City of South Perth
GREEN PLAN

FINAL REPORT
2002

City of South Perth

Green Plan

Accompanying database available at:
http://www.southperth.wa.gov.au

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City of South Perth *GreenPlan*

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OVERVIEW OF THE SOUTH PERTH GREEN PLAN

The City of South Perth is noted for its gracious street trees, extensive parks and gardens and its leafy environment, all of which complement the urban village atmosphere cherished by its residents.

On three sides of the City, the foreshores of the Swan-Canning Estuary sustain important naturally occurring native vegetation and wildlife, but by virtue of its developed state and inner city location, only seven hectares of inland bushland remains in reserves managed by local government. However, larger areas of remnant bushland occur on private land, mostly in Aquinas College, Manning and Koonawarra Primary Schools.

The small area of remnant bush means that there are considerable threats and constraints to the survival of what remains. At the same time, the large area of public open space presents many opportunities to restore native vegetation and create links between ecologically significant areas.

The natural environment in the City of South Perth has four main components:

- Remnant Native Vegetation;
- Public Parks and Gardens;
- Street Trees;
- Private parks and gardens.

Currently these are managed separately. The South Perth *Green Plan* was initiated to devise a strategy for the City to integrate the management of these components.

The *Green Plan* seeks to conserve existing bushland and rehabilitate native plants within the context of an inner urban society setting. It aims to provide internal linkages for wildlife and enhance biodiversity, within the regional perspective of the State Government's *Bush Forever* and the *Perth Greenways Plan.*

Greenways

In the South Perth *Green Plan,* the concept of *Greenways,* adapted to suit local conditions, is introduced as the key unifying element; and the framework for design, policy and management. The Greenways are assemblages of remnant bushland, public gardens and parks, street trees and private gardens, defined in terms of nodes and linkages.

Boulevards of street trees form the spines and linkages of the Greenways. The Boulevards were identified and classified on the basis of their species content and contribution to both the streetscape and to biodiversity.

Twenty four Greenways are recognised across the City and 1,495 Boulevards are classified, although not all of them are within the Greenways.

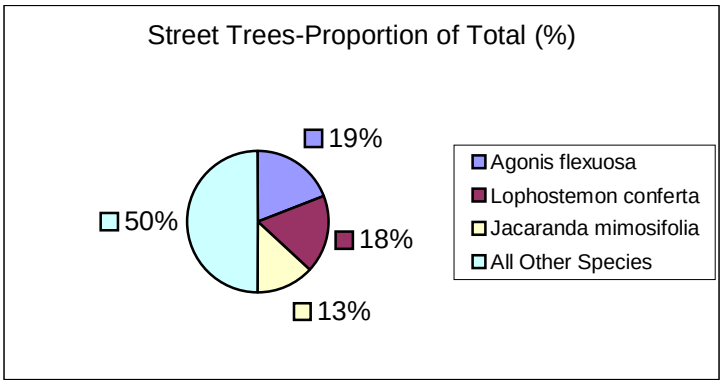
Street Trees Within the Greenways Context

The system of Greenway nodes and linkages places considerable importance on the composition of the street tree system. Within the urban environment street trees can play many important roles. They provide aesthetic value, act as a buffer to street noise, provide shade and shelter, provide habitat for mammals, birds and insects and they can act as linkages, or vegetation corridors, between larger habitat nodes. These include parks, reserves, other open ground and remnants of natural vegetation such as the bushland at Manning and Koonawarra Primary Schools and the estuary foreshores.

The City of South Perth has over 14,000 street trees in 312 streets**.** The City's detailed descriptive database of this extensive street tree system has been used by this study to develop the Greenways. The aim of the *Green Plan* was to ascertain the distribution of the existing street trees from the data base to identify any gaps that may exist. Where gaps exist along potential linking corridors the *Green Plan* recommends that native trees be planted to enhance potential for habitat for native fauna and to increase the amount of native vegetation throughout the City.

The composition of the system of street trees in the City reflects historical trends in species selection. This has resulted in a system that is dominated by a few species which are mostly exotic to the city.

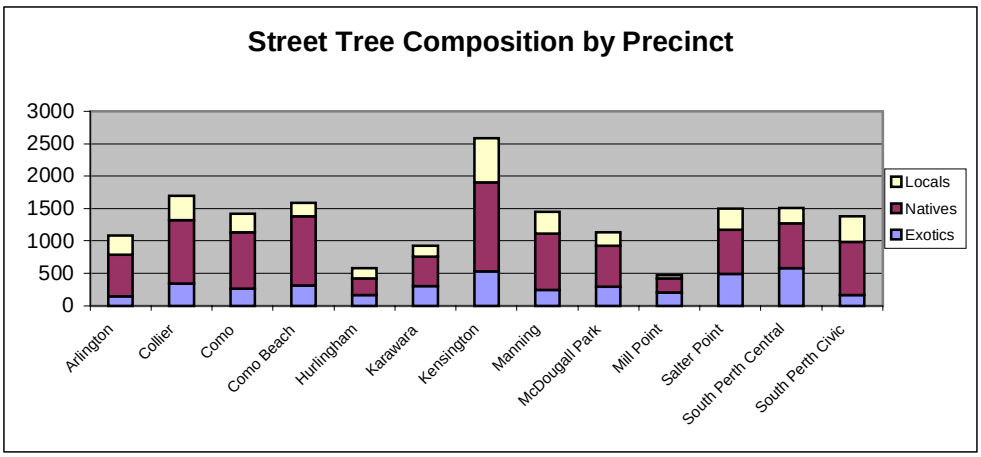
The street trees of South Perth are dominated by three species which make up 50% of the total number. One species is exotic to Australia (*Jacaranda mimosifolia*), one is exotic to Western Australia (*Lophostemon conferta*) while *Agonis flexuosa* is a local South Perth native.



Local native species contribute approximately 26% of the total number of street trees in South Perth but over 90% of these are *Agonis flexuosa*.

Street Trees and Boulevards

The street tree study has distinguished between boulevards of native and exotic species. This was a useful step in building a picture of linkages between remnants and describing the composition of street trees on a precinct basis.



Boulevards were classified by local species composition. The analysis shows there are few large Boulevards with high native species diversity within the City; and that the precincts of South Perth Central and Waterford have significantly higher exotic species content than other precincts. Further street tree plantings should aim to increase the representation of other local species.

Many Boulevards are essentially composed of one species. While many of these may have aesthetic appeal, such boulevards may have few native fauna resources. Where possible, after considering any cultural values, the species content should be modified over time to increase the representation and diversity of local native species. This can be done by natural attrition as well as active replacement of trees and expansion of the system. Significantly, there are approximately 720 specimens of *Melia azedarach*, nearly 5% of total trees. This species is a known environmental weed and is a source for invasion of local native vegetation. These specimens should be removed and replaced with local native species.

The role of the street tree network can be enhanced by strategic planting of understorey or partner-plants in tree/shrub combinations where possible. It is not suggested that median strips be used for this purpose as a more contiguous crown system is required. To consolidate the street tree system, public Greenspaces should be converted to native gardens or managed as native bushland. The *Green Plan* urges that a policy of information dissemination to improve public awareness and involvement be adopted, complemented by "plants to residents" scheme detailed in the report.

Remnant Vegetation

Within the City of South Perth the major areas of remnant vegetation occur along the Swan and Canning River foreshores with small isolated areas mainly located in the south of the City. Internally, most of the native vegetation remnants are in good condition with the exception of Davilak Reserve, which is in poor condition but is actively being rehabilitated by the City.

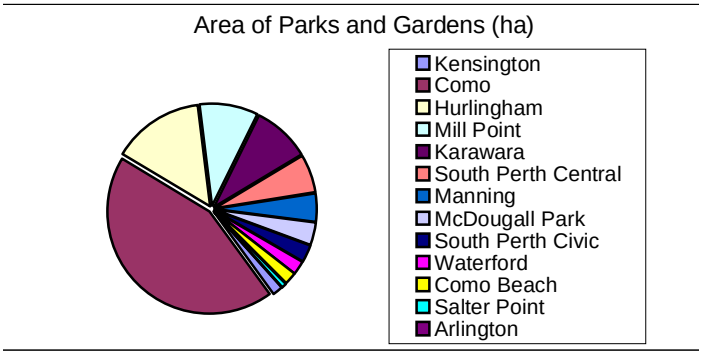
All internal remnants are being rehabilitated through planting of local species and eradication of weeds and exotics. These activities are being undertaken by various bodies besides the City, especially schools. All internal remnants have existing management plans and should continue to be managed under those guidelines.

The main observations on remnant vegetation are:

- Vegetation in the larger reserves is generally in better condition;
- Populations of some species are moving toward senescence. The causes include reproductive dysfunction and establishment failure; for example many of the banksias in Davilak Reserve, Manning Primary School, Mt Henry. As a consequence community structures are changing though replanting efforts at Davilak and other reserves are counterbalancing the trend to some extent;
- Rehabilitation efforts appear to be focused on filling gaps with trees and shrubs and this is an appropriate method. However there is scope for making use of remaining microhabitats to attempt re-introduction of a larger suite of species.

Parks and Open Spaces

The City manages a large number of public gardens and parks. The information presented in the *Green Plan* includes park descriptions, weed control and general recommendations.



Many of the parks consist of large swathes of turf with minimal peripheral planting of trees while others more closely resemble a garden in layout. The *Green Plan* recommends that where possible, native gardens be planted below existing park trees and that non-essential grassed areas be converted to native garden. This will enhance native flora distribution and diversity while achieving reduced water usage. There is considerable scope for novel garden design within the large range of parks and gardens present. Just as Davilak Reserve is held up as an example of urban bushland rehabilitation, parks and gardens could be selected as examples of urban native garden renewal or expansion. A number of opportunities have been identified in the *Green Plan* , including Collier Park Golf Course, Coolidge Reserve, McNabb Loop Reserve, and Sir James Mitchell Park. Other opportunities include the use of road reserves, drainage sumps and Water Corporation main drains, all of which represent large areas of land that can be used for tree planting.

Two significant occurrences of native vegetation were recorded within the City's parks. The Collier Park Golf Course retains small stands of native vegetation associated with permanent lakes. These stands are isolated from the fairways and present an opportunity for preservation, limited direct expansion and reinforcement through the planting of local natives throughout the golf course. McNabb Loop Reserve is a remnant plantation which has a weed infested native understorey which presents an opportunity for native vegetation rehabilitation. Other important observations from the field work include:

- Marsh Avenue is a unique park due to the presence of a number of mature trees of various species of Oak (*Quercus*). The nature of this park should be preserved by maintaining the predominance of the Oaks. Additional garden bed planting of native species in conjunction with added native trees will enhance native fauna resources;
- Coolidge Reserve forms the northern part of a contiguous chain of three Greenspaces which includes Davilak Reserve and Neil McDougall Park. The native vegetation in Coolidge Street Reserve should be expanded through additional garden beds and large trees. The benefits of rehabilitation efforts in Davilak Reserve, and native gardens in Coolidge Reserve and McDougall Park will be synergistic;
- David Street and Mount Henry-Roebuck provide good examples of native gardens in South Perth. Both require some weed and access works to increase faunal resources.

The foreshores of South Perth have been identified as having regional ecological significance (*Bush Forever*) and being important components of Perth Greenways. The *Green Plan* urges the retention of all foreshore remnants, building links between them and enhancing the greenways linking to the internal remnants and open spaces. This will require coordination with landowners and should involve as large a spectrum of the community as possible through conservation and neighbourhood groups, schools and expert advisers.

Plants-To-Residents Scheme

The *Green Plan* recommends that a plants-to-residents scheme should be developed and that street tree enhancement programmes should be expanded. Plants to residents schemes have been recognised as major avenues by which a local government can bring about an improvement in its physical and biological environment. Such schemes are in use by Western Australian councils, for example the City of Melville and Shire of Mundaring, and it is recommended that the City of South Perth take a similar approach.

The scheme should mesh with the Street Tree management and expansion program. It should aim to fulfil Greenways objectives by ensuring that species offered to residents are local native species, with an appropriate mixture of species. *Agonis flexuosa*, which is the main street tree, should not be offered. The species offered should be easily grown, be either trees or shrubs, and include a range of flowering times. This will ensure that the backyard flora of South Perth will provide richer food and habitat resources for native fauna across all seasons. The increase in cover and diversity of flora should focus on depauperate precincts and Greenways

To achieve this, the native seed orchard at Davilak Reserve should be maintained and expanded. Efforts should be made to expand the range of species used in rehabilitation works to include herbaceous species, for example ground orchids, Trigger Plants, Kangaroo Paws and their relatives. Such efforts may require close liaison by City staff with native plant horticulturalists such as Kings Park and Garden or Native Orchid Societies with tubers for sale.

Developers should be encouraged to remove plants in the path of destruction for relocation. Though such plants may not be local, the dearth of remnant vegetation beyond the southern foreshores probably discounts any negative effects.

The centrepiece of the *Plants To Residents Scheme* is an interactive web based enquiry and ordering system for residents to use, which has been provided as part of the *Green Plan* . It is a dynamic system based on associated *Green Plan* databases and GIS themes. The database is monitored by related webpages which can be accessed by City staff. The resident information compiled also provides a nucleus for use by community conservation groups.

Electronic Format of the Green Plan

The *Green Plan* is presented as an environmental management system for protecting, linking and enhancing the public and private green spaces, biological resources and amenities of the City. The *Green Plan* will be a tool for use by staff of the City and an information resource for the public. It is composed of:

- The summary report with selected maps, strategies and recommendations providing an overview of the *Green Plan*;
- A computer based inventory of existing resources, policies and management plans which is provided as a CD with an accompanying *Guide* at the back cover.
- The skeleton of a spatial decision support and management system for the outdoor assets, green spaces and vegetation resources of the City of South Perth, for use by Council Parks and Gardens staff. It will become part of the City's overall environmental management system developed to implement the *Environmental Strategy 1999-2002*.

Together, these provide a plan outlining a variety of strategies for revegetation on public land and for encouraging revegetation on private land, based on a twenty year planning horizon. The *Green Plan* sets out the next steps to link existing natural and semi-natural areas and provides an implementation program to guide revegetation by the City and the Community generally.

Recommendations and Implementation of the Green Plan

The *Green Plan* makes over 100 specific recommendations on topics including Research, Extension, and Greenways, including specific Greenways. Implementation strategies and timeframes are suggested for:

- Species Management;
- Water Sensitive Urban Design;
- Conservation and Rehabilitation;
- Street Tree Management Within the Greenways Context;
- Extension;
- Plants to Residents and Street Tree Enhancement.

The *Green Plan* suggests initial targets to be met within any future *State of the Environment Review* timeframes.

1 INTRODUCTION

1.1 Background

The City of South Perth's *Environmental Strategy 1999-2002* is concerned with implementing the City's Strategic Objectives relating to environment and heritage. It provides the context for this *Green Plan*, which is an environmental management system for protecting, linking and enhancing the public and private green spaces, biological resources and amenities of the City. The *Green Plan* will be a tool for use by staff of the City and an information resource for the public.

The *Green Plan* is composed of:

- This summary report with selected maps, strategies and recommendations providing an overview of the *Green Plan*;
- A computer based inventory of existing resources, policies and management plans which may be provided as a CD with an accompanying *Guide* at the back cover, and will be available through the City of South Perth website;
- The skeleton of a spatial decision support and management system for the outdoor assets, green spaces and vegetation resources of the City of South Perth, for use by Council Parks and Gardens staff. It will become part of the City's overall environmental management system developed to implement the *Environmental Strategy 1999-2002*.

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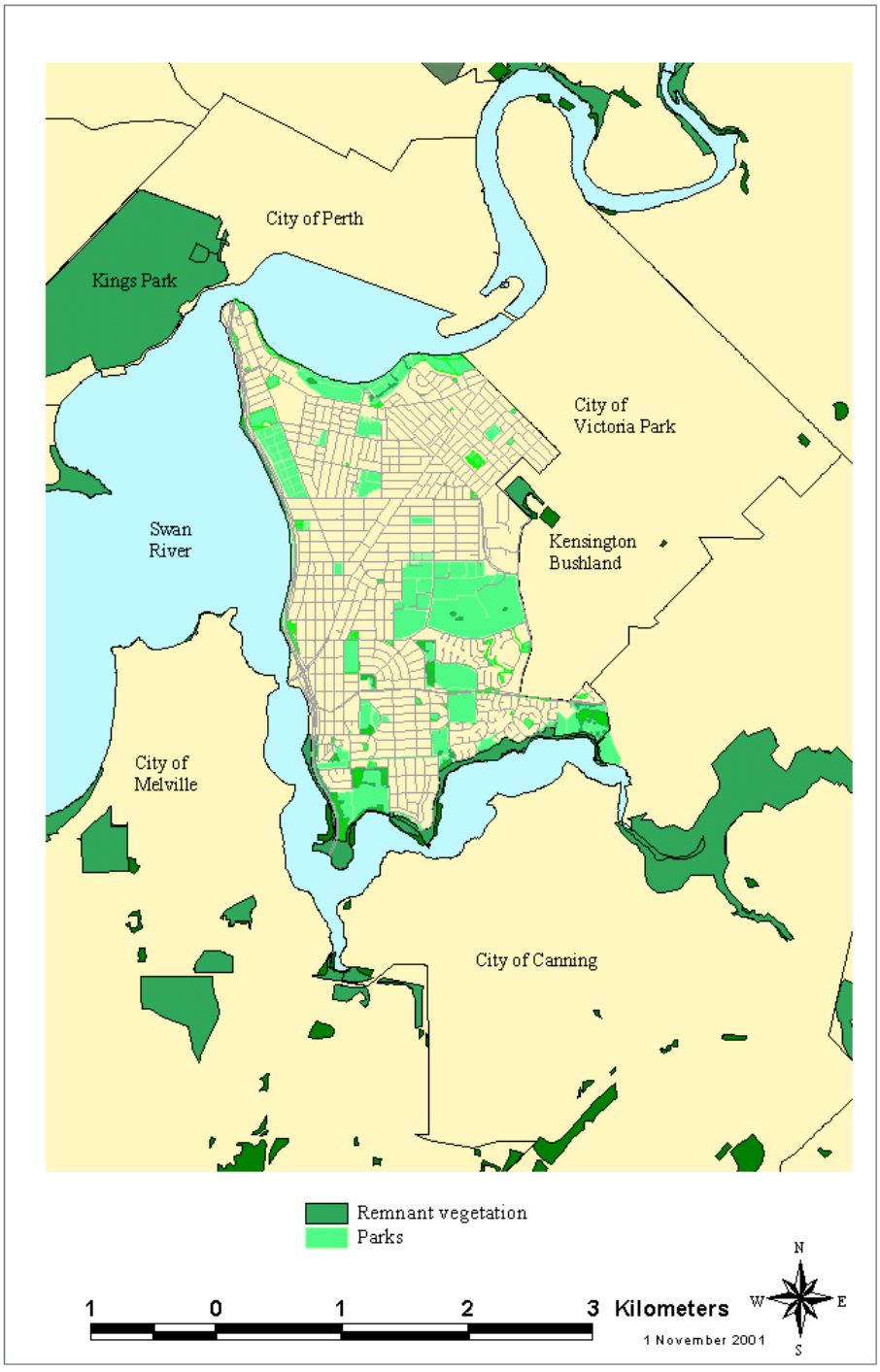
The City of South Perth is responsible for managing approximately 74 hectares of foreshore reserves fronting the Swan River Estuary on its north, west and southern boundaries. It has a large area of land dedicated to parks and open space, with approximately 50 reserves ranging in size from 0.1 hectares to over 30 hectares, and totalling approximately 218 hectares or 11% of the municipality's total area of 1990 hectares. This exceeds the normal planning standard for open space provision, but reflects the City's predominantly residential land use and population of 36,447.

Figure 1 shows the location of the City of South Perth, its administrative boundaries, main features and vegetation cover. The City has a dearth of naturally occurring native vegetation and wildlife, by virtue of its developed state and its inner city location. Apart from the estuary foreshores, only seven hectares of inland bushland is managed by local government, however larger areas of remnant bushland occur on private land, mostly schools (Aquinas College, Manning Primary School and Koonawarra Primary School).

The small area of remnant bush means that there are considerable threats and constraints to the survival of what remains. At the same time, the large area of public open space presents many opportunities to restore native vegetation and create links between ecologically significant areas. Other opportunities include the use of road reserves, drainage sumps and Water Corporation main drains all of which represent large areas of land that can be used for tree planting.

Figure 1 Location and Major Greenspaces



The *Green Plan* is one of a number of environmental initiatives undertaken by the City of South Perth within its Strategic Objectives and *Environmental Strategy 1999-2002*. It integrates the recently redrafted Street Tree Management Policy and will contribute to the precinct plans to be developed under that Policy. Together, these documents will guide future tree planting on the road reserves within the City of South Perth to provide a balance in species mix which will ensure that when conditions are appropriate, local native tree species are used and that the road reserves serve as links between ecologically significant areas.

The *Green Plan* provides guidelines for planting and restoration for other areas beyond road reserves and is integrated with existing foreshore and bushland management plans. Strategies for encouraging land owners to preserve existing bushland or replant native species are targeted at large and small landholders, ranging from private residents and schools, through to public institutions and businesses.

1.2 Objectives

The *City of South Perth Strategic Plan 2002-2005* provides a city wide Vision Statement intended to allow the city to develop whilst maintaining its cultural and environmental identity. It also provides an appropriate vision statement for the *Green Plan.*

Vision Statement

"An attractive riverside City reflecting the needs of the community and developed in harmony with its natural environment"

Action Plan 2.2.1 of the City of South Perth's *Environmental Strategy 1999-2002* is to "Develop a *Greening Plan* that identifies wildlife corridors and explores revegetation possibilities between areas of remnant vegetation, using road reserves, public parks, gardens and drainage sumps."

The Brief derived from the Action Plan prescribes that the overall objective for the *Green Plan* is to provide a structured and systematic approach to managing vegetation, and to provide strategies to maintain and improve biodiversity and amenity in the City of South Perth for the long term. Specific aims are to:

- Establish a baseline environmental data set and overall vegetation inventory for the City of South Perth, which will act as a tool for environmental planning and management, and will also provide important information on the conservation status of vegetation communities;
- Provide a graphical illustration, using the City of South Perth Geographical Information System, between the greening plan and existing services and land ownership and vesting issues;

And to develop strategies to:

- Ensure the long term conservation of remnant bushlands, foreshore areas, wildlife corridors and other significant habitat;
- Establish ecological links between significant habitat areas;
- Restore and rehabilitate vegetation communities and ensure the long term viability of existing flora;
- Maintain and increase the flora of the City, which is a predominant and attractive feature of the City of South Perth;
- Educate the local community on vegetation management issues and foster its involvement in maintaining remnant bushlands, whilst encouraging local residents to participate in the regeneration or enhancement of public or private land;
- Outline innovative schemes for complementing plantings on public land with planting on private land.

The *Green Plan* consists of a computer based inventory of existing vegetation, linking detailed map coverage and data bases of the attributes and locations of vegetation, with projections showing the restoration and enhancement of green spaces in the future, and strategies for achieving this. It is a mapped vision of the future vegetation cover for the City of South Perth.

The *Green Plan* will be a dynamic entity, capable of being continuously updated and reviewed at periodic intervals. This format means it will be readily accessible to the public and will provide a high degree of transparency and public accountability in accordance with best practice management under the ISO 14000 series of standards relating to Environment Management Systems.

1.3 Approach

This *Green Plan* has been developed under the guidance of a Community Environmental Advisory Group (CEAG). Staff of the City supervised the consultants, provided guidance and reviewed progress. Members of CEAG provided information, local knowledge, ideas and comment on material as it was produced.

The approach was to maximise the availability of data and information during production of the *Green Plan* by placing all material on the project website as soon as it became available. The website enabled communication of the results of the study to the steering committee and facilitation of feedback. It provided the opportunity for a free flow of ideas between the working group and CEAG.

The study involved desk top research, analysis of air photography and extensive field work to collect new data and ground truth observations and conclusions. The major tasks were:

- Review of the literature, management plans, Council's existing GIS mapping system and databases and other relevant data;

- Inventory of public and private green spaces including remnant native vegetation, Council parks and gardens, and street trees;
- Identification of potential linkages between green space areas and nomination of boulevards for specific action;
- Developing environmental strategies for vegetation management, revegetation, weed control, plantings on public and private lands and educational programs;
- Recommending an implementation program.

2 POLICY FRAMEWORK

The *Green Plan* is not an isolated, one-off initiative to beautify a city, but is part of a broad movement toward environmental sustainability supported at international, national, and state levels. Within the City of South Perth, the *Green Plan* is a key measure to implement the City's *Environmental Strategy 1999-2002* and Council's Strategic Objectives relating to environment and heritage.

Sustainable development as a concept has its origins within General Assembly Resolution 44/228 of 22 December 1989, which was adopted when the nations of the world called for the United Nations Conference on Environment and Development to adopt a balanced and integrated approach to environment and development questions. Local governments in Western Australia have participated in *Local Agenda 21* which addresses the pressing problems of today and also aims at preparing the world for the challenges of the next century.

On behalf of the Australian Government, *Environment Australia* defines the concept of Ecologically Sustainable Development (ESD) as:

> *Using, conserving and enhancing the community's resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be increased.*

To achieve this *Environment Australia* suggests Australians need to develop ways of using those environmental resources which form the basis of our economy in a way which maintains and, where possible, improves their range, variety and quality. At the same time we need to utilise those resources to develop industry and generate employment.

The Goal for ESD is development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends. As a cornerstone philosophy ESD provides the basis for much of the planning and decision making in relation to natural resource management in Western Australia.

The *Green Plan* has thus been prepared with reference to, and within the context of, many other policies at different levels, which mutually support the greening initiative. This framework is shown in the Table 1.

Table 1 Policy Context

Agency	Policy
Australian Government	• Inter Governmental Agreement on the Environment
	• National Strategy for Biological Diversity
	• Japan Australia Migratory Birds Agreement (JAMBA),
	• China Australia Migratory Birds Agreement (CAMBA)
State Government	• A Strategic Plan for Perth's Greenways
	• Bush Forever
	• Environment Protection (Swan Coastal Plain Lakes) Protection Policy 1992
	• Environment Protection (Swan and Canning Rivers) Protection Policy 1995
	• Swan Canning Cleanup Program - Action Plan
	• Swan Estuary Marine Park and Adjacent Nature Reserves Management Plan 1999-2009;
	• Metropolitan Region Scheme
	• State Planning Strategy
City of South Perth	City of South Perth Environmental Strategy 1999-2002
	Principal Activities Plan - Strategic Objectives
	Town Planning Scheme No 6
	Town Planning Scheme No. 5 Amendment No. 17.
	Street Tree Management Policy,
	Local Law No.2 of 2000 -relating to Activities on Thoroughfares and Trading in Thoroughfares and Public Places.
	Milyu Nature Reserve Rehabilitation Plan
	Municipal Heritage Inventory
	Parks, Reserves and Foreshore Management Plans
	Aboriginal Heritage Act 1972-1980 (Section 18)
	Planning Policies: • No. P19 "Trees on Development Sites and Adjoining Verges"; • P33 "General Design Guidelines for Residential Development". Environmental Policies: • No. E2 "Visual Pollution" • E3 "Ground Water Management"; • E5 "Energy Conservation" • E6 "Natural Wetlands"; • E7 "Recycled/Recyclable Products Purchasing Policy" • E8 "Tree Preservation". • Environmental Management Plans • "Street Tree Management Plan" 1994. • "Urban Bushland Survey" (1994); Other Policies • Community Relations Policy No. CR 2.6 "Junior Council Conservation and Environment Award". • Works Policy No. 4 "Provision of Facilities for Cyclists" Management Practices: • E1 "Control and Management of Pesticides"; • E2 "Use of Toxic Pesticides"; • H6 "Use of Dangerous Chemicals".

3 ENVIRONMENTAL AND SOCIAL FRAMEWORK

3.1 Climate and Weather

The Perth Region has a Mediterranean type climate with long hot summers and mild wet winters. Temperatures are highest in January and February with an average of 29.5^0C maximum and 17^0C minimum. Temperatures in January and February may reach 43^0C and on average 5 days in each month exceed 35^0C. In the winter the average maximum temperature is 18^0C with a 9^0C minimum.

The average annual rainfall is 877 mm with the majority of rain falling between May and August inclusive. In summer, easterly winds commonly occur in the morning, followed by a south-westerly afternoon sea breeze. Sea breezes (44% exceed 17 kts) occur on 60% of days per year. During winter, SW winds prevail with NW storm events occurring regularly, with calm periods between fronts. Dissipating tropical cyclones affect the area on average each seven years, mostly in late summer.

Greening techniques can significantly ameliorate climatic extremes and improve human comfort through the provision of shade, reduction of wind effects and at least perceptually, temperature reduction.

The "Greenhouse Effect" is likely to have a significant effect on foreshores of the Swan Estuary. In the next fifty years there is likely to be a significant climate change with a more frequent El Nino and a slight shift in sea levels. A changed weather regime with less frequent, but more intense storms is expected (Intergovernmental Panel on Climate Change, 2001). The main implications for foreshores in the estuary are the possibility of increased erosion, loss of vegetation and property damage from water incursion, due to a coincidence of floods, tides and wave action flood during storms.

Changing rainfall patterns in the short and long term will continue to affect native vegetation and gardens, groundwater and wetlands, bringing water use restrictions which will require modification of irrigation and nutrient management practices on public and private lands.

3.2 Landform, Soils and Vegetation

The main soil types of the Swan Coastal Plain within the City are grey Bassendean soils and yellow Karrakatta soils in the western part of the municipality. Vasse soils are found adjacent to the rivers. The Swan Coastal Plain has been extensively cleared of vegetation for agriculture and settlement. Clearing, forestry, drainage, development along rivers and foreshores and land use practices generally, have significantly altered the biophysical environs of the system over time. The remnant vegetation of the City is largely confined to State reserves, poorer Bassendean soil areas and wetland areas which have survived early drainage and urban development Figure 2.

Although the natural vegetation cover in the City has been greatly reduced , remnant stands of Jarrah, *Eucalyptus marginata*, occur on higher ground and the pale grey Bassendean sands support remnants of *Eucalyptus rudis/Melaleuca preissii* woodlands. Around the remaining wetlands there are heavier peaty soils with Paperbark, *Melaleuca rhaphiophylla* and Flooded Gum, *Eucalyptus rudis*.

3.2.1 Estuary Fringing Vegetation

The foreshore vegetation of the estuary comprises a few areas of remnant vegetation including wetlands and woodlands and areas modified for public recreation, which are mostly grassed. Key fringing vegetation includes *Eucalyptus rudis*, *Casuarina obesa*, *Melaleuca rhaphiophylla*, *M. preissii*, *Baumea articulata* and *Juncus kraussii* with the latter three species having a critical role in foreshore stability. Saline wetlands and samphire flats fringing the estuary are key waterbird feeding areas and provide important bank and foreshore stabilisation, as well as habitats of very high ecological value. In the past, samphire areas have been the subject of mosquito management control programs that included chemical control measures, filling and drainage. The few remaining areas still have the potential to be mosquito breeding areas and require enlightened management.

(Note common names for all plant species mentioned are listed in Appendix 6)

3.2.2 Introduced Plants

Extensive weed invasion has occurred in cleared and disturbed areas. The most common introduced plants are agricultural and pasture species and trees, shrubs and herbs imported for domestic gardens. In some cases these have spread to the bushland and rivers as weeds.

3.3 Fauna

Although the City area now supports no large native mammals, there is a wide variety of native invertebrate and vertebrate fauna, particularly birds. The usage of the Swan Estuary by water birds is one of the highest conservation values and the protection of water bird habitats from conflicting uses should be a primary aim. Many species of resident and migratory birds have been recorded for the estuary and wetlands.

Trans-equatorial waders migrate from as far away as Siberia, and are protected by International Treaties, the Japan Australia Migratory Birds Agreement (JAMBA), and the China Australia Migratory Birds Agreement (CAMBA). The extensive salt marshes and inter-tidal and sub tidal shallows around the shores, particularly in Milyu Nature Reserve, are the most important water bird habitats.

Introduced feral mammals are common, including the house mouse, European rabbit, foxes, rats, cats and dogs. Introduced birds, fish and invertebrates occur.

3.4 Hydrology and Drainage

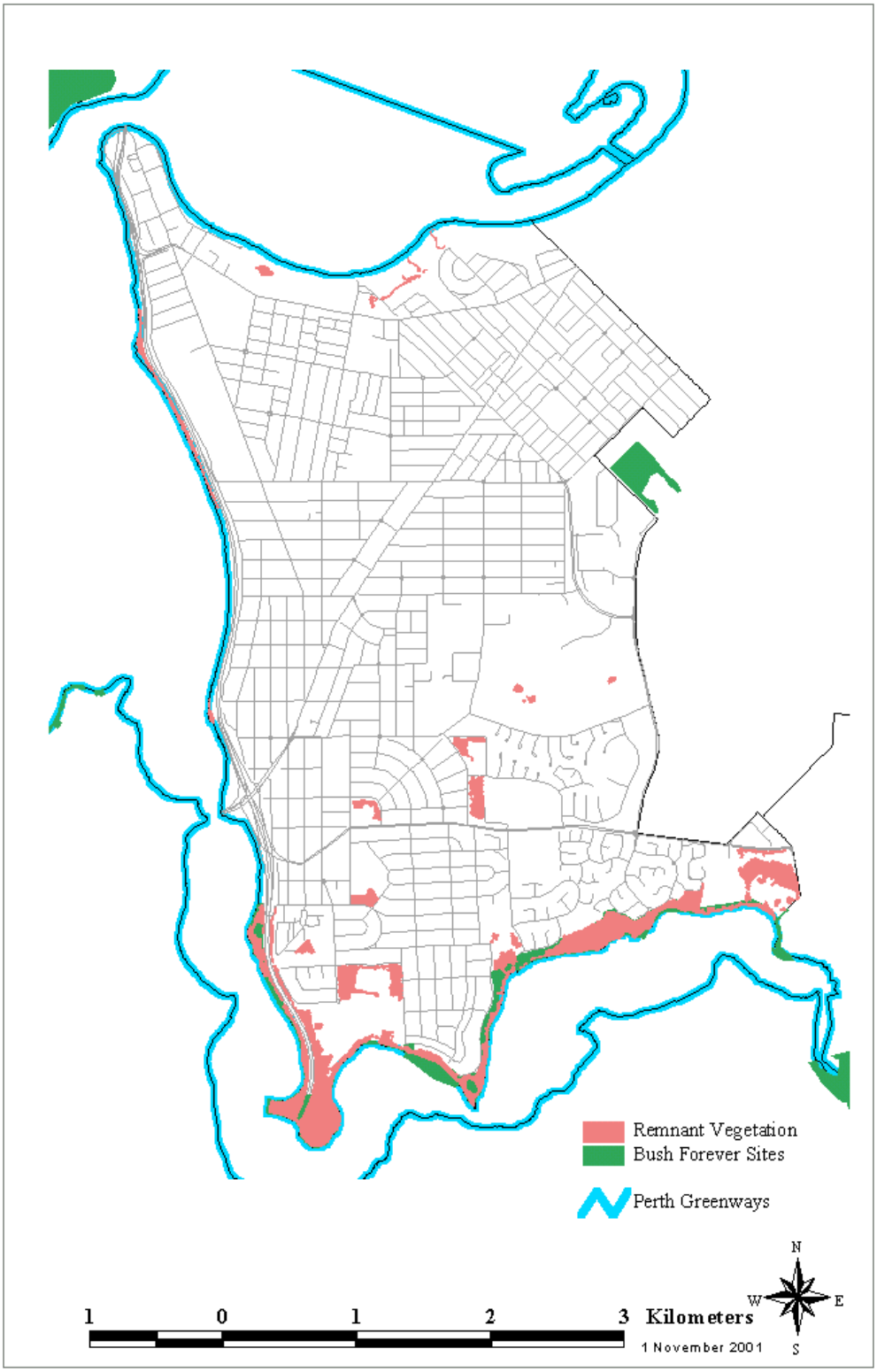
Groundwater moves in a generally westerly direction through the City and interacts with the saline waters of the estuary that borders the City on three sides. This has important implications for irrigation water supply and the management of fertilisers and nutrients that can pollute the estuary through drainage and groundwater flows.

The remaining wetlands and lakes in the City have suffered clearing of vegetation in the past and in some cases sanitary landfill practices. They have high environmental value but can become eutrophic and subject to blooms of blue green algae in summer. Former landfill sites, stormwater and adjacent parkland may contribute significant amounts of nutrients. The potential sources of nutrients, pollution and excess water likely to affect wetlands and the estuary are:

- Fertiliser use on irrigated turf areas;
- Initial fertiliser use on revegetation areas;
- Incoming drainage waters containing contaminants from roads and industrial areas;
- Possible spills from sewage lines or pumps;
- Stormwater from roofs and car parks.

Any of these may have unacceptable impacts on wetlands and the estuary. Groundwater extraction has the potential to affect lake levels and adjacent bores.

Figure 2 Remnant Vegetation, Bush Forever and Perth Greenways



3.5 Heritage

3.5.1 Aboriginal Heritage

A search of the Register of Aboriginal Sites resulted in seventeen records of relevance, including art, mythological, ceremonial and history sites. One fish trap site is recorded at Como, while Mount Henry Spit and Davilak Reserve, which have remnant vegetation present, are also recognised as having Aboriginal Heritage significance.

Site No 3536, the Swan River, is of mythological importance to Aboriginal people. Aboriginal camping areas were situated near many wetlands. Along with their mythological status and use as a camping ground, the wetlands were also a widely known source of turtle and wildfowl.

Under *Section 18 of the Aboriginal Heritage Act 1972-1980*, Ministerial consent is required where a development may alter or damage the significance of an Aboriginal site. Management's aim should be to redefine the historic links of selected sites, and to recognise the mythological importance of the Swan River to Aboriginal people, through educational displays and interpretation programs.

3.5.2 European Heritage

The City of South Perth Municipal Heritage Register, lists many buildings places and trees of significance. The Database attached to this report records 121 locations which have had A.H.C. nomination. Many of these locations, such as the Great Depression foreshore camps at Canning Bridge, Neil McDougall Park, Sir James Mitchell Park and Royal Perth Golf Course, have relevance to the *Green Plan* and design and plans for plantings should have regard for historic aspects and include them in information programs.

3.6 Parks, Green Space and Conservation Areas

The City of South Perth manages about 50 reserves ranging in size from 0.1 hectares to over 30 hectares, totalling approximately 218 hectares. It also manages streets, roads and other green space tenures which are shown on Figure 3. Also shown are many private lands and green spaces, particularly in schools, that have conservation values and are managed by the owners.

Most foreshore lands abutting the Swan Estuary are managed by Council, but some are held in a complex pattern of Crown Reserves vested in various agencies including local government, vacant Crown land (VCL) and privately owned land. Milyu Nature Reserve is vested in the National Parks and Nature Conservation Authority and managed by the Department of Conservation and Land Management.

The area of land dedicated to parks and open space is about 11% of the municipality's total area of 1990 hectares, which exceeds the normal planning standard for open space provision, reflecting the City's predominantly residential landuse and population. Some other statistics of relevance are included in the Table 2.

Figure 3 Remnant Vegetation and Parks

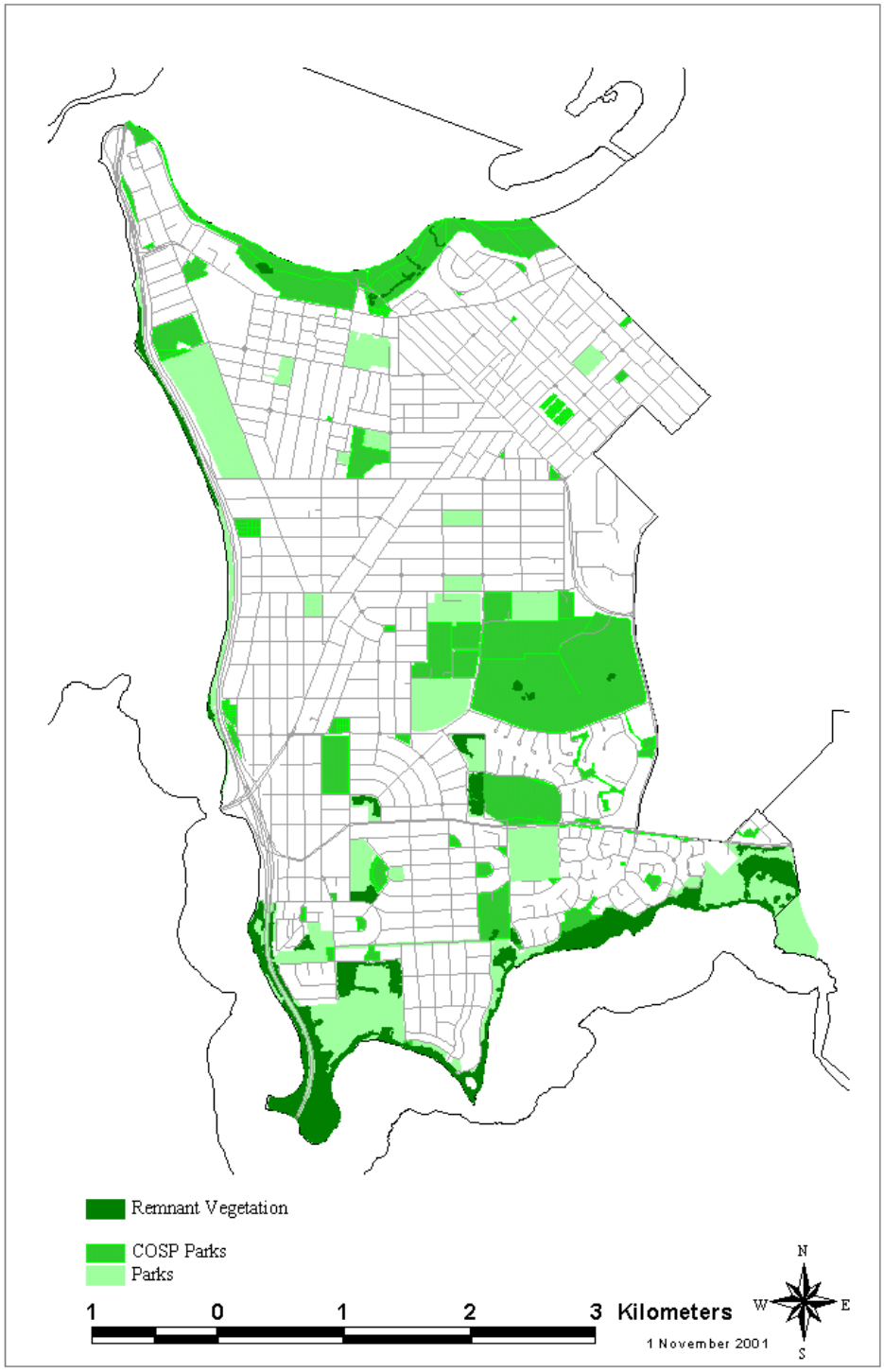


Table 2 Snapshot of the City and its Greenspace

Total Area of City of South Perth	1990 hectares
Total linear distance of sealed roads	185km
Area of Public Open Space	Approx. 430 hectares
Area of natural bushland reserves	7.1 hectares
Total linear distance of foreshore	18.8 km
Total area of foreshore reserves	Approx. 74 hectares
Population	36 447
Number of homes	17 530

4 THE *GREEN PLAN*

4.1 Methodology

4.1.1 Analysis and Review

A review of City of South Perth (COSP) policies, management plans, the literature and other relevant data was ongoing throughout the term of the study. The City's extensive Geographical Information Systems (GIS) and database coverage of the topics relevant to the study were reviewed and further baseline geographical information was obtained from custodian government agencies for the development of the *Green Plan* GIS. Relevant ecological information was sourced from AGWA, CALM, the WA Museum and Department of Environmental Protection. Digital versions were sought for all spatially referenced information as it was to form the basis for the GIS which is at the core of this project. All data was integrated into the *Green Plan* GIS with non-spatial information being linked via a web based decision support system. A bibliography of management plans, and their relevant recommendations, is contained within an attached Database. A recommendation of this study is that, where possible, these documents be made available to the public via the Internet.

The study review provided important information both for the final report and for the design of the field work so that existing information and the results of this project could be collated, integrated and linked via a database to the GIS themes developed as part of the study.

4.1.2 Determination of Greenspace Coverages and Databases

4.1.2.1 Remnant Vegetation

Four components of Greenspace in the City of South Perth were recognised as part of the inventory process. These included;

- Remnant Native Vegetation;
- COSP Parks and Gardens;
- Street Trees;
- Non-COSP parks and gardens.

Remnant vegetation and COSP Parks and Gardens were the subjects of field assessment. Street tree information was based on existing COSP data, while the last component above was produced by remote image classification. Field assessment involved site based data collection.

All four components contribute different types of Greenspace:

- The remnant native vegetation may be found over a range of tenure classes and the boundary of an individual remnant may traverse a number of cadastre. It represents relic biodiversity, and is faunal habitat.
- COSP parks and gardens are cadastrally-based Greenspace managed by Council. They are used for a range of social purposes with direct impact upon the type of garden planting. The trees and shrubs present provide habitat and other faunal resources.
- Street trees provide linear connections between other Greenspace. They provide habitat and other faunal resources in the absence of native vegetation.
- Non-COSP parks and gardens are cadastrally-based Greenspace managed by a range of different individuals and groups (including private ownership). Such Greenspaces are used for a range of purposes with direct impact upon the type of garden planting. Any trees and shrubs present may provide habitat and other faunal resources. Descriptive information for this type of Greenspace was not sought by this study beyond a aerial photographic interpretation of extent.

4.1.2.2 Remnant Vegetation

Remnant vegetation was described with the following database fields.

Table 3 Remnant Vegetation Data Base Fields

Field	Description
Location	The spatial distribution of native vegetation in relation to cadastre and zoning schemes
Species List	Species present - classified as weed (exotic, non-local native), local native,
Management	List of recommendations from this and previous studies
Site Description	A descriptive statement for the site

4.1.2.3 COSP Parks and Gardens

COSP parks and gardens were assessed in a similar fashion to remnant vegetation with the final database having the following fields:

Table 4 Parks and Gardens Database Fields

Field	Description
Location	The spatial distribution of the park in relation to cadastre and zoning
Species List	Species present - classified as exotic, native, local native, weed
Recreational Use	Passive versus active
Park Structure	Scattered versus peripheral distribution of shrubs and trees
Management	List of recommendations from this and previous studies
Site Description	A descriptive statement for the site

4.1.2.4 Street Trees

Extensive street tree information is held by the City of South Perth. This information formed the core of a GIS coverage and included the following important fields:

Table 5 Street Tree Database Fields

Field	Description
Spatial	The location of the tree
Species List	Species - classified as exotic, native, local native,
Condition	Statement of health
Height	Height in metres
Management	List of recommendations from this and previous studies

4.1.2.5 Private Greenspace

Private Greenspace was assessed remotely via a supervised classification of an aerial photograph mosaic covering the city. This classification involved the selection of typical Greenspace as training sites. The training sites were selected to encompass the range of vegetated surfaces within the city including grass (ovals, bowling greens, parkland), wetland vegetation (reed beds and samphire), native vegetation (woodland, heath and riparian), plantation trees, and other woody plants (essentially backyard shrubs and trees). These sites were then used to extrapolate across the entire image set – essentially classifying the image into two colours representing vegetated versus non-vegetated surfaces. The final pixel size for the classified image was 4 x 4 metres.

4.1.3 Development of *Green Plan* Coverage and Databases

Development of the *Green Plan* involved assembly of the Greenspace components to produce a strategic vision for the City. This was done within the overall framework of the existing *Bush Forever* and *Perth Greenways* recommendations. The Greenspace components were integrated within a Geographic Information System. The spatial properties of each component were the foundation for the *Green Plan* . The Greenways, which are the individual linkages within the city, consist of street trees and cadastre of all tenures.

One of the key steps was to simplify the street tree coverage, which contained over 14,000 records, into a form which revealed linear street tree chains. This was done by a buffering process within a GIS. The result was called the ***Boulevard*** coverage. Individual Boulevards contained all the street trees which were within 10 metres of each other. Thus Boulevards could consist of various combination of local native, non-local native, or exotic species. The final fields within the Boulevard coverage are shown below.

Table 6 Boulevard Database Fields

Field	Description
Spatial	The location of the Boulevard
Trees	The total number of trees in the Boulevard
Local	The number of local trees in the Boulevard
Native	The number of native trees (including local) in the Boulevard
Management	List of recommendations from this and previous studies
Link	The ID's of the component Street Trees

The cadastral components of individual Greenways included blocks with Remnant Vegetation and/or possessed significant areas of Greenspace. These were considered to be Greenspace Nodes. Between these nodes a planning line was drawn. This line was used to spatially incorporate all other cadastre and street trees within 150 metres either side, forming the links or Greenways, between the Greenspace Nodes. Twenty four Greenways were identified which provide networks within the City and links between the *Bush Forever* and *Perth Greenways* Sites. This is the *Green Plan.*

4.2 Results

4.2.1 Decision Support System Data Bases and GIS Coverages

The outcome of this study is a decision support system, which is a tool for the interrogation and maintenance of the databases, thereby facilitating management decisions towards achieving the objectives listed as detailed in Section 1.2.

Recommendations produced as a result of this study have been grouped together into five broad classes. The details of these recommendations can be viewed on the Website:

- General – These recommendations have city wide application. They are policy recommendations to build upon the existing Greenspace to protect existing biodiversity, provide greater local native vegetation cover, control noxious species and build faunal linkages.
- Specific – These recommendations deal with specific Parks, Reserves and Remnants. They detail implementation recommendations.
- Research – These recommendations deal with areas where more information is required and should be investigated in collaboration with local groups as well as Educational and Research institutions. They will assist in developing targeted measures to protect biodiversity.
- Extension – These recommendations aim to build the level of understanding, awareness and participation of COSP staff, residents and visitors. They embrace a number of different approaches and opportunities.
- Greenways (including Specific Greenways) – These recommendations arise from the analysis undertaken by this study. They include broad recommendations with City-wide application and site-specific recommendations to 'build' Greenways as derived in the *Green Plan* .

Lists of the Microsoft Access databases and Mapinfo GIS coverage provided by this study are found below. Street trees and the relevant cadastre which comprise the Greenways are flagged in all digital datasets.

Table 7 Databases Produced by This Study

Name	Description
Biblio.mdb	Bibliographic details for reports and publications dealing with South Perth Greenspaces
Heritage.mdb	Indigenous and Non-indigenous heritage locations in South Perth. Based on data provided by DAA and AHC
Parks.mdb	COSP Parks and Open Spaces
Recommend.mdb	Recommendations resulting from this study
Spremveg.mdb	Remnant Vegetation in City of South Perth
Species.mdb	List of plant species found in South Perth
Spsttrees.mdb	Street Trees and Boulevards

Table 8 GIS Themes Produced by this Study

Name	Description
Boulevards.tab	Mapped distribution of Street Tree Boulevards
Greencad.tab	Greenways cadastral components
Greenways.tab	Mapped distribution of Identified Greenways
Parks.tab	Mapped distribution of COSP Parks and Gardens
Remveg.tab	Mapped distribution of Remnant Native Vegetation
Spsttress.tab	Locations of individual Street Trees
Vegcover.bmp	Classified image of vegetation cover in South Perth

The maps and databases which form the inventory bring together all of the key values to enable the community to consider and determine its future expectations for the local environment.

4.2.2 Remnant Vegetation

This study has defined remnant vegetation as *any areas of the natural vegetation remaining after clearing has taken place.* Within the City of South Perth the major areas of remnant vegetation occur along the Swan and Canning River foreshores with small isolated areas mainly located in the south of the City (Figure 3). Internally, most of the native vegetation remnants are in good condition (Keighery rating of 3 - *Bush Forever*) with the exception of Davilak Reserve. The latter reserve is in poor condition but has been designated as a recovery remnant and is actively being rehabilitated by COSP. All internal remnants are being rehabilitated through planting of local species and eradication of exotics. These activities are being undertaken by various bodies besides COSP (e.g. schools) . All internal remnants have existing management plans and should continue to be managed under those guidelines.

The peripheral remnants consist of large contiguous foreshore reserves to the south, remnants associated with educational institutions (Clontarf and Aquinas) and fragmented remnants to the west and north (Western Foreshore, including Milyu and Sir James Mitchell Park respectively).

The main observations on remnant vegetation are:

- Vegetation in the larger reserves is generally in better condition;
- Populations of some species are moving toward senescence. The causes include reproductive dysfunction and establishment failure; for example many of the banksias in Davilak Reserve, Manning Primary School, Mt Henry. As a consequence community structures are changing though replanting efforts at Davilak and other reserves are counterbalancing the trend to some extent;
- Rehabilitation efforts appear to be focused on filling gaps with trees and shrubs and this is an appropriate method. However there is scope for making use of remaining microhabitats to attempt re-introduction of a larger suite of species.

These features of each remnant have been detailed in the Remnant Vegetation database (spremveg.mdb) linked to the *Green Plan* GIS via cadastre Pin number and may be accessed via the web.

Table 9 Remnant Vegetation in City of South Perth Precincts

Precinct	Number of Lots	Remnant Vegetation Area (ha)
Mill Point	2	1.60
Hurlingham	12	0.63
South Perth Central	2	1.51
Arlington	0	0
Kensington	0	0
South Perth Civic	0	0
Collier	0	0
Como Beach	3	0.46
Como	5	0.60
Karawara	3	3.86
McDougall Park	1	1.06
Waterford	21	23.00
Manning	4	1.70
Salter Point	20	38.94

4.2.3 Parks and Open Spaces

For the purpose of the *Green Plan* the term Parks and Open Spaces includes active and passive recreation reserves, schools, golf courses, Perth Zoo, Government land such as the CALM and AgWest sites as well as council land such as the works depot and refuse collection site. As part of this study, COSP Parks were visited, species lists compiled and general observations recorded. Two significant occurrences of native vegetation were recorded from COSP Parks. The Collier Park Golf Course retains small stands of native vegetation associated with permanent lakes. These stands are isolated from the fairways and present an opportunity for preservation, limited direct expansion and reinforcement through the planting of local natives throughout the golf course. McNabb Loop Reserve is a remnant plantation which possesses a weed infested native understorey. This understorey presents an opportunity for native vegetation rehabilitation.

Plant species lists for parks and reserves are divided into native species (local and non-local), and exotics (weeds and non-weeds). The information presented includes park descriptions and recommendations. Weed control recommendations are included.

Table 10 Parks and Gardens in City of South Perth Precincts

Precinct	Number of Lots	ParkArea (ha)
Arlington	1	0.08
Como	15	102.41
Como Beach	25	4.22
Hurlingham	26	33.64
Karawara	5	21.18
Kensington	65	3.82
Manning	5	9.95
McDougall Park	2	8.80
Mill Point	15	21.56
Salter Point	5	1.97
South Perth Central	4	14.64
South Perth Civic	2	6.00
Waterford	6	5.73

Important observations from the field work include:

- Marsh Avenue Reserve is a unique park in COSP due to the presence of a number of mature trees of various species of Oak (Quercus). The nature of this park should be preserved by maintaining the predominance of the Oaks. Additional garden bed planting of native species in conjunction with added native trees will enhance native fauna resources;
- Coolidge Street Reserve forms the northern part of a contiguous chain of three Greenspaces –which includes Davilak Reserve and Neil McDougall Park. The native vegetation in Coolidge Street Reserve should be expanded through additional garden beds and large trees. The benefits of rehabilitation efforts in Davilak Reserve, and native gardens in Coolidge Reserve and McDougall Park will be synergistic.
- David Street and Mount Henry-Roebuck provide good examples of native gardens which exist in South Perth. Both require some weed and access works to increase faunal resources.

4.2.4 Street Trees

Within the urban environment street trees can play many important roles. They provide aesthetic value, act as a buffer to street noise, provide shade and shelter, provide habitat for mammals, birds and insects. Local species of street trees support higher diversity and abundance of insect fauna than do exotic species and these in turn translate to greater amounts of food resources for predator species, vertebrate or not (Powell & Emberson, 1996).

Street trees can act as links, or vegetation corridors, between larger habitats that exist in parks, reserves, other open ground and remnants of natural vegetation such as the bushland at Manning and Koonawarra Primary Schools and the Canning and Swan River foreshores.

Where street trees are concerned, the aim of the *Green Plan* was to ascertain the extent of the existing street trees from the council data base and identify any gaps that may exist. Where these gaps exist along potential linking corridors it is recommended that native trees be planted to enhance potential for habitat for native fauna and to increase the amount of native vegetation throughout the City.

The street trees of South Perth are dominated by three species which make up 50% of the total number. One species is exotic to Australia (*Jacaranda mimosifolia*), one is exotic to Western Australia (*Lophostemon conferta*) while *Agonis flexuosa* is a local South Perth native.

Table 11 Main Street Trees in the City of South Perth

Species	Number	Proportion of Total (%)
Agonis flexuosa	*2877*	*19.8*
Lophostemon conferta	*2678*	*18.4*
Jacaranda mimosifolia	*1927*	*13.31*

Local native species contribute approximately 26% of the total number of street trees in South Perth. Over 90% of these are *Agonis flexuosa*. Table 12 details local species representation.

Table 12 Local Species as Street Trees in the City of South Perth

Species	Total
Acacia saligna	*16*
Adenanthos cygnorum	*1*
Agonis flexuosa	*2877*
Banksia attenuata	*4*
Banksia ilicifolia	*4*
Banksia menziesii	*10*
Banksia prionotes	*7*
Casuarina obesa	*95*
Corymbia calophylla	*45*
Eucalyptus gomphocephala	*5*
Eucalyptus marginata	*34*
Eucalyptus rudis	*4*
Melaleuca preissiana	*3*
Nuytsia floribunda	*11*
Xanthorrhea preissii	*11*

Figure 4 shows Boulevards classified as containing more than 80% of *native* species, whereas Figure 5 shows Boulevards classified as having high *local native* species composition (>80%). There are few large *local* Boulevards throughout the city. Further street tree plantings should aim to increase the representation of other local species. This will diversify the resources available to native fauna. It is well established that healthy, well-watered, actively-growing native trees support a large invertebrate fauna which is not found in comparable exotic tree species (Powell & Emberson 1996). It was noted that the precincts of South Perth Central and Waterford have significantly higher exotic species content than other precincts.

The diversity of trees along a particular street may have aesthetic appeal, but such boulevards often have few native fauna resources. Figure 6 shows Boulevards which essentially are comprised of one species. Where possible, after considering any cultural values, the local native species content should be diversified. Significantly, there are approximately 720 (5% of total trees) specimens of *Melia azedarach*. This species is a known environmental weed and is a source for invasion of local native vegetation. These specimens should be removed and replaced with local native species.

The street tree study has distinguished between boulevards of native and exotic species which was a useful step in building a picture of linkages between remnants and describing the composition of street trees on a precinct basis.

Table 13 Street Tree Details by Precinct

Precinct	Road Length (Km)	Street Trees	Native Trees	Local Trees	Trees per Km	Natives Per Km	Locals Per Km
Mill Point	22.6	421	220	53	18.6	9.7	2.3
Hurlingham	9.8	424	255	152	43.3	26.0	15.5
South Perth Central	21.8	1271	696	241	58.3	31.9	11.1
Arlington	14.3	782	640	301	54.7	44.8	21.0
Kensington	26.2	1902	1377	679	72.6	52.6	25.9
South Perth Civic	14.4	984	819	396	68.3	56.9	27.5
Collier	23.7	1326	985	374	55.9	41.6	15.8
Como Beach	38.7	1379	1065	206	35.6	27.5	5.3
Como	24.3	1129	868	295	46.5	35.7	12.1
Karawara	15	756	456	165	50.4	30.4	11.0
McDougall Park	23.9	921	630	212	38.5	26.4	8.9
Waterford	17.3	874	328	78	50.5	19.0	4.5
Manning	19.2	1112	866	339	57.9	45.1	17.7
Salter Point	26.1	1179	690	323	45.2	26.4	12.4
Total	297.3	14460	9895	3814	48.6	33.3	12.8

In the above table red indicates poor street tree precincts i.e. those precincts where either;

- Density of all street trees is less than 40 per km road length (1 every 25 metres),
- Native street tree density is less than 30 per km road length (1 every 33 metres),
- Local street tree density is less than 20 per km road length (1 every 50 metres).

The densities above represent initial targets for COSP for expansion and enhancement of the street tree cover. It is notable that Arlington, which has poor cover of vegetation in general (see Figure 7), possesses a reasonable complement of street trees which meet the initial targets already - as do Kensington and South Perth Civic.

Figure 4 Boulevards where more than 80% are a Native Species

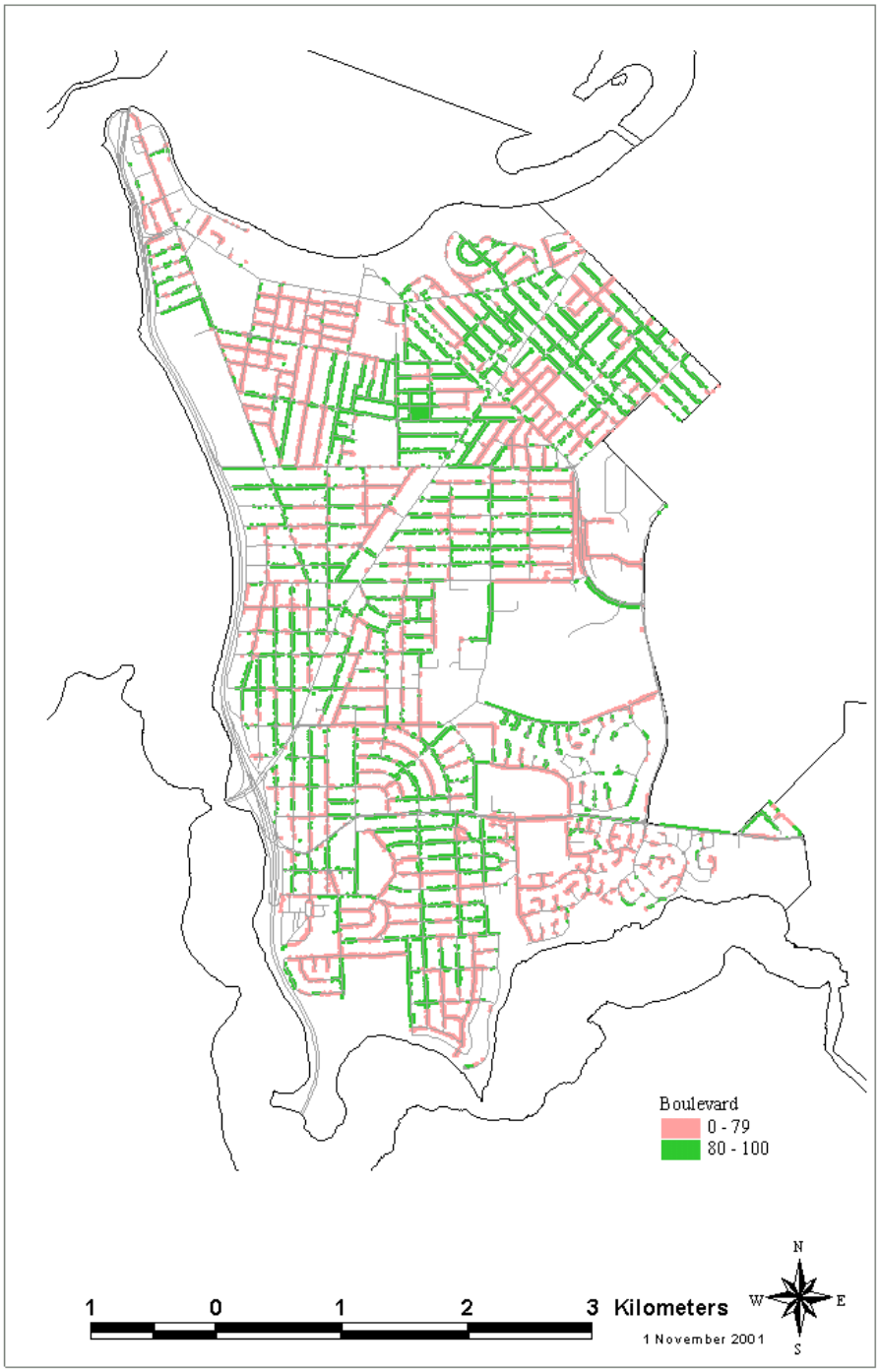


Figure 5 Boulevards where more than 80% are a Local Species

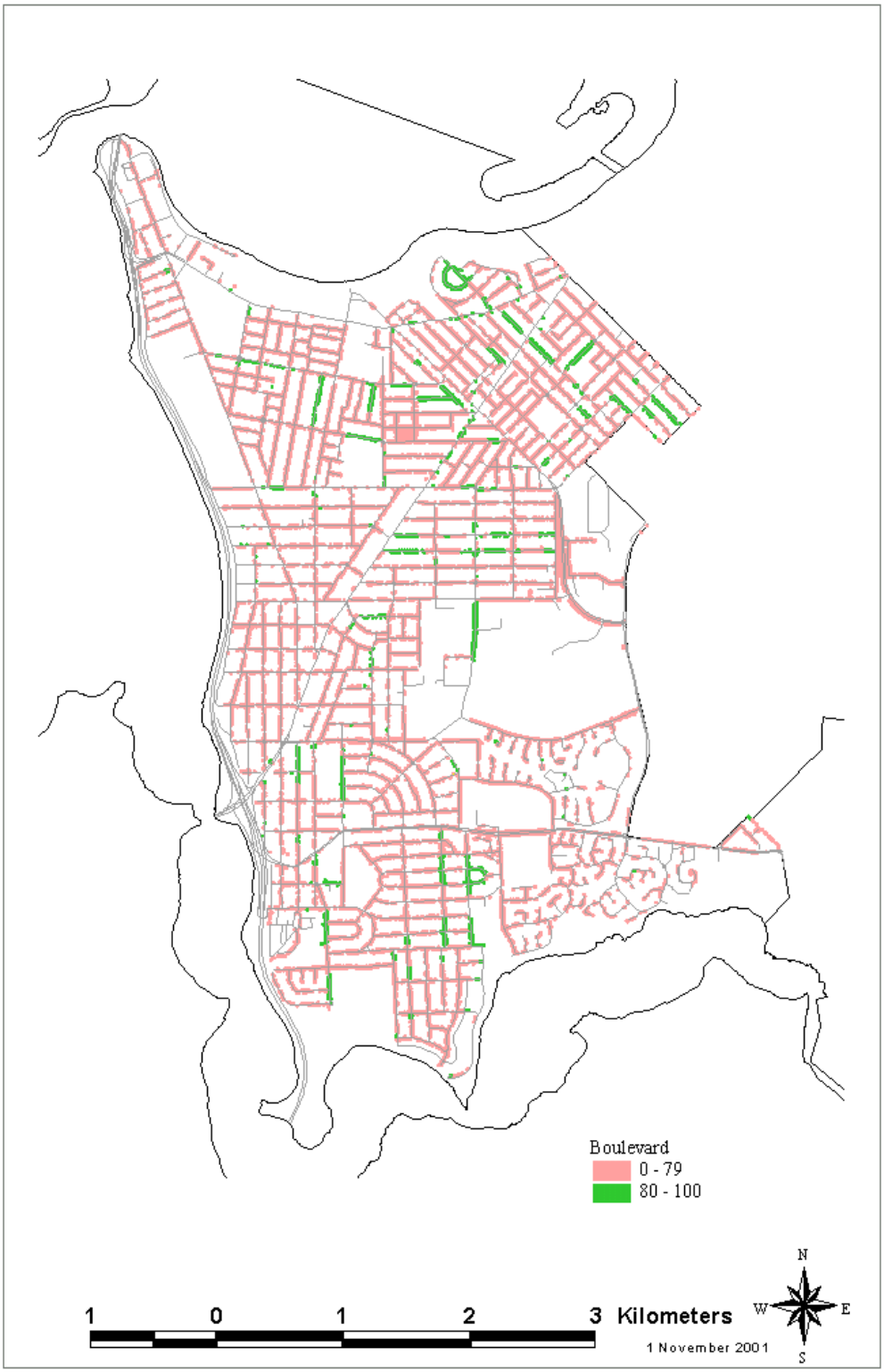
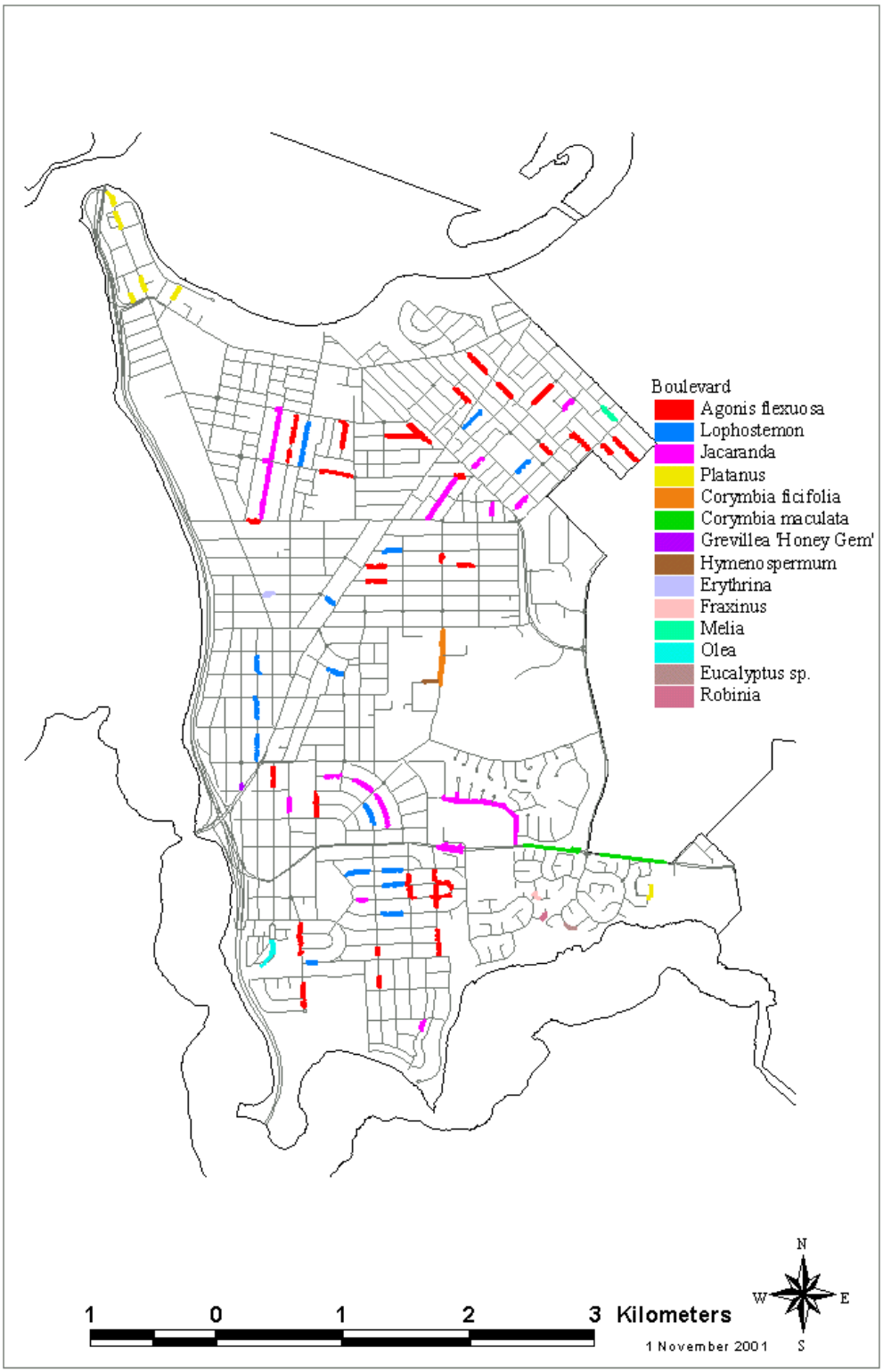


Figure 6 Boulevards where more than 80% are a Single Species



4.2.5 Vegetation Cover within the City

Figure 7 shows vegetation cover as derived by the classification process described in Section 4.1.2. Over 60% of the city is covered by some form of Greenspace. On a precinct basis the coverage ranges from a low of 47% in Arlington to a high of 75% in Como, most of which is Collier Park Golf Course.

Table 14 Vegetation Cover in City of South Perth Precincts

Precinct	Precinct Area (ha)	Vegetated Area (%)
Mill Point	122.9	62.98
Hurlingham	79.6	69.49
South Perth Central	149.8	63.74
Arlington	64.6	47.21
Kensington	157.9	55.22
South Perth Civic	94.1	55.14
Collier	166.1	49.93
Como Beach	206.1	52.61
Como	233.0	75.34
Karawara	109.4	54.84
McDougall Park	115.3	52.16
Waterford	156.2	67.75
Manning	111.8	57.00
Salter Point	207.3	66.21
Total	**1974.2**	**63.82% overall**

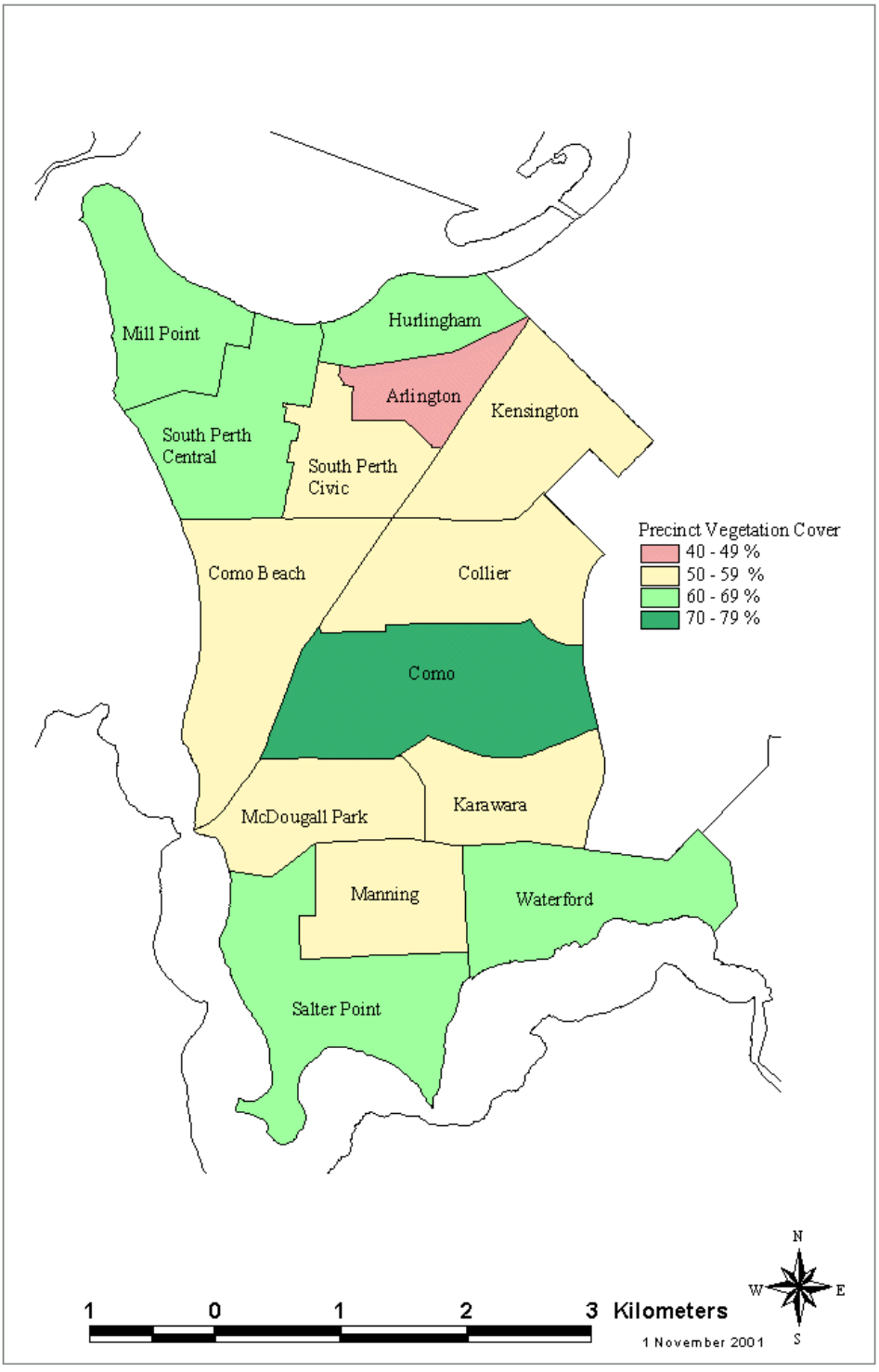
The city appears to have an adequate coverage of Greenspace. However the table below shows there are 280ha of grass making up over 20% of the vegetation cover of the City and 14% of the total City area.

Table 15 Vegetation Cover in City of South Perth

Covert	Area (ha)	% of City Area
All Vegetation	1259	64
Grass	278	14
Total City Area 1974 Ha		

Therefore the focus of the city should be to change from grass to native garden wherever possible to enhance Greenspace quality. This can be achieved by the expansion of gardens and trees around the periphery of sporting ovals and playgrounds.

Figure 7 Vegetation Cover by Precinct



4.2.6 Greenways

As described in Section 4.1.2, the natural environment in the City of South Perth has four main components:

- Remnant Native Vegetation;
- COSP Parks and Gardens;
- Street Trees;
- Non-COSP parks and gardens.

Currently these are managed separately and the *Green Plan* was initiated to devise a strategy for the City to integrate the management of these components.

Within the regional perspective of the *Perth Greenways Plan* and *Bush Forever*, the City of South Perth *Green Plan* aims to provide internal linkages and enhance the existing diversity. The Greenways within the city are each comprised of a nodes and linkages system as shown in Figure 8, the Milyu Nature Reserve - Ernest Johnston Park Greenway.

Figure 8 Detailed View of Greenway Number 10

Details of the components of this Greenway are shown in Table 16 opposite.

Table 16 Typical Greenway Components

Greenway Components (derived from the website)

Remnant Vegetation
- Milyu Native Reserve
- Western Foreshore

Parks and Open Spaces
- Ernest Johnson Oval

Street Tree Boulevards
- 257 302 370 406 413 430 442, 448 454 456 459 460 461 469 **470** 471 473 475 482 484 489 490 494 495 499 501 503 504
  Note: Red Boulevards are > 80% native species Blue Boulevards are > 80% local species **Bold** Boulevards are > 80% monospecific

Recommendations

Green Plan
- Discuss with Royal Perth Golf Club the planting of natives between the fairways
- Expand native/local species street tree plantings along South Terrace

Remnant Vegetation

Milyu (a subset of recommendations)
- Protect and enhance areas with native species
- Provide visitors with opportunities to observe and increase their knowledge of flora, fauna and habitats
- Protect flora, fauna and habitats from pests, weeds, wildfires or any other physical disturbance
- Seek approval from CALM before any mosquito and midge control programmes or modifications to increase water exchange

Western Foreshore (a subset of recommendations)
- Retain dead tree limbs for fauna habitats and create additional bird habitat with local native species plantings (MRWA/COSP)
- Direct Rangers to monitor prawning parties (COSP)
- Form a Western Foreshore Steering Committee with representatives of COSP, MRWA, SRT, Aboriginal interests, and local community (COSP)
- Use slope walling and plant local native vegetation to prevent erosion (MRWA/COSP)
- Incorporate oil and grease traps and biological filters into the storm water disposal system (COSP/MRWA)
- Group trees to retain and frame views and to provide shade and shelter (COSP/MRWA)
- Locate important flora and fauna habitats, priority species and fire sensitive species and develop management recommendations for their conservation
- Protect flora, fauna and habitats from pets, weeds, wildfires or any other physical disturbance

Parks and Gardens

Ernest Johnson Park
- Expand native garden planting in Ernest Johnston Park

Figure 9 shows the 24 Greenway planning lines while Table 16 lists the Greenways. All Greenways and their components can be viewed via the web decision support system. Maps of the individual greenways are contained in Appendix 7.

Figure 9 Greenway Planning Lines

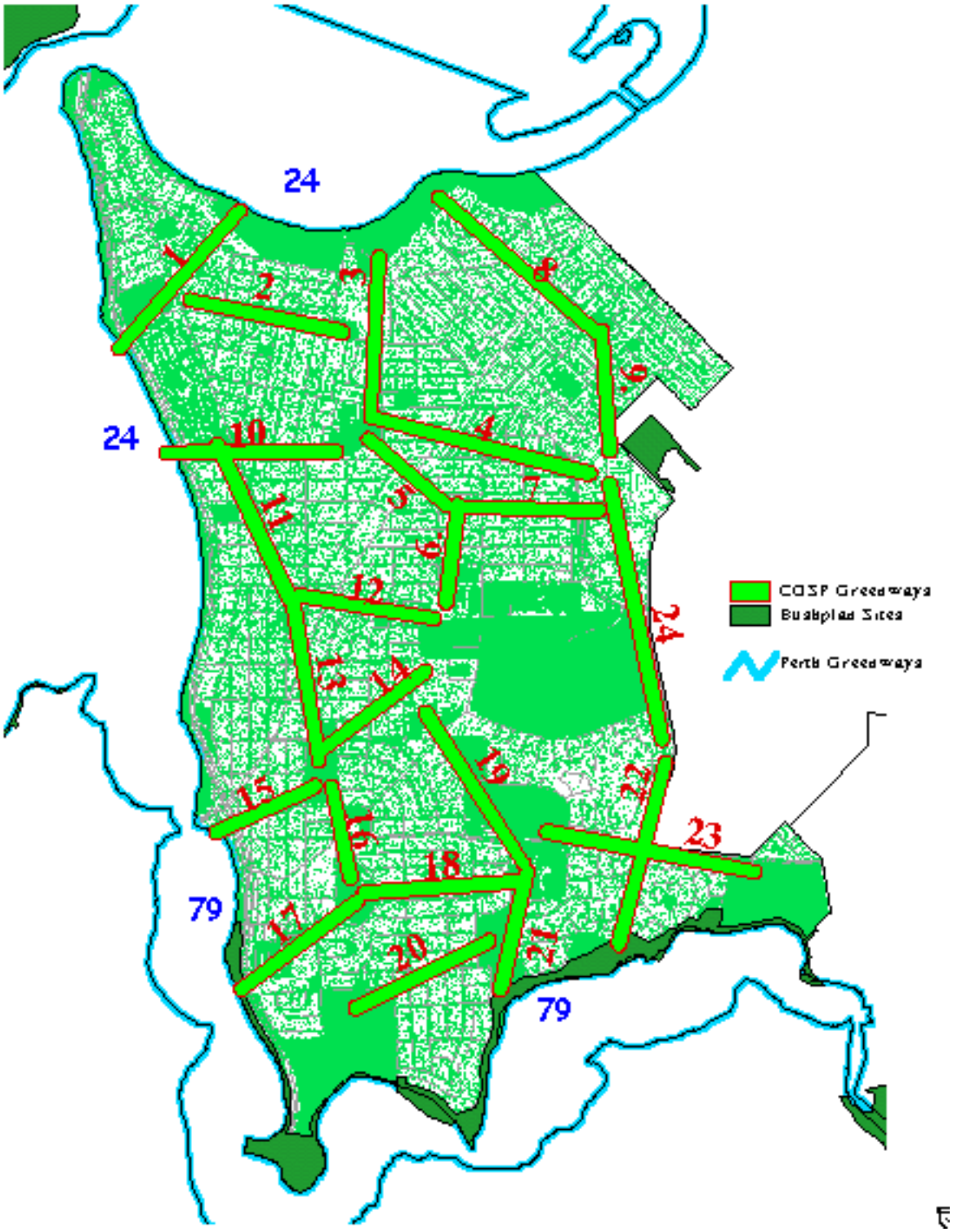


Table 17 Individual Greenways Descriptions

ID	Name	Description
1	Sir James Mitchell Park – Milyu Nature Reserve	Connects the northern and western foreshores (Perth Greenways) via the Zoo and Richardson Park.
2	Richardson Park - Wesley College	Connects Richardson Park through to Wesley College along Angelo St
3	Sir James Mitchell Park - Ernest Johnston Oval	Connects Sir James Mitchell Park, Coolidge Reserve, Wesley College and Ernest Johnston Oval
4	Ernest Johnston Oval - Agriculture Department	Connects Ernest Johnston Oval - Agriculture Department/ Kensington Bushland (Bush Forever Site), crosses Canning Highway
5	Ernest Johnston Oval – Collier Primary School	Connects Ernest Johnston Oval – Collier Primary School, crosses Canning Highway
6	Collier Primary School - Penrhos College	Connects Collier Primary School to Penrhos College, bounded by Throssel and Murray Streets
7	Collier Primary School - Agriculture Department	Connects Collier Primary School to Agriculture Department/Kensington Bushland along Monash Ave
8	Sir James Mitchell Park - Kensington Primary School	Connects Sir James Mitchell Park and Kensington Primary School
9	Kensington Primary School - Agriculture Department	Connects Kensington Primary School and Kensington Bushland.
10	Milyu Nature Reserve - Ernest Johnston Oval	Connects Milyu Nature Reserve, Royal Perth Golf Course and Ernest Johnston Oval along South Terrace, crosses Kwinana Freeway.
11	Royal Perth Golf Club - Como Primary School	Connects the Royal Perth Golf Club and Como Primary School, west of Labouchere Rd
12	Como Primary School - Penrhos College	Connects Como Primary School and Penrhos College, crossing Canning Highway
13	Como Primary School - Neil McDougall Park	Connects Como Primary School, Coolidge Reserve and Neil McDougall Park, crosses Canning Highway
14	Neil McDougall Park - Penrhos College	Connects Penrhos College, Coolidge Reserve and Neil McDougall Park
15	Neil McDougall Park - Western Foreshore	Connects Neil McDougall Park and the Western Foreshore - a Perth Greenways Link
16	Neil McDougall Park - Manning Primary School	Connects Neil McDougall Park, Davilak Reserve and Manning Primary School Bushland, crosses Manning Rd
17	Manning Primary School - Western Foreshore	Connects Manning Primary School, Mount Henry Open Space and the Western Foreshore (Perth Greenways), crosses Kwinana Freeway
18	Manning Primary School - Trinity Playing Fields	Connects Manning Primary School and Trinity Playing Fields, bounded by Bradshaw-Conochie Crescent
19	Trinity Playing Fields - Como High School	Connects Como High School, Koonawarra and Goss bushlands to Trinity Playing Fields, crosses Manning Rd
20	Aquinas College - Challenger Ave. Park	Connects Mt Henry Spit bushlands (Perth Greenways), Aquinas College through to Challenger Avenue Park
21	Salter Point Foreshore - Trinity Playing Fields	Connects Salter Point Foreshore (Perth Greenways), Challenger Avenue Park and Trinity Playing Fields, along Elderfield Rd.
22	Waterford Foreshore - Karawara Park	Connects Waterford Foreshore (Perth Greenways), Bodkin Park and Karawara Park, west of Kent Street, crosses Manning Rd
23	George Burnett Park - Clontarf College	Connects Goss bushlands, George Burnett Park and Clontarf College (Perth Greenways Link), south of Manning Road
24	Karawara Park - Agriculture Department	Connects Karawara Park, Collier Park Golf Course and Kensington Bushlands (Perth Bushplan site), west of Kent Street

5 RECOMMENDATIONS

Recommendations produced as a result of this study have been grouped together into five broad classes. Within the decision support system appropriate recommendations for specific sites, boulevards and Greenways are detailed.

5.1 General Recommendations

These recommendations have city wide application. They are policy recommendations to build upon the existing Greenspace to protect existing biodiversity, provide greater local native vegetation cover, control noxious species and build faunal linkages.

No.	Recommendation	Description
1	Introduce a Native Plants to residents scheme	Planting local natives in private gardens will increase the vegetation cover across the city and improve the connectivity of recognised Greenways
2	More stringent guidelines should be adopted for cat ownership in houses adjoining bushland or wetland areas	Control of household pets will increase these areas potential as faunal habitat
3	Consideration be given to introducing a fox trapping program	This should focus on the foreshore areas, utilising local veterinarians to euthanase captured animals
4	Establish native gardens beneath and between existing park trees	This aims to increase the resources and refuges for local birds
5	Develop a conservation strategy for the Oblong Turtle	This species is the principal internal ground faunum. Its population status and ecological requirements need to be documented.
6	Introduction of Oblong Turtles into water bodies throughout city	This will assist to increase numbers where current populations are not considered viable
7	Discontinue planting and eradicate Melia azedarach (Cape lilac).	This species is considered a bushland invader.
8	Expand native species plantings in Sir James Mitchell Park as recommended in the Sir James Mitchell Park Foreshore Management Plan	This park is of regional significance but has a poor representation of native species
9	Recognise and retain distinctive boulevards ('monospecific' boulevards) of street trees that are identified within the Green Plan.	Community Consultation should be conducted to ascertain cultural significance
10	Further investigation be carried out to explore opportunities to plant native species in drainage sumps located between Kensington bushland and Hayman Road and Sir James Mitchell Park	Sumps can provide faunal habitat as well as ameliorating groundwater/stormwater run off problems
11	Encourage the State Government to reserve the conservation category wetland located east of Clontarf College for the purpose of conservation	
12	The City of South Perth continue to address water quality problems in surface water bodies	Through stormwater treatment and the use of aquatic, wetland and fringing plants

....Cont

No.	Recommendation	Description
13	As a general principle, only local native trees will be planted as street trees along streets adjoining natural bushland or foreshore areas	To expand faunal habitat and increase connectivity
14	The City of South Perth continue to monitor blue-green algae blooms in surface water bodies	In conjunction with a public education programme of preventative measures and precautions required in the event of a bloom
15	The City of South Perth consider planting local native submerged aquatic plants in addition to emergent plants that have been planted	To improve water quality and provide a food source for wetland fauna
16	The City of South Perth continue it's water quality monitoring program	With the aim of further understanding the sources of excess nutrients that enter the City's stormwater system
17	The City of South Perth should continue to support the seed orchard and seed bank that have been created at Davilak Reserve	With the view to making the City's nursery self sufficient in provenance native seed stock and assist in preserving the City's biodiversity
18	The City of South Perth continue it's current rabbit control program	This should focus on the Mt Henry area, including Aquinas College and Cloisters Reserve
19	Local schools, nursing homes and other community facilities should be encouraged to embrace Green Plan principles	Through the offer of a limited number of free trees, supplied through the Council nursery on an annual basis
20	As a general principle, lines of local trees will be used to create windbreaks on the perimeter of active sports fields	With the aim to increase shade cover to protect against UV radiation, reduce water stress to turf and improve microclimate and habitat
21	As a general principle, the City of South Perth should increase native tree cover on passive recreation reserves	With the aim to increase shade cover to protect against UV radiation, reduce water stress to turf and improve microclimate and habitat
22	The City of South Perth conduct dieback surveys of reserves where the disease may be a problem	CALM dieback interpreters may be required for this task. Banksia species are particularly susceptible and occur throughout the city
23	The City of South Perth consider regular application of phosphonic acid to areas prone to dieback as a preventative measure	To protect native species against infection with the dieback fungus (Phytophthora cinnamomi) under CALM guidance
24	The City continue its weed control program for perennial veldt grass	

5.2 Specific Recommendations

These recommendations deal with specific Parks, Reserves and Remnants. They detail implementation recommendations.

No.	Recommendation	Description
25	Investigate a weed control programme in the North Eastern corner of Aquinas College	This area contains a significant remnant of native bushland currently infested by weeds.
26	The Gwenyfred Road drainage sump be rehabilitated as a native remnant for the purpose of improving the appearance of the area, reducing fire risk and creating a habitat 'island' relatively close to the Kensington bushland	Sumps can provide faunal habitat as well as ameliorating groundwater/stormwater run off problems
27	Install and expand the native gardens within Coolidge Reserve	This reserve is part of the Coolidge-Davilak-McDougall triplet of sites
28	Maintain the distinctive nature of Marsh Ave. Reserve and plant a native understorey	This reserve is dominated by Oaks (Quercus sp). There is no comparable park in South Perth.
29	Rehabilitate the Melaleuca remnants at Sir James Mitchell Park by re-contouring and understorey plantings	Through re-battering and planting to create groves similar to the grove that is currently under rehabilitation
30	Expand the use of local native species in garden beds at Neil McDougall Park	To reinforce the link between Davilak Reserve, Neil McDougall Park and Coolidge Reserve
31	The island and lake in Neil McDougall Park be revegetated with local native species.	This should be done as a slow transition, starting with the removal of exotic species with the greatest weed potential
32	Interpretative signs be installed at Sir James Mitchell Park and Neil McDougall Park	To inform people of the flora and fauna found there, domestic animal control, no feeding the birds and measures that will improve the lakes' water quality
33	Encourage expansion of native vegetation around the wetlands in Collier Park Golf Course	Vegetation retains a number of native species and is not in the area of play. These areas should be ruled "out of bounds".
34	Encourage planting of native species between fairways in Collier Park Golf Course	This will enhance fauna habitat.
35	Manage the Remnants in Collier Park Golf Course as native vegetation/native garden	These areas abut the water bodies and are in fair condition. Undertake a vegetation survey in spring to determine the species present.
36	A low limestone fence be built at Clydesdale park to replace the existing log-rail fence adjacent Mill Point Road	Entrances through the fence should be curved inwards toward the reserve to discourage turtles from crossing this busy road
37	The City of South Perth consider removing the boundary fencing of the George Street drainage sump and the sump be re-battered and landscaped according to water sensitive design principles	Sumps can provide faunal habitat as well as ameliorating groundwater/stormwater run off problems
38	The City of South Perth consider removing boundary fencing at the Roebuck Drive drainage sump and the sump be re-battered and landscaped according to water sensitive design principles	Sumps can provide faunal habitat as well as ameliorating groundwater/stormwater run off problems
39	Discuss with Royal Perth Golf Course the planting of natives between the fairways	The golf course is within a Greenway.

5.3 Research Recommendations

These recommendations deal with areas where more information is required and should be investigated in collaboration with local groups as well as Educational and Research institutions. They will assist in developing targeted measures to protect biodiversity

No.	Recommendation	Description
40	Undertake a comparison study of bird use of internal remnants and parks.	This would assess the relative importance of parks and remnants
41	Support research into the use of flame burners for inducing fire effects on native plants such as Banksias	To ensure the health of plants that may require fire for long-term survival or reproduction such as local Banksia species
42	Develop baseline fauna lists, particularly ground vertebrates	Basic biodiversity information is an important data set for furture research and management.
43	Support further research into control measures for commonly occurring or difficult to control weeds	Target species should include Oxalis pes-caprae and Romulea rosea.

5.4 Extension Recommendations

These recommendations aim to build the level of understanding, awareness and participation of COSP staff, residents and visitors. They embrace a number of different approaches and opportunities

No.	Recommendation	Description
44	Select floral/faunal emblem for city	This will act as a 'flagship species' representing the environmental management effort
45	Develop an information database for bushland and wetland restoration that can be easily accessed by the public	This could include environmental as well as other knowledge. Delivery could be via web/libraries/cd to schools etc. An informed public is an involved public
46	Develop education/applied research links with relevant institutions	This allows for cost-effective information collection - many universities will support student projects
47	The City of South Perth provide information to staff and residents regarding native reptiles, particularly snakes	Public education should help to ensure that habitat is protected and staff and residents respond appropriately to any sightings
48	Develop and distribute a new residents "Green Kit"	Include recommended native species, water-saving strategies, bird-attracting, etc. Initially this could be provided to all residents
49	The City of South Perth supports local schools to protect and regenerate any bushland that remains on their land	This should include both Public and Private schools.
50	The City of South Perth produce a series of leaflets detailing the local fauna and flora.	This will improve public awareness, contribute to research/management. Leaflets could be arranged by various themes (eg Greenspace types, taxonomic groups, target audience etc.)

5.5 Greenways Recommendations (Including Specific Greenways)

These recommendations arise from the analysis undertaken by this study. They include broad recommendations with City-wide application and site-specific recommendations to 'build' Greenways as derived in the *Green Plan* .

No.	Recommendation	Description
51	Adopt a policy of establishing greenway nodes and connections that will enhance native vegetation and habitat throughout the City	As discussed in section 4.1.3 of Green Plan Report
52	Consideration be given to planting only local native trees in reserves that link to the southern shoreline of the City	In recognition of the natural setting of this area, increase faunal habitat and to enhance Greenway connectivity
53	Replace exotic street trees and plant native species in Greenway linked Boulevards	This will enhance the connectivity of each Greenway and provide habitat for avian fauna
54	Plant native understorey species around the base of native street trees	To create habitat, enhance streetscapes that are amenable to such treatments and increase Greenway connectivity
55	Invite Educational, Governmental and private institutions to participate in Greenway enhancement programmes	As detailed for individual Greenways
56	Expand native tree species planting in parks/open spaces linked to Greenways	As detailed for individual Greenways
57	Expand native/local species street tree plantings in Greenway linked streets	As detailed for individual Greenways
58	Create and/or expand native gardens in parks/open spaces linked to Greenways	As detailed for individual Greenways
59	Where no major street tree connections exist, plants to residents scheme should be pursued as a priority	As detailed for individual Greenways

6 IMPLEMENTATION

This study has resulted in the production of a web-based spatial database system. This system is not essential for the implementation of the *Green Plan* but the benefits of its use are considerable. It is provided as a skeleton structure and requires more development to become a fully featured management tool and a publicly available information resource.

6.1 Species Management

Native and exotic fauna in COSP are listed in Appendix 7. To date native fauna surveys within COSP have been species inventories – there being no detailed studies of seasonal or disturbance-related variation in community structures or species population sizes. COSP and Murdoch University researchers are currently studying the Oblong Turtle. As a consequence of this dearth of information little can be said about the status of many species, with essentially no information on invertebrates apart from collection details (Museum of W.A., AGWA Entomology collections).

This observation applies equally to knowledge concerning the exotic fauna. Clearly many of these species are impacting upon the native flora and fauna of South Perth, but the extent and nature of such impacts remain anecdotal in most cases.

A recommendation of this study is to encourage links to scientific research institutes to expand management understanding of the native and exotic flora and fauna. One critical observation of this study is the lack of connectivity between remnant ecological communities along the rivers and those in the interior of the City. This relates to the fragmented nature of the internal communities but it may also reflect a true spatial distinction between those two communities. The flora reflect this distinction and it is suggested that fauna are also distinct. Our understanding of the similarities or differences between the internal and foreshore bird assemblages needs to be rectified to best determine rehabilitation efforts in both regions. Management of perceived problem species should be proactive as the greening of the city proceeds.

Specific issues include;

- Control of Sea Gulls in both the internal and foreshore regions. Standing water bodies and barbecue areas are beacons to a number of species which may be aggressive towards local species. Signs should be erected at all locations where seagull may become intrusive. Such signs should indicate the importance to the local flora and fauna of seagull control.
- Similar actions should be undertaken for Kookaburras, Rainbow Lorikeets and Muscovy Ducks.
- Control of exotic mammals throughout the city. Rabbits need to controlled by an eradication program followed by monitoring at the eastern foreshores to prevent return.
- The subsidised sterilisation program for cats should be maintained and introduced for all domesticated exotic animals. The environmental as well as personal financial benefits should be more widely advertised. Information regarding the handling of native fauna, snake conservation and management, and contacts for juvenile or injured wildlife rehabilitation should be prepared and made easily available.
- A survey of the bird populations within precincts and around specific locations (e.g. Neil McDougall Park and certain Green Spaces, Goss Avenue and other internal remnant, Sir James Mitchell Park and other foreshore reserves. These surveys should be developed in conjunction with a volunteer network and aim to describe the seasonal dynamics of populations, aspects of their resource use etc. This will assist with rehabilitation of their habitat needs as a component of the greening process.
- A frog and reptile survey of parks and remnants should aim to describe the species present, their populations and habitat relationships.

Herbaceous and woody weeds and garden escapes should be controlled within remnant bushlands. In some situations this may include removal of these species from local streets (eg *Melia azedarach*). A public awareness campaign should be developed to encourage residents to contain environmental weeds. Such a campaign should include on-ground activities (eg clean up days, tree-for-tree replacement offers) and have community information resources available on the web.

The most important environmental weeds in South Perth are the herbaceous weeds the control of which is well established (Hussey et al. 1997, Scheltema & Harris 1995). Control methods should be environmentally aware – such advice also applies to management of adjacent lands. Priority species for control are listed below. An environmental weed management strategy with public involvement should be developed.

Table 18 Priority weed species in the City of South Perth

Species	
Acacia podalyrifolia	*Lupinus spp*
Arctotheca calendula	*Melia azedarach*
Arundo donax	*Oenothera spp*
Asphodelus fistulosis	*Orobanche minor*
Avena spp.	*Oxalis spp.*
Brassica tournefortii	*Paspalum spp.*
Cortaderia selloana	*Pelargonium capitatum*
Ehrharta spp.	*Pennisetum clandestinum*
Emex australis	*Polycarpon tetraphyllum*
Erodium botrys	*Raphanus raphanistrum*
Euphorbia spp.	*Ricinus communis*
Freesia sp.	*Romulea rosea*
Gazania linearis	*Schinus spp*
Geranium molle	*Stenotaphrum secundatum*
Gladiolus spp.	*Trachyandra divaricata*
Homeria spp	*Typha orientalis*
Leptospermum laevigatum	*Watsonia bulbillifera*

There is some debate over the benefits of using local species (or local populations of species) in rehabilitation works. While it is clear that species exotic to a region do not provide the same range and types of resources for local fauna – and may have other negative effects, the impact of using non-local populations as sources for propagation materials is poorly understood. In South Perth where both the fauna and flora of remnant bushlands are now fragments of historical occurrences, the use of such materials should not be discounted. Our knowledge of the genetic structures and reproductive biology of local species and populations is rudimentary thus the cost/benefit of any "local species only" strategy can not be determined. Caution is advised but pragmatism in the face of ongoing habitat degradation is required.

6.2 Water Sensitive Urban Design

Perth's climate is Mediterranean – dry, hot summers followed by cool wet winters. As Perth's population grows the pressures on water supply are increasing. This presents a number of problems and opportunities in managing stormwater during the winter months and maintaining landscaped areas during summer. Therefore, urban design should incorporate elements that conserve water in the landscape.

These design elements will reduce the requirements for reticulation and improve stormwater quality. Where possible, stormwater should be infiltrated on-site rather than conveyed through the drainage network to the Swan or Canning Rivers. Where possible, water sensitive design will create attractive use of water in the landscape.

Examples of suitable landscape treatments include redesigning drainage sumps to create seasonal wetlands using local native species. Other suitable treatments include removing wood lining from drains and recontouring drains to create attractive 'streamlines', again utilising local native species.

Water sensitive urban design requires consideration of the entire stormwater treatment train from the top of the catchment down. This may involve utilising engineering treatments such as trash racks and drainage separator units for removing rubbish and sediment. Generally though, there should be a preference for utilising our sandy soils of the Coastal Plain for filtering stormwater and biological treatment systems such as wetlands with appropriate native vegetation.

Exotic garden and turf plants require greater amounts of water over summer. This can lead to increased levels of runoff, which may contain significant levels of added fertilisers or other chemicals (Powell & Emberson 1996). Planting public and private parks and gardens with drought tolerant native and selective removal of turfed areas will reduce water use and associated runoff. COSP should adopt water-sensitive design principles as part of its park and gardens management. COSP should include water-sensitive garden design information within the environmental website and as a part of an information kit to residents.

6.3 Conservation and Rehabilitation

The *Green Plan* seeks to conserve existing bushland and rehabilitate native plants within the context of an inner urban society setting. It aims to achieve this by recognising 24 Greenways across the city. These Greenways are assemblages of remnant bushland, public gardens and parks, private gardens and parks, and COSP street trees. Separate recommendations target each component. Existing bushland management plans are supported.

The native seed orchard at Davilak Reserve should be maintained and expanded. Efforts should be made to expand the range of species used in rehabilitation works to include herbaceous species (eg ground orchids, Trigger Plants, Kangaroo Paws and their relatives etc.) Such efforts may require close liaison by COSP staff with native plant horticulturalists (eg Kings Park), Garden societies (eg Native Orchid Societies with tubers for sale), and developers (to remove plants in the path of destruction for relocation). Though such plants may not be local, the dearth of remnant vegetation beyond the southern foreshores probably discounts any negative effects.

COSP manage a large number of public gardens and parks. Many of these consist of large swathes of turf with minimal peripheral planting of trees while others more closely resemble a garden in layout. As part of the *Green Plan*, it is recommended that, where possible, native gardens be planted below existing park trees and non-essential grassed areas be converted to native garden. This will enhance native flora distribution and diversity while achieving reduced water usage. There is considerable scope for novel garden design within the large range of parks and gardens present. Just as Davilak Reserve is held up as an example of urban bushland rehabilitation, parks and gardens could be selected as examples of urban native garden renewal/expansion. A number of opportunities have been identified and include Collier Park Golf Course, Coolidge Reserve, McNabb Loop Reserve, and Sir James Mitchell Park.

The foreshores of South Perth have been identified as having regional ecological significance (*Bush Forever*) and being important components of Perth Greenways. COSP is urged to retain all foreshore remnants, build links between them and enhance the greenways linking to the internal remnants and open spaces. This will require coordination with landowners (particularly the Catholic Church) and should involve as large a spectrum of the community as possible – through conservation and neighbourhood groups, schools and expert advisers. A Plants-to-residents scheme should be developed and street tree enhancement programmes expanded.

All activities and ground works should be routinely incorporated into the management databases provided by this study. The web system included with this report provides the nucleus for the design of a COSP environmental website.

6.4 Street Trees within the Greenways Context

The extensive street tree system and detailed descriptive database has been used by this study to develop the Greenways. The composition of the system of street trees in COSP reflects historical trends in species selection. This has resulted in a system that is dominated by few species which are mostly exotic to the city. It is recommended that this composition be modified over time to increase the representation and diversity of local species. This can be done by natural attrition as well as active replacement of trees and expansion of the system. Proposed targets and timeframes are outlined below.

Table 19 Street Tree Composition

Date	Street Tree Composition (300 kms of roads)							
	Street Trees	Native Trees	Local Trees	Trees per Km	Natives Per Km	Locals Per Km	Local species richness	Local species equitability
2001	14,460	9,895	3,814	48.6	33.3	12.8	15	0.079
2002	14,700	10,500	4,200	49	35	14	15	-
2005	15,000	12,000	6,000	50	40	20	20	0.148
2010	15,000	12,000	9,000	50	40	30	20	0.268

Equitability represents the dominance of a particular species. A low index, eg. 0.079, indicates one species dominates the assemblage (eg *Agonis flexuosa* in the year 2001 assemblage of 15 species) while an index of 15 in 2001 would be completely even (see Begon *et al* 1986 for further information). Because of the dominance of *A. flexuosa* in the current local species assemblage, equitability may always be a low value unless *A. flexuosa* plants are removed and that is not recommended. There is only so much space for additional street trees and so the incorporation of new local plants will require attrition of existing trees. This process must be done in consultation with community and should target those species with undesirable properties (eg *Melia azedarach, Schinus* sps.) or which are over-represented (eg *Jacaranda mimosifolia, Lophostemon conferta*).

Local species which are candidate street trees and are not currently represented include *Actinostrobus* pyramidalis, *Allocasuarina fraseriana, Banksia grandis, Dryandra sessilis, Jacksonia spp., Melaleuca cuticularis* amongst others.

The system of Greenway nodes and links places a considerable importance on the composition of the street tree system. The role of the street tree network can be enhanced by strategic planting of understorey or partner-plants (tree/shrub combinations) where possible. It is not suggested that median strips be used for this purpose as a more contiguous crown system is required. To consolidate the street tree system public Greenspaces should be converted to native gardens/managed as native bushland. COSP is urged to adopt a policy of information dissemination to improve public awareness and involvement – complemented by "plants to residents" scheme as detailed below.

6.5 Extension

A major initiative of this study is to ensure the availability of information and other resources (eg conservation group) to the citizens of South Perth and other interested parties. This is achieved by the dual production of hardcopy documents and electronically accessible information via the internet. In addition, the website is based on Access databases which may be readily edited to include new and updated information. This study urges that this dual approach to information dissemination be adopted by COSP, developed and be incorporated into any future council-wide spatial management system.

Specific recommendations to facilitate information availability and increase public awareness/involvement include:

- Flora/fauna emblems – these can be used to create community involvement in the nomination and selection process. A sense of ownership can greater improve a sense of personal responsibility. This presents a clear avenue to include educational institutes.
- Green kit – to be provided to residents on request and to be available in an electronic form for wide dispersal. Such a kit would include horticultural information; a description of local environment; contacts details – including council, community groups, nurseries; regulatory requirements – pets, native fauna, weeds, chemicals, watering; etc.
- Web system – for interaction between individuals and groups/council; information exchange, education etc.

The table below indicates the relationship between some of the recommendations of this study and various audiences. By a multi-faceted approach the objectives of the COSP *Green Plan* can best be guaranteed.

Table 20 Community Involvement

Recommendation	Community Involvement	Educational Involvement	COSP Involvement	Research Involvement	Nonlocal/groups Involvement
Select floral/faunal emblem for city	Nomination and selection process	Nomination and selection process	Nomination and selection process	Nomination and selection process	Nomination and selection process
Build a local knowledge base for access by public	Web based information system, feedback, interaction	Web based information system, feedback, expertise	Link to corporate database via cadastre, maintenance	Development of database,	PR value for environment, additional funding
Develop education - applied research links with relevant institutions	Volunteers, local expertise, conservation teams	Applied research – birds, rehabilitation, seed orchard, conservation teams	Administration, organisation, funding	Birds again, fauna studies, Seed banks, propagation p2r	Funding
Create and distribute a new residents "Green Kit"	Volunteers, local community groups, preparation	Volunteers testing, preparation	Management, preparation, distribution	Nil	Funding
The City of South Perth supports local schools to protect and regenerate any bushland that remains on their land	Formation of community groups, think global – act local	Plants to schools and native garden landscape support, bushrangers	Administration, organisation, funding	Information, expert panel	Funding

6.6 Plants to Residents and Street Tree Enhancement

Plants to residents schemes have been recognised as major avenues by which a local government can bring about an improvement in its physical and biological environment. Such schemes are in use by Western Australian councils (e.g. City of Melville, Shire of Mundaring) and it is recommended that the City of South Perth establish a comparable approach. The scheme should mesh with COSP Street Tree management and expansion. It should aim to fulfil Greenways Objectives by ensuring that species offered to residents are local native species, with an appropriate mixture of species. *Agonis flexuosa*, which is the main street tree should not be offered. The species offered should be easily grown, be either trees or shrubs, and include a range of flowering times. This will ensure that the backyard flora of South Perth will provide richer food and habitat resources for native fauna across all seasons.

It is proposed that COSP adopt the following initial targets to be met within any future "State of the Environment" review timeframes. The increase in cover and diversity of flora should also focus on depauperate precincts and Greenways.

Annual targets

- Provide local species to 10% of total target audience;
- Provide local species to 25% of Greenways cadastre.

Preliminary cost estimates of such a scheme are provided below.

Table 21 Plants to Residents and Street Tree Enhancement - Cost Estimates

Target Area	Number of Cadastre (Approximate)	Cost estimate (assuming 75 cents per plan)
COSP	11800	$885 (10% of previous column)
Greenways	5200	$975 (25% of previous column)

The mechanism recommended for this initiative is a web-based request form which can viewed at the associated website (http://www.ozgis.com.au/). This request form accomplishes the following:

- Description of the local native plant species available as part of the scheme. The description to include horticultural information and a picture of the species.
- Local native plant request by resident – this request is validated by email, phone number and contact address details. These, together with a COSP rate notice ID, provide a degree of certainty that the request is not a hoax.
- Processing of the request identifies whether a street tree exists opposite the residents property and then advised them of the tree's description. If no tree is present the form asks the resident if they would like a street tree planted (location permitting).
- Invitation for the resident to become more involved in COSP environmental activities, links to information of interest.

The database constructed by the requests is dynamic and compatible with associated *Green Plan* databases and GIS themes. The database is monitored by related webpages which can be accessed by COSP staff. The resident information compiled provides a nucleus for community conservation groups.

6.7 Implementation Timeframes and Conclusion

A timeframe for the implementation of the *Green Plan* recommendations is presented below. This study is critically timed for the *South Perth State of the Environment* study – the two providing the core environmental information and planning framework for the City of South Perth. The *Green Plan* objectives should be re-assessed as part of any State of the Environment review.

Table 22 Green Plan Implementation Timetable

Year	Event
2001	Adoption of *Green Plan*
	SOE Assessment
2002	Local fauna surveys commence
	Plants to Residents and Street Tree Enhancement Schemes commence
	CEAG remodeled
	Native gardens in Greenways initiated
	Extension Schemes developed
	COSP Environmental Website established
2003	Assessment of all implemented *Green Plan* schemes and website
	Flora diversity schemes commence
2004	Local fauna surveys complete, environmental strategies developed
2005	Flora diversity schemes assessed and expanded
	Street Tree and Plants to Residents schemes assessed
	SOE Assessment

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Appendix 1 City of South Perth - Parks and Remnant Vegetation

Appendix 2 User Guide to Green Plan Website

WEB PAGE 1 – Home Page

South Perth Greenplan - Microsoft Internet Explorer

File Edit View Favorites Tools Help

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South Perth Greenplan

City of South Perth

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Welcome to the City of South Perth Green Plan website.

The Green Plan is a comprehensive inventory of vegetation across the City of South Perth. Specifically, the aims for the Green Plan are to:

- ensure the long term conservation of remnant bushlands, foreshore areas, wildlife corridors and other significant habitat;
- attempt to establish ecological links between significant habitat areas; restore and rehabilitate vegetation communities and ensure the long term viability of existing flora;
- maintain and increase the flora of the City, which is a predominant and attractive feature of the City of South Perth;
- educate the local community on vegetation management issues and foster its involvement in maintaining remnant bushlands, whilst encouraging local residents to participate in the regeneration or enhancement of public or private land;
- establish a baseline environment data set and overall vegetation inventory for the City of South Perth, which will act as a tool for environmental planning and management, and will also provide important information on the conservation status of vegetation communities;
- outline innovative schemes for complementing plantings on public land with planting on private land.

On this website you can find the Green Plan Report 2002 (3075kb PDF file), which is the basis of future biodiversity planning for the City of South Perth.

There are a number of databases, including:

- Remnant vegetation
- Parks and open spaces
- Street trees
- Overall vegetation cover for the City

The website also details plans for future biodiversity planting to enhance existing vegetation and create links between parks and open spaces, and natural vegetation (see 'Greenways').

This website is a resource for information on Aboriginal and European heritage sites in the City, sources of native plant stock, suitable plants for growing as street trees and for domestic gardens.

In time, the website will include modules to allow you to order street trees and a small number of plants for your garden (see 'Planting' page).

Done Internet

Description

The following are links to the various study areas of this document

Home Page	The Home Page describes the Green Plan and provides a link to a PDF version of this report and contact information for the City of South Perth
Overview	The Overview section provides a html version of the Summary of the Green Plan Report
Greenways	This section opens with a click able map of the Greenways that span the City of South Perth
Vegetation Cover	The Vegetation Cover section of the website provides detailed information and access to databases on the parks and open spaces, remnant vegetation, street trees and overall vegetation cover of the City. The final section demonstrates the breakdown of the vegetation cover across the precincts of the City and the mosaic image used to calculate vegetation cover.
Biodiversity	This page leads to a number of tables regarding the biodiversity of the City, including frogs, reptiles, mammals, birds and weeds.
Heritage	This page leads to a graphical display of vegetation change in two South Perth reserves from 1929 to 2000, along with information on Indigenous and European heritage
Planting	This page leads to information on planting native species in parks, local gardens, as street trees and sourcing native plants from nurseries and ordering plants under the City's Plants to Residents Scheme.
Recommendations	This section provides a summary of recommendations in the Green Plan

WEB PAGE 2- Overview

Description

Overview of Green Plan Report – html version of text of the report summary

WEB PAGE 3 - Parks and Open Spaces

Description

Greenways	Leads to a click able map of the Greenways

Click Greenways	Leads to description of Greenway, relevant recommendations and links to Remnant Vegetation, Parks and Open Spaces and Street Tree Boulevards relevant to Greenway.
Within Greenways page	Click on map to see detail of Greenway

WEB PAGE 4 - Vegetation Cover

Description

Types of vegetation cover	Opens page with headings Parks and Open Spaces, Remnant Vegetation, Street Trees and Vegetation Cover
Parks and Open Spaces	Opens a clickable map with list of parks across the City
Specific park	Aerial photo of park and details such as cadastre and other relevant information
Remnant Vegetation	Clickable map with remnant vegetation
Specific remnant	Aerial photo of remnant along with details such as cadastre and relevant management plan
Street trees	Access to street tree database through selecting particular streets or species. Summary of tree condition across City also available.
Vegetation Cover	Map showing relative vegetation cover for each precinct along with mosaic image used for calculating vegetation cover. Vegetation cover and area of precincts is shown in a table.

WEB PAGE 5 - Biodiversity

Description

Biodiversity data for the City	Leads to tables of biodiversity data for the City
Frogs	List of frog species found in the City
Reptiles	List of reptile species found in the City
Mammals	List of mammal species found in the City
Birds	List of bird species found in the City
Weeds	List of weeds found in the City of South Perth

WEB PAGE 6 - Heritage

Description

Natural, Indigenous and European Heritage

Vegetation History	Graphical display of vegetation history at two sites across the City from 1929 to 2000

Indigenous locations	Table of information on sites of Indigenous heritage value
Non-indigenous locations	Table of information on non-indigenous heritage sites throughout the City

WEB PAGE 7 - Planting	
Description	
Planting information	
Local Native Planting Guide	Details of local native species, the soil type they prefer and how they are most easily propagated.
Native Garden Planting Guide	Lists of plants for general garden, native garden and local aquatic plants.
Street Tree Planting Guide	List of suggested species for general and greenways planting
Native Plant Sources	Locations, contact details and brief description of the products of specialist native plant nurseries.
Plants to Residents	Details of native plants that are available to residents as part of the Plants to Residents Scheme

WEB PAGE 8 - Recommendations	
Description	
Recommendations	
General	General recommendations in the report
Specific	Site specific recommendations.
Research	Recommendations for further research
Extension	Recommendations suggesting public education
Greenways	Recommendations specific to greenways
Greenways site specific	Recommendations specific to sites within greenways

Appendix 3 Content of South Perth Green Plan Data Bases

Database	Description
Biblio.mdb	Documents of relevance, including reports, rehabilitation and weed control literature, environmental guides etc.
Heritage.mdb	Attributed indigenous and non-indigenous heritage locations in South Perth
Parks.mdb	Attributed cosp parks information
Recommend.mdb	Listing of recommendations from this study
Rehab.mdb	Rehabilitation guidelines for species and locations in South Perth
Species.mdb	Species database with simple descriptions
Spremveg.mdb	Attributed native vegetation remnants information
Spsttrees.mdb	Attributed COSP Street Tree and Boulevard information
Weeds.mdb	Control guidelines for weed species in South Perth

Biblio.mdb

Brief Description

Documents of relevance, including reports, rehabilitation and weed control literature, environmental guides etc. The indexing fields are Bibid and Siteid. Bibid indexes the literature while Siteid indexes the remnant/parks sites from the relevant databases.

Tables

Index	Index table containing Bibid and Siteid
Main	Index table for Remnants and Parks
Refs	full citation for each reference

Queries

Query1	a combination query for the above 3 tables

Related Databases

Parks, Spremveg, Spsttrees, Rehab, Weeds

Heritage.mdb

Brief Description

Attributed indigenous and non-indigenous heritage locations in South Perth.

Tables

Aboriginal	full details of Indigenous Heritage sites as provided by Department of Aboriginal Affairs. Descriptive fields are expanded in the Indig_key Table below.
AHC	Australian Heritage Commission listings for South Perth. Ahcid is their index number. Address is as provided. Where possible this list has been linked to the GIS cadastre coverage as below.
Cadahc	The GIS linking table for AHC data. Cadastral Pin number (A_Pin) and AHCID are the linking index fields.
Indig_key	Brief descriptive expansion of Indigenous heritage types

Queries

Query1	Combines AHC and Cadahc into the one table

Related Databases

All spatial databases may be related through the Pin number

Parks.mdb

Brief Description

Attributed COSP Parks information. The indexing fields are Spid and Siteid. Spid indexes the Species Tables while Siteid indexes the remnant/parks sites. As this database currently stands it includes tables from the Species, Weeds and Rehab databases below – this is to enable simplified web access.

Tables

Greenway	table relating Greenwayid with greenway name and description
Main	the main descriptive table for Parks. Siteid is the index. Fields include park name, the name of a linked aerial photograph, park usage information, vegetation distribution
Manage	relevant management recommendations indexed by Siteid and Bibid (see Biblio.mdb above)
Parkgw	indexing table for Siteid and Greenwayid
Site	indexing table for Siteid and cadastral Pin number. Allows GIS linkage.
Sitelist	plant species recorded for individual parks. Indexed by Siteid and Spid
Usage	park usage – Siteid is the index
Rehab Database Tables include	planting, habitat, rehabdesc, source - see below for explanation.
Species Database Tables include	species - see below for explanation.
Weeds Database Tables include	details, form, habit, locate, priority, seeds, spread - see below for explanation.

Queries

Query1 – combines main, usage and site above
Query2 – produces a list of species for sites
Query3 – produces rehabilitation details for sites
Query4 – produces weed control details for sites
Query5 – links parks with Greenways

Related Databases

All spatial databases may be related through the Pin number
Weeds, Rehab and Species database may be related through the Spid number
Greenways are linked by the Greenwayid number

Recommend.mdb

Brief Description

Listing of recommendations from this study and from previous studies in South Perth.

Tables

Boullink	links recommendations to individual Boulevards by Boulid
Gwlink	links recommendations to individual Greenways by Siteid
Main	indexed by Recid, this table contains the name and description of each recommendation classified by Type (see below)
Remparklink	links recommendations to individual Parks and Remnants by Siteid
Type	Recommendation types

Queries

Boulquery	combination table for Boulevards
Gwquery	combination table for Greenways
Query1	combination table with type classification
Rempkquery	combination table for Parks and Remnants

Related Databases

All spatial databases may be related through the Siteid or Boulid

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Rehab.mdb

Brief Description

Rehabilitation guidelines for species and locations in South Perth.

Tables

Form	plant growth habit descriptors
Habit	life history descriptors
Locate	habitat descriptors
Planting	propagation descriptors
Habitat	habitat descriptors
Rehabdesc	main table indexed by Spid and with other descriptors coded – see tables above and below
Source	propagule sources

Queries

None

Related Databases

All environmental databases may be related through the Spid number

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Species.mdb

Brief Description

Species database with simple descriptions

Tables

Species	species table with simple desciptions – indexed by Spid

Queries

None

Related Databases

All environmental databases may be related through the Spid number

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Spremveg.mdb

Brief Description

Attributed native vegetation remnants information. The indexing fields are Spid and Siteid. Spid indexes the Species Tables while Siteid indexes the remnant/parks sites. As this database currently stands it includes tables from the Species, Weeds and Rehab databases below – this is to enable simplified web access.

Tables

Greenway	table relating greenwayid with greenway name and description
Main	the main descriptive table for Remnants. Siteid is the index. Fields include Remnant name, the name of a linked aerial photograph, Remnant usage information, vegetation distribution
Manage	relevant management recommendations indexed by Siteid and Bibid (see Biblio.mdb above)
Remgw	indexing table for Siteid and Greenwayid
Site	indexing table for Siteid and cadastral Pin number. Includes simple descriptors of the remnant vegetation present and allows GIS linkage.
Sitelist	plant species recorded for individual parks. Indexed by Siteid and Spid
Usage	park usage – Siteid is the index
Rehab Database Tables include	planting, habitat, rehabdesc, source - see below for explanation.
Species Database Tables include	species - see below for explanation.
Weeds Database Tables include	details, form, habit, locate, priority, seeds, spread - see below for explanation.

Queries

Query1 – combines main, usage and site above
Query2 – produces a list of species for sites
Query3 – produces rehabilitation details for sites
Query4 – produces weed control details for sites
Query5 – links remnants with Greenways

Related Databases

All spatial databases may be related through the Pin number
Weeds, Rehab and Species database may be related through the Spid number
Greenways are linked by the Greenwayid number

Spsttrees.mdb

Brief Description

Attributed COSP Street Tree and Boulevard information.

Tables

Boulgw	links boulevards to Greenways
Localnative	boulevard summary of local and native composition
Monoboul	monospecific (>80%) boulevard summary
Stnames	street names (Stid is indexed to Sttrees table)
Stnumb	street numbers
Sttrees	main table with Spid the indexing field, linked to other tables in the database by various indices
Suburb	suburb names (Sid is indexed to Sttrees table)
Ward	ward names (Wid is indexed to Sttrees table)

Queries

Boulquery	boulevard query for natives, locals etc.
Search	combination query for many of the descriptive tables above

Related Databases

Recommend.mdb

Weeds.mdb

Brief Description

Control guidelines for weed species in South Perth.

Tables

Details	main table indexed by Spid and with other descriptors coded – see tables below
Form	Plant Growth Habit Descriptors
Habit	life history descriptors
Locate	habitat descriptors
Priority	ranking of weeds for control
Seeds	propagation forms
Spread	classified invasion forms

Queries

Query1	combinatorial query

Related Databases

All environmental databases may be related through the Spid number

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Appendix 4 South Perth Greenplan GIS Coverages

All GIS coverages are in Mapinfo Tab format unless otherwise stated. Map projection is AMG Zone 50.

1. Primary Coverages

(a)	Remveg	The primary remnant vegetation coverage
(b)	Remcad	Above coverage intersected with cadastre
(c)	Parkcad	COSP parks intersected with cadastre
(d)	Dolaparkcad	General Parks coverages intersected with cadastre
(e)	Strees	Street Trees
(f)	Boulevard	Boulevards derived by a 5m buffer around every street tree
(g)	Monoboul	Extracted boulevards which are essentially monospecific
(h)	Greenspace	Classified aerial photograph - Windows Bitmap image, rectified
(i)	Greenways	Simple Greenways lines
(j)	Aboriginal	AAD heritage coverage
(k)	Cadahc	AHC data related to cadastral Pin number

2. Accessory Coverages

(a) Linework

- COSP — COSP boundaries
- Precincts — COSP Precinct boundaries
- Roads — Roads in the City of South Perth
- Cadastre — Cadastre in the City of South Perth
- LGA — Contextual LGA boundaries

(b) Images

- Southperth – Year 2000 aerial photograph (ECW format), rectified
- 1929 – Year 1929 aerial photograph (ECW format)
- 1948 – Year 1948 aerial photograph (ECW format)
- 1959 – Year 1959 aerial photograph (ECW format)
- 1969 – Year 1969 aerial photograph (ECW format)
- 1978 – Year 1978 aerial photograph (ECW format)
- 1988 – Year 1988 aerial photograph (ECW format)

Appendix 5 Vegetation Condition Classes

Pristine	Natural vegetation in good health. All vegetation layers are intact. Evidence of continuing vegetative and seedling recruitment (esp Banksias). Little damage by galls (on trees and shrubs) or mistletoe (on trees).
Very Good	Evidence of localised low level damage to otherwise healthy bush. Recruitment should be apparent. Weed and grazing damage is confined (<20% of area). Some modification to vegetation structure due to changes in fire regimes may be apparent. Little evidence of logging or fire wood collection.
Good	Evidence of localised high level damage to otherwise low-level damaged bush. Recruitment is localised and the populations of some species may be senescent. Weed and grazing damage is apparent in <50% of the area. Modification to vegetation structure due to changes in fire regimes may be apparent. Gall and mistletoe damage may be apparent. Evidence of logging or fire wood collection.
Degraded	Widespread high level damage. Recruitment is disrupted and most woody species appear senescent. Weed and grazing damage may be apparent throughout the area. Modification to vegetation structure due to changes in fire regimes may be apparent. Locally some strata may be absent. Gall and mistletoe damage may be apparent. Evidence of logging or fire wood collection.
Very Degraded	Widespread high level damage. Recruitment is disrupted and most woody species appear senescent. Weed and grazing damage may be apparent throughout the area. Modification to vegetation structure due to changes in fire regimes may be apparent. Widespread loss of vertical strata. Gall and mistletoe damage may be apparent. Evidence of logging or firewood collection.
Damage	(categorisation is dependent upon the severity and duration of the disturbing force)
High level	grazing (domestic and feral), logging, clearing and excavation, die-back, salinisation or other water table modification, road works, flower picking, major structures (e.g. managed or fenced areas), mowing, car bodies.
low level	dumping (household, garden etc.), minor structures (e.g. sheds), fire wood collection, weed infestation, modified fire regime.

Appendix 6 Common Names Of Species Mentioned In The Report

Scientific Name	Common Name
Acacia cyclops	Red-eyed Wattle
Actinostrobus pyramidalis	Swamp Cypress
Adenanthos cygnorum	Woolly Bush
Agonis flexuosa	Weeping Peppermint
Allocasuarina fraseriana	Common Sheoak
Arctotheca calendula	Capeweed
Arundo donax	Giant Reed
Asphodelus fistulosis	Wild Onion
Avena barbata	Bearded Oat
Avena fatua	Wild Oat
Avena sativa	Oats
Banksia attenuata	Candle Banksia
Banksia grandis	Bull Banksia
Banksia ilicifolia	Holly-leafed Banksia
Banksia menziesii	Firewood Banksia
Banksia prionotes	Acorn Banksia, Saw-toothed Banksia
Baumea articulata	Jointed Twig Rush
Baumea juncea	Bare Twig Rush
Brassica tournefortii	Mediterranean Turnip
Callitris preissii	Rottnest Island Pine
Casuarina obesa	Swamp Sheoak
Cortaderia selloana	Pampas Grass
Corymbia calophylla	Marri
Cynodon dactylon	Couch
Dryandra sessilis	Parrotbush
Ehrharta calycina	Veldt Grass
Ehrharta longiflora	Annual Veldgrass
Emex australis	Doublegee
Eragrostis curvula	Weeping Love Grass
Eragrostis sp.	Lovegrass
Erodium botrys	Long Storksbill
Eucalyptus gomphocephala	Tuart
Eucalyptus marginata	Jarrah
Eucalyptus rudis	Flooded Gum
Eucalyptus todtiana	Coastal Blackbutt
Euphorbia peplus	Petty Spurge
Euphorbia terracina	Geraldton Carnation Weed
Exocarpos sparteus	Broom Ballart
Ferraria crispa	Black Flag
Freesia sp.	Freesia
Gazania linearis	Gazania
Geranium molle	Cranesbill
Gladiolus caryophyllaceus	Wild Gladiolus
Gladiolus undulatus	Wavy Gladiolus

Cont.....

Scientific Name	Common Name
Homeria breyniana	Cape Tulip
Homeria flaccida	One-leaf Cape Tulip
Jacaranda mimosifolia	Jacaranda
Jacksonia furcellata	Grey Stinkwood
Jacksonia sternbergiana	Green Stinkwood
Leptospermum laevigatum	Victorian Tea Tree
Lolium perenne	Perennial Rye Grass
Lolium rigidum	Annual Rye Grass
Lophostemon conferta	Queensland Box
Lupinus spp.	Lupin
Melaleuca cuticularis	Saltwater Paperbark
Melaleuca lanceolata	Rottnest Island Tea-tree
Melaleuca lateritia	Robin-redbreast Bush
Melaleuca leucadendra	Weeping Paperbark
Melaleuca preissiana	Stout Paper Bark
Melaleuca rhaphiophylla	Freshwater Paperbark
Melia azedarach	Cape Lilac
Nuytsia floribunda	WA Christmas Tree
Oenothera spp.	Evening Primrose
Orobanche minor	Lesser Broomrape
Oxalis corniculata	Yellow Wood Sorrel
Oxalis glabra	Finger-leaf Oxalis
Oxalis pes-caprae	Soursob
Oxalis purpurea	Purple Wood Sorrel
Paspalum dilatatum	Paspalum
Paspalum vaginatum	Paspalum
Pelargonium capitatum	Rose Pelargonium
Pennisetum clandestinum	Kikuyu
Quercus robur	English Oak
Quercus sp.	species of Oak
Quercus suber	Cork Oak
Raphanus raphanistrum	Wild Radish
Ricinus communis	Castor Oil Plant
Romulea rosea	Guildford grass
Schinus spp.	Pepper Tree
Stenotaphrum secundatum	Buffalo Grass
Trachyandra divaricata	Onion Weed
Typha orientalis	Bulrush
Watsonia bulbillifera	Watsonia
Xanthorrhoea preissii	Blackboy

Appendix 7 Fauna of South Perth

Information obtained from previous fauna surveys within South Perth. Species with an asterisk are feral species with established populations.

Frogs

Scientific Name	Common Name
Helioporus eyrei	Moaning Frog
Crinia georgiana	
Limnodynastes dorsalis	Pobblebonk
Litoria adelaidensis	Slender Tree Frog
Litoria moorei	
Myobatrachus gouldii	Turtle Frog
Ranidella glauerti	

Reptiles

Scientific Name	Common Name
Pseudonaja affinis	Dugite
Tiliqua rugosa	Bobtail
Pogonia minor	Bearded Dragon
Leiolopisma trilineatum	Swamp Skink
Cryptoblepharus plagiocephalus	Fence Skink
Menetia greyii	Grey's Skink
Hemiergis peronii	Yellow Bellied Skink
Ctenotus leseurii	Striped Skink

Mammals

Scientific Name	Common Name	Comment
Cercartetus concinnus	South-western Pygmy Possum	historical records, extinct?
Chalinolobus gouldii	Gould's Wattle Bat	present?
Dasyurus geoffroii	Native Cat	historical records, extinct?
Eptesicus regulus	Bat	present?
Isoodon obesulus	Short-nosed Bandicoot	confined to foreshores
Macropus fuliginosus	Western Grey Kangaroo	historical records, extinct?
Macropus irma	Brush Wallaby	historical records, extinct?
Rattus fuscipes	Southern Bush Rat	confined to foreshores
Hydromys chrysogaster	Water Rat	confined to foreshores
Trichosurus vupecula	Brush-tailed Possum	confined to foreshores
*Felis cattus**	Feral Cat	noxious in the bush
*Vulpes vulpes**	Fox	noxious in the bush
*Mus musculus**	House Mouse	noxious in the bush
*Rattus rattus**	Black Rat	noxious in the bush
*Rattus norvegicus**	Brown Rat	noxious in the bush
*Oryctolagus cuniculus**	Rabbit	noxious in the bush

Birds

Scientific Name	Common Name
Tachybaptus novaehollandiae	Australasian Grebe
Anas rhynchotis	Australasian Shoveler
Falco cenchroides	Australian Kestrel
Gymnorhina tibicen	Australian Magpie
Pelecanus conspicillatus	Australian Pelican
Corvus coronoides	Australian Raven
Tadorna tadornoides	Australian Shelduck
Cygnus atratus	Black Swan
Coracina novaehollandiae	Black-faced Cuckoo-shrike
Artamus cinereus	Black-faced Woodswallow
Himantopus himantopus	Black-winged Stilt
Oxyura australis	Blue-billed Duck
Lichmera indistincta	Brown Honeyeater
Hydroprogne caspia	Caspian Tern
Tringa hypoleucos	Common Sandpiper
Sterna hirundo	Common Tern
Sterna bergii	Crested Tern
Anhinga melanogaster	Darter
Gallinula tenebrosa	Dusky Moorhen
Fulica atra	Eurasian Coot
Cecropis ariel	Fairy Martin
Cacatua roseicapilla	Galah
Phalacrocorax carbo	Great Cormorant
Egretta alba	Great Egret
Calidris tenuirostris	Great Knot
Cracticus torquatus	Grey Butcherbird
Rhipidura fuliginosa	Grey Fantail
Pluvialis squatarola	Grey Plover
Anas gibberifrons	Grey Teal
Poliocephalus poliocephalus	Hoary-headed Grebe
Dacelo novaeguineae *	Laughing Kookaburra
Streptopelia senegalensis	Laughing Turtle-Dove
Phalacrocorax sulcirostris	Little Black Cormorant
Cacatua pastinator	Little Corella
Egretta garzetta	Little Egret
Megalurus gramineus	Little Grassbird
Phalacrocorax melanoleucos	Little Pied Cormorant
*Cairina moschata**	Muscovy Duck
Biziura lobata	Musk Duck
Phylidonyris novaehollandiae	New Holland Honeyeater
Pandion haliaetus	Osprey
Anas superciliosa	Pacific Black Duck
Larus pacificus	Pacific Gull
Phalacrocorax varius	Pied Cormorant
Porphyrio porphyrio	Purple Swamphen

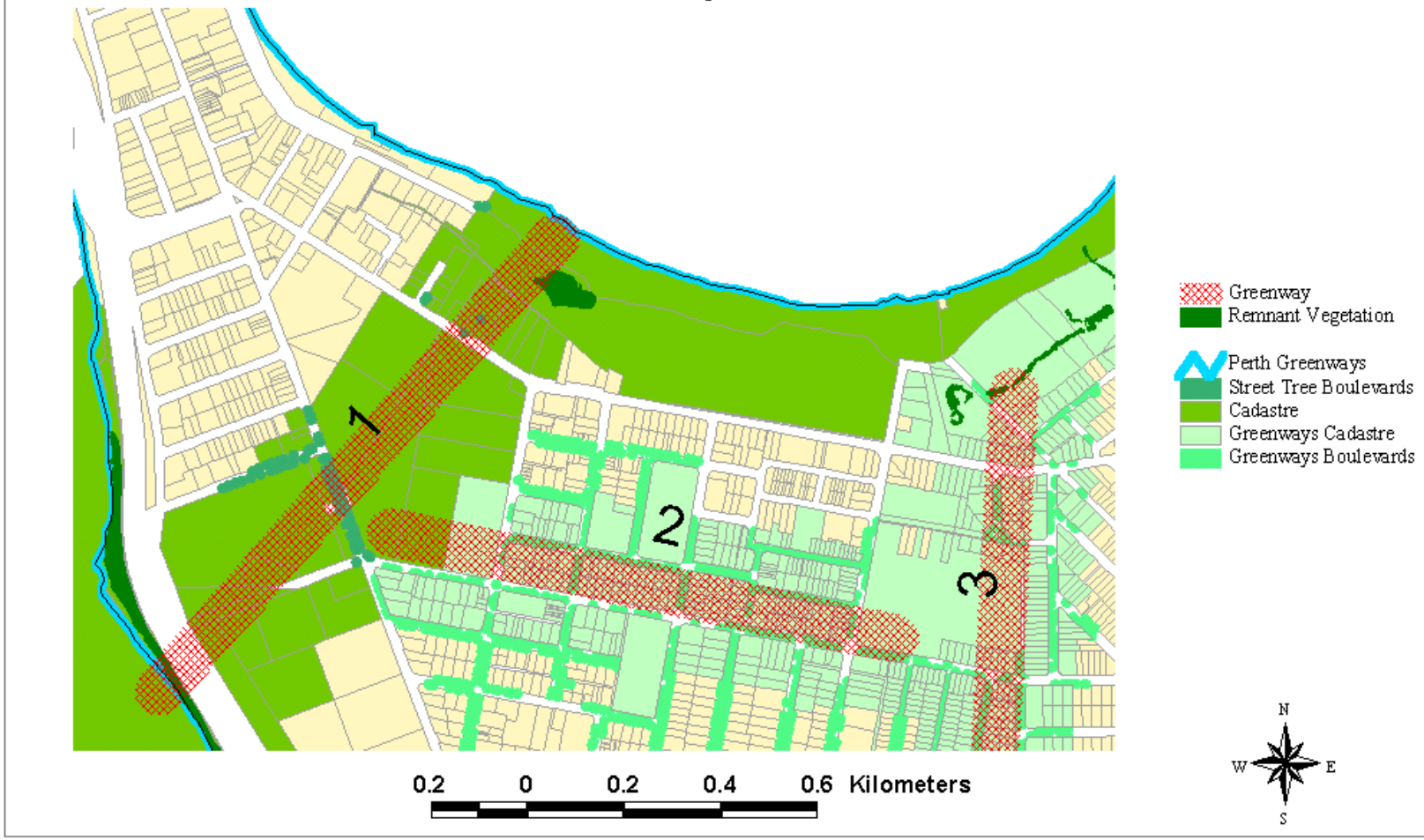
Cont...

Scientific Name	Common Name
Merops ornatus	Rainbow Bee-eater
*Trichoglossus haematodus**	Rainbow Lorikeet
Anthochaera carunculata	Red Wattlebird
Charadrius ruficapillus	Red-capped Plover
Calidris ruficollis	Red-necked Stint
Anthus novaeseelandiae	Richard's Pipit
Arenaria interpres	Ruddy Turnstone
Halcyon sancta	Sacred Kingfisher
Calidris acuminata	Sharp-tailed Sandpiper
Larus novaehollandiae	Silver Gull
Zosterops lateralis	Silvereye
Lichenostomus virescens	Singing Honeyeater
Ninox novaeseelandiae	Southern Boobook Owl
Malurus splendens	Splendid Fairy-wren
Pardalotus punctatus	Spotted Pardalote
Threskiornis spinicollis	Straw-necked Ibis
Pardalotus striatus	Striated Pardalote
Cecropis nigricans	Tree Martin
Hirundo neoxena Welcome	Swallow
Gerygone fusca Western	Gerygone
Haliastur sphenurus	Whistling Kite
Haliaeetus leucogaster	White-bellied Sea-Eagle
Phylidonyris nigra	White-cheeked Honeyeater
Ardea novaehollandiae	White-faced Heron
Rhipidura leucophrys	Willie Wagtail
Platalea flavipes	Yellow-billed Spoonbill
Acanthiza chrysorrhoa	Yellow-rumped Thornbill

Appendix 8 Greenways Detail Maps

ID	Name	Description
ID	Name	Description
1	Sir James Mitchell Park – Milyu Nature Reserve	Connects the northern and western foreshores (Perth Greenways) via the Zoo and Richardson Park.
2	Richardson Park - Wesley College	Connects Richardson Park through to Wesley College along Angelo St
3	Sir James Mitchell Park - Ernest Johnston Park	Connects Sir James Mitchell Park, Coolidge Park, Wesley College and Ernest Johnston Park
4	Ernest Johnston Park - Agriculture Department	Connects Ernest Johnston Park - Agriculture Department/ Kensington Bushland (Bush Forever Site), crosses Canning Highway
5	Ernest Johnston – Collier Primary School	Connects Ernest Johnston – Collier Primary School, crosses Canning Highway
6	Primary School - Penrhos College	Connects Monash Ave. Primary School to Penrhos College, bounded by Throssel and Murray Streets
7	Primary School - Agriculture Department	Connects Monash Ave. Primary School to Agriculture Department/Kensington Bushland along Monash Av
8	Sir James Mitchell Park - Kensington Primary School	Connects Sir James Mitchell Park and Kensington Primary School
9	Kensington Primary School - Agriculture Department	Connects Kensington Primary School and Kensington Bushland.
10	Milyu Nature Reserve - Ernest Johnston Park	Connects Milyu Nature Reserve, Royal Perth Golf Course and Ernest Johnston Park along South Terrace, crosses Kwinana Freeway.
11	Royal Perth Golf Club - Como Primary School	Connects the Royal Perth Golf Club and Como Primary School, west of Labouchere Rd
12	Como Primary School - Penrhos College	Connects Como Primary School and Penrhos College, crossing Canning Highway
13	Como Primary School - Neill McDougal Park	Connects Como Primary School, Coolidge Reserve and Neill McDougal Park, crosses Canning Highway
14	Neill McDougal Park - Penrhos College	Connects Penrhos College, Coolidge Reserve and Neill McDougal Park
15	Neill McDougal Park - Western Foreshore	Connects Neill McDougal Park and the Western Foreshore - a Perth Greenways Link
16	Neill McDougal Park - Manning Primary School	Connects Neill McDougal Park, Davilak Reserve and Manning Primary School Bushland, crosses Manning Rd
17	Manning Primary School - Western Foreshore	Connects Manning Primary School, Mount Henry Open Space and the Western Foreshore (Perth Greenways), crosses Kwinana Freeway
18	Manning Primary School - Trinity Playing Fields	Connects Manning Primary School and Trinity Playing Fields, bounded by Bradshaw-Conochie Crescent
19	Trinity Playing Fields - Como High School	Connects Como High School, Koonawarra and Goss bushlands to Trinity Playing Fields, crosses Manning Rd
20	Aquinas College - Challenger Ave. Park	Connects Mt Henry Spit bushlands (Perth Greenways), Aquinas College through to Challenger Avenue Park
21	Salter Point Foreshore - Trinity Playing Fields	Connects Salter Point Foreshore (Perth Greenways), Challenger Avenue Park and Trinity Playing Fields, along Elderfield Rd.
22	Waterford Foreshore - Karawara Park	Connects Waterford Foreshore (Perth Greenways), Bodkin Park and Karawara Park, west of Kent Street, crosses Manning Rd
23	George Burnett Park - Clontarf College	Connects Goss bushlands, George Burnett Park and Clontarf College (Perth Greenways Link), south of Manning Road
24	Karawara Park - Agriculture Department	Connects Karawara Park, Collier Park Golf Course and Kensington Bushlands (Perth Bushplan site), west of Kent Street

Greenway 1 Detail



Greenway 1: Sir James Mitchell Park - Milyu Nature Reserve

Remnant Vegetation
- Milyu Native Reserve
- Western Foreshore

Parks and Open Spaces
- Richardson Park
- Sir James Mitchell Park

Street Tree Boulevards
28 63 72 79 114 134 148 150 215

Note: Red Boulevards are > 80% native species
Blue Boulevards are > 80% local species
Bold Boulevards are > 80% monospecific

Recommendations

Green Plan

- Expand native garden planting in Richardson Park

Remnant Vegetation
Milyu Native Reserve (this is a subset of recommendations)

Management Plan Recommendations

- Protect and enhance areas with native species
- Provide visitors with opportunities to observe and increase their knowledge of flora, fauna and habitats
- Protect flora, fauna and habitats from pets, weeds, wildfires or any other physical disturbance
- Local Govt authorities should identify, manage and protect Greenways
- The establishment of Greenways will require the protection and management of existing vegetation as well as revegetation
- The use of local native species in Greenways should be encouraged. Re-vegetation projects should ensure species and structural diversity be maintained

Greenplan Recommendations

- None

Western Foreshore (this is a subset of recommendations)

Management Plan Recommendations

- Retain dead tree limbs for fauna habitats and create additional bird habitat with local native species plantings (MRWA/COSP)
- Group trees to retain and frame views and to provide shade and shelter (COSP/MRWA)
- Select shade trees from the species lists provided and plant in recreation areas at Narrows, Como and Scouts (COSP/MRWA)
- Plant low maintenance areas with local native species (MRWA)

- Monitor Veldt Grass each year. Control with Fusilade (COSP)
- Review and modify the MRWA landscape plan (1989) in accordance with the Western Foreshore Mgt Plan (1993) (MRWA/COSP)
- Mimimise or prevent native vegetation being removed or damaged by reserve maintenance or visitor development facilities
- Protect and enhance areas with native species
- Locate important flora and fauna habitats, priority species and fire sensitive species and develop management recommendations for their conservation
- Provide visitors with opportunities to observe and increase their knowledge of flora, fauna and habitats
- Protect flora, fauna and habitats from pets, weeds, wildfires or any other physical disturbance

Greenplan Recommendations

- None

Parks and Gardens

Richardson Park

Management Plan Recommendations

- Augment existing landscape features with local native species

Greenplan Recommendations

- Expand native garden planting in Richardson Park

Sir James Mitchell Park

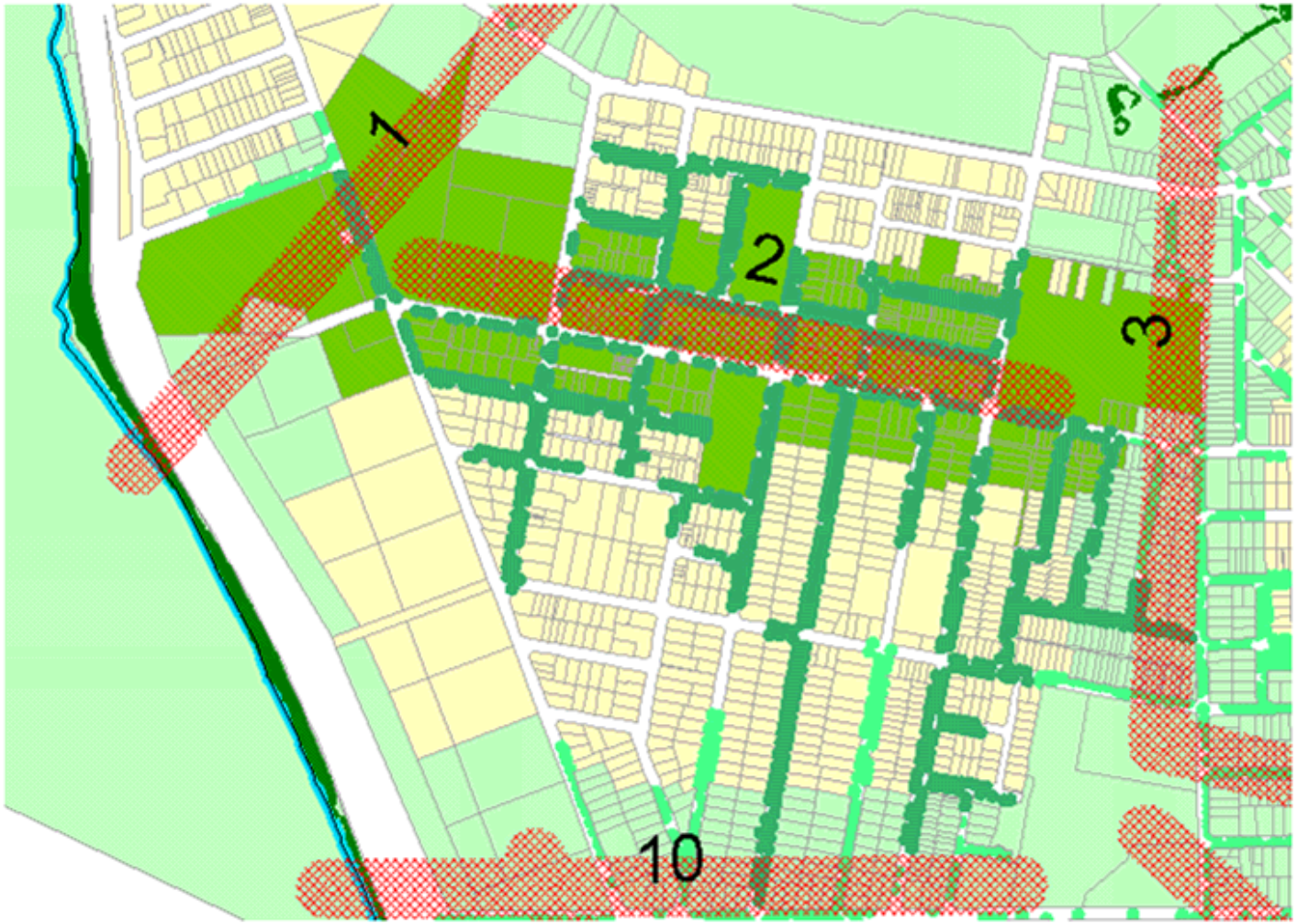
Management Plan Recommendations (this is a subset of recommendations)

- Augment existing landscape features with local native species
- Accept the "Revised Tooby plan - 1987" in respect to the number of trees in the area covered by that plan
- Trees planted in the area covered by the "Revised Tooby Plan - 1987" be planted in elliptical rows perpendicular to the river
- SJMPCAG consult residents whose views may be affected and advise council on the placement of these trees
- A landscape plan be developed in areas not covered by the "Revised Tooby Plan -1987" to give maximum benefit to park users in those areas and minimise obstruction of views
- SJMPCAG consult residents whose views may be affected and advise council on the implementation of the landscape plan for areas not covered by the "Revised Tooby Plan - 1987"
- Local provenance E. rudis and other endemic trees be planted within the park except in areas whose character is currently defined by other species or landscape elements
- Trees of endemic species be planted as an entry statement in Coode St, and to provide shade in car parks and roadside parking areas
- The M. rhaphiophylla/E. rudis community and the M. rhaphiophylla Grove be reinforced and maintained with suitable endemic trees
- A weed management strategy to be developed for the M. rhaphiophylla groves
- Conduct an environmental assessment and develop a management plan for the lake system

Greenplan Recommendations

- Expand native species plantings in Sir James Mitchell Park
    - This park is of regional significance but has a poor representation of native species
- Interpretative signs be installed at Sir James Mitchell Park and Neil McDougall Park
    - To inform people of the flora and fauna found there, domestic animal control, no feeding the birds and measures that will improve the lakes' water quality
- Consideration be given to enhancing the melaleuca remnants at Sir James Mitchell Park
    - Through re-battering and planting to create groves similar to the grove that is currently under rehabilitation

Greenway 2 Detail



Greenway
Remnant Vegetation

Perth Greenways
Street Tree Boulevards
Cadastre
Greenways Cadastre
Greenways Boulevards

0.2 0 0.2 0.4 0.6 Kilometers

N
W
E
S

Greenway 2: Richardson Park – Wesley College

Remnant Vegetation

- None

Parks and Open Spaces

- Richardson Park

Street Tree Boulevards

132 145 150 180 187 188 198 201 213 215 219 221 222 223 224 225 228 230 231 232 236 237 241 242 246 250 257 258 259 260 261 264 266 272 275 279 292 302

Note: Red Boulevards are > 80% native species
Blue Boulevards are > 80% local species
Bold Boulevards are > 80% monospecific

Recommendations

Green Plan

- Expand native garden planting in Richardson Park
- South Perth PS be invited to participate in greenways enhancement programme
- Wesley College be invited to participate in greenways enhancement programme
- Expand native/local species street tree plantings along Angelo Street

Remnant Vegetation

None

Parks and Gardens

Richardson Park

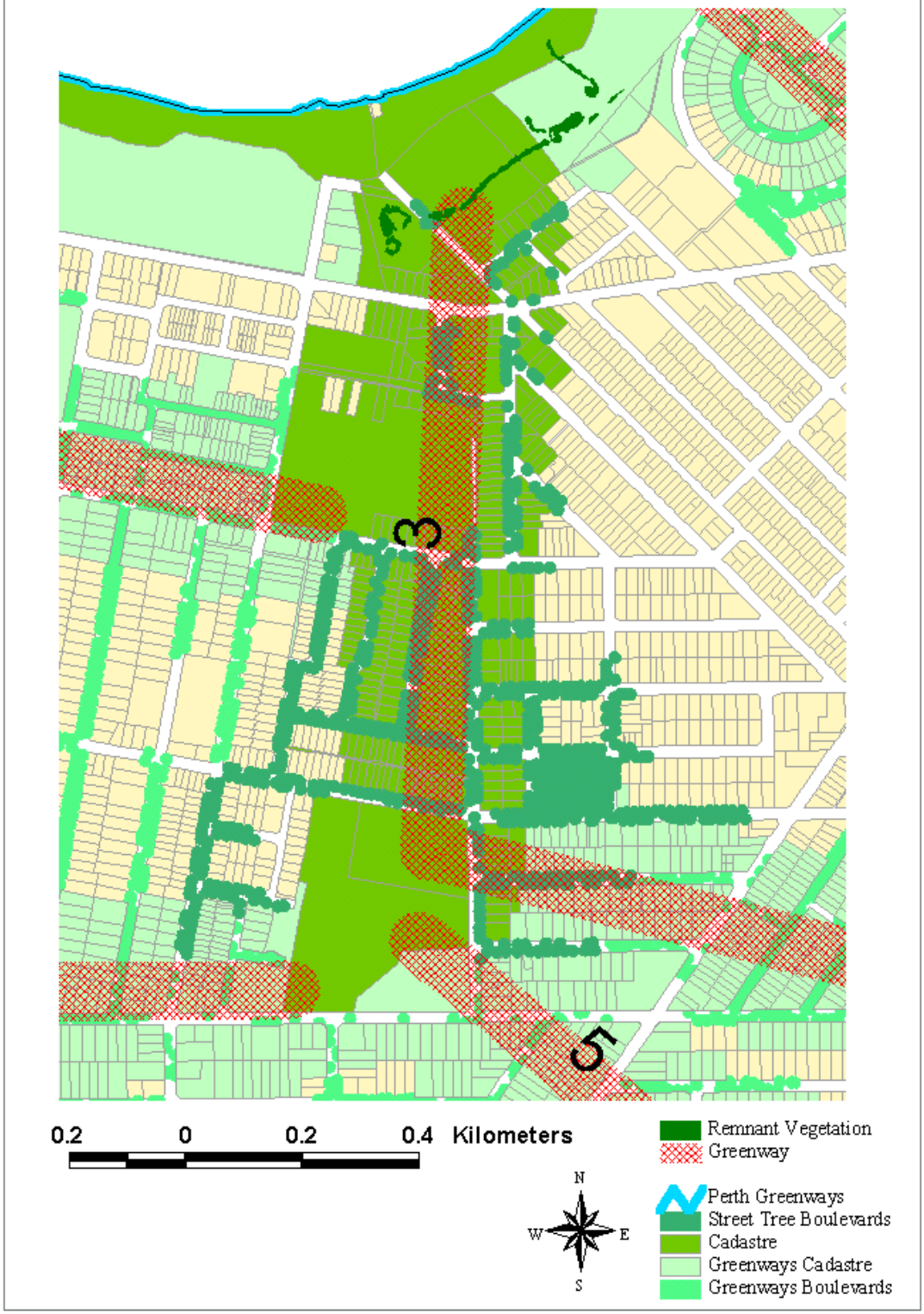
Management Plan Recommendations

- Augment existing landscape features with local native species

Greenplan Recommendations

- Expand native garden planting in Richardson Park

Greenway 3 Detail



Greenway 3: Sir James Mitchell Park – Ernest Johnston Park

Remnant Vegetation

- None

Parks and Open Spaces

- Clydesdale
- Ernest Johnson
- Sir James Mitchell Park

Street Tree Boulevards

103 104 113 137 152 154 165 168 174 176 191 195 205 214 240 251 255 274 279 287 295 298 302 316 317 353 360 373 388 402 420 425

Note: Red Boulevards are > 80% native species
Blue Boulevards are > 80% local species
Bold Boulevards are > 80% monospecific

Recommendations

Green Plan

- Expand native garden planting in Ernest Johnston Park
- Expand native/local species street tree plantings along Sandgate Street

Remnant Vegetation

None

Parks and Gardens

Clydesdale

Management Plan Recommendations

- Augment existing landscape features with local native species
- Local Govt authorities should identify, manage and protect Greenways
- The establishment of Greenways will require the protection and management of existing vegetation as well as revegetation
- The use of local native species in Greenways should be encouraged. Re-veg projects should ensure species and structural diversity be maintained

Greenway Recommendations

- A low limestone fence be built at Clydesdale park to replace the existing log-rail fence adjacent Mill Point Road
    - Entrances through the fence should be curved inwards toward the reserve to discourage turtles moving on to Mill Point Road

Ernest Johnson

Management Plan Recommendations

- Augment existing landscape features with local native species

Greenplan Recommendations

- Expand native garden planting in Ernest Johnston Park

Sir James Mitchell Park

Management Plan Recommendations (this is a subset of recommendations)

- Augment existing landscape features with local native species
- Accept the "Revised Tooby plan - 1987" in respect to the number of trees in the area covered by that plan
- Trees planted in the area covered by the "Revised Tooby Plan - 1987" be planted in elliptical rows perpendicular to the river
- SJMPCAG consult residents whose views may be affected and advise council on the placement of these trees
- A landscape plan be developed in areas not covered by the "Revised Tooby Plan -1987" to give maximum benefit to park users in those areas and minimise obstruction of views
- SJMPCAG consult residents whose views may be affected and advise council on the implementation of the landscape plan for areas not covered by the "Revised Tooby Plan - 1987"
- Local provenance E. rudis and other endemic trees be planted within the park except in areas whose character is currently defined by other species or landscape elements
- Trees of endemic species be planted as an entry statement in Coode St, and to provide shade in car parks and roadside parking areas
- The M. rhaphiophylla/E. rudis community and the M. rhaphiophylla Grove be reinforced and maintained with suitable endemic trees
- A weed management strategy to be developed for the M. rhaphiophylla groves
- Conduct an environmental assessment and develop a management plan for the lake system

Greenplan Recommendations

- Expand native species plantings in Sir James Mitchell Park
    - This park is of regional significance but has a poor representation of native species
- Interpretative signs be installed at Sir James Mitchell Park and Neil McDougall Park
    - To inform people of the flora and fauna found there, domestic animal control, no feeding the birds and measures that will improve the lakes' water quality
- Consideration be given to enhancing the melaleuca remnants at Sir James Mitchell Park
    - Through re-battering and planting to create groves similar to the grove that is currently under rehabilitation

Greenway 4 Detail

Greenway
Remnant Vegetation

Perth Greenways
Street Tree Boulevards
Cadastre
Greenways Cadastre
Greenways Boulevards

0.2 0 0.2 0.4 0.6 Kilometers

N
W E
S

Greenway 4: Ernest Johnston Park – Agriculture Department

Remnant Vegetation

- None

Parks and Open Spaces

- David Street Reserve
- Ernest Johnson
- Moresby St Reserve

Street Tree Boulevards

317 373 388 402 407 408 410 414 420 422 423 424 425 428 432 434 435 436 438 440 441 443 444 445 446 447 449 450 451 453 457 458 463 464 465 466 467 478 481 483 485 486 487 488 492 493 496 497 498 502 506 507 509 512 528

Note: Red Boulevards are > 80% native species
Blue Boulevards are > 80% local species
Bold Boulevards are > 80% monospecific

Recommendations

Green Plan

- Expand native species plantings in Moresby Street Reserve
- Expand native/local species street tree plantings along South Terrace
- Expand native garden planting in Ernest Johnston Park
- Invite CALM and DAWA to participate in greenways enhancement programme

Remnant Vegetation

None

Parks and Gardens

David Street Reserve

Management Plan Recommendations

- Augment existing landscape features with local native species

Greenway Recommendations

- None

Ernest Johnson

Management Plan Recommendations

- Augment existing landscape features with local native species

Greenway Recommendations

- Expand native garden planting in Ernest Johnston Park

Moresby St Reserve

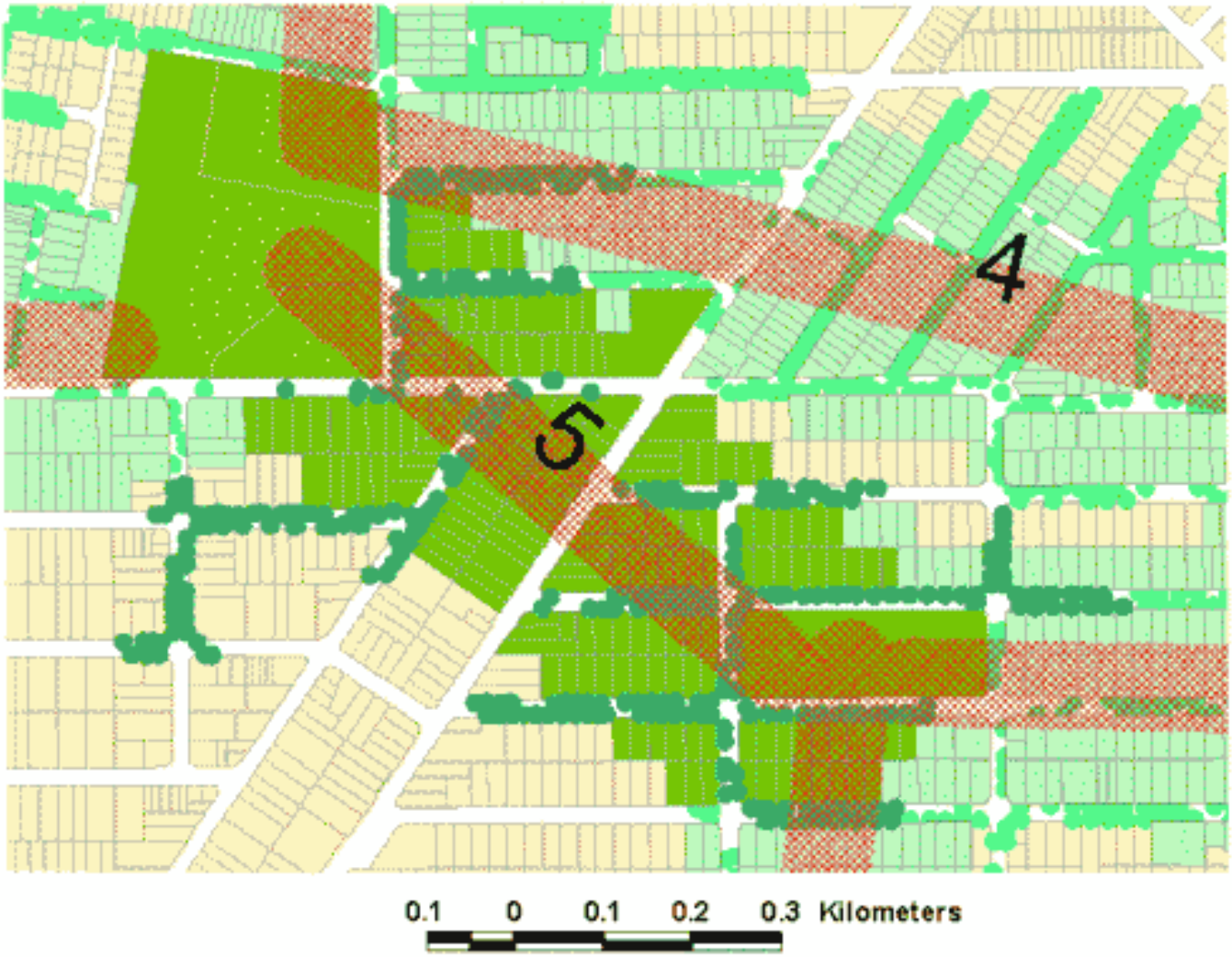
Management Plan Recommendations

- Augment existing landscape features with local native species

Greenway Recommendations

- Expand native species plantings in Moresby Street Reserve

Greenway 5 Detail



Greenway 5: Ernest Johnston Park – Collier PS

Remnant Vegetation

- None

Parks and Open Spaces

- Ernest Johnson

Street Tree Boulevards

425 455 462 468 472 474 476 477 479 480 491 500 505 510 513 514 516 526 533 534 536 541 571 572 573 574 584 610

Note: Red Boulevards are > 80% native species
Blue Boulevards are > 80% local species
Bold Boulevards are > 80% monospecific

Recommendations

Green Plan

- Expand native garden planting in Ernest Johnston Park
- With no major street tree connection, plants to residents scheme should be pursued as a priority
- Collier PS be invited to participate in greenways enhancement programme

Remnant Vegetation

None

Parks and Gardens

Ernest Johnson

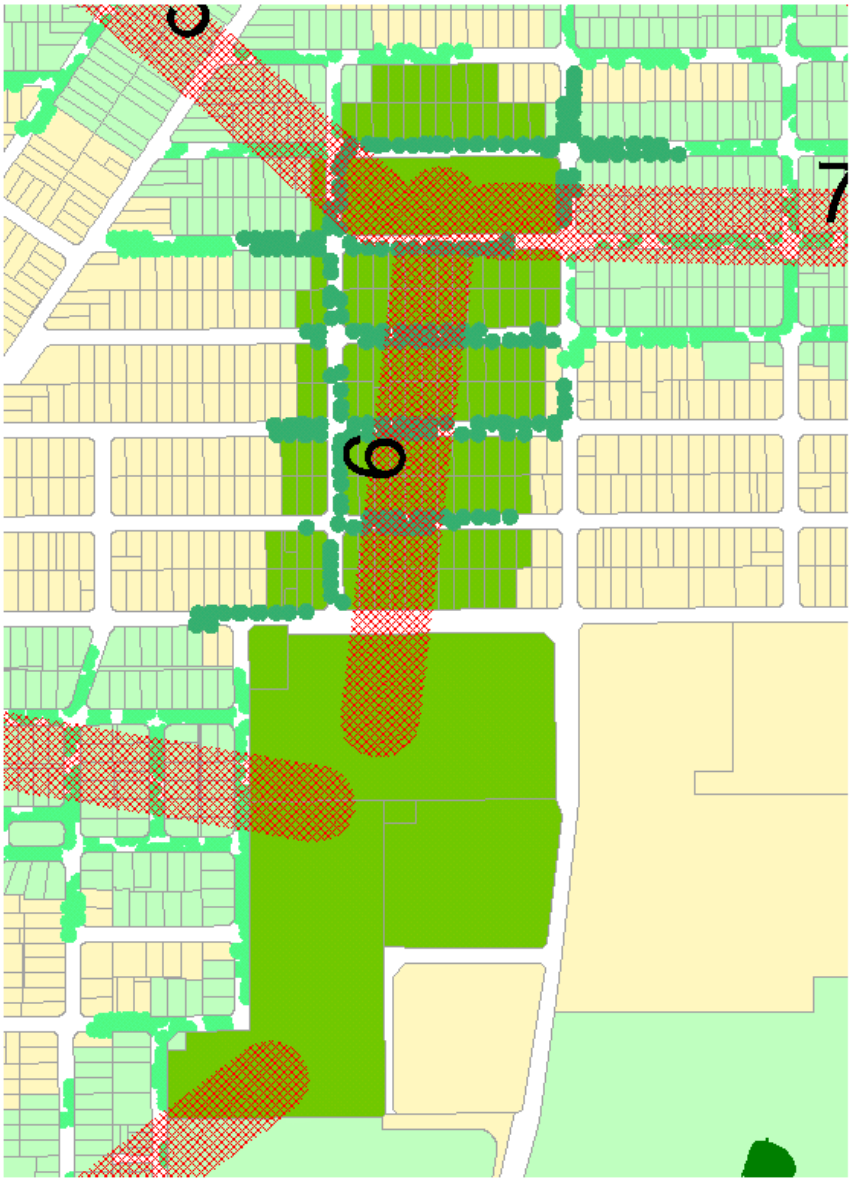
Management Plan Recommendations

- Augment existing landscape features with local native species

Greenway Recommendations

- Expand native garden planting in Ernest Johnston Park

Greenway 6 Detail



Greenway 6: Collier PS – Penrhos College

Remnant Vegetation

- None

Parks and Open Spaces

- McNabb/Tennis
- Collier Park Village
- McNabb Loop
- Ryrie Reserve

Street Tree Boulevards

516 533 540 541 572 573 574 584 609 610 613 618 625 629 630 642 643 661 670 680 687 695 696

Note: Red Boulevards are > 80% native species
Blue Boulevards are > 80% local species
Bold Boulevards are > 80% monospecific

Recommendations

Green Plan

- Collier PS be invited to participate in greenways enhancement programme
- Expand native/local species street tree plantings along Throssell Street
- Expand native garden planting in McNabb Tennis Park
- Expand native garden planting in Ryrie Reserve
- Penrhos College be invited to participate in greenways enhancement programme

Remnant Vegetation

None

Parks and Gardens

McNabb/Tennis

Management Plan Recommendations

- Augment existing landscape features with local native species

Greenplan Recommendations

- Expand native garden planting in McNabb Tennis Park

Collier Park Village

Management Plan Recommendations

- Augment existing landscape features with local native species

Greenplan Recommendations

- None

Ryrie Reserve

Management Plan Recommendations

- Augment existing landscape features with local native species

Greenplan Recommendations

- Expand native garden planting in Ryrie Reserve

Greenway 7 Detail

Greenway 7: Collier PS – Agriculture Department

Remnant Vegetation

- None

Parks and Open Spaces

- None

Street Tree Boulevards

498 516 527 529 530 531 532 538 540 562 563 564 565 566 567 568 569 570 572 573 574 575 577 578 579 580 582 599 601 602 603 604 605 606 607 609 610 618 621

Note: Red Boulevards are > 80% native species
Blue Boulevards are > 80% local species
Bold Boulevards are > 80% monospecific

Recommendations

Green Plan

- Invite CALM and DAWA to participate in greenways enhancement programme
- Collier PS be invited to participate in greenways enhancement programme
- Expand native/local species street tree plantings along Hobbs Avenue
- Expand native/local species street tree plantings along Monash Avenue
- Expand native/local species street tree plantings along Bessell Avenue

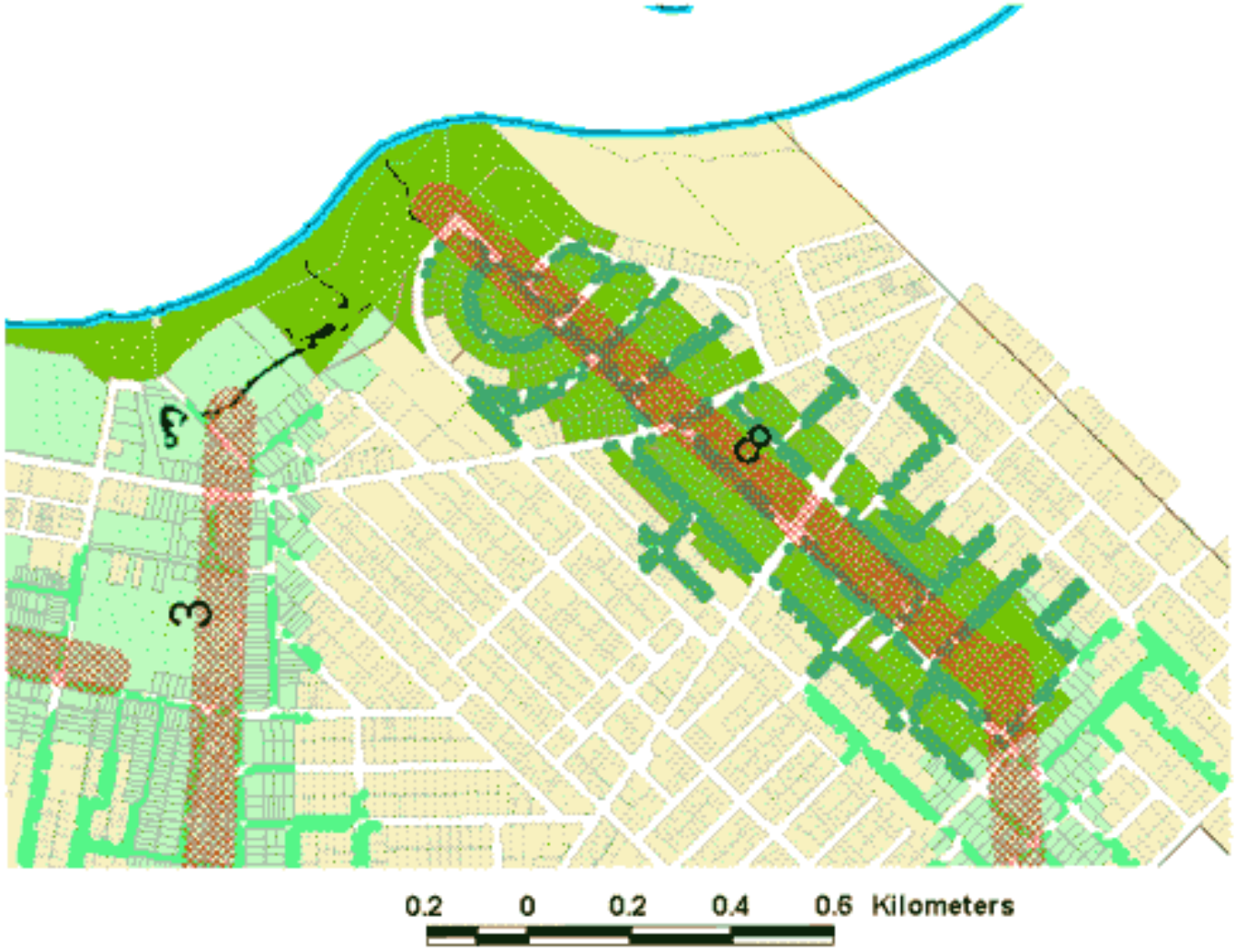
Remnant Vegetation

None

Parks and Gardens

None

Greenway 8 Detail



Greenway 8: Sir James Mitchell Park – Kensington PS

Remnant Vegetation

- None

Parks and Open Spaces

- Brandon/Darling Reserve
- Sir James Mitchell Park

Street Tree Boulevards

33 34 35 39 40 49 58 65 66 70 82 85 87 89 91 94 95 96 98 101 102 107 118 119 122 124 133 151 163 166 173 183 189 196 199 209 211 217 229 243 249 252 262 271 290 291 308

Note: Red Boulevards are > 80% native species
Blue Boulevards are > 80% local species
Bold Boulevards are > 80% monospecific

Recommendations

Green Plan

- Expand native/local species street tree plantings along Hovia Terrace
- Expand native/local species street tree plantings along Banksia Terrace
- Kensington PS be invited to participate in greenways enhancement programme

Remnant Vegetation

None

Parks and Gardens

Brandon/Darling Reserve

Management Plan Recommendations

- Augment existing landscape features with local native species

Greenplan recommendations

- None

Sir James Mitchell Park

Management Plan Recommendations (this is a subset of recommendations)

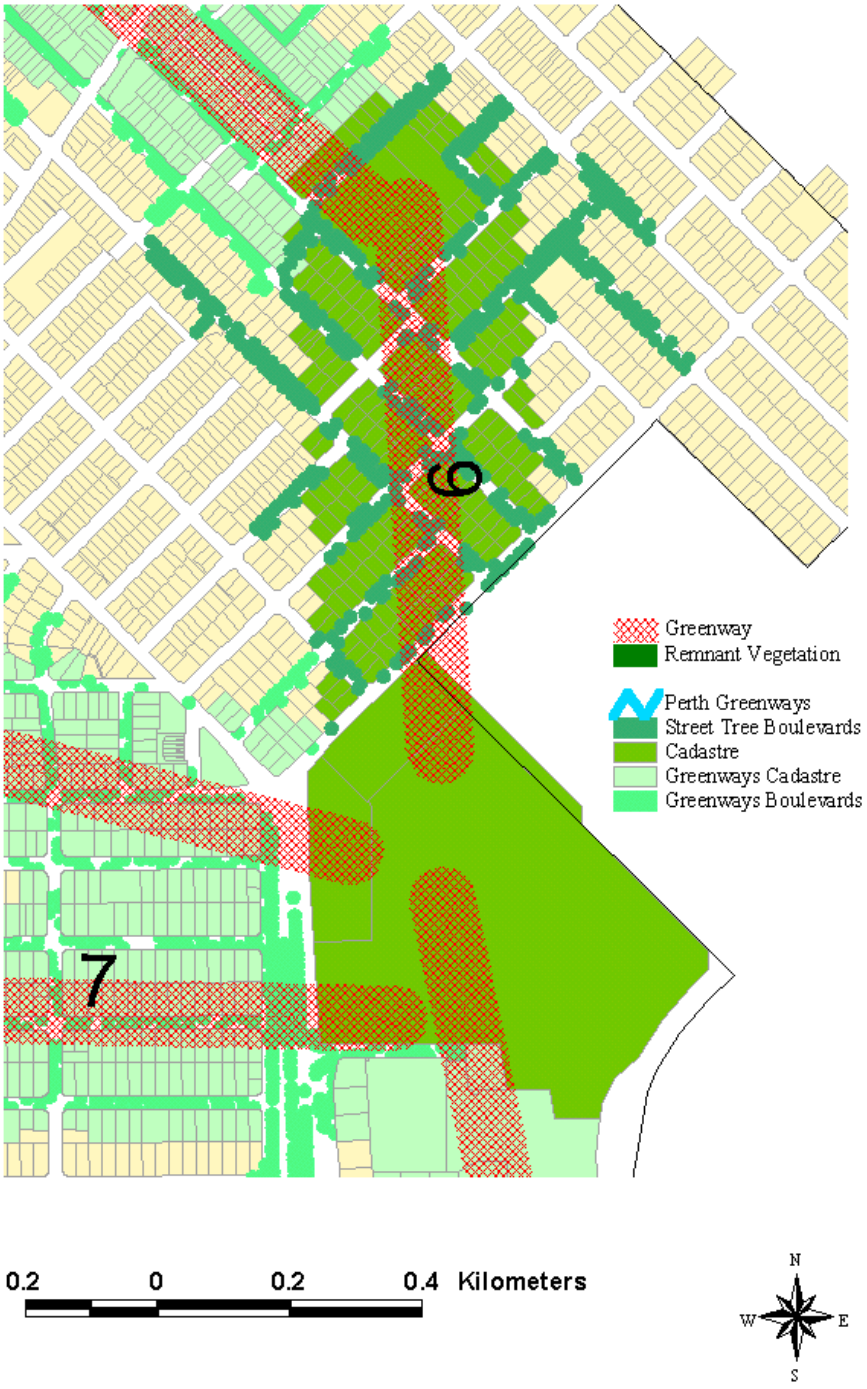
- Augment existing landscape features with local native species
- Accept the "Revised Tooby plan - 1987" in respect to the number of trees in the area covered by that plan
- Trees planted in the area covered by the "Revised Tooby Plan - 1987" be planted in elliptical rows perpendicular to the river

- SJMPCAG consult residents whose views may be affected and advise council on the placement of these trees
- A landscape plan be developed in areas not covered by the "Revised Tooby Plan -1987" to give maximum benefit to park users in those areas and minimise obstruction of views
- SJMPCAG consult residents whose views may be affected and advise council on the implementation of the landscape plan for areas not covered by the "Revised Tooby Plan - 1987"
- Local provenance E. rudis and other endemic trees be planted within the park except in areas whose character is currently defined by other species or landscape elements
- Trees of endemic species be planted as an entry statement in Coode St, and to provide shade in car parks and roadside parking areas
- The M. rhaphiophylla/E. rudis community and the M. rhaphiophylla Grove be reinforced and maintained with suitable endemic trees
- A weed management strategy to be developed for the M. rhaphiophylla groves
- Conduct an environmental assessment and develop a management plan for the lake system

Greenplan Recommendations

- Expand native species plantings in Sir James Mitchell Park
    - This park is of regional significance but has a poor representation of native species
- Interpretative signs be installed at Sir James Mitchell Park and Neil McDougall Park
    - To inform people of the flora and fauna found there, domestic animal control, no feeding the birds and measures that will improve the lakes' water quality
- Consideration be given to enhancing the melaleuca remnants at Sir James Mitchell Park
    - Through re-battering and planting to create groves similar to the grove that is currently under rehabilitation

Greenway 9 Detail



Greenway 9: Kensington PS – Agriculture Department

Remnant Vegetation

- None

Parks and Open Spaces

- Bill McGrath
- Morris Mundy Reserve

Street Tree Boulevards

199 211 233 238 249 252 262 268 271 278 290 291 308 312 315 321 323 327 329 344 349 351 354 359 366 379 387 393 398 399 405 415 417 418 421 427 431 433 437 452

Note: Red Boulevards are > 80% native species
Blue Boulevards are > 80% local species
Bold Boulevards are > 80% monospecific

Recommendations

Green Plan

- Invite CALM and DAWA to participate in greenways enhancement programme
- With no major street tree connection, plants to residents scheme should be pursued as a priority
- Kensington PS be invited to participate in greenways enhancement programme
- Expand native garden planting in Morris Mundy Reserve
- Expand native garden planting in Bill McGrath Reserve

Remnant Vegetation

None

Parks and Gardens

Bill McGrath

Management Plan Recommendations

- Augment existing landscape features with local native species

Greenplan Recommendations

- Expand native garden planting in Bill McGrath Reserve

Morris Mundy Reserve

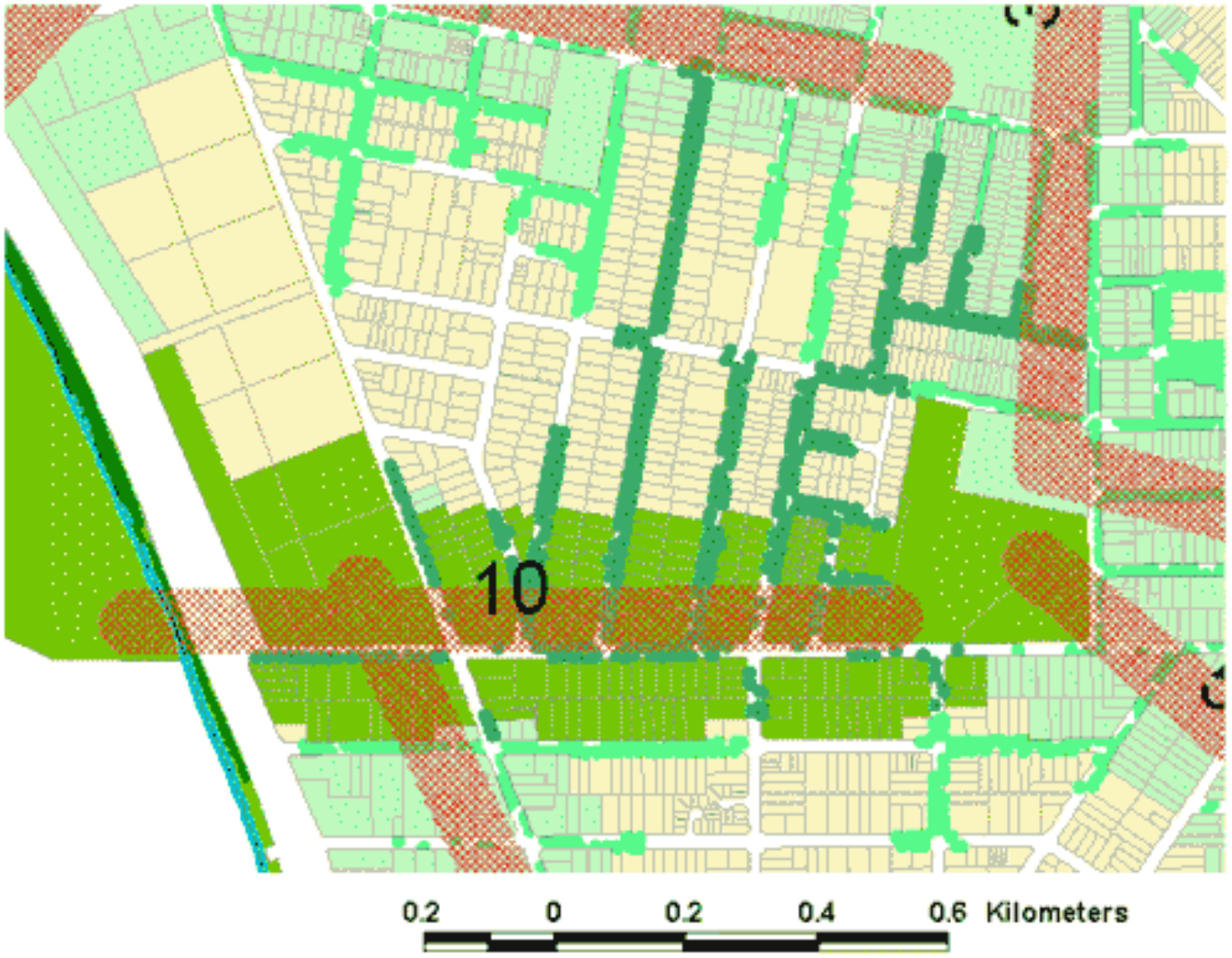
Management Plan Recommendations

- Augment existing landscape features with local native species

Greenplan Recommendations

- Expand native garden planting in Morris Mundy Reserve

Greenway 10 Detail



Greenway 10: Milyu Nature Reserve - Ernest Johnston Park

Remnant Vegetation

- Milyu Native Reserve
- Western Foreshore

Parks and Open Spaces

- Ernest Johnson

Street Tree Boulevards

257 302 370 406 413 430 442 448 454 456 459 460 461 469 470 471 473 475 482 484 489 490 494 495 499 501 503 504

Note: Red Boulevards are > 80% native species
Blue Boulevards are > 80% local species
Bold Boulevards are > 80% monospecific

Recommendations

Green Plan

- Discuss with Royal Perth GC the planting of natives between the fairways
- Expand native/local species street tree plantings along South Terrace
- Expand native garden planting in Ernest Johnston Park

Remnant Vegetation

Milyu Native Reserve (this is a subset of recommendations)

Management Plan Recommendations

- Protect and enhance areas with native species
- Provide visitors with opportunities to observe and increase their knowledge of flora, fauna and habitats
- Protect flora, fauna and habitats from pets, weeds, wildfires or any other physical disturbance
- Local Govt authorities should identify, manage and protect Greenways
- The establishment of Greenways will require the protection and management of existing vegetation as well as revegetation
- The use of local native species in Greenways should be encouraged. Re-vegetation projects should ensure species and structural diversity be maintained

Greenplan Recommendations

- None

Western Foreshore (this is a subset of recommendations)

Management Plan Recommendations

- Retain dead tree limbs for fauna habitats and create additional bird habitat with local native species plantings (MRWA/COSP)
- Group trees to retain and frame views and to provide shade and shelter (COSP/MRWA)
- Select shade trees from the species lists provided and plant in recreation areas at Narrows, Como and Scouts (COSP/MRWA)
- Plant low maintenance areas with local native species (MRWA)
- Monitor Veldt Grass each year. Control with Fusilade (COSP)
- Review and modify the MRWA landscape plan (1989) in accordance with the Western Foreshore Mgt Plan (1993) (MRWA/COSP)
- Mimimise or prevent native vegetation being removed or damaged by reserve maintenance or visitor development facilities
- Protect and enhance areas with native species
- Locate important flora and fauna habitats, priority species and fire sensitive species and develop management recommendations for their conservation
- Provide visitors with opportunities to observe and increase their knowledge of flora, fauna and habitats
- Protect flora, fauna and habitats from pets, weeds, wildfires or any other physical disturbance

Greenplan Recommendations

None

Parks and Gardens

Ernest Johnson

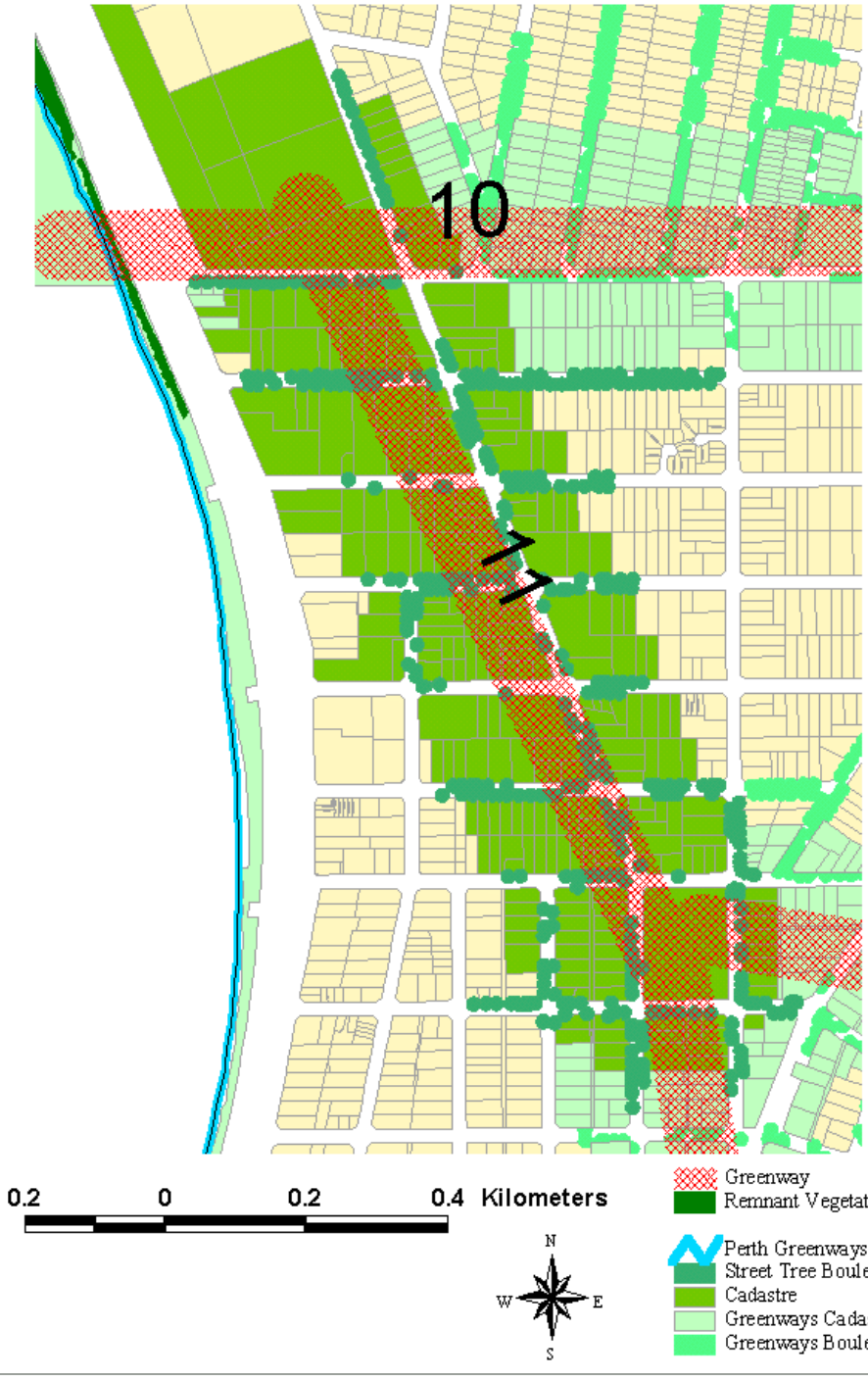
Management Plan Recommendations

- Augment existing landscape features with local native species

Greenplan Recommendations

- Expand native garden planting in Ernest Johnston Park

Greenway 11 Detail



Greenway 11: Royal Perth Golf Club – Como PS

Remnant Vegetation

- None

Parks and Open Spaces

- Comer Reserve

Street Tree Boulevards

413 459 471 489 490 504 519 521 522 523 537 549 550 552 553 555 556 559 581 589 591
592 593 594 595 596 608 623 624 628 631 635 637 644 650 654 676 677 678 679 685
686 697 704 705 708 714 719 720 722 723 725 726 736 740 747 750 751 752 755 758

Note: Red Boulevards are > 80% native species
Blue Boulevards are > 80% local species
Bold Boulevards are > 80% monospecific

Recommendations

Green Plan

- Discuss with Royal Perth Golf Club the planting of natives between the fairways
- Expand native garden planting in Comer Reserve
- Expand native/local species street tree plantings along Labouchere Road
- Como Primary School be invited to participate in greenways enhancement programme

Remnant Vegetation

None

Parks and Gardens

Comer Reserve

Management Plan Recommendations

- Augment existing landscape features with local native species

Greenplan Recommendations

- Expand native garden planting in Comer Reserve

Greenway 12 Detail

Greenway 12: Como PS – Penrhos College

Remnant Vegetation

- None

Parks and Open Spaces

- McNabb/Tennis
- Axford-Barker Reserve
- Collier Park Village

Street Tree Boulevards

655 685 686 697 699 703 704 708 714 717 720 721 722 724 725 726 728 729 730 731 732 733 734 735 737 738 739 740 741 742 745 746 748 749 750 751 752 753 754 755 757 759 760 763 764 767 768 769 770 771 773

Note: Red Boulevards are > 80% native species
Blue Boulevards are > 80% local species
Bold Boulevards are > 80% monospecific

Recommendations

Green Plan

- Expand native garden planting in McNabb Loop Reserve
- Penrhos College be invited to participate in greenways enhancement programme
- Como Primary School be invited to participate in greenways enhancement programme
- Expand native garden planting in Axford-Baker Reserve
- Expand native/local species street tree plantings along Thelma Street

Remnant Vegetation

None

Parks and Gardens

McNabb Loop Reserve/South Perth Tennis Club

Management Plan Recommendations

- Augment existing landscape features with local native species

Greenplan Recommendations

- Expand native garden planting in McNabb Tennis Park

Axford-Barker Reserve

Management Plan Recommendations

- Augment existing landscape features with local native species

Greenplan Recommendations

- Expand native garden planting in Axford-Baker Reserve

Collier Park Village

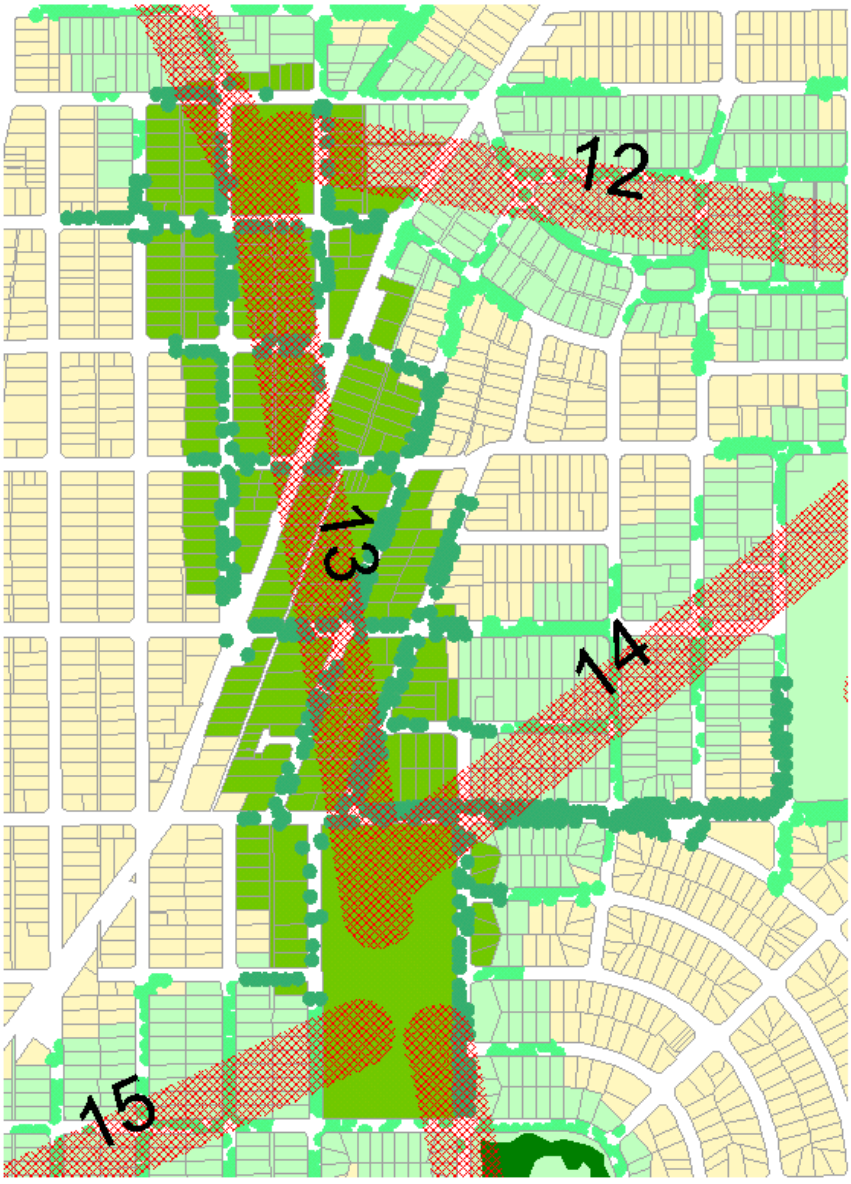
Management Plan Recommendations

- Augment existing landscape features with local native species

Greenplan Recommendations

- None

Greenway 13 Detail



0.2 0 0.2 0.4 Kilometers

N
W E
S

Greenway
Remnant Vegetation
Perth Greenways
Street Tree Boulevards
Cadastre
Greenways Cadastre
Greenways Boulevards

Greenway 13: Como PS – Neill McDougall Park

Remnant Vegetation

- None

Parks and Open Spaces

- Coolidge Reserve
- Neill McDougall Park

Street Tree Boulevards

697 704 708 714 720 722 725 726 736 740 747 750 751 752 755 758 776 777 778 780 785 786 788 796 797 803 805 815 821 822 823 829 832 835 839 843 850 855 857 860 861 867 869 872 874 877 881 885 887 891 895 905 919 920 926 929 932 937 941 942 950 954 960 961 974 975 990 998 1006

Note: Red Boulevards are > 80% native species
Blue Boulevards are > 80% local species
Bold Boulevards are > 80% monospecific

Recommendations

Green Plan

- With no major street tree connection, plants to residents scheme should be pursued as a priority
- Expand native garden planting in Neil McDougall Park
- Expand native garden planting in Coolidge Reserve

Remnant Vegetation

None

Parks and Gardens

Coolidge Reserve

Management Plan Recommendations

- Augment existing landscape features with local native species
- Programme to monitor soil nutrient, irrigation and mowing status of parks within McDougall Park Catchment should continue to be implemented (COSP)

Greenplan Recommendations

- Expand the native gardens within Coolidge Street Reserve
    - This reserve is part of the Coolidge-Davilak-McDougall triplet of sites
- Expand native garden planting in Coolidge Reserve

Neil McDougall Park

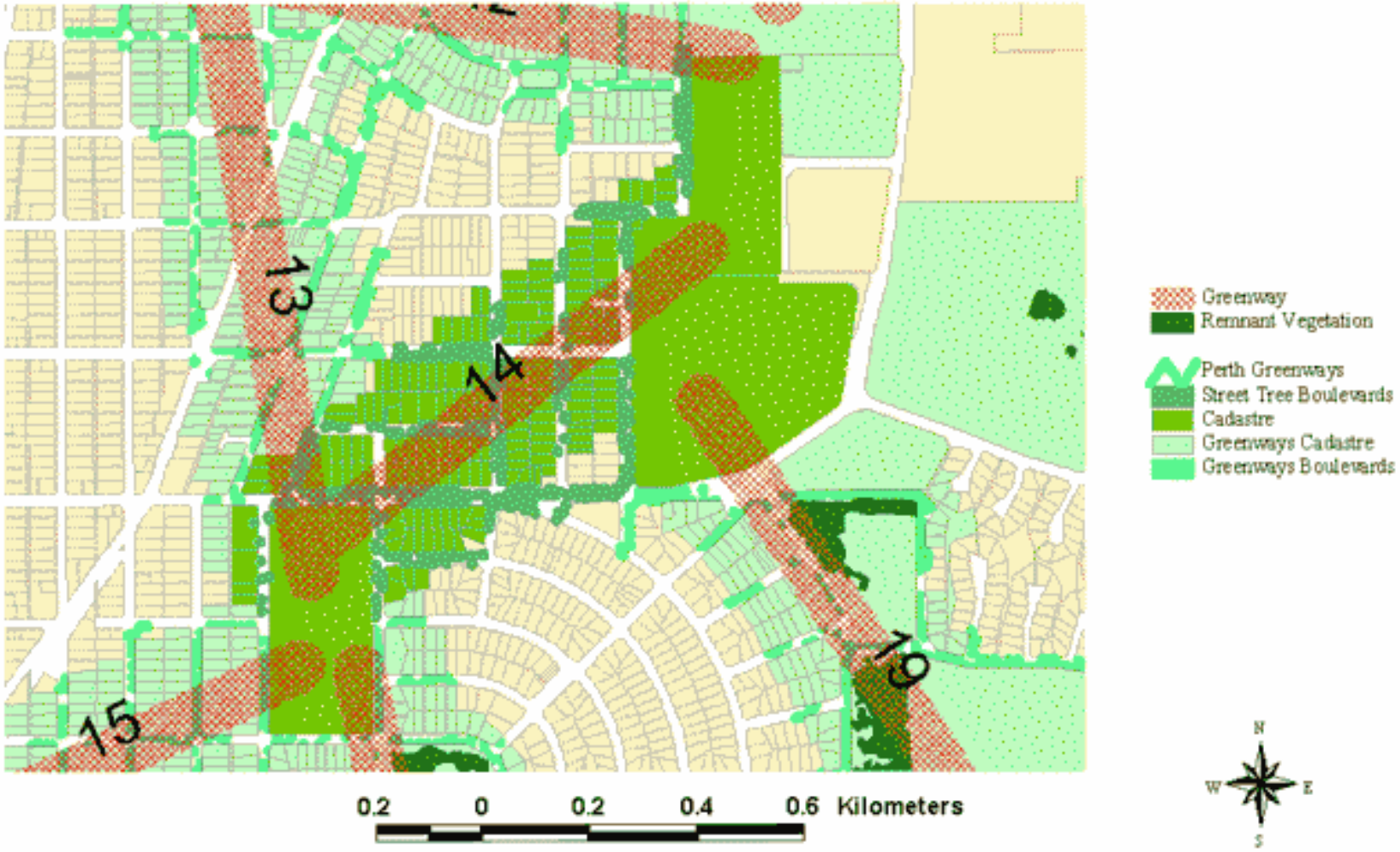
Management Plan Recommendations

- Augment existing landscape features with local native species
- Dredge the park lake in accordance with programme proposed
- Instigate a check for turtles in the sediments of the lake
- Notify nearby residents before the dredging programme is undertaken
- Recontour all vertical lake banks
- Do not disturb existing vegetation near lake banks and on the island
- Do not disturb the reed bed currently est. on the SW side of the island
- Dead trees adjacent to the island should be retained during the dredging for bird roosting sites
- Appropriate signage should be erected
- Planting of vegetation would best be conducted in Spring, corresponding to the growth season
- Edge treatments and planting should be done in accordance with 3.2.9
- Programme to monitor soil nutrient, irrigation and mowing status of parks within McDougall Park Catchment should continue to be implemented (COSP)
- Residents should be made aware of the environmental responsibilities of living within the surface water catchment of the lake
- The water quality monitoring programme (3.4.7) is recommended for implementation
- Formation of a "Friends Group" for the park should be pursued
- Do not fertilise or water lawn as a matter of habit
- Do not dispose of waste materials in road side drains
- Use pesticides sparingly and select low mobility, persistence and toxicity chemicals
- Install an efficient irrigation system
- Use "nitrogen-only" fertilisers on lawns for most years with phosphorous applications restricted to 1 in every 3 years
- Use small applications during growing seasons for highly soluble fertilisers
- Select slow release fertilisers where possible
- Mimimise lawn areas

Greenplan Recommendations

- The island and lake in Neil McDougall Park be revegetated with local native species.
    - This should be done as a slow transition over at least five years, starting with the removal of exotic species with the greatest weed potential
- Interpretative signs be installed at Sir James Mitchell Park and Neil McDougall Park
    - To inform people of the flora and fauna found there, domestic animal control, no feeding the birds and measures that will improve the lakes' water quality
- Expand the use of local native species in garden beds at Neil McDougall Park
    - To reinforce the link between Davilak Reserve, Neil McDougall Park and Coolidge Reserve
- Expand native garden planting in Neil McDougall Park

Greenway 14 Detail



Greenway 14: Neill McDougall Park – Penrhos College

Remnant Vegetation

- None

Parks and Open Spaces

- Coolidge Reserve
- Neill McDougall Park
- Collier Park Village

Street Tree Boulevards

760 807 808 809 825 840 848 849 852 856 858 859 868 870 873 876 877 883 885 886 887 888 890 891 893 894 920 926 927 929 932 937 941 942 944 950 954 960 961 974 975

Note: Red Boulevards are > 80% native species
Blue Boulevards are > 80% local species
Bold Boulevards are > 80% monospecific

Recommendations

Green Plan

- With no major street tree connection, plants to residents scheme should be pursued as a priority
- Penrhos College be invited to participate in greenways enhancement programme
- Expand native garden planting in Neil McDougall Park
- Expand native garden planting in Coolidge Reserve
- TAFE & Como SHS be invited to participate in greenways enhancement programme

Remnant Vegetation

None

Parks and Gardens

Coolidge Reserve

Management Plan Recommendations

- Augment existing landscape features with local native species
- Programme to monitor soil nutrient, irrigation and mowing status of parks within McDougall Park Catchment should continue to be implemented (COSP)

Greenplan Recommendations

- Expand the native gardens within Coolidge Street Reserve
    - This reserve is part of the Coolidge-Davilak-McDougall triplet of sites
- Expand native garden planting in Coolidge Reserve

Neil McDougall Park

Management Plan Recommendations

- Augment existing landscape features with local native species
- Dredge the park lake in accordance with programme proposed
- Instigate a check for turtles in the sediments of the lake
- Notify nearby residents before the dredging programme is undertaken
- Recontour all vertical lake banks
- Do not disturb existing vegetation near lake banks and on the island
- Do not disturb the reed bed currently est. on the SW side of the island
- Dead trees adjacent to the island should be retained during the dredging for bird roosting sites
- Appropriate signage should be erected
- Planting of vegetation would best be conducted in Spring, corresponding to the growth season
- Edge treatments and planting should be done in accordance with 3.2.9
- Programme to monitor soil nutrient, irrigation and mowing status of parks within McDougall Park Catchment should continue to be implemented (COSP)
- Residents should be made aware of the environmental responsibilities of living within the surface water catchment of the lake
- The water quality monitoring programme (3.4.7) is recommended for implementation
- Formation of a "Friends Group" for the park should be pursued
- Do not fertilise or water lawn as a matter of habit
- Do not dispose of waste materials in road side drains
- Use pesticides sparingly and select low mobility, persistence and toxicity chemicals
- Install an efficient irrigation system
- Use "nitrogen-only" fertilisers on lawns for most years with phosphorous applications restricted to 1 in every 3 years
- Use small applications during growing seasons for highly soluble fertilisers
- Select slow release fertilisers where possible
- Mimimise lawn areas

Greenplan Recommendations

- The island and lake in Neil McDougall Park be revegetated with local native species.
    - This should be done as a slow transition over at least five years, starting with the removal of exotic species with the greatest weed potential
- Interpretative signs be installed at Sir James Mitchell Park and Neil McDougall Park
    - To inform people of the flora and fauna found there, domestic animal control, no feeding the birds and measures that will improve the lakes' water quality
- Expand the use of local native species in garden beds at Neil McDougall Park
    - To reinforce the link between Davilak Reserve, Neil McDougall Park and Coolidge Reserve
- Expand native garden planting in Neil McDougall Park

Collier Park Village

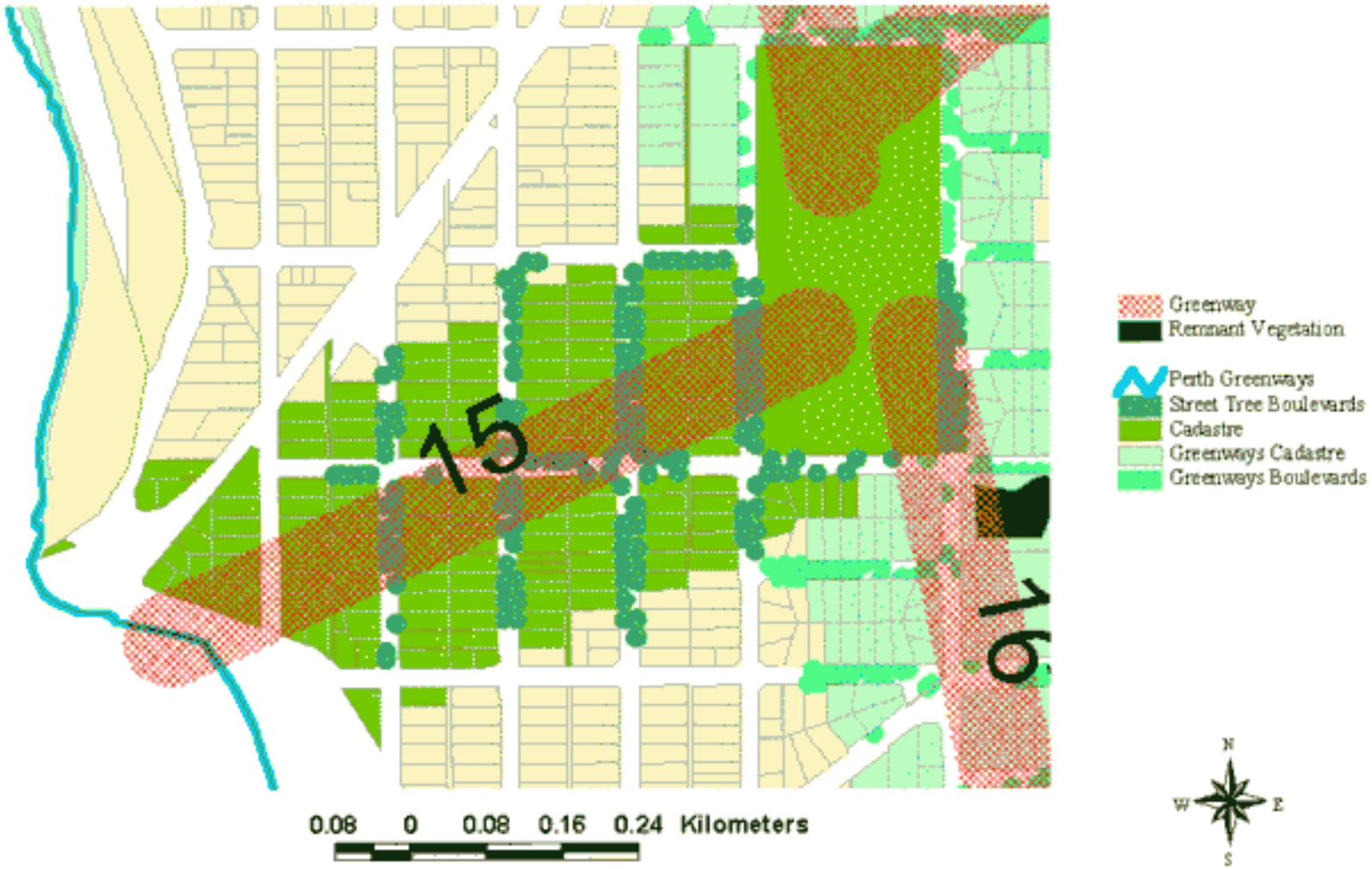
Management Plan Recommendations

- Augment existing landscape features with local native species

Greenplan Recommendations

- None

Greenway 15 Detail



Greenway 15: Neill McDougall Park – Western Foreshore

Remnant Vegetation

- None

Parks and Open Spaces

- Neill McDougall Park

Street Tree Boulevards

975 990 993 998 1001 1006 1012 1018 1022 1024 1027 1038 1039 1042 1046 1050 1051 1052 1054 1059 1060 1061 1063 1065 1068 1069 1081 1091 1097 1108

Note: Red Boulevards are > 80% native species
Blue Boulevards are > 80% local species
Bold Boulevards are > 80% monospecific

Recommendations

Green Plan

- With no major street tree connection, plants to residents scheme should be pursued as a priority
- Expand native garden planting in Neil McDougall Park

Remnant Vegetation

None

Parks and Gardens

Neil McDougall Park

Management Plan Recommendations

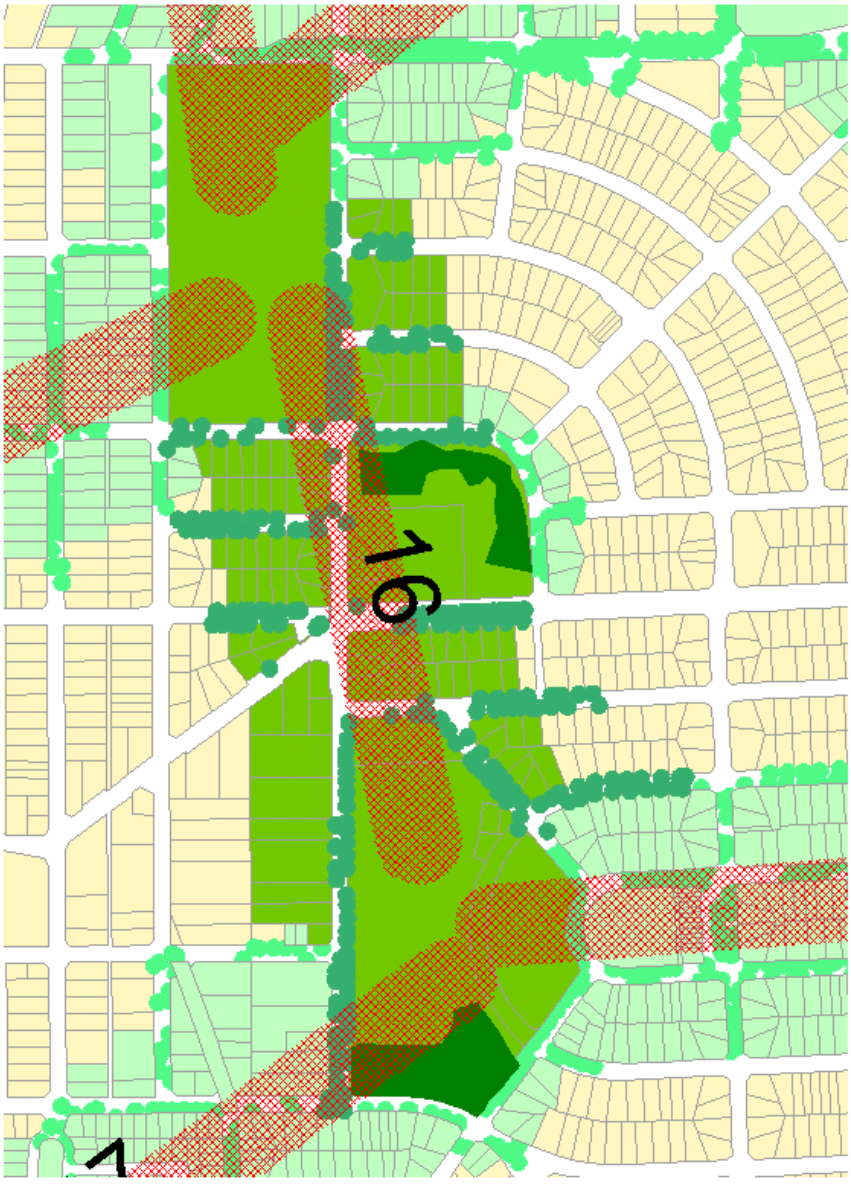
- Augment existing landscape features with local native species
- Dredge the park lake in accordance with programme proposed
- Instigate a check for turtles in the sediments of the lake
- Notify nearby residents before the dredging programme is undertaken
- Recontour all vertical lake banks
- Do not disturb existing vegetation near lake banks and on the island
- Do not disturb the reed bed currently est. on the SW side of the island
- Dead trees adjacent to the island should be retained during the dredging for bird roosting sites
- Appropriate signage should be erected
- Planting of vegetation would best be conducted in Spring, corresponding to the growth season
- Edge treatments and planting should be done in accordance with 3.2.9
- Programme to monitor soil nutrient, irrigation and mowing status of parks within McDougall Park Catchment should continue to be implemented (COSP)
- Residents should be made aware of the environmental responsibilities of living within the surface water catchment of the lake

- The water quality monitoring programme (3.4.7) is recommended for implementation
- Formation of a "Friends Group" for the park should be pursued
- Do not fertilise or water lawn as a matter of habit
- Do not dispose of waste materials in road side drains
- Use pesticides sparingly and select low mobility, persistence and toxicity chemicals
- Install an efficient irrigation system
- Use "nitrogen-only" fertilisers on lawns for most years with phosphorous applications restricted to 1 in every 3 years
- Use small applications during growing seasons for highly soluble fertilisers
- Select slow release fertilisers where possible
- Mimimise lawn areas

Greenplan Recommendations

- The island and lake in Neil McDougall Park be revegetated with local native species.
    - This should be done as a slow transition over at least five years, starting with the removal of exotic species with the greatest weed potential
- Interpretative signs be installed at Sir James Mitchell Park and Neil McDougall Park
    - To inform people of the flora and fauna found there, domestic animal control, no feeding the birds and measures that will improve the lakes' water quality
- Expand the use of local native species in garden beds at Neil McDougall Park
    - To reinforce the link between Davilak Reserve, Neil McDougall Park and Coolidge Reserve
- Expand native garden planting in Neil McDougall Park

Greenway 16 Detail



Greenway
Remnant Vegetation

0.09 0 0.09 0.18 Kilometers

N
W E
S

Perth Greenways
Street Tree Boulevards
Cadastre
Greenways Cadastre
Greenways Boulevards

Greenway 16: Neill McDougall Park – Manning PS

Remnant Vegetation

- Davilak Reserve
- Manning Primary School bushland

Parks and Open Spaces

- Jarman Avenue
- Neill McDougall Park

Street Tree Boulevards

974 985 998 1025 1049 1050 1051 1052 1053 1060 1066 1080 1082 1083 1086 1114 1116 1117 1125 1141 1155 1160 1165 1166 1182 1199 1220 1248

Note: Red Boulevards are > 80% native species
Blue Boulevards are > 80% local species
Bold Boulevards are > 80% monospecific

Recommendations

Green Plan

- With no major street tree connection, plants to residents scheme should be pursued as a priority
- Manning PS be invited to participate in greenways enhancement programme
- Expand native garden planting in Jarman Avenue/James Miller Oval
- Expand native/local species street tree plantings along Ley Street

Remnant Vegetation
Davilak Reserve

Management Plan Recommendations

- Manage the reserve for passive recreation (COSP)
- Encourage local residents to exercise vigilance over the reserve and to report any suspicious activities or fires immediately to appropriate authorities (COSP)
- Develop a fire management strategy to reflect the management of the reserve in conjunction with Kensington Fire Brigade (COSP)
- Augment the existing Banksia woodland vegetation within the reserve (see report for details)
- Create nodes around several of the more substantial groves of Banksias (see report for details)
- Maintain the rest of the site as a dry reserve with regular mowing, slashing, hand weeding, herbicide treatment as appropriate (see report for details)
- Test for presence of dieback
- Continue to assist COSPEA in their work developing the seed orchard (COSP)
- Incorporate work required at the seed orchard into the annual maintenance budgets (COSP)
- Ensure adequate funding is provided by council to conduct a staged implementation of the management plan (COSP)
- Implement recommendations as per assigned priority (see reports for details)

- Two monitoring programmes should be conducted: 1. Quality of native species. 2. Re-colonisation of native species
- Monitoring should be conducted during flowering season between April and November
- Local community should be encouraged to participate in the rehabilitation
- Many more native trees should be planted
- Monitoring of the performance of Crassula colorata should be routinely undertaken
- Maintain open grassed areas to keep people away from regeneration areas
- Plantings in the future should be concentrated in the areas the pilot study has identified as doing well
- Seed bank area should be fenced
- Signs around the reserve should encourage people not to pick any flowers within the reserve
- Provide information about the impact of fire on the environment in an information panel for use at Salter Point and Waterford. This information can also be used at Cloisters and Davilak Reserve information shelters (COSP)

Greenplan Recommendations

- Re-assess the merits and intentions of rehabilitation efforts at Davilak reserve
    - This study considers that Davilak Reserve would perform a more important environmental role as a native garden park
- The City of South Perth should continue to support the seed orchard and seed bank that have been created at Davilak Reserve
    - With the view to making the City's nursery self sufficient in provenance native seed stock and assist in preserving the City's biodiversity

Manning Primary School bushland

Management Plan Recommendations

- None

Greenplan Recommendations

- The City of South Perth supports local schools to protect and regenerate any bushland that remains on their land
    - This should include both Public and Private schools. Also see recommendation number 60
- Manning PS be invited to participate in greenways enhancement programme

Parks and Gardens

Jarman Avenue

Management Plan Recommendations

- Augment existing landscape features with local native species

Greenplan Recommendations

- Expand native garden planting in Jarman Avenue/James Miller Oval

Neil McDougall Park

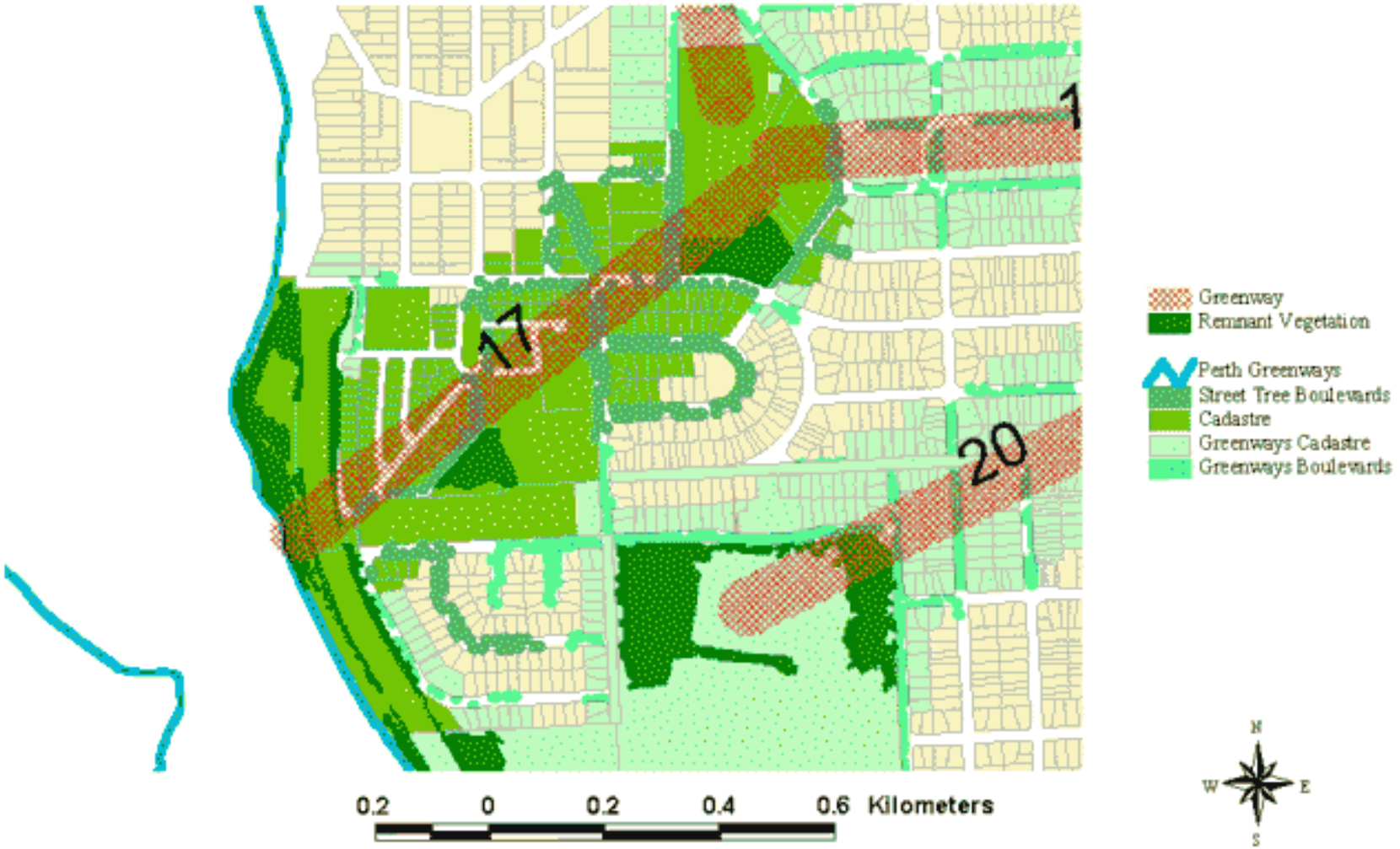
Management Plan Recommendations

- Augment existing landscape features with local native species
- Dredge the park lake in accordance with programme proposed
- Instigate a check for turtles in the sediments of the lake
- Notify nearby residents before the dredging programme is undertaken
- Recontour all vertical lake banks
- Do not disturb existing vegetation near lake banks and on the island
- Do not disturb the reed bed currently est. on the SW side of the island
- Dead trees adjacent to the island should be retained during the dredging for bird roosting sites
- Appropriate signage should be erected
- Planting of vegetation would best be conducted in Spring, corresponding to the growth season
- Edge treatments and planting should be done in accordance with 3.2.9
- Programme to monitor soil nutrient, irrigation and mowing status of parks within McDougall Park Catchment should continue to be implemented (COSP)
- Residents should be made aware of the environmental responsibilities of living within the surface water catchment of the lake
- The water quality monitoring programme (3.4.7) is recommended for implementation
- Formation of a "Friends Group" for the park should be pursued
- Do not fertilise or water lawn as a matter of habit
- Do not dispose of waste materials in road side drains
- Use pesticides sparingly and select low mobility, persistence and toxicity chemicals
- Install an efficient irrigation system
- Use "nitrogen-only" fertilisers on lawns for most years with phosphorous applications restricted to 1 in every 3 years
- Use small applications during growing seasons for highly soluble fertilisers
- Select slow release fertilisers where possible
- Mimimise lawn areas

Greenplan Recommendations

- The island and lake in Neil McDougall Park be revegetated with local native species.
    - This should be done as a slow transition over at least five years, starting with the removal of exotic species with the greatest weed potential
- Interpretative signs be installed at Sir James Mitchell Park and Neil McDougall Park
    - To inform people of the flora and fauna found there, domestic animal control, no feeding the birds and measures that will improve the lakes' water quality
- Expand the use of local native species in garden beds at Neil McDougall Park
    - To reinforce the link between Davilak Reserve, Neil McDougall Park and Coolidge Reserve
- Expand native garden planting in Neil McDougall Park

Greenway 17 Detail



Greenway 17: Manning PS – Western Foreshore

Remnant Vegetation

- Manning Primary School bushland
- Mt Henry Public Open Space
- Western Foreshore

Parks and Open Spaces

- Jan-Doo Park
- Jarman Avenue

Street Tree Boulevards

1227 1248 1265 1266 1271 1299 1310 1327 1333 1334 1335 1336 1337 1338 1339 1340 1343 1344 1346 1351 1375 1378 1385 1396 1426 1428 1440 1443

Note: Red Boulevards are > 80% native species
Blue Boulevards are > 80% local species
Bold Boulevards are > 80% monospecific

Recommendations

Green Plan

- With no major street tree connection, plants to residents scheme should be pursued as a priority
- MT. Henry Dental Hospital be invited to participate in greenways enhancement programme
- Expand native/local species street tree plantings along Cloister Avenue

Remnant Vegetation

Manning Primary School bushland

Management Plan Recommendations

- None

Greenplan Recommendations

- The City of South Perth supports local schools to protect and regenerate any bushland that remains on their land
    - This should include both Public and Private schools. Also see recommendation number 60
- Manning PS be invited to participate in greenways enhancement programme

Mt Henry Public Open Space

Management Plan Recommendations

- None

Greenplan Recommendations

- MT. Henry Dental Hospital be invited to participate in greenways enhancement programme

Western Foreshore (this is a subset of recommendations)

Management Plan Recommendations

- Retain dead tree limbs for fauna habitats and create additional bird habitat with local native species plantings (MRWA/COSP)
- Group trees to retain and frame views and to provide shade and shelter (COSP/MRWA)
- Select shade trees from the species lists provided and plant in recreation areas at Narrows, Como and Scouts (COSP/MRWA)
- Plant low maintenance areas with local native species (MRWA)
- Monitor Veldt Grass each year. Control with Fusilade (COSP)
- Review and modify the MRWA landscape plan (1989) in accordance with the Western Foreshore Mgt Plan (1993) (MRWA/COSP)
- Mimimise or prevent native vegetation being removed or damaged by reserve maintenance or visitor development facilities
- Protect and enhance areas with native species
- Locate important flora and fauna habitats, priority species and fire sensitive species and develop management recommendations for their conservation
- Provide visitors with opportunities to observe and increase their knowledge of flora, fauna and habitats
- Protect flora, fauna and habitats from pets, weeds, wildfires or any other physical disturbance

Greenplan Recommendations

- None

Parks and Gardens

Jan-Doo Park

Management Plan Recommendations

- Augment existing landscape features with local native species

Greenplan Recommendations

- None

Jarman Avenue

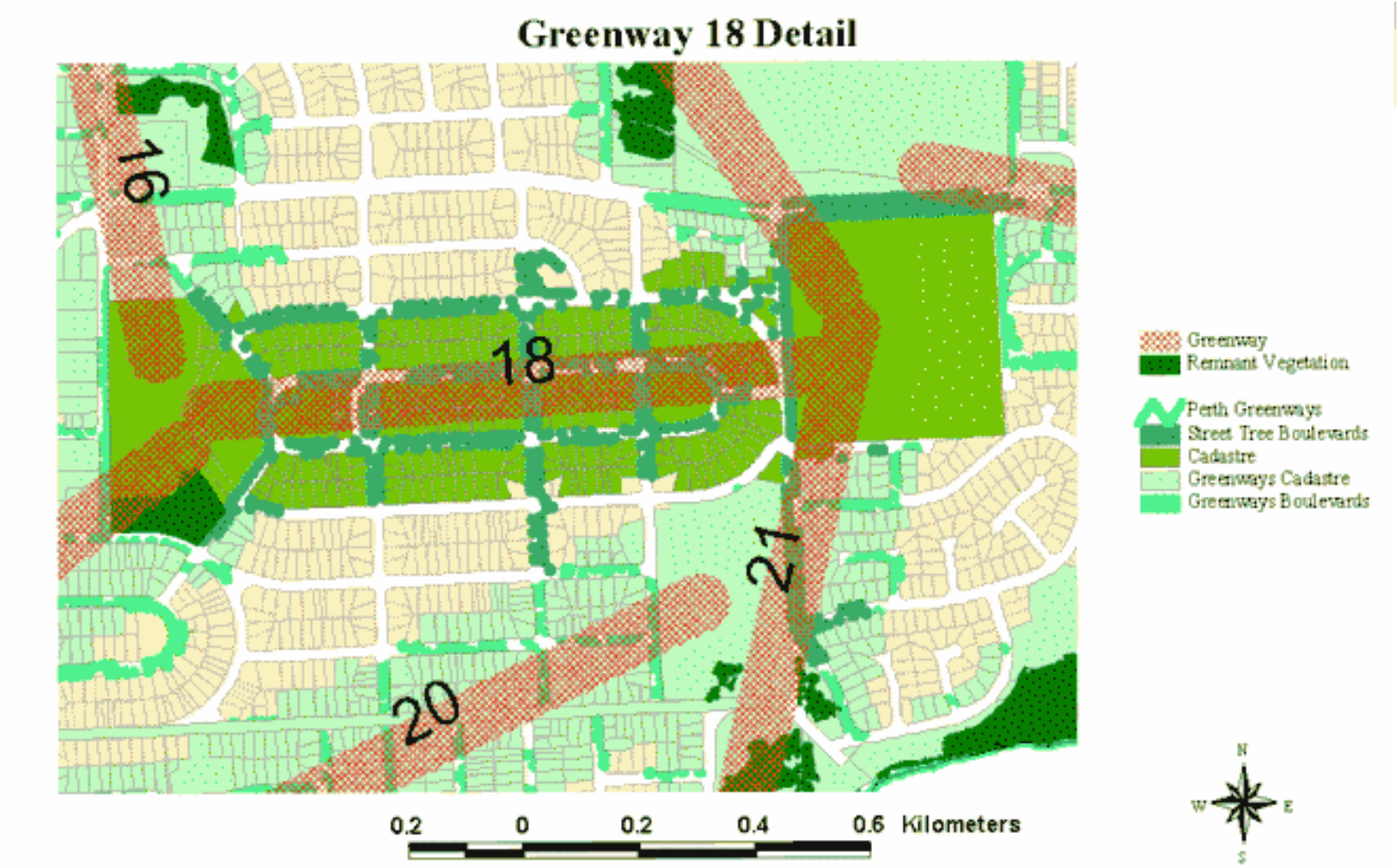
Management Plan Recommendations

- Augment existing landscape features with local native species

Greenplan Recommendations

- Expand native garden planting in Jarman Avenue/James Miller Oval

Greenway 18 Detail



Greenway 18: Manning PS – Trinity Playing Fields

Remnant Vegetation

- Manning Primary School bushland

Parks and Open Spaces

- Bradshaw Conochie
- Jarman Avenue
- Elderfield Road Reserve
- Challenger Ave

Street Tree Boulevards

1119 1159 1169 1179 1181 1182 1185 1186 1187 1189 1190 1193 1194 1196 1197 1199 1200 1201 1203 1204 1209 1213 1215 1220 1226 1227 1230 1231 1232 1237 1239 1244 1246 1247 1251 1253 1270 1273 1277 1284 1285 1286 1288 1310

Note: Red Boulevards are > 80% native species
Blue Boulevards are > 80% local species
Bold Boulevards are > 80% monospecific

Recommendations

Green Plan

- Expand native/local species street tree plantings along Bradshaw Crescent
- Expand native/local species street tree plantings along Conochie Crescent
- Expand native garden planting in Bradshaw-Conochie Reserve
- Expand native garden planting in Elderfield Road Reserve
- Trinity College be invited to participate in greenways enhancement programme

Remnant Vegetation

Manning Primary School bushland

Management Plan Recommendations

- None

Greenplan Recommendations

- The City of South Perth supports local schools to protect and regenerate any bushland that remains on their land
    - This should include both Public and Private schools. Also see recommendation number 60
- Manning PS be invited to participate in greenways enhancement programme

Parks and Gardens

Bradshaw Conochie

Management Plan Recommendations

- Augment existing landscape features with local native species

Greenplan Recommendations

- Expand native garden planting in Bradshaw-Conochie Reserve

Jarman Avenue

Management Plan Recommendations

- Augment existing landscape features with local native species

Greenplan Recommendations

- Expand native garden planting in Jarman Avenue/James Miller Oval

Elderfield Road Reserve

Management Plan Recommendations

- Augment existing landscape features with local native species

Greenplan Recommendations

- Expand native garden planting in Elderfield Road Reserve

Challenger Ave

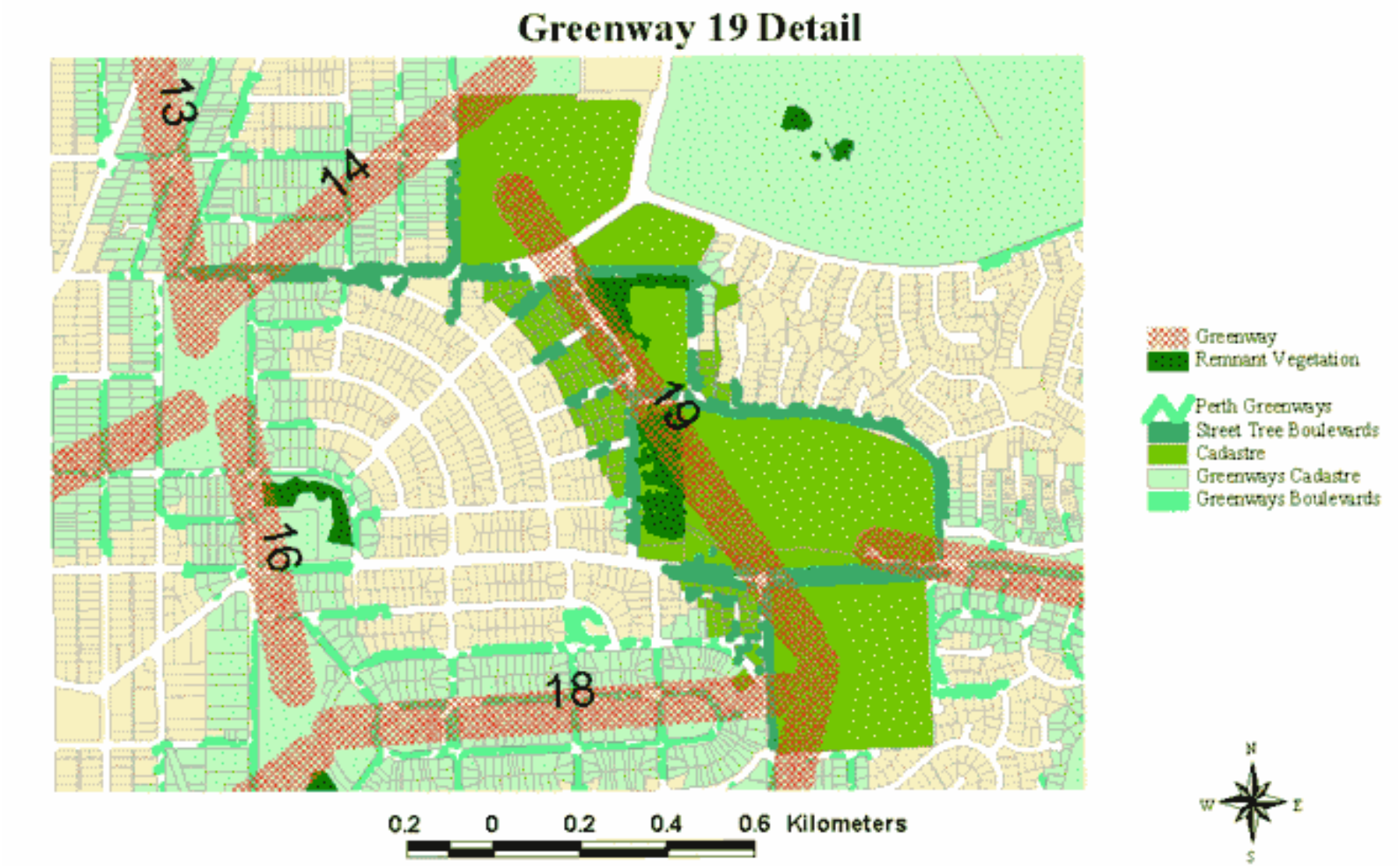
Management Plan Recommendations

- Augment existing landscape features with local native species
- Ensure council mowing teams or street sweepers collect grass clippings that could enter waterways or drains (COSP)
- Adopt a statement of purpose for all foreshore reserves which includes "conservation of flora and fauna and passive recreation" (COSP)

Greenplan Recommendations

- Expand native garden planting in Challenger Avenue Reserve

Greenway 19 Detail



Greenway 19: Trinity Playing Fields – Como SHS

Remnant Vegetation

- Goss Avenue
- Koonawarra Primary School bushland

Parks and Open Spaces

- George Burnett Park
- Elderfield Road Reserve

Street Tree Boulevards

868 873 876 877 906 907 909 922 933 935 951 962 964 966 972 980 996 1000 1002 1007 1009 1010 1037 1104 1109 1119 1140 1145 1148 1169 1179 1193 1215

Note: Red Boulevards are > 80% native species
Blue Boulevards are > 80% local species
Bold Boulevards are > 80% monospecific

Recommendations

Green Plan

- TAFE & Como SHS be invited to participate in greenways enhancement programme
- Expand native garden planting in Elderfield Road Reserve
- Trinity College be invited to participate in greenways enhancement programme
- Expand native/local species street tree plantings along Goss Avenue
- Koonawarra PS be invited to participate in greenways enhancement programme
- Expand native garden planting in George Burnett Oval

Remnant Vegetation

Goss Avenue

Management Plan Recommendations (this is a subset of recommendations)

- The bushlands should be managed for passive recreation only (COSP/EDWA)
- Erect signs to educate residents not to dump rubbish or pick wildflowers (COSP)
- Liase with the local community to ascertain which pathways are the most used and close down and rehabilitate those not used (COSP)
- Lay and roll crushed limestone (or similar) on remaining pathways (COSP)
- Remove all dumped rubbish (COSP)
- Encourage local residents to exercise vigilance and report any suspicious activity or fires to appropriate authorities (COSP)
- Maintain a register of fire outbreaks (COSP)

- Ensure the first verge mowing occurs in spring to reduce fire hazard (see also Rec. 5.2.2) (COSP)
- Implement a Veldt Grass spraying programme to reduce fuel loads (COSP/EDWA)
- Monitor the site regularly for the presence of feral species (COSP)
- Develop a weed control program utilising manuals denoted in the plan which details actions at the most appropriate times for individual weeds (COSP)
- Investigate the potential of direct seeding or smoke techniques for revegetation where natural regeneration will not suffice (COSP)
- All plantings/seeding should be species representative of the vegetation complex (COSP)
- Plant Corymbia calophylla along the eastern side of the reserve (COSP)
- Select sedge/rush species endemic to Banksia sump lands capable of nutrient uptake for planting on the southern bank of the drain (COSP)
- Liase with Water Corp. to ensure proposed drain plantings and works are consistent with their objectives (COSP/Water Corp.)

Greenplan Recommendations

- The City of South Perth supports local schools to protect and regenerate any bushland that remains on their land
    - This should include both Public and Private schools. Also see recommendation number 60

Koonawarra Primary School bushland

Management Plan Recommendations

- Encourage Koonawarra PS to formally name their bushland (COSP/EDWA)
- When names have been approved, erect information signs in visible pats of each bushland (COSP/EDWA)
- The bushlands should be managed for passive recreation only (COSP/EDWA)
- Erect signs to educate residents not to dump rubbish or pick wildflowers (COSP/EDWA)
- Install bollards along the internal boundary of the Koonawarra Bushland (EDWA)
- Remove all dumped rubbish (EDWA)
- Encourage local residents to exercise vigilance and report any suspicious activity or fires to appropriate authorities (COSP)
- Ensure the first verge mowing occurs in spring to reduce fire hazard (see also Rec. 5.2.2) (COSP)
- Implement a Veldt Grass spraying programme to reduce fuel loads (COSP/EDWA)
- Revise the fire management strategy in line with the implementation of this management plan (COSP/KFB)
- Support and enforce the existing designation under the Local Law Relating to Dogs. Erect appropriate signage (COSP)
- Monitor the site regularly for the presence of feral species (COSP)
- Support any moves by the COSP to educate residents about responsible cat ownership (COSP)
- Develop a weed control program utilising manuals denoted in the plan which details actions at the most appropriate times for individual weeds (COSP)

- Investigate the potential of direct seeding or smoke techniques for revegetation where natural regeneration will not suffice (COSP)
- All plantings/seeding should be species representative of the vegetation complex (COSP)
- Encourage Koonawarra PS to actively involve themselves in the care and maintenance of the school bushland (COSP/EDWA)
- Seek support from EDWA for funds to implement recommendations relevant to Koonawarra Bushland (COSP)

Greenplan Recmmendations

- Koonawarra PS be invited to participate in greenways enhancement programme

Parks and Gardens

George Burnett Park

Management Plan Recommendations

- Augment existing landscape features with local native species
- Maintain present summer verge mowing programme (COSP)

Greenplan Recommendations

- Expand native garden planting in George Burnett Oval
    - To complement Goss Avenue bushland, the local native species planted at Lake Gillon and to enhance Greenway connectivity

Elderfield Road Reserve

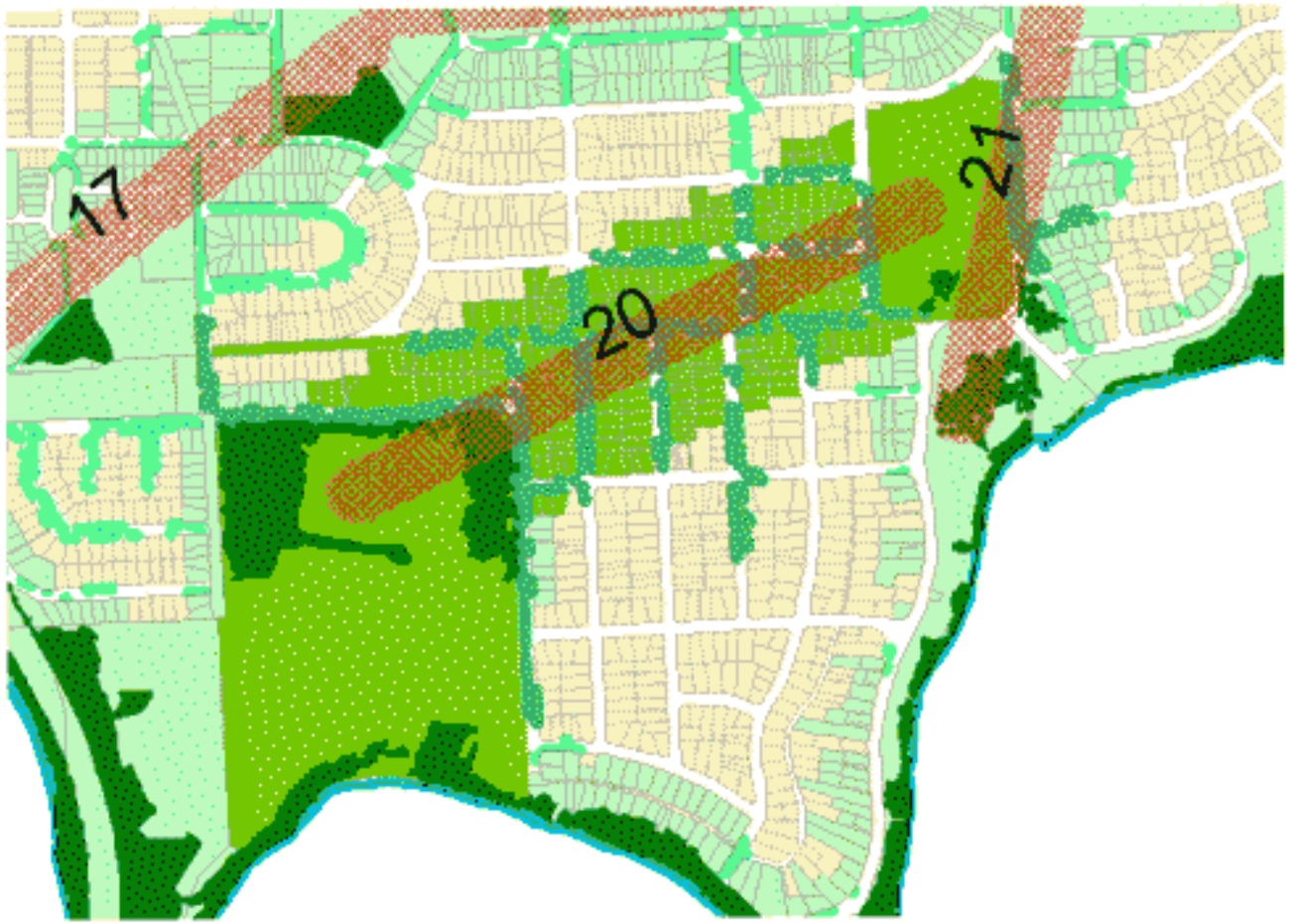
Management Plan Recommendations

- Augment existing landscape features with local native species

Greenplan Recommendations

- Expand native garden planting in Elderfield Road Reserve

Greenway 20 Detail



Greenway
Remnant Vegetation

Perth Greenways
Street Tree Boulevards
Cadastre
Greenways Cadastre
Greenways Boulevards

0.2 0 0.2 0.4 0.6 Kilometers

N
W E
S

Greenway 20: Aquinas College – Challenger Ave. Park

Remnant Vegetation

- Aquinas College

Parks and Open Spaces

- Hope/Roebuck
- Challenger Ave

Street Tree Boulevards

1288 1354 1355 1356 1368 1372 1383 1386 1388 1389 1390 1391 1392 1397 1400 1404 1405 1406 1407 1408 1409 1410 1412 1413 1414 1415 1416 1417 1418 1419 1420 1421 1424 1427 1429 1433 1436 1439 1442 1451

Note: Red Boulevards are > 80% native species
Blue Boulevards are > 80% local species
Bold Boulevards are > 80% monospecific

Recommendations

Green Plan

- With no major street tree connection, plants to residents scheme should be pursued as a priority
- Aquinas College be invited to participate in greenways enhancement programme
- Expand native garden planting in Hope-Roebuck Reserve
- Expand native garden planting in Challenger Avenue Reserve

Remnant Vegetation

Aquinas College

Management Plan Recommendations (this is a subset of recommendations)

- Plan vermin (e.g. fox) control programs in conjunction with managers of all adjacent bushland and wetland areas including the Canning River Regional Park and Aquinas College (COSP/CALM/AQCOLL)
- Control flammable introduced grass species such as Veldt grass in bushland and adjacent areas (COSP/AQCOLL)
- Remove stacks of prunings from foreshore slopes where vegetation exists to minimise fire risk (COSP/AQCOLL)
- Plant local native reeds on eroded foreshores (COSP/AQCOLL)
- Protect the point from erosion with a limited number of paths and signs closing off access to steep slopes from above and below (COSP/AQCOLL)
- Make development application to SRT to extend 2m high fence along freeway to waters edge on SE side of Mt Henry Bridge (AQCOLL)

- Erect signs on the foreshores to increase awareness of rehabilitation programs (COSP/AQCOLL)
- Continue with revegetation of Quarry area (AQCOLL)
- Close all existing paths on School slope, rehabilitate them and erect signs to encourage student co-operation (AQCOLL)
- Collect seed locally and propagate local species required for each revegetation situation (COSP/AQCOLL)
- All plantings should be in accordance with the MT Henry Peninsula Mgt Plan (1993) vegetation maps and species lists (COSP/AQCOLL)
- Monitor success of revegetation and carry out remedial actions as necessary (COSP/AQCOLL)
- Set up transects and quadrats for annual monitoring in each vegetation association (AQCOLL/COSP)
- Groups undertaking rehabilitation/management should keep records of methods employed and their outcome, including photographic records (COSP/AQCOLL)
- Provide AQCOLL and other local residents guidelines to minimise application of water and fertilisers to gardens, lawns and ovals (COSP)
- AQCOLL students should undertake ongoing fauna surveys (AQCOLL/COSP)
- Examine the feasibility of reintroducing appropriate faunal species once pests are excluded (COSP/AQCOLL/CALM)
- Discourage access to limestone out crops to protect lichens (AQCOLL)
- Undertake revegetation on all foreshores and bushland (see 12.1,12.2,12.3,12.4) (COSP/AQCOLL)
- No mowing should occur in areas of native vegetation (COSP/MRWA/DPUD/AQCOLL)
- Undertake weed control as recommended (COSP/AQCOLL)
- Minimise reticulation and fertilising near bushland to discourage weed invasion (COSP/AQCOLL)
- Construct a firm based path between lawns or ovals and bushland to limit weed invasion (COSP/AQCOLL)
- Remove all reticulation and kikuyu and couch grass south of the Boarding-Boatshed Rd (AQCOLL)
- Do not deposit weeds or prunings in bushland (AQCOLL)
- Create a solid barrier between composting sites and bushland (AQCOLL)
- Replace planted species with local native species on a progressive basis (COSP/AQCOLL)
- AQCOLL students should research the impact of rabbits on the vegetation at the point (COSP/AQCOLL)

Perth's Greenways

- Local Govt authorities should identify, manage and protect Greenways
- The establishment of Greenways will require the protection and management of existing vegetation as well as revegetation
- The use of local native species in Greenways should be encouraged. Re-veg projects should ensure species and structural diversity be maintained
- The management of vegetation on private lands that contribute to greenways should be encouraged

Greenplan Recommendations

- Instigate a weeding programme in the NE of Aquinas College
- The City of South Perth supports local schools to protect and regenerate any bushland that remains on their land
    - This should include both Public and Private schools. Also see recommendation number 60
- Aquinas College be invited to participate in greenways enhancement programme

Parks and Gardens

Hope/Roebuck

Management Plan Recommendations

- Augment existing landscape features with local native species

Greenplan Recommendations

- Expand native garden planting in Hope-Roebuck Reserve

Challenger Ave

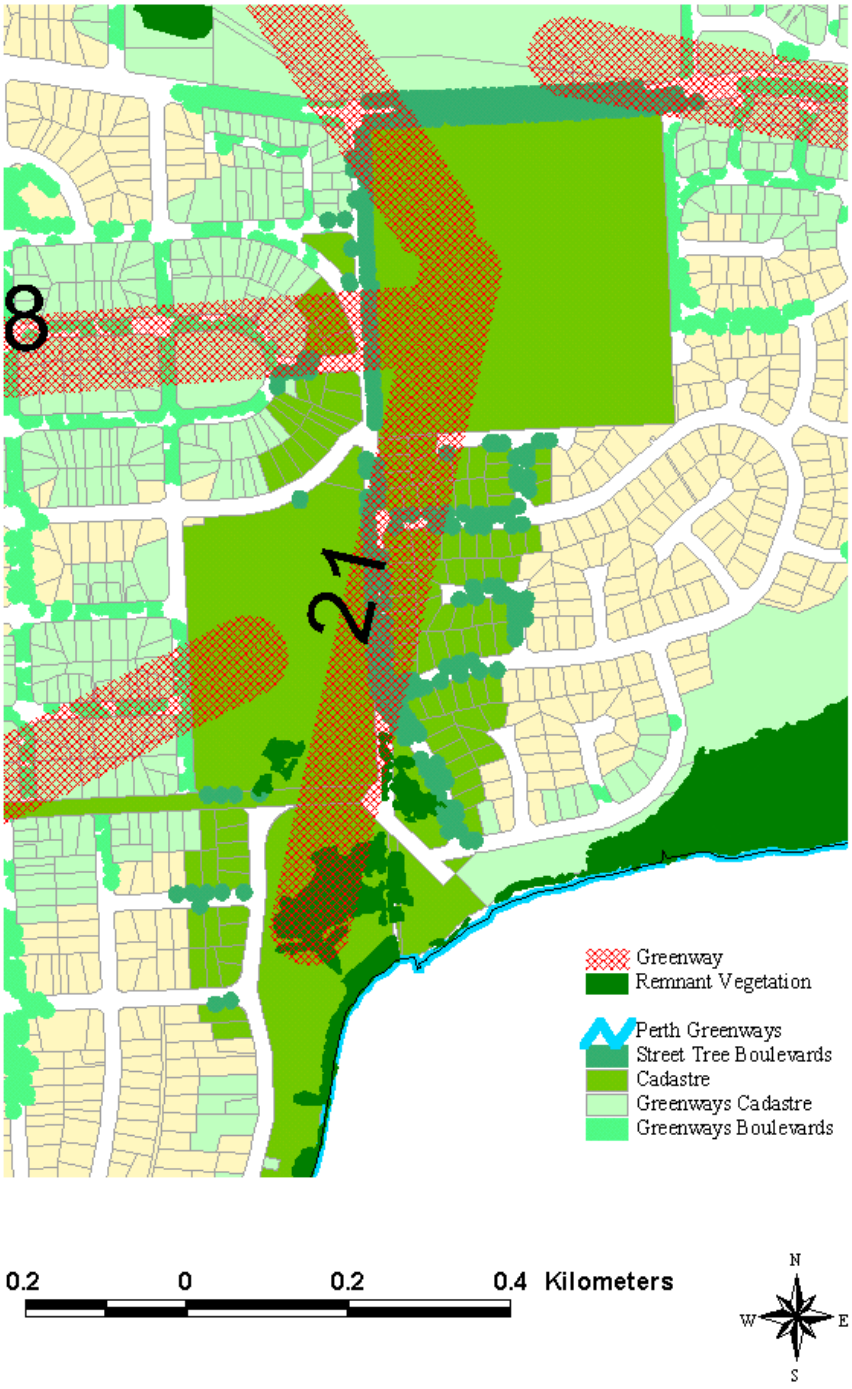
Management Plan Recommendations

- Augment existing landscape features with local native species
- Ensure council mowing teams or street sweepers collect grass clippings that could enter waterways or drains (COSP)
- Adopt a statement of purpose for all foreshore reserves which includes "conservation of flora and fauna and passive recreation" (COSP)

Greenplan Recommendations

- Expand native garden planting in Challenger Avenue Reserve

Greenway 21 Detail



Greenway 21: Salter Point Foreshore – Trinity Playing Fields

Remnant Vegetation

- Salter Point/Waterford

Parks and Open Spaces

- Elderfield Road Reserve
- Challenger Ave

Street Tree Boulevards

1119 1179 1215 1247 1282 1284 1286 1288 1301 1306 1313 1315 1347 1349 1382 1398 1404 1405 1430 1431 1447

Note: Red Boulevards are > 80% native species
Blue Boulevards are > 80% local species
Bold Boulevards are > 80% monospecific

Recommendations

Green Plan

- Expand native garden planting in Elderfield Road Reserve
- Trinity College be invited to participate in greenways enhancement programme
- Expand native garden planting in Challenger Avenue Reserve
- Expand native/local species street tree plantings along Elderfield Road

Remnant Vegetation

Salter Point/Waterford

Management Plan Recommendations (this is a subset of recommendations)

- Implement intensive weed control (COSP)
- Implement intensive re-veg program focussing on eroding riparian zones (COSP)
- Augment trees in Sandon Park using large native tree stock (COSP)
- Protect 2 remaining beaches at Sandon Park by reinforcing vegetation on either side (COSP)
- Provide information to local residents to discourage dumping in Sandon Park (COSP)
- Install bollards around wetland perimeter 3m from existing vegetation in Melaleuca Grove (COSP)
- Continue re-veg program in local govt drain entering Melaleuca Grove (COSP)
- Plant native trees between Melaleuca Grove and Elderfield Drain to extend native vegetation (COSP)
- Reinforce tree line and extend foreshore vegetation to improve environmental integrity between Scout Hall and Fairview Gardens (COSP)
- Protect vegetation with bollards in areas where obvious trampling occurs (COSP)
- Develop a landscape plan for the area (Scout Hall to Fairview Gardens) in conjunction with residents (COSP)

- Reinforce plantings between DUP and river (COSP)
- Assess the use of informal track providing access to Juncus stands near Bodkin Drain (COSP)
- Continue Penrhos College involvement in seed collection, weed control and replanting (PENCOLL/COSP)
- Continue re-veg program to manage weeds and replacement with local indigeneous flora (COSP)
- Remove suspended debris between 1 and 2m above ground and mulch to ensure control of annual grasses (COSP)
- Liaise with residents before instigating tree planting projects that may impact on the extent of views (COSP)
- Canvass residents and develop a list of residents who do not object to tree planting on the foreshore adjacent to their properties (COSP)
- Design and implement a schedule for weed maintenance within the native vegetation and turfed areas (COSP)
- Implement streamlining program for the open section of Elderfield Main Drain. Plant with endemic species (COSP)
- Select and mark suitable sites for photographs to enable annual monitoring through photographic record of vegetation condition (COSP)
- Control annual grasses and other weeds which increase the flammability of the reserve (COSP)
- Promote native fauna (frogs, birds) in reserves through a rehabilitation program that increases nesting sites and habitats (COSP)
- Discourage residents (and visitors) from feeding wildlife, using non-intrusive signage (COSP)
- Continue the Birds Australia monitoring program and ensure COSP maintains a register of birdlife for the area. This information can be used to develop signs (COSP)
- Adopt a statement of purpose for all foreshore reserves which includes "conservation of flora and fauna and passive recreation" (COSP)

Perth's Greenways

- Local Govt authorities should identify, manage and protect Greenways
- The establishment of Greenways will require the protection and management of existing vegetation as well as revegetation
- The use of local native species in Greenways should be encouraged. Re-veg projects should ensure species and structural diversity be maintained

Greenplan Recommendations

- None

Parks and Gardens

Elderfield Road Reserve

Management Plan Recommendations

- Augment existing landscape features with local native species

Greenplan Recommendations

- Expand native garden planting in Elderfield Road Reserve

Challenger Ave

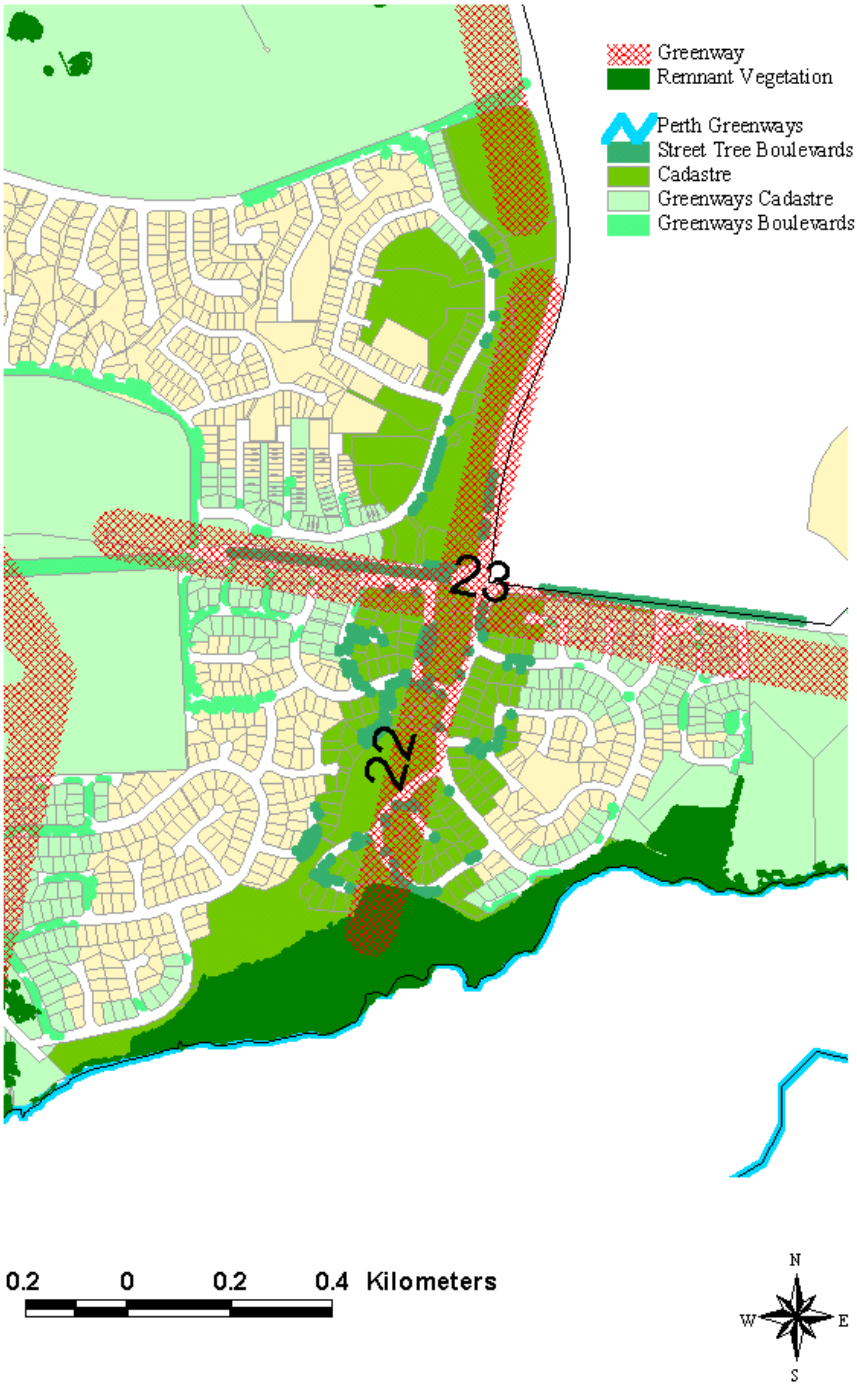
Management Plan Recommendations

- Augment existing landscape features with local native species
- Ensure council mowing teams or street sweepers collect grass clippings that could enter waterways or drains (COSP)
- Adopt a statement of purpose for all foreshore reserves which includes "conservation of flora and fauna and passive recreation" (COSP)

Greenplan Recommendations

- Expand native garden planting in Challenger Avenue Reserve

Greenway 22 Detail



Greenway 22: Waterford Foreshore – Karawara Park

Remnant Vegetation

- Salter Point/Waterford

Parks and Open Spaces

- Bodkin Park
- Manning Road (3)
- Manning Road (4)
- Karawara Park
- Lady Gowrie Park

Street Tree Boulevards

934 952 977 999 1041 1055 1071 1084 1095 1115 1142 1143 1146 1156 1172 1174 1178 1192 1202 1205 1211 1212 1216 1223 1238 1245 1249 1255 1287 1292 1293 1303 1316 1319 1320 1326 1329 1332 1341 1350 1357

Note: Red Boulevards are > 80% native species
Blue Boulevards are > 80% local species
Bold Boulevards are > 80% monospecific

Recommendations

Green Plan

- Expand native/local species street tree plantings along Kent Street
- Expand native/local species street tree plantings along Waterford Avenue
- Expand native garden planting in Bodkin Park
- Expand native garden planting in Manning Road Reserves
- Expand native garden planting in Karawara Park
- Expand native garden planting in Lady Gowrie Reserve

Remnant Vegetation

Salter Point/Waterford

Management Plan Recommendations (this is a subset of recommendations)

- Implement intensive weed control (COSP)
- Implement intensive re-veg program focussing on eroding riparian zones (COSP)
- Augment trees in Sandon Park using large native tree stock (COSP)
- Protect 2 remaining beaches at Sandon Park by reinforcing vegetation on either side (COSP)
- Provide information to local residents to discourage dumping in Sandon Park (COSP)

- Install bollards around wetland perimeter 3m from existing vegetation in Melaleuca Grove (COSP)
- Continue re-veg program in local govt drain entering Melaleuca Grove (COSP)
- Plant native trees between Melaleuca Grove and Elderfield Drain to extend native vegetation (COSP)
- Reinforce tree line and extend foreshore vegetation to improve environmental integrity between Scout Hall and Fairview Gardens (COSP)
- Protect vegetation with bollards in areas where obvious trampling occurs (COSP)
- Develop a landscape plan for the area (Scout Hall to Fairview Gardens) in conjunction with residents (COSP)
- Reinforce plantings between DUP and river (COSP)
- Assess the use of informal track providing access to Juncus stands near Bodkin Drain (COSP)
- Continue Penrhos College involvement in seed collection, weed control and replanting (PENCOLL/COSP)
- Continue re-veg program to manage weeds and replacement with local indigeneous flora (COSP)
- Remove suspended debris between 1 and 2m above ground and mulch to ensure control of annual grasses (COSP)
- Liaise with residents before instigating tree planting projects that may impact on the extent of views (COSP)
- Canvass residents and develop a list of residents who do not object to tree planting on the foreshore adjacent to their properties (COSP)
- Design and implement a schedule for weed maintenance within the native vegetation and turfed areas (COSP)
- Implement streamlining program for the open section of Elderfield Main Drain. Plant with endemic species (COSP)
- Select and mark suitable sites for photographs to enable annual monitoring through photographic record of vegetation condition (COSP)
- Control annual grasses and other weeds which increase the flammability of the reserve (COSP)
- Promote native fauna (frogs, birds) in reserves through a rehabilitation program that increases nesting sites and habitats (COSP)
- Discourage residents (and visitors) from feeding wildlife, using non-intrusive signage (COSP)
- Continue the Birds Australia monitoring program and ensure COSP maintains a register of birdlife for the area. This information can be used to develop signs (COSP)
- Adopt a statement of purpose for all foreshore reserves which includes "conservation of flora and fauna and passive recreation" (COSP)

Perth's Greenways

- Local Govt authorities should identify, manage and protect Greenways
- The establishment of Greenways will require the protection and management of existing vegetation as well as revegetation
- The use of local native species in Greenways should be encouraged. Re-veg projects should ensure species and structural diversity be maintained

Greenplan Recommendations

- None

Parks and Gardens

Bodkin Park

Management Plan Recommendations

- Augment existing landscape features with local native species
- Assess the use of informal track providing access to Juncus stands near Bodkin Drain (COSP)
- Provide groups of native shade trees consistent with existing vegetation. Species M. preissiana, E. rudis and C. calophylla (COSP)
- Provide rubbish bins close to DUP with Poo-ch pouch dispensers (COSP)
- Prepare a feasability Study for the installation of islands and plantings within the Bodkin Lakes, removal of couch and tree planting (Water Corp/COSP)
- Monitor existing plantings in the Bodkin Drain and infill as required (COSP)
- Investigate feasibility of installing sediment and gross pollutant traps to improve water quality (COSP)
- Ensure council mowing teams or street sweepers collect grass clippings that could enter waterways or drains (COSP)
- Adopt a statement of purpose for all foreshore reserves which includes "conservation of flora and fauna and passive recreation" (COSP)
- Undertake water quality sampling and analysis to ensure nutrient levels within water entering wetlands and river is acceptable (COSP/Schools/Community/ Ribbons of Blue)

Greenplan Recommendations

- The City of South Perth encourage the Water Corporation to remove the wood lining of main drain running through Bodkin Park
    - With the aim of creating a 'living stream' to enhance the local habitat and biological filtering of stormwater
- Expand native garden planting in Bodkin Park

Manning Road (3)

Management Plan Recommendations

- Augment existing landscape features with local native species

Greenplan Recommendations

- Expand native garden planting in Manning Road Reserves

Manning Road (4)

Management Plan Recommendations

- Augment existing landscape features with local native species

Greenplan Recommendations

- Expand native garden planting in Manning Road Reserves

Karawara Park

Management Plan Recommendations

- Augment existing landscape features with local native species

Greenplan Recommendations

- Expand native garden planting in Karawara Park

Lady Gowrie Park

Management Plan Recommendations

- Augment existing landscape features with local native species

Greenplan Recommendations

- Expand native garden planting in Lady Gowrie Reserve

Greenway 23 Detail

Greenway 23: George Burnett Park – Clontarf College

Remnant Vegetation

- Clontarf
- Goss Avenue

Parks and Open Spaces

- George Burnett Park
- Manning Road (1)
- Manning Road (2)
- Manning Road (3)
- Manning Road (4)
- Lady Gowrie Park
- Manning Road (5)

Street Tree Boulevards

1000 1077 1084 1085 1089 1093 1095 1098 1115 1119 1124 1126 1131 1136 1137 1139 1142 1143 1146 1147 1156 1157 1158 1161 1168 1171 1172 1173 1174 1177 1178 1188 1192 1202 1207 1211 1214 1224 1225 1235 1241

Note: Red Boulevards are > 80% native species
Blue Boulevards are > 80% local species
Bold Boulevards are > 80% monospecific

Recommendations

Green Plan

- Expand native garden planting in George Burnett Oval
- Expand native garden planting in Manning Road Reserves
- Clontarf College be invited to participate in greenways enhancement programme
- Expand native/local species street tree plantings along Manning Road

Remnant Vegetation

Clontarf

Management Plan Recommendations

- Adopt a statement of purpose for all foreshore reserves which includes "conservation of flora and fauna and passive recreation" (COSP)
- Monitor existing foreshore vegetation (COSP/CB)
- Eradicate introduced species in Br Kearney's Garden (COSP/CB)
- Control bulrush to >10% of surface area of open drains (COSP/CB)
- Plant the landfill buffer adjacent to the salt-marsh at Clontarf East with dry land species of Bassendean Complex (COSP)

- Extend foreshore fauna survey over longer period (COSP)
- Control vermin in conjunction with managers of all nearby bushland and foreshore (DPUD/CALM/COSP/AQCOLL)
- Share expertise in plant propagation with CB/CLABCOL (COSP)
- Assist Skillshare and CLABCOL in rehabilitation trial projects on the foreshore (COSP)
- Extend Parks and Recreation Reservation on foreshore at Clontarf East to include all remnant salt-marsh and a narrow buffer of land filled rising ground (COSP/CB/DPUD)
- Extend protection of System 6 area M67 to include Clontarf Central and East foreshore and Centenary Park foreshore (DPUD/SRT/EPA)

Perth's Greenways

- Local Govt authorities should identify, manage and protect Greenways
- The establishment of Greenways will require the protection and management of existing vegetation as well as revegetation
- The use of local native species in Greenways should be encouraged. Re-veg projects should ensure species and structural diversity be maintained
- The management of vegetation on private lands that contribute to greenways should be encouraged

Greenplan Recommendations

- The City of South Perth encourage the State Government to reserve the conservation category wetland located east of Clontarf College for the purpose of conservation
- The City of South Perth supports local schools to protect and regenerate any bushland that remains on their land
    - This should include both Public and Private schools. Also see recommendation number 60
- Clontarf College be invited to participate in greenways enhancement programme

Goss Avenue

Management Plan Recommendations (this is a subset of recommendations)

- The bushlands should be managed for passive recreation only (COSP/EDWA)
- Erect signs to educate residents not to dump rubbish or pick wildflowers (COSP)
- Liase with the local community to ascertain which pathways are the most used and close down and rehabilitate those not used (COSP)
- Lay and roll crushed limestone (or similar) on remaining pathways (COSP)
- Remove all dumped rubbish (COSP)
- Encourage local residents to exercise vigilance and report any suspicious activity or fires to appropriate authorities (COSP)
- Maintain a register of fire outbreaks (COSP)
- Ensure the first verge mowing occurs in spring to reduce fire hazard (see also Rec. 5.2.2) (COSP)
- Implement a Veldt Grass spraying programme to reduce fuel loads (COSP/EDWA)
- Monitor the site regularly for the presence of feral species (COSP)
- Develop a weed control program utilising manuals denoted in the plan which details actions at the most appropriate times for individual weeds (COSP)

- Investigate the potential of direct seeding or smoke techniques for revegetation where natural regeneration will not suffice (COSP)
- All plantings/seeding should be species representative of the vegetation complex (COSP)
- Plant Corymbia calophylla along the eastern side of the reserve (COSP)
- Select sedge/rush species endemic to Banksia sump lands capable of nutrient uptake for planting on the southern bank of the drain (COSP)
- Liase with Water Corp. to ensure proposed drain plantings and works are consistent with their objectives (COSP/Water Corp.)

Greenplan recommendations

- The City of South Perth supports local schools to protect and regenerate any bushland that remains on their land
    - This should include both Public and Private schools. Also see recommendation number 60

Parks and Gardens

George Burnett Park

Management Plan Recommendations

- Augment existing landscape features with local native species
- Maintain present summer verge mowing programme (COSP)

Greenplan Recommendations

- Expand native garden planting in George Burnett Oval
- To complement Goss Avenue bushland, the local native species planted at Lake Gillon and to enhance Greenway connectivity

Manning Road (1)

Management Plan Recommendations

- Augment existing landscape features with local native species

Greenplan Recommendations

- Expand native garden planting in Manning Road Reserves

Manning Road (2)

Management Plan Recommendations

- Augment existing landscape features with local native species

Greenplan Recommendations

- Expand native garden planting in Manning Road Reserves

Manning Road (3)

Management Plan Recommendations

- Augment existing landscape features with local native species

Greenplan Recommendations

- Expand native garden planting in Manning Road Reserves

Manning Road (4)

Management Plan Recommendations

- Augment existing landscape features with local native species

Greenplan Recommendations

- Expand native garden planting in Manning Road Reserves

Lady Gowrie Park

Management Plan Recommendations

- Augment existing landscape features with local native species

Greenplan Recommendations

- Expand native garden planting in Lady Gowrie Reserve

Manning Road (5)

Management Plan Recommendations

- Augment existing landscape features with local native species

Greenplan Recommendations

- Expand native garden planting in Manning Road Reserves


Greenway 24 Detail
Greenway
Remnant Vegetation
Perth Greenways
Street Tree Boulevards
Cadastre
Greenways Cadastre
Greenways Boulevards
4
7
6
24
19
0.2 0 0.2 0.4 Kilometers
N
W
E
S

Greenway 24: Karawara Park – Agriculture Department

Remnant Vegetation

- None

Parks and Open Spaces

- Collier Park Golf Course
- Karawara Park

Street Tree Boulevards

498 579 580 658 702 743 744 774 871 884 934 952

Note: Red Boulevards are > 80% native species
Blue Boulevards are > 80% local species
Bold Boulevards are > 80% monospecific

Recommendations

Green Plan

- Invite CALM and DAWA to participate in greenways enhancement programme
- Expand native/local species street tree plantings along Kent Street
- Expand native garden planting in Karawara Park
- Expand native garden planting in Collier Park Golf Course
- Expand native/local species street tree plantings along Hayman Road

Remnant Vegetation

None

Parks and Gardens

Collier Park Golf Course

Management Plan Recommendations

- Augment existing landscape features with local native species

Greenplan Recommendations

- Manage the Remnants in the CPGC as native vegetation/native garden
    - These areas abut the water bodies and are in fair condition. Undertake a vegetation survey in spring to determine the species present.
- Encourage expansion of native vegetation around the wetlands in CPGC
    - Vegetation retains a number of native species and are not in the area of play. These areas should ruled "out of bounds".
- Encourage planting of native species between fairways CPGC
- Expand native garden planting in Collier Park Golf Course

Karawara Park

Management Plan Recommendations

- Augment existing landscape features with local native species

Greenplan Recommendations

- Expand native garden planting in Karawara Park