Fauna Rehabilitation Plans
Wonga Road Bushland

Middle Harbour Catchment Area

2003

SECTION 2

REHABILITATION PLAN

Wonga Road Bushland

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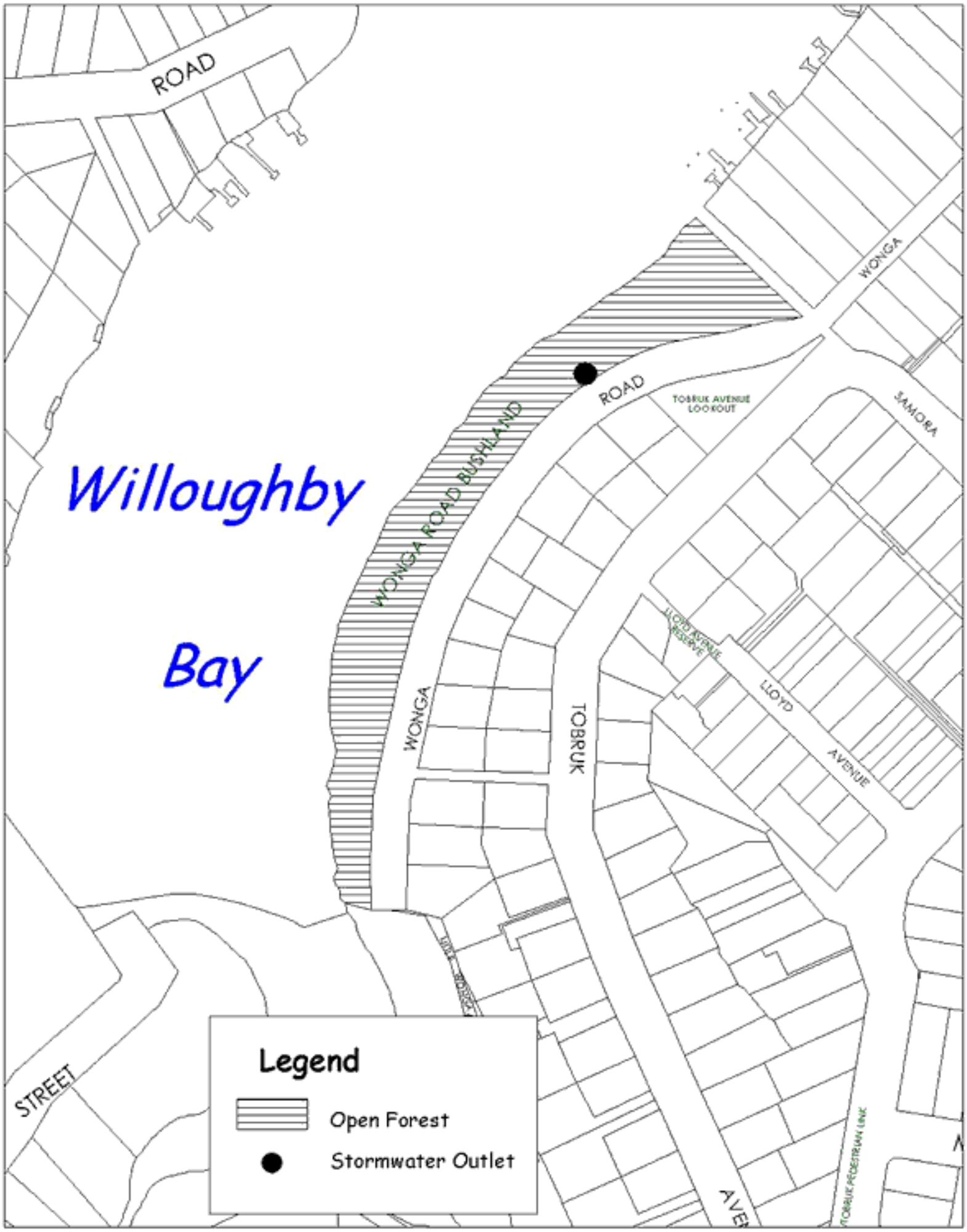

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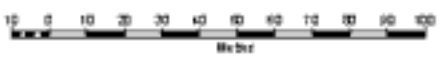

Map 1 - Vegetation Zones

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INTRODUCTION

Wonga Road Bushland is a narrow 25m wide north-west facing strip of remnant vegetation bordered by Wonga Road, Willoughby Bay and the open lawn area of Primrose Park to the south. The entire area of the bushland parcel is 9 800m^2. The dominant vegetation association is *Angophora costata* (Sydney Red Gum) and *Eucalyptus piperita* (Sydney Peppermint) Open Forest community. The bushland at Wonga Road is typical foreshore vegetation on Hawkesbury sandstone.

Weeds species are predominantly found at the most northern end of the bushland area. The remainder of the bushland area has been successfully regenerated and requires only minimal maintenance.

Recreational opportunities are extremely limited. There are no walking tracks, formal or informal. Therefore there is minimal impact on the bushland area from visitor usage. This may be one of the reasons the site has responded so well to regeneration.

The bushland acts as a wildlife corridor and vegetative buffer along the foreshore of Willoughby Bay. The fauna diversity for Wonga Road Bushland is low, the lowest recorded in Middle Harbour Catchment. This is probably due to the reserves small and narrow size. Despite this, native birds, possums, reptiles, frogs and bats including visiting Large Bent-wing Bats (*Miniopterus schreibersii*), listed as a Vulnerable species under the *NSW Threatened Species Conservation Act 1995*, still inhabit this reserve.

1.0 FLORA

Refer to **Map 1 -Vegetation Communities** for location details.

Wonga Road Bushland consists of a remnant vegetation community that is part of the Sydney Sandstone Complex – Sydney Sandstone Gully Forest (10ag) as indicated by Benson and Howell, 1994. The vegetation is symbolic of the North Shore and consists of:

1. *Angophora costata* (Sydney Red Gum) and *Eucalyptus piperita* (Sydney Peppermint) Open Forest community with a midstorey dominated by *Allocasuarina littoralis* (Black She-oak), *Banksia serrata* (Old Man Banksia), *Glochidion ferdinandi* (Cheese Tree) and *Pittosporum undulatum* (Sweet Pittosporum) and an understorey of *Pteridium esculentum* (Bracken Fern) and *Omalanthus populifolius* (Bleeding Heart Tree).

For further information see:
Appendix E – Indigenous Flora of North Sydney Database

1.1 Creekline Vegetation

There is no creekline or associated vegetation in Wonga Road Bushland.

1.2 Weed Assessment

Weed species are present in the various locations due to many factors. Large Leaf Privet (*Ligustrum lucidum*), Camphor laurel (*Cinnamomum camphora*), Fishbone Fern, Crofton Weed (*Ageratina adenophora*), Blackberry Nightshade (*Solanum nigrum*) and Lantana (*Lantana camara*) are present along the stormwater channels. Bamboo (*Phyllostachys spp*.), Cotoneaster (*Cotoneaster sp*.), Asparagus Fern (*Protoasparagus aethiopicus*), African Olive (*Olea europaea spp. africana*), Ochna (*Ochna serrulata*) and Honeysuckle (*Lonicera joponica*) are present along the residential boundary to the north. Milk Thistle, Ehrharta (*Ehrharta erecta*), Cobblers pegs (*Bidens pilosa*) and Fleabane (*Conyza sp*.) are commonly found along the edge of the roadway.

Weed species adjacent to roadways and residential areas are present due to many factors that contribute increased moisture and nutrients to the bushland edge. These include:

- 'Hard surface' runoff from impervious surfaces e.g. roads;
- Stormwater entering bushland;
- Imported fill soil and major disturbance to the original soil structure when the road was formed;
- Dumping of garden clippings into the reserve that has enabled many ornamental species to spread throughout the bushland area.

Along the perimeter of the bushland, adjacent to the road, the original soil profile has been disturbed and the native seed bank (found in the topsoil) has been buried or lost. The native seed bank takes many years to develop and mature. Major soil disturbance makes unassisted native plant regeneration almost impossible. To assist regeneration, sections of the bushland may have to be planted with local indigenous species. The placement of these plants will reflect their natural occurrence in the existing bushland ecosystem.

2.0 FIRE

2.1 Fire History

No pile burns or strip burns have been undertaken within this bushland area to date. Several pile burns are however planned for 2001/02. The piles are located close to the waters edge of Willoughby Bay.

Fire is an ecological tool required to sustain the plant communities of Wonga Road Bushland. There are several areas within Wonga Road Bushland that require burning for the purposes of maintaining diversity and stimulating the germination of native seeds which lay dormant in the soil. Some species can be eliminated from a bushland area due to the absence of fire.

As addressed in the Bushland Fire Management Policy, 1997: Section 4 – 'several areas that contain high fuel levels require burning not only for ecological purposes but also to manage the fuel levels on some sites'.

3.0 FAUNA

Information used in this section has been compiled from the Fauna Survey conducted by Dr Arthur White and the Biosphere Environmental Consultants in March 2002. Fauna sightings recorded on the Fauna of North Sydney Database 2003 and the North Sydney Bushland Continuing Bird Survey Interim Report by Peter Ekert and the Ekerlogic Consulting Services in December 2002 has also been considered. However, these two surveys are not specific for each reserve, rather the broader area of Middle Harbour Catchment.

For further information see:
Section 1.7 – Method
Appendix B – Fauna Survey Middle Harbour Bushland Reserves 2002
Appendix D – Fauna of North Sydney Database 2003
Appendix M - North Sydney Bushland Continuing Bird Survey Interim Report 2002

3.1 Terrestrial Vertebrates Overview

There are few native fauna species found within this bushland area. Ringtail Possums (*Pseudocheirus peregrinus*) reside in the canopy. Possum dreys can be seen on close inspection. Common bird species such as the Noisy Miner (*Manorina melanocephala*) the Pied Currawong (*Strepera graculina*) and the Rainbow Lorikeet (*Trichoglossus haematodus*) can be witnessed along Wonga Road. The Laughing Kookaburra (*Dacelo novaeguineae*) is also occasionally seen in the reserve.

Seabirds also utilize this bushland area for roosting and nesting sites. This bushland parcel acts as a wildlife refuge with minimal human disturbance. White-faced Herons (*Ardea novaehollandiae*), Mangrove Heron (*Ardeola striatus*), Masked Plover (*Vanellus miles*), Pacific Duck (*Anas superciliosa*) and occasional visits by the Little Egret (*Ardea garzetta*).

There is a lack of nesting hollows in Wonga Road bushland. Native birds, arboreal mammals and bat species suffer from the lack of safe nesting and roosting sites. These creatures play an important role in the ecology of the existing vegetation communities. They act as pollinators, natural seed dispersal units and aid in the germination of some native plant species.

For further information see:
Appendix D – Fauna of North Sydney Database 2003

3.2 Other Native Fauna Groups

- Terrestrial Invertebrates
- Aquatic Vertebrates, and
- Aquatic Invertebrates.

A formal survey of the diversity and abundance of Terrestrial Invertebrates has never been undertaken by North Sydney Council. It is recommended that more detailed studies be undertaken in the future. Aquatic birds are recorded in the Fauna Survey and the Fauna of North Sydney Database, however it is recommended that a more comprehensive study of Aquatic Vertebrate fauna also be undertaken in the future.

Aquatic Macro-invertebrates are regularly sampled in water testing of creeklines in North Sydney as indicators of water quality. This testing is carried out by the Open Space and Environmental Services division.

For further information contact:
North Sydney Council Open Space and Environmental Services division.

For further information see:
Appendix D – Fauna of North Sydney Database 2003

3.3 Introduced and Feral Animals

Only one exotic mammal species has been recorded in the reserve: the House Mouse (*Mus musculus*).

Five introduced bird species were recorded in the Fauna Survey: House Sparrow (*Passer domesticus*), Red-Whiskered Bulbul (*Pycnonotus jocosus*), Common Starling (*Sturnus vulgaris*), Common Mynah (*Acridotheres tristis*), and Spotted Turtle Dove (*Streptopelia chinensis*).

European Honey Bees (*Apis mellifera*) are also known to have created hives in tree hollows throughout the area. The Red Fox (*Vulpes vulpes)* is also seen in the area, although none have been sighted in Wonga Road Bushland.

3.4 Pets

Dogs and cats are rarely seen throughout the bushland of Wonga Road. No cats were seen in the Fauna Survey and no dog scats were collected either.

It is North Sydney Council policy that dogs must be on a lead whilst in bushland and that dog owners must pick up after their dogs. Under the *Companion Animals Act 1999,* cats are prohibited from harming native fauna. This is only possible if cats are kept out of the reserve. North Sydney Council encourages owners to keep cats inside all or most of the time.

For further information see:
Section 1.4.3 – Relevant Legislation: *Companion Animals Act, 1999*
Appendix J – Cat Attack and Fates of Native Animals of North Sydney Council From 1992 – 2001; Some Statistics for Ringtail Possums – 1 July 2001 to 30 June 2002, Sydney Metropolitan Wildlife Services

3.5 Vulnerable and Threatened Species

Two Vulnerable and Threatened species have been recorded flying over or near Wonga Road Bushland: the Grey-headed Flying-fox (*Pteropus policephalus*); and the Large Bent-wing Bat (*Miniopterus schreibersii*), both listed as Vulnerable Schedule 2 under the *NSW Threatened Species Conservation Act 1995.*

The Powerful Owl (*Ninox strenua*) has been recorded in the area on the Fauna of North Sydney Database. It is likely that this species may visit the area for food but it is unlikely that it nests or roosts in the area at present. The Powerful Owl is listed as a Vulnerable Species on Schedule 2 of the *NSW Threatened Species Conservation Act 1995.*

For further information see:
Section 1.4.3 – Relevant Legislation: *NSW Threatened Species Conservation Act 1995*
Section 1.5.11 – Specific Habitat Requirements

3.6 Locally Rare Species

Wonga Road Bushland is entirely bounded on its lower side by harbour foreshore. Seabirds utilize this bushland area for roosting and nesting sites. White-faced Herons (*Ardea novaehollandiae*), the Mangrove Heron (*Ardeola striatus*), Masked Plover (*Vanellus miles*), Pacific Duck (*Anas superciliosa*) and occasional visits by the Little Egret (*Ardea garzetta*) are some of the sea birds sighted at Wonga Road Bushland.

Small insectivorous birds such as the Superb Blue Fairy-wren (*Malurus cyaneus*) and Silvereye *(Zosterops lateralis)* inhabit the reserve. These species are locally significant and indicators of the health and habitat provided by bushland.

Crimson Rosella's (*Platycercus elegans*), the Laughing Kookaburra *(Dacelo novaeguineae)*, Red Wattle Birds (*Anthochaera carunculata),* Magpie-larks (*Grallina cyanoleuca)* and Black-faced Cuckoo-shrikes (*Coracina novaehollandiae*) are frequently sighted in the reserve. And although not indigenous to the region, Sulphur-crested Cockatoo's (*Cacatua galerita*) are also seen in Wonga Road Bushland.

Migratory species are known to visit the area in Spring and Summer each year from the Asia Pacific Region for breeding: the Common Koel (*Eudynamis scolopacea*) and the Channel-billed Cuckoo (*Scythrops novaehollandiae*). Pairs return to the same site each year to parasitise the nests of Pied Currawongs (*Strepera graculina),* Australian Ravens *(Corvus coronoides*), Australian Magpies (*Gymnorhina tibicen*), Magpie-larks and Red Wattle Birds.

For further information see:
Appendix C – Conservation Status of Wildlife in North Sydney
Section 1.5.13 – Specific Habitat Requirements

4.0 FAUNA REHABILITATION MANAGEMENT PLAN

4.1 Habitat Protection for Locally Significant Species

The aim of the Rehabilitation Plan for Wonga Road Bushland is to protect and enhance habitat for all known locally occurring native fauna. By doing so, these measures may help provide habitat for more occasional visiting and species uncommon to the area.

Species Habitat Protection and Restoration:

Mammals:

Common Brushtail Possum (*Trichosurus vulpecular*).
A Brushtail Possum was spotted in trees off Wonga Road.

Common Ringtail Possum (*Pseudecheirus peregrinus*)
Ringtail Possums present in trees off Wonga Road.

Grey-headed Flying Fox (*Pteropus poliocephalus*)
Flying foxes observed flying over the reserve.

Gould's Wattle Bat (*Chalinolobus gouldii*)
Detected flying over the southern end of the reserve.

Birds:

Australian Magpie	*Gymnorhina tibicen*
Black-faced Cuckoo-shrike	*Coracina novaehollandiae*
Channel-billed Cuckoo	*Scythrops novaehollandiae*
Common Koel	*Eudynamis scolopacea*
Crested Pigeon	*Geophaps lophotes*
Crimson Rosella	*Platycercus elegans*
Laughing Kookaburra	*Dacelo novaeguineae*
Little Black Cormorant	*Phalacrocorax sulcirostris*
Little Egret	*Ardea garzetta*
Little Pied Cormorant	*Phalacrocorax melanoleucos*
Magpie-lark	*Grallina cyanoleuca*
Mangrove Heron	*Ardeola striatus*

Masked Lapwing	*Vanellus miles*
Pacific Duck	*Anas superciliosa*
Powerful Owl	*Ninox strenua*
Rainbow Lorikeet	*Trichoglossus haematodus*
Red Wattlebird	*Anthochaera carunculata*
Silvereye	*Zosterops lateralis*
Southern Boobook Owl	*Ninox novaeseelandiae*
Superb Blue Fairy-wren	*Malurus cyaneus*
Tawny Frogmouth	*Podargus strigoides*
Welcome Swallow	*Hirundo neoxena*
White-browed Scrub-wren	*Sericornis frontalis*
White-faced Heron	*Ardea novaehollandiae*

Reptiles:

Grass Skink (*Lampropholis guichenot*i)
Present in the western end of Wonga Road Bushland.

Delicate Skink (*Lampropholis delicata*)
Found in the eastern area of Wonga Road Bushland.

Southern Leaf-tail Gecko (*Phyllurus platurus*)
Recorded in the area but not at presently recorded in Wonga Road Bushland.

Blue-tongue Lizard (*Tiliqua scinoides*)
Recorded in the area but not at presently recorded in Wonga Road Bushland.

The Green Tree Snake (*Dendrelaphis punctulata*), Golden-crowned Snake (*Cacophis squamulosus*) and Red-bellied Black Snake (*Pseudechis porphyriacus*)
Recorded occasionally in Middle Harbour Catchment in the Fauna of North Sydney Database

Frogs:

Common Eastern Froglet (*Crinia signifera*)
Present in a stormwater drain at the southern end of the reserve.

4.2 Summary of Fauna Survey Findings

Native fauna diversity for Wonga Road Bushland is low, the lowest in Middle Harbour Catchment. This is probably due to its small and narrow size.

No ground-dwelling mammals were found. Two possum species were observed, with Ringtail Possums (*Pseudecheirus peregrinus*) being higher in abundance than Brushtail Possums (*Trichosurus vulpecular*). One species of exotic rodent was present: the House Mouse (*Mus musculus*). Two species of Bat were detected: The Grey-headed Flying-fox (*Pteropus poliocephalus*) and the Large Bent-wing Bat (*Miniopterus schreibersii*).

Twenty species of bird were recorded, with five of these being exotic. The Continuing Bird Survey observed four species of birds, bellowing the lowest in avian diversity for all the bushland areas in North Sydney.

Two species of reptile were recorded and only one species of frog.

For further information see:
Appendix B – Fauna Survey Middle Harbour Bushland Reserves 2002
Appendix M – North Sydney Bushland Continuing Bird Survey Interim Report 2002

4.3 Site Issues and Objectives

SITE ISSUES

- Wonga Road Bushland has the potential to be more greatly linked to Primrose Park and Brightmore Reserve through the creation of Green Corridors.

- With minimal walking tracks and little recreational usage, this reserve has the potential to act as a refuge for nesting water birds.

- The reserve is small and narrow and bounded by Wonga Road on the eastern side and by harbour foreshore on the western side.

- Residents along Wonga Road could be encouraged to plant indigenous plants in their front yards through the 'Native Havens – Flora for Fauna in Your Garden' program, and be educated about pets and native fauna.

OBJECTIVES

Wonga Road Bushland

- To protect the diversity of vegetation communities and habitats,

- To promote biodiversity,

- To re-establish native vegetation and community structure of connective canopy, dense middle storey and understorey vegetation,

- To preserve and create shelter sites,

- To create Green Corridors and Wildlife Linkages,

- To create clean fresh water sources,

- To reduce the effect of 'edge effects',

- To eradicate all feral animals – namely, the Red Fox,

- To reduce the effect of domestic and introduced animals on native fauna,

- To reduce the effect of aggressive and territorial native species (Noisy Miner, Pied Currawong) on native fauna,

- To encourage the practice of Bush Regeneration work that preserves and protects habitat,

- To reduce the artificial light shining directly into the reserve,

- To educate and facilitate residents wishing to create native fauna habitat gardens.

4.4 Nesting seasons of Scrub Birds

This table is to be used when considering the timing of pile burns and broad area burns, and primary bush regeneration. These activities should be carried out outside the breeding season of scrub birds. This is a list of scrub birds that are known to inhabit or thought to most likely inhabit (*) this bushland reserve.

Table 1 – Bird Species, Nesting Height above Ground and Nesting Season

Common Name	Height (m)	J	F	M	A	M	J	J	A	S	O	N	D
Superb Fairy-wren	Up to 1m												
* White-browed Scrub-wren	On or near ground												
Silvereye	1 – 5m												
Red Wattlebird	3 – 10m (-20)												

Key Indicates breeding season

5.0 ACTION PLAN

Refer to **Map 2 – Rehabilitation Zones and Green Corridor Proposal**

Priority

The priority ratings given to each action in the matrix are subject to the availability of staff, funding and existing ideologies at the time of creation. For these reasons modification of priorities may occur as special circumstances arise.

ST	(Short Term)	Action completed within 2 years.
MT	(Medium Term)	Action completed within 2-4 years.
LT	(Long Term)	Action commenced after 4 years.
O	(Ongoing)	Action is carried out on a regular basis for the life of this action plan.
C	(Commenced)	Action has commenced.
CP	(Completed)	Action has been carried out.
AN	(As Needs Basis)	Action to be carried out on an as needs basis.

illoughby

Bay

N
W
E
S

WONGA ROAD

Zone 5

HLAND

ROAD

TOBRUK AVENUE LOOKOUT

WONGA

TOBRUK

LLOYD AVENUE RESERVE

LLOYD

AVENUE

LITTLE WONGA RD

AVENUE

DIAMOND/TOBRUK PEDESTRIAN LINK

Legend

- Green Corridor
  Bushland extension into parkland
- Green Corridor
  Sympathetic street planting
- Aerial Pathway

Scale 1:2000

10 0 10 20 30 40 50 60 70 80 90 100

Metres

Map 2 - Rehabilitation Zones and Green Corridor Proposal

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Table 2: Management Strategies for Wonga Road Bushland

For further information on all Action objectives see **Section 2.1** *Management Strategies for North Sydney Local Government Area*, and **Section 2.2** *Statement of Management Practices for Bush Regeneration Works.*

Zone	Objective	Threatening Process	Action	Fauna Protected	Comments	Priority
1	Declaration of Fauna Conservation Area	Lack of protection for native fauna under the Local Government Act.	Zone Wonga Road Bushland as a 'Wildlife Protection Area' under the *Companion Animals Act, 1998.*	- All Native Fauna	There are no formal walking tracks in Wonga Road Bushland and little public usage. This would be a relatively easy reserve with which to trial a Wildlife Protection Area. See **Section 1.4.3:** *Relevant Legislation.*	ST
1	Replacement of lost shelter sites.	Loss of shelter sites.	Leave and replace rocks, logs, leaf litter and dead trees. Create temporary artificial shelter sites in areas that have been cleared. Place educational signage stating the importance of leaving these items in bushland areas.	- Reptiles - Frogs - Terrestrial Mammals	Dead trees should be left safe. They may need to be lopped back to stags. Collars of at least 30cm should be left where branches are to be removed, to allow for hollows to develop. Rocks and logs can be used in landscaping bush regeneration	O

Zone	Objective	Threatening Process	Action	Fauna Protected	Comments	Priority
					sites.	
1	Weed removal techniques that preserves habitat.	Over-clearing and loss of shelter and habitat for native fauna in bush regeneration work.	Apply mosaic clearing pattern technique to bush regeneration work. Clear only, an area no larger than 20m x 20m or 1/3 of the site. Leave areas of weeds (de-seeded) that provides middle storey vegetation and/or connective canopy. Ensure Contract Tenders include native fauna habitat protection and ensure site supervisor follows habitat protection methods. Primary Bush Regeneration and removal of scrub layer to be carried out outside scrub bird breeding season.	- All Native Fauna - Small Bird Species - Possums	Lantana (*Lantana camara*) often provides the only habitat for small birds such as Superb Blue Fairy-wrens. *Pittosporum undulatum* is frequently over cleared in bush regeneration works, often providing the only middle storey vegetation for possums and birds. See **Table 1:** *Bird Species, Nesting Height above Ground and Nesting Season*.	O

Zone	Objective	Threatening Process	Action	Fauna Protected	Comments	Priority
1	Recreation of Natural Vegetation Structure.	Lack of connective canopy.	Create a Tree Plan for the reserve. Plant indigenous canopy species in areas lacking canopy. Install aerial pathways between areas lacking connective canopy. See: 'Installation of Aerial Pathways'.	- Possums		ST O
		Lack of dense middle storey vegetation.	Use of fire as a tool to regenerate middle storey vegetation. 'Direct Seed' middle storey species where the use of fire is inappropriate or has been unsuccessful. Plant middle storey seedlings where the use of fire is inappropriate or has been unsuccessful.	- Small Bird Species - Ringtail Possums	Loss of middle storey vegetation is one of the primary causes for loss of native fauna.	ST O

Zone	Objective	Threatening Process	Action	Fauna Protected	Comments	Priority
		Lack of understorey vegetation.	Remove weeds to encourage natural regeneration. Use fire as a tool to encourage regeneration. Plant or direct seed indigenous ground covers where natural regeneration has been unsuccessful.	- Reptiles - Terrestrial Mammals - Invertebrates - Birds foraging for insects	Some species of ground covers generally always naturally regenerate.	ST O
1	Reduce 'Edge Effect'	'Edge Effect' changing flora and fauna species diversity, allowing invasion of weed species and predation.	Plant 'Buffer Plants' along edges of reserves.	- Small Bird Species - Reptiles	For appropriate buffer species see **Section 2.1.5** *Buffer Planting.*	MT C
			Advertise and encourage the 'Native Havens – Flora for Fauna in your Garden' program.	- Small birds - Reptiles - Birds - Possums	Residents bordering Wonga Road Bushland were letterbox dropped advertising the 'Bush Friendly Backyard' program in October 2002.	C
1	Creation of 'Core' Conservation Area	Lack of core area with minimal disturbance and 'edge effect'. Disturbance from pedestrian traffic.	Reduce the number of walking tracks. Create formal walking tracks with boardwalks.	- All Native Fauna	Boardwalks over water puddles will create habitat for frogs. No formal walking tracks exist in Wonga Road Bushland.	AN

Zone	Objective	Threatening Process	Action	Fauna Protected	Comments	Priority
1	Creation of Green Corridors and Wildlife Linkages	Isolated pockets of bushland.	Create Green Corridors and linkages by extending indigenous planting on the parkland at the lower end of Wonga Road, Primrose Park.	- Large Bent-wing Bats - Birds - Some Terrestrial Fauna	See **Map 2** for proposed Green Corridor plantings. Green Corridor planting needs to take into consideration views. To prevent blocking views, shrubs should only be used.	LT
			Advertise and encourage the 'Native Havens – Flora for Fauna in your Garden' program.	- Small birds - Reptiles - Birds - Possums	Residents bordering Wonga Road Bushland were letterbox dropped advertising the 'Bush Friendly Backyard' program in October 2002.	O
1	Effective Fire Management	Lack of fire and subsequent and loss of vegetation diversity and middle storey vegetation.	Broad Area and/or Pile Burns approximately every 10 years. Broad area burn to be no greater than 1/4 of reserve area.	- All Native Fauna	Broad area and pile burns should be carried out outside breeding times of scrub birds. See **Table 1:** *Bird Species, Nesting Height above Ground and Nesting Season*. No burns have been carried out in Wonga Road Bushland to date.	O

Zone	Objective	Threatening Process	Action	Fauna Protected	Comments	Priority
1	Creation of Fresh Water Sources	Lack of clean freshwater sources.	Create Frog Ponds. Ensure clean stormwater is released into stormwater outlets through the use of Gross Pollutant Traps and public education.	- Birds - Reptiles - Frogs	See **Appendix H:** *Frog Facts No.2.* The 'Yellow Fish Road' project in 2001 – 2002 aimed to educate people that 'the drain is just for rain'.	LT CP
			Create Bird Baths.	- Birds	See **Appendix I:** *How to Build a Bird Bath.*	MT
1	Feral Animal Control	The Red Fox – Predator of native fauna.	Carry out Fox Baiting Program; and Den Fumigation.	- Possums - Birds - Reptiles	Fox baiting has not yet been carried out in Wonga Road Bushland.	STO
		European Honey Bees - Occupy critical habitat of nesting hollows.	Remove Bee hives by blocking the hollow containing the bees, or to kill with flame or smoke.	- Possums - Parrots	Some hollows occupied by bees can be high and difficult to get too. Removal of hollow or killing with an insecticide is not favourable. Apiarists can be hired for assistance and/or Bee hive removal.	ST O

Zone	Objective	Threatening Process	Action	Fauna Protected	Comments	Priority
		European Honey Bees - Interfere with natural and successful pollination of native vegetation.		- Native Bees	Loss of small pollinating mammals and many bird species has also affected the loss of pollination of many species.	
		Indian Mynahs - Occupy tree hollows.	Trap by use of Tree Netting or removal in nesting hollow.	- Possums - Parrots	Indian Mynahs may not be in high enough numbers in bushland areas in North Sydney for Tree Netting.	ST O
		Feral Cats - Predator of native fauna.	Set Cat Traps. Cats to be taken to the local vet to be euthanased.	- Possums - Birds - Reptiles	To date no feral cats have been sighted in North Sydney.	AN
		Rabbits - Destroy native seedlings and regeneration.	Set Rabbit Traps.	- Native Plant Regeneration	Few rabbits have been sighted in North Sydney's Middle Harbour. These have been escaped or dumped pet rabbits. The *Calicivirus* is not known to have reached North Sydney.	AN
1	Domestic Animal Control	Disturbance from dogs and dog scent; dog faeces affecting bushland soil pH and nutrient status; and dog predation.	Install educational signage around reserves, stating that dogs need to be kept on leads in bushland areas and that owners need to pick up after their dog.	- All Native Fauna	Dogs disturb, chase and some kill native fauna. This disturbance and scent cause some nesting birds and possums to abandon nests.	ST

Zone	Objective	Threatening Process	Action	Fauna Protected	Comments	Priority
			Provide dog bins at either end of bushland reserve walking tracks.		A dog bin could be provided at the lower end of Wonga Road Bushland.	ST
			Educate residents with the 'Enviro-pet: North Sydney Guide to Pets and Native Fauna' publication. To increase Ranger patrol and enforcement laws.		'Enviro-pet: North Sydney Guide to Pets and Native Fauna' is an educational booklet addressing the issue of pets and native fauna to be distributed to all pet owns in North Sydney in mid 2003.	C ST O
		Domestic cat predation, scent and faeces.	Instate cat curfews and cat exclusion from bushland areas. See 'Declaration of Fauna Conservation Area'. Educate resident cat owners with 'Enviro-pet: North Sydney Guide to Pets and Native Fauna'.	- All Native Fauna	Domestic cats are responsible for the deaths of many native fauna. 'Enviro-pet: North Sydney Guide to Pets and Native Fauna' is an educational booklet addressing the issue of pets and native fauna to be distributed to all pet owns in North Sydney in mid 2003.	ST O C

Zone	Objective	Threatening Process	Action	Fauna Protected	Comments	Priority
			To trap cats found in bushland areas and return to the owner with a letter or take to Pound.		The only way to effectively stop cat predation is to keep cats in doors, all the time or at least during dusk, evening and dawn.	ST O
1	Minimise Artificial Lighting	Residential, street, footpath, and playing field lighting obstructing nocturnal native fauna vision and reducing the overall effective habitat area of reserve.	Install light shields on street, footpath and playing field lighting next to reserves. Educate residents backing onto the reserve to not direct lighting into the reserve.	- Possums - Owls - Nocturnal Fauna	Tawny Frogmouths benefit from lights, as lights attract moths and other insects. Light shields will not impact negatively on Tawny Frogmouths.	MT
1	Installation of Nesting Boxes	Lack of nesting and breeding hollows.	Install nesting boxes bushland reserve for Possums and Parrots.	- Hollow Nesting Fauna - Parrots - Brushtail Possums - Ringtail Possums - Owlet Nightjars	Nesting boxes can be made for many hollow dwelling species. For further information on nest box designs refer to ' The Nest box Book: Nestboxes for Birds and Mammals' (1997) Gould League of Victoria Inc. Nesting Boxes have been successful in attracting Ringtail Possums and some Brushtail Possums.	C ST O

Zone	Objective	Threatening Process	Action	Fauna Protected	Comments	Priority
					In 2003 Council Employed 'Sleepy Hollows' to make and install Possum Boxes throughout reserves in North Sydney.	
					Nesting Boxes have not yet proven successful in North Sydney in attracting Parrots. Boxes for other species have not yet been trialed. Nest Box invasion of European Bees needs to be monitored and boxes removed if invaded. Apiarists will remove and use hives. Bee swarming season, from November – January, instigates a higher chance of bees moving into boxes and installation should be avoided in this time. Indian Mynahs invading Nest Boxes has not been an issue in North Sydney.	
Wonga Road	Installation of Traffic Calming Devices	Possum fatality on roads due to speeding vehicles.	Install traffic calming devices on roads adjacent to bushland areas.	- Possums - Blue-tongue Lizards	Contact North Sydney Council's Traffic Department.	LT

Zone	Objective	Threatening Process	Action	Fauna Protected	Comments	Priority
1 & Wonga Road	Installation of Aerial Pathways	Increased risk to possums due to lack of connective canopy and the need to come down to the ground.	Construct aerial pathways to allow possums to move safely over Wonga Road Bushland and into Brightmore Reserve. Suggestion of 3 pathways.	- Possums	The RTA has trialed aerial pathways over large roads between bushland. See **Map 2**, for suggested Aerial Pathway construction.	MT
Various	Installation of Aerial Bundle Cabling	Frequent Possum and Bat electrocution in certain areas of aerial cables.	Install Aerial Bundle Cabling (ABC) on electric cables identified as having frequent bat and/ or possum electrocution. Identified areas need to be submitted to the OSES division.	-Possum -Grey-headed Flying-foxes	ABC is carried out by Energy Australia in conjunction with North Sydney Councils Open Space and Environmental Services Division (OSES).	LT O
1	Reduce Habitat Favoured by Aggressive Native Fauna	Large populations of the Noisy Miner and Pied Currawong.	Re-establish dense middle storey vegetation in bushland areas through the use of fire, natural regeneration, planting or direct seeding. Plant shrubs and understorey vegetation only in island pockets and/ or in parkland.	- Small Bird Species - Visiting and Migrant Birds - Possums out of their nest in daylight hours.	Dense middle storey vegetation provides shelter for small birds. Noisy Miners and Pied Currawongs are 'edge' species that utilize edges of bushland areas. Bushland in North Sydney is predominately small and narrow and dominated by large areas of 'edge'.	MT C

Zone	Objective	Threatening Process	Action	Fauna Protected	Comments	Priority
			Discourage the planting of 'Robyn Gordon' and other large flowering hybrid Grevilleas in Parkland and private gardens, as they supply a large quantity of nectar to Noisy Miners.		Pied Currawongs and Noisy Miners favour stands of trees only as habitat.	
1	Pollution, Poison and Insecticide Control	Use of Insecticides, Pesticides and Organophosphates.	Increase public education on the dangers of these chemicals to native fauna. Increase public education on organic gardening and natural alternatives to garden/ vegetable/ orchid pests.	- Tawny Frogmouths - Insectivorous Birds - Blue-tongue Lizards - Insectivorous Reptiles - Frogs - Kookaburra's, Magpies, Butcher Birds - Owls	Birds and reptiles that consume poisoned insects store the toxin in their fat reserves. In times of food shortage, fat reserves are used and the toxin is released. These poisons cause a painful death due to attacking the Central Nervous System.	MT O
		Use of Rat Poison that indirectly kills Possums.	Increase public education on the dangers of rat poison to native fauna.	- Antechinus - Possums	Possums will eat and die from rat poison.	MT O
		Use of Rat Poison to directly kill possums.	Increase public education on how to live with Possums. Sell Possum Boxes to the community at cost price.	- Brushtail and Ringtail Possums	Some residents, frustrated with having a possum in their roof, or eating their garden plants will purposely poison or trap possums	C O

Zone	Objective	Threatening Process	Action	Fauna Protected	Comments	Priority
			To distribute Councils publication 'Living with Possums' that addresses this issue.		and release them into bushland, causing probable death.	
1		Pollution and toxins entering waterways and stormwater outlets. Eg. Pesticides.	Enforce tighter controls and fines on industry, companies and persons who pollute waterways, through the Environmental Protection Association.	- Fish & Crustaceans - Water Birds that eat fish and crustaceans - Ducks and Water Birds - Frogs	There is one stormwater outlet in the eastern higher end of Zone 1.	O
1	Seasonal food availability.	Loss of vegetation diversity. Loss of food availability all year round, particularly in winter.	Plant a diversity of vegetation that provides a mixture of flowers, seeds and berries throughout the year.	- Nectivore and Frugivore Birds - Possums	For further information see: **Table 1.4:** *Flowering and Fruiting Times of Native Trees and Shrubs.*	O MT
1	Re-introduction of Native Fauna	Loss of biodiversity.	Re-introduce Blue-tongue Lizards into suitable habitat.	-Blue-tongue Lizards	These species can be bred and the program overseen by a trained Herpetologist and Apiarist.	LT
1			Re-introduce Native Bees into suitable habitat.	- Native Bees - Native Flora	Permission is needed from the NSW National Parks and Wildlife Service. See **Section 2.1.20:** *Re-introduction of Native Fauna.*	