

Chapter 3

Nimbyism and Nature: Whose Backyard Is It Anyway?

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Abstract The Ku-ring-gai community have long expressed a strong desire to keep their suburbs green. When asked, most people comment that they moved to the area to live in a bushland setting. Given this enduring set of values, it is interesting that Council spends a great deal of time fielding complaints from residents about nature's miscreants, those birds, animals and plants that fail to respect property boundaries or intrude into the lives of residents in the bushland interface areas. This paper examines one such dilemma challenging public land managers; when people and nature come into conflict. The issue in question is that of a long standing flying fox camp in Ku-ring-gai and the problems arising from the close proximity of these animals to local residents. It is a debate that has passionate proponents on both sides.

The flying fox management issue provides an insight into the juxtaposition between people who want to live close to nature but on strictly human terms. The strategies proposed to keep the peace between the residents and the champions of the flying fox is an instructive environmental management example that is likely to become increasingly common as pressure on the remaining natural resources in urban areas continues to rise.

Keywords Suburbs • Bushland • Nature • Land manager • Environmental management

3.1 Introduction

The Ku-ring-gai Council Local Government Area (LGA) is located to the northwest of the city of Sydney and is regarded as part of the city's North Shore region. The LGA covers 84 km² and contains distinctive physical features such as deeply incised and forested gullies, with Sydney Blue Gum vegetation dominating the ridgelines.

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The area receives an annual average rainfall of 1,118 mm per annum and contains 2 critically endangered and 5 endangered vegetation communities, 1 threatened population and 18 threatened species (Biodiversity Strategy 2006).

Trees, specifically Sydney Blue Gums, are considered iconic and give the local area a distinctive character. The Blue Gum High Forest and Sydney Turpentine Ironbark vegetation communities (assemblages of flora associated with the trees) have been classified critically endangered with less than 1% of the original pre European settlement forest area remaining (Biodiversity Strategy 2006).

The Ku-ring-gai Biodiversity Strategy (2006) p.7 states '*Within our LGA the bushland-urban interface is a major factor defining our character and influencing biodiversity*'.

After thousands of years of occupation of the area by Garingai people, Europeans first settled in the area around 1810. Given the high rainfall and productive clay soils, the area served to provide fresh fruit and vegetables to the Sydney market. During the early part of the twentieth century, Ku-ring-gai became popular with wealthy city dwellers looking for a rural retreat that was close to, but also a world away from, the dirty polluted atmosphere of the city. The Ku-ring-gai community today remains one of the least disadvantaged communities in Australia (SIEFA Index 2012).

The urban footprint of Ku-ring-gai dominates the higher contours with housing extending into bushland areas along ridge lines to the north and south of the main ridge that divides the municipality in half. With a major road artery and railway line located on the top of the main ridge, urban development is intensifying along the length of this corridor. Three national parks surround the LGA and 120 bushland reserves are managed by Council within the area. Around 13,000 homes are directly located on the bushland interface and as a consequence bushfire is an ever present danger.

The Ku-ring-gai Community Strategic Plan expresses the Vision for 2030 as '*Ku-ring-gai will be a creative, healthy and liveable place where people respect each other, and conserve the magnificent environment and society for the children and grandchildren of the future*'

Efforts to conserve the natural resources of the area continue, although external funding and support for such programs is currently declining. At the same time there are those in the community that find living so close to nature arduous for one reason or another. Some residents believe that their property is their property and trespassers, whether they are human or not, should enter only upon invitation. In some cases this may not have always been their opinion. Advancing age, ill-health and other changes in life circumstances can alter a person's attitude to the bushland from one of inspiration to exasperation. New residents, particularly those from overseas can be intimidated by the bush and its creatures as they are completely alien to them.

Within the community there is a wide range of views regarding conservation; from the entitlement of a reasonable person to enjoy their property to a deep green commitment. The behavioural characteristics of many wild species are not always consistent with the needs and expectations of some land owners.

This paper explores the tension between residents and wildlife on the urban bushland interface in Ku-ring-gai. As the urban footprint expands and intensifies so does the pressure on the survival of species and their habitats in remnant bushland. The management of the flying fox and their camps in the Ku-ring-gai municipality and elsewhere has generated a broad range of responses in the community, both positive and negative. The subsequent policies and strategies introduced by various land managers to control the impacts of flying foxes on residents contain instructive lessons for the wider management of urban wildlife. Ku-ring-gai Council gathered data from other land managers to review the success of flying fox management strategies already attempted. The information coming from this investigation along with extensive community and stakeholder consultation provided the basis for Ku-ring-gai's own approach to the management of the flying fox and its habitat.

3.2 The Benefits of Bushland

Being near bushland brings a sense of calm and substance, a place where the hectic pace of life can be shut out. The air seems fresher and the scent of the bush invigorating as the trees and other plants play host to a myriad of insects, birds and animals.

Many people elect to purchase property in Ku-ring-gai because they enjoy the 'natural' feel of the area. Apart from the inherited and contemporary societal values associated with living in close proximity to nature, other more tangible benefits can be linked to bushland. These benefits have been expressed in Council's Community Vision and include enhanced property values; educational values; market values such as income from fees charged for film locations; seed banks; and recreational activities, to name but a few that enrich the lives of the local community.

Communities with extensive tree canopy are generally cooler in summer (Brown et al. 2013) and quieter for the most part. While these benefits are acknowledged both unofficially and officially, the contention for some living in specific bushland locations demand Council's time and attention.

3.3 The Disbenefit of Bushland

Trees cause a great deal of angst and sometimes rightly so. The Ku-ring-gai area has a long history of severe storms characterised by gale force winds and hail. Storms have on occasions (such as 1991 in North Turramurra) caused millions of dollars of damage and taken the lives of local residents.

Storm damage to homes, infrastructure, cars, roads, parks, gardens and businesses often occurs as result of falling trees and their limbs. Thousands of trees can come down in a severe storm, taking months to clear away and dispose of. The costs are not only financial but also physical and psychological. The 1991 storm generated a

clean-up bill of \$670 M (Ku-ring-gai Council 1991) which in 2014 dollars would be well over \$1B. Street trees contributed to the damage bill but so did trees located in bushland reserves, close to homes, gardens, pools and other infrastructure.

The other local issue of great concern regarding trees is bushfire. Ku-ring-gai also has a long history of impact by bushfire and some in the community believe that a canopy tree close to their home makes their home more vulnerable to radiant heat. Extensive research has demonstrated that the loss of most homes in bushfire is from ember attack as it is the major source of ignition (Blanchi and Leonard 2005; NSW RFS 2011). Regardless, some in the community continue to believe the only way to reduce the risk of losing their home in a bushfire is to remove the trees.

Fire and storm dominate the conversation around trees and their associate risks. However other nuisances are associated with living in close proximity to bushland, for example, leaf drop blocking gutters and littering swimming pools, animals such as lizards and snakes taking up residence in gardens and birds stealing food from unsuspecting pets. While these issues may seem trivial, to those people who have to endure them it is very serious. Some people feel trapped in their homes during magpie mating season, gardens get taken over by weeds for fear of stepping on a snake and pool owners give up trying to keep their pool clean having been defeated by the mass of leaf litter falling most days.

Living in close proximity to wildlife habitat s can be exhilarating to some and obnoxious to others with both ends of the spectrum populated by relatively small percentages of the interface community. Both extremities make good sense in their arguments for and against the conservation of these natural areas and the constituent wildlife. Land managers are required to tread a wary path between the two factions. With no easy answers available and a strong incentive to avoid win/lose outcomes, land managers continue to search for win-win solutions.

3.4 The Flying Fox

In recent times one species has demanded a great deal of attention, both within Ku-ring-gai and across Australia. This species highlights some of the challenges of managing habitats and animal populations in close proximity to the community. Managing flying fox populations on the urban interface has required considerable time, research and investment to be directed to it. An examination of the issues and the strategies may yield some important lessons for public land managers when facing the challenges of managing urban interface spaces and species.

Grey-headed flying foxes (*Pteropus poliocephalus*) are large migratory bats that occupy forests and woodlands in the coastal lowlands, tablelands and slopes of southeast Australia from Bundaberg (Queensland) to Geelong (Victoria). They are present continuously in coastal lowlands in the northern part of their range and in metropolitan areas such as Brisbane, Newcastle, Sydney and Melbourne, where artificially diverse food occurs because of plantings.

Grey-headed flying foxes feed primarily on blossoms and fruit in canopy vegetation and supplement these with leaves. Their diet includes over 100 species of native flowering trees and fleshy-fruited trees and vines.

The modern flying fox diet now includes fruit of introduced plants such as garden and orchard trees, street trees, introduced palms and some noxious weeds. Grey-headed flying foxes forage over extensive areas with one-way commutes of over 50 km recorded between camps and foraging areas, although commuting distances are more often less than 20 km.

Flying foxes play a vital role in our ecosystems, particularly in pollination and seed dispersal of flowering and fruiting trees. Because they move freely among habitat types during their foraging trips they transport and disperse pollen and seeds of diet plants across fragmented, degraded and urban landscapes. Seeds have a greater chance of growing into mature plants when they germinate away from their parent plant. Seed dispersal also helps to expand the gene pool within forests which in turn promotes forest resilience to future impacts to the local environment (Qld EHP 2014).

The Grey-headed flying fox is listed as Vulnerable under the NSW *Threatened Species Conservation Act 1995* (TSC Act) and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Females give birth to only one live young each year, which is one of the reasons their population is very vulnerable. This legislation protects these animals and it is illegal to harm or try to move them without the appropriate consent.

Within the Ku-ring-gai area an important maternal colony of Grey-headed flying-foxes roosts in the Ku-ring-gai Flying-fox Reserve (KFFR). The bushland reserve is adjacent to an urban residential area and bounded by approximately 100 properties.

Covering an area of 15.34 ha, the KFFR contains a variety of wildlife habitats. In addition to flying foxes the reserve supports other threatened species such as the Powerful Owl and Sydney Turpentine Ironbark Forest (an Endangered Ecological Community under the *NSW TSC Act* and *EPBC Act*) (Fig. 3.1).

In 1991, an urban residential property development was approved in close proximity to the Ku-ring-gai flying fox camp. A Reserve area was identified and a Conservation Agreement entered into between Ku-ring-gai Council and the New South Wales Government in response to concerns the maternal colony was likely to be under threat. The Agreement ensured the continued protection and preservation of native flora and fauna, in particular the Grey-headed flying fox colony and all elements of its habitat within the reserve (Ku-ring-gai Flying fox Reserve Management Plan 2013).

The Reserve is significant for the flying foxes as it provides a roosting and maternity habitat, access to food in both urban landscapes and native forests and a stopover habitat for migrating animals, whilst supporting a resident population. The Reserve is also a site for long-term research, including the longest population monitoring of any flying fox camp in Australia (Ku-ring-gai Flying fox Reserve Management Plan 2013).

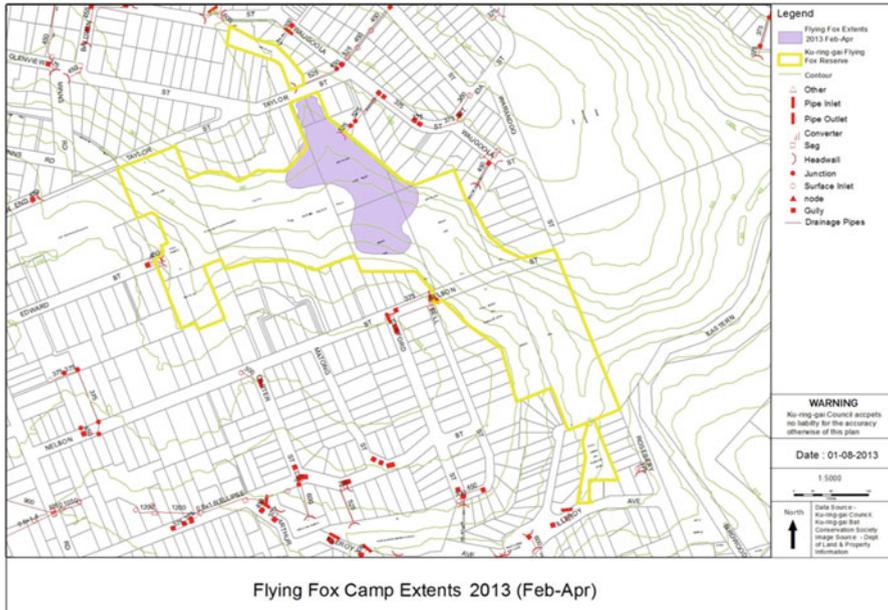


Fig. 3.1 Map of Ku-ring-gai Flying Fox Reserve (Ku-ring-gai Flying Fox Plan of Management 2013)

Since the 1980s the Ku-ring-gai Bat Conservation Society and other researchers have monitored flying fox numbers in the Reserve. This data has been incorporated into a national database to better understand trends in flying fox movements and to detect any decline in numbers.

Ku-ring-gai data shows annual and seasonal variations in the KFFR camp population from zero to around 80,000 animals. During winter numbers may fall to only a few hundred with no flying foxes recorded on eight occasions. During the summer months numbers swell to around 20,000–40,000 peaking in the March breeding season. Numbers of 70,000 or more animals have been recorded only twice – in 2000 and 2009. The local data indicates a trend of decreasing average numbers in Grey-headed flying foxes between 1998 and 2012. This trend is consistent with the increase in the number of camps in the Sydney Basin from 7 in 1989 to 22 in 2013.

Historically the flying fox colony has moved periodically around the KFFR, in response to seasonal conditions and as an adaptation to roost tree damage. At times when the flying fox colony inhabits the deeper areas of the Reserve the impacts to residents have been negligible. However, since 2009 the flying fox colony moved into an area very close to properties adjacent to the KFFR, as depicted in Fig. 3.2 below.

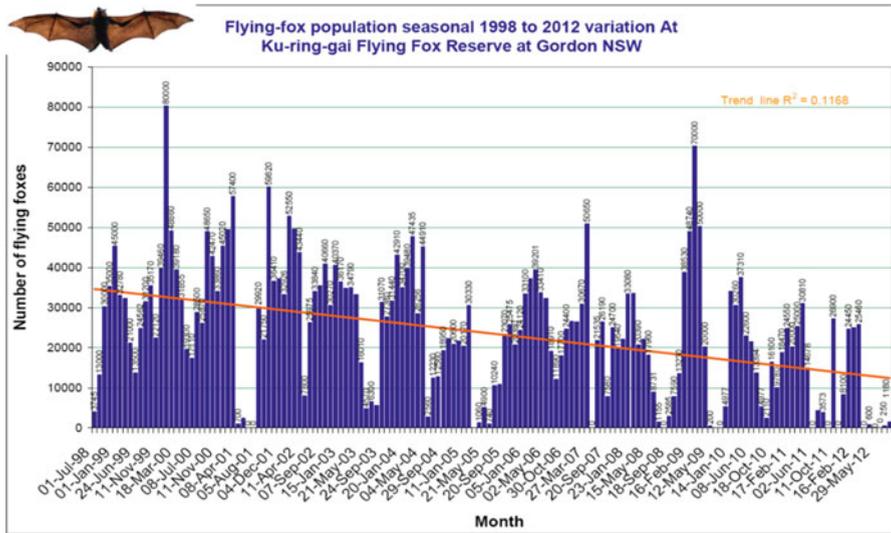


Fig. 3.2 Flying Fox numbers over time in the Ku-ring-gai Flying Fox Reserve (Ku-ring-gai Flying Fox Plan of Management 2013)

3.5 Ku-Ring-Gai Flying Fox Management

While Council is the land manager of the KFFR, the community has played a vital role in the Reserve’s management. The Ku-ring-gai Bat Conservation Society has provided valuable advice and assistance with on-ground works since 1985. In recent years, the number of issues from residents adjacent to the Reserve has risen as a result of the noise, smell and droppings impacting them when the flying foxes have shifted closer to the Reserve edge.

The KFFR has a specific management plan prepared in accordance with the Ku-ring-gai Flying-fox Reserve Conservation Agreement. In response to the ongoing lifestyle, health and wellbeing impacts on residents adjacent to the KFFR, the 2013 Ku-ring-gai Flying-fox Reserve Management Plan attempts to strike a balance between management actions to conserve the threatened species and ecological communities within the Reserve and management actions to reduce the impacts of the flying foxes on residents. Such balance had to occur within a prescribed management framework, largely determined by State and Federal legislation (for example, the *Threatened Species Conservation Act 1995* and the *Environment Protection & Biodiversity Conservation (EPBC) Act 1999*) and the conditions of the Conservation Agreement.

The 2013 plan was prepared in consultation with the Ku-ring-gai Flying fox Reserve Advisory Group, consisting of representatives from Council, the Ku-ring-gai Bat Conservation Society, residents and relevant government agencies.

In developing the management strategy for the KFFR, Council and the Advisory Group critiqued a number of potential management actions (which were derived

from other land managers who had already attempted many different strategies with varying success) against a set of criteria, including the terms and conditions of the Conservation Agreement, relevant legislation, research, Council plans and policies, the Reserve's physical constraints, funding, staff resources, community support and volunteer capacity. Council also consulted numerous stakeholders and residents adjacent to the KFFR during the public exhibition period of the 2013 KFFR Management Plan.

3.6 Learning from the Experience of Other Land Managers

Many Councils in NSW and other states manage bushland reserves containing flying fox camps. Flying foxes do not always choose to camp in bushland reserves and occasionally move into town areas where park and street trees provide a source of food and shelter. In these instances the impact of these animals is more obvious and immediate and more likely to bring the animals into closer contact with a larger number of people. At least in reserves there is a 'buffer' between the flying foxes and people, although in Ku-ring-gai this buffer can be quite small depending on the exact location the flying foxes choose to roost each season.

Given the protection afforded to the flying fox under law, there are limited options available to land managers to control the impacts of flying foxes on local communities.

Roberts et al. (2011) discuss the remedies utilised to reduce the impact of flying foxes on the community. These have included minimising disruption to the camps and nudging-dispersal-relocation techniques. Numerous agencies have attempted to re-locate flying foxes with varying degrees of failure as the animals demonstrate a strong fidelity to camps that is not easily broken. If they do move it is not as a group (Eby and Roberts 2011).

The outcomes of 17 recent Flying fox dispersal attempts were systematically reviewed (Roberts and Eby 2013) and a set of common outcomes were identified to guide their use in Australia. Camps varied in size from several hundred animals to over 200,000. This review identified that:

- in all 17 cases, dispersed flying foxes did not abandon the local area;
- in 16 of the 17 cases, dispersals did not reduce the number of flying foxes in a local area;
- dispersed flying foxes did not move far (in approximately 63 % of cases the flying foxes only moved <600 m from the original site, contingent on the distribution of available vegetation. In 85 % of cases, new camps were established nearby);
- in all cases, it was not possible to predict where replacement camps would form;
- conflict was often not resolved. In 71 % of cases conflict was still being reported either at the original site or at other unacceptable locations years after the initial dispersal actions;

- repeat dispersal actions were generally required (in all cases except extensive vegetation removal); and
- the financial costs of all dispersal attempts were high, ranging from tens of thousands to millions of dollars, for active dispersals (for example, using noise, smoke etc.).

Roberts and Eby (2013) note that these patterns only varied where abundant financial and human resources were available (for example, Royal Botanic Gardens – Melbourne and Royal Botanic Gardens – Sydney); or specific landscape characteristics existed (for example isolation from neighbours in Batchelor, NT); or the connection through a habitat link to an ‘acceptable’ location as in the Royal Botanic Gardens – Melbourne).

It appears that the potential for unintended consequences, the lack of ability to pre-determine or control the new location of replacement camps and the high costs involved make relocation an unviable option.

3.7 Viable Management Options for the Ku-Ring-Gai Flying Fox Reserve

3.7.1 Council Management Actions

Management actions implemented in the 2013 Ku-ring-gai Flying fox Reserve Management Plan, aimed at reducing the impacts of the flying foxes on residents adjacent to the Reserve, include: the re-location of a flying fox release cage (as part of the KFFR rehabilitation and release program) to a nearby Reserve; canopy replenishment in the core of the KFFR; strategic tree removal and treatment works in the KFFR, close to residential housing; formalised community engagement processes and elevated community engagement efforts during periods of greatest community concern; and continued consultation with relevant agencies, organisations, councils and flying fox experts on management options for the Reserve. Unfortunately, the activities conducted to date have had little success in alleviating the impacts on residents adjacent to the Reserve.

Hence, in November 2014 a range of management options aimed at nudging or dispersing flying foxes from properties adjacent to the KFFR were re-assessed based on their economic, social and environmental costs/benefits, and in their ability to, as stated in the recently released Flying Fox Camp Management Policy 2014 – Consultation Draft (NSW OEH 2014) be “legally defensible in balancing community concerns and neighbourhood amenity with environmental outcomes”. The management options assessed were:

- Improving roost habitat in the KFFR core, away from residents
- Private property tree removal
- Selective roost tree removal/pruning within 10 m of a dwelling wall, pool, deck or other living space in the most affected areas

- Selective roost tree removal/pruning within 10 m of the KFFR boundary in the most affected areas
- Creation of 10 m vegetation buffer zone from the KFFR boundary in the most affected areas
- Creation of 25 m vegetation buffer zone from the KFFR boundary in the most affected areas
- Creation of 50 m vegetation buffer zone from the KFFR boundary in the most affected areas
- Use of noise to disperse and re-locate flying-foxes

This assessment revealed that the key factors in determining the likely success of any nudging/dispersal attempts can be identified as follows:

- whether the conflict is likely to be resolved in the broader community and not just around the original site, that is, the problem is not transferred from one undesirable location to another, or several, other undesirable locations;
- whether the financial and human resources required are proportionate to the scale of impact being experienced within the community;
- the likelihood and scale of any unintended (but detrimental) social and environmental impacts;
- the specific landscape characteristics, that is, are alternative camp locations isolated from urban settlements and is there a habitat link to ‘acceptable’ locations?;
- the welfare outcomes for the flying foxes; and
- the availability of food sources – flying foxes are unlikely to leave a local area when a camp is dispersed as long as food remains available.

In light of the above, in the case of the KFFR, the physical, legislative, environmental and financial constraints, as well as the potential unintended social consequences deem any management actions to nudge or disperse the camp location, beyond further strategic tree removal to alleviate the most direct impacts of the flying foxes, not appropriate or feasible. As a result, Council recently resolved to fund selective roost tree removal/pruning within 10 m of the KFFR boundary in the most affected areas.

3.7.2 Encouraging the Community to Adapt

The local community is divided on the best way to deal with the flying fox. Apart from the physical discomfort experienced by some, resident concerns extend to the health risks arising from the proximity to flying foxes. Council provides information on the prevention and treatment of diseases transmitted to people through bites and scratches from flying foxes. Encouraging people directly involved with the flying fox to be vaccinated against diseases transmitted through bites and scratches is the first priority. Educating the residents on their risk exposure from living in proximity to a flying fox is aimed at alleviating their concerns relating to this aspect.

In extreme situations residents can consider the benefits of retro fitting properties, including acoustic insulation, pool covers and high pressure water pumps for cleaning down surfaces quickly and effectively.

With no good alternative responses yet available, Council manages the KFFR with conservation and habitat protection as main objectives. It is thought that by doing so, this will contribute to the overall health of the species and conform to the Conservation Agreement and the species 'threatened' status.

3.8 Discussion

As with any community debate land managers need to juggle a number of responsibilities. Legislation often dictates the type of responses that can and cannot be considered. Nimbyism and justice in decision making on environmental issues is usually topical. The label of Nimbyism has been used by some in the past to disempower the arguments regarding an unwanted and arguably unwarranted development. In particular the Nimbyism label can be applied intentionally to disengage the views of those in the community negatively affected by a development from the decision making process. It is unsurprising then that dissatisfaction with land managers occasionally features in newspapers across the country. While the case of flying fox management is a different context to that of a development, there are certain similarities. Both sides of the case (want flying foxes; do not want flying foxes) have passionate proponents with valid viewpoints that need to be reconciled to a conclusion. Some residents enjoy the presence of these animals while others suffer them unwillingly.

Fairness in such dichotomous and emotionally charged situations is a hard road to tread. Chances are that nobody will be satisfied with a compromise except possibly the flying foxes. As Smith and Scott (2006) notes urbanisation generates pressures from a combination of expanding population and increasing demands on natural areas. Inevitably tensions grow and conflict follows.

Institutional arrangements for the conservation of remnant habitat areas and endangered species come under close scrutiny from time to time. This scrutiny is particularly fierce from those whose properties adjoin the natural areas where wildlife activity impacts upon the peace and enjoyment of home owners. Councils are generally the target of any complaints in situations where the Council is the land manager.

Ku-ring-gai residents reportedly (North Shore Times 28/08/13 Danielle Nicastrì) endure 'a living hell' created by the noise and odour from the nearby flying fox camp. One resident claims in the article that '*you cannot hold a conversation in our back yard, we cannot swim in our pool and we haven't had friends stay over or have a BBQ because of the bats*'.

Clearly their complaints have substance as anyone who visits the local flying fox camp during times of activity will attest to. Ku-ring-gai Council's Councillors and the General Manager have described the resident's situation as 'horrific' (North

Shore Times, 28/08/13 Danielle Nicastrì) and have since responded with strategies designed to reduce the impact of noise inside homes by removing roosting habitats adjacent to houses.

Flying fox activity regularly appears in the news at locations traversing the length of the Australian east coast. Flying fox numbers swell and decline up and down the coast for reasons not yet well understood. The Royal Botanic Gardens in Melbourne elected to encourage the flying foxes out of the gardens to limit damage to trees and public areas. The Royal Botanic Gardens in Sydney has attempted to do the same. Some Ku-ring-gai residents worry it will mean more flying foxes on their door step while others believe that increasing the pressure on these animals will see emerging diseases such as Hendra virus take a stronger hold on the weakening condition of the flying foxes over time. According to the NSW DPI (2014) '*hungry bats may have been carrying Hendra virus, and stressed animals tend to shed more virus*'. Directing resources towards flying fox habitats to keep the animals healthy may reduce the probability of viruses, such as Hendra, causing problems in the future.

Flying fox supporters join together in societies (such as the Ku-ring-gai Bat Conservation Society) to promote the welfare of the flying fox. In Cairns, the ABC News (29/04/14) reported that the Council attempted to relocate a flying fox camp out of the main street by trimming trees and removing the roosting sites. Local protestors claimed that these actions would do nothing to solve the problem but rather make it worse. '*it causes stress to the colony and possibly to individuals and if there is some relocation occurring then this can be to a more problematic area*' one protestor claimed.

According to those supporting the flying fox in Ku-ring-gai, '*before 1989 there were seven flying fox camps around Sydney... located on the edge of cleared land where animals had easy access to both bushland and urban gardens. In 2013 there are now twenty two camps And some [camps] are now occupied through winter*' (Friends of Bats newsletter, June, 2013). It is proposed that misguided attempts to modify habitats and scare flying foxes onto other locations has had the effect of fragmenting the camps into a series of smaller camps (Friends of Bats newsletter, June 2013). Arguably this has increased the number of people coming into close contact with the species, increasing the number of complaints and pressure for further control attempts to no good effect for either the flying foxes or local residents.

Millions of dollars in public funds has been spent across the country in attempts to move flying foxes to more desirable locations. According to Roberts et al. (2011) relocation attempts have been '*ad hoc, and lacking of systematic documentation, costing and monitoring*' and flying foxes have relocated to '*new sites that have been unanticipated and in undesirable locations*'.

Presently there is no foreseeable change in the legal status of flying foxes and current research and experience suggests that there are no viable management options in sight to alleviate the most severe impacts of the flying foxes on residents living in close proximity to camps. In most cases those negatively affected by the noise and odour have little choice but to improve the resilience of their homes and properties in an attempt to lessen the effects of living in close proximity to the flying foxes.

3.9 Lessons Learnt

The experience of managing land devoted to the conservation of the flying fox in urban Australia has been complex and lengthy. Several lessons emerge from the research into flying fox management that could be helpful in the management of other species that affect properties neighbouring bushland areas. The following lessons have informed Council's management approach within the KFFR:

- Interfering with habitats or attempts to modify the natural behaviour of the flying fox inevitably exacerbates the problem through unintended consequences. Attempts by the Sydney Royal Botanic Gardens to move flying foxes out saw the flying foxes end up in Centennial Park. Attempts by Cairns City Council to move the flying foxes out of trees in the main street saw the animals move into trees at a local school. In both cases the magnitude of the problem was amplified by bringing more people into closer contact with the animals;
- Community education: the most popular community education events run by Ku-ring-gai Council concern local wildlife particularly when it involves species that are controversial and have a human impact such as flying foxes, ticks, bandicoots and bush turkeys. People can happily co-exist with the flying fox habitat nearby when they better understand the values associated with flying foxes, the general magnitude of impact and options available to manage any negative impacts;
- Modification of the built environment: a far more practical, effective and efficient management measure is to strengthen the resilience of homes, properties and lifestyles to the impact of wildlife;

As Roberts et al. (2013) note it is the magnitude of the perceived problem that is important. This needs to be understood before responding. For example, if noise, smell and faeces from a camp affect only a small number of residents, then smaller, local-scale mitigation options should be applied. In this way the unintended consequences of the management action will be minimised and be less likely to result in a worsening of the problem.

It is the unintended consequences of management actions that need to be thoroughly investigated and understood. For example altering the flying fox habitat or the animal's natural behaviour may inadvertently foster the incidence of zoonotic disease by increasing the stress on animals who are already experiencing pressure for resources from urbanisation of habitat areas.

Biodiversity integrity and human health have long thought to be inextricably linked (Pongsiri et al. 2009). Strategies to manage wildlife impacts on urban populations need to be mindful of the bigger picture surrounding the immediate context of these decisions. Increasing pressure by further degrading biological resources to the point where the system declines could have a range of significant consequences. Conserving the integrity and diversity of biological resources can assist in maintaining resilience to emerging diseases. The response to the problems created by urban development encroaching on conservation areas must prioritise minimal disruption to the service and functions of the natural systems for any successful resolution to emerge.

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