TOWN OF VICTORIA PARK REMNANT VEGETATION MANAGEMENT PLAN

TOWN OF VICTORIA PARK

August 2004

Prepared by:

Ecoscape (Australia) Pty Ltd

9 Stirling Highway • PO Box 50, North Fremantle WA 6159

Telephone: (08) 9430 8955 Facsimile: (08) 9430 8977

email: ecoscape@iinet.net.au

website: http://www.ecoscape.com.au

REPORT FOR TOWN OF VICTORIA PARK
REMNANT VEGETATION MANAGEMENT PLAN
COPYRIGHT STATEMENT 2003
ECOSCAPE (AUSTRALIA) PTY LTD
ABN 70 070 128 675

Direct all inquiries to:

Ecoscape (Australia) Pty Ltd
9 Stirling Highway • PO Box 50 North Fremantle WA 6159
Ph: (08) 9430 8955 Fax: (08) 9430 8977
ecoscape@iinet.net.au

Document Status

Rev. No.	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
0	LJ & AW	DK				
1	LJ & AW	DK				

Table of Contents

Management Plan Remnant Vegetation

LIST OF TABLES

LIST OF FIGURES AND PLATES

Acknowledgments

Management Plan Remnant Vegetation

Ecocscape would like to thank the following individuals and organisations for their assistance in preparing this document:

- The Friends of Kensington Bushland and in particular Mr Andrew Thomson
- Ms Cathy Taylor, Friends of Hillview Community Bushland
- Ms Edith Young, The Town of Victoria Park
- Mr Ray Cranfield, CALMScience Manjimup, formerly with the West Australian Herbarium

Summary

Management Plan Remnant Vegetation

The Town of Victoria Park is largely contained within the Bassendean Vegetation Complex, with small portions along the Swan River contained within the Vasse and Swan Complex.

The Remnant Vegetation Management Plan aims to provide a useful and practical management plan for the integrated management of the remaining indigenous vegetation in the Town of Victoria Park.

There are 39 sites within the 18km^2 of the Town of Victoria Park that retain some remnant vegetation. This includes 4 bushland sites (two of which are remnants along the edge of reserves that are designated for other purposes), 9 parks, 9 street trees, and 17 sumps. All sites that contain some native vegetation have potential conservation value. For both cultural and ecological values it will be important to maintain and enhance the indigenous vegetation that remains within the Town of Victoria Park.

Whilst parks contain the majority of the 15 species of indigenous trees, the bushland sites contain the majority of the more than 200 plant species present. The bushland also supports one Priority Taxa, which is considered rare but not currently endangered. The sumps contain relatively few species but they support native trees across the greatest number of sites.

There are number of species that are only present at one or two sites. For some species this is a result of the limited extent of the Vasse and Swan Vegetation Complex, for other species it reflects the degree of clearing within the municipality.

To manage the risk of losing species from the municipality, the number of sites where species occur needs to be increased. There are opportunities for this given that there are 20 km of roads, 100 ha of parks and 75 sumps (58 of which contain no remnant vegetation). There are also opportunities to enhance the condition of the existing bushland given that 22% is in poor-very poor condition.

1.0 Introduction

Remnant Vegetation Management Plan

Remnant vegetation can provide an area with a distinct character and a link to the past. Due to its scarcity, the remaining small vestiges of the Municipality's original vegetation need to be actively managed to retain their aesthetic, cultural, and ecological values.

The Town of Victoria Park has largely been cleared for urbanisation and only contains two small bushland reserves, with the remaining sites with indigenous flora largely consisting of individual trees or small stands on roadsides, parks and sumps. The remaining vegetation is an ecologically and culturally valuable asset to the Town of Victoria Park. Remnant vegetation in both bushland blocks and single trees can provide various resources for a number of faunal species, and can also be a seed source for future rehabilitation sites. The conservation of the different vegetation types is important to the overall landscape amenity and value of the municipality.

Whilst there is relatively little remnant vegetation within the municipality there has not previously been a comprehensive inventory completed. This management plan details the remnant vegetation within the Town of Victoria Park and examines its maintenance and enhancement. Another management plan is currently being undertaken in Balbuk Way foreshore for the Town of Victoria Park. This foreshore joins with City of Belmont's foreshore.

1.1 Aim and Objectives

The purpose of the Remnant Vegetation Management Plan is to develop a management approach to the existing remnant vegetation that enables the Town of Victoria Park to progressively and comprehensively manage, in an integrated manner, the remaining native vegetation. The Remnant Vegetation Management Plan will guide the immediate and long term management of local native vegetation in the Town and ensure it's protection and enhancement. Key objectives of the Plan are:

- Establishment of an inventory of the Town's remnant vegetation to guide future environmental planning and management actions.
- To actively manage the Town's native vegetation in accordance with best practicable measures to ensure its long-term conservation.
- Rehabilitate existing areas of native vegetation to ensure the protection of biodiversity within the Town in accordance with the principles of a sustainable urban environment.
- Increase awareness within the local community of the importance and values of remnant vegetation and increase community involvement in native vegetation conservation projects.
- Strategically identify areas within the town for revegetation to create a network of ecological corridors including; streetscapes, sumps, areas surrounding bushland and parks.
- Development of programs to encourage the use of indigenous vegetation in landscaping on private land.

In addition to the above objectives which apply to all areas of native vegetation within the Town, a specific set of objectives have been developed for the Bushland Management section and are outlined below.

Bushland Specific Objectives:

- To maintain and enhance native vegetation and fauna values of the bushlands within the Town of Victoria Park.
- Revegetate degraded land within and surrounding bushland areas using best practice restoration techniques in order to create self sustaining natural vegetation communities and minimise weed infestations.
- Continue to undertake weed control activities to minimise and eradicate significant weed species.
- Develop fire preparedness and response strategies for bushland reserves.

The management plan is divided into sections on the basis of the following topics:

- Bushland;
- Parkland;
- Roadside Trees;
- Sumps; and
- Greenspaces (which strategically includes all the above categories).

Each of these sections can be read independently.

2.0 The Study Area

Remnant Vegetation Management Plan

2.1 The Study Location and Boundaries

2.1.1 The Town of Victoria Park

The Town of Victoria Park was proclaimed on July 1st 1994 after the boundaries and extent of the City of Perth were redefined. It is separated from the Perth CBD by the Swan River on its western boundary and bordered by the Cities of Perth, South Perth, Belmont and Canning.

The boundaries of the Town include 6 kms of frontage to the Swan River on the North/West, Orrong Road on the North/East, Welshpool/Boundary/Manning Roads on the South East and Berwick Street on the South West.

The Town of Victoria Park covers 17.62 km^2, of which 100 ha is zoned as parks. The Town is divided into a number of suburbs and precincts. For the purposes of this report the municipality will be divided into the four management sectors (which largely coincide with suburb boundaries) that the municipal staff use (See Figure 1).

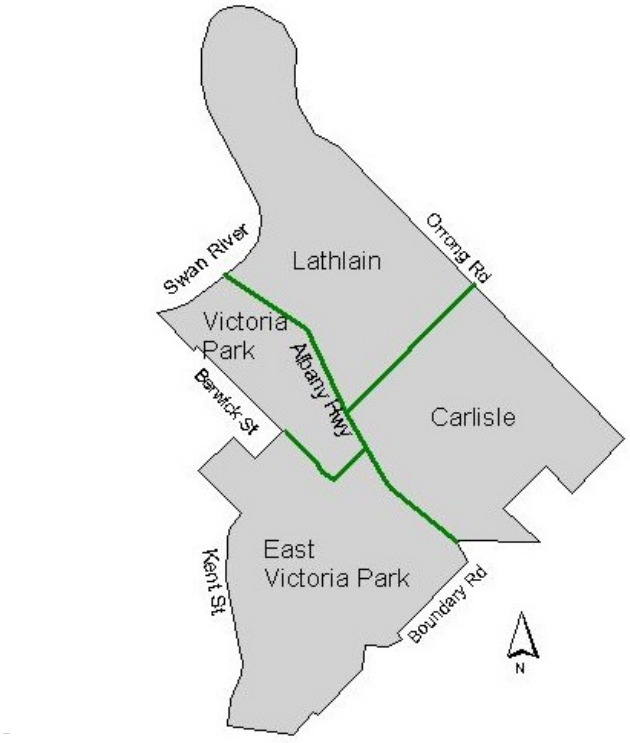


Figure 1. The Town of Victoria Park and its Management Sectors

2.2 The Natural Environment

2.2.1 Geomorphology and soils

The majority of the Town of Victoria Park is located within the Bassendean Dune System of the Swan Coastal Plain (Gozzard, 1986). There are also areas of Spearwood Dune System, River Terraces and River Floodplains (Gozzard, 1986).

The Bassendean Dune System is the most easterly and oldest of the three remnant dune systems that compose the Swan Coastal Plain. It consists of sand plains with low dunes and occasional swamps. The Spearwood Dune System is younger, with higher hills and less leached soils. The dominant soil type of the area, the Bassendean Sands, consists of fine to medium-grained, grey humic sands overlying deep yellow sand with some limestone development. The sand soils of the Spearwood Dunes are fine to medium grained, pale and olive yellow sands that are derived from Tamala Limestone. (Gozzard, 1986).

Closer to the Swan River the landscape is made up of poorly drained plains with variable undifferentiated estuarine and marine deposits. The silty sand of the River Terraces is fine to medium grained and strong brown. The River Floodplains contain clay and clayey silt. The clay is mid to dark grey and has a 0.2m thick oyster shell bed near the surface. The clayey silt is yellow brown to strong brown with variable clay content. (Gozzard 1986).

2.2.2 Climate

The Town of Victoria Park has a temperate Mediterranean climate, with hot dry summers and mild wet winters. The majority of the rainfall occurs between April and October. The mean annual temperature range is between 12– 24 ^{o}C, with a mean maximum of 32 ^{o}C in summer and a mean minimum of 5 ^{o}C in winter with occasional light frosts. Mean annual rainfall is 801mm, with mean humidity ranging between 48 – 66%. (Sharman, 1999).

2.2.3 Vegetation Communities

Within the Town of Victoria Park there are three vegetation complexes; the Bassendean the Swan and the Vasse. As shown in Figure 2, the majority of the Town is located within the Bassendean Vegetation Complex.

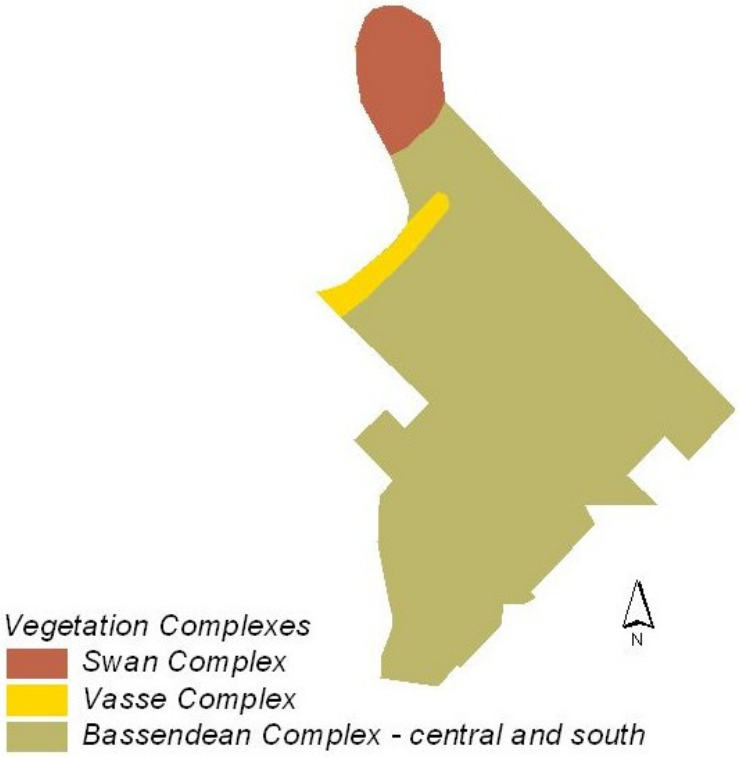


Figure 2. Vegetation Complexes within the Town of Victoria Park (adapted from Heddle et al, 1980)

The Bassendean System stretches discontinuously for the whole length of the Swan Coastal Plain from Moore River to Dunsborough. The vegetation varies from Jarrah, Sheoak and Banksia woodland to Paperbark and Honey Myrtle low woodland, to sedgelands on the moister sites (Heddle *et al,* 1980). It is generally covered by low woodland dominated by Banksias, Pricklybark (which is replaced by Jarrah to the south) and Christmas Trees, with a dense understorey.

Woollybush is characteristic shrub of the Bassendean sands. Other shrubs include *Eremaea pauciflora*, Common Brown Pea (*Bossiaea eriocarpa*), Guinea Flower (*Hibbertia subvaginata*), Bearded Heath (*Leucopogon conostephenoides*), Pearl Flower (*Conostephium pendulum*) and Pixie Mops (*Isopogon linearis*). The herbs include Pineapple Bush (*Dasypogon bromelifolius*) and Triggerplants (*Stylidium* species) and the sedges include *Lyginia barbata* (Beard, 1981 & Powell & Keighery, 1995). The high level of species diversity found growing on these sands is of ecological importance for overall biodiversity of the area.

Along the Swan River, the Vasse Vegetation Complex consists of a mixture of closed scrub of Paperbarks, fringing woodland of Flooded Gum and Paperbarks, and open forest of Tuart, Jarrah and Marri (Heddle *et al*, 1980). The Swan Complex consists of fringing woodlands of Flooded Gum and Freshwater Paperbarks. There are also localised occurrences of low open forest of Swamp Sheoak and Saltwater Paperbarks (Heddle *et al,* 1980).

2.2.4 The Dominant Indigenous Trees of Victoria Park

Brief descriptions of some of the dominant native trees found in the Town of Victoria Park are listed below (adapted from Bodkin 1986; Paczkowska and Chapman, 2000; Powell, 1990 and Seddon, 1972). Peppermint Trees (*Agonis flexuosa*) are not included in this list, or this management plan, as it is unlikely that it naturally occurs in Victoria Park. The main distribution of Peppermint Trees extends from Bremer Bay to Mandurah. Whilst they do occur in parts of Perth, this is mainly in association with limestone and wetter sites, and its distribution has been greatly increased due to its attractiveness as a street tree.

Gum Trees

Corymbia calophylla Marri

A large shady tree that is widespread and common. It has much the same distribution as Jarrah, but more common on moister sites (it is replaced by Flooded Gum in poorly drained sites). It is abundant through the lower south-west of Western Australia and less common north of Perth. Its urn-shaped fruits, known as honkey nuts, are easily recognised. The bark is grey, rough and flaky. It tends to flower prolifically every year producing creamy white flowers in mid summer to late autumn.

Eucalyptus gomphocephala Tuart

Tuart is a large tree restricted to the Swan Coastal Plain that grows mostly on shallow brown or yellow sands and loams over limestone, as such it usually occurs within 10 km of the coast or near estuaries. It can occur as pure stands but is also often associated with Banksias and Sheoaks. It gives way to Jarrah as shallow limestone becomes less prevalent further from the coast. However it still occurs in soils such as the Bassendean, though in less abundance . It has pale grey and rough bark and produces yellow flowers in autumn.

Eucalyptus marginata Jarrah

A widespread and common medium to large tree on the sands of the coastal plain and the laterite of the Darling Plateau. It prefers light to medium, well-drained soils in a protected, sunny position. Whilst it is common around Perth, its northern limit is near Gingin. It can live for several hundred years. It has grey, brown stringybark and it produces white flowers from spring to summer. It tends to only flower prolifically every 5 years or so.

Eucalyptus rudis Flooded Gum

A medium to large shady tree growing along watercourses, flood plains and freshwater lakes. It prefers heavy, moist soils in an open, sunny position. Its bark is rough on the trunk and lower branches and smooth and grey-white on the upper branches. It produces white flowers in spring.

Eucalyptus todtiana Pricklybark, Coastal Blackbutt

A small to medium-sized tree with a weeping habit, generally occurring near the crests of low sandy rises in the Bassendean Sands. It is more often mixed with Jarrah and Marri in the west and Banksia and Sheoak in the east. It prefers light, well-drained soils in an open, sunny position. The bark is rough and is grey to brown with tough, fine fibres. It produces white flowers in late summer.

Banksias

Banksia attenuata Slender, Coast or Candle Banksia

A common small tree up to 10 meters high. It prefers light, acid, moist soils in an open, sunny position but is adaptable enough to be one of the most common banksias in the region, extending from Kalbarri to Bremer Bay. The flower spikes are bright yellow and are produced in late spring and summer.

Banksia ilicifolia Holly Leaf Banksia

A small erect tree, with branches tending upwards, that superficially resembles Parrot Bush. It generally occurs in sandy soils within 50 km of the coast, showing preference for low-lying areas. The flower spikes are initially yellow, then turn pink, then finally red. The flowers are produced throughout the year, in greatest abundance between late winter and early summer.

Banksia menziesii Firewood Banksia

A common, spreading tree to 8 meters growing from Kalbarri to Mandurah. It prefers light to medium, well-drained soils in an open, sunny position. The flower-spikes of this Banksia change from silver-grey to rich pink to orange and pink as they develop. Flowers are produced from late summer to late winter.

Sheoaks

Casuarina obesa *Swamp Sheaok*

This elegant tree with drooping branches grows to 10 m. It occurs across southern Australia near saline wetlands, such as estuaries and withstands prolonged waterlogging. It is superficially similar to the eastern states species *Casuarina glauca*.

Allocasuarina fraseriana Common Sheoak

Common Sheoak, along with Slender Banksia and Firewood Banksia is one of the three most common small trees of the region. In the Metropolitan Region it occurs in almost all of the dryland soil types. Common Sheoak is a tree 8 to 15 meters tall. There are separate male and female plants. The females have globular or egg-shaped cones. The males produce brown catkins (flowers).

Paperbarks and Honey Myrtles

Melaleuca cuticularis Saltwater Paperbark

A small tree or large shrub that grows along the margins of wetlands and waterways. The Swan Estuary is the northern limits of its distribution. It is tolerant of prolonged waterlogging, saline water and salt-laden wind and spray. It can occur in association with Freshwater Paperbark, and where it does Saltwater Paperbark occurs closer to the water. Its bark is white and papery and it produces white or cream flowers in spring.

Melaleuca rhaphiophylla Freshwater Paperbark

A small to medium-sized tree growing around lakes, rivers and swamps throughout much of the southwest. It will not tolerate permanent waterlogging. It has white papery bark and produces white to cream flowers in spring or early summer.

Melaleuca viminea Mohan

A shrub or small tree growing near several different types of wetlands from Kalbarri to Mount Barker. It may be exploiting sites less favourable to more competitive species. Its bark is coarse and fibrous and produces white flowers between late winter and mid spring.

Melaleuca preissiana Modong, Stout Paperbark

A medium tree with thick branches, growing in winter wet depressions slightly further from the river and lake edges than Freshwater Paperbark. It is Perth's largest paperbark, reaching up to 15 meters. It has whitish papery bark and produces pale yellow, cream white flowers in summer.

Other

Nuytsia floribunda Christmas Tree

A semi-parasitic tree up to 8 metres that is common in almost all soil types on the coastal plain, particularly in low-lying areas. It sets seed, but these are only viable for a short time. It often reproduces by suckering which appears as a stand of trees with a mass of 'seedlings' around the base of a 'parent'. It produces dense masses of brilliant orange flowers from late spring to early summer.

2.2.5 Fauna

The opportunities for native animals to survive in Victoria Park are diminished by the degree of land clearing and presence of predators and competitors such as cats, foxes, rats and mice. The small size of the remaining bushland affects the amount of resources available to native animals but links between remnants facilitates migration that can increase the effective size of remnants and provide refuges during incidents such as fire.

Various studies have shown that small ground dwelling mammals do not tend to exist in urban remnants (How and Dell, 1993), but numerous birds, reptiles and insects are still present in the bushland in Victoria Park (Turpin, 1990). The remaining bushland areas of the municipality can provide a variety of food and shelter resources for birds, reptiles, amphibians and some mammals (eg. bats, possums and introduced mammals). Scattered trees can also provide these resources, particularly for birds due to their high level of mobility. Different areas will provide resources for different species, such as wetter areas providing more resources for amphibians.

Long-necked Turtles (*Chelodina oblonga*) are one of the native reptiles surviving in the Town of Victoria Park. Long-necked Turtles are found at G.O. Edwards Park in the Town of Victoria Park (Young pers. comm., 2003) as well as many permanent freshwater and seasonal swamps throughout the Perth region (Bush *et al*, 1995).

The Long-necked Turtle spends most of its time in water but also migrates between water bodies and females may travel considerable distances over land to lay eggs. During these travels many are killed on roads and many hatchlings die before reaching water or become trapped after falling into stormwater drains (Bush *et al*, 1995). Linkages between greenspaces, as discussed in this report, are critical in maintaining such populations.

2.3 The Cultural Environment

2.3.1 Aboriginal culture

Aborigines have inhabited southern West Australia for more than 40,000 years. The Town of Victoria Park is within the Whadjuk state of the Bibbulmun nation of the Nyoongah people (Morrison, 1994).

The Swan River and its foreshores have been recognised for their importance to the Aboriginal people in regard to food, resources, occupation areas and links with dreamtime mythology. Aboriginal occupation of sites along the Swan River dates back to 38,000 BP (before present) with the river used for fishing, shellfish gathering and meeting places, particularly at crossing points.

Whilst no specific consultation has been undertaken with Aboriginal groups for this project a number of Aboriginal sites are known to occur in the municipality. A search of the Department of Aboriginal Affairs web-site revealed that a total of eleven sites were recorded for the Town of Victoria Park. One is located on the campus of Curtin University, another two in Carlisle and the rest adjoining the river at Belmont Racetrack and Burswood. The Belmont Racetrack area is known Warndoolier (Swan River Trust, 1997).

No registered Aboriginal sites are known to occur in the existing remnant bushland areas.

The Swan River itself has also been listed by the Department as a site with mythological significance. It is not envisaged that the scale of works proposed in this report will impact or degrade any recognised sites, given its focus towards environmental rehabilitation.

3.0 Methodology

Remnant Vegetation Management Plan

3.1 Site Selection

The selection of sites for assessment was based on advice from the Town of Victoria Park's staff and opportunistic observations. Only parks and roads thought to support remnant vegetation were inspected. It should be noted that all parks and roads that support indigenous remnant vegetation may not have been inspected. When other sites are identified within the Town they should be added on to this management plan. All bushland sites and all sumps were inspected.

A total of 98 sites (ranging from entire reserves to single trees) were assessed. Thirty-nine of these were found to support indigenous vegetation and be within the Town of Victoria Park.

3.2 Site Classification

Given the number of sites that consist of individual scattered trees, sites were defined by reserves boundaries rather than the extent of the indigenous vegetation. Following from this, sites were classified on the basis of the general management applicable to the site. The classes were:

- Bushland;
- Parkland;
- Roadside trees; and
- Sumps.

Greenspace is an additional category that incorporates all public open space (regardless of the presence of remnant vegetation) to provide an opportunity to examine an integrated management approach. Sites were included in this category on the basis of land tenure (parks/reserves/ovals and schools/hospitals) rather than site assessment.

3.3 Vegetation Boundaries

The vegetation communities were not mapped within the Kensington Bushland as a fire had recently burnt more than 30% of the reserve and it had burnt across the vegetation community boundaries as identified by Cranfield and Parker (1992). Therefore the boundaries suggested by Cranfield and Parker (1992) were adapted without modification.

Due to the small size and degree of degradation the Hillview, PCYC and Waste Storage Facility Sites have been mapped as one vegetation type.

3.4 Track Mapping

Tracks were mapped from sites assessments and on the basis of 2002 aerial photographs. Tracks were divided into vehicle tracks (vehicle), formal pedestrian tracks (foot) and informal pedestrian tracks (informal). Vehicle tracks were defined as such when they were wide enough for a vehicle and were utilised by management vehicles as well as pedestrians.

Formal pedestrian tracks were tracks that had previously been made into formal tracks by the placement of gravel or similar surface. Informal pedestrian tracks were those tracks that were present but had been created by people regularly walking through the area rather than being put in by management authorities.

3.5 Site Assessment

3.5.1 Timing

Site assessment for all sites was undertaken between March and May 2003.

3.5.2 Bushland Condition

The criteria used to assess bushland condition are listed in Table 1.

Table 1. Criteria Used for Bushland Condition Assessment

Condition Rating	Criteria
Very Good – Excellent	• 80 – 100% Native Flora composition • Vegetation structure intact or nearly so • Cover/abundance of weeds less than 5% • Minor signs of disturbance
Fair – Good	• 50 – 80% Native Flora composition • Vegetation structure modified or nearly so • Cover/abundance of weeds 5 – 20% • Disturbance influence moderate
Poor	• 20 – 50% Native Flora composition • Vegetation structure completely modified • Cover/abundance of weeds 20 – 60% • Disturbance incidence high
Very Poor	• 0 – 20% Native Flora composition • Vegetation structure disappeared • Cover/abundance of weeds 60 – 100% • Disturbance incidence very high

Source: Kaesehagen (1995)

As a fire had burnt 3.34 ha (31.5%) of the Kensington Bushland in February 2003 the bushland condition was largely taken from a map previously prepared by Andrew Thomson[1] in 2000. The map has been modified as slightly different classes were used. The weed map (Figure 22) is also based on a map prepared by Andrew Thomson (in 2001). Due to difficulties in determining the exact locations of weeds during their summer dormancy, the map is only approximate.

[1] Andrew Thomson is a community bush regenerator who has worked on the site for around 5 years.

3.5.3 Values of Sumps

Conservation

Sites were deemed to have some conservation value if some indigenous vegetation was present.

Aesthetic

Sites were deemed to have aesthetic value, regardless of the presence of indigenous vegetation, if they had at least some of the following attributes:

- Multiple mature trees;
- Integration with surroundings (such as an adjacent park); and
- Structural diversity (i.e. shrubs and trees).

Examples of a sump with little aesthetic value is shown in Plate 1 and a sump with aesthetic value is shown in Plate 2.

Plate 1. A Sump with little aesthetic value - 39 Esperance Street

Plate 2. A sump with aesthetic value - 30-32 Satellite Place

3.6 Definitions

Terms used in this report include:

Bushland

'Land on which there is vegetation which is either a remainder of the natural vegetation of the land, or if altered, is still representative of the structure and floristics of the natural vegetation, and provides the necessary habitat for native fauna' (WAPC, 2000).

Exotic Plants

Plants that have been introduced to Australia.

Greenspace

Any public open space regardless of whether the plants present are indigenous or not.

Indigenous Plants

Plants that naturally occur at a site.

Non-indigenous Plants

Plants that are native to Australia but have been introduced into the area.

Parkland

Public open space that is predominately grassed areas with scattered trees.

Priorities

The Priorities for recommendations are based on a 5 year implementation period and therefore defined in terms of the timeframe for implementing each recommendation.

Priority	Timeframe
High	1 year
Medium	2-3 years
Low	5 years

Rare and Priority Flora Species

The Conservation Codes in Western Australia are as follows:

Declared Rare Flora – Extant Taxa. "Taxa which have been adequately searched for and are deemed to be in the wild either rare, in danger of extinction, or otherwise in need of special protection and have been gazetted as such."
Priority One – Poorly Known Taxa "Taxa which are known from one or a few (generally <5) populations which are under threat, either due to small population size, or being on lands under immediate threat. Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey."
Priority Two – Poorly Known Taxa "Taxa which are known from one or a few (generally <5) populations, at least some of which are not believed to be under immediate threat (ie. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but urgently need further survey."
Priority Three – Poorly Known Taxa "Taxa which are known from several populations, and the taxa are not believed to be under immediate threat (ie. not currently endangered), either due to the number of known populations (generally >5), or known populations being large, and either widespread or protected. Such taxa are under consideration for declaration as 'rare flora' but need further survey."
Priority Four – Rare Taxa "Taxa which are considered to have been adequately surveyed and which, whilst being rare (in Australia), are not currently threatened by any identifiable factors. These taxa require monitoring every 5-10 years."

Roadside Trees

This plan only considers trees located on roadside verges that are indigenous to the municipality.

Significant Trees

Trees listed on the Town of Victoria Park's Significant Tree Register. Trees are placed on the significant tree register if they are deemed to meet some or all of the following criteria:

- Aesthetic quality;
- Particularly old or venerable;
- Commemorating, or having associations with, an important historical event;
- Associated with a well-known public figure or ethnic group, or providing a significant contribution to the landscape;
- Rare species; and
- Having horticultural or genetic value.

Sumps

Compensation basins collect stormwater from roads and sealed surfaces and allow it to infiltrate into the soil.

4.0 Bushland

Remnant Vegetation Management Plan

4.1 Overview

Four bushland sites were identified with the Town of Victoria Park. Three of the sites are contiguous: Kensington Bushland, the Kent Street Sand Quarry and the PCYC site. All the sites are located in Parks and Recreation Reserves identified in the Town Planning Scheme. Whilst the Kent Street Sand Quarry and the PCYC site are not managed as bushland, they are still considered as bushland in this plan. All four sites are shown in Figure 3, and photographs of each site are included in Appendix Two.

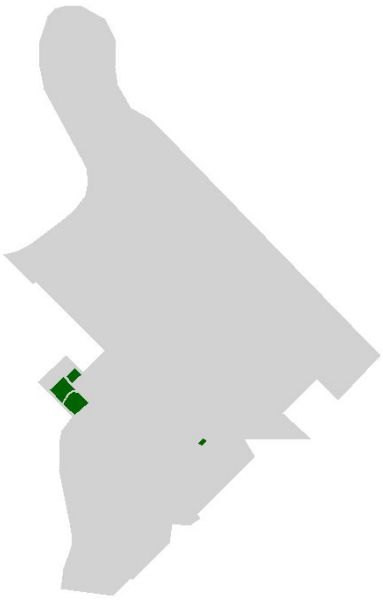


Figure 3. Bushland within the Town of Victoria Park

The sites ranged from 2 to 10.6 hectares in size, with a total of 22.4 ha. However these figures are based on lot sizes and include the cleared portions of those lots. The extent of uncleared bushland is 14.7 ha. The condition of bushland sites are shown in Table 2.

Table 2. Bushland Condition (area in ha) at Sites within the Town of Victoria Park

Conditon	Kensington	Quarry	PCYC	Hillview	Total
Very Good - Excellent	7.4	0	0	1.0	8.4
Fair - Good	2.2	0	0	0.7	2.9
Poor	0.3	0.8	0	0.1	1.2
Very Poor	0.7	0.9	0.4	0.2	2.2
Cleared	0	5.0	2.7	0	7.7
Total	10.6	6.7	3.1	2.0	22.4

Weeds are a major cause of degradation at the bushland sites, but trampling also contributes considerably. The length of tracks at each site is shown in Table 3.

Table 3. Length of Tracks (m) at Sites within the Town of Victoria Park

Track Type	Kensington#	PCYC & Quarry*	Hillview	Total
Vehicle	1170	0	118	1288
Formal pedestrian	0	0	402	402
Informal Pedestrian	1260	0	312	1572
Temporary Firebreak	134	0	0	134
Total	2564	0	832	3396

*No tracks in bushland portion of sites

Vehicle tracks are also used by pedestrians

The Town of Victoria Park has an arrangement for the City of South Perth to make available two Bushcare Officers to work at the Kensington and Hillview Reserves once a week. These officers undertake general maintenance including seed collecting, weed control, planting and track and fence maintenance. The City of South Perth is also preparing a Bushland Recovery Plan for Kensington in response to the recent fire. This will involve a fauna survey to establish the effect of the fire on fauna populations, and intensive weed control measures.

The Council's operations are also supplemented by the activities of the Friends of Kensington Bushland, a small community-based group.

In many areas of south-western W.A., the water-borne fungal disease *Phytophthora cinnamomi* has had a devastating impact. There are no visible signs of the disease in the Victoria Park bushland. Its presence can sometimes be difficult to detect, especially after fire, but many *Banksia* woodland plants are susceptible and so if it had been present for any length of time a decline in the trees would most likely have been reported by the public. An assessment for the presence of the disease has been undertaken in Kensington Bushland in 2002, but it was not found to be in the area. Infection of bushland areas would severely reduce the conservation, scientific and educational value of the reserve.

4.2 General Recommendations

There are a number of measures that should be applied to all the bushland sites in the Town of Victoria Park.

High Priorities
1. Maintain records of any rehabilitation works undertaken including the timing of planting, and numbers, species and sources of seedlings planted; and details of weed control such as chemical usage and area sprayed;
2. Undertake systematic monitoring of bushland condition to assess the effectiveness of work and plan further works. The form of the monitoring would depend upon resources available but as a minimum it is suggested that this consist of annual monitoring of the extent of targeted weeds with the use of a GPS and 5 yearly mapping of bushland condition;
3. Complete a comprehensive species list for the sites. There is no comprehensive list for any of the bushland sites, though the Kensington list is extensive;
4. Plant only those species naturally occurring at the sites, taking into account differences across a site such as Kensington;
5. Undertake seed collection within the Town and use local provenance in revegetation wherever possible, particularly adjacent to bushland areas;
6. Prepare fire management strategies for each reserve;
7. Maintain records of fires in reserves, including the extent and dates of fires;
8. Liaise with school and community groups to maximise opportunities for education and participation in management;
9. Integrate Council operations with the activities of the Friends of Kensington Bushland. Generally community-based groups should be encouraged to provide assistance with focused projects, such as specific sites or weeds within a reserve, while the Municipality bears the burden of broader responsibilities (such as control of extensive weeds such as Veld Grass);
10. Maximise the effective area of the bushland by managing adjacent land, including reserves and road verges, in a complimentary manner (by maximising the number of native plants and controlling weeds);
11. Control access through bushland through a range of measures including fencing and provision of adequate formal paths;
12. Regularly prune along tracks to encourage the use of paths and discourage limbs being broken off plants.
Medium Priorities
13. Develop dieback and disease management protocols;
14. Undertake dieback assessment if suspicions arise of dieback infestations;
15. Develop a policy establishing objectives for managing bushland within the Municipality.
Low Priorities
No Recommendations

It has been noted that there have been low survival rates of seedlings planted in Kensington and Hillview bushland sites. To maximise survival rates the seedling must be an adequate size, with well-developed root systems, and planted as early as possible during winter. Experienced persons should also be onsite to ensure that seedlings are being planted at the

correct depth, that mulch is not placed against the seedlings (which can encourage fungi), and that seedlings are handled correctly.

Weed control is a major issue in most urban bushland. Suggested controls for the major weeds identified at the Victoria Park sites are shown in Table 4.

Table 4. Methods for Control of Major Weeds

Major Weed	Timing of Control	Suggested management and control
Perennial Veldgrass (*Erharta calycina*)	Cooler months July - August (2 flushes) & after fires	Cut out – ensure crown removal; spray with Fusilade® 8 mL/L (4L/ha) + wetting agent; Spray regrowth and seedlings 4-6 weeks.
Black Flag (*Ferraria crispa*)	During Flowering Aug - Oct	Hand remove very small populations (approx 2m x 2m), sift soil to find all corms. Larger populations spray with metsulfuron methyl 0.2 g/15L + glyphosate 1 %.
Freesia (*Freesia* species)	Beginning of flowering Jul - Oct	Spot spray metsulfuron methyl 0.2 g/15L + Pulse® 2.5-5 g/ha.
Ixia species	Beginning of flowering Aug - Dec (varies between species)	Spot spray metsulfuron methyl 0.2 g/15L + glyphosate 1 %.
Lupins (*Lupinus* species)	During flowering Jul - Nov	Hand remove scattered plants. Spray dense infestations metsulfuron-methyl 0.1 g/15L (2-3 g/ha) + wetting agent.
Pelargonium (*Pelargonium capitatum*)	During flowering Aug – Dec & after fire	Hand pull isolated plants taking care to remove entire stem – will reshoot from below ground level. Spot spray metsulfuron methyl 5 g/ha + Pulse®.
Soursob (*Oxalis pes-caprae*)	Beginning of flowering Jun – Oct	Spot spray metsulfuron methyl 0.2 g/15L + Pulse®, or 1% glyphosate. Physical removal can result in spread of bulbils.
Clover (*Trifolium* species)	Before flowering Jun – July	Hand remove isolated plants before flowering. Spot spraying Lontrel® 10 mL/10L + wetting agent

* Adapted from Brown and Brooks, 2002

4.3 Kensington Bushland Baron-Hay Court

4.3.1 Site Description

Vegetation

A detailed study of the reserve by Cranfield and Parker (1992) identified the more than 200 plant species listed in Appendix One, and three basic vegetation types. The three vegetation types were:

- **Low *Banksia* Woodland** of *Banksia attenuata, Banksia menziesii* and *Banksia ilicifolia*;
- **Low *Banksia/Eucalyptus* Woodland** containing the above mentioned *Banksia* species as well as *Eucalyptus marginata, Eucalyptus todtiana* and *Allocasuarina fraseriana*; and
- **Low Shrubland** of Allocasuarina humilis.

Maps of the vegetation communities are included in **'**Flowering Calendar for Reserve No. 3694 in Metropolitan Perth' (Cranfield and Parker, 1992) and 'Kensington Bushland Reserve Management Plan' (Sharman, 1999). The maps do not match exactly and this may reflect different individuals conducting the mapping, or changes in the community boundaries over time (as a result of influences such as fire). The communities were not remapped during this project, given that fire has recently burnt more than 30% of the reserve.

Whilst the species list is extensive it is not comprehensive (Cranfield pers. comm., 2003) and there are several species worth noting. The site contains a Priority 4 Taxa, Perth Hop-Bush (*Dodonaea hackettiana)*, and interestingly a substantial population of Holly-leaf Banksia (*Banksia ilicifolia).*

Perth Hop-Bush is an erect shrub or small tree to 4 m that is restricted to the Swan Coastal Plain, with its main populations around Perth. It appears to be a disturbance opportunist that is killed by fire (Powell, 1990).

The Holly-leaf Banksia exhibits a preference for low-lying areas (Powell, 1990) as opposed to the Kensington site where the watertable is approximately 16 m below the groundlevel.

The original species list prepared by Cranfield and Parker (1992) also included *Caladenia huegelii*. This species is now Declared Rare, a category of plants that have been deemed to be in the wild either rare, in danger of extinction, or otherwise in need of special protection, and gazetted as such, following approval by the Minister for the Environment. However, this species has been reviewed and the species present at Kensington is now thought to be *Caladenia georgii*, which has no conservation status (Cranfield pers. comm., 2003). It is listed in Appendix One as *Caladenia ?georgii*.

Calectasia cyanea has also been recorded at the site and is Declared Rare. In this case the taxa has been reclassified and the plants present are now classified as Calectasia narragara, which has no conservation status.

Condition

As shown in Figure 4, prior to the 2003 fire, the condition of the Kensington Bushland varied from very good-excellent in the internal areas, to very poor along much of its perimeter.

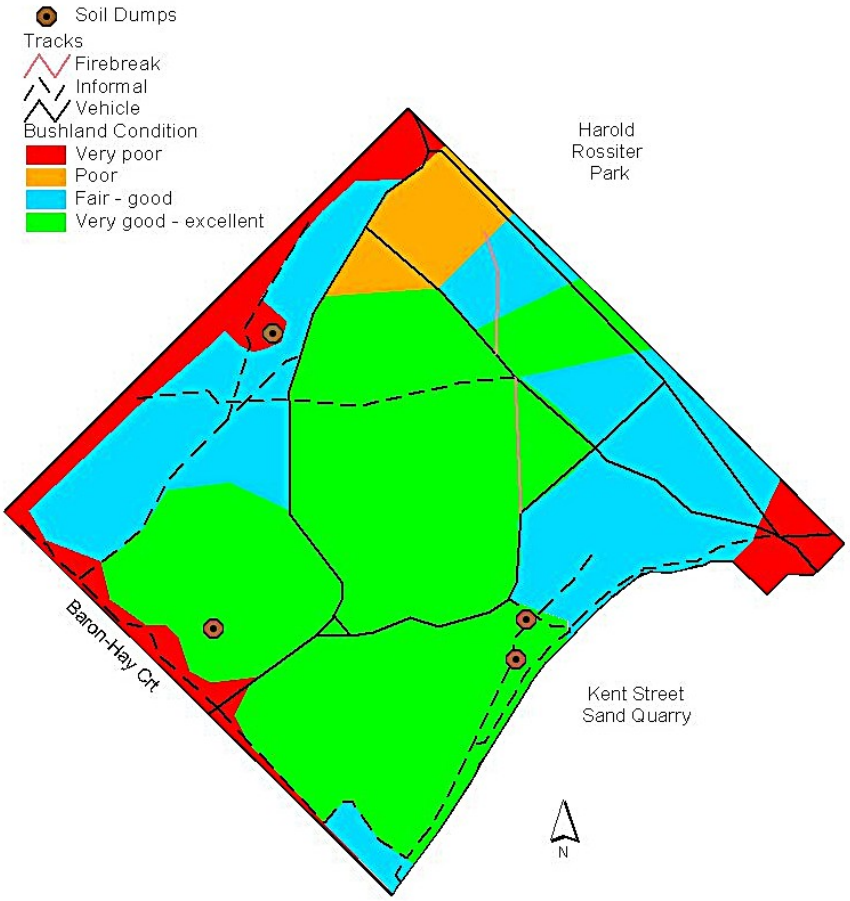


Figure 4. Bushland Condition within Kensington Bushland (adapted from map drawn by Andrew Thomson in Dec 2000)

The area of degradation along the north-western boundary reflects the large trench that has been dug along this edge and the soil dump that has been placed nearby. The northern most corner has been previously cleared for a pump (which is now disused), and the south-eastern edge has been degraded by constant pedestrian access along this boundary.

There are numerous areas of degradation throughout the reserve that are too narrow to show in the above map. Along the edges of paths trampling has contributed to the dominance of weeds and there is also a network of informal tracks established.

There are a number of soil dumps in the reserve. These tend to develop into nodes of weeds as they usually contain a large amount of weed seeds.

The most serious weeds at the site are Black Flag (*Ferraria crispa*), Capeweed (*Arctotheca calendula*), *Gladiolus* species, Soursob (*Oxalis pes-caprae), Freesia* species and Perennial Veld Grass (*Ehrharta calycina*). African Lovegrass (*Eragrostis curvula*) and Couch Grass (*Cynodon dactylon*) are also present (Thomson pers. comm., 2003).

Fauna

The seventeen bird species, twelve reptile species and several invertebrates recorded in the reserve by Turpin (1990) are listed in Appendix One. Whilst this list is not comprehensive as the survey was only conducted during one season Turpin (1990) noted that a number of species are significant.

Of the 17 birds identified, 5 are significant. These are:

- Three diurnal birds of prey (the Collared Sparrowhawk, Brown Goshawk and Black Shouldered Kite), which are becoming rare in urban areas;
- The Rufous Whistler (*Pachycephela rufiventris*) that does not occur in urban gardens.
- The Carnaby's Cockatoo (*Calyptorhynchus latirostris*) that is listed as Declared Threatened Fauna.

There are 2 significant reptile species. These are:

- The Small Spotted Gecko (*Diplodactyles alboguttaulus*) which was not previously recorded south of the Swan River; and
- The Slender Legless Lizard (*Pletholax gracilis*) that is rarely recorded south of the Swan River.

There were no native mammals recorded within the reserve.

Conservation value

The bushland is registered as being regionally significant by the WA Planning Commission (Bush Forever Site #48).

The site contains:

- In excess of 200 plant species;
- 3 vegetation communities;
- 7 significant animals;
- 1 Priority Taxa.

4.3.2 Current Management

Current use

The reserve is currently managed by the Town of Victoria Park under a 999 year Crown lease dating from 1913. It is used for passive recreation (walking and dog exercise), access between Baron-Hay Court and Etwell Street and provides opportunities for education (given that there are a number of schools nearby).

A Management Plan for the Kensington Bushland was prepared by the Perth City Council in 1993, but has not been formally reviewed since 1997.

The site is classified in the Municipal Heritage Inventory within Management Category A, which is 'worth the highest level of protection'. These sites are: 'recommended for entry into the State Register of Heritage Places which gives legal protection; development requires consultation with the Heritage Council of WA and the local government; and provide

maximum encouragement to the owner under the Town of Victoria Park Planning Scheme to conserve the significance of the place. Incentives to promote conservation should be considered.'

Access

There is a fence around the entire reserve with 3 formal entrances to the reserve. Carparks are located on Etwell Street and Baron-Hay Court. Another entrance is located at the rear of George Reserve. There is formal pedestrian access around locked gates at Etwell Street and George Reserve, but there are no vehicle barriers at the Baron-Hay Court entrance that has allowed numerous cars to be dumped in the reserve (Friends of Kensington Bushland, 2003). The Baron-Hay Court Entrance is shown in Plate 3.

Plate 3. The Baron-Hay Court entrance to Kensington Bushland Reserve

The bollards visible in Plate 3 have been installed outside the fence, for the length of the reserve, along Baron-Hay Court.

The reserve contains a network of formal and informal tracks. The formal pedestrian tracks are trafficable by vehicles. Firefighting and management vehicles can access these at the entrances shown in Figure 5.

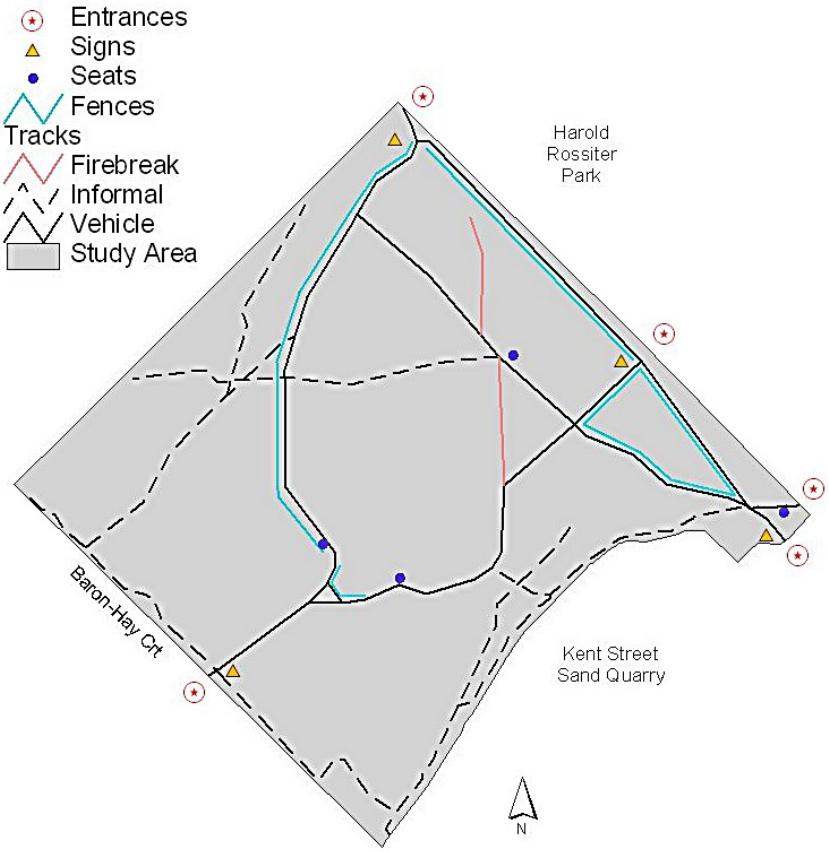


Figure 5 Access for Kensington Bushland

Access along some sections of paths has been obstructed by overhanging vegetation. This can discourage the use of formal paths, obstruct firefighting vehicles, and result in limbs being broken off plants by members of the public or management vehicles (an example of which is shown in Plate 4).

Plate 4. Damage to an Unpruned Plant

There are a large number of informal tracks through the site. The erection of internal fencing within the reserve has reduced traffic on some of these tracks but it should be noted that some of these original tracks were established along temporary firebreaks and there is potential for such tracks to become established along the recently created firebreaks.

Some of the tracks emanate from gates on Baron-Hay Court that do not lead to formal tracks.

Signage

At each entrance there is a sign stating that 'In the interest of flora and fauna protection please keep dogs on leash and remain on path'. Council bylaws require dogs to be kept on leads whilst in the reserve. This bylaw is consistent with standard bushland management practices. These bylaws are not always obeyed. The location of the adjacent designated dog exercise area may contribute to this (Friends of Kensington Bushland, 2003).

At the entrance from Harold Rossiter Park the 'dogs on leash' sign is positioned behind the internal fence. Whilst this reflects siting difficulties it is not good practice to place signs behind a fence as it makes it more difficult to see and can give the impression the message does not apply outside the intervening fence.

There is a notice board at the Etwell Street entrance and another smaller one at the Baron-Hay Court entrance. The former contains a few posters whilst the latter is empty. There is also a sign at Etwell Street welcoming visitors to the 'Kensington Bushland Reserve'.

Fire History

Although a precise fire history of the reserve has not been maintained at least three major fires have occurred in the last decade. Most, if not all, of these were deliberately lit. (Friends of Kensington Bushland, 2003)

Approximately 20% of the reserve was burnt in March 1993, the western quarter of the reserve was burnt in November 1999, and the reserve was burnt again in February 2003 (Friends of Kensington Bushland, 2003). The most recent fire in February burnt approximately 3.34 ha (31.5%) of the reserve (see Figure 6).

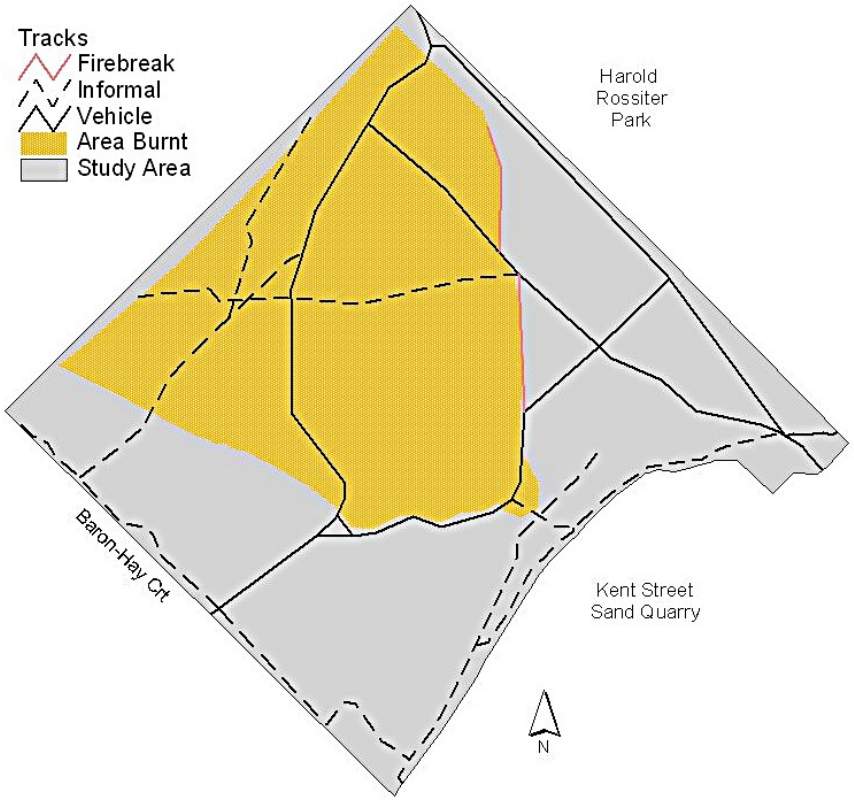


Figure 6. The Extent of the February 2003 Fire

Rubbish

Rubbish and car dumping has been an ongoing problem in the reserve (Friends of Kensington Bushland, 2003).

Bags for disposal of dog faeces are provided at the Etwell Street and Baron-Hay Court entrances.

Rehabilitation

Past rehabilitation activities by the Friends of Kensington Bushland have included various plantings of indigenous species but these have had low survival rates. Factors that may have contributed to this include inexperienced planters and plants being too small, and the exposure of the sites would also not have helped (Thomson pers. comm., 2003). Plantings undertaken in 2001 and 2002 have had a 14% survival rate along the verges where they were planted (Thomson pers. comm., 2003).

There is a small amount of natural regeneration occurring on the site, including a few Woollybush (*Adenanthos cygnorum*) on the south west side of the reserve near Kent Street.

4.3.3 Site Specific Recommendations

The major foci of should be the improvement of the bushland condition rather than increasing facilities, with the site work being focused at:

- The site of the recent fire for weed control; and
- The entrances to the reserve as these provide an opportunity to make a statement to the community about the Council's commitment to managing remnant vegetation, and these are highly degraded areas.

The specific recommendations for the site are:

High Priorities
16. Obscure (by raking and brushing or blocking) and/or rehabilitate tracks created during fire fighting operations as these have the potential to become major pedestrian tracks; 17. Close and rehabilitate informal tracks; 18. Restrict access into the burnt area to allow natural regeneration; 19. Continue weed control with reference to Table 4, with particular emphasis placed on the burnt area for spraying; 20. Prioritise control of bulbs in order of Black Flag then Freesias and Ixias. 21. Control weeds at adjacent sites such as the Kent Street Quarry and the PCYC; 22. Remove soil dumps as they are a source of weeds and do not blend into their surrounds. 23. Provide local fire brigades with maps of reserve showing all access and water points;
Medium Priorities
24. Install internal fencing, where required, to restrict traffic through bushland at the minimum width required for fire vehicle access. The placement and construction of fences will need to balance the aesthetics and function. Options (from least intrusive to most intrusive) include: • Blocking off unwanted tracks with brushing and logs; • Short sections of fence (of several metres only) at the intersection of formal paths to prevent corner cutting and provide an sense of entry to a new section of path; • Long sections of fence along the entire length of paths, or where fires have occurred (as either a temporary or permanent structure). This has already been implemented along some paths at the site. Options for fencing construction include: • A 500mm high post and rail fence with rails joined at the top, using regular round 150mm diameter poles of CCA Treated Pine; • A 1.2 metre high post and rail fence with ring-lock wire between the rail and ground level, using regular round 150mm diameter poles of CCA Treated Pine; 25. Install vehicle access measures at the Baron-Hay Court Entrance. 26. Remove gates along Baron-Hay Court that do not lead to formal tracks; 27. Install a screen along fencelines where weeds are not controlled on the adjacent sites. This could be achieved with shadecloth, or planting indigenous climbers such as *Hardenbergia comptoniana*; 28. Prepare an interpretation plan for the site. This should establish consistent colours, material and styles for signs, themes for interpretation, and appropriate locations for signs and seats. Given there are three main entrances, there would be an opportunity to give each a different theme (for example one concentrating on birds, one on flowers and one on trees), other alternatives are linking weeds, management and fire. Interpretation along trails within the site should also be considered; 29. Prepare a landscape plan for the entrances; 30. Upgrade signage at the three main entrances. These signs should include a compartment that can be regularly opened so that areas recently sprayed for weeds can be displayed, these upgraded signs should also be of sufficient size that multiple messages can be included – this will facilitate the rationalisation of other signs such as

the need to keep dogs on leashes;

31. Manage the unmowed strip of long grass between Harold Rossiter Park and the Kensington Bushland firebreak. The native plants in this strip should be supplemented with seedlings and the site managed as a native garden to reduce the amount of grass seed entering the bushland.

Low Priorities

32. Remove disused pump near George Reserve, and rehabilitate area;
33. Upgrade formal tracks to minimise erosion and maximise utility. Whilst FESA require 3 m wide access tracks, the entire width need not be sealed. The minimum width for disabled access is 1.5 m and this would be the minimum for a sealed path. If the path is to be more than 1.5 m and less than 3 m it needs to be narrower than a standard vehicle's wheelbase so that wheels are not driven along its edges, causing the edges of the path to break-up. The construction and tapering of edges is critical to their longevity. There are a number of options, though FESA should be consulted to ensure access for Firefighting Vehicles. Two options are:
    - 1.5 – 1.8 m wide crushed and compacted limestone tracks with indigenous herbaceous species planted along the edge;
    - 1.5 - 1.8 m stabilised (cemented) limestone path (or similar alternative). This uses a wet mixture of cream coloured cement and crushed limestone. The surface is harder and more durable without looking unnatural in a bush setting, therefore providing a good alternative for this particular site. Examples of this material being used can be seen at Northbank in Fremantle and Lefroy Rd off Carrington Rd in Beaconsfield where it is being used as a carpark;
34. Seek to have the Metropolitan Region Scheme zoning for the site to be changed from 'Urban' to a more appropriate category.

4.4 Kent Street Sand Quarry Kent Street

4.4.1 Site Description

Vegetation

This site would have originally supported the same vegetation assemblage as the adjacent Kensington Bushland site. The site was used as a quarry until 1993 and the majority of the site remains cleared. The native vegetation in the quarry is now currently limited to the edges of the site. The dominant indigenous species remaining on site includes Jarrah (*Eucalyptus marginata*), Woollybush (*Adenanthos cygnorum*), Candle Banksia (*Banksia attenuata)* and Firewood Banksia (*Banksia menziesii).*

Condition

Vegetation quality ranges from very poor to poor (with the majority of the vegetation being poor due to the high level of weed invasion and lack of native understorey). The narrowness of the remnant bushland strips has contributed to the uniformity in classes for this site, as the opportunities for viewing the bushland structure in its entirety and classifying its condition is reduced. The bushland condition is shown in Figure 7.

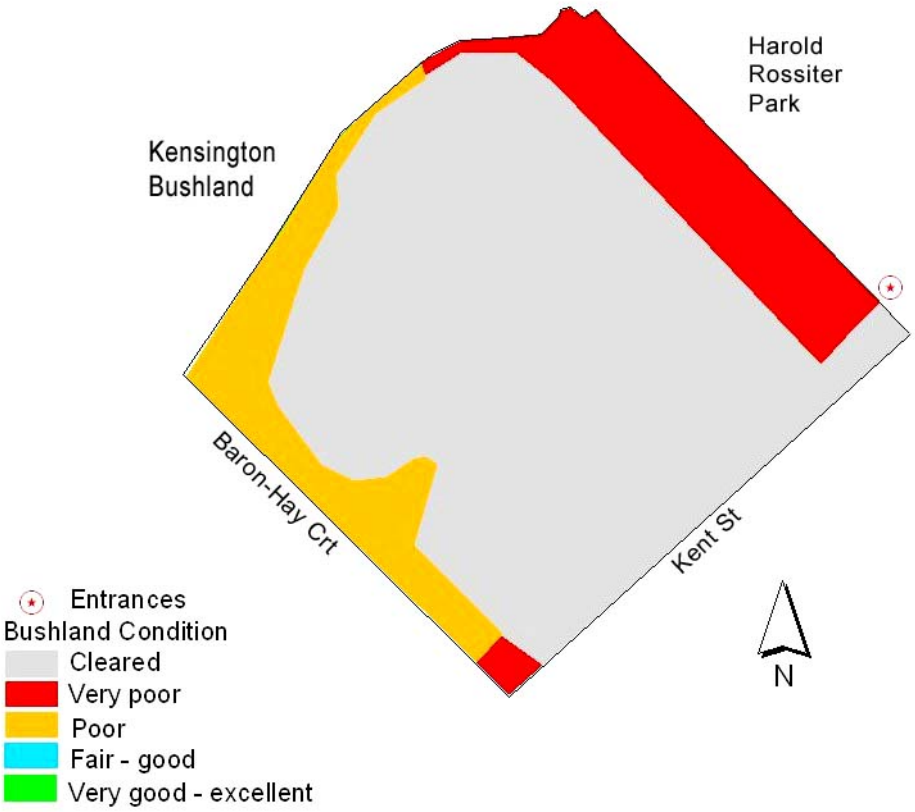


Figure 7. Bushland Condition at the Municipal Waste Storage Facility

There are a number of weed species present in the cleared area as well as in the remaining bushland. The dominant weed species in the remaining bushland include Perrenial Veld Grass (*Ehrharta calycina*) and Pine Trees (*Pinus* species) near Baron-Hay Court. In the

cleared area the weeds include Cape Lilac (*Melia azedarach*), Castor Oil Plant (*Ricinus communis*), Giant Reed (*Arundo donax*) and Geraldton Wax (*Chamelaucium uncinatum*).

Fauna

Rainbow Bee Eaters (*Merops ornatus*) have been seen to utilise the site for nesting (Friends of Kensington Bushland, 2003). There will also be other animals such as reptiles and other bird species that utilise the site for food and shelter resources.

Conservation value

This bushland presently has limited conservation value due to the narrowness of vegetated areas and degree of weed invasion. However it appears to contain the Town's largest population of *Dodonaea hackettiana* (which is a Priority 4 species) and it provides a buffer against weed invasion for the adjacent Kensington Bushland. Should the site be redeveloped it has potential to enhance the functioning and value of the adjacent Kensington Bushland.

Social and cultural value

At present this bushland's social value is in providing a visual screen for the quarry site. The Friends of Kensington Bushland have expressed a desire for the site to be converted into an Environmental Interpretative Centre with artificial wetlands and an outdoor arts venue.

4.4.2 Current Management

Current use

At present the site is being used as a storage facility for inert waste and construction materials by the Town of Victoria Park.

Access

The site is enclosed by a 2 m high fence with access restricted to one gate off Etwell Street. Verge access has also been restricted by lower fences along Etwell and Kent Streets and bollards along Baron-Hay Court.

Signage

Two signs state that the site is 'Private Property' and entry is by appointment only. These signs are located at the gate off Etwell Street and at the corner of Baron-Hay Court and Kent Street.

Rubbish

The site's designated purpose is for the storage of the Town of Victoria Park's construction materials and inert waste, including slabs, bricks and concrete, green waste, and soils. As hard rubbish such as this has been dumped in the quarry for a number of years a thick layer (10-20 metres) of concrete has built up in some areas (Friends of Kensington Bushland, 2003).

4.4.3 Site Specific Recommendations

As the long-term prospects of the site have yet to be resolved the issue of how to rehabilitate the entire site is not considered, although the site does have potential to enhance the sustainability of the adjacent bushland. As bushland is fairly scarce in the Town any future plans for the area should incorporate the existing perimeter vegetation. In the interim the following should be managed:

- Weed removal
- Fencing to protect existing vegetation
- Maintaining habitat for fauna particularly birds

In the immediate future management should concentrate on protecting the population of Perth Hop-Bush (*Dodonaea hackettiana)* and minimising any negative impacts from the site.

High Priorities
35. Cordon-off the *Dodonaea hackettiana* so that works do not further impact upon the population, which could provide a useful source of seed; 36. Control and remove weed species, with reference to Table 4, that have the potential to invade the Kensington Bushland Site with priority given to control of Veld Grass, Pine Trees and Geraldton Wax.
Medium Priorities
37. Install a screen along fencelines where weeds are not controlled on the adjacent sites. This could be achieved with shadecloth, or planting indigenous climbers such as *Hardenbergia comptoniana*.
Low Priorities
38. Develop long-term plan for site

4.5 PCYC Site Anketell Street

4.5.1 Site Description

Vegetation

The vegetation type is the same as that at the adjacent Kensington Bushland. Thirty native species were observed during an initial site inspection. This included an excellent specimen of Pricklybark (*Eucalytpus todtiana*), and examples of Woollybush (*Adenanthos cygnorum*), Holly-leaf Banksia (*Banksia ilicifolia)*, Jarrah (*Eucalyptus marginata*), Firewood Banksia (*Banksia menziesii)*, and Candle Banksia (*Banksia attenuata)*.

Condition

Whilst there remains some semblance of the original structure, weeds dominate much of the site. The condition of the uncleared area is poor to very poor. The extent of the uncleared area is shown in the bushland condition map in Figure 8.

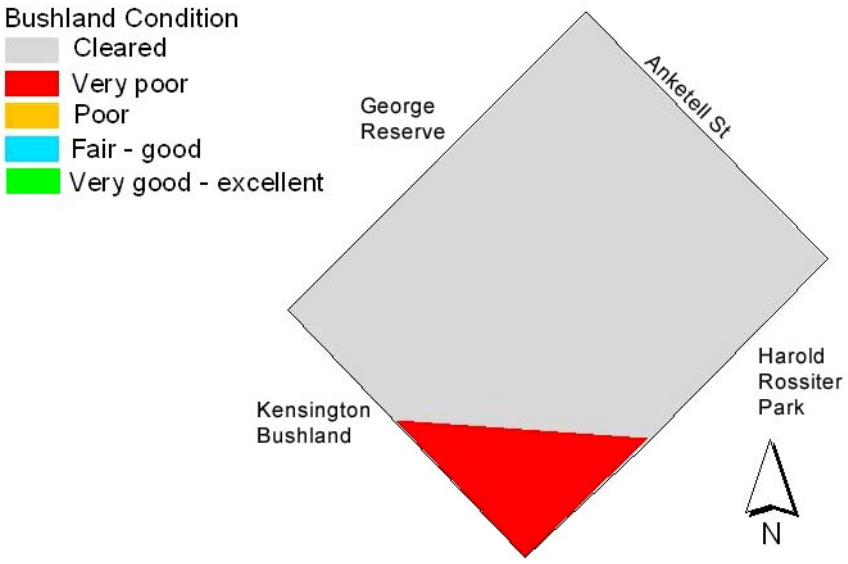


Figure 8. Bushland Condition at the PCYC Site

Conservation value

The site's conservation value has deteriorated as the bushland has not been actively managed in sympathy with the adjacent Kensington site, but it still retains some excellent trees and some understorey species. There is considerable opportunity to enhance its value.

Social and cultural values

The social and cultural values of this bushland have deteriorated considerably as it is not actively managed as part of the adjacent bushland or PCYC facilities. There is considerable opportunity to enhance its value by utilising the site for nature studies and creating walking paths.

4.5.2 Current Management

Current use

Much of the site has been used as part of the PCYC facilities, including a BMX track. At present much of the rear of this lot is not utilised except for rubbish dumping. The site has potential to be redeveloped in a complimentary manner to the adjacent bushland and parkland.

Access

Formal access is via the entrance to the PCYC off Anketell Street. The rear of the site is accessed down a steep embankment, down which there are no formal paths. There are also gaps in the fence along the boundary with the Kensington Bushland, through which informal paths have developed.

Signage

There is no signage specifically relating to the remnant vegetation onsite.

Fire History

No fire history was obtained for the site, though it does not appear to have been burnt in recent years.

Rubbish

There is a considerable amount of rubble that has been dumped on the embankment towards the rear of the lot, and the remains a large number of tyres from the now derelict BMX track.

4.5.3 Site Specific Recommendations

The management of the bushland will need to be considered in the context of the entire site.

High Priorities
No recommendations
Medium Priorities
39. Develop a plan site with consideration of: • The site containing possibly the best example of a Pricklybark Tree in the municipality; • Whilst degraded, the portion of the lot abutting the Kensington Bushland still contains more than 30 indigenous species; • Rehabilitating and/or managing weeds (eg. Veld Grass, Freesia), with reference to Table 4, in at least a portion of the lot will assist in maintaining the Kensington Bushland by creating a buffer.
Low Priorities
No recommendations

4.6 Hillview Community Bushland Hillview Tce

4.6.1 Site Description

Vegetation

The vegetation on the site is remnant Banksia woodland containing more than 60 native plant species (Griffin, undated). This species list is included in Appendix One, but it is based on several short visits and is not comprehensive (Cranfield pers. comm., 2003). Several additional species were observed in assessing the site. Some of these would have been present but not observed such as *Conospemum triplinervium* and others appear to have been planted subsequently such as *Calothamnus quadrifidus, Dodonaea hackettiana* and several Eucalypts.

The vegetation community of Hillview Community Bushland is composed of an Open Low Woodland overstorey of Candle Banksia (*Banksia attenuata),* Firewood Banksia *(Banksia menziesii)* and Christmas Tree (*Nuytsia floribunda)* over a Low Scrub mid-storey of Woollybush (*Adenanthos cygnorum)* and Stinkwood (*Jacksonia furcellata)* over a Low Heath of Dwarf Sheoak (*Allocasuarina humilis), Calothamnus sanguineus, Calytrix fraseri and Eremaea pauciflora.*

The trees present on the reserve also include one Holly-leaf Banksia (*Banksia ilicifolia)* and one Common Sheoak (*Allocasuarina fraseriana).* The trees that are present now are concentrated towards the southern corner of the reserve, on the corner of Hill View Terrace and Berwick Street. The woodland community in Hillview Bushland differs structurally to that at Kensington Bushland due to its higher position in the landscape, there are significantly less trees present on the site.

Condition

The site is quite degraded in sections, particularly the north-west corner, as is shown in Figure 9.

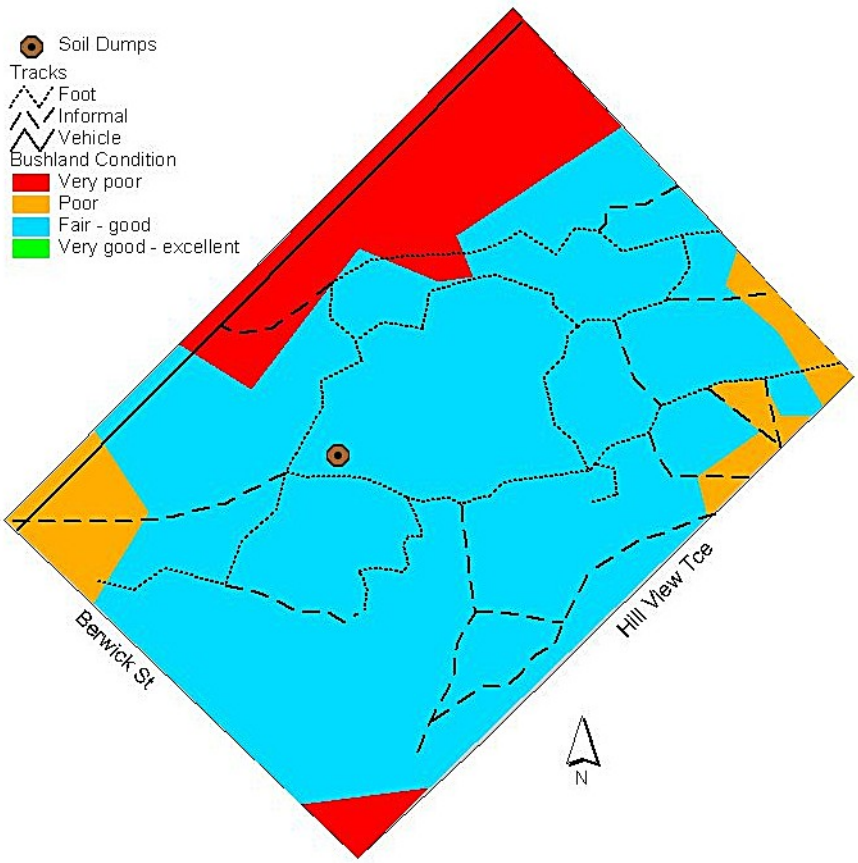


Figure 9. Bushland Condition of Hillview Community Bushland

There are a number of weeds present on the site. The most serious weeds are Black Flag (*Ferraria crispa*), *Freesia* species and Veld Grass (*Ehrharta* species). Black Flag has invaded over one third of the reserve and has proved very difficult to control (Thomson pers. comm., 2003).

There also appears to be a number of species planted onsite that were not originally recorded onsite. These include: several Eucalypts, *Calothmanus quadrifidus* and *Dodonaea hackettiana.* If the site is to be managed inline with present standards for bushland management species not recorded as naturally occurring onsite should generally be considered weeds. Species should only be introduced to site after careful consideration as to whether gardening or bushland management is being undertaken.

It should also be noted that a number of the Christmas Trees have been cut with an axe, which was most likely an act of wonton vandalism. Christmas Trees are semi-parasitic plants but will **not** unduly stress their hosts, unless the host is already dying.

Fauna

There are a number of insect, reptile and bird species present on the site. A study carried out by Turpin (1990) found four species of reptiles, no native mammals and eight bird species. A number of invertebrates were also recorded. A full list of the species recorded can be seen in Appendix One.

Conservation value

The reserve has high conservation value due to the scarcity of remnant vegetation in Victoria Park. The site also contains several species of interest;

- *Banksia ilicifolia* is located on this elevated site in contrast to its favoured position in low-lying areas; and
- *Dodonaea hakecttiana* is a Priority 4 Taxa, though it appears to have been planted onsite.

Social and cultural values

During the mid to late 1990s a series of art projects were undertaken at the site. In 1994 a community arts project was jointly run by the Community Arts Network, the Perth City Council, the National Trust, and the Friends of Hillview Community Bushland. The Playback Theatre held a number of events focusing on the natural and cultural history of Victoria Park culminating in the collection of Aboriginal stories. The Aboriginal artist Toogarr, Jerry Morrison, also designed a number of paths and the echidna sculpture shown in Plate 5.

Plate 5. Aboriginal Sculpture of an Echidna (Nynarrin)

In 1999, the Friends of Hillview Community Bushland gained a National Heritage Trust grant to install signs onsite. Recycled poles were painted and installed by artist Lance Chadd with motifs relating to local flora, fauna and people along with Nyoongar and English equivalent names for the site.

The site is registered by The National Trust of Australia (WA) (Griffin, undated). The site is classified in the Municipal Heritage Inventory as Management Category A. These sites are 'worth of the highest level of protection' and 'recommended for entry into the State Register of Heritage Places which gives legal protection; development requires consultation with the Heritage Council of WA and the local government; provide maximum encouragement to the

owner under the Town of Victoria Park Planning Scheme to conserve the significance of the place. Incentives to promote conservation should be considered.'

4.6.2 Current Management

Current use

A draft management plan was prepared by Griffin (undated) on behalf of the local community but this has not been adopted by Council.

At present the site does not appear to experience high levels of use, perhaps except as a short-cut across the corner of Berwick Street and Hill View Terrace. There were two seating areas established as part of the 1994 community art project. These each consist of a circle of rocks and seem to be seldom used.

There is evidence of antisocial behaviour such as paint-sniffing but there is no vandalism evident, except perhaps Christmas Trees being cut with an axe.

There has been little development of the site, and this is in accordance with the conditions associated with the Municipality acquiring the site. These include that:

- The site be maintained as a community park with access for members of the public;
- No development of the site may occur without written permission from the Vendor for a period of 10 years from the settlement date (1998); and
- Best practice be used in managing the site.

Access

The site is unfenced other than a row of bollards around the outside of the reserve to prevent unauthorised vehicle access. The proliferation of pedestrian tracks within the small area is a major issue.

Formal paths were established as part of the community art project during the 1990s. These are indicated by the presence of ironstone gravel. All other tracks have been recorded as informal, with the exception of the limestone path utilised by pedestrians and management vehicles along the boundary with the National Archives. All the paths are shown in Figure 10, even though some of the formal pedestrian paths are now barely discernible.

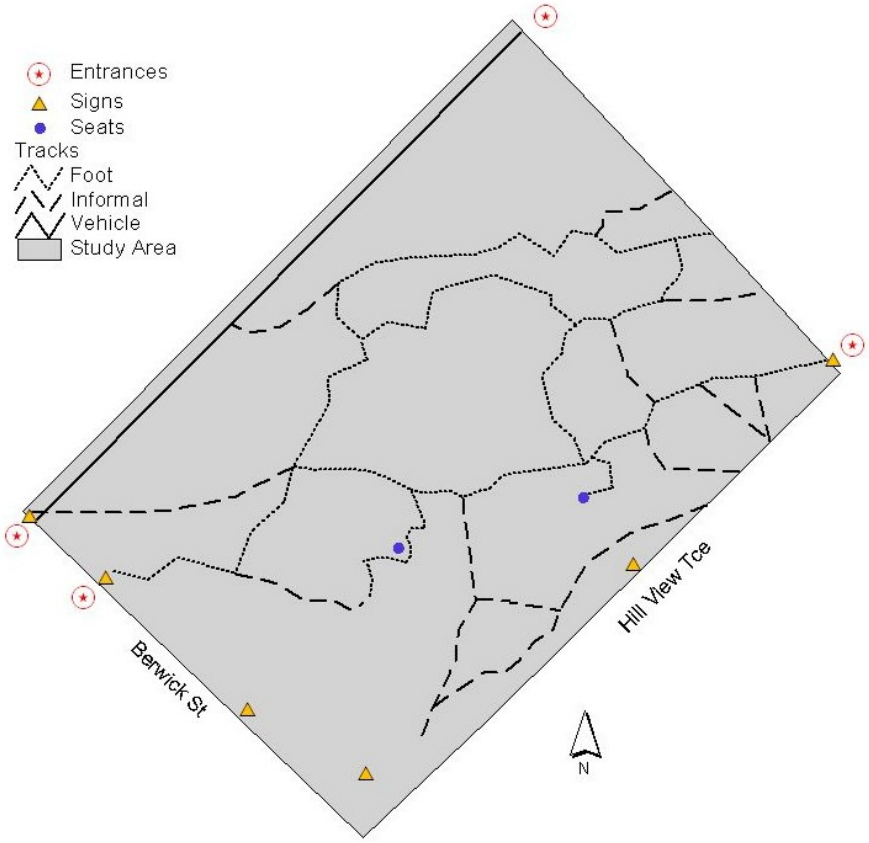


Figure 10. Access within Hillview Community Bushland

There is not a clear path to access the totem poles on the corner of Berwick Street and Hillview Terrace, but they are clearly visible from the road.

Signage

There are a number of signs on the edges of the reserve:

- Two signs naming the reserve are located on Hill View Terrace and Berwick Street.
- Two signs indicate the presence of the limestone path; they are located opposite corners of the reserve. These signs try to encourage people to use the limestone path and not the tracks through the reserve.
- At the corner of Berwick Street and Hill View Terrace there is a pair of Aboriginal totem poles that have been painted with pictures and words associated with Aboriginal heritage of the area. One totem pole has the English name of the reserve and one has the Aboriginal name (Kata Djinanjiny).

Fire management

Anecdotal information indicates that the block was burnt annually prior to the late 1980's, with the last major fire on the bushland block being in 1986, suggesting that the site has not been burnt for about 17 years (Friends of Kensington Bushland, 2003).

Rubbish

The rubbish on the site mainly consists of general litter, spray cans, syringes and dog faeces. There is also a soil dump and a small amount of rubble such as bitumen and blue metal onsite.

Rehabilitation

Funding was obtained from the National Heritage Trust for the installation of bollards and seedling planting. In June 1999, 4500 seedlings were planted. In December 1999 there was an average survival rate of 18% and this dropped to 9% by May 2001. Seedlings planted on the southern side of the site tended to have the highest rate of survival. (Thomson pers. comm., 2003).

4.6.3 Site Specific Recommendations

High Priorities
40. Plant seedlings in bare areas, including near the entrances off Berwick Street and the northern corner of the reserve, as well as along tracks that should no longer be used.
41. Continue to control weeds, with reference to Table 4.
42. Maintain only the main diagonal track to reduce track duplication and bushland fragmentation. Given the open vegetation and conditions of purchase at the site, pedestrians could not be reasonably excluded from the site, therefore formal track/s need to be maintained to counter the proliferation of informal tracks. The main diagonal track should be the only track maintained at it is the most used track and provides the shortest route across the reserve.
43. The main diagonal should be surfaced with crushed limestone to its present width (between 500mm and 1000mm wide) and pruned only to this width. Maintaining this width minimises the disturbance of this small and degraded reserve, and there are wider paths around the perimeter of the site. Using crushed limestone instead of ironstone gravel as was previously used is recommended as it blends in with the sandy soils of the site but also clearly shows where the path to be used is located. The surfacing the one tracks will create uniformity along the track and reinforce its status above the tracks not to be maintained.
Medium Priorities
44. Remove all plants that do not naturally occur on the site including several Eucalypts, *Calothmanus quadrifidus* and *Dodonaea hackettiana.* The plants could be removed immediately, which would have the advantage of reducing seed being set, but given the degraded nature of the site these species could be removed when new plantings are established over several years.
Low Priorities
45. Consider the placement of one or two small interpretative signs onsite. The low present level of usage would need to form part of this consideration.

5.1 Overview

The nine parks (two of which are adjacent) within the Town of Victoria Park supporting indigenous vegetation are shown in Figure 11.

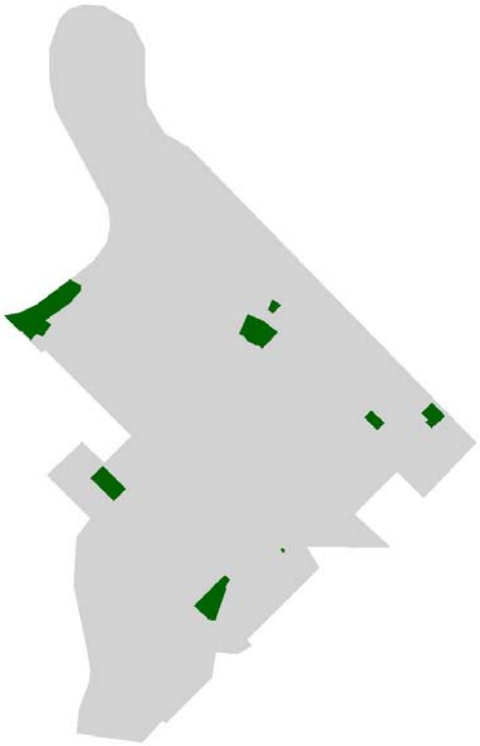


Figure 11 Distribution of Parks with Indigenous Trees

Under the Town Planning Scheme seven out of the nine parklands are zoned for Parks and Recreation. Playfield Conservation Area is zoned for Public Purposes – Civic Use, and Alday Reserve is zoned Residential. Under the Metropolitan Region Scheme of Perth seven of the nine parklands are zoned as Urban. Taylor Reserve is zoned as Parks and Recreation and Lathlain Park is zoned Parks and Recreation with restricted access.

Jarrah and Christmas Trees are the only indigenous trees that are present in more than 3 parks, as can be seen in Table 5.

Table 5. Indigenous Trees Present at Parks within the Town of Victoria Park

Species	Carlisle Reserve	Harold Rossiter Park	Rayment Park	Taylor Reserve	Lathlain Park	Playfield Conservation	Parnham Park	Higgins Park	Alday Reserve	Total
Marri									X	1
Tuart		X						X		2
Jarrah		X	X		X		X			4
Flooded Gum				X						1
Pricklybark										0
Swamp Sheoak				X						1
Sheoak		X			X					2
Firewood Banksia	X	X							X	3
Candle Banksia	X	X								2
Holly-leaf Banksia										0
Christmas Tree	X				X	X			X	4
Saltwater Paperbark				X						1
Freshwater Paperbark				X						1
Mohan				X						1
Stout Paperbark				X						1
Total	3	5	1	6	3	1	1	1	3	24

Two of the trees do not occur in any parks and seven of the fifteen trees only occur at one site. The distribution of species between the parks is influenced by the vegetation complexes in which they occur. There are a number of species only present at Taylor Reserve & McCallum Park as these are located within the Vasse Vegetation Complex, whilst the other parks are located in the Bassendean Complex.

5.2 Recommendations

Many of the issues relating to the management of native trees in parks are the same as those for exotic trees. These include: compaction of surrounding soil by pedestrian traffic; damage sustained when cutting grass; the need to prune branches and limbs for safety; and the long timeframes for establishing trees.

High Priorities
46. Avoid using phosphorous fertilisers around the base of Banksias. This is not generally an issue as fertilisers high in nitrogen are used for lawns but worth noting as these trees have evolved to survive in nutrient poor soils and are therefore highly susceptible to phosphorous poisoning.
Medium Priorities
47. Increase the number of parks where each indigenous species occurs;.
Low Priorities
48. Develop landscape designs for the large lawn parklands which incorporate reconstructed bushland areas.

5.3 Site Details

Carlisle Reserve *Briggs Street*

There are a number of Candle Banksia (*Banksia attenuata)*, Firewood Banksia (*Banksia menziesii)* and two Christmas Trees (*Nuytsia floribunda*) in the southern portion of the reserve, with lawn underneath. The two Christmas trees appear to be stressed. There is a carpark at the southern end of the reserve with small bollards in place to prevent cars entering the reserve. There is very little rubbish at the site and bins are provided in the adjacent Carlisle Reserve.

Harold Rossiter Park *Kent Street*

Harold Rossiter Park is located on the corner of Etwell Street and Kent Street and consists of three ovals each surrounded by rows of trees. Indigenous trees include a number of Jarrah (*Eucalyptus marginata*), eight Tuarts (*Eucalyptus gomphocephala*), Sheoaks (*Allocasuaruina fraseriana*), *Banksia attenuata* and *Banksia menziesii.* The other trees in the parkland are all non-indigenous, including a number of introduced *Eucalyptus* species and *Allocasuarina* species.

This park is one of only two sites within the Municipality that supports more than one individual Tuart.

All the trees in the park look unstressed except for several introduced Eucalypts near the PCYC site. These trees have thinned canopies and have re-sprouted on lower branches and trunks. The possible cause of this stress may be related to a nearby tree that has been cut down. If the stump was poisoned, this may have been indirectly absorbed into the roots of the surrounding trees. Whilst no indigenous trees are affected this issue should be considered in managing all parkland trees.

Rayment Park *Rayment & Howick St*

The vegetation consists of numerous Eucalypt species and two exotic Norfolk Island Pines (*Araucaria heterophylla*). The majority of the Eucalypts are non-indigenous but there are four Jarrahs (*Eucalyptus marginata*) in the area surrounding the playground. There is also one pink flowering form of Marri (*Corymbia calophylla*), which is a non-indigenous cultivar. The trees appear to be in good health.

Taylor Reserve & McCallum Park *McCallum Lane*

The Swan River, Taylor Street, McCallum Lane and Ellam Street bound this reserve. Remnant indigenous vegetation in the parkland consists predominately of Flooded Gum (*Eucalyptus rudis*) with three native *Melaleuca* species (*M. cuticularis, M. rhaphiophylla, M. viminea*), and six Swamp Sheoaks (*Casuarina obesa*) on the riverbank. There are also a number of exotic species in the reserve. Some Flooded Gums appear stressed and this may be due to drought conditions over recent years. Figure 12 shows an example of tree stress.

Figure 12. Stressed Flooded Gum in Taylor Reserve

There are further trees located towards Ellam Street. In this stand there is an overstorey of Flooded Gum with an understorey of *Melaleuca*s. Closer to the river there are scattered Flooded Gums and occasional Paperbarks and Swamp Sheoaks.

Figure 13. Swamp Sheoak on the Swan River in Taylor Reserve, Victoria Park.

Lathlain Park *McCartney Crescent*

This reserve is situated in the eastern corner of Lathlain Park. The dominant trees in the reserve are Jarrah (*Eucalyptus marginata*) and Sheoak (*Allocasuarina fraseriana*). There are also two native Christmas Trees (*Nuytsia floribunda*) that are suckering and one *Banksia menziesii*. The trees all appear to be in good health. There have been a number of non-indigenous Eucalypt trees planted at this site.

The reserve can be accessed from the Lathlain Park carpark. The area of indigenous trees is divided into two stands separated by the entrance to Lathlain Park carpark. The eastern stand is bounded by Lathlain Park carpark, McCartney Crescent and Roberts Road. The western stand is bounded by McCartney Crescent, another carpark of Lathlain Park and the tennis courts of Lathlain Park.

The edges of the reserve adjacent to the road have a 1.5 meter wire fence. The vegetated area adjacent to the Lathlain Park carpark is enclosed by bollards. There is one locked gate in the eastern stand. The western stand has no barrier between the second carpark and the trees, allowing cars to easily access that area.

There are no signs referring to the presence of the indigenous trees. The only sign in the vicinity is one located at the entrance to Lathlain Park carpark that names the park. The site was clear of rubbish.

Impacts from surrounding land uses may include pedestrian traffic, water and nutrients from the sump that has recently been constructed next to the eastern stand of trees and litter during sport seasons.

Playfield Conservation Area *Devenish St & Hillview Tce*

The vegetation at this site has an overstorey and understorey approximating the structure of bushland rather than parkland. However, the Playfield Conservation Area is planted with predominately Australian, not indigenous, plants such as Sheoaks from the eastern states. There are some indigenous species including Spearwood (*Kunzea ericifolia), Conostylis* species, and a Christmas tree (*Nuytsia floribunda*). The area is mulched and well maintained, containing only a few grassy weeds and a few plants of Geraldton Waxflower (*Chamelaucium uncinatum*). There does not appear to be any signs of disease presence. There are a number of *Banksia* species that have been planted in the reserve including Bull Banksia (*Banksia grandis).*

Parnham Park *Star Street*

The only indigenous species present is one Jarrah (*Eucalyptus marginata*). The tree is located on Star Street approximately 78 meters north of Oats Street. The edges of the grassed parkland have various native mature trees scattered along them. There is a sporting clubroom located at the Mercury Street end of the park. There are no parking facilities and fencing consists of a row of bollards approximately 3 metres away from the road. There is a small children's playground located in the park near the corner of Oats and Star Street, as well as a fenced off compensation basin (sump). There is an access gate for management vehicles from Mars Street. Bins are located at various points around the park.

Higgins Park *Hillview Terrace*

There are native and exotic trees scattered around the edges of this park. There is one indigenous tree, a Tuart (*Eucalyptus gomphocehala*) located on the southern side of the tennis courts. This tree is only located at this site, Harold Rossiter Park and one roadside site. This park consists of three sets of tennis courts and a large oval. There is a row of bollards around the park, located approximately five metres away from the road.

Alday Reserve *Alday Street*

This site is located on Alday Street and has a number of indigenous plants.

There are three Tree Smokebushes (*Conospermum triplinervium*) located in a fenced area with a number of other native and exotic plants. Only one of these is healthy but it remains significant as this is one of only three sites where the plant occurs, and the only one that is not bushland.

Other indigenous species present are one Christmas Tree (*Nuytsia floribunda*), one *Banksia menziesii,* and one Marri (*Corymbia calophylla*). All trees are relatively small in size and are located at the rear of the reserve. In the middle of the reserve there is a small area of play equipment. The park has three bins, a water fountain and a seat.

6.0 Roadside Trees

Remnant Vegetation Management Plan

6.1 Overview

The indigenous roadside trees located are scattered throughout the municipality as shown in Figure 14.

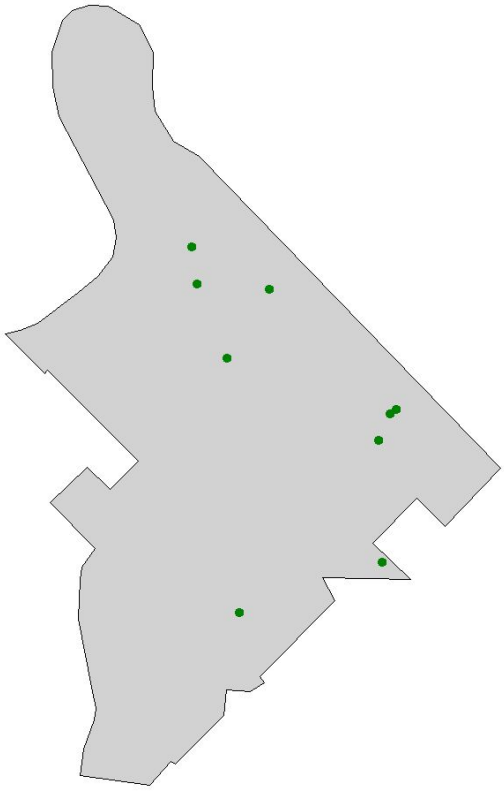


Figure 14. Roadside Trees in the Town of Victoria Park

There were nine sites where indigenous roadside trees were located. Six of these sites consisted of single trees, one consisted of two trees and another consisted of multiple trees. One of the sites contained one shrub. Three of these sites have registered Significant Trees. Additional comments are given in Table 6.

Table 6. Roadside trees in the Town of Victoria Park

Roadside Tree	Address	Trees	Additional comments
1	Rutland Ave	1 Woollybush	• Healthy small shrub. • Adjacent to railway opp. Industrial area. • On sand/gravel surface.
2	93 Solar Way	1 Marri	• Unhealthy - stressed tree with exposed roots. • Verge used for car parking.
3	94 Solar Way	1 Jarrah	• Healthy tree • Pruned around powerlines.
4	Axon Ave	1 Marri	• Healthy tree with bark damage. • Under powerlines. • Verge used for car parking.
5	Kitchener Ave	1 Pricklybark	• Relatively healthy medium tree. • Growing under powerlines
6	Hill View Tce	1 Christmas tree	• Healthy tree. • On verge with maintained lawn.
7	Mars St	1 Sheoak	• Healthy tree. • On verge with maintained lawn
8	65 Cookham St	2 Jarrah	• Healthy with one dead branch. • Under powerlines • On verge with maintained lawn.
9	Cnr of Burswood Rd and Great Eastern Hwy	Multiple Tuart	• Healthy small to medium trees. • Adjacent to railway • Behind maintained garden on maintained grassy area.

Shaded rows indicate that the Trees are registered as significant

Many of the issues relating to the management of native trees on road reserves and footpaths are the same as those for exotic trees. These include: compaction from pedestrian and vehicle access; damage sustained when cutting grass; damage due to passing vehicles; damage caused when utilities are upgraded; the need to prune branches and limbs for safety; and the long timeframes for establishing trees.

The trees appear to be maintained in accordance with standard arboriculture practices and the Council's pruning policy. A number of the trees are of sufficient height that they have been pruned around powerlines. Whilst this is required pruning these trees to the extent required for safety can occasionally compromise their aesthetics and longevity.

Whilst these indigenous trees are long-lived species, with only 9 sites containing indigenous trees, (of which six consist of single trees), the long-term preservation of these species on this land-use type needs to focus on increasing the total number of individuals.

6.2 Recommendations

High Priorities
49. Continue maintaining the roadside trees in accordance with standard arboriculture practices and the Council's pruning policy; 50. Register all indigenous Roadside Trees (excluding the Roadside Tree 1, which is a small shrub) as Significant Trees.
Medium Priorities
51. Revise the Treeplan for the Town of Victoria Park and determine opportunities for increasing the number of indigenous Roadside Trees.
Low Priorities
No Recommendations

6.3 Site Details

Roadside tree 1 *Rutland Ave*

The site contains one Woollybush (*Adenanthos cygnorum*) and is located on Rutland Avenue, adjacent to the railway line, approximately 250 m north of Welshpool Road, between Briggs Street and Welshpool Road. Other shrubs present include introduced Victorian Tea-trees (*Leptospermum laevigatum*) and Bottlebrushes (*Callistemon* species). There are also Norfolk Island Pines (*Araucaria heterophylla*) in the vicinity. The site has a fair amount of rubbish.

Roadside tree 2 and 3 *Solar Way*

This site contains one Marri (*Corymbia calophylla*) on the road verge of 93 Solar Way and one Jarrah (*Eucalyptus marginata*) on the road verge of 94 Solar Way. The trees are located approximately 50 metres from Mercury Street.

Roadside tree 4 *Axon Ave*

This site consists of one Marri (*Corymbia calophylla*) that is located on a road verge in Axon Avenue, approximately 25 m west of Kitchener Ave. The tree is located very close to the railway line that acts as a corridor between the Perth metropolitan and rural areas.

Roadside tree 5 *Kitchener Ave*

This site consists of one Pricklybark (*Eucalyptus todtiana*). The tree is located on the railway side of Kitchener Avenue, opposite Egham Road, Lathlain. The surrounding fence prevents parking at the base of the tree. A gate to gain access into the railway reserve is located next to the tree on the eastern side and the lower limbs have been hit by passing vehicles. Some branches are touching a cable between the adjacent powerline and a nearby house. There is one dead branch.

Roadside tree 6 *Hill View Tce*

This site consists of one Christmas Tree (*Nuytsia floribunda*). The tree is located on the corner of Hill View Terrace and Devenish Street, East Victoria Park. The tree is on the verge outside Playfield Conservation Area and is adjacent to the pylon for the powerline along Hill View Terrace.

Roadside tree 7 *Mars St*

This site consists of one Sheoak (*Allocasuarina fraseriana*). The tree is located on a residential verge on the corner of Mars and Mercury Street, Carlisle.

Roadside tree 8 *Cookham St*

This site consists of two Jarrah (*Eucalyptus marginata*) located on a residential verge. The trees are located approximately 40 metres from Goddard Street.

Roadside tree 9 *Burswood Rd*

This site consists of a stand of multiple Tuart (*Eucalyptus gomphocephala*) trees located behind a maintained garden bed. The site is located on the corner of Burswood Road and the Great Eastern Highway and is adjacent to the railway line. There are small, medium and large trees present with the majority of trees being small. The area around the base of the stand of trees is maintained grass (including a number of weeds) but would not be considered a lawn area. There is no direct access to the site as it is situated away from the actual roadside. There is a bore located close to the stand of trees. The garden bed in front of the stand of trees is lit up at night.

7.0 Sumps

Remnant Vegetation Management Plan

7.1 Overview

A total of 75 compensation basins (sumps) were assessed for this management plan. Under the Town Planning Scheme No. 1 sumps fall into a number of different zones. Of the total number of sumps there is one sump in Industrial, two in Office/Residential, three in Parks and Recreation, and one in Public Purpose, and 68 in Residential schemes.

Of the 75 sumps, 17 support indigenous vegetation. These 17 are shown in Figure 15. Details of sumps without indigenous vegetation can be seen in Appendix Five.

Figure 15. Sumps with Indigenous Trees

All sumps were fenced, but sometimes the fences were within the location's boundaries rather than on the boundary. At these sites vegetation outside the fence, but inside the lot, were still deemed to be in a sump rather than on the road verge.

All sump sites have potential value. Sumps that contain indigenous or introduced vegetation have potential to be recreated as habitat for local fauna such as birds, reptiles and amphibians. Existing vegetation already provides both food and shelter resources for a variety of species. Sumps that contain native vegetation have more potential conservation value due to the fact that native fauna are more attracted to the resources provided by native flora. There is the potential to create a variety of habitats on the existing sumps, particularly those that already contain indigenous vegetation. There is also the opportunity for sumps to

have social value by utilising the space on the Lot not fenced off. Two sumps in the Town already have social value, with one having a playground in front of the fenced off sump, and the other having a garden with a picnic table and bin provided. There are a number of ways in which the land could be utilised to provide both social and conservational value to the community.

A summary of the sumps with indigenous vegetation is given in Table 7.

Table 7. Sumps with Indigenous Vegetation

Sump	Address	Management Sector	Indigenous Vegetation	Aesthetic Value
1	30-32 Satellite Pl	Carlisle	8 Jarrah, 1 Sheoak	Yes
2	28 Mars St	Carlisle	1 Jarrah	Yes
3	91 Planet St	Carlisle	1 Jarrah	
4	7 Marchamley St	Carlisle	1 Sheoak	Yes
5	2 Asteroid Wy	Carlisle	4 Jarrah, 1 Banksia	Yes
6	53 Solar Wy	Carlisle	3 Jarrah	
7	76 Planet St	Carlisle	1 Sheoak outside fence	
8	59 Gallipoli St	Carlisle	7 Marri	Yes
9	77 Howick St	Carlisle	1 Sheoak outside fence	
10	101 Howick St	Carlisle	1 Sheoak, 2 Jarrah	
11	19 Apollo Wy	Carlisle	4 Sheoak	Yes
12	61 Camberwell St	East Vic Pk	1 Jarrah	
13	6 Westmoreland St	East Vic Pk	1 Sheoak & shrubs outside	Yes
14	51 Cornwall St	Lathlain	1 Jarrah	
15	162 Orrong Rd	Lathlain	4 Jarrah, 3 Marri	
16	27 Staines St	Lathlain	2 Jarrah	
17	16 Stiles St	Lathlain	1 Zamia Palm	

It should be noted that Sump 17 (16 Stiles Street) is the only site that contains Zamia Palm (*Macrozamia riedlei*) in the municipality, except for the Kensington Bushland.

The details for each site are given in Section 7.3 below. Rubbish in sumps included household rubbish such as bricks, chairs and other hard rubbish, general litter and green waste but unless otherwise stated the rubbish was general litter.

7.2 Recommendations

Whilst only a limited number of species are presently grown in sumps there are a relatively large number of sites where they grow. The indigenous flora in sumps forms a significant part of an integrated management strategy for managing the indigenous flora in the Municipality. There is the potential opportunity to revegetate sites that already contain indigenous vegetation as small habitat areas that could provide important resources for birds and amphibians. Sumps could be revegetated with indigenous sedges and grasses as well as a number of trees and shrubs that are suited to the moist conditions that are created in sumps.

High Priorities
No recommendations
Medium Priorities
52. That the management of trees in sumps be formalised; 53. Where possible replace weed species with indigenous flora; 54. Develop sumps as habitat for birds and amphibians; 55. Review sump requirements for the Town in terms of stormwater management. Those sumps that are in excess of requirements should be assessed for their conservation and/or recreation potential and either reconstructed for conservation and/or recreation purposes or sold and some of the money used for the re-establishment of remnant vegetation in the Town of Victoria Park; and 56. Those sumps that are required for drainage function should be developed as habitat areas for both native flora and fauna.
Low Priorities
No recommendations

7.3 Site Details

Sump 1 **30-32 Satellite Place**

The existing vegetation is predominately indigenous. There are eight Jarrah (*Eucalyptus marginata*) trees and one Sheoak (*Allocasuarina fraseriana*) inside the fence. Outside the fence there are a number of non-indigenous *Callistemon* shrubs. The site is moist and covered in exotic grasses that were green in some areas.

Sump 2 **28 Mars Street**

There are a number of trees, both indigenous and exotic species, on this site. There are two mature Eucalypt trees, one of which is the indigenous Jarrah (*Eucalyptus marginata*). There is one juvenile Gum Tree and one Wattle that are non-indigenous, and five exotic trees and a few exotic shrubs. The sump is dry with the site covered in exotic grasses.

Sump 3 **91 Planet Street**

The existing vegetation consists of two mature and one juvenile Eucalypt trees, with one mature tree being the indigenous Jarrah (*Eucalyptus marginata*) and the other two being non-indigenous. On the edge of the site there are a number of non-indigenous Lillypilly (*Acmena smithii*). Outside the fence there are three trees, two exotic species and one non-indigenous Eucalypt tree. The sump is dry and the site is covered in exotic grasses, with some green grass near the drain.

Sump 4 **7 Marchamley Street**

The sump is located behind the pump station. The only existing vegetation inside the fence is an indigenous Sheoak (*Allocasuarina fraseriana*). Outside the fence there are seven non-indigenous Eucalypt trees, three exotic trees and three exotic shrubs. The sump is moist and covered with green exotic grasses.

Sump 5 **2 Asteroid Way**

Existing vegetation consists of four mature indigenous Jarrah (*Eucalyptus marginata*) trees and one *Banksia*. There is one non-indigenous Melaleucas outside the fence. The sump is dry and is covered in exotic grasses and is located in a residential area.

Sump 6 **53 Solar Way**

The existing vegetation on the site consists of three indigenous Jarrah (*Eucalyptus marginata*) trees and four exotic Cape Lilac (*Melia azedarach*) trees. The sump is moist and the site is covered in exotic grasses.

Sump 7 **76 Planet Street**

There is no existing vegetation inside the fence on this site. Outside the fence there is one mature indigenous Sheoak (*Allocasuarina fraseriana*) and one juvenile exotic tree. The sump is dry and the site is covered with exotic grasses.

Sump 8 **59 Gallipoli Street**

The existing vegetation inside the fence consists of four mature indigenous Marri (*Corymbia calophylla*) trees and six small exotic shrubs. Outside the fence there were another three Marri trees and one exotic tree. The sump is dry and the site is covered with exotic grasses.

Sump 9 **77 Howick Street**

The only existing vegetation inside the fence is a few juvenile exotic Cape Lilac (*Melia azedarach*) trees. The sump is dry and is covered in exotic grasses. Outside the fence there are a number of small and large trees including a Sheoak (*Allocasuarina fraseriana*), a small non-indigenous Eucalypt and another non-indigenous species.

Sump 10 **101 Howick Street**

The existing vegetation consists of two large indigenous trees inside the fence, one Sheoak (*Allocasuarina fraseriana*) and one Jarrah (*Eucalyptus marginata*). Outside the fence there is another mature Jarrah tree. The sump is dry and the site is covered in exotic grasses.

Sump 11 **19 Apollo Way**

Existing vegetation consists of four large indigenous Sheoaks (*Allocasuarina fraseriana*), one dead Acacia tree that is non-indigenous, and a few small exotic trees. Outside the fence there are two small Melaleuca sp. trees that are non-indigenous. The sump is moist and has green grass growing in some areas. The site is covered in exotic grasses.

Sump 12 **61 Camberwell Street**

The existing vegetation consists of two Eucalypt trees, of which one is a mature indigenous Jarrah (*Eucalyptus marginata*), and a few small exotic Cape Lilac (*Melia azedarach*) trees. The sump is very dry and covered in exotic grasses.

Sump 13 **6 Westmoreland Street**

There is no existing vegetation inside the fence on this site. Outside the fence there are a number of exotic and native trees and shrubs, including one indigenous Sheoak (Alloc*asurina fraseriana*). There is an exotic creeper on the fence. The sump is dry and the site is covered with exotic grasses.

Sump 14 **51 Cornwall Street**

The existing vegetation consists on two mature trees and five juvenile exotic trees. One mature tree is exotic and the other is an indigenous Jarrah (*Eucalyptus marginata*). The site is moist and covered with green exotic grasses. Outside the fence there are a few small shrubs and one exotic tree.

Sump 15 **162 Orrong Road**

The vegetation consists of five Eucalypt trees and four exotic shrubs. Of the Eucalypt trees there is one indigenous Jarrah (*Eucalyptus marginata*), three indigenous Marri (*Corymbia calophylla*) and one non-indigenous tree. Outside the fence there are another four Eucalypt trees – with three being Jarrah and the other a non-indigenous species. The sump is dry and the site is covered with exotic grasses.

Sump 16 **27 Staines Street**

The vegetation consists of two indigenous Jarrah (*Eucalyptus marginata*) trees and one exotic tree. Outside the fence there are a number of mature exotic trees that hide most of the fence. The sump is dry and the site is covered in exotic grasses.

Sump 17 **16 Stiles Street**

The only existing vegetation on this site is a mature indigenous Zamia Palm (*Macrozamia riedlei*). The sump is dry and the site is covered in exotic grasses.

8.0 Greenspace

8.1 Overview

The category of Greenspace provides an opportunity to examine opportunities for increasing the number of sites where indigenous vegetation is present and the extent of links between these sites through an integrated design and management approach. Features of the landscape that facilitate linkages include adjacent parks, roads, waterways, and railways. In Perth's Strategic Greenways Plan both the Swan River foreshore and the railway reserve were identified as potential greenways in the Town of Victoria Park (Tingay,1997). The City of South Perth intends to utilise such a feature in creating a wildlife corridor along Kent Street, from Etwell Street to Hayman Road (Simone, 2003).

The importance of managing remnant vegetation across all landuse types becomes apparent when the present distribution of indigenous vegetation is compared to the total extent of greenspace.

8.2 Present Distribution of Indigenous Flora

8.2.1 Distribution by Management Sectors

The present distribution of indigenous vegetation is neither distributed equally across the municipality nor between the different classes of land use. The clustered distribution of sites is shown in Figure 16.

Figure 16. Distribution of All Indigenous Vegetation, in Different Management Sectors

There is a concentration of sites in Carlisle and Lathlain, and paucity in Victoria Park. This concentration in Carlisle and Lathlain is largely due to the number of vegetated sumps in the area, as shown in Table 8.

Table 8. Sites Containing Indigenous Vegetation By Management Sector

Management Sector	Bushland	Parks	Roads	Sumps	Total
Carlisle		2	3	8	13
Lathlain		2	4	7	13
Victoria Park		4	1		5
East Victoria Park	4	1	1	2	8
Total	4	9	9	17	39

8.2.2 Distribution by Land Use Category

The diversity of indigenous trees contained in each land use category varies significantly, as shown in Table 9

Table 9. Occurrence of Dominant Indigenous Trees by Land Use

	Bushland	Parks	Roads	Sumps	All Sites
Number of species	7	13	5	3	15

Whilst Table 9 gives some indication of the relative importance of each land use category it should be kept in mind that whilst parks support most of the indigenous trees, bushland supports the greatest number of plants and whilst sumps support relatively few species of trees they contain them at a relatively high number of sites. A more detailed analysis of the significance of land use can be based on the information given in Table 10.

Table 10. Occurrence of Dominant Indigenous Trees by Land Use

Species	Bushland		Parks		Roads		Sumps		Total		Total
	S	M	S	M	S	M	S	M	S	M	
Marri			1		2		1	2	4	2	6
Tuart			1	1		1			1	2	3
Jarrah		3	1	3	1	1	4	6	6	13	19
Flooded Gum			1	1					1	1	2
Pricklybark	1	1			1				2	1	3
Swamp Sheoak				1							1
Sheoak		1		2	1		5	1	6	4	10
Firewood Banksia		4	1	2					1	6	7
Candle Banksia		2		3						5	5
Holly-leaf Banksia	2	1							2	1	3
Christmas Tree		2	2	1	1				3	3	6
Saltwater Paperbark				1							1
Freshwater Paperbark				1							1
Mohan				1							1
Stout Paperbark				1							1
Total S M	3	14	7	17	6	2	10	9	26	42	69
Total	17		25		8		19		69		

'S' indicates single tree 'M' indicates multiple trees at site

A number of species were only located at Taylor Reserve/McCallum Park due to the fact that these species typify the Vasse Vegetation Complex, which only occurs within Victoria Park along the Swan River. These species are Saltwater Paperbark, Freshwater Paperbark, Mohan, Stout Paperbark, Swamp Sheoak and Flooded Gum.

Tuart was only observed at three sites within the Municipality, one of which only had one tree. This low number of sites reduces the opportunities to manage any risks that could lead to the loss of the species from the area, and is significant given the dwindling numbers of populations on the Swan Coastal Plain. The extent of the communities dominated by Tuart (*Eucalyptus gomphocephala*) has been reduced by approximately 65% since European settlement (Hopkins *et al*., 2001). Furthermore, since the mid-1990s there has been a noticeable decline in the health of Tuart populations south of Mandurah. Concerns over the long-term viability of the remaining Tuart communities has been sufficient to lead to the development of a Tuart Conservation Strategy and Implementation Plan. (Tuart Response Group, 2002)

The distribution of several indigenous plants that are not trees should also be noted. Zamia Palms, only occur at two sites: Kensington Bushland and Sump 17 (16 Stiles Street). Common Smokebush occurs at Alday Reserve as well as the Kensington and Hillview Bushland sites.

8.3 Policy Framework

The framework of local government policy and procedure is sufficient to manage the trees on the property managed by the Town of Victoria Park.

The Council Policies relevant to managing the remnant vegetation are:

- The Street Tree Master Plan that has designated that Hayman Road, Kent Street and Goodwood Parade contain predominately 'Native Trees – Informal Stands' and Marri is the designated tree in other areas;
- Policy Procedure PKS2 – Remnant Native Vegetation;
- Policy Procedure PKS3 – Street Trees – Planting;
- Policy Procedure PKS4 – Street Trees - Pruning;
- Policy Procedure PKS5 – Street Trees – Removal; and
- The Significant Tree Registry.

There was also a motion carried 8 - 0 in 1998 stating 'that Council support the planting of the most suitable tree species for a particular site, the priority being given to local and native species where appropriate' (resolved OCM 585/98).

There is presently no policy stating a desire to maximise the number of sites at which indigenous flora occurs, or statements formalising the management of vegetation in sumps.

8.4 Opportunities for Increasing Indigenous Flora

The opportunities to increase the extent of indigenous flora within the municipality become apparent when the present distribution of indigenous flora is compared to the extent of greenspaces. Both these distributions are shown in Figure 17 below (and shown in greater detail in Figure 21 in Appendix Six).

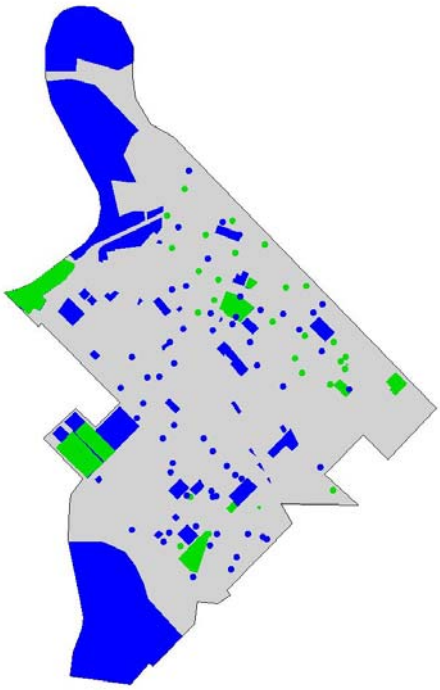


Figure 17. Greenspaces with (green) and without (blue) Remnant Vegetation

A number of the sites, such as Belmont Racecourse and Curtin University, form a significant portion of the greenspace within the Municipality. Whilst the Town of Victoria Park should consider these sites in developing greenspace linkages they can not directly influence their management. The extent to which Council-managed land contains indigenous flora is shown in Table 11.

Table 11. Number of Sites in Various Classes Containing Indigenous Flora

Class	Sites Containing Indigenous Vegetation*	Total Sites*
Bushland	2	2
Parkland	9	32
Sumps	17	75
Total	28	109

* based on contiguous areas

The above table is based on contiguous units (i.e. adjacent sites are counted as one) to avoid such issues as the arbitrary boundaries between adjacent ovals within parks. It does not include roadside trees as it is more appropriate to examine them in terms of road length rather than number. There are a total of 9 sites with indigenous trees on approximately 20 km of streets and roads within the Town of Victoria Park. The opportunities within each land use category are examined below.

Bushland

The area of bushland within the municipality cannot be feasibly increased. The opportunities with respect to bushland is enhancing the present bushland, approximately 22% of the bushland is poor-very poor.

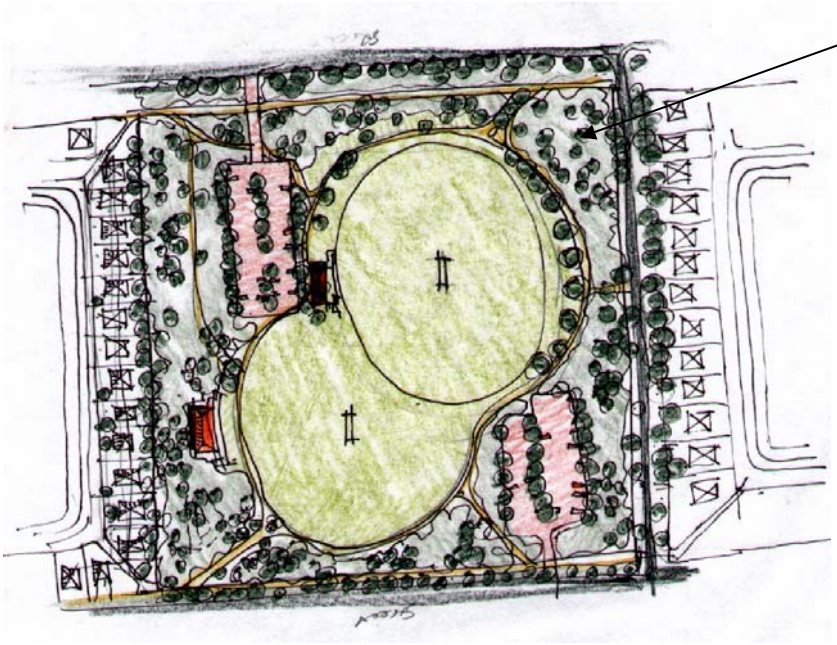
There are also opportunities to enhance the functioning of bushland through the sympathetic management of adjacent land and street verges (by minimising weeds and maximising indigenous plants).

Parkland

Parkland already supports a significant portion of the indigenous trees in Victoria Park and it provides the greatest opportunity for increasing the number of the widest range of trees as:

- The extent of bushland is limited;
- The criteria for suitable park trees is less stringent than those for street trees; and
- There is limited space at individual sumps.

Parks can be used to manage the risk of losing many species from the area, particularly a number of shrubs that have horticultural value such as Common Smokebush, Tree Smokebush and Perth Hop-Bush. There is the potential to develop a parkland design that incorporates reconstructed bushland, particularly on the perimeters of the parkland as shown in Figures 18 and 19.



- Identify locations for planting outside areas used for active or passive recreation open space.
- Establish paths and access through bush and pockets of lawn.

Figure 18. Plan View of Parkland Revegetation

Figure 19. Cross Section of Parkland Revegetation

The number of parklands and ovals in the Town provides opportunities for the establishment of reconstructed remnant areas within the Town. Establishing or extending areas of indigenous vegetation within parklands will increase the preferred habitat of local fauna, such as the native Long-necked Turtles in G.O Edwards Park. To ensure the survival of such species the creation of corridors between reserves, and the management of predators (e.g. cats), and adjacent lawns (e.g. fertilizer and chemical use, and the timing and extent of mowing) also needs to be examined. Other species such as native birds are also affected by introduced species (such as ducks and geese) in terms of competition for food and shelter, and management practices should take this into account.

The Swan River foreshore offers good opportunities for the re-establishment of indigenous vegetation communities particularly those belonging to the Swan Complex that is no longer represented in the Town of Victoria Park.

Roads

Whilst these are long-lived species, with only nine roadside sites containing indigenous trees, (of which six consist of single trees), the long-term preservation of these species on this land-use type needs to focus on increasing the total number of individuals. Not all of the indigenous trees will be suitable as street trees. Unsuitable trees include Flooded Gums which grow adjacent to wetlands and Christmas Trees that can damage unducted underground utilities with their haustoria (which they use to parasitise other plants).

The Town of Victoria Park has a Street Tree Master Plan specifying which trees are suitable on which streets and this should be reviewed to examine opportunities to increase indigenous roadside trees. Marri is the only indigenous tree specified in this plan, and it does incur some maintenance costs associated with removing the 'honky nuts' that fall from it. Given the restriction in selecting street trees these opportunities may exist in areas where there is limited pedestrian traffic (such as along the rail corridor and in industrial areas) or overhead powerlines.

The Street Tree Master Plan also identifies areas for native trees, but indigenous trees have not been stated as a preference within these areas.

Sumps

Sumps provide opportunities for increasing the distribution of indigenous trees due to the fact only 17 of the 75 sumps have any native vegetation. The potential varies between management sectors as is evident in Table 12.

Table 12. Values of Sumps in each Management Area.

	Carlisle	Victoria Park	East Victoria Park	Lathlain	**Total**
Aesthetic & Conservation	5	0	1	1	7
Conservation Only	3	0	1	6	10
Aesthetic Only	3	1	1	2	7
Other	8	6	24	13	51
Total	19	7	27	22	**75**

Lathlain has the highest number of sumps with indigenous vegetation. Carlisle has the highest number of sumps with indigenous flora and aesthetic value, as well the highest number of sumps with aesthetic value but no indigenous flora. East Victoria Park has the greatest number of sumps with no vegetation. This pattern is very obvious in Figure 20.

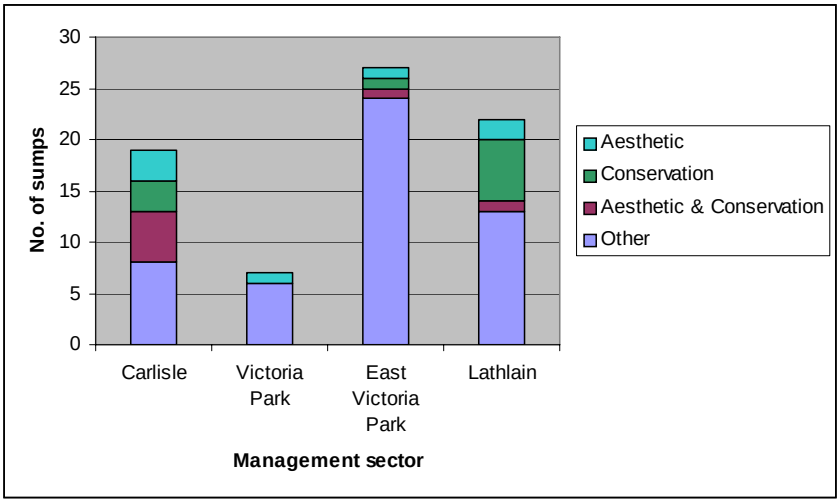


Figure 20. The Values of Sumps in each Management Area

The sumps also provide an opportunity to expand the distribution of some of the wetland associated species only located in McCallum Park/Taylor Reserve such as Flooded Gums and Paperbarks that are suited to wetter sites.

Interestingly, there were more opportunistic observations of birds at sumps with indigenous trees than those without. Birds were present at 21 of the 75 (28%) sumps assessed. Of the 17 sumps with indigenous vegetation, birds were present at 9 (52%) compared to the 12 of the 58 (21%) sumps without indigenous vegetation.

Many of the sumps have the potential for further habitat enhancement through the reconstruction of indigenous species and habitats. For example there is the potential to establish frog habitats through revegetating with appropriate species and the introduction of refuges such as old logs etc. Frog species may have to be introduced initially but should survive in the long term provided there is sufficient habitat structure for them to breed and escape from predators.

8.5 Recommendations

Recommendations for management of vegetation present on each land use category are provided in the previous sections of this plan. To maximise the number of sites where indigenous vegetation is present and the extent of links between these sites through an integrated management approach the following additional recommendations are made.

High Priorities
57. Develop a list of indigenous flora suitable for each land use type.
Medium Priorities
58. Develop a Green Plan for the Town of Victoria Park which examines opportunities for extending the area of native vegetation and linkages between greenspaces both within and outside of the municipality.
59. Develop additional policies stating a desire to increase the number of sites at which indigenous vegetation occurs.
Low Priorities
60. Liaise with government and private landowners to examine ways in which their land can incorporate native vegetation.

9.0 Funding

Remnant Vegetation Management Plan

9.1 Funding Requirements

9.1.1 Introduction

Much of the current management of indigenous flora is focussed upon revegetation, weed and disease control, fencing, signage and mulching of bushland sites. An increase in funding levels will be necessary to continue the restoration and management of the bushland areas and expand the program for protecting and enhancing the indigenous flora throughout the municipality.

There are 60 recommendations in this report, some of which do not require specific funding as they refer to the formalisation, review or continuation of current practices. Recommendations requiring specific one-off funding are costed under capital funding and all other recommendations are listed in the recurrent funding sections below.

9.1.2 Capital Works Funding

Estimates of the costs for implementing the works recommended in this plan are given in Table 13. These costs are only approximate as they can vary considerably, depending on how much work is completed by Council Staff and the details of design and materials. The cost of upgrading signage will depend on decisions such as whether aluminium or plastic backing is used, whether single or multiple colours are used, whether the signs are single or double-sided, and the complexity of the sign layout (which will determine the graphic design costs).

Table 13. Approximate Capital Works Costs for Bushland Management

Recommendations	Capital Expense
BUSHLAND	
Develop disease protocols	$500
Kensington	
Upgrade signage at the three main entrances	$10 000
Prepare a landscape plan for the entrances	$2 000
Remove soil dumps	$500
Install trickle irrigation at Etwell Street Entrance	$500
Install vehicle access measures at Baron-Hay Court Entrance	$100 - $900
Remove gates along Baron-Hay Court	$300
Remove disused pump near George Reserve	#
Install a screen along fencelines	Costed for adj. sites
Establish garden between Harold Rossiter Park & Kensington	$600
Quarry	
Cordon-off the *Dodonaea hackettiana* population	$100
Install a screen along fence	$100 - $500
PCYC	
Install a screen along fence	$50 - $200
Hillview	
Upgrade the main diagonal track by pruning along its sides	$50
PARKS	
Develop landscape designs for parklands incorporating bushland	$2 000 per park
ROADSIDE TREES	
Revise the Treeplan	*
Register indigenous Roadside Trees	*
SUMPS	
Formalise management of trees in sumps	*
Review sump requirements for the Town	*
GREENSPACES	
Develop a Green Plan for the Town of Victoria Park	*
Develop a list of indigenous flora suitable for each land use type	$500
Develop additional policies	*
TOTAL (using maximum costs)	$18 650

*** not costed as work to be undertaken as part of broader municipal functions**

 # requires negotiation with custodian

9.1.3 Recurrent Bushland Funding

At present the Town of Victoria Park sets aside approximately $30 000 per annum for recurrent bushland works, which is undertaken by volunteers, council staff and contractors (Young pers. comm., 2003).

The extent of rehabilitation required will depend on the areas of bushland condition. The estimated costs have been based on the areas of bushland condition shown in Table 14 and the typical costs for bushland management in Perth are shown in Table 15. Costs for cleared sites were not calculated as there are no specific proposals and the costs can vary significantly depending on the extent of earthworks proposed for sites such as the Quarry.

Table 14. Bushland Condition (area in ha) at Sites within the Town of Victoria Park

Condition	Kensington	Quarry	PCYC	Hillview	Total
Very Good - Excellent	7.4	0	0	1.0	8.4
Fair - Good	2.2	0	0	0.7	2.9
Poor	0.3	0.8	0	0.1	1.2
Very Poor	0.7	0.9	0.4	0.2	2.2
Cleared	0	5.0	2.7	0	7.7
Total	10.6	6.7	3.1	2.0	22.4

Table 15. Cost of professional rehabilitation per square metre

Condition	Very Good to Excellent	Fair to Good	Poor	Very Poor
Establishment			$5.00	$6.00
After 1st Year	$0.10	$0.50	$2.00	$3.00
After 2nd Year	$0.10	$0.10	$1.00	$1.20
After 3rd Year	$0.10	$0.10	$0.50	$0.50
Years thereafter	$0.10	$0.10	$0.10	$0.10

These estimates are based on the full commercial costs of maintaining or restoring bushland to very good condition. A significant proportion of the establishment costs are dedicated to seedlings. It is assumed that seedlings will be bought at a cost of approximately $1.75 each and that 2-3 seedlings will be planted per square metre in poor to very poor sites.

These estimates reflect the cost of maintaining or restoring bushland to very good condition. The cost of restoration is higher than maintenance because costs such as seedlings do not have to be borne. It should be noted that even though the cost of maintaining very good bushland is approximately $0.10/m^2, the maintenance costs will be greater in poorer quality bushland as the weeds are in higher abundance and increase their extent more rapidly. This should be taken into account when considering if the overall goal of a site should be maintenance rather than restoration.

Costs could be reduced significantly with the use of staff and volunteer labour, particularly in maintenance of higher quality bushland where a greater proportion of costs are labour.

The total costs, based on the above data, are shown in Table 16.

Table 16. Total Cost of Professional Rehabilitation per Category

Condition	V. Good to Excellent 8.4 ha	Fair to Good 2.9 ha	Poor 1.2 ha	Very Poor 2.2 ha	Total 14.7 ha
Establishment	$0	$0	$60 000	$132 000	$192 000
After 1st Year	$8 400	$14 500	$24 000	$66 000	$112 900
After 2nd Year	$8 400	$2 900	$12 000	$26 400	$49 700
After 3rd Year	$8 400	$2 900	$6 000	$11 000	$28 300
Years thereafter	$8 400	$2 900	$1 200	$2 200	$14 700
Total of above	$33 600	$23 200	$103 200	$237 600	$397 600

The above cost estimate is based on targeting all areas within a five-year timeframe. The costs could be spread over a greater number of years, for example by staggering the years of establishment within or between reserves.

The typical costs also do not factor in optimising opportunities (such as increasing weed mapping and weed control after fires).

Whilst not individually costed, the recommendations below should be undertaken as part of ongoing works.

Table 17. Recommendations for On-going Works

Category	Recommendations
BUSHLAND	Complete a comprehensive species list for all sites in each season Maintain records Monitor bushland condition Plant only those species naturally occurring Maintain records of fires Liaise with school and community groups Integrate operations with community groups Manage adjacent land in a complementary manner Control access Prune along tracks
Kensington	Reassess dieback presence Rehabilitate firebreaks Control weeds Prioritise weed control Provide local fire brigades with maps Control weeds at adjacent sites Install internal fencing where required
Quarry	Create a buffer for the Kensington Bushland
PCYC	Control weeds Consider the presence of Pricklybark and +30 indigenous species Create a buffer for the Kensington Bushland
Hillview	Control weeds Remove all non-indigenous plants Plant seedlings in the bare areas
PARKS	Avoid using phosphorous fertilisers around the base of Banksias Increase the number of parks where each indigenous species occurs
ROADSIDE TREES	Manage roadside trees in accordance with standard practices
SUMPS	Replace introduced species with indigenous flora where practicable Develop sumps as habitat for birds and amphibians
GREENSPACES	Liaise with government and private landowners

9.2 Funding Sources

There are a number of external sources of funding in the form of grants and employment and training programmes, which are described below.

Funds can also be sought from the major stakeholders in the area including the local businesses, Water Corporation, Western Power, the Department of Planning and Infrastructure and the Department of Sport and Recreation.

Bushcare

Bushcare is a programme administered by Environment Australia and funded by the Natural Heritage Trust. It provides funding to projects that can demonstrate:

- A regional perspective;
- Activities are aimed at conservation of bushland;
- Projects are community-based;
- Have a 1-3 year time frame; and
- Detailed programmes have been developed for projects.

Further emphasis is placed on areas that contain significant ecological communities and/or species, which are afforded protection under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*. It is also necessary to demonstrate that the funding can achieve a demonstrable improvement in bushland condition.

Gordon Reid Foundation

The Lotteries Commission's Gordon Reid Foundation for Conservation provides funding to help community groups conserve natural habitats and biodiversity. There are two grant categories, Minor Grants for up to $5000 and Major Grants for grants over $5000, which are available to incorporated organisations. Only local government authorities and non-profit community groups can apply for this type of funding. Projects that have previously received funding support from the Foundation include revegetation, direct seeding, fencing remnant vegetation, and controlling weeds, feral animals, disease and fire.

Greening WA

Greening WA Inc works with the community to protect and restore native vegetation at a greater rate than the rate of decline. Greening WA is particularly concerned with restoring degraded farmland, neglected wetlands and natural bushland. Greening WA is a member of the national Greening Australia federation. It is resourced through the Federal Government's Bushcare program, the Western Australian government, corporate sponsors and members. Greening WA is involved with administering a number of programs for revegetation and protection of remnant vegetation, such as the National Corridors of Green Program. Greening Australia also provides plants, seeds and materials to school groups in the metropolitan area called 'Grow us a Home'.

Community Environment Art and Design Funding

Community Environment Art and Design (CEAD) was established as a funding programme by the Australia Council for the Arts to stimulate and support innovative approaches to designing the built and natural environment. This program has recognised the fundamental link between the quality of the environment and the cultural life of communities, and encourages direct community involvement in planning for the future. The design, construction and placement of interpretive signage throughout the bushland areas could qualify as a CEAD project and receive funding, provided that local artists and/or community members are involved.

Corporate Sponsorship

There are a number of bushland management activities currently funded (either jointly or wholly) by corporate parties, such as Alinta Gas, Western Power, Alcoa, Woodside, insurance companies and banks. This avenue for funds for implementing works should be explored more fully.

10.0 References

Remnant Vegetation Management Plan

Beard, JS (1981) *Vegetation Survey of Western Australia 1:250 000. Explanatory notes to Sheet 7 – The vegetation of the Swan area.* University of Western Australia Press, Nedlands, Western Australia.

Bodkin, F (1986) *Encyclopedia Botanica. The essential reference guide to native and exotic plants in Australia*. Cornstalk Publishing, Sydney, Australia.

Brown, K and Brooks, K (2002) *Bushland Weeds – A practical guide to their management.* Environmental Weeds Action Network (Inc), Greenwood, Western Australia.

Bush, B, Maryan, B, Browne-Cooper, R and Robinson, D (1995) *Guide to the reptiles and frogs of the Perth region.* University of Western Australia Press, Nedlands, Western Australia.

Cranfield, RJ and Parker, CM (1992) Flowering Calendar for Reserve No. 3694 in Metropolitan Perth. *Western Australian Naturalist*. 19: 48-60.

Cranfield, RJ (2003) April 2003, personnel communication. Senior Technical Officer, the Department of Conservation and Land Management, Science Department, Manjimup, Western Australia - formerly from WA Herbarium.

Friends of Kensington Bushland. (2003) March 20, Special meeting of the Environmental Liaison Advisory Group. Town Of Victoria Park.

Gozzard, JR (1986) *Perth, Sheet 2034 II and Part 2034 III and 2134 III*. Perth Metropolitan Region Environmental Geology Series, Geological Survey of Western Australia.

Griffin EA and Associates (undated) *Hillview Community Bushland Management Plan (draft).*

Heddle, E.M., Loneragan, O.W. and Havel, J.J. (1980) Vegetation Complexes of the Darling System Western Australia. *In Atlas of Natural Resources Darling System Western Australia Explanatory Text.* Department of Conservation and Environment, Western Australia, Perth.

Hopkins, AJM, Bleeston, GR, Harvey, JM, Lemin, H and Shepher, DP (2001) *A Database on the Vegetation of Western Australia.* Technical Report No. 251. The Department of Agriculture Western Australia, Perth.

How, R and Dell, J (1993) Vertebrate fauna of the Perth metropolitan region: consequences of a modified environment. In *Urban Bush Management: Proceedings of a Seminar held at Gosnells, WA on 23rd June, 1992*. Australian Institute of Urban Studies; Greening Western Australia; Department of Conservation and Land Management; and The Tree Society. AIUS (WA).

Kaesehagen, DB (1995) Bushland condition mapping. In Burke, G. (ed) *Invasive Weeds and Regenerating Ecosystems in Western Australia Conference Proceedings*. Murdoch University, Perth, pp. 33-39.

Morrison, J (1994) Hillview Project – Final Report (unpublished).

MP Rogers & Associates Pty Ltd (1999) Mandurah Ocean Shoreline Management Study.

Paczkowska G and Chapman AR (2000) *The Western Australian Flora – a descriptive catalogue.* Wildflower Society of WA, WA Herbarium, CALM and Botanic Gardens and Parks, Perth, Western Australia.

Perth City Council (1993) *Kensington Bushland Management Plan.* The Department of Parks, Gardens and Landscape

Powell, R (1990) *Leaf and Branch. Trees and tall shrubs of Perth.* Department of Conservation and Land Management, Western Australia.

Seddon, G (1972) *Sense of Place.* University of Western Australia Press, Nedlands, Western Australia.

Sharman, EJ (1999) Kensington Bushland Reserve Management Plan (draft). Prepared for the Town of Victoria Park.

Simone, N (2003) April, 2003, personnel communication. Acting Environmental Officer, City of South Perth.

Swan River Trust (1997) *Swan River System Landscape Description*. Report No. 28

Thomson, A (2003) April 2003, personnel communication. Deputy Representative Friends Of Hillview Community Bushland.

Tingay & Associates (1997) *A strategic plan for Perth's Greenways. Volume 1*.

Tuart Response Group (2002) *Status Report. Tuart Conservation and Protection.*

Turpin, MC (1990) Ecological appraisal of an isolated *Banksia* Woodland, Reserve No. 3694, south of the Swan River, Perth. *Western Australian Naturalist.* 18: 131-138.

Waters, A (2003) March/April 2003, personnel communication. Environmental Scientist, Ecoscape (Australia) Pty Ltd.

Western Australian Planning Commission (2000) *Bush Forever. Volume 1 – Policies, Principles and Processes.* Western Australian Planning Commission, Perth, Western Australia.

Young, E (2003) May 2003, personnel communication. Town of Victoria Park.