some of the more specific obstacle in native mammals care are as follows:

Feeding – many species have highly specific dietary requirements that cannot be met by commercial foodstuffs like those available for dogs and cats (DECC 2008). Certainly diets

can be met with products found at the local green grocer and butchers, however this could be perceived as too time-consuming by the general public and a readymade commercial feed is needed for each species in order for native pets to become mainstream. (Hopwood 1996)

Housing – most species inhabit large home ranges in the wild which are difficult to replicate in an urban environment (New 2006).

Behavioural and psychological implications – there are a number of natural behaviours and reactions to human contact that pose difficulties when attempting to keep some species as pets. Many species are nocturnal and may not adapt to functioning during the day, a number of the more iconic species such as the quoll are solitary and will not bond or show affection to an owner, aggression is common in most males upon reaching sexual maturity, some species such as kangaroos are prone to diseases linked to stress (DECC 2008).

Life expectancy- Australian natives are not known for their longevity with many only living for a few years. This would be unsatisfactory for many owners looking for a companion animal (Croft 2000).

There is also concern that if given a commercial value, animals may be taken from the wild to be sold into the pet trade and also if animals that are not naturally found in NSW were released or escaped then they may disrupt the natural order and threaten existing populations (DECC 2008). Furthermore pet animals may develop diseases, from other pets, that are not found in the wild which could be introduced to the wild population if the animal were to escape (DECC 2008). Hopwood (1996) argues that escaped native pets would pose a greatly reduced risk to the landscape than exotic cats and dogs.

Captive breeding programs need to be established with a strict recording system where each animal within the industry is tracked and monitored. This could be done through micro-chipping like that which is carried out on pet dogs and cats today. This would assist in preventing animals taken from the wild entering the pet population (Croft 2000).

Potential Impacts of Keeping Australian Mammals

The debate over native pet ownership in NSW has been ongoing for the better part of two decades. And while the negative arguments are not particularly adamant they are persistent enough to effectively halt the industry from becoming a reality. The DECC (2008) state that public knowledge about the care of native mammals is not sufficient to ensure basic animal welfare is met. Conversely records on the treatment of pets in general, are quite alarming with a high statistic of abandonment and abuse (Parliament of Victoria 2002). Also when pets develop behavioural problems for example aggression in dogs or a boxing male kangaroo or the owner's circumstances alter and they can no longer care for the animal there is the question of the pet's future. The NSW RSPCA is forced to euthanize more than half of the dogs and cats it receives annually, which can be upwards of 45,000 animals (Croft 2000). Although if this argument is used as an excuse not to introduce native animals as pets then it could be satisfactorily argued that animals should not be kept as pets at all.

Wildlife is an as yet unknown source of zoonotic diseases. If closely monitored and preventative measures taken it may be possible to prevent many zoonotic diseases in the native pet population and stop this from becoming a negative issue. This was demonstrated when the hysatid disease was reduced in human populations by eradicating the causative tapeworm from the pet canine populations (Hopwood 1996).

Breeding colonies would need to be established to supply the pet trade. Excess animals could be released into the wild to augment existing populations also adding to their genetic diversity. It is feared however that captive bred animals may become too domesticated or genetically different to naturally occurring animals to be released back into the wild (New 2006).

Pet keeping is a mutually beneficial activity for both the owners and the animals. It is believed that native pets would become a great advantage to *in situ* conservation. Awareness

of different species would improve through education and a personal connection with the animals; this would work to inspire many to help preserve the species (Wamsley 1996).

Native mammals may reduce the numbers of cats and dogs in suburbia and as a result reduce the threat of escaped pets decimating local wildlife populations (Hopwood 1996).

Potential Pet Species

Despite the arguments the National Consultative Committee on Animal Welfare (NCCAW) admits that out of the vast array of native mammals some species may make suitable pets. As such they have developed a criterion for selecting species to be allowed as pets. This criterion includes ease of adaptability to captivity, ease of captive breeding, level of husbandry required, level of behavioural enrichment required, health and public safety risks and the welfare of the animal (DAFFA 2008). Hopwood (1996) states that the robustness of a species is an important factor; some species will thrive in harsh conditions while others are nervous and delicate and require a great deal of specialist care.

It is evident that there are native pets being kept off the record, which are not part of black market trading. Young native animals that are rendered motherless, by car accidents or other means, are often found and raised as pets or wild individuals become tame through repeated exposure to humans. Wamsley (1996) proclaims to have kept eastern quolls, wombats, bandicoots, bettongs, possums and potoroos. Also stating that they are as good as traditional pets as companion animals.

It is already legal to keep an extensive list of native mammals in Victoria and other states.

Through a tiered licensing system, similar to the one used for reptiles in NSW. With a class 1 licence residents are permitted to keep:

- Common Brushtail Possum *Trichosurus vulpecula*
- Common Ringtail Possum *Pseudocheirus peregrinus*
- Common Wombat *Vombatus ursinus*

- Fat-tailed Dunnart *Sminthopsis crassicaudata*
- Kowari *Dasyuroides byrnei*
- Mitchell's Hopping-mouse *Notomys mitchelli*
- Red-legged Pademelon *Thylogale stigmatica*
- Red-necked Pademelon *Thylogale thetis*
- Red-necked Wallaby *Macropus rufogriseus*
- Rufous Bettong *Aepyprymnus rufescens*
- Sugar Glider *Petaurus breviceps*
- Swamp Wallaby *Wallabia bicolor*
- Tammar Wallaby *Macropus eugenii*
- Tasmanian Bettong *Bettongia gaimardi*
- Tasmanian Pademelon *Thylogale billardierii*

(DSE 2009)

Methodology

The literature review showed that there is very limited research conducted into the suitability of Australian native fauna as companion animals, and if they would be accepted by the public. An acknowledged strategy for determining this is through consultation with the general population (FitzGibbon & Jones 2006). For this reason the methods selected are aimed to expose attitudes, values, perceptions and knowledge of residents of the Ku-ring-gai area in regards to keeping them as pets. It is important to understand how attitudes and perspectives may vary depending on geographical location and cultural beliefs may impact on the study.

Study Area

The local study area is Ku-ring-gai council area. The Ku-ring-gai district is located on Sydney's North Shore and is made up of nine suburbs, Gordon, Killara, Lindfield, Pymble, Roseville, St Ives, Turramurra, Wahroongah and Warrawee. The Estimated Resident Population figures are updated on an annual basis considering birth, death, overseas and internal migration and indicate that there are approximately 107 000 residents currently living in the area (Ku-ring-gai Council, 2008). The area encompasses a wide variety of ethnic backgrounds and lifestyles and indiscriminate sampling was required to give an accurate understanding of the attitudes of the residents as a whole.

Selection Process

Due to the size of the Ku-ring-gai area it was not feasible to survey the entire community, due to time and resource restraints. Initially it was considered that specific areas within the district could be surveyed to determine whether attitudes varied depending on the extent of urbanisation and relation to the bush. However it was resolved that the majority of the community had sufficient exposure to bush and park

lands that a random selection approach to survey distribution would provide desired results to fulfil the study objectives. Three hundred addresses were pulled from the council database of all postal addresses in the Ku-ring-gai district. Upon inspection the selected addresses showed that there was an even distribution across the nine suburbs and urbanisation levels.

Surveys

Self completion surveys (Robson, 2006) were implemented during this study, each individual/household selected were asked to fill in the answers to the survey questions, that were sent out by mail. All surveys were sent with an accompanying cover letter ensuring the study participant of their complete anonymity, an overview of the project and the role that their input was to play in the project (FitzGibbon & Jones 2006). All posted surveys included a stamped return address envelope and also included a tea bag. 300 surveys were sent to the randomly selected addresses.

Methods of Analysis

For statistical analysis, the percentage value of responses for each question was determined through MS Excel. Each survey was then compared to the rest of the surveys as a single unit using multivariate techniques to determine patterns of attitudes, knowledge and trends in regards to pet ownership in the Ku-ring-gai area. The use of graphs and other visual portrayals of the data allowed analysis of varying attitudes, knowledge and perspectives of Ku-ring-gai residents in relation to the concept of native mammals as pets. The results that were gained from the surveys were coded and entered into MS Excel this was required to convert the raw data into tables and graphs. When analysing the free response questions, related answers were grouped to ease coding.

Questions that resulted in specific answers, such as suggested species to keep as pets, were input into MS Excel to determine percentages of responses.

Responses of the different age groups and sexes were compared using non-metric multidimensional scaling (nMDS). Differences in responses made by the four age groups (18-30yrs, 31-50yrs, 51-65yrs and 66+yrs) were determined analysis of similarity (ANOSIM). This test is equivalent to an ANOVA (a multivariate non-parametric analogue); it tests the null hypothesis that there is no difference in composition among treatments (surveys) (Clarke & Green 1988). A test statistic (Global R) is calculated, which compares the observed differences among treatments to differences among replicates within treatments (Clarke & Green 1988). SIMPER (similarity percentage), an analysis that calculates the average Bray-Curtis dissimilarity between all of the surveys was used to determine discriminating characteristics between the age groups. The data was standardised and fourth root transformed prior to analysis to remove any effects of different scales of measurement for each survey question (PRIMER, Clarke 1993).

Results

Overall Differences Between Sexes and Age groups

The non-metric multidimensional scaling showed that there was no significant difference between survey responses provided by males and female respondents (Global R = 0.013, P = 0.196) (Fig. 1).

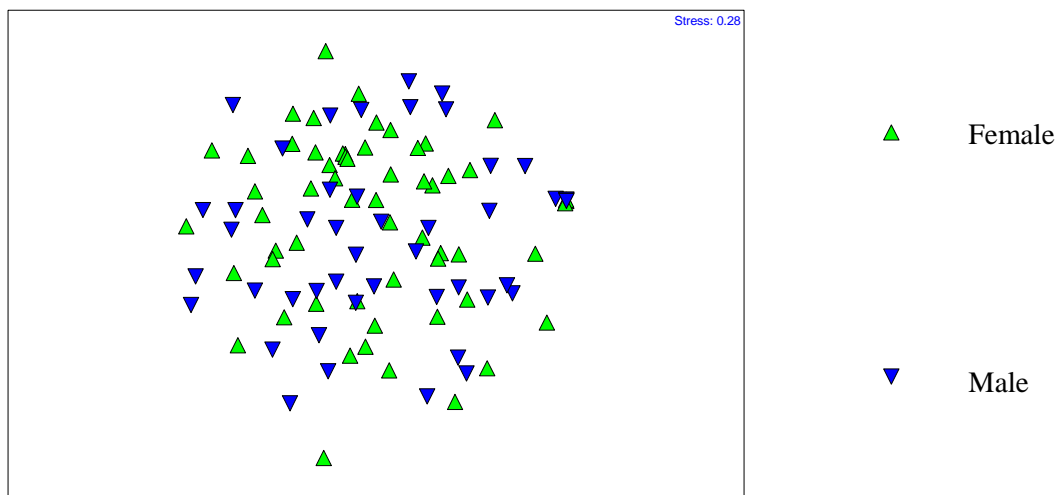


Figure 2 nMDS sites based on survey responses provided by male and female respondents

The differences in responses occurred from the different age groups. The non-metric multidimensional scaling showed that there was a significant difference between the age groups (Global R = 0.099, P = 0.001) (Fig. 2). Ages 18 – 65 years generally responded similarly for most questions, while respondents aged 66 years and older generally provided different opinions and experiences.

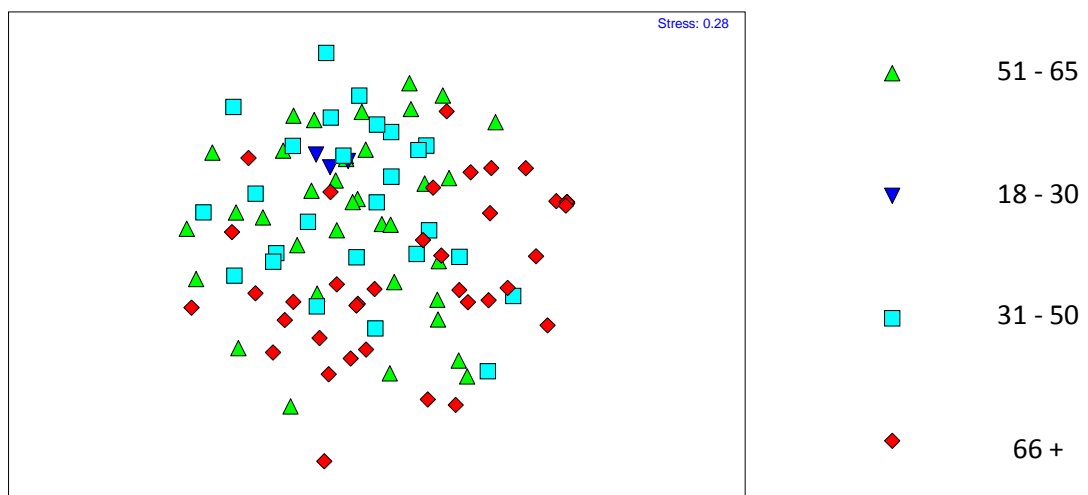


Figure 3 nMDS sites based on survey responses provided by different age groups.

There are high levels of similarity in overall response between the three younger age groups (18-30, 31-50, 51-65) while they are all significantly different from the oldest age groups (66+)

Groups	R Statistic	Significance Level %
51 – 65 vs. 18 - 30	-0.313	98.3
51 – 65 vs. 31 - 50	-0.031	85.2
51 – 65 vs. 66+	0.161	0.1
18 – 30 vs. 31 - 50	-0.322	99.0
18 – 30 vs. 66+	0.091	20.1
31 – 50 vs. 66+	0.194	0.1

Table 1 ANOSIM R- statistic and Significance level of responses provided by each of the four age brackets (18-30, 31-50, 51-65, 66+)

There was a significant difference between 31-50 and 66+ age groups on a number of questions. Ease of maintenance, companionship, interactivity, friendliness, entertaining and independence were qualities more valued by the younger group, while small size, quiet, safe, attractive and long-living characteristics were important to older residents of Ku-ring-gai. 31-50 year olds were willing to spend, on average, \$500 on the initial set up of a pet in contrast with over 66 year old who were willing to spend \$100-\$300. A greater portion of the 66+ age group currently own a pet when compared to 31-50 year olds. (Table 1)

Question	AVERAGE ABUNDANCE		DISSIMILARITY/SD	CUMULATIVE CONTRIBUTION %
	31 – 50yrs	66+yrs		
Have you ever owned a pet?	0.27	0.80	1.39	10.23
What qualities do you look for in a pet? (easy maintenance)	0.73	0.38	1.16	18.87
What qualities do you look for in a pet? (Companionship)	0.69	0.50	1.04	26.59
What qualities do you look for in a pet? (Small)	0.42	0.55	1.04	34.25
What qualities do you look for in a pet? (Interactive)	0.50	0.30	1.01	41.63
What qualities do you look for in a pet? (Quiet)	0.27	0.43	0.94	48.57
What qualities do you look for in a pet? (Safe)	0.31	0.40	0.93	55.23
What qualities do you look for in a pet? (Friendly)	0.88	0.68	0.83	67.40
What qualities do you look for in a pet? (Attractive)	0.23	0.25	0.76	66.61
What qualities do you look for in a pet? (Long-living)	0.15	0.30	0.75	71.65
What qualities do you look for in a pet? (Entertaining)	0.23	0.08	0.61	75.42
What would you be willing to spend on the initial purchase and setup of a pet?	3.58	2.10	1.47	78.40
What qualities do you look for in a pet? (Independent)	0.12	0.10	0.48	81.10
Do you have children living with you?	1.23	1.98	1.70	83.56
What qualities do you look for in a pet? (Energetic)	0.12	0.08	0.46	85.90
Do you currently own a Pet?	1.27	1.78	1.48	88.16
Would you be willing to undergo training to teach you how to care for native mammals if you were to get one as a pet?	1.12	1.63	1.37	90.40

Table 2 SIMPER analysis of dissimilarity of responses provided by 31-50 year olds and over 66 years old age groups.

Age groups 51-65 years and 66+ showed more similarity however were still significantly to set them apart from one another in their preferences. Like the 31-50 year age group 51-65 year olds stipulated that they sought pets that possessed the following qualities: ease of maintenance, companionship, interactivity, friendliness and independence. Again residents over 66 years of age placed greater importance on pets that are small and quiet. These two age groups showed similarities in regards to safety, attractiveness and long living species however these qualities were not of extreme importance. Again the younger of these two age groups was willing to spend more on the initial setup of a pet however 51-65 year old are only willing to spend approximately \$300. Also similar to the previous analysis was current pet ownership with the 66+ age group owning pets more commonly than 51-65 year olds (Table 2, Table 3).

Question	AVERAGE ABUNDANCE		DISSIMILARITY/SD	CUMULATIVE CONTRIBUTION %
	51 – 65yrs	66+yrs		
Have you ever owned a pet?	0.28	0.80	1.36	10.11
What qualities do you look for in a pet? (easy maintenance)	0.69	0.38	1.13	18.62
What qualities do you look for in a pet? (Companionship)	0.75	0.50	1.05	26.59
What qualities do you look for in a pet? (Small)	0.42	0.55	1.04	34.27
What qualities do you look for in a pet? (Interactive)	0.44	0.30	0.96	41.40
What qualities do you look for in a pet? (Quiet)	0.33	0.43	0.96	48.43
What qualities do you look for in a pet? (Safe)	0.39	0.40	0.97	55.45
What qualities do you look for in a pet? (Friendly)	0.78	0.68	0.88	62.05
What qualities do you look for in a pet? (Long-living)	0.31	0.30	0.86	68.13
What qualities do you look for in a pet? (Attractive) 25	0.22	0.25	0.75	73.23
What qualities do you look for in a pet? (Independent)	0.28	0.10	0.68	77.81
What would you be willing to spend on the initial purchase and setup of a pet?	2.86	2.10	1.41	80.42
What qualities do you look for in a pet? (Large)	0.08	0.10	0.45	82.70
Do you currently own a Pet?	1.25	1.78	1.48	84.91
What qualities do you look for in a pet? (Other)	0.06	0.10	0.41	87.00
Would you be willing to undergo training to teach you how to care for native mammals if you were to get one as a pet?	1.28	1.63	1.36	89.08
What qualities do you look for in a pet? (Energetic)	0.08	0.08	0.41	91.05

Table 3 SIMPER analysis of dissimilarity of responses provided by 51-65 year olds and over 66 years old age groups.

In Depth Analyses

Females provided the greater portion of responses with 58 returned opposed to 47 men completing the survey. Of these 3 were from the 18-30 years age bracket and 26, 36 and 40 from the 31-50, 51-65 and 66+ age groups respectively. This provided a very limited perception of the attitudes of the younger members of the Ku-ring-gai area. A larger percentage indicated that they did not have children living with them, 63 households with children against 42 without. Alternatively there were more households with pets, 57 respondents stated that they do currently own a pet while 48 did not, stating various reasons from limitations of housing and allergies to it being too soon since the death of a previous pet and the fear that a new pet might outlive them. Only 5 of the 105 respondents stated that they had no interest in owning a pet, all others either currently owned a pet or had done so in the past.

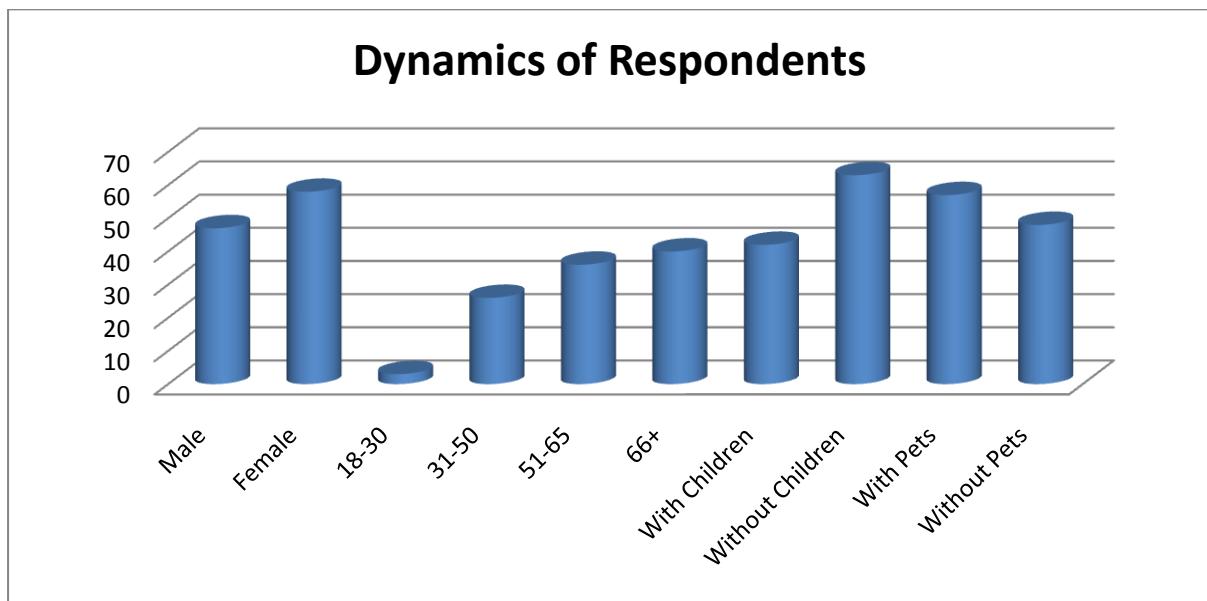


Figure 4 Dynamics of respondents from the Ku-ring-gai area.

Almost 50% (51 respondents) placed themselves in the limited awareness of native animals category indicating that they could only name the most common native species. Progressively smaller numbers were seen to specify that they could answer larger numbers of native species. 29% (30 respondents) stated they were aware of different native species, 19% (20

respondent) have a good awareness while only 4% (4 respondents) are exceptionally aware of native species. These respondents were 2 WIRES member, a veterinary student and a retired zoo keeper.

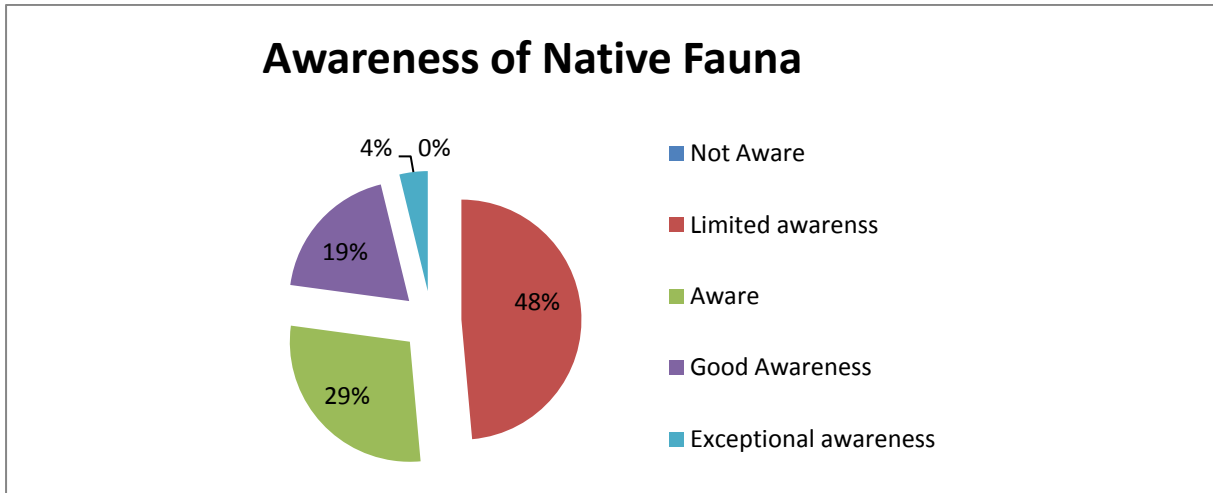


Figure 5 Self determined awareness of native fauna of the Ku-ring-gai residents.

65% (68 respondents) believed that it should not be legalised to keep native mammals as pets. Many residents stated that they believed that “they are wild creatures that should be left to their natural habitat” and “they would not cope well in captivity”. A number also indicated that they were worried that animals would be taken from wild populations and that if they were to be kept as pets they may escape and have a negative impact on natural populations. There were 37 respondents (35%) agreed that natives should be legal as pets. However they were not so adamant in their responses with almost half simply stating “why not” when asked to explain their answer, others acknowledged conservational benefits and their appeal as something different to the ordinary. Despite the majority of respondents stating that they would not wish to own a native pet 75% indicated that they would undergo a training program to educate themselves on native mammal care if they did find themselves owning one.

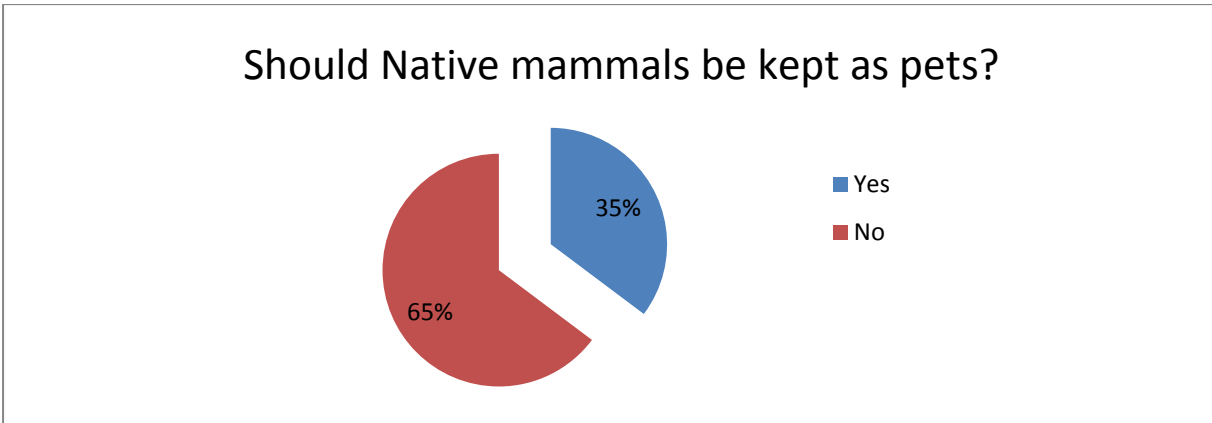


Figure 6 Attitudes of Ku-ring-gai residents regarding legalising native mammals as pets.

Friendliness was seen to be the most important with 80 respondents selecting this quality, companionship and ease of maintenance were also high priorities (Fig. 7).

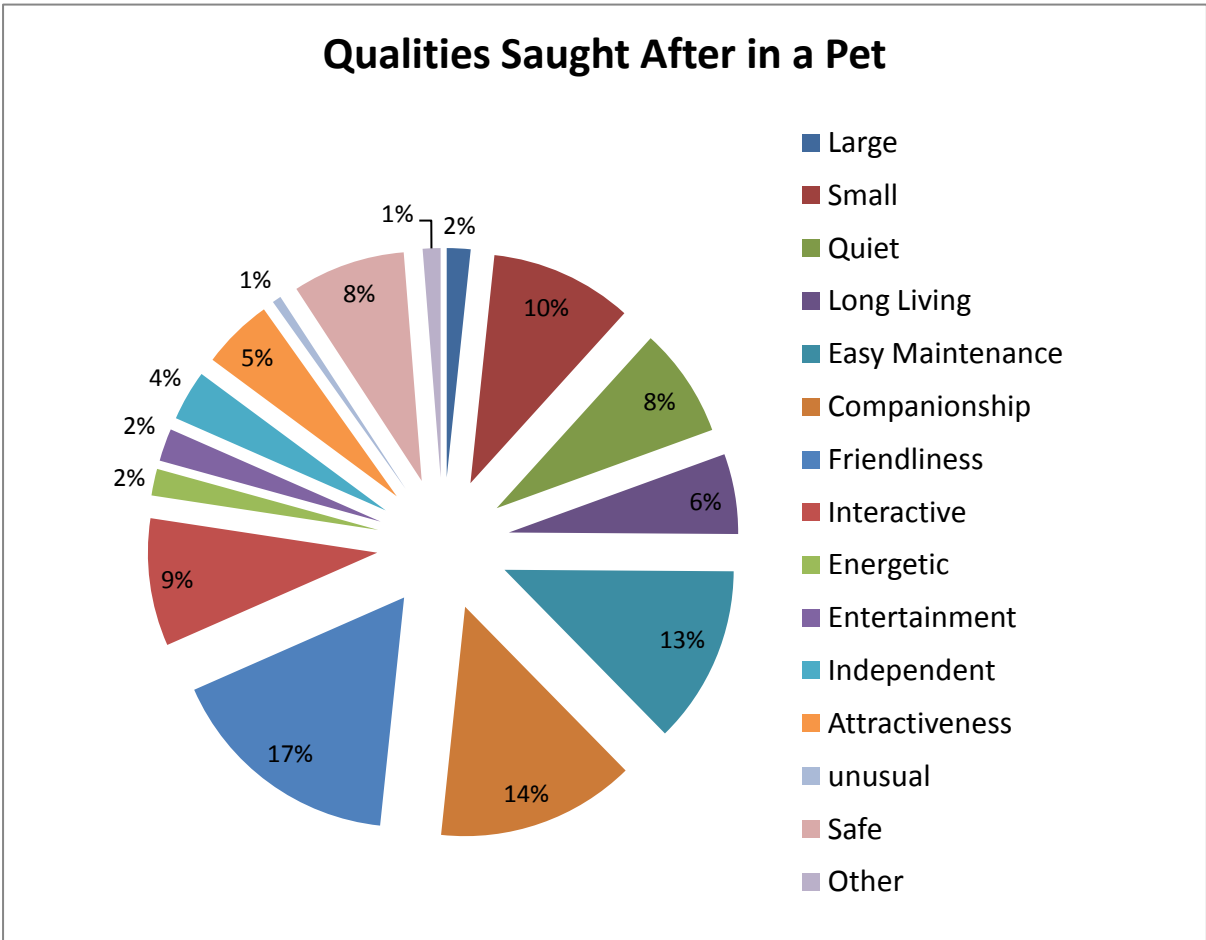


Figure 7 Percentage of times pet characteristics were selected as being important when considering a species as a pet

35% of residents would be willing to pay up to \$500 for the initial cost of a pet, 20% would be willing to pay \$1000 and 30% would pay no more than \$300. Almost 70% of respondents said that they would be willing to pay between \$20 and \$40 a week for the weekly up-keep of a pet, 19% stated they would pay no more than \$10 with the remaining respondents paying between \$50 and \$100 a week.

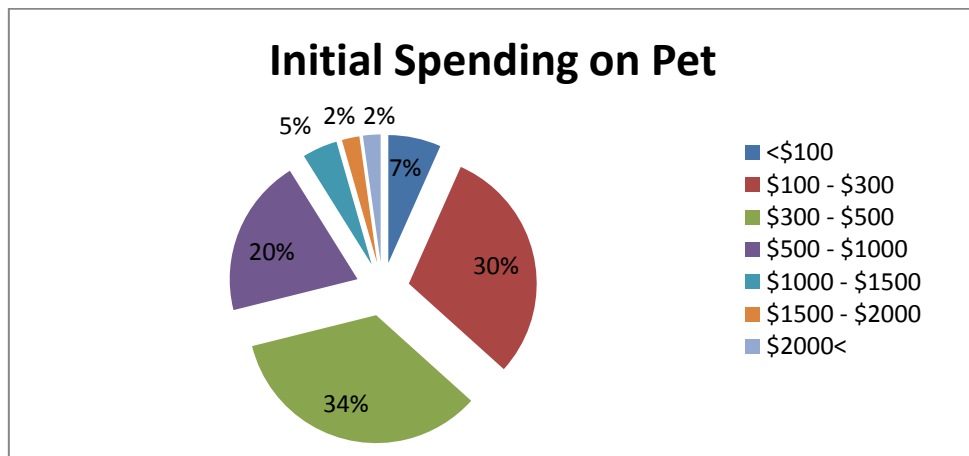


Figure 8 The amount Residents are willing to spend on the initial set-up of a pet.

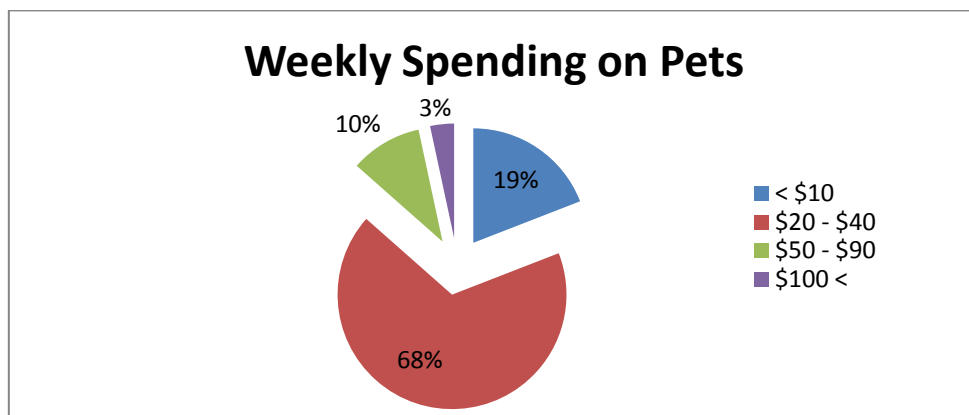


Figure 9 The amount residents are willing to spend on the weekly upkeep of a pet.

Discussion

The results gained in this study were not entirely representative of the Ku-ring-gai population. The majority of the results were provided by the eldest age group (66 years and over) and while there was a sufficient amount of information available from the two middle age groups (31 – 65 year olds) there were only three surveys returned by the 18-30 year age bracket. This was insufficient to give an accurate representation of this portion of the community. It was hypothesised that this younger age group would be the most supportive of the proposal however two of the three respondents from this group indicated that they did not agree with the scheme, the third was not sure. One respondent reasoned

“Native animals are already under threat; by domesticating them we would be drastically changing the dynamics of the Australian wildlife (by changing the species).”

A common response from the over 66 years age group was that that native animals have special need in regards to their feeding and habitat that would be hard to provide to them in an urban environment. Others thought it would be a good way to educate children about native animals and that native pets would have less impact on the environment and natural systems when compared to foxes and feral cats. Both points of view are represented fairly well with relevant reasoning explaining most of the choices made by the residents regarding the legalisation of native pets. This was initially unexpected when the majority of respondents professed to have a limited knowledge of native animals. A theme that emerged amongst the residents who were against legalising native pets was the concern that animals would be taken directly from wild populations to supply the pet trade, approximately 20 respondents referenced this directly and a number of others commented that *“wild animals should remain in the wild”*. Others who accepted the native pets proposal expressed concerns about regulations and suggested a licensing and training system. The responses regarding the

legalisation of native mammalian pets may have been different if the question had made it clearer that animals would not be taken from wild populations, but from purpose established populations and furthermore that strict management practices would be put in place to regulate the industry.

The Ku-ring-gai region was originally a bushland area that possessed a diverse variety of native species, however it has since become densely urbanised and is merely bordered by national parks and fragmented bushland (Hopwood, 2001). A large number of species native to the area have since disappeared and those that have adapted to the change in habitat, such as the possum, have been labelled as pests due to their proximity to people (Jones 2007).

Attempts to conserve naturally occurring species in the small pockets of bushland still present in the area has not yet proven successful as they are simply too close to the human population and contact often results in the death of the animal (Lunney et al, 2004). The impacts that the pet industry would have on conservation was also raised in survey responses, again residents offered conflicting views with some residents believing that efforts should be focused on *in-situ* conservation and that only common native species should be allowed while others arguing that the breeding of endangered natives species as pets may provide a insurance against extinction. When considering these perspectives it could be suggested that species that are native to the Sydney basin be introduced as pets. For example it may not be feasible to introduce a species native to Western Australia. This would allow for greater identification with residents and their natural surroundings and encourage understanding and tolerance.

The majority of respondents admitted to having a limited understanding of native species and could only name the more common species. This lack of understanding may have led to the majority arguing against native pets however it is unclear as to whether they are justified in their negativity. A number of respondents stated that natives would be unsuitable due to their nocturnal nature although this characteristic may make them more suitable when considering

the habits of modern humans. A pet that sleeps during the daylight hours while its owner is at work, and is most active during the early morning and evening when they are home may prove to be a better adjusted pet than say a dog left alone in a backyard, who may become bored and destructive. Nevertheless the lack of awareness throughout the community indicates that the population would be ill-equipped to provide appropriate care and conditions to allow natural behaviours. Native species are significantly different to species that are currently being kept as pets and consideration needs to be given not only to their nocturnal behaviours but also territorial tendencies, social requirements and feeding behaviours. Some species are commonly found in groups or pairs, such as wallabies and sugar gliders, while others are strictly solitary, such as the spotted-tailed quoll. Interactions between native species and humans and other pets are difficult to predict and while there are reports that natives have been raised with dogs and cats and have matured to become well adjusted pets it is unlikely that this could be guaranteed on a regular basis. These issues were raised by respondents frequently, one in particular stated,

“Natives would be too high maintenance – they would not be correctly housed or fed, diet cannot be manufactured, most live in colonies. Lack of understanding would lead to abuse and neglect.”

Furthermore concerns were raised that by placing a monetary value on particular species that animals would be unlawfully taken from the wild populations to supply the pet trade. This is a legitimate concern and methods of verifying the origin of an animal would need to be implemented. Micro-chipping of all legally bred animals with an identification number and certificate similar to that used in dog and cat identification would be a possibility. Placing a value on these animals may also have a positive impact as people who are willing to spend the money to purchase the animal, husbandry materials and an appropriate licence are more likely to provide suitable care in the very least to ensure they haven't wasted their money.

The profits gained from the sale of native animals could be used to improve the facilities and programmes run by the breeders thus enhancing conservation potential of individual species, it could also supplement government funding of *in-situ* conservation programmes.

A license and monitoring system would be vital in the management and regulation of a native pet industry; this was often stipulated by residents who agreed that they should be made legal. Training and education programmes would also need to be implemented. There was a very good response from residents when asked if they would undergo training courses if they were to obtain a native species as a pet. 75% agreed that it would be necessary and in some case added that it should be illegal to own natives without undertaking relevant training programmes. In an ideal scenario prospective owners should be required to undertake a species specific training course to obtain a license to own that specific species however this would be a massive logistical undertaking for a government body and associated organisations and a broader approach would be more practical. That the majority of respondents are willing to undergo training shows that Ku-ring-gai residents are fundamentally concerned for the welfare of their pets.

The surveys showed that there is a high level of pet keeping amongst Ku-ring-gai residents. The majority, 55%, currently own pets while all but five had owned pets in the past. There was a substantial diversity of types of pets owned, while dogs and cats had the highest representation residents also kept fish, birds, small mammals, horses, sheep, goats and chickens. Some had even previously kept native species such as possums and wallabies. This shows that the area is in favour of the pet keeping in general and would perhaps be willing to accept native species as pets if marketed appropriately. This could either be from a conservational perspective, by educating the public on the limitations of current conservation programs and how owning a native pet may help in the ultimate preservation of that species, or by permitting only common species and educating the public on how these species will be

an environmentally friendly alternative to current pets like cats and rabbits who can cause severe negative impacts on the native ecosystems if they become feral. It also became apparent that the presence of children in a household did not impact on the decision to own a pet. While there is still a market to cater to with children, a number of respondents commented that their children were very excited by the idea of owning a wombat or wallaby, there was still interest from older residents. It was found that there was a higher level of support from the eldest age bracket (66+) with 40% of respondents agreeing that native pets should be legalised. Both the 31-50years and 51-65years age brackets resulted in a 2:1 ratio against the proposal meaning that there is no clear age range to market to.

It was an aim of this project to determine some factors that a native species would have to meet to have a chance of acceptance as a pet. Through asking residents which qualities they look for when considering a pet a checklist of characteristics has been provided against which species can be assessed on their suitability. The top two characteristics sought by residents were friendliness and companionship. This may mean that solitary animals would not be appropriate as they would not be likely to exhibit affection towards an owner over any length of time. It may be argued that cats are essentially solitary creatures however they have had the benefit of thousands of years of mutually beneficial domestication that is simply not possible to replicate in today's society. Other popular characteristics were ease of maintenance and small in size; this may be cause to disqualify species that require large enclosures and/or difficult feeding requirements and also anything that is larger than a medium sized dog (30kgs). A price range was also determined, any pet that has an initial set up cost of more than \$1000 is going to be placed in a very small market of buyers. It was determined that the majority of residents (34%) would be willing to pay no more than \$500 for a pet and its associated equipment, 30% would pay even less with a maximum budget of \$300. Only 9% of respondents were willing to spend more than \$1000 on their pets initially.

For a new species to be successful in the wider community of the pet industry and not only a small niche market it is essential that they be packaged under \$1000. The weekly upkeep can also not exceed more than \$40 as it was indicated by a majority of 68%, 19% looked for pets that would not cost them more than \$10 a week, while only 13% would pay more than \$50 per week. This shows that food must be relatively cheap and easily accessible.

Residents were asked to identify an animal that they would choose if they were permitted to own a native species; some common species mentioned were wallabies, wombats, bettongs, possums, sugar gliders and bandicoots. These species can all be legally kept in other states however it is unclear if they would meet the criteria indicated by respondents. Further research is needed regarding which species would be suitable; this may be conducted through the industry already established in Victoria and South Australia.

Conclusions

The surveys showed that there was no significant difference in the attitudes of Ku-ring-gai residents in regards to keeping native mammals as pets, however further research into the attitudes of the youngest age group (18–30 yrs) is needed as the response rate for this group was inadequate.

With a 75% rejection of the native mammals as pets proposal there was no clear age group to market to with positive and negative response ratios being similar across all age groups (18-30, 31-50, 51-65, 66+). This level of rejection and the reasoning behind it indicates that the residents of Ku-ring-gai are as yet unready to accept native mammals into their homes as pets and further education as to why native species are a better alternative to current pets is needed in order for more residents to support the proposal.

A checklist was determined that native species would need to meet in order for them to be included in mainstream pet keeping. Mammals species that are likely to succeed in the pet industry must be small, friendly, easy to care and relatively inexpensive (<\$1000). Species that may be appropriate include Bettongs, Pademelons and other small wallabies, common brushtail and common ringtail possums, kowaris, hopping mice and sugar gliders.

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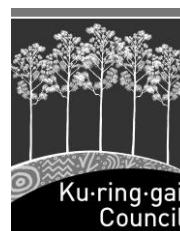
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Appendices

Appendix 1 Cover letter for Resident Survey



Dear Resident,

My name is Sarah Turp, I'm a student at the University of Western Sydney studying my final year of Animal Science. This year I'm conducting a major study through Ku-ring-gai Council, Sydney, investigating the possibility of a larger variety of native Australian mammals being introduced as pets in NSW. Residents such as you are an important factor in this study and you have been randomly selected for involvement. This survey aims to determine the attitudes of different community demographics to keeping native animals as pets.

As your participation in this survey is critical and would be greatly appreciated, a draw will be run with Borders gift voucher prize of \$50. The number at the top of this letter will correspond with the number on the survey page. Once you hand in the survey your number will be placed in the draw. Please keep this cover letter as it is the record of your number and check Ku-ring-gai Council website (www.kmc.nsw.gov.au/wildthings) on 1st July 2009 to see if you have the winning number.

Please **be assured of your anonymity** in this project and only complete the survey if you are 18 years of age or older.

Once you have completed the survey please return it using the self-addressed, pre-paid envelope included, before Friday 19th June 2009.

The council and I thank you for taking the time to fill out this survey. If you have any questions regarding the study please do not hesitate to contact myself, my university supervisor Ricky Spencer or Peter Clarke of Ku-ring-gai Council.

Sincerely,

S. Turp

Sarah Turp

Animal Science Student

University of Western Sydney

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8. Do you believe that it should be legal to keep Native Australian animals as pets?

Yes No

Why? _____

9. If you could choose one Australian mammal species to own as a pet which would it be and why?

10. What qualities do you look for in a pet? Please circle

Large	Small	Quiet	Longliving
Easy maintenance	Companionship	Friendliness	Interactive
Energetic	Entertainment	Independent	Attractiveness
Unusual	Safe	Dangerous	
Other	_____		

11. What would you be willing to spend on the initial purchase and setup of a pet? (I.e. purchase of animal, cage, bedding, bowls, toys etc) Please circle one

Less than \$100	\$100-\$300	\$300-\$500	\$500-\$1000
\$1000-\$1500	\$1500-\$2000	\$2000+	

12. What would you be willing to spend on the weekly upkeep of a pet?

Please circle one

Less than\$10	\$20-\$40	\$50-\$90	\$100+
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13. Would you be willing to undergo training to teach you how to care for native mammals if you were to get one as a pet? Yes No

Thank-you for your time!