



## **Submission to the Environment and Communications Legislation Committee**

**The impact of feral deer on the natural environment at the Banksia Bush Care Site, Stanwell Park, N.S.W.**

### **ABSTRACT**

In the last two years, feral Rusa deer introduced into the Royal National Park in 1906 have killed or significantly damaged 1,778 trees in 2.5 hectares of the 4.5 hectare park on the headland in the middle of Stanwell Park beach, and are destroying nearly all regrowth of native species as soon as they appear. They have turned parts of this littoral rainforest into a cattle yard.

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## Background

I purchased my home in Stanwell Park in 1972, and have lived there ever since. Some 4.5 hectares of land on which no houses had been built at the end of Stanwell Avenue was compulsorily acquired by the New South Wales Government in 1968 for the purposes of having a park close to the beach, as part of its headlands policy. The management of the park was handed over to Wollongong Council.



The Banksia Bushcare site

Early photographs of Stanwell Park show that this land was mainly littoral rainforest, but it was cleared for farming from time to time. When I bought my house in 1972, it was surrounded by the noxious weeds, lantana and cassia. There were some ironbark, wattle, banksia and rainforest understorey plants like mutton wood and mock olive, but predominantly it was infested with lantana.

In the late 1970s, Brian Phillips, the then Council ranger, and I decided to do something about the lantana in the park, and we started to remove it and replace it with native species.

Over the next ten years, I had cleared lantana, cassia and asparagus fern from about four quarter acre blocks of the park to the west, and two to the east. I planted over 800 mostly rainforest trees in the cleared areas, and watered them with a dripper system. Most of the planted trees were native to the Illawarra as found in Leon Fuller's *Wollongong's Native Trees*. A small number of plants came from the Council, but I purchased most of them from nurseries. Some of them, such as Lilly Pilly, Illawarra Flame Trees, Cabbage Tree and Bangalow Palms, I germinated myself from seed dropped by local trees.

The removal of the lantana in particular allowed native trees to germinate naturally: Cheese trees, Lilly Pilly, Coastal banksia, Red fruited olive plum, Guioas, Coastal tea tree, Cabbage tree palm, Celery wood, the two species of Mutton wood and Mock Olive. The park area behind the Kiosk is now a magnificent, mature rainforest skirted with a row of Sydney blue gums Turpentine, Celery wood, Red fruited olive plum and Casuarina.



The Blue gum forest behind the Kiosk, and the rainforest further uphill. These trees were planted 30 years ago, and none of them needed any protection because deer had not then started to come into Stanwell Park.

After I had retired in 2004, I had more time on my hands, and decided to remove the remaining lantana and cassia from the park. In the meantime, a much worse noxious weed, *ochna serrata* from Africa had entered the park and was taking over prolifically. It was impossible to pull out once it reached a height of 100 mm, because a dog leg developed in the tap root. It was so invasive that it inhibited the growth of lantana and prevented any native species from growing because of its thick foliage. The future of the park was bleak, because the trees were getting old, and would die without any possibility of their offspring succeeding them. We would have a monoculture of *ochna*, ready to act as a seed distribution source for the birds to spread the infestation into the Royal National Park and along the Illawarra escarpment, where it was already becoming a problem.

Since 2004, I have planted some 370 more trees in this headland park, to fill the spots created by the removal of the noxious weeds. Most of them had to be protected by caging once the deer numbers started to increase. Some of the trees, such as young Bangalow and Cabbage tree palms, did not need protection because the deer generally did not seem disposed to eat them. The young palms, however, were being destroyed by trampling. Most of these trees protected by cages had been germinated by myself, but some have been supplied by Wollongong Council. By the end of this year, virtually all of the noxious weeds will be under control in at least 2.5 of the park's 4.5 hectares. The area will need continuous maintenance, particularly in the first year after removal, because of the presence of weed seed.

## **The Rusa Deer Invasion**

Rusa deer from Indonesia were introduced into the Royal National Park in 1906. When I moved into the area in 1972, they were occasionally seen around the Otford area. They were rarely seen in Stanwell Park, and certainly not in Banksia Bush Care site until about 20 years ago. Then a buck with a couple of does appeared. He did a bit of damage, but not all that much to be worried about. Then they disappeared for a couple of years, and the regeneration flourished with ferns and grasses around the trees that I planted.

About five years ago, bikie gangs of raunchy Rusa bucks came down from Bald Hill and started doing wheelies in the park, and sharpened up their antlers on the native trees for the next Big Rut Out. Ten and perhaps more buck deer started attacking everything, ringbarking the young native trees, and



leaving gaping wounds in the older ones. Residents reported seeing between 20 and 30 deer in the picnic areas of Stanwell Park during some dry periods. It was pointless planting any trees in bushland without providing them with protection.

## Deer Damage

There are four ways in which deer can destroy a forest. The first is by partially ring barking the tree which may not result in the death of the tree, but certainly weakens it significantly. The second is by snapping off young trees about a metre off the ground. The third is by complete ring barking of younger trees, thus killing them. The fourth is by eating new trees as they come up.



Three examples of deer damage: in the first example, severe partial ringbarking to very old *Polyscias elegans* (Celery wood). The tree will probably survive because the ringbarking has not been complete, but around the other side of the tree is a very old scar of a similar attack in the past. In the second, the deer has partially ringbarked the trunk, but then broken the tree in half. In the third, I had marked this tree with safety tape with the intention of protecting it with wire or ochna trunks, but when I got around to doing it, it was too late. It had been totally ringbarked and killed.



The circle part of Banksia Bushcare site two years after removal of lantana, ochna and cassia. Deer have destroyed most of the native regrowth

The circle part of the Banksia Bush Care area shown above was heavily infested with lantana and ochna. The height of the lantana can be seen in the background of the first photo. The banksias were getting old and one in the first photo had blown over onto the ground. The clearing of the lantana and ochna was completed some two years ago. There were very few young trees that survived the weed infestation, and those that did survive were destroyed by the deer once they could get at them. Most of the native trees that sprouted since the clearing, such as cheese trees, were



immediately eaten by the deer. Some trees, such as Lilly Pilly, whose leaves are not normally eaten by deer, were broken off close to the ground. The third photo shows one of them.

The end result of these four kinds of damage is that a forest will not regenerate, and without protections of some kind being put in place, bush care is a waste of time.

There are some positives: Lomandra, which the deer do not normally eat, and which is prolific in the Coastal tea tree section of the park is spreading into the cleared areas. Most of the existing trees and all of the planted trees have their common and botanical names on a label for community education. The giant nests are constructed from the lantana, ochna and cassia stalks removed from the site. The centre of the nest is filled with leaf mulch to provide a compost heap for the tree planted downhill. The permanently wet centre acts as a fire retardant. The porcelain eggs in the nests have become a source of community involvement with local children painting them.

## Three Methods of Protecting Trees from Deer

### Cages

We built cages out of wooden stakes, star pickets and flower wire that I mostly bought with my own money and which Wollongong Council occasionally purchased for us. These cages are shown in the above photos and are largely effective. Occasionally the deer have destroyed one where only wooden stakes were used, and we are now reinforcing all of them with star pickets.

### Flower Wire Wrapping

We protected the existing trees from ringbarking, and did this by wrapping flower wire around their trunks. This seems to discourage the deer from sharpening their antlers on them.



The Bangalow palm in the first photo was attacked by deer through rubbing. Its roots were affected as it can be easily shaken. Flower wire was put around for protection, but its new shoots are significantly smaller than before, despite the assistance of a dripper. In the second photo a Guioa which had been protected by flower wire was still destroyed by a deer snapping it off. Flower wire around small trees is not always foolproof. The third photo is one of the 40 sandpaper figs eaten to the ground by the deer over two nights. A couple of the destroyed figs started to regrow from the roots, and I was able to protect them by a cage.



### Use of Lantana and Ochna Sticks

I had noticed that the deer rarely damaged a tree with low lateral branches, presumably because they would get in their eyes while doing a rub. There was a new use for the tonnes of ochna plant that we removed. We could wrap them around the trunks to imitate the function of low lateral branches. They are held on with cable ties. Anything that resembles low lateral branches is suitable. In the last photo below, we have used bamboo cuttings. This method seems to work.



Ochna, lantana and bamboo tied on with cable ties to mimic low lateral branches.

### Deer Fencing

The only real alternative for preventing the destruction of native regrowth of a forest is by fencing. We have done this by creating small copses of regenerating trees, and more recently by the erection of a deer fence around a large area.



First photo: The difference between the area protected by hinge wire around a regenerating copse and the bare ground beyond it, eaten out by deer is significant. In the second photo we found three young Guioas and a Tuckeroo struggling for some light amidst a stand of cassia and ochna, and then used the hinged wire to create a copse.

Some parts of the Banksia Bush care site have been so denuded of grasses and undergrowth that they now look like a cattle yard. I approached the Council late last year about purchasing the materials for a 150 metres of deer fence around a particularly sensitive area where deer had been attacking mature Bangalow palms, germinated and planted by another Stanwell Park bush care volunteer. They had also partially or completely ringbarked nearly all the rainforest trees in the area.



The fencing wire and star posts were duly supplied, and the Banksia Bushcare volunteers have now completed it.



Deer fence around a sensitive area behind the sand dune at Stanwell Park Beach where the deer had been attacking over 100 Bangalow palms.

### Survey of Dead and Damaged Trees

On 20 and 21 June 2019, I carried out a survey of the dead and damaged trees in about half of the Banksia Bushcare site area.



Area of the survey in red

I have set out a list of the native trees in the survey area of the Banksia Bush Care site, including those not damaged because of deer preference, and caging and trunk protection, to demonstrate the rich species diversity of this littoral forest.

TREE SPECIES	DAMAGED	KILLED
Acacia binervata (Two veined hickory)		
Acacia maidenii (Maiden's wattle)		
Acmena smithii (Lilly Pilly) *	22	5
Agathis robusta (Kauri pine)		
Alectryon subcomnereus (Native quince) *		
Alphitonia Excelsa (Red Ash)		
Archontophoenix cunninghamiana (Bangalow palm)*	27	18

Araucaria heterophylla (Norfolk Island pine)		
Banksia integrifolia (Coastal banksia)*	17	4
Banksia serrata (Old man banksia)		
Brachychiton acerifolius (Illawarra flame tree)*	8	1
Breynia oblongifolia (Breynia)*	25	14
Callistemon salignis (Willow bottle brush)		
Casuarina Cunninghamiana (River oak)		
Commersonia fraseri (Brown currajong)		
Corymbia maculata (Spotted gum)		
Cryptocarya microneural (Murrogun)	1	
Cupaniosis anacardioides (Tuckeroo)*	6	
Cyathea australis (Rough tree fern)		
Diospyros Australia (Black plum) *	2	
Diploglottis cunninghamii *		
Doryphora sassafras (Sassafras) *		
Elaeodendron australe (Red fruited olive plum) *	34	2
Endiandra sieberi (Corkwood) *		
Eucalyptus botryoides (Bangalay)		
Eucalyptus grandis (Flooded gum)		
Eucalyptus paniculata (Grey Ironbark)		
Eucalyptus pilularis (Blackbutt)		
Eucalyptus saligna (Sydney blue gum)		
Eucalyptus robusta (Swamp mahogany)		
Ficus coronata (Sandpaper fig) *	4	37
Ficus hillii (Hill's fig)		
Ficus macrophylla (Moreton bay fig)		
Ficus rubiginosa (Port Jackson fig) *		
Glochidion ferdinandi (Cheese tree)	98	31
Guioa semiglauca (Guioa)	172	39
Homalanthus populifolius (Native bleeding heart)		
Leptospermum laevigatum (Coast Tea Tree)		
Lophostemon confertus (Brush box)		
Livistona australis (Cabbage tree palm)	4	
Macadamia tetraphylla (Macadamia)		



Myrsine (variabilis and howittiana) (Mutton wood) *	117	49
Notelaea (longifolia and venosa) (Mock olive) *	87	24
Podocarpus elatus (Plum pine) *	1	
Polyscias elegans (Celery wood) *	20	
Synoum glandulosum (False Rosewood) *	4	
Syncarpia glomulifera (Turpentine)		
Pittosporum undulatum (Pittosporum) *	37	20
Toona ciliate (Red cedar) *		
Trema tomentose (Native peach)	10	1
Other	1	46
<b>Total</b>	<b>1,588</b>	<b>190</b>

**Total of Trees Killed and Damaged over the last two years: 1,778**

\* Trees that have had to be protected by caging or by wrapping flower wire or ochra and lantana sticks around their trunks.

#### **Some Explanations for These Figures**

The trees that are most susceptible to deer rub are rainforest species without low lateral branches. These include Guioa semiglauc (Guioa), Glochidion ferdinandi (Cheese tree), Polyscias elegans (Celery wood), the Myrsine (Mutton wood) and Notelaea (Mock olive) have these features. For some reason, the deer seem to love the smooth bark of the Guioas and Polyscias making trunk protection compulsory for every tree. Next in popularity for attack are the Myrsine, and then the Glochidion and Notelaea. These are the most numerous of all the rainforest species in the park. Diospyros Australia (Black plum) also has smooth barked but there are only two of the species in the whole of the park and one has been attacked. Likewise, there is only one Cryptocarya microneural (Murrogun) in the park, and it has also been damaged.

The deer generally do not rub against rough bark species such as Leptospermum (Coastal tea tree), Acacia (binervata and maidenii), Turpentine (Syncarpia glomulifera) and Grey iron bark (Eucalyptus paniculata).

The category of "killed" is where there has been total ringbarking of the tree, followed by leaf loss. Some of the other trees categorised as "damaged" may well die.

The category "other" covers species killed that I was not able to identify because of lack of leaves or loss of bark.

The reason for some other smooth barked species, such as Illawarra flame trees, not featuring prominently in the list of damaged or killed list is because they have mostly been planted, and it was useless planting them unless they were properly protected with a cage.

*Archontophoenix cunninghamiana* (Bangalow palm) cannot be ringbarked, as it is a palm. However, 18 of them have been killed by the deer by rubbing against them, and it seems that they have snapped the palm's roots. Some of the ones that died have been 3 metres tall. As a result, apart from very large Bangalows, I have had to discourage the deer by flower wire around the trunk or binding dead ochna to them. Bangalow palms have also been attacked by branches being broken and eaten. The deer fence erected near the main walkway to the beach was to protect the flourishing forest of Bangalows.



First photo: A Bangalow palm rubbed by deer. Death seems to result from snapping the roots. Second photo: All Bangalow palms, this size or under now have to be protected by flower wire or being tied with sticks.

Cabbage tree palms are usually immune from attack, but several have been partly eaten during dry periods.

### **What Can Be Done?**

Culling is the obvious answer, but it becomes very difficult in the Banksia Bush Care area because of the proximity to houses. Culling takes place within the Royal National Park, and it does not seem to have made much difference to the spread of *Rusa* deer. Even if culling becomes more extensive, it is



never going to be complete, and we will continue to have to protect plants from deer in the ways I have described.

The big problem for the community is that a number of bush care volunteers who have simply given up because the deer are making it a waste of time. The cost of caging is significant and Council bush regeneration budgets are limited.

Cages do protect trees, but they won't work for understorey and grasses. The only solution, apart from total fencing, is to find native species that deer will not eat. A study done in the Royal National Park in 2005 by David Keith and Belinda Pellos revealed that the deer did not seem to eat *Banksia ericifolia* or *Melaleuca Nodosa*. Other native species that they do not seem to favour eating are *Lomandra* and Coastal rosemary. Research should be carried out to identify more such plants for the sake of preserving at least some understorey.

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