



Bushland Rehabilitation Plans

Tunks Park Bushland

Middle Harbour Catchment

2001

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Tunks Park Bushland

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INTRODUCTION

Tunks Park bushland consists of a narrow strip bordered by residential properties, sports fields, the waters of Flat Rock Creek and associated tributaries. Stormwater enters the main tributary at the junction of Marks St and Hamilton Lane, Crows Nest. The area is approx. 55 130m². The dominant vegetation association is an *Angophora costata* (Smooth-barked Apple) and *Eucalyptus resinifera* (Red Mahogany) Open Forest with *Eucalyptus pilularis* (Blackbutt) Open Forest dominating to the west. Weed species are dominant along property boundaries, creekline edges and the numerous stormwater drains located at various points throughout the bushland area.

Bush regeneration activities are carried out by the Tunks Park Bushcare Group, Tunks Park West Bushcare Group, Council's Bushland Management Team and bush regeneration contractors. The bushland at Tunks Park forms an important link to Mortlock Reserve and the bushland of Flat Rock Gully located in the Willoughby Council area.

The bushland is mainly utilised by passive recreationists. The absence of a formal track system through the bushland has limited certain issues that lead to bushland degradation eg. creation of informal tracks, trampling of vegetation, the presence of dogs and their faeces, litter and vandalism. The creation of informal tracks can lead to soil erosion due to the loss of vegetation, soil compaction and the invasion of weed species.

A broad area burn was conducted during 1996 west of the suspension bridge. The native plant regeneration resulting from the fire was extensive, with an increase in the population size of some species and the germination of species not recorded in a pre-burn flora survey.

Site History

Aboriginals frequented the valley and used the creek as a fresh water source for many thousands of years. Shell middens and rock art are represented in the area and perhaps many other signs of Aboriginal life are present but remain undiscovered. The Aboriginal name for this area has been lost along with most of the verbal history of the local indigenous people. The successive generations of Aboriginal people had a deep respect for the area, living in natural harmony with the environment for many thousands of years.

Before the sport fields at Tunks Park were created in the 1950's, a natural creekline and extensive estuarine mudflats could be seen adjacent to the present bushland areas of both Tunks Park and the bushland of Willoughby Council. In the 1940's the Mayor, Ald. Fowle spoke about the area saying that 'It is a pity to see such a valuable piece of land lying in a useless state'.

Discussion over reclamation of the area began in 1944 and it was decided that the area be turned into sport fields. The Garbage Depot on Young Street would 'suffice for approx. another year'. Garbage was then transferred from 1945 to the mudflats after pipes were laid to carry the water from the unaffected upper catchment creeklines, under the (then yet to be constructed) sport fields and directly into Long Bay (Willoughby Bay). Silt from the Bay and the remaining mudflats was then used as packing to create the flat surface that we see today. By 1954, reports show that the grass was beginning to grow despite the saline content of the fill soil. Flooding was also reported in heavy rains when the drainage pipes would become obstructed with fallen trees, fencing and other debris that had been washed down from the upper catchment.

Tunks Park was named after William Tunks, the first Mayor of St. Leonards from 1867-1883. He was also elected to the Legislative Assembly as a member for St Leonards in 1864. He was very active in community affairs, being particularly interested in improving public reserves in the district. It was largely through his efforts that Gore Hill Cemetery was established and the site of Lavender Bay Baths was secured.

Examples of European Heritage in Tunks Park includes the sewage viaduct, constructed as part of the West Middle Harbour Sub-main in 1927 and the suspension bridge built by the North Sydney Tramway and Development Company and opened in 1882.

There are two Bushcare Groups working within the Tunks Park bushland area. They include the Tunks Park Bushcare Group and the Tunks Park West Bushcare Group.

Tunks Park Bushcare Group began in 1993 and they currently meet once a month. The Bushcare Site continues to expand as more degraded areas become successfully rehabilitated. In 2000, the Group spent a total of 147hrs working on their site. The Tunks Park West Group formed in 1998 due to increasing resident concern for the bushland adjoining their backyards. The Group meet once a month and have rehabilitated and regenerated a large area spanning the length of several residential blocks. In 2000, the Group spent a total of 120 hrs working on their site.

The Bushland Management Team visit each bushland Reserve on a monthly rotational basis. Tunks Park (including Tunks Park West) was regenerated and rehabilitated for approx. 122 hrs during 2000. Activities included maintenance weeding of seasonal weed invasions; spot-spraying edges; hand removal of Madeira Vine and tubers; watering and maintaining plantings throughout the year.

Contract bush regenerators have been working in the area since 1991. The contract bush regeneration team spent a total of 1140 hrs regenerating several areas within the bushland of Tunks Park during 2000.

BACKGROUND

Reserve Summary

Council Zoning	Bushland
Area of Reserve	55 129m ²
Level of Degradation:	
<10%	-
10-30%	6941m ²
31-60%	6997m ²
>60%	26 314m ²
Length of Boundaries	4434.3m
No. of Properties Adjoining Bushland	36
Length of walking track	N/A

1.0 FLORA

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

Tunks Park consists of two remnant vegetation communities which are 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* (Smooth-barked Apple) and *Eucalyptus resinifera* (Red Mahogany) Open Forest dominated by a midstorey of *Allocasuarina littoralis* (Black She-oak), *Hakea dactyloides* (Broad-leaved Hakea), *Grevillea linearifolia* (White Spider Flower), *Elaeocarpus reticulatus* (Blueberry Ash), *Glochidion ferdinandi* (Cheese Tree) and an understorey of *Lomandra longifolia* (Mat Rush), *Dianella caerulea* (Paroo Lily) and native grasses (including *Entolasia* sp.).
2. *Eucalyptus pilularis* (Blackbutt) Open Forest with a dominant midstorey of *Dodonaea triquetra* (Native Hop Bush), *Pittosporum undulatum* (Sweet Pittosporum), *Glochidion ferdinandi* (Cheese Tree) and *Entolasia stricta* in the understorey.

For further information see:

Appendix 5 – Table 1: Classification of vegetation communities.

Section 3 – Native plant species list for Tunks Park.

1.1 Creekline Vegetation

The creekline receives stormwater from the greater residential catchment of Cammeray. The piped stormwater enters the creekline below the junction of Hamilton Lane and Marks Street, Cows Nest. This tributary continues through the bushland and joins the main creek (Flat Rock Creek) which originates in the Willoughby bushland area in the upper catchment. Flat Rock Creek flows beneath the sports fields of Tunks Park via several underground concrete channels and drains to Long Bay.

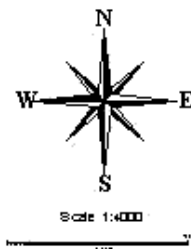
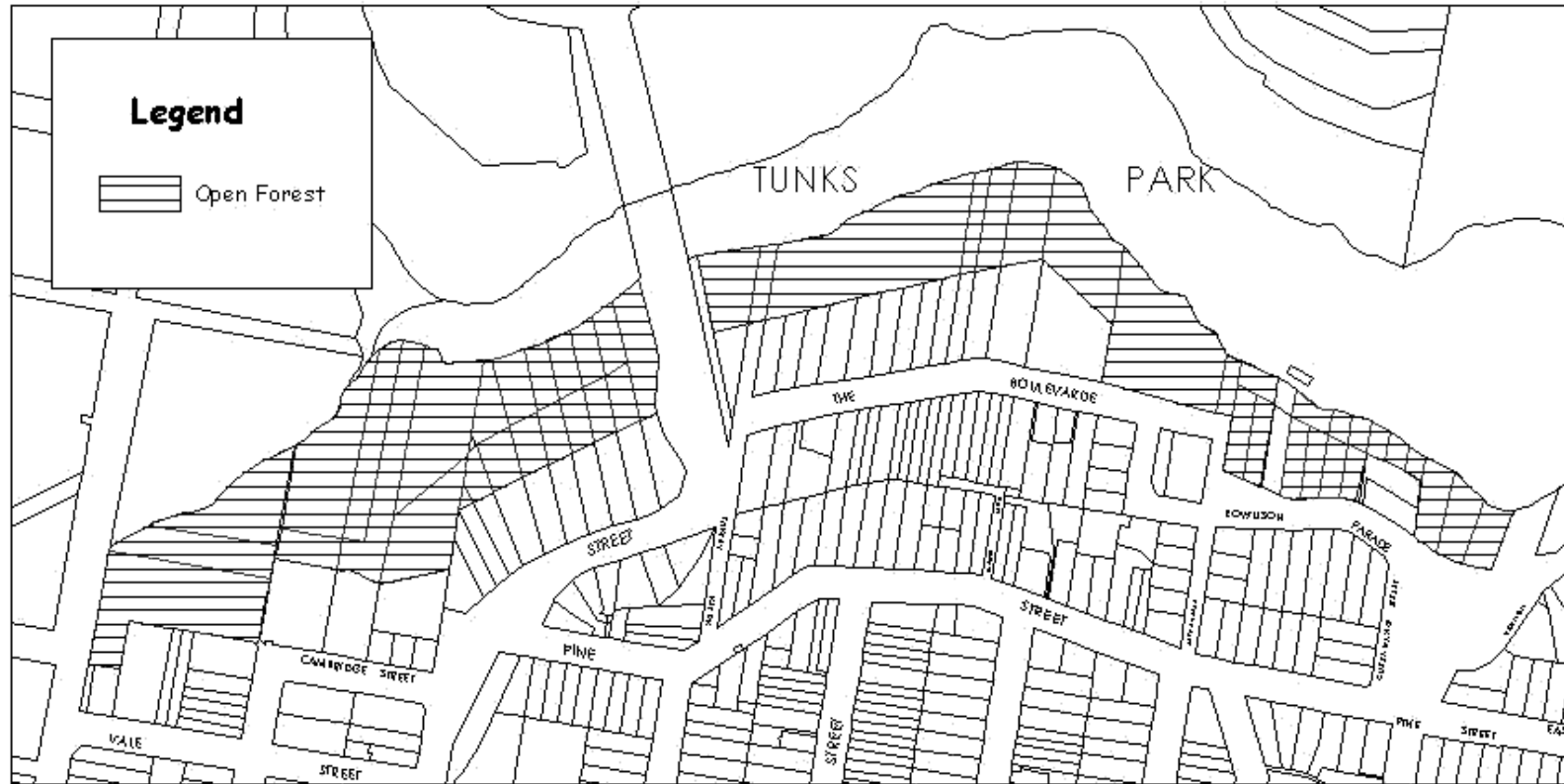
Remnant creekline vegetation includes *Callicoma serratifolia* (Black Wattle), *Acmena smithii* (Lily Pily), *Ceratopetalum apetalum* (Coachwood), *Elaeocarpus reticulatus* (Blueberry Ash), *Glochidion ferdinandi* (Cheese Tree), *Polyscias sambucifolia* (Elderberry Panax) and *Clerodendrum tomentosum* (Hairy Clerodendrum). Weed species are also found throughout the bushland edges of the creekline. These are discussed below.

The original estuarine plant community at the mouth of the creekline adjacent to Long Bay was lost during the construction of the sports fields in the 1950's. This area would have contained mangrove thickets, mudflats and habitat for a wide variety of estuarine flora and fauna. Remnant vegetation of the lost estuarine environment can still be witnessed on the lower edges of the bushland. Native species include *Casuarina glauca* (Swamp She-oak), *Gahnia aspera* (Sword Grass) and *Juncus usitattus* (Common Rush).

1.2 Weed Assessment

Weed species are present in the reserve due to many factors.

The creekline is a source of weed seed and increased nutrient pollution from the upper catchment. This has resulted in the spread of weed species along the banks of the creekline below. Large Leaf Privets (*Ligustrum lucidum*) and pockets of Lantana (*Lantana camara*) line the banks of the creek in some areas. Exotic vines are also present in the area eg. Morning Glory (*Ipomea indica*) and Balloon Vine (*Cardiospermum*



Map 1 - Vegetation Zones

grandiflorum). Other prominent weed species found along the creekline are Cassia (*Senna pendula*), Madeira Vine (*Anredera cordifolia*) and Camphor Laurel (*Cinamomum camphora*).

Weed species found adjacent to the rear of residential properties are present due to many factors which contribute increased moisture and nutrients to the bushland edge. These include:

- 'Hard surface' runoff from impervious surfaces eg. Driveway, concrete paths, roof;
- Garden watering systems and pools;
- Imported fill soil and major disturbance to the original soil structure;
- Use of fertiliser; and
- Dumping of garden clippings 'over the back fence' has also enabled many ornamental species to spread throughout the bushland.

Native species which are usually found along rainforest margins eg. *Pittosporum undulatum* (Sweet Pittosporum), *Elaeocarpus reticulatus* (Blueberry Ash) and *Glochidion ferdinandi* (Cheese Tree) are successfully colonising areas of Open Forest. These native species flourish in elevated soil moisture and nutrient conditions and in areas where fire has been excluded for long periods.

The original soil profile has been disturbed in some locations 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. Due to this factor, 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.

Weed species also invade along the edge of the bushland. The perimeter of bushland along the edge of the sport fields is highly impacted by 'edge effects' where the bushland is bordered by lawn grass species and wind borne seeds are most likely to be deposited along these edges as the bushland slows down wind velocities.

For further information see:

Appendix 5 – Table 2: Weed assessment details.

Section 4 – Weed species list for North Sydney.

Refer to **Map 2 - Land Management Issues** for the location of Weed Zones.

1.3 Vulnerable and Threatened Species

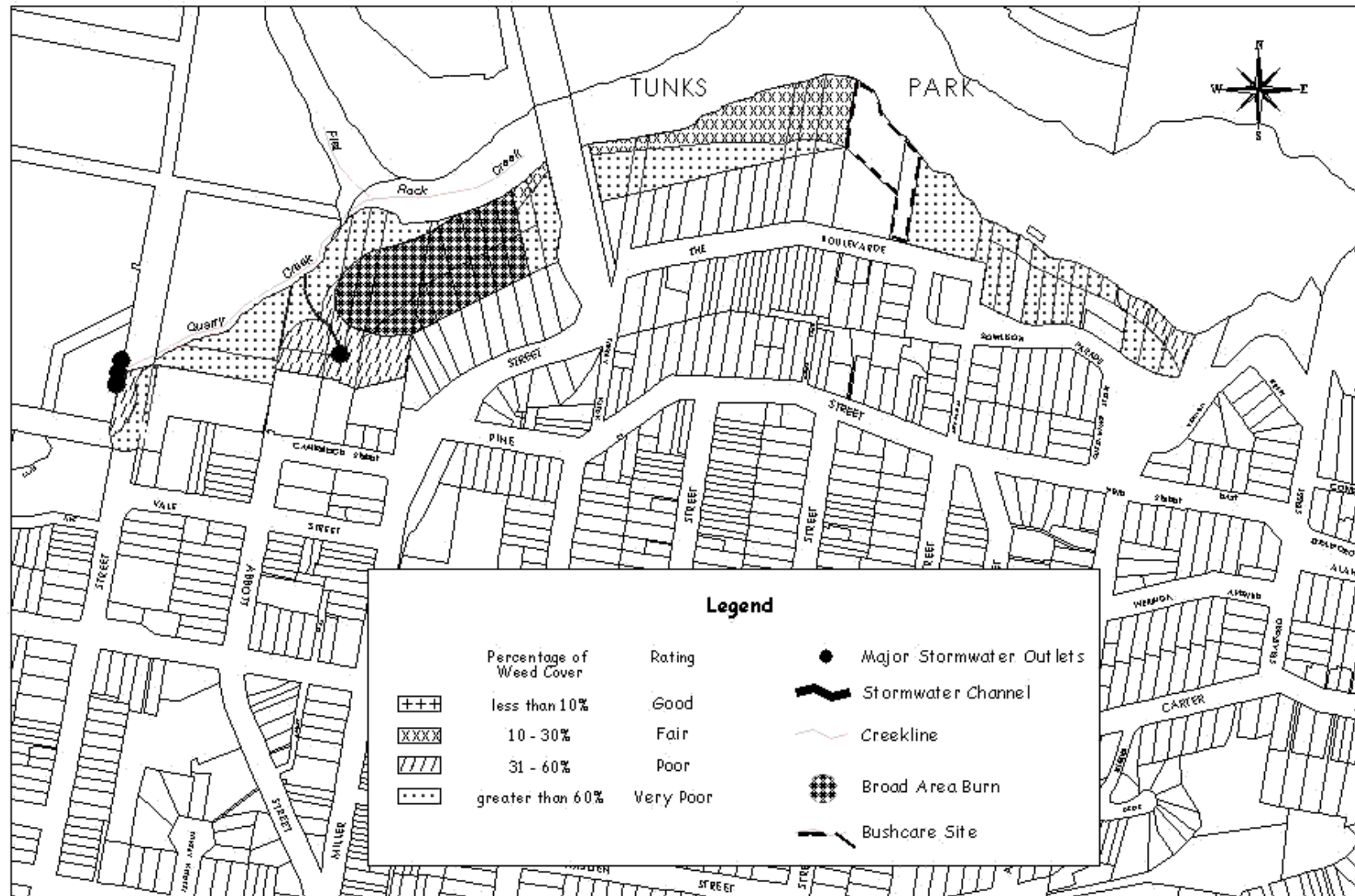
There are no known vulnerable or threatened flora species in the bushland of Tunks Park as listed in the *Threatened Species Conservation Act, 1995*.

1.4 Locally Rare Species

Locally rare species include *Asplenium australasicum* (Birds Nest Fern), *Caustis flexuosa* (Old Mans Beard), *Gahnia melanocarpa*, *Actinotus minor* (Lesser Flannel Flower), *Sigesbeckia orientalis* (Indian Weed), *Bossiaea heterophylla*, *Pultanea flexilis* (Graceful Bush-pea), *Pomaderris discolor* (Pomaderris), *Xylomelum pyriforme* (Woody Pear), and *Wikstromia indica*.

For further information see:

Appendix 5 - Table 3: Regional significance of Locally Rare Species.



Legend

Percentage of Weed Cover	Rating	Symbol	Description
+++	Good	●	Major Stormwater Outlets
XXXX	Fair	—	Stormwater Channel
///	Poor	—	Creekline
....	Very Poor	■	Broad Area Burn
		—	Bushcare Site

Scale 1:1000

Map 2 - Land Management Issues

2.0 FAUNA

2.1 Terrestrial Vertebrates

There are a wide diversity of fauna species within the bushland areas of Tunks Park. There is evidence of Ringtail Possums (*Pseudocheirus peregrinus*), Brushtail Possums (*Trichosurus vulpecular*) and the Grey-headed Flying Fox (*Pteropus poliocephalus*) who frequent the area on nightly foraging trips.

Eastern Water Dragons (*Physignathus lesueurii*) have been sighted along the creeklines and stormwater runoff areas. Usually both adults and juveniles can be witnessed. This suggests that there is a healthy population present in the area. The Blue-tongue Lizards (*Tiliqua scincoides*) and Eastern Water Skinks (*Sphenomorphus quoyii*) are commonly found in the area. The Green Tree Snake (*Dendrelaphis punctulata*), the Golden-crowned Snake (*Cacophis squamulosus*) and the Red-bellied Black Snake (*Pseudechis porphyriacus*) are rarely seen.

Common bird species can be found in the bushland of Tunks Park. These include the Noisy Miner (*Manorina melanocephala*), the Australian Magpie (*Gymnorhina tibicen*), the Pied Currawong (*Strepera graculina*) and visiting Rainbow Lorikeets (*Trichoglossus haematodus*). Other common species that have been sighted in the bushland include the Grey-headed Butcherbird (*Cracticus torquatus*), the Red Wattlebird (*Anthochaera carunculata*), and the Black-faced Cuckoo-shrike (*Coracina novaehollandiae*).

The Southern Boobook Owl (*Ninox novaeseelandiae*) occasionally visits the bushland area. This species has also been witnessed hunting Ringtail Possums in Cremorne Point bushland and also in the bushland of Gore Cove, in Wollstonecraft. Tawny Frogmouth Owls (*Podargus strigoides*) are found in the bushland of Tunks Park

The Common Koel (*Eudynamis scolopacea*) and the Channel-billed Cuckoo (*Scythrops novaehollandiae*) are both migratory species visiting in Spring and Summer each year from the Asia Pacific Region.

Less common species include the White-headed pigeon (*Columba leucomela*), the Eastern Whip-bird (*Psophodes olivaceus*), the White-browed Scrubwren (*Sericornis frontalis*) and the Spotted Pardalote (*Pardalotus punctatus*).

The Australian Kookaburra (*Dacelo novaeguineae*), Magpie Lark (*Grallina cyanoleuca*), the Welcome Swallow (*Hirundo neoxena*) and the Willy Wagtail (*Rhipidura leucophrys*) are occasionally witnessed along the bushland edges. A pair of Masked Plovers (*Vanellus miles*) are commonly seen on the sports fields adjacent to the bushland area.

Periodically, Yellow-tailed Black Cockatoos (*Calyptorhynchus funereus*), the Sulphur-crested Cockatoo (*Cacatua galerita*) and the Crimson Rosella (*Platycercus elegans*) have been seen in Primrose Park bushland perhaps seeking out any available nesting hollows.

There is a lack of nesting hollows in Tunks Park due to the absence of mature native trees that tend to bear such hollows. 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 vegetation communities of Tunks Park. They act as pollinators, natural seed dispersal units, and aid in the germination of some native plant species.

For further information see:

Section 5 – Fauna in North Sydney

Section 8 – Law and Policy: *National Parks and Wildlife Act, 1974.*

2.2 Other native Fauna Groups

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

A formal survey of the diversity and abundance of the above group of organisms has never been undertaken by North Sydney Council. It is recommended that more detailed studies be undertaken in the future.

2.3 Introduced and Feral Animals

Tracks, scats and other traces of the Red Fox (*Vulpes vulpes*) have been identified in Tunks Park. The Red Fox would probably have a territory covering the area of both Tunks Park and adjoining Willoughby Council bushland areas.

It is recommended that Fox Control Programs be implemented in conjunction with neighbouring Council areas, or if possible, on a regional basis. The Fox Control Program would also have to be an ongoing yearly expenditure so that foxes from outside the city that move into the newly created urban bushland niches are not left to take up a territory and begin to reproduce in the area.

For further information see:

Section 5 – Fauna of North Sydney: Introduced Species.

2.4 Vulnerable and Threatened Species

There are no vulnerable or threatened fauna species found in the bushland of Tunks Park as listed in the *Threatened Species Conservation Act, 1995*.

2.5 Locally Rare Species

A formal survey of the diversity and population size of all existing fauna species in North Sydney has never been undertaken, therefore, it is impossible to ascertain whether a species is rare or not. The precautionary principle is utilised in bush regeneration activities to accommodate this lack of knowledge. Current and ongoing data collection of fauna species exists as a result of the community based Wildlife Watch Program and sightings made by Council staff and Contractors. All fauna is protected in North Sydney and it is essential to know what exists to assist in better management practices.

3.0 BUSHLAND FRAGMENTATION

The bushland of Tunks Park is bordered by residential development, roads, parkland and sports fields. The thin, narrow size of the bushland parcel makes it vulnerable to weed invasion and rapid weed colonisation. Some of the bushland areas are bordered by lawn which is an edge that requires constant maintenance to keep the lawn grasses from invading the bushland.

There are no formal tracks within Tunks Park bushland and informal tracks found throughout are relatively insignificant.

The bushland of Tunks Park lies adjacent to the bushland of Mortlock Reserve in North Sydney. These two areas are separated by Brothers Avenue. This bushland parcel also joins up with the bushland of Flat Rock Gully, Willoughby to the north. The only feature separating these two separately managed areas is Flat Rock Creek.

3.1 Habitat Corridors

The creation of a wildlife habitat corridor extending from Mortlock Reserve to the bushland of Tunks Park will greatly benefit native wildlife in existing within both bushland areas. The benefits include the ability to move to other bushland areas safely, the increase of foraging areas and the greater selection of suitable nesting/roosting sites.

Integrated management with neighbouring Willoughby Council in regards to the adjacent Flat Rock Gully bushland will provide a single vision for the area. It is important that the two management bodies work closely together to initiate bushland regeneration practices and integrate ideas on the management of Flat Rock Creek, which passes through both bushland areas. Strategic planning for the regional bushland area between the two Councils will ensure a holistic approach to management is achieved.

4.0 FIRE

Refer to **Map 2 - Land Management Issues** for details of fire history.

During 1996 a broad area burn was undertaken in bushland on the western side of the Suspension Bridge. Preparation for the burn included tree injection of large woody weeds such as Large Leaf Privet (*Ligustrum lucidum*), Camphor Laurel (*Cinamomum camphora*) and control of Ochna (*Ochna serrulata*) throughout the understorey. Fire trails were cut through the bushland as an extra precaution to local residences and the adjoining bushland that was not part of the total planned burn area. The burn was assisted by two local Fire Brigades and Council's Bushland Management Team.

The fire was a success, in that, the diversity of native species present after the fire was greater than the diversity of native species present before the fire. The results of the pre-burn and post-burn surveys are located in Appendix 5. Weed species to emerge after the burn included Ink Weed (*Phytolacca octandra*), Blackberry Nightshade (*Solanum nigrum*) and Lantana (*Lantana camara*).

Due to the success of the native plant regeneration following the broad area burn, future burns will be planned for this area.

Fire is an ecological tool required to sustain the plant communities of Tunks Park. There are several areas throughout Tunks Park 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'.

For further information see:

Appendix 5 – Table 4: Fire history of Tunks Park.

Appendix 5 – Table 6 & Table 7: Pre-burn and Post-burn Vegetation Survey.

Section 9 – Bushland Fire Management Policy for North Sydney Council.

5.0 URBAN RUNOFF

Refer to **Map 2 - Land Management Issues** for the location of stormwater channels.

Stormwater originates from the greater suburb of Cammeray and is discharged into the creekline below the junction of Hamilton Lane and Marks Street. There are three stormwater pipes which open out into the natural creekline at this point. The natural creekline runs through the bushland gully for approx. 200m before entering Flat Rock Creek and then eventually being diverted into a series of underground concrete stormwater channels which drain to Long Bay.

There are several other stormwater pipes which drain directly into the bushland area. These pipes drain into the understorey and in many locations, deep channels have formed from the effects of erosion and high velocity outputs at the end of pipe during high rainfall periods. Sewerage pipes also traverse this bushland area. Again, in heavy rainfall, fluid was often seen to be leaking from the round concrete pop-top lids into the surrounding bushland area. The increased moisture and nutrients have had a negative affect on native vegetation and has contributed to the growth of weed species.

Other urban runoff originates from residential properties. Runoff enters the bushland from small pipes that carry runoff water from hard surface areas including driveways, roofs, cemented areas and other impervious surfaces. The runoff enters the bushland creating moist soil conditions not favourable to the existing native species in the area.

For further information see

Appendix 5 – Table 5: Stormwater characteristics of Tunks Park.
Middle Harbour Catchment Management Plan, 1999: Stanton Library.

6.0 ABORIGINAL CULTURAL SITES

There is one known Aboriginal site located within Tunks Park. All Aboriginal sites are significant and protected in the North Sydney area. All sites require specialist management and there are certain procedures which need to be undertaken in relation to bush regeneration practices, monitoring and maintenance processes.

The identification and location of all known and potential Aboriginal sites in Tunks Park have been recorded on a closed access database and an Aboriginal Site Management Strategy for this bushland area was prepared in 1999 by North Sydney Council's Aboriginal Heritage Officer.

For further information see:

Section 8 – Law and Policy: Aboriginal Heritage Management.
Aboriginal Site Management Strategy for Tunks Park, 1999.
Development Control Plan: Heritage and Cultural Resources, 1999.

7.0 EUROPEAN HERITAGE SITES

A sewage viaduct which extends from the bushland of North Sydney, across the sports fields of Tunks Park and into the bushland of Willoughby, is an important part of the local sewage system. It is also symbolic of the progress of local urban infrastructure and development. This viaduct is one of the few visible structures from the underground sewage systems across Sydney. It was constructed as part of the West Middle Harbour

Sub-main during 1927 and is a good example of period concrete construction in an attractive and prominent location.

The Suspension Bridge (Northbridge) is a historically important local bridge. The bridge extends from Miller Street linking Cammeray with Northbridge. It was built by the North Sydney Tramway and Development Company and opened in 1882, this bridge was a privately funded investment by a land speculation company intending to open up what is now Northbridge. The company went into liquidation in 1891 and the bridge was completed and opened by the construction contractor. A suspension bridge, it comprised of three spans for a total length of 1010ft, with ironbark decking, steel work imported from Clyde, Scotland and cables from Warwick in England. Stone was delivered by punt up from Middle Harbour. Tramlines were extended across the bridge in 1913. It was taken over by the Department of Main Roads in 1925 and was found to be in a weakened state. The bridge was reconstructed as a reinforced concrete arch with the sandstone towers retained as portals and reopened in 1939.

The Suspension Bridge is a picturesque landmark and a dramatic and spectacular structure. The concrete arch is of considerable technical interest and stylisation and detailing to match original towers is a rare feature executed with skill and style.

For further information see:

North Sydney Heritage Study Review, 1993: Stanton Library.

North Sydney Council Heritage Inventory Database: Stanton Library.

8.0 RESERVE USERS

The community may utilize the bushland areas of Tunks Park for:

- Nature appreciation
- Aesthetics - Green Buffer zone

Tunks Park bushland can be accessed by public transport (bus only) or by private vehicle. A car park is located off Brothers Avenue which accommodates around 50 cars.

8.1 Vandalism and Misuse

The presence of graffiti and structural damage is minimal within the bushland areas of the Park.

9.0 EXISTING PROPERTIES ADJOINING BUSHLAND

9.1 Noxious Weeds

Noxious weeds such as Madeira Vine (*Anredera cordifolia*), Lantana (*Lantana camara*), Morning Glory (*Ipomea indica*) and Large Leaf Privet (*Ligustrum lucidum*) are found throughout the bushland.

Isolated thickets of Lantana, which form a monoculture in the midstorey, has provided habitat for many species of small birds eg. White-browed Scrub-wrens, Silvereyes, Superb Blue-wrens. These patches of Lantana will be left until last to be regenerated within the bushland area. Suitable habitat in adjacent sections of the bushland will be created and allowed to mature before the Lantana is removed. This will ensure survival of the small bird species within this area.

As regeneration activities are initiated in Tunks Park by the Bushland Management Team, Contractors, the Tunks Park Bushcare Group and/or the Tunks Park West Bushcare Group, Noxious Weeds Notices will be sent out to adjoining properties if noxious weeds are present on their land.

For further information see:

Section 4 – Noxious Weeds/Environmental Weeds list for the North Sydney Council area.

Section 8 – Law and policy: *Noxious Weeds Act, 1993*.

9.2 Encroachment

Any person found to be encroaching onto bushland areas will be approached by Council and the issues concerned will be discussed.

9.3 Dumping

There is recent evidence of garden refuse dumping into the bushland area, especially in the western sector of Tunks Park bushland. Garden refuse dumping appears to have been occurring for many years. Reminders of past household and industrial waste dumping episodes can also be seen.

Piles of garden refuse are generally made up of lawn clippings, tree branches, discarded household pot plants and weed species. Dumping garden refuse into the bushland has many negative affects on the surrounding environment including:

- Increased soil nutrients from the decomposition of vegetative matter,
- The spread of weed species into the bushland by seed or cuttings,
- The spread of lawn grass into the understorey, and
- The spread of exotic household plants, some of which spread rapidly throughout the bushland.

Thousands of dollars are spent each year to combat weed species from spreading throughout the bushland. To educate the local residents on these issues will help to reduce this major threat to the bushland of Tunks Park.

Residents are encouraged to take advantage of Council's Green Waste Pick-up Service. Collections can be organised at any time of the year by calling 9936 8326 and leaving your details.

For further information see:

Section 8 – Law and Policy: *Local Government Act, 1919*.

9.4 Pets

Dogs and cats are infrequently seen throughout the bushland of Tunks Park. Should you wish to exercise your dog in the bushland areas of North Sydney, your pet must remain on a leash. Cats may be kept in at night for the benefit of our local nocturnal native fauna who reside in the bushland areas of Tunks Park.

For further information see:

Section 8 – Law and policy: *Companion Animals Act, 1999* and Councils Policy on Dog Control in North Sydney.

10.0 ACTION PLAN

10.1 Rehabilitation Works

Detailed information and the location of rehabilitation works to be carried out over the lifespan of this document in each bushland area. Each bushland reserve is divided into smaller Zones to provide a more detailed vision for each different location. The rehabilitation works are then given a priority rating.

10.2 Management Strategies and other Programs

These additional documents are required to assist a successful rehabilitation process.

10.0 ACTION PLAN

10.1 Rehabilitation Works

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.

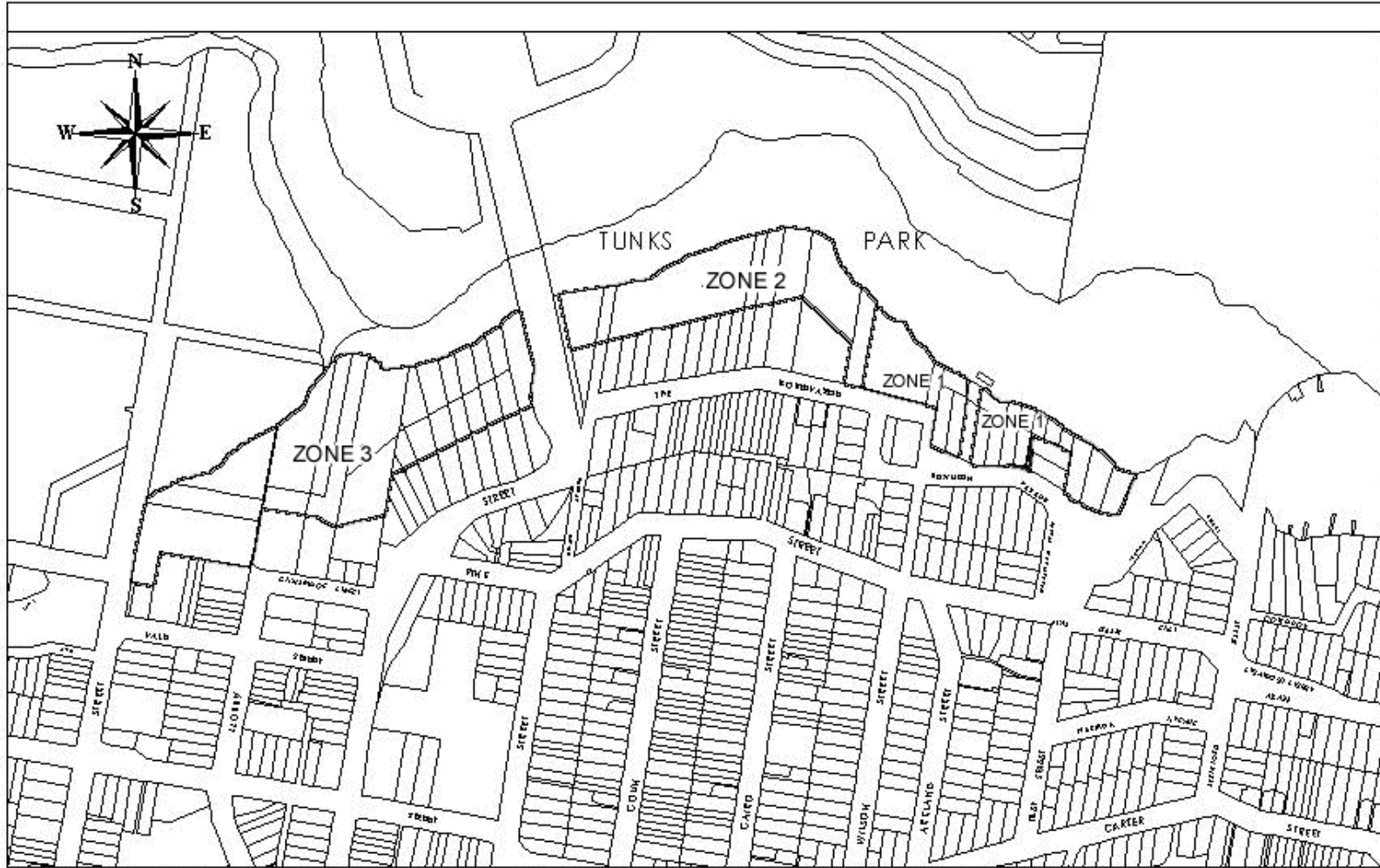
Identification numbers e.g. 1A, 1B etc. shown in the **Issues** column of the Action Plan relate to the corresponding Map for that zone and the action required.

NOTE: The Rehabilitation Plan is designed to be relevant for a five year period and to be extensively reviewed and updated at the end of this time.

OBJECTIVES

Tunks Park Bushland

- To conserve and restore the remnant indigenous plant communities of the area,
- To rehabilitate disturbed bushland edges to reflect the floristic and structural diversity of former vegetation communities,
- To conserve locally rare flora and promote biodiversity,
- To control and reduce the spread of weeds throughout the bushland,
- To provide native habitat for the local indigenous fauna and encourage the creation of corridors to other bushland parcels,
- To protect and conserve areas of Aboriginal Heritage,
- To minimize the effects of stormwater pollution on creeklines and urban runoff in the surrounding bushland,
- To minimize the spread of weed species from adjacent land, and
- To facilitate residents wishing to regenerate remnant bushland in their backyards or recreate the bushland which once existed there.



Scale 1:5000



Map 3 - Rehabilitation Zones

ZONE 1

Refer to **Map 3 - Rehabilitation Zones** for the location of this zone.

An area of remnant Open Forest dominated by *Angophora costata* (Smooth-barked Apple), *Eucalyptus resinifera* (Red Mahogany), *Glochidion ferdinandi* (Cheese Tree) and *Allocasuarina littoralis* (Black She-oak). The residential edge of this zone is dominated by weed species. Two stormwater outlets are present in this area which drain directly into the understorey. This zone is being regenerated by bush regeneration contractors.

Refer to **Map 4 - Rehabilitation Actions** for the location of Proposed Actions in each individual zone.

Issue	Current Condition	Proposed Action	Priority	Performance Measure
Vegetation Management 1A	Edge of native garden adjacent to the playground at the eastern end of Tunks Park impacted upon by 'edge effects' i.e. wind blown weed seeds are deposited and lawn grass species are invading.	Create a natural log border between the native garden and the lawn. Maintain the edges of the native garden by spot spraying (with Roundup Biactive (or similar with low surfactant)).	ST/O	Log border has been created and maintained.
	Weed species emerging in good/fair bushland due to natural dispersal processes.	Work from the good areas out into the more degraded edges. Sweep through the area six times per year. Maintain.	C/O	'Good bush' areas are appropriately maintained.
	<i>Pittosporum undulatum</i> (Sweet Pittosporum) are successfully colonising sections of this zone.	Thin out these species by stem injection, especially in situations where these trees are obstructing the growth of other native species in the zone. Protect areas of interconnecting canopy.	C/O	Pittosporums are appropriately culled.

Issue	Current Condition	Proposed Action	Priority	Performance Measure
	Wandering Jew (<i>Tradescantia fluminensis</i>) forming a carpet monoculture in the understorey in sections of this zone.	Roll back Wandering Jew and compost on site. Direct seed the exposed soil with local indigenous seeds collected from the surrounding bushland area. Maintain.	C/O	Herbaceous weeds have been composted, native seed has been sown and the area is appropriately maintained.
	Canopy areas are under stress from invasive weedy vines including Morning Glory (<i>Ipomea indica</i>) and Balloon Vine (<i>Cardiospermum grandiflorum</i>).	Sever vines at the base of the canopy trees. Follow stem back to root anchor. Cut and paint with Roundup Biactive (or similar with low surfactant). Scrape and paint the stem of weedy vines (2-3 inches) which are trailing through the understorey.	C/O	Vines have been appropriately controlled.
	Large Leaf Privet (<i>Ligustrum lucidum</i>) and Lantana (<i>Lantana camara</i>) are common throughout this zone.	Inject mature fruit producing Privet trees at a rate no more than 25% per year. Remove seedlings and saplings. Pile the cut woody weed species and plan for pile burns on this site. Cut and paint the base of Lantana at the root node. Weave the cut stems back up into the Lantana in the midstorey where appropriate. Remove sections of Lantana where required. Add cut stems to pile burns when removed. Use of direct seeding and planting of local native species will be undertaken	C/O C/O O	Privet trees have been appropriately injected/removed. Lantana has been appropriately controlled and the are maintained. Direct seeding undertaken where appropriate.

Issue	Current Condition	Proposed Action	Priority	Performance Measure
		where appropriate.		
	Noxious weed species present on adjacent residential properties.	As bush regeneration activities commence in this zone, any adjacent residences found to have noxious weeds growing on their property will be issued a Noxious Weeds Notice to control the growth and spread of these species into the bushland area.	ST/O	Noxious Weeds Notices sent to offending residents where appropriate.
Locally Rare Species 1B	<i>Asplenium australasicum</i> (Birds Nest Fern) and <i>Wikstromia indica</i> are located within this zone. Only a small colony of each plant species remains.	Collect seed of these species from adjacent bushland areas in the same catchment within a 10km radius. Propagate this species for redistribution and plant in appropriate areas that are being regenerated to increase the stock size of these species. Ensure their long-term viability in the area. The use of fire may also be beneficial to the germination of natural seed sources within the existing soil (where appropriate). Maintain.	MT/O	Locally rare species numbers are maintained in the area.
Garden Refuse Dumping	Some residential properties of The Boulevard show recent evidence of dumping garden refuse into the bushland area.	Send offending property owners a Council Dumping Notice stating the reasons why garden refuse dumping has a negative impact on the bushland and the fines which may be imposed. Refer them to the Council's free Green Waste Pick-up Service which can be used when required.	ST	Offending residents have been issued a Dumping Notice.

Issue	Current Condition	Proposed Action	Priority	Performance Measure
		Follow-up with a locally targeted community education program.	MT	Community Education Program has been instigated.



ZONE 2

Refer to **Map 3 - Rehabilitation Zones** for the location of this zone.

A remnant Open Forest dominated by *Angophora costata* (Smooth-barked Apple), *Eucalyptus resinifera* (Red Mahogany), *Glochidion ferdinandi* (Cheese Tree), *Elaeocarpus reticulatus* (Blueberry Ash) and *Allocasuarina littoralis* (Black She-oak) with midstorey of *Hakea dactyloides* (Broad-leaved Hakea) and *Grevillea linearifolia* (White Spider Flower). Three stormwater outlets are present in this area which drain directly into the understorey. Zone 2 is regenerated and rehabilitated by the Tunks Park Bushcare Group and bush regeneration contractors.

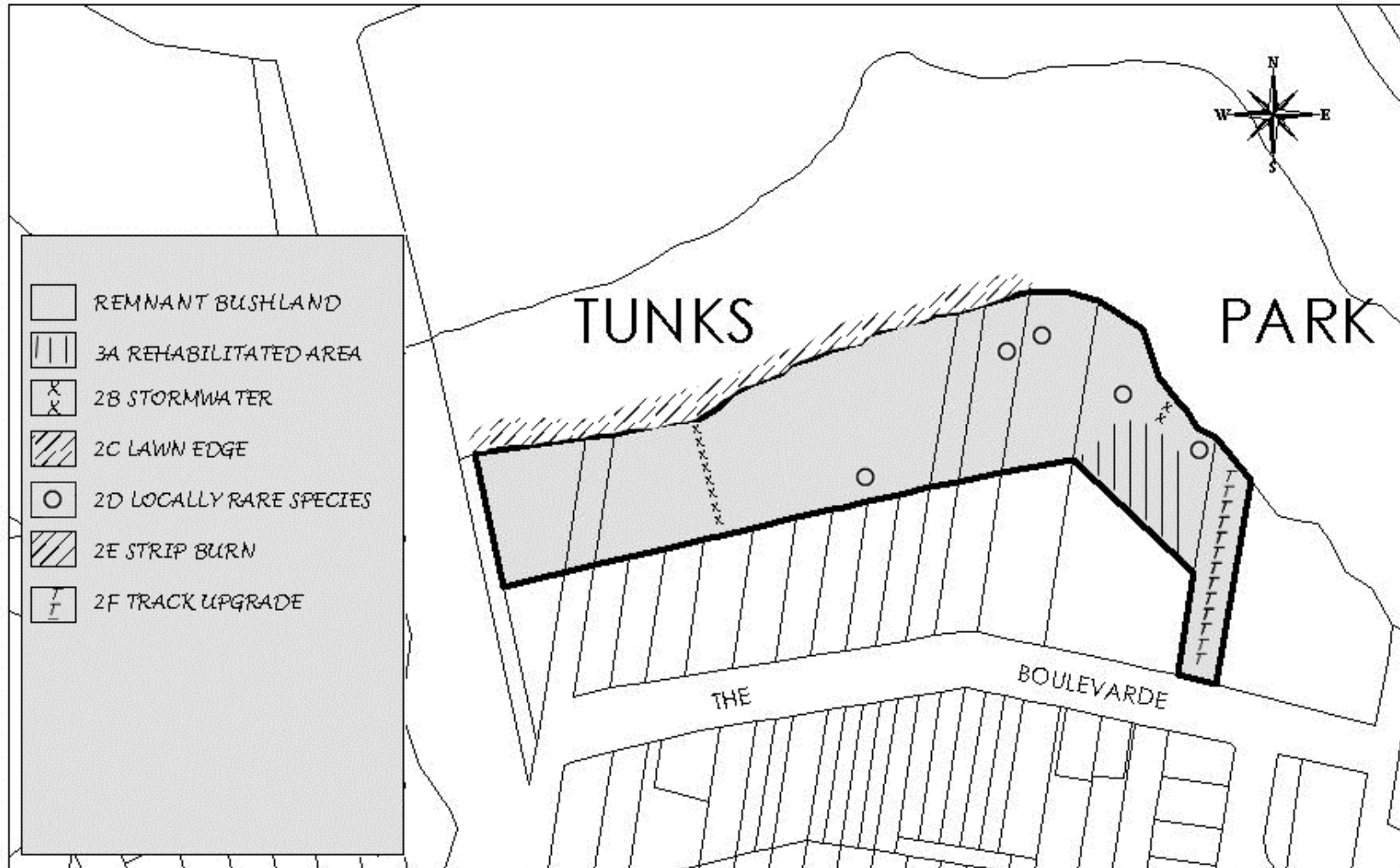
Refer to **Map 4 - Rehabilitation Actions** for the location of Proposed Actions in each individual zone.

Issue	Current Condition	Proposed Action	Priority	Performance Measure
Vegetation Management	Noxious weed species present on adjacent residential properties.	As bush regeneration activities commence in this zone, any adjacent residences found to have noxious weeds growing on their property will be issued a Noxious Weeds Notice to control the growth and continual spread of these species into the bushland area.	ST/O	Noxious Weeds Notices sent to offending residents where appropriate.
	Weed species emerging in good/fair bushland due to natural dispersal processes.	Work from the good areas out into the more degraded edges. Sweep through the core area of bushland six times per year removing annual weeds and any new regrowth. Maintain.	C/O	'Good bush' areas are appropriately maintained.
2A	A major part of the original Bushcare Site has been successfully rehabilitated. Annual and regrowth of weed species on	Maintain the rehabilitation area. Remove seasonal and re-emerging weed species as required.	C/O	Rehabilitation area is adequately maintained.

Issue	Current Condition	Proposed Action	Priority	Performance Measure
	the site is minimal.			
2B	Weed species are dominant along stormwater outlets and areas of urban runoff.	<p>Work from the good bush, removing the weeds and moving back towards the stormwater drainage lines and the edge of residential boundaries. These weed dominated areas will be included in the final stages of regeneration and rehabilitation for this zone.</p> <p>To plan for future works along the main stormwater outlets, selectively clear small circular patches of weedy vegetation and plant a variety of native canopy species. Maintain. These planted trees will mature and allow for bank stabilisation, canopy habitat and food sources for fauna when bush regeneration commences in these areas in the long term.</p>	C/O ST/O	'Good bush' areas are appropriately maintained and selective primary work has commenced along the drainage line. The area is appropriately maintained.
2C	Thin strip of lawn grass separates the access roadway through Tunks Park and the bushland edge. This edge creates a constant maintenance cycle to prevent lawn grass from growing up into the bushland.	Reclaim lawn areas as bushland where the lawn is less than 2 meters wide between the bushland and the access roadway. Rehabilitate and maintain. Plant these thin strips with local native species e.g. low growing native grasses and groundcovers.	LT	Lawn has been reclaimed, rehabilitated and appropriately maintained.
	New areas are being opened up and the process of primary weeding has	Stack woody weeds in areas of primary weed removal. Prepare for pile burn to	C/O	Woody weeds are stacked for pile burn and the post-fire

Issue	Current Condition	Proposed Action	Priority	Performance Measure
	commenced.	assist in the natural regeneration of native plant species and to reduce fuel levels on the site. Maintain.		environment is adequately maintained.
Locally Rare Species 2D	<i>Gahnia melanocarpa</i> , <i>Sigesbeckia orientalis</i> , <i>Bossiaea heterophylla</i> , <i>Caustis flexuosa</i> (Old Mans Beard) and <i>Xylomelum pyriforme</i> (Woody Pear) are located in this zone. Only a small colony of each plant species remains.	Collect seed of these species from adjacent bushland areas in the same catchment within a 10km radius. Propagate this species for redistribution and plant in appropriate areas that are being regenerated to increase the stock size of these species. Ensure their long-term viability in the area. The use of fire may also be beneficial to the germination of natural seed sources within the existing soil (where appropriate). Maintain.	ST/O	Locally rare species numbers are maintained in the area.
Fire 2E	Extensive <i>Allocasuarina littoralis</i> (Black She-oak) monoculture located adjacent to the Bushcare site contains predominantly old growth, senescing plant specimens. The diversity of species is also reduced in the understorey due to the thick layer of fallen pine needles.	Plan for a broad area burn to naturally regenerate the <i>Allocasuarina</i> area. Conduct a pre-fire flora and fauna survey. Involve the local fire brigade when constructing fire breaks and look at issues of access to the site. Maintain. Conduct post-burn flora and fauna survey 18 months after the burn has been undertaken.	MT	A broad area burn is undertaken at the appropriate time of year and the post-fire environment is adequately maintained.
Reserve Users 2F	Highly utilised informal track present on the eastern boundary of this zone. The track traverses the bushland from The Boulevard to the sports field area	The track will be upgraded using materials which blend in with the surrounding bushland to limit the amount of soil erosion and compaction	MT	Track is upgraded with appropriate materials and the area is maintained.

Issue	Current Condition	Proposed Action	Priority	Performance Measure
	below. The track is steep and shows signs of soil erosion and soil compaction. Issues of public safety must also be considered.	occurring on this site. Maintain.		
Garden Refuse Dumping	Some residential properties of The Boulevard show recent evidence of dumping garden refuse into the bushland area.	<p>Send offending property owners a Council Dumping Notice stating the reasons why garden refuse dumping has a negative impact on the bushland and the fines which may be imposed. Refer them to the Council's free Green Waste Pick-up Service which can be used when required.</p> <p>Follow-up with a locally targeted community education program.</p>	<p>ST</p> <p>MT</p>	<p>Offending residents have been issued a Dumping Notice.</p> <p>Community Education Program has been instigated.</p>



Map 4 - Rehabilitation Actions - Zone 1

ZONE 3

Refer to **Map 3 - Rehabilitation Zones** for the location of this zone.

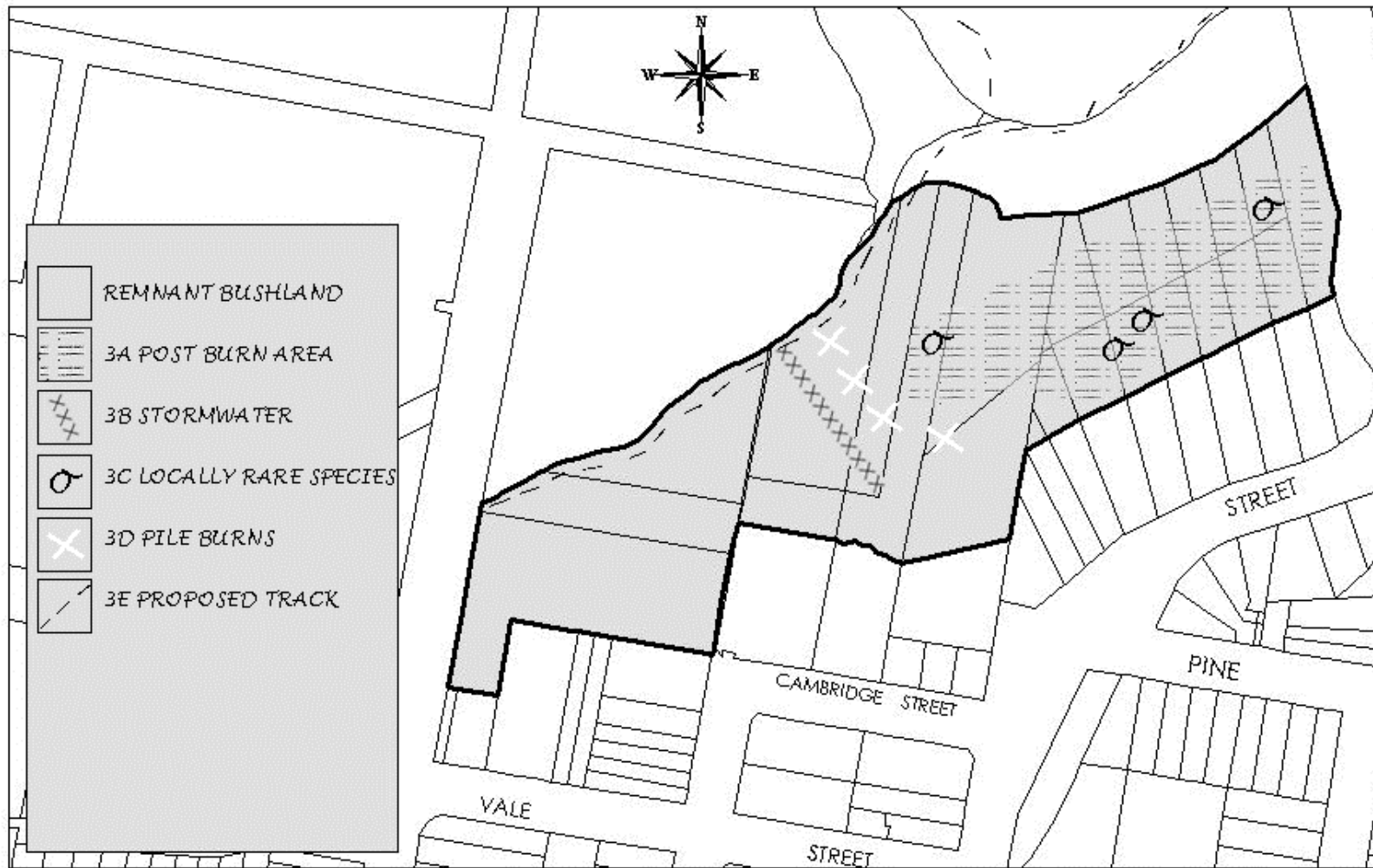
Remnant Open Forest dominated by *Eucalyptus pilularis* (Blackbutt) with a midstorey dominated by *Dodonaea triquetra* (Native Hop Bush), *Pittosporum undulatum* (Sweet Pittosporum), *Glochidion ferdinandi* (Cheese Tree) and an understorey of *Lomandra longifolia* (Mat Rush), *Entolasia stricta* and various other native grass species. Zone 3 is regenerated by the Tunks Park West Bushcare Group and bush regeneration contractors. Members of the Backyard Bushcare Program also participate in regenerating the property boundaries in this zone. Two main stormwater outlets are found within this zone. A hazard reduction burn was undertaken along the eastern boundary of this zone during 1996.

Refer to **Map 4 - Rehabilitation Actions** for the location of Proposed Actions in each individual zone.

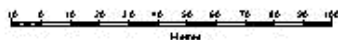
Issue	Current Condition	Proposed Action	Priority	Performance Measure
Vegetation Management	Noxious weed species present on adjacent residential properties and land owned by Roads and Traffic Authority (RTA).	As bush regeneration activities commence in this zone, any adjacent residences found to have noxious weeds growing on their property will be issued a Noxious Weeds Notice to control the growth and continual spread of these species into the bushland area. Liaise with the Water Board in regards to the weed species spreading from their land into areas currently being regenerated by Council and Bushcare volunteers. Negotiate for best practice outcomes.	ST/O C/O	Noxious Weeds Notices sent to offending residents where appropriate. Consultations have been initiated and the area is being appropriately maintained.

Issue	Current Condition	Proposed Action	Priority	Performance Measure
3B	Weed species are dominant along stormwater outlets and areas of urban runoff.	Work from the good bush, removing the weeds and moving back towards the stormwater drainage lines and the edge of residential boundaries. These weed dominated areas will be included in the final stages of regeneration and rehabilitation for this zone. Maintain. To plan for future works along the main stormwater outlets, selectively clear small circular patches of weedy vegetation and plant a variety of native canopy species. Maintain. These planted trees will mature and allow for bank stabilisation, canopy habitat and food sources for fauna when bush regeneration commences in these areas in the long term. Maintain plantings.	C/O ST/O	'Good bush' areas are maintained and work commences in appropriate areas along the stormwater drain. Native species are planted and maintained.
	Weed species are present within residential gardens adjacent to the bushland area and the burn site (1996).	Continue to expand the Backyard Bushcare Program along this residential edge. Monitor, evaluate and maintain. <i>Backyard Bushcare is a community program funded by Council assisting residents to undertake bush regeneration, weed removal and /or planting of native species in their backyards.</i>	C/O	Backyard Bushcare Program has been launched in all residential areas where properties back onto areas zoned as Bushland in the LEP.
Locally Rare Species 3C	<i>Actinotus minor</i> (Lesser Flannel Flower), <i>Pultanaea flexilis</i> (Graceful Bush-pea) and <i>Pomaderris discolor</i> (Pomaderris) are located within this	Collect seed of these species from adjacent bushland areas in the same catchment within a 10km radius. Propagate this species for redistribution	ST/O	Locally rare species numbers are maintained in the area.

Issue	Current Condition	Proposed Action	Priority	Performance Measure
	zone. Only a small colony of each plant species remains. The broad area burn in 1996 allowed the population numbers of these species to increase. <i>Pomaderris discolor</i> (Pomaderris) and <i>Pultanaea flexilis</i> were not recorded in the pre-burn survey.	and plant in appropriate areas that are being regenerated to increase the stock size of these species. Ensure their long-term viability in the area. The use of fire may also be beneficial to the germination of natural seed sources within the existing soil throughout this zone. Maintain.		
Fire 3D	An area between the western edge of the burn site (1996) and the urban runoff channel on the eastern side of the Tunks Park Bushcare Site has undergone primary clearing. There are numerous piles of woody weeds stacked throughout the understorey.	Piles will be burnt in the cooler months assisted by the local Fire Brigade to further stimulate native plant germination in this zone. Maintain the post pile-burn area.	MT	Pile burns are burnt at the appropriate time of year and the post-fire environment is adequately maintained.
Reserve Users 3E	No formal track system throughout this zone. Willoughby Council is planning to create a formal track system in the adjacent Flat Rock Gully bushland area which adjoins the bushland of Tunks Park. An opportunity exists to link up with the Willoughby track upgrade by creating a formal track to start from the junction of Flat Rock Creek and the major tributary from Marks St and follow the creekline upslope, finishing at Marks St, Crows Nest.	Continue discussion about the track upgrade with Willoughby Council. Involve the two Bushcare Groups at Tunks Park (i.e. Tunks Park and Tunks Park West Bushcare Groups) in the decision making process. Produce a plan for the creation of the formal track in conjunction with Willoughby Council. Track design will take into account the sensitivities of the landscape and only materials which blend in with the surrounding environment will be used. Install directional signage. Maintain.	LT	Consultation, planning and design phase has been completed.



Scale 1:2250



Map 4 - Rehabilitation Actions - Zone 3

ZONE 4

Refer to **Map 3 - Rehabilitation Zones** for the location of this zone.

Remnant Open Forest dominated by *Eucalyptus pilularis* (Blackbutt). The bushland structure would have originally been similar to that found in Zone 3. This zone was once open lawn and a weedy edge to the existing bushland downstream. This zone contains highly degraded soil conditions. There is evidence of household items, building rubble and non-biodegradable rubbish throughout the soil profile. This site was rehabilitated in 1997 with jute mat, bank stabilisation and planting of local indigenous species. The plantings have been successful. The weed Madeira Vine (*Anredera cordifolia*) has been a constant threat to the long term viability of the site. Three large stormwater outlets drain from this point down into the existing tributary of Flat Rock Creek. Weed species, including *Cardiospermum grandiflorum* (Balloon Vine) and *Ipomea indica* (Morning Glory) are prolific along the edge of the waterway. The opposite side of the Creek is governed by Willoughby Council. This zone was rehabilitated in 1997 in conjunction with rehabilitation works being carried out by Willoughby Council in the adjacent bushland.

Issue	Current Condition	Proposed Action	Priority	Performance Measure
Vegetation Management	Rehabilitation area at the top of the catchment. Annual weeds and weed regrowth (especially Madeira vine (<i>Anredera cordifolia</i>)) are a constant issue for the site.	Maintain the rehabilitation area by removing annual weeds and weed regrowth and by selectively injecting Privet species along the waters edge.	C/O	Rehabilitated area is adequately maintained.

10.2 Management Strategies and other Programs required for a successful rehabilitation process.

Management Strategy/Program	Priority	Responsibility
Creekline Management Strategy	LT	Bushland Management Team
Fire Management Strategy	MT	Bushland Management Team
Fauna Study	ST	Bushland Management Team
Feral Animal Control Program	MT	Bushland Management Team
Wildlife Corridor Strategy	ST	Bushland Management Team
<i>Community Education Program</i> – Noxious Weeds, Domestic Animals, Garden Refuse Dumping, Local urban Flora and Fauna (on a reserve by reserve basis). <i>Issuing Notices</i> (where required) – Noxious Weeds Notices, Garden Refuse Dumping Notices. <i>Promotion of Council’s existing Programs:</i> Backyard Bushcare Program, Wildlife Habitat Gardens, Wildlife Watch Program.	ST/O ST/O C/O	Bushland Management Team
Biodiversity Management Plan (Taking into account an ‘All of Council’ approach i.e. planning and assessment, field staff procedures and practices, responsibilities of local industry and businesses)	LT	Environmental Services