

Attachment 3:

Summary of Research by Ecology Australia

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Much research has been conducted to document the impacts of dogs in bushland areas, both within Bayside and across the world. A recent review was conducted by Hennings (2016) of over 75 publications from the scientific literature on the impacts of domestic dogs on wildlife. In the review, the author concluded:

“The evidence that dogs negatively impact wildlife is overwhelming. It is clear that people with dogs – on leash or off – are much more detrimental to wildlife than people without dogs. Dogs (*Canis lupus familiaris*) are considered to be a subspecies of wolves (*Canis lupus*), and wildlife perceive dogs as predators.

Impacts include:

Physical and temporal displacement

The presence of dogs causes wildlife to move away, temporarily or permanently reducing the amount of available habitat in which to feed, breed and rest. Animals become less active during the day to avoid dog interactions. Furthermore, the scent of dogs repels wildlife and the effects remain after the dogs are gone.

Disturbance and stress response

Animals are alarmed and cease their routine activities. This increases the amount of energy they use, while simultaneously reducing their opportunities to feed. Repeated stress causes long-term impacts on wildlife including reduced reproduction and growth, suppressed immune system and increased vulnerability to disease and parasites.

Indirect and direct mortality

Dogs transmit diseases (such as canine distemper and rabies) to and from wildlife. Loose dogs kill wildlife.

Human disease and water quality impacts

Dog waste pollutes water and transmits harmful parasites and diseases to people. The average dog produces $\frac{1}{2}$ to $\frac{3}{4}$ pound of faecal matter each day – a hundred dogs can produce more than 500 pounds of waste per week. Pet waste as a significant contributor to one of the region's most ubiquitous and serious pollutants, *E. coli* bacteria.

People do not always take responsibility for their impacts on wildlife. Several studies demonstrate that natural area visitors, including dog owners, often don't believe they are having much of an effect on wildlife, or assign blame to different user groups rather than accepting responsibility themselves. Some natural area visitors assume that when they see wildlife, it means that they are not disturbing the animals – or worse, that because they didn't see any wildlife, they didn't disturb any.

In summary, people and their dogs disturb wildlife, and people are not always aware of or willing to acknowledge the significance of their own impacts. People with dogs are much more detrimental to wildlife than people alone; off-leash dogs are worse; and off-trail impacts are the highest.

Wildlife conservation is not the only valid reason to preserve natural areas. Park providers must weigh the trade-offs between wildlife, habitat, water quality and recreational values. But when considering different types of public access in a natural area, it is important to understand that the research is clear: people with dogs substantially increase the amount of wildlife habitat affected and are more detrimental to wildlife than people without dogs.”

Other impacts by dogs include trampling of vegetation and nutrient enrichment which is of particular importance for the native vegetation in Bayside that is adapted to the naturally nutrient-poor soils.

Both direct and indirect predation is severely reduced, if dogs remain leashed (Hennings 2016, Chester 2005).

A recent Master’s Thesis by Bob Holderness-Roddam titled “*The effects of domestic dogs (Canis familiaris) as a disturbance agent on the natural environment*” investigated the disturbance and the consequences of dogs for native wildlife, particularly vertebrate species. It is stated in the thesis that:

“In addition to the catastrophic effects of killing, maiming and orphaning of wildlife; disturbance can contribute to energetic loss through premature flight or reduced feed intake and reproductive disruption due to nest disturbance. Dogs have been implicated in disease transmission to native wildlife; with faecal contamination of waterways having potential negative effects for marine mammal health.”

At George Street Reserve, the primary reason for dogs to be on-lead is to protect the vegetation values.

Ecology Australia has conducted an investigation into the vegetation at George Street Reserve, from which the following is taken that document the research that has been conducted at that particular site:

“The sensitive components of the Sand Heathland vegetation community include the indigenous vascular plants (both above and below ground parts) and the bryophytic soil crust. These vegetation components are influenced by the soil structure and chemistry (among other things) which are also sensitive to disturbance.

The vascular and bryophytic vegetation components and the soil structure are vulnerable to trampling by pedestrians and dogs. The soil crust which dominates the soil surface in areas of the reserve is particularly vulnerable as the mosses, lichens and liverworts are very shallow rooted. Trampling will also decrease plant cover (e.g. detaching leaves and/or branches), potentially reducing the competitive ability of individual plants, leaving the soil surface open for invasion by weeds.

Soil compaction also occurs as a result of trampling, and can damage the root system of plants and inhibit recruitment. Damage to the roots can negatively affect a plants ability to obtain water and nutrients from the soil and can also leave it susceptible to infection (e.g. to Cinnamon Fungus *Phytophthora cinnamomi*). The soils are particularly vulnerable to trampling as they are sandy, therefore, informal tracks can be easily made.

Dog faeces are recognised for their ability to enrich soil fertility. Indigenous species of Sand Heathland can be particularly sensitive to increased soil fertility as they are adapted to soils of low nutrient status. Nutrient enrichment can have a two-fold effect on the indigenous vegetation as it can favour exotic species by giving them a competitive advantage and it can also be toxic to indigenous species adapted to soils with low fertility (Frood and Calder 1987).

If allowed access to roam free within the study area, dogs could also aid the dispersal of weed species and may also prey on indigenous fauna species within the reserve.”

The following photos are from Ecology Australia.



The photo above compares a typical example of vegetation at George Street Reserve that is fenced off from pedestrian and dog access (left of frame) to vegetation where pedestrians and dogs are allowed access (right of frame). The left side of the photo shows a healthy bryophyte layer of mosses and lichens along with scattered organic litter, compared to the right side of the fence that primarily comprises bare ground (Ecology Australia 2009).



This photo shows a close up of the bryophyte soil-crust layer at George Street Reserve (Ecology Australia 2009).

A study by Practical Ecology (2012) states that Ricketts Point contains high quality fauna habitat, with the reserve supporting the most significant hollow-bearing tree habitat of all the 14 nature reserves assessed. The Ricketts Point coastline is home to many seabirds that gather and roost on the rocks at low tide, or scavenge along the shoreline. These birds are easily disturbed and impacted by dogs, particularly un-leashed dogs. Ricketts Point Marine Sanctuary covers the marine habitat including seaweed covered rocks that provide shelter for an abundance of small marine creatures including brittle stars, bristle works and crustaceans. Other wildlife that may be impacted by dogs the call Ricketts Point Marine Sanctuary home include an abundance of fish, shrimp, seabirds and the flightless Little Penguin.

A 2007 study in Sydney compared urban beaches where dog walking was permitted to beaches where dog walking was prohibited (Banks and Bryant 2007). In that study, the

authors concluded that dog walking caused a 41% reduction in numbers of bird individuals detected and a 35% reduction in species richness.

The dramatic reduction in bird diversity and abundance in response to dog walking has immediate implications for other popular recreational activities pursued by humans. This includes bird watching and ecotourism where visitor satisfaction shows a strong relationship to numbers of species seen (Banks and Bryant 2007).

The review by Miller (2012) concludes that:

“Because dog populations are orders of magnitude larger than natural (or feral) predator populations, domestic dogs represent a formidable threat to other species worldwide. Domestic dogs and other pets are underappreciated drivers of wildlife decline that must be better controlled through community- and state-level policies and conservation efforts.”

There is no doubt that foxes are present in the Bayside municipality, and affect our native wildlife. However, as dog populations are orders of magnitude larger than natural (or feral) predator populations (Miller 2012), their impacts are proportionally much less.

A study by Holderness-Roddam (2011) analysed data on native wildlife presenting for care in Tasmania and concluded that:

“The data is indicative of domestic dogs having a more deleterious effect than domestic cats on native wildlife in Tasmania; particularly in urban and suburban areas and on beaches.”

Given the urban setting of Bayside City Council, and the beach setting of Ricketts Point and other Bayside beaches, the conclusions drawn in that study are readily comparable to the reserves in question.

Ways to control foxes are limited in urban areas given that the poisons that can be used to manage foxes are also lethal to pet dogs and cats. As such, the most effective way Bayside can reduce impacts to native wildlife by introduced predators such as dogs, foxes and cats, is by ensuring dogs are kept on lead in designated areas with important biodiversity values and cat curfews are implemented.

Native coastal wildlife faces an extensive list of threats, including habitat loss and fragmentation, predation by introduced predators, invasion by weeds and other pests, human disturbance, pollution and climate change to name just a few. Bayside is attempting to manage these and other threats where ever possible, and this includes the proposed changes to dog regulations.

For some species the combination of a variety of threats is very dire, leaving them vulnerable to extinction. This is particularly the case for threatened species such as the Sooty Oystercatcher (*Haematopus fuliginosus*), Pacific Gull (*Larus pacificus pacificus*) and Pied Cormorant (*Phalacrocorax varius*), and many migratory birds that utilise habitat at Ricketts Point and other coastal area before flying to other parts of the world on a seasonal basis. For migratory birds to obtain enough energy resources to make their long flights to other parts of the world, the impacts of interrupted feeding and excess energy expansion fleeing from dogs can reduce their ability to make the long flights, reduce breeding and result in deaths.

With regards to dogs, the evidence that dogs negatively impact wildlife is overwhelming. It is clear that people with dogs – on leash or off – are much more detrimental to wildlife than people without dogs (Hennings 2016).

There is a rapidly growing body of evidence suggesting that the most profound effects of carnivores on prey may be through fear rather than mortality. The non-lethal effects of predators can include habitat displacement to safer but less desirable areas (e.g. less food or shelter), increased stress, reduced feeding, and decreased reproduction (Miller 2012).

References

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